

As filed with the Securities and Exchange Commission on 3 March 2022

UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 20-F

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended 31 December 2021

Commission file number 1-13202

Nokia Corporation

(Exact name of Registrant as specified in its charter)

Republic of Finland
(Jurisdiction of incorporation)

Karakaari 7 FI-02610 Espoo, Finland
(Address of principal executive offices)

Esa Niinimäki, Deputy Chief Legal Officer, Corporate, Telephone: +358 (0) 10 44 88 000, Facsimile: +358 (0) 10 44 81 002,
Karakaari 7, FI-02610 Espoo, Finland
(Name, Telephone, E-mail and/or Facsimile number and Address of Company Contact Person)

Securities registered pursuant to Section 12(b) of the Securities Exchange Act of 1934 (the "Exchange Act"):

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
American Depositary Shares	NOK	New York Stock Exchange
Shares		New York Stock Exchange ⁽¹⁾

(1) Not for trading, but only in connection with the registration of American Depositary Shares representing these shares, pursuant to the requirements of the Securities and Exchange Commission.

Securities registered pursuant to Section 12(g) of the Exchange Act: **None**

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Exchange Act: **None**

Indicate the number of outstanding shares of each of the registrant's classes of capital or common stock as of the close of the period covered by the annual report. Shares: 5 675 461 159.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Exchange Act. Yes ☐ No ☒

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" or "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ☒
Non-accelerated filer ☐
Emerging growth company ☐

Accelerated filer ☐
Smaller reporting company ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP ☐
International Financial Reporting Standards as issued by the International Accounting Standards Board ☒
Other ☐

If "Other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow. Item 17 ☐ Item 18 ☐

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

Cross-reference table to Form 20-F

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Forward-looking statements

Certain statements contained in this report constitute "forward-looking statements." Forward-looking statements provide Nokia's current expectations of future events and trends based on certain assumptions and include any statement that does not directly relate to any current or historical fact. The words "believe," "expect," "expectations," "anticipate," "foresee," "see," "target," "estimate," "designed," "aim," "plan," "intend," "influence," "assumption," "focus," "continue," "project," "should," "is to," "will," "strive," "may" or similar expressions as they relate to us or our management are intended to identify these forward-looking statements, as well as statements regarding:

- A) business strategies, market expansion, growth management, and future industry trends and megatrends and our plans to address them;
- B) future performance of our businesses and any future distributions and dividends;
- C) expectations and targets regarding financial performance, results, operating expenses, cash flows, taxes, currency exchange rates, hedging, cost savings and competitiveness, as well as results of operations including targeted synergies and those related to market share, prices, net sales, income and margins;
- D) expectations, plans, timelines or benefits related to changes in our organizational and operational structure;
- E) market developments in our current and future markets and their seasonality and cyclicalities, including the communications service provider market, as well as general economic conditions, future regulatory developments and the expected impact, timing and duration of the COVID-19 pandemic on our businesses, our supply chain, our customers' businesses and the general market and economic conditions;
- F) our position in the market, including product portfolio and geographical reach, and our ability to use the same to develop the relevant business or market and maintain our order pipeline over time;
- G) any future collaboration or business collaboration agreements or patent license agreements or arbitration awards, including income from any collaboration or partnership, agreement or award;
- H) timing of the development and delivery of our products and services, including our short-term and longer-term expectations around the deployment of 5G and our ability to capitalize on such deployment as well as use our global installed base as the platform for success in 5G, and the overall readiness of the 5G ecosystem;
- I) the outcome of pending and threatened litigation, arbitration, disputes, regulatory proceedings or investigations by authorities;
- J) restructurings, investments, capital structure optimization efforts, divestments and our ability to achieve the financial and operational targets set in connection with any such restructurings, investments, and capital structure optimization efforts including our ongoing cost savings program;
- K) future capital expenditures, temporary incremental expenditures or other R&D expenditures to develop or rollout new products, including 5G; and
- L) the sustainability and corporate responsibility contained in the sustainability and corporate responsibility section of this report.

These statements are based on management's best assumptions and beliefs in light of the information currently available to it and are subject to a number of risks and uncertainties, many of which are beyond our control, which could cause actual results to differ materially from such statements. These statements are only predictions based upon our current expectations and views of future events and developments and are subject to risks and uncertainties that are difficult to predict because they relate to events and depend on circumstances that will occur in the future. Risks and uncertainties that could affect these statements include but are not limited to the risk factors specified under the section "Operating and financial review and prospects-Risk factors" of this report and in our other filings or documents furnished with the U.S. Securities and Exchange Commission. Other unknown or unpredictable factors or underlying assumptions subsequently proven to be incorrect could cause actual results to differ materially from those in the forward-looking statements. We do not undertake any obligation to publicly update or revise forward-looking statements, whether as a result of new information, future events or otherwise, except to the extent legally required.

Introduction and use of certain terms

Nokia Corporation is a public limited liability company incorporated under the laws of the Republic of Finland and registered to the Finnish Trade Register since 1896. In this Annual Report on Form 20-F, any reference to “we,” “us,” “the Group,” “the company” or “Nokia” means Nokia Corporation and its consolidated subsidiaries and generally Nokia’s continuing operations, except where we separately specify that the term means Nokia Corporation or a particular subsidiary or business segment only or our discontinued operations. References to “our shares,” matters relating to our shares or matters of corporate governance refer to the shares and corporate governance of Nokia Corporation.

Nokia Corporation has published its consolidated financial statements in euro for periods beginning on or after 1 January 1999. In this Annual Report on Form 20-F, references to “EUR,” “euro” or “€” are to the common currency of the European Economic and Monetary Union, references to “dollars,” “US dollars,” “USD” or “\$” are to the currency of the United States, and references to “Chinese yuan” or “Chinese yuan renminbi” or “CNY” are to the official currency of the People’s Republic of China. Solely for the convenience of the reader, this Annual Report on Form 20-F contains conversions of selected euro amounts into US dollars at specified rates or, if not so specified, at the year-end rate of 1.1326 US dollars per euro, and conversions of selected euro amounts into Chinese yuan renminbi at specified rates or, if not specified, at the year-end rate 7.1947 Chinese yuan renminbi per euro. The referred year-end rates were the European Central Bank reference rates on 31 December 2021. No representation is made that the amounts have been, could have been or could be converted into US dollars or Chinese yuan at the rates indicated or at any other rates.

Additional terms are defined in the “Glossary.”

The information contained in, or accessible through, the websites linked throughout this Annual Report on Form 20-F is not incorporated by reference into this document and should not be considered a part of this document.

Nokia Corporation furnishes Citibank, N.A., as Depositary, with its consolidated financial statements and a related audit opinion of our independent auditors annually. These financial statements are prepared on the basis of International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board and in conformity with IFRS as adopted by the European Union. In accordance with the rules and regulations of the SEC, we do not provide a reconciliation of net income and shareholders’ equity in our consolidated financial statements to the generally accepted accounting principles in the US, or US GAAP. We also furnish the Depositary with quarterly reports containing unaudited financial information prepared on the basis of IFRS, as well as all notices of shareholders’ meetings and other reports and communications that are made available generally to our shareholders. The Depositary makes these notices, reports and communications available for inspection by record holders of American Depositary Receipts (ADRs), evidencing American Depositary Shares (ADSs), and distributes to all record holders of ADR notices of shareholders’ meetings received by the Depositary.

In addition to the materials delivered to holders of ADRs by the Depositary, holders can access our consolidated financial statements, and other information included in our annual reports and proxy materials, at nokia.com/financials. This Annual Report on Form 20-F is also available at nokia.com/financials as well as on Citibank’s website at <https://app.irdirect.net/company/49733/hotline/>. Holders may also request a hard copy of this annual report by calling the toll-free number 1-877-NOKIA-ADR (1-877-665-4223), or by directing a written request to Citibank, N.A., Shareholder Services, PO Box 43077, Providence, RI 02940-3081, United States. With each annual distribution of our proxy materials, we offer our record holders of ADRs the option of receiving all of these documents electronically in the future.

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Business overview

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The platform for our future

The Nokia platform guides everything we do across our global organization. Its three elements shape our ambition, our strategy and our culture.

Our purpose

At Nokia, we create technology that helps the world act together.

While lives may be getting longer, healthier and richer, the world is facing fundamental challenges: pressure on the planet is increasing, productivity is stalling and access to opportunity remains stubbornly unequal. Technology is central to the solution.

With our customers, we create the critical networks that bring together the world's people, machines and devices, sensing and acting in real time.

- Responding to climate change through more efficient use and re-use of the world's resources
- Restoring productivity growth by bringing digital to the physical industries it has not yet reached
- Providing more inclusive access globally to work, healthcare, markets and education
- Meaningful interactions, to drive human progress

Our commitment

We deliver critical networks through technology leadership and trusted partnerships.

Four strategic commitments define our role in an evolving market:

- We are a trusted partner for critical networks
- We focus on technology leadership in each of our businesses
- We capture the value shift to cloud and new business models
- We create value with long-term research and intellectual property

Read more on page 18.

Essentials

Our guiding principles for the ways of working with and for Nokia are being open, fearless and empowered.

We are continuously working to create a company culture that is inclusive and our essentials lay the foundation of our cultural renewal that is required to deliver our purpose, our strategic commitment and to better serve our customers. Our essentials reflect what we all want to experience.

- **Open** - in mindset, to opportunity, through/with transparency
- **Fearless** - bringing authenticity, sharing ideas and opinions, embracing collaboration
- **Empowered** - to make decisions, to act with clear accountability

Read more on page 83.

Helping the world act together

At Nokia, we create technology that helps the world act together.

We have a responsibility to enable digitalization. We partner with our customers so our technology can help meet some of the most pressing challenges the world faces such as climate change, the digital divide and stalling productivity growth.

Today, the vast majority of the world's economy has not yet been digitalized, leaving a lot of potential. Our products and services can radically accelerate the digitalization process, making operations safer, more connected and more efficient.

In 2021, we significantly reduced the carbon footprint of our products, which in turn reduces the ecological impact of our customers. Driving the acceleration of digitalization is critical for making industries more sustainable, offers significant business opportunities and is key to addressing our global challenges.

Through technology leadership and trusted partnerships we are making a difference in the world.

Regional split of employees and net sales



Global reach

Our technology solutions enable critical networks for communications service providers (CSPs), enterprise verticals and hyperscalers around the world.

Net sales in 2021

EUR 22.2bn

Countries of operation

~130

Average number of employees in 2021

~87 900

Financial Highlights

	2021 EURm	2020 EURm	2019 EURm
For the year ended 31 December, Continuing operations			
Net sales	22 202	21 852	23 315
Gross profit	8 834	8 193	8 264
Gross margin	39.8 %	37.5 %	35.4 %
Operating profit	2 158	885	485
Operating margin	9.7 %	4.0 %	2.1 %
Profit/(loss) for the year	1 654	(2 513)	18
	EUR	EUR	EUR
Earnings per share, diluted	0.29	(0.45)	0.00
Proposed dividend per share ⁽¹⁾	0.08	0.00	0.00
	2021 EURm	2020 EURm	2019 EURm
As of 31 December			
Net cash and current financial investments	4 615	2 485	1 730

(1) The Board of Directors proposes to the Annual General Meeting to be authorized to decide in its discretion on the distribution of an aggregate maximum of EUR 0.08 per share as dividend and/or equity repayment.

Shareholder distributions

Dividend per share proposed in respect of 2021⁽¹⁾

EUR 0.08

Share buyback program to return up to

EUR 600m

over 2 years

(1) The Board of Directors proposes to the Annual General Meeting to be authorized to decide in its discretion on the distribution of an aggregate maximum of EUR 0.08 per share as dividend and/or equity repayment.

Strengthening our technology leadership

R&D investment over the past two decades

EUR 130bn+

Patent families declared as essential to 5G

4 000+

Nobel Prizes awarded for ground-breaking achievements in global innovation

9

Ethical business

In February 2021, we were named for the fourth consecutive year (2018-2021), and the fifth time overall, as one of the World's Most Ethical Companies by Ethisphere.

Read more about our sustainability and corporate responsibility work on page 74.

We announced our target to use 100% renewable electricity by 2025.

Our business groups

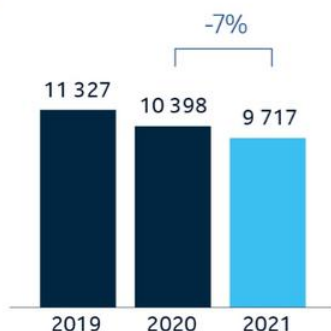
Nokia's renewed operating model is designed to enable the delivery of our strategic ambitions, with a lean corporate center enabling fully accountable business groups. Nokia has four business groups with each business group aiming to become a technology and market leader in their respective sector.

Mobile Networks

Mobile Networks provides products and services for radio access networks covering technologies from 2G to 5G, and microwave radio links for transport networks.

Read more on page 24.

Segment net sales
(EURm)



Segment operating
margin (%)

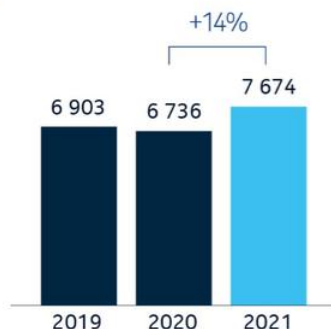


Network Infrastructure

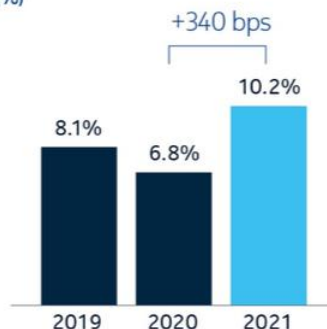
Network Infrastructure provides fiber, copper, fixed wireless access technologies, IP routing, data center, subsea and terrestrial optical networks – along with related services – to customers including communications service providers, webscales (including hyperscalers), digital industries and governments.

Read more on page 26.

Segment net sales
(EURm)



Segment operating
margin (%)

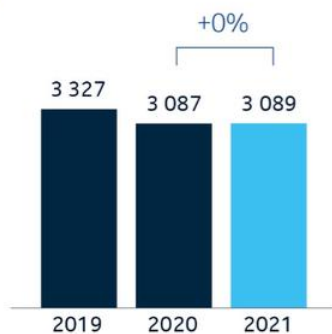


Cloud and Network Services

Cloud and Network Services enables CSPs and enterprises to deploy and monetize 5G, cloud-native software and as-a-Service delivery models.

Read more on page 28.

Segment net sales
(EURm)



Segment operating
margin (%)

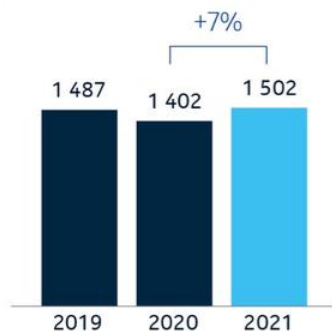


Nokia Technologies

Nokia Technologies is responsible for managing Nokia's patent portfolio and monetizing Nokia's intellectual property including patents, technologies and the Nokia brand.

Read more on page 29.

Segment net sales
(EURm)



Segment operating
margin (%)



Letter from our President and CEO

“This was the year we hit the reset button. We restarted with a whole new operating model, purpose, strategic commitments and cultural essentials. Our new purpose reflects both our current role and our ambition for the future: At Nokia, we create technology that helps the world act together. Considering the pace of our delivery in 2021, we have created an excellent foundation to move to the “accelerate” phase of our strategy to deliver further growth and extend profitability.”

Pekka Lundmark, President and CEO

Press reset

2021 was a transformational year for Nokia. This was the year we hit the reset button. We restarted with a whole new operating model, purpose, strategic commitments and cultural essentials.

At our Capital Markets Day in March, we launched a three-phase plan to reset, accelerate and scale our business to help us deliver on our commitments and return to sustainable, profitable growth.

The reset phase began with shifting our focus from an end-to-end approach to four fully accountable business groups, which aim for technology leadership in all the markets we compete in. We put in place a simplified operating model, led by a slimmed-down leadership team, with clear responsibilities and ownership of their respective areas.

We refocused our cost base and stepped up our investments in key areas like 5G to strengthen our technology leadership.

We adopted a new purpose: At Nokia, we create technology that helps the world act together. And we started the process of renewing our company culture around three essentials: Open, fearless and empowered.

I am pleased to say we made faster than expected progress against our plan this year, achieving improved competitiveness and strengthened technology leadership.

Strong financial and strategic performance

The changes put in place enabled us to deliver a strong financial performance in 2021 with improvements in net sales, gross and operating margins. And the continued strong cash generation and balance sheet put us in a position to look to reinstate shareholder distributions through both a dividend and a share buyback.

All our business groups made significant progress in 2021 to make us more competitive in all the markets in which we compete. Mobile Networks largely closed the gap with competition in 5G and improved its gross margin while continuing to step up R&D investments. Network Infrastructure extended its technology leadership and saw significant growth driven by Fixed Networks and Submarine Networks. Cloud and Network Services took good steps to rebalance its portfolio and we saw encouraging growth in its key focus areas. Nokia Technologies delivered a strong performance and made good progress expanding in areas such as automotive and consumer electronics.

Technology leadership

There were several high-profile and industry-leading product launches this year as we ramped up our efforts to strengthen our technology leadership across all our four business groups.

Mobile Networks launched our new AirScale 5G portfolio, powered by our advanced ReefShark System-on-Chip technology, giving our customers enhanced capacity and connectivity while offering greater energy efficiency and ease of deployment. We made good progress against all our KPIs, including increasing the proportion of our 5G shipments that are “5G Powered by ReefShark” to 76% of all our 5G shipments in December. This put us on track to achieve our target of 100% of all 5G product shipments by the end of 2022. We also opened a new Open RAN testing and collaboration center in the US, and announced partnerships with most of the biggest hyperscalers for cloud-based 5G radio solutions.

Network Infrastructure strengthened Nokia's leadership in IP routing and silicon innovation with the launch of FP5, the industry's most advanced processor for service provider IP networks. We also continued to drive the market in fiber and 5G fixed wireless access, and in Optical Networks we started deploying our market-leading PSE-V coherent chipset to give customers increased performance and cost efficiency. Our Submarine Networks business remains the market leader and is driving innovation in technology and customer solutions.

Cloud and Network Services strengthened our competitive advantage in private wireless with the launch of MX Industrial Edge, a new solution category that will enable on-premises processing of a host of Industry 4.0 applications and help customers accelerate their digitalization plans. We also launched our first Software-as-a-Service products for our communications service provider customers, giving them more flexibility and ways to capture revenue.

Nokia Technologies achieved the important milestone of 4 000 patent families declared as essential for 5G standards. We filed more than 1 500 patent applications, demonstrating our strength and commitment to innovation, and became one of the first companies to receive ISO 9001 certification for our high-quality patent portfolio management.

Additionally, our new **Strategy and Technology** function launched the Nokia Technology Vision 2030 setting out the opportunities we expect to see from trends such as human augmentation and digital-physical fusion as we move from 5G to 5G-Advanced and then 6G by the end of this decade.

Technology is central to solving the biggest global challenges of our time

The stronger our technology the bigger the role we can play as enablers of the green transition. Digitalization can improve productivity, energy efficiency and waste management across industries.

The vast majority of the world's economy has not yet been digitalized, leaving a lot of potential. As we said at the COP26 climate summit in November: "There's no green without digital." Nokia wants to lead the way on the global stage in making the case for digitalization as central to addressing the climate challenge.

We are committed to reducing emissions by 50% across both our own operations and products in use (so-called Scope 3) between 2019 and 2030. Our new recalibrated science-based targets fulfill our commitment to align with a 1.5°C global warming scenario. And in 2021, Nokia also announced a new target to purchase 100% of our electricity from renewable sources by 2025 to power our offices, R&D labs and factories. We also became a founding member of the World Economic Forum's First Movers Coalition, which targets greater uptake of zero-emissions products and services by 2030.

We clearly demonstrated that sustainability is core to our business and embedded into the design, delivery and life cycle of our products and services. For instance, our latest AirScale and FP5 products can improve energy efficiency by 50-75% compared to previous generations. Improving performance and energy efficiency is a win-win financially and environmentally and a major driver for our business as customers increasingly prioritize sustainability when deciding on their partners.

We also take seriously the role of connectivity in building a fairer and more inclusive world. We aim to connect the unconnected and support digital skills to close the digital divide, providing equal access to opportunity. Our ambition is to provide critical networks that enable digital access to healthcare, education, employment, social services, businesses and markets. One concrete example in 2021 was connecting almost 100 schools across Kenya to enable digital learning.

I am also proud that, for the fourth time in a row, we were recognized as one of the World's Most Ethical companies by the Ethisphere Institute.

"There's no green without digital. Nokia wants to lead the way on the global stage in making the case for digitalization as central to the climate challenge."

50-75%

Our latest AirScale and FP5 products can improve energy efficiency by 50-75% compared to previous generations

100%

of the electricity to power our offices, R&D labs and factories will come from renewable sources by 2025

Looking ahead

Overall, 2021 was a transformational year for Nokia and one that created an excellent foundation for us to move into the "accelerate" phase of our strategy to deliver growth and expand profitability.

I am enormously grateful to the entire Nokia team for helping us to successfully reset our business this year and making sure we fulfilled our company purpose to create technology that helps the world act together.

Pekka Lundmark
President and CEO

Our customers and market view

We target three customer segments with our hardware, software and services portfolio: Communications service providers, enterprise verticals and hyperscalers.

Networks play an increasingly important role in the economy and throughout society to enable mission-critical functions for both consumers and businesses. This allows Nokia to expand its market opportunities for delivering critical networks.

Critical networks combine carrier-grade resilience, reliability and security with webscale flexibility and elasticity. They are already in use today across industries like precision manufacturing, remote surgery, and high-frequency trading. As we move ahead in an era of digitalization, critical networks will gain much more importance and reliability requirements will increase significantly.

We target three customer segments with our hardware, software and services portfolio: Communications service providers, enterprise verticals and hyperscalers. Additionally, we focus on licensees in selected industries that benefit from the value of our innovations, primarily in the mobile devices, automotive, consumer electronics and emerging IoT industries.

In this section, we outline the trends that we see in each of our customer segments. Our analysis of the market evolution and customer trends informs our strategy.

Communications service providers (CSPs)

The CSPs estimated total addressable market (TAM) grew by 4% to EUR 98 billion from 2020 to 2021.

A communications service provider offers telecommunications services like voice and/or data services through fixed and/or mobile connectivity to consumers, enterprises, governments and other communications service providers. The CSPs estimated total addressable market grew by 4% to EUR 98 billion from 2020 to 2021. We expect it to grow only moderately at 1% compound annual growth rate (CAGR) 2021-26. We project the total radio access network (RAN) market outside China to continue solid growth during the same period. The market growth is driven by strong 5G RAN demand, partially offset by declining investments in 2G/3G and LTE. IP routing and optical networks for CSPs are expected to grow slightly above, or at the rate of, the overall CSP market. CSP investment in higher-speed access technologies (fiber and fixed wireless access) continues to drive investment in IP and optical layers to handle the increasing demand. The 5G cycle will also yield growth in software, namely in 5G Core and in all software segments supporting 5G operations and monetization.

CSPs have kept their capital expenditure intensity flat, but increased their earnings before interest, taxes, depreciation and amortization (EBITDA) by automation, digitalization, shift in channel mix, outsourcing and asset sales. We expect them to remain focused on the monetization of their connectivity strengths and on cost optimization. CSPs continue to assess their deployment architecture, asset structure, operating model and vendor relationships. They are also considering the divestments of passive infrastructure and the transition to network sharing models. In areas in which the network is built for coverage this might reduce the demand for network vendor equipment.

CSPs nurture a more diverse supplier ecosystem based on open architectures. Their aim is to broaden their supplier options and increase competition to strengthen their pricing power towards the network vendors. We have seen the first examples of CSPs relying on hyperscalers to lead the transition to a cloud-based operational and business model. This introduces new players and increases competition for established network vendors. Lastly, geopolitics and environmental, social and governance (ESG) criteria influence investment decisions. Security and sovereignty have become important factors in the vendor landscape. Government-funded broadband initiatives influence the investments of CSPs, for example in rural areas and support the emergence of neutral hosts. ESG factors drive green energy use, energy consumption reduction plans and circular economy approaches and shift the criteria for vendor selection as a result.

Enterprise

Enterprise estimated TAM grew by 9% to EUR 16 billion from 2020 to 2021.

Enterprise TAM includes fast-growing enterprise verticals and more mature hyperscaler markets. Enterprise estimated TAM grew by 9% to EUR 16 billion from 2020 to 2021. We forecast this market to grow strongly at 9% CAGR until 2026.

Enterprise verticals

An enterprise vertical represents a grouping of companies by an industry (like energy or transportation) that offers products and services that meet specific needs of that industry. Within the enterprise verticals segments, we primarily focus on transportation, energy, manufacturing, logistics and the public sector. We project that growth will be mainly driven by private wireless networks in manufacturing and logistics as well as energy. We estimate IP routing and optical networks will grow moderately.

The digitalization and automation of operations across verticals accelerates demand for critical networks. In manufacturing and logistics, the transition to software-centric operations and the adoption of industrial clouds and operational technology (OT) edge will further increase efficiency. Private wireless networks and mission-critical industrial edge applications are key enablers. In the energy sector, networks allow for demand management and grid automation. In transportation, vehicle automation and the automation of ports and hub operations will further increase efficiency.

Hyperscalers

Hyperscaler refers to companies like Alphabet (Google), Amazon (Amazon Web Services), Microsoft and Meta Platforms (Facebook) that provide cloud solutions at a global scale, leveraging massive connected data centers. Our TAM for hyperscalers consists of optical networks and IP routing. Within optical networks, we foresee that data center interconnect (DCI) technology will be a strong driver.

Hyperscalers are not only a customer segment for Nokia. They also assume an increasingly important role in the telecommunication domain and will become ecosystem partners and potential competitors. Hyperscalers target edge computing as the next growth engine for industrial automation workloads and low-latency applications. They partner with CSPs to co-locate edge stacks on-premise and at metro sites. Furthermore, they aim to run telco network workloads on their cloud infrastructure. Hyperscalers engage in the transformation of network operations with collaboration models and services for 5G cloud deployments.

CSPs	Verticals	Hyperscalers
<p>Focus on connectivity strengths and cost optimization</p> <p>Favoring cloud strengths in vendor and partner ecosystem</p> <p>Network monetization targeting enterprise and edge use cases</p> <p>ESG energy consumption reduction plans, circular economy approaches</p>	<p>Digitalization and automation of operations in industrial segments</p> <p>Transition to software-centric operations and adoption of industrial clouds and OT edge</p> <p>Energy and manufacturing as early adopters of private wireless and automation solutions</p> <p>Federal, state government and cities network modernization acceleration</p>	<p>Edge computing as growth engine – industrial automation workloads across on-premise, edge, public cloud</p> <p>Partnering with CSPs to co-locate edge stacks and building an ecosystem for low-latency apps</p> <p>Targeting telco and network workloads to run on their cloud infrastructure</p> <p>Collaborating with CSPs in the transformation of network operations</p>

Industry trends

Shaping the future of critical networks

We have identified 10 trends that will shape the future of critical networks and influence the distribution of value and the future competitive landscape within the industry ecosystems.

1. Open architectures and Open RAN:

We see increased activities towards open network architectures, most notably Open RAN (radio access network) with the O-RAN alliance. Open RAN aims at splitting a base transceiver station (BTS) into its subcomponents with open interfaces and introduces a new network function, RAN Intelligent Controller. The subcomponents can then be provided by different suppliers. CSPs currently experiment with the objective to build and nurture the open ecosystem and diversify their supplier base.

2. Cloud RAN:

Cloud RAN refers to all or some of the baseband functions being run on a commercial-off-the-shelf (COTS) computing platform rather than purpose-built hardware. The objective is to benefit from cloud computing efficiencies and the pooling of resources. Its adoption will be dependent on the cost-efficiency of COTS platforms, fiber build-out and the availability of hosting data centers.

3. Private wireless networks:

Large industrials are enhancing their operational technology networks with the target of connecting their infrastructure and devices, often in a wireless manner. This enables the collection and aggregation of operational data, which in turn is used to improve overall productivity. We currently see players in enterprise verticals building their own private 4G/5G networks complementing their wi-fi and fixed networks and expect this trend to continue.

4. Edge cloud:

To advance digitalization and automation, there is demand for specific workloads to move from the central cloud to be closer to the application due to the required low latency. The on-premise enterprise edge is best suited to serve privacy-oriented, mission-critical use cases. The remaining low latency use cases can be served at the Wide Area Network (WAN) termination site.

5. Hybrid cloud:

Hybrid cloud is emerging as a strong enabler for accelerating digital transformation. Enterprises adopting hybrid cloud models benefit from public cloud (multi-cloud) services, augmented by traditional IT systems and privacy-oriented private clouds. In this context, enterprises or CSPs as their WAN providers have brought the large cloud providers (Amazon Web Services, Microsoft Azure, Google Cloud Platform) in their WAN.

6. As-a-Service delivery and business models:

With as-a-Service (aaS) business models predominant for software applications in enterprise, CSPs have started migrating their IT apps to public clouds and consuming them aaS. This development is also increasing in network software. For network functions like 5G Core, CSPs will likely use a phased approach with software migrating to a cloud deployment model (hybrid) first, before transitioning to an aaS business model. We expect that in the mid- to long-term, most network software and network functions will be consumed in an aaS model.

7. Coherent routing:

Pluggable coherent 400G optics, optimized line systems and network automation will enable the next generation of IP/Optical network evolution primarily for point-to-point router connections (DCI). Aggregation and backbone networks will leverage reconfigurable optical add-drop multiplexer (ROADM)-optimized IP topologies to optimize for performance and cost.

8. Infrastructure sharing:

CSPs are seeking to optimize their cost and asset structure, which leads to network sharing initiatives and spin-offs. The emergence of neutral hosts is supported by government broadband initiatives and capital from infrastructure funds. The neutral host model will take different forms depending on the market context. We expect predominantly passive infrastructure sharing with some expansion into active fiber and metro edge compute across the mid-term time frame.

9. Non-terrestrial networks:

Non-terrestrial networks are under disruption from technology-driven performance and cost improvements and the emergence of the Low Earth Orbit (LEO) deployment model. We expect the non-terrestrial networks to be mainly complementary to terrestrial networks in terms of coverage in low population density areas.

10. System-on-a-Chip (SoC):

SoCs provide a source of competitive differentiation on performance, cost and power. Industry and use case specific workloads leverage custom SoCs that provide the required performance at optimal total cost of ownership. Software applications will be redesigned to take advantage of hybrid SoC-based and commoditized x86-based platforms. We expect the build-out of the edge and the migration of workloads to hybrid cloud architecture to influence the timing of bespoke SoC utilization. The industry perspective changes from x86 for all workloads towards use case driven bespoke processor and accelerators.

Our strategic commitments

Our main strategic commitment is to deliver critical networks through technology leadership and trusted partnerships. Building on this, four strategic commitments define the focus of our strategy in an evolving market.

In March 2021, we concluded a strategic review which resulted in four strategic commitments, announced as part of our Nokia platform. While our purpose describes the “why” and our cultural essentials the “how” of what we do, the strategic commitment establishes the “what.” Our main strategic commitment is to deliver critical networks through technology leadership and trusted partnerships. Building on this, our four strategic commitments define our focus in an evolving market, help us strengthen our position to secure opportunities in technology disruptions and hedge against potential risks.

We are a trusted partner for critical networks

Our customers build the critical networks that provide essential services for the economy and throughout society. Critical networks have the combined traits from CSP and hyperscaler networks. Like CSP networks, critical networks deliver “carrier-grade” performance, high availability and resilience. Like hyperscaler networks, they are intelligent, autonomous, flexible and agile enough to serve customers on demand. To be their trusted partner, our understanding of the needs of CSPs, enterprises and hyperscalers in an evolving market is essential. Value creation opportunities come from a deep, trusted partnership with our customers: for CSPs, for enterprise verticals and for hyperscalers.

We focus on technology leadership in each of our businesses

Cost and performance remain the top priorities for our customers. CSPs, in particular, have not experienced strong top-line growth in recent years but still need to continuously invest in their networks. Our customers build their critical networks based upon a best-of-breed approach. Network elements are selected on a best performance per total cost of ownership basis. We see this trend becoming more important as networks become more open and cloudified.

In our highly competitive industry, technology leadership is also required to underpin momentum and financial returns. It is the key to regain some pricing power, drive market share and improve profitability. Competitive dynamics in the CSP industry strongly favor the top two vendors. Almost all CSPs dual source, giving vendors no pricing power unless they offer some technology advantage. In a market with a small number of vendors,

technology leadership is the main lever to grow organically. In addition, technology leadership increases the scale of the business and consequently improves the operating leverage in a business with high fixed costs.

In our industry, only the top one or two players create value and earn returns above their cost of capital. Therefore, each of our businesses is focused on technology leadership, and we will reconsider our segment participation in the domains in which we do not have technology leadership and do not see a credible path to achieve it.

We capture the value shift to cloud and new business models

We see networks evolving to further optimize performance to cost and increase flexibility. Value in critical networks will migrate away from monolithic systems towards silicon, software and service and will be captured through different business models like as-a-Service (aaS), for example. This development will allow networks to be consumed more flexibly and tailored towards new use cases that combine the capabilities of different players.

We have positioned our business to capture growth opportunities by investing in Open RAN (radio access networks) and cloudification. We work closely with the main hyperscalers to bring cloud computing benefits to mobile networks. We rebalance our investments to build and strengthen a winning proposition in a cloud-native software suite in the domains of 5G Core, analytics and artificial intelligence, mission-critical industrial edge and private wireless, digital operations, monetization and security. We target to transform our software business into an aaaS business and delivery model.

We create value with long-term research and intellectual property

Sustainable technology leadership requires us to anticipate, shape and invest in the next technology wave. Our innovations, research assets and intellectual property provide both the technology and the financial platform to enable us to take the long-term view and deliver sustainable success.

While our business groups focus on near- to mid-term innovation, Nokia Bell Labs, our world-renowned industrial research arm, is focused on a farther time horizon in its ambition to anticipate and shape longer-term technology cycles and inflection points. To that end, we are deeply engaged in leading and influencing standards and developing new standard essential patents (SEPs). Standards work is important for us to shape technology cycles. This gives us the ability to take a longer-term perspective and to invest in further technology leadership for the future.

Our path to continued technology leadership

As one of the industry's leading investors in communication technology research and development (R&D), we drive innovation across a comprehensive portfolio of network equipment, software, services and licensing opportunities.

Nokia's world-leading research and development

We have a global network of R&D centers, each with technology and competence specialties and ecosystems. Most of our R&D is conducted in the business group structures and is further elaborated upon in the business group section of this report.

Nokia Bell Labs and long-term technology leadership

Nokia Bell Labs continues its long-standing tradition of disruptive innovation in the fundamental technologies that underpin communications networks and systems, helping us to further secure our technology leadership. A key part of its charter is to also explore concepts that generate growth opportunities in adjacent and emerging markets. To address this dual mission, Nokia Bell Labs streamlined its structure in 2021, forming two organizations under the Nokia Bell Labs umbrella:

- Bell Labs Core Research: focuses on creating game-changing innovations that define the future of networks. It also explores key technologies to prepare our businesses for the 6G era on a ten-year horizon.
- Bell Labs Solutions Research: focuses on creating new value chains. It identifies opportunities beyond our current product and solutions portfolio and explores new market spaces and technology licensing possibilities.

Nokia has pioneered many of the foundational technologies of the 5G era and our research is already now focusing on the future beyond 5G so that we are firmly positioned to continue our leading role. 5G-Advanced is a key stepping stone to the 6G era and will develop 5G to its fullest capabilities, providing an improved experience for humans and machines, as well as extensions for new use cases and functionalities. Nokia is investing to lead in 5G-Advanced networks that are anticipated to begin appearing in 2025. We are also already actively preparing for leadership in 6G. Hexa-X, the European Commission's flagship 6G initiative for research into the next generation of wireless networks, began in January 2021 with Nokia as project lead and working closely with a strong consortium of European partners.

Our Technology Vision 2030

Going into 2030, we believe that two of the most impactful drivers that will dominate network traffic and shape the evolution of networks will be human augmentation and digital-physical fusion.

In 2021, we analyzed the direction and drivers of technological change in a company-wide exercise that resulted in our Technology Vision 2030.

We expect that new human augmentation technologies, like extended reality (XR), as well as digital-physical fusion technologies, like digital twins, will drive network traffic and future developments in connectivity as we enter this new era of unprecedented immersiveness and industrial digitalization.

This will create a next level of expectations for networks – on performance, reliability, ubiquity, security, openness and sustainability – with completely new pressures to match the agility of the cloud as emerging use cases focus on aaS models and performance-sensitive applications at the edge.

As we move from the 5G era towards 5G-Advanced and onwards to the 6G era, the communications fabric will need to be architected differently. Examples of this network evolution will include extreme performance specialized networks for lowest latency and highest reliability, a multi-layered network of networks to meet the new requirements of emerging applications, and with network aaS, the enabling of networks to be consumed like cloud services.

With a focused corporate and technology strategy, we believe we are strongly positioned to lead this evolution.



Nokia has been adapting to the needs of an ever-changing world for over 155 years.

Milestones

1865

Founded as a single paper mill operation

1960s

Nokia becomes a conglomerate comprising rubber, cable, forestry, electronics and power-generation businesses

2007

Entered a joint venture with Siemens, combining mobile and fixed-line phone network equipment businesses and creating Nokia Siemens Networks (NSN)

2011

Entered a strategic partnership with Microsoft to address increasing competition from iOS and Android operating systems

2011

Acquired the wireless network equipment division of Motorola

2013

Purchased Siemens' stake in NSN

2014

Sold Devices and Services business to Microsoft

2016

Acquired Alcatel-Lucent, including Bell Labs, creating an innovation leader in next-generation technology and services

2017

Created Nokia Shanghai Bell, a joint venture between Nokia and China Huaxin, integrating Alcatel-Lucent Shanghai Bell Co. Ltd and Nokia China

2017-2021

Additional acquisitions enhancing our technology leadership such as:

Deepfield, the US-based leader in real-time analytics for IP network performance management and security; Comptel, a Finland-based telecommunications software company; Unium, a Seattle-based software company that specializes in solving complex wireless networking problems for use in mission-critical and residential wi-fi applications; and Elenion, a US-based company focusing on silicon photonics technology

Innovations

1926

Brought sound to motion pictures*

1947

Developed the transistor, a tiny device that revolutionized the entire electronics industry*

1954

Created the solar cell, enabling the conversion of the sun's energy into electricity*

1958

Developed the laser, creating the foundation for fiber optics*

1962

Launched the first communications satellite, Telstar 1, into orbit enabling the first ever broadcast of live television between the US and Europe*

1969

Developed Unix, the software system that made the large-scale networking of diverse computing systems and the internet practical*

1982

Introduced both the first fully digital local telephone exchange in Europe and the world's first NMT car phone

1991

Enabled the first GSM call using a Nokia phone over the Nokia-built network of Finnish communications service provider Radiolinja

1998

Became the world's largest manufacturer of mobile phones

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2001

Invented MIMO (Multiple-Input and Multiple-Output), a key element of a large number of modern wireless systems, that allows for greater throughput without increasing bandwidth requirements*

2006

Developed Softrouter, a routing architecture permitting development of a programmable, open network infrastructure to allow easier deployment of new services that make use of exposed network capabilities*

2014

Developed XG-FAST technology, enabling service providers to generate fiber-like speeds of more than 10Gbps over short distances using existing copper infrastructure*

2017

Developed Probabilistic Constellation Shaping, an innovative technology to get the most out of each fiber, irrespective of its length and capabilities

2019

Opened the world's first live end-to-end 5G lab, the Future X Lab in Murray Hill, New Jersey, US

2020

Selected by NASA to build and deploy the first end-to-end LTE solution on the lunar surface

Enabled commercial deployment of the world's first 5G liquid cooling solution

Set the 5G speed world record

2021

Developed the Resh programming language to take control of and manage a fleet of robots

*Bell Telephone Laboratories (1925-1984). Following its acquisition by Nokia in 2016, the company was renamed Nokia Bell Labs.

Customer Experience

The Nokia Customer Experience (CX) organization was formed in 2021 to ensure we engage customers with a unified and consistent voice. It also serves as our customers' advocate inside Nokia to see to it that we understand the needs of our customers and deliver the best possible experience for them.

The new CX organization unites our sales and customer marketing under one umbrella, allowing us to better leverage commonly required platforms, processes and resources. CX drives growth across all business group portfolios by engaging CSPs, enterprise verticals, hyperscalers and governments, positioning Nokia as a technology leader, innovation partner and solutions provider worldwide.

Our customers benefit through the unique insights as the result of our extensive analysis of the market. This enables them to make the best strategic technology decisions to help grow their business.

While enterprise sales, marketing and delivery have moved under the CX umbrella, products developed for this diverse customer segment remain in the relevant business groups. Working across industries such as manufacturing, supply chain logistics, energy, transportation and the public sector, as well as harnessing the power of our growing partner community, the enterprise team helps customers address their unique business challenges through Industry 4.0 digital transformation. Our solutions help transform operations and modernize communication networks with leading next-generation technologies from across our businesses – including IP, optical, fiber and private wireless networking. The enterprise team has worked with more than 2 200 organizations – connecting people and technologies, improving safety both in the workplace (workers and operations) and in cities around the world, increasing automation and agility to boost productivity and efficiency, and helping customers achieve greater resilience and sustainability through digitalization.

Together, CX and the business groups align on our go-to-market ambitions, resourcing and customer requirements, enabling the business groups to remain accountable for their own financial performance. Collective competence, delivered consistently across all business groups, coupled with deep expertise across each unique industry we serve, solves customer challenges, inspires growth and enables our customers to achieve their immediate and long-term goals.

Case study: Nokia 5G private wireless networking moves from trial to permanent deployment for Lufthansa Technik

5G private wireless networking has enabled Lufthansa Technik to maintain business continuity throughout the pandemic, providing the ability to conduct virtual aircraft maintenance inspections for its civil aviation customers over fast, high-definition video links.

Over a high-quality video stream, customers communicate in real time with engine mechanics performing maintenance work. Dismantled parts are jointly inspected on-screen in high resolution, enabling informed decisions to be made. Virtual Table Inspection has now been integrated into Lufthansa Technik's digital AVIATAR technical aircraft fleet management solution.

The network is based on Nokia Digital Automation Cloud (NDAC) 5G SA. NDAC is a 5G private wireless platform providing high-bandwidth, low-latency, hyperfast private wireless connectivity and local edge computing, providing key digitalization enablers for customers looking to transform to Industry 4.0 operations.

Mobile Networks

2021 was a transformational year for Mobile Networks. We increased our R&D investments and largely closed the gap with key competition in 5G.

Tommi Uitto
President, Mobile Networks

Mobile Networks provides products and services for radio access networks covering technologies from 2G to 5G, and microwave radio links for transport networks.

Market overview

In RAN, we are seeing an uplift in the 5G share of the market, as communications service provider customers replace volumes of previous technology generations to better serve subscribers with high-speed mobile broadband.

Our market is also driven by growth in enterprise use cases, as companies across different industries, including manufacturing and energy, further automate their business processes.

The estimated Mobile Networks addressable market, excluding China, for 2021 was EUR 46 billion. We currently forecast an addressable market for 2022 of EUR 49 billion. We estimate that the addressable market will grow by approximately 3% in 2022 excluding the impact of changes in foreign currency exchange rates.

Business overview and organization

Aligned with our customer needs and as part of Nokia's transformation, Mobile Networks adopted a new organization and operating model at the start of 2021. The business group now encompasses not only products for RAN and microwave links, but also network management solutions and services to plan, deploy, optimize and maintain networks.

In 2021, Mobile Networks launched a new 5G portfolio powered by the latest ReefShark System-on-Chip technology, bringing increased capacity and connectivity to our customers. The launches covered new AirScale radios, including the industry's lightest high-power, 400MHz 32TRX Massive MIMO, and new baseband modules, supporting 90 000 connected users simultaneously while enabling a reduction in power consumption of up to 75%. With Single RAN software and multiradio baseband plug-in cards supporting all radio access technologies from 2G to 5G, Nokia is accelerating 5G rollouts and reducing overall RAN total cost of ownership, by unlocking network efficiencies with common transport, common operability, common software delivery and increased hardware sharing.

Mobile Networks proactively develops new approaches to building networks. In 2021, we launched Nokia Edge Automation to manage multiple cloud deployments supporting new 5G use cases, opened a new Open RAN testing and collaboration center in the US, and announced partnerships with Amazon Web Services (AWS), Google Cloud and Microsoft for cloud-based 5G radio solutions.

In 2021, we met our target to hold an estimated 25-27% share of the RAN market, excluding China. Our 4G networks deliver industry leading performance with best average downlink and uplink speeds, providing a solid foundation for us to evolve our customers' networks to 5G⁽¹⁾. In 2021, we also largely closed the gap with our key competition in 5G performance.

By the end of 2021, Nokia supplied to approximately 40% of launched 5G networks, in half of the countries with live 5G. We had 214 commercial 5G deals, which included many new 5G customers, such as Net4Mobility in Sweden, Telus in Canada, Orange in Belgium, Elisa in Estonia and TPG Telecom in Australia. We also strengthened our footprint in China, signing new 5G deals with China Mobile and China Broadcasting Network.

Our primary focus is on building technology leadership and bringing the best performing networks to our customers. We made significant progress in enhancing our R&D output during 2019-2021. Our 5G R&D headcount increased by approximately 60% from the beginning of 2019 until the end of 2021 and our 5G software feature output increased 130% during the same time period, outpacing the increase in our headcount and indicating improved efficiency and productivity.

In line with Nokia's overall commitment to support the Paris Agreement to limit global warming to 1.5°C, Mobile Networks announced that it would reduce the average power consumption of its AirScale 5G mMIMO Base Station Site Solution by 50% by 2023, compared to our 2019 level. In addition, to cut cooling energy consumption, we successfully trialled our Liquid Cooling baseband solution with Japanese communications service provider, KDDI.

Competition

The RAN market, including associated network management solutions and network services, is a highly consolidated market. Our main competitors are Huawei, Ericsson, Samsung and ZTE, but there are also a number of smaller competitors competing in specific technology or regional sub-segments. For example, in microwave radio links, our competitors include Ceragon, NEC and Aviat.

214

commercial 5G deals

130%

increase in 5G software feature output from start of 2019 till end of 2021

2021 in brief

In 2021, Mobile Networks net sales declined 7% as expected market share loss in North America was partially compensated for by other regions. With increased investments in R&D, we were able to accelerate product roadmaps towards technology leadership. Despite these investments, improved cost competitiveness and execution meant we were still able to deliver a segment operating margin of 7.9% remaining stable year-on-year.

- Reached 214 commercial 5G deals and had more than 420 private wireless customers, over 80 with 5G
- Launched our new AirScale 5G portfolio powered by ReefShark technology, bringing higher capacity, coverage, power efficiency and easy deployment
- Our new AirScale portfolio is O-RAN ready, supporting our efforts to develop cloud-based, open approaches to building networks
- Set a new target to reduce our base station power consumption by 50% by 2023 compared to our 2019 level
- Launched new AI-driven digital services to help CSPs reduce the complexity of network support and maintenance
- Launched Nokia Smart Node, an all-in-one solution for premium 5G mobile indoor coverage, as well as new additions to our Wavence microwave transport portfolio

(1) Nokia analysis based on crowdsourced data from Tutela Technologies Ltd. (May-September 2021)

Network Infrastructure

Spanning the globe, both on land and under the sea, our networks are the capillaries of connectivity.

Federico Guillén
President, Network Infrastructure

Network Infrastructure works with a wide range of customers in the CSP, enterprise, webscale and hyperscaler segments to meet their access, transport, routing and core needs, both terrestrial and subsea.

Market overview

Network Infrastructure comprises four complementary business divisions that can share best practice and collaborate on technology and operations, while maintaining a specialized, highly customer-centric approach.

The pandemic has accelerated and highlighted the explosion in global demand for connectivity and capacity, with moves in every society towards online work, education, entertainment, medicine and socializing. A renewed focus on broadband as a critical network element provides the impetus for CSPs, governments and others to invest in fiber, fixed wireless access and supporting IP and optical network infrastructure. As access technology evolves to 10G, 25G, and beyond, communications service providers add revenue streams by serving residential users, businesses, and 5G cells with a single network.

Our products help established CSPs and new players to build networks that can enable a new wave of industrial digitalization. They support consumers, enterprises and webscales (including hyperscalers). On land and under the sea, our networks are the capillaries of connectivity.

The estimated Network Infrastructure addressable market, excluding Submarine Networks, for 2021 was EUR 42 billion. We currently forecast an addressable market for 2022 of EUR 45 billion. We estimate that the addressable market will grow by approximately 3% in 2022 excluding the impact of changes in foreign currency exchange rates.

Business overview and organization

Our business divisions are: Fixed Networks, IP Networks, Optical Networks and Submarine Networks. Across our portfolio we combine innovative hardware and software solutions with specialist professional services to deliver value to customers.

Fixed Networks offers fiber and copper-based access infrastructure; wi-fi solutions, cloud and virtualization. We have a leading position in fiber technology and are the leaders in XGS-PON⁽¹⁾. We were also the first to offer a commercial 25G PON solution. Our in-house developed Quillion chipset brings best-in-class performance across our portfolio and enables us to innovate rapidly and with agility. We have made a strong start in the relatively new area of 5G fixed wireless access (FWA), based on technology leadership. Our wi-fi portfolio includes mesh solutions and cloud-based controllers – to manage wi-fi access points in the home – while CSPs can streamline and automate operations with our software-defined access network portfolio.

IP Networks provides IP routing solutions for IP aggregation, edge and core applications for residential, business, mobile and industrial services. Our solutions – combined with our network automation platform – enable customers to control, manage, analyze and secure their IP networks. Our software-defined WAN solutions bring easy, efficient network connectivity configuration among clouds and to any enterprise branch. Nokia has recently brought to market a next-generation “data center fabric” solution, making data center switching and cloud environments easier to scale, adapt and operate. Our ability to offer high performance and massively scalable networks is based on innovation – during 2021, we launched the latest generation in our successful in-house designed family of routing silicon.

Optical Networks is a leader in optical transport networks for metro, regional, long-haul and ultra-long-haul applications, helping communications service providers build smarter transport networks, using our software tools and automation to deliver streamlined service delivery and lower total cost of ownership. The portfolio includes coherent optical transponders, optical transport network switching, wavelength-division multiplexing, reconfigurable optical add-drop multiplexer solutions and optical line systems for metro access and aggregation, data center interconnect, regional and long-haul/ultra-long-haul applications. Our intense focus on technology innovation enabled us, in 2021, to start shipping our fifth generation of coherent optical technology, based on our in-house designed PSE-V digital signal processor.

Submarine Networks has a large physical infrastructure and a strongly cyclical business pattern. As submarine capacity is in an expansion phase – driven by webscales – the market is strong and Nokia is a leader. During 2021 we sought to consolidate our leadership by updating our fleet and focusing on converting a strong backlog of orders into revenue and we are bringing our technology focus to bear on areas including next-generation spatial division multiplexing.

25G PON

We brought the world's fastest fiber network to life

50%

Our Quillion and PSE-V chipsets provide around 50% higher energy efficiency than previous generations

75%

FP5 offers up to 75% reduction in power consumption by comparison with previous generation

Competition

Our competitors include Huawei and ZTE, along with Calix and Adtran (Fixed Networks), Cisco and Juniper (IP Networks), Ciena and Infinera (Optical Networks), and Subcom and NEC (Submarine Networks).

2021 in brief

In 2021, Network Infrastructure grew net sales by 14% from 2020, driven by strong growth in our Fixed Networks and Submarine Networks divisions, as well as solid performance in our IP Networks and Optical Networks divisions. Our segment operating margin grew by a healthy 3.4 percentage points to 10.2%.

- Launched our FP5 routing silicon and platforms, offering CSPs enhanced capacity, security and power efficiency with high investment protection
- Brought the world's fastest fiber network (25G PON) to life for Proximus, Belgium; we are also trialing 25G with, among others, Openreach, UK
- Chosen by Telefónica, Spain, to complete its IP network transformation, enabling the expansion of fiber-to-the-home and 5G services
- Selected as the single supplier for Swisscom's new fully automated, high-capacity optical transport network
- Chosen by China Mobile Cloud to provide an end-to-end SDN solution for its public cloud service
- Selected for 2Africa: The world's largest subsea system

(1) Dell'Oro Broadband Access 2021 Q3 report

Cloud and Network Services

In 2021, CNS made significant progress in its mission to help customers and partners create new value, deliver innovative digital services and transform business operations.

Raghav Sahgal

President, Cloud and Network Services

Cloud and Network Services serves communications service providers, enterprise, and hyperscale customers and partners, helping them to navigate three major industry transitions: the introduction of 5G networks and services, cloud-native software and as-a-Service delivery models.

Market overview

The introduction of 5G networks and services, cloud-native software and as-a-Service delivery models places demands on organizations to find new ways to monetize digital assets, optimize costs, navigate complexity and mitigate security risks for their mission-critical networks.

The estimated Cloud and Network Services addressable market for 2021 was EUR 26 billion. We currently forecast an addressable market for 2022 of EUR 28 billion. We estimate that the addressable market will grow by approximately 5% in 2022 excluding the impact of changes in foreign currency exchange rates.

Business overview and organization

Cloud and Network Services comprises four areas of business focus: Business applications software, cloud and cognitive services, core networks software and enterprise solutions. The group has prioritized research and development and portfolio investments that reinforce our focus on technology leadership, which is a leading priority for our customers and a crucial marketplace differentiator.

Addressing selected platforms for growth, we are focusing our investment on 5G core software, analytics and AI Services, digital operations, monetization, private wireless and industrial automation, and security.

We have identified these fast-growing, higher-margin areas as being critically important to our CSP and enterprise customers as they deploy, operate, and monetize the next wave of 5G.

We are already delivering cloud-native solutions that provide network quality of service and agility. We are enabling customers to leverage network intelligence for user insights that facilitate efficiency and sustainability, self-protection and self-healing. We are deploying industrial solutions that drive digital transformation and Industry 4.0. And we are helping CSPs to automate network operations and manage security.

Transition to Software-as-a-Service (SaaS) delivery of network software and associated use cases is also a key aspect of Cloud and Network Services' strategy.

Throughout 2021, Cloud and Network Services has refined operations and sales team alignment to create efficiencies and enhance portfolio positioning with customers.

Customer demand for 5G digital operations, monetization, security and analytics solutions has resulted in solid business applications software performance. Cloud and cognitive services continues to demonstrate improved performance across its cloud and managed services portfolio.

Digitalization plays a critical role in combating climate change and enabling a sustainable future. Our AI-based energy efficiency service provides an intelligent, automated way for CSP customers to control equipment power consumption, enabling them to manage energy use across their networks. In addition, our private wireless technology supports solar power plant and wind farm communications, maintenance and safety needs.

During 2021, we were named by industry analysts as a market leader in subscriber data management software⁽¹⁾, network automation software⁽²⁾, private cellular networking⁽³⁾ and data, AI and development platforms⁽⁴⁾.

Competition

Cloud and Network Services operates in a fast-moving marketplace characterized by numerous competitors that range from niche providers to global technology enterprises whose offerings span several technical capabilities.

The competitive environment comprises networking companies, infrastructure and application software suppliers, services specialists, hyperscalers, cloud providers and a wide range of industry segment businesses.

We operate in a dynamic situation, where vendors and other industry participants may on occasion be a partner or a direct competitor, depending on the nature of the engagement. We are acutely aware of the need to build alliances with partners such as hyperscalers, who are increasingly influential players in this space.

Attained marketplace leadership in private wireless networking with more than

420 customers,

of which over

80 include 5G

AI-based energy management automation can reduce energy costs and carbon footprint by

30%

2021 in brief

We worked hard throughout 2021 to rebalance our portfolio in Cloud and Network Services and ensure our investments are focused on the right areas for growth in the future. This was therefore a transition year for the business with net sales stable year-on-year and a 5.4% segment operating margin. The segment operating margin increased 7.6 percentage points primarily due to provisions that negatively impacted in 2020 not present in 2021.

- Announced our first SaaS products for CSPs and enterprises across analytics, security and data management services
- An industry first, we are deploying our full 5G Standalone Core for DISH in the public cloud with Amazon Web Services
- Attained marketplace leadership in private wireless networking with more than 420 customers, of which over 80 include 5G
- Key product launches included Nokia Data Marketplace, Nokia iSIM, Nokia MX Industrial Edge and Nokia NetGuard XDR Security
- Secured pan-industry recognition⁽⁵⁾ for our Vodafone Anomaly Detection Service, based on Nokia machine learning software
- Lufthansa Technik announced that its Nokia 5G private wireless-enabled virtual inspection service went into full commercial use

(1) Analysys Mason. (September 2021) Subscriber data management: worldwide market shares 2020 and forecast 2020-2021.

(2) Appledore. (July 2021) Leading Suppliers in Network Automation Software.

(3) Technology Business Research (May 2021) Private Cellular Networks Vendors Benchmark.

(4) Analysys Mason. (November 2021) Data, AI and development platforms: worldwide market shares 2020.

(5) 5G World. (September 2021) Most Innovative AI or ML Technology for the Network.

Nokia Technologies

Licensing is a virtuous circle, a wheel that has been turning for many years, powering innovation. It enables other companies to build on our inventions without having to make their own investments in R&D.

Jenni Lukander
President, Nokia Technologies

Nokia Technologies is responsible for managing Nokia's patent portfolio and monetizing Nokia's intellectual property, including patents, technologies and the Nokia brand.

Market overview

Nokia Technologies is responsible for managing Nokia's patent portfolio and monetizing Nokia's intellectual property, including patents, technologies and the Nokia brand, building on Nokia's continued innovation leadership, long-term investment into research and development and decades of driving technology standards development.

Business overview and organization

Nokia Technologies has three focus areas: Patent Licensing of Nokia's patent portfolio, Technology Licensing of Nokia's technologies for integration into consumer devices and Brand Partnerships for licensing the Nokia brand.

Patent Licensing: We manage the Nokia patent portfolio, working with the three other Nokia business groups, and continue to pursue and grow our patent licensing and monetization activities which drive most of Nokia Technologies' net sales. This includes our successful mobile devices

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licensing program, where we currently have licensing agreements with most of the major smartphone vendors. We also have patent licensing programs for consumer electronics, connected cars, smart meters, payment terminals and other emerging technologies in the field of IoT.

In 2021, we announced new patent licensing agreements with Daimler and several other vehicle manufacturers, as well as Samsung and Lenovo. These new agreements reflect the significance of our contributions to cellular and multimedia standards.

Technology Licensing: We continue to license our innovative multimedia technologies, such as OZO Audio and OZO Playback, to smartphone and camera manufacturers through our Technology Licensing business. We also drive advanced audio and video research and standardization through our Multimedia Technologies research unit.

Brand Partnerships: Nokia is a global brand that is recognized by almost everyone. We work with HMD Global – our licensee for Nokia-branded phones and tablets – along with brand partners in other product categories, to increase the reach and strength of the Nokia brand.

4 000+

patent families declared as essential to 5G standards

ISO 9001

Achieved certification for our high-quality patent portfolio management

Industry leading patent portfolio

Nokia has defined many of the fundamental technologies used in virtually all mobile devices. We have invested more than EUR 130 billion in R&D since 2000 and taken a leading role in standardization, holding a variety of leadership positions in global standards development organizations. As a result, we own one of the broadest and strongest patent portfolios in the mobile communications sector, with around 20 000 patent families (each family composed of several individual patents), of which over 4 000 are declared as essential to 5G.

Our portfolio has a long lifetime, with the vast majority of patents still in force in ten years' time, providing a long-term foundation for the business. We have been ranked #1 in several independent third-party studies for our 2G, 3G, 4G and 5G patents that have been declared essential for cellular standards.

We also have a strong multimedia patent portfolio, built on thirty years of investment in R&D. For example, we excel in video compression technology that enables large data files to be shared across the internet. The work of Nokia's engineers in video research and standardization has been recognized with numerous international awards, including four Technology & Engineering Emmy® Awards.

We continue to generate new intellectual property at a robust rate, refreshing our portfolio from R&D activities across all Nokia businesses. In 2021, we filed patent applications for more than 1 500 new inventions, enabling 5G networks, connected 5G devices and more.

We actively manage our patent portfolio by continuously evaluating our collective assets and taking actions to optimize the size of our overall portfolio, while preserving the high quality of our patents. And in 2021, Nokia became one of the first companies to achieve the globally recognized ISO 9001 certification for our high-quality patent portfolio management process.

2021 in brief

On the back of new licenses signed we were able to deliver 7% net sales growth in 2021. Combined with continued control on our cost base we also delivered EUR 1 185 million segment operating profit.

- Expanded our patent licensing coverage across key markets, including agreements with Daimler, Samsung and Lenovo
- Drove innovation, filing over 1 500 new inventions, and reaching the landmark of 4 000 patent families declared as essential to 5G standards
- Achieved ISO 9001 certification for our high-quality patent portfolio management
- Commenced patent infringement proceedings against OPPO, OnePlus and Realme in several countries in Asia and Europe
- Received a Technology & Engineering Emmy® Award for our multimedia research
- Integrated new OZO Audio and OZO Playback features into more devices, including the Nokia-branded tablet
- Worked with our brand partners to explore new licensing opportunities

Supply chain, sourcing and manufacturing

During 2021, global supply chain disruptions impacted operations across industries.

Nokia's supply chain is essential to our customers and our business, and for managing the customer demand and supply for our hardware, software and contract manufactured products. Our end-to-end operations include sourcing, demand and supply planning, manufacturing, distribution and logistics.

Given the size and scope of our portfolio, we purchase over EUR 12 billion worth of products and services per year from 11 000 different suppliers to fully support our complex supply chain. Throughout 2021, we were presented with many challenges and opportunities that included semiconductor shortages, the ongoing COVID-19 pandemic, climate change, and geopolitical and security concerns, all during a critical growth period for 5G.

While our 2021 net sales were impacted by supply chain constraints, we believe Nokia performed well despite these challenges. We will continue to work to optimize our supply chain; thinking innovatively, digitally and across the longer term, working to further develop a resilient and sustainable supply chain for our customers.

Resilience through strong partnerships and digitalization

Strong partnerships and digitalization investments are critical as we build resilience. We are collaborating with our customers and suppliers to build up our solid partner network. We optimize our supply chain by leveraging digitalization to strengthen capabilities to predict and simulate various operational scenarios to minimize disruptions.

We continue to drive a diverse and resilient supplier base to ensure quality, innovation and effective risk mitigation. We partner closely across our different business groups and maintain long-lasting relationships with our suppliers. We also closely collaborate with our customers to fully understand their long-term needs. This approach is helping us address the global semiconductor shortage.

Our geographically dispersed manufacturing network consists of our own manufacturing (24% of the network) and contract manufacturing partners to minimize geographic and geopolitical risks. Our network is strategically located around the world: Asia Pacific & Japan/India (29%), Europe (27%), China (29%) and the Americas (15%).

We continuously optimize our manufacturing and supplier network across the regions and leverage artificial intelligence and machine learning capabilities in developing the supply chain and factory network. This regional approach will not only enable us to deliver a more rapid response to our customers' needs, but also decrease transportation costs and reduce CO2 emissions.

Sustainability through innovation

We are committed to cut emissions by 50% by 2030. This commitment requires actions from us, our customers and our suppliers. We continuously challenge our full supply chain to, for example, develop new digital solutions to cut emissions.

We are delivering on increased customer demand for circular supply. Notable examples include a frame agreement with Orange and a T-Mobile USA project where we deinstalled cards from idle base station sites, upgraded software (SW), inspected and shipped back, thus avoiding approximately 844 metric tons of CO2 emissions.

Throughout our manufacturing network, our own factories are on track to be carbon neutral by 2025 through hydro, wind, solar and other sustainable sources. Many of our electronics manufacturing services (EMS) partners have roadmaps to be carbon neutral by 2030.

We clearly communicate our Third-party Code of Conduct and Nokia Supplier Requirements, which incorporate Responsible Business Alliance (RBA) Code of Conduct requirements, to our suppliers. These include standards for responsible sourcing in important areas such as the environment and human rights. Adherence is checked through audits and EcoVadis documentation audits.

We also partner with our suppliers to invest in sustainable solutions and took important steps together in 2021 in areas like transportation and packaging.

We are committed to prioritizing and strengthening resilience and sustainability across the end-to-end supply chain to help us effectively deal with current challenges and be ready for whatever is next.

Refer to "Sustainability and Corporate Responsibility" section for more information on Nokia's sustainability targets and achievements, including those related to supplier sustainability.

COP26

Recognized with a COP26 Compass Award for Supply Chain Capacity Building for reaching beyond our own operations, driving best practices with our suppliers and their suppliers

Own manufacturing

As of 31 December 2021, the production capacity for our wholly owned sites is noted below:

Country	Location and products ⁽¹⁾	Productive capacity, net (m ²) ⁽²⁾
Australia	Kilsyth: radio frequency systems	5 400
China	Suzhou: radio frequency systems	27 000
Finland	Oulu: base stations	10 000
France	Calais: submarine cables	24 000
France	Trignac: radio frequency systems	7 300
Germany	Hannover: radio frequency systems	23 500
India	Chennai: base stations, radio controllers and transmission systems	12 000
Poland	Bydgoszcz: remanufacturing, product integration	15 200
UK	Greenwich: submarine cables	12 000
USA	Meriden: radio frequency systems	31 000

(1) We consider the production capacity of our manufacturing network to be sufficient to meet the requirements of our business. The extent of utilization of our manufacturing facilities varies from plant to plant and from time to time during the year. None of these facilities is subject to a material encumbrance.

(2) Production capacity equals the total area allotted to manufacturing and to the storage of manufacturing-related materials.

2021 in brief

- Software supply chain digitalization strengthened continuous delivery capability for SW and Services business models, such as Software-as-a-Service
- Founding member of Trust Your Supplier program, a blockchain-based network designed to improve supplier validation, onboarding, and life cycle information management
- Recognized with a COP26 Compass Award for Supply Chain Capacity Building for reaching beyond our own operations, driving best practices with our suppliers and their suppliers
- Growing customer interest in circular supply as we delivered 40% more units compared to 2020
- Shipped 10 metric tons of 5G equipment on weekly carbon-neutral flights from China to Europe, using Sustainable Aviation Fuel, a tested and approved biofuel blended with traditional fuels
- On track to eliminate approximately 200 metric tons of packaging/year by end of 2022 via reusable supplier bins at our Chennai factory, reducing our carbon footprint by 1.1 metric tons/year; expanding to other sites

Corporate governance

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Corporate governance statement

This corporate governance statement is prepared in accordance with Chapter 7, Section 7 of the Finnish Securities Markets Act (2012/746, as amended) and the Finnish Corporate Governance Code 2020 (the “Finnish Corporate Governance Code”).

Introduction

In 2021, we continued delivering on Nokia’s commitment to strong corporate governance and related practices. To do that, the activities of the Board of Directors are structured to develop the Company’s strategy and to enable the Board to support and oversee the management on the delivery of it within a transparent governance framework. The table below sets out a high-level overview of the key areas of focus for the Board’s and its Committees’ activities during the year.

	January	February/ March	April	May	July	September/ October	December
Board	<ul style="list-style-type: none"> - Business and financial reviews - Company purpose - Strategy - Annual and long-range forecast and target setting - Board evaluation - Review of CEO’s performance, targets and remuneration - Annual Policy and Charter review 	<ul style="list-style-type: none"> - Business review - Strategy - Capital Markets Day - Plans to reset cost base - Convening the remote Annual General Meeting (AGM) - Remuneration Report 2020 - Nokia Equity Program 2021–2023 	<ul style="list-style-type: none"> - AGM and appointing Board Chair, Vice Chair and Committee members - Business and financial reviews - Strategy 	<ul style="list-style-type: none"> - Business and financial reviews - Strategy - Ethics & compliance - Litigation update - Digitalization and IT transformation - Future Nokia workplace 	<ul style="list-style-type: none"> - Annual sustainability review - Business and financial reviews - Strategy - Nokia innovation framework - Corporate Affairs update 	<ul style="list-style-type: none"> - Annual strategy meeting - Business and financial reviews - Group Leadership Team (GLT) succession planning 	<ul style="list-style-type: none"> - Business and financial reviews - Strategy - Annual and long-range forecast and target setting - Board evaluation - Key risks review - Digitalization update - Investors’ feedback on sustainability, governance and remuneration
Corporate Governance and Nomination Committee	<ul style="list-style-type: none"> - AGM proposals on Board composition and remuneration - Committee compositions - Corporate governance statement 			<ul style="list-style-type: none"> - AGM shareholder feedback - Planning of Board composition proposal 		<ul style="list-style-type: none"> - Board evaluation approach - Preparing Board composition proposal to AGM 	<ul style="list-style-type: none"> - Board remuneration review and benchmarking - Corporate governance developments - Annual Charter review
Personnel Committee	<ul style="list-style-type: none"> - Culture - Incentive achievements for 2020 - CEO and GLT performance - Incentive targets and objectives for 2021 - Nokia Equity Program proposal 			<ul style="list-style-type: none"> - Culture - AGM shareholder feedback - GLT remuneration - eLTI 2021 plan 	<ul style="list-style-type: none"> - Human capital risk review - GLT succession planning - LTI development - PC Advisor update 	<ul style="list-style-type: none"> - Alignment on 2022 incentive and equity framework - Human capital update 	<ul style="list-style-type: none"> - 2022 incentive targets - 2022 equity allocations - Investor and proxy advisor update - Remuneration Report for 2021 - Annual Charter review
Audit Committee		<ul style="list-style-type: none"> - Q4 and full-year 2020 financials, annual report - Auditor reporting - Ethics and compliance, internal audit and internal controls updates - AGM proposals to the Board - Structured finance update 	<ul style="list-style-type: none"> - Q1 financials - Auditor reporting - Ethics and compliance, internal audit and internal controls updates - Finance IT and digitalization - Cybersecurity - Tax update - Credit risk update - Conflict Minerals Reporting 		<ul style="list-style-type: none"> - Q2 financials - Auditor reporting - Ethics and compliance, internal audit and internal controls updates - Cybersecurity 	<ul style="list-style-type: none"> - Q3 financials - Auditor reporting - Ethics and compliance, internal audit, internal controls updates - Sustainability reporting developments - Cybersecurity 	<ul style="list-style-type: none"> - Enterprise Risk Management - Treasury update - Pensions update - Audit and internal controls updates - 20-F and annual report update - Financing strategy - Annual Charter and Policy review

Technology Committee	<ul style="list-style-type: none"> - Updates on major innovation and technology trends - Review of strategic technology initiatives - Technical excellence awards - Annual Charter review 	<ul style="list-style-type: none"> - Updates on major innovation and technology trends - Review of strategic technology initiatives 	<ul style="list-style-type: none"> - Updates on major innovation and technology trends - Technology vision and strategy - Review of strategic technology initiatives 	<ul style="list-style-type: none"> - Updates on major innovation and technology trends - Review of strategic technology initiatives
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Annual General Meeting 2021 and 2022

The Annual General Meeting 2021 took place at the Company's headquarters in Espoo on 8 April 2021. To prevent the spread of the COVID-19 pandemic, the Board resolved on extraordinary measures pursuant to the temporary legislation approved by the Finnish Parliament on 3 October 2020. The Annual General Meeting 2021 was convened to be held without shareholders and their proxy representatives being present at the meeting venue. Participation in the Annual General Meeting and use of shareholder rights was possible only by voting in advance as well as by submitting counterproposals and asking questions in advance. Approximately 66 000 shareholders representing approximately 2 500 million shares and votes were represented at the Annual General Meeting through advance voting. The Annual General Meeting supported all of the Board's proposals.

As the COVID-19 situation remains serious, Nokia Corporation's Annual General Meeting 2022 is planned to be held on 5 April 2022 without shareholders' presence to prevent the spread of the ongoing pandemic. Similarly to 2020 and 2021, the meeting will be held under extraordinary measures pursuant to the temporary legislation approved by the Finnish Parliament on 8 May 2021. Participation and exercise of shareholder rights in the meeting will be possible only by voting in advance, submitting counterproposals and asking questions in advance. Proposals of the Board of Directors to the Annual General Meeting 2022 were published on 3 February 2022.

Regulatory framework

Our corporate governance practices comply with Finnish laws and regulations, our Articles of Association approved by the shareholders and corporate governance guidelines (Corporate Governance Guidelines) adopted by the Board of Directors. Corporate Governance Guidelines reflect our commitment to good corporate governance. They include the directors' responsibilities, the composition and election of the members of the Board and its Committees, and certain other matters relating to corporate governance. We also comply with the Finnish Corporate Governance Code adopted by the Securities Market Association.

In addition, we comply with the rules and recommendations of Nasdaq Helsinki and Euronext Paris as applicable to us due to the listing of our shares on the exchanges. Furthermore, as a result of the listing of our American Depositary Shares on the New York Stock Exchange (NYSE) and our registration under the US Securities Exchange Act of 1934, we follow the applicable U.S. federal securities laws and regulations, including the Sarbanes-Oxley Act of 2002 as well as the rules of the NYSE, in particular the corporate governance standards under Section 303A of the NYSE Listed Company Manual. We comply with these standards to the extent such provisions are applicable to us as a foreign private issuer.

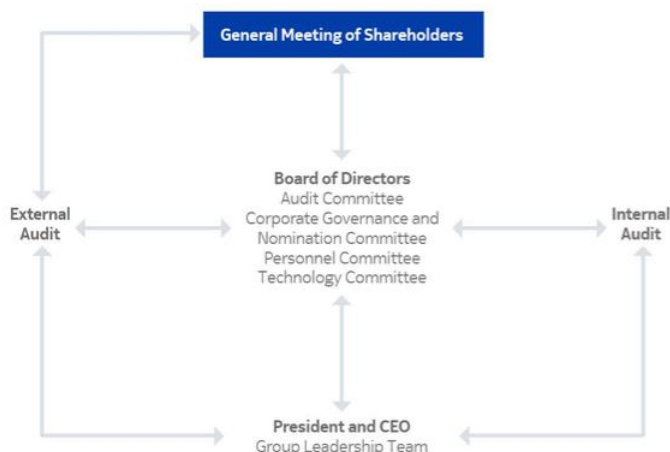
To the extent compliance with any non-domestic rules would conflict with the laws of Finland, we are obliged to comply with Finnish laws and applicable regulations. There are no significant differences in the corporate governance practices applied by Nokia compared with those applied by the US companies under the NYSE corporate governance standards with the exception that Nokia complies with Finnish law with respect to the approval of equity compensation plans. Under Finnish law, stock option plans require shareholder approval at the time of their launch. All other plans that include the delivery of company stock in the form of newly issued shares or treasury shares require shareholder approval at the time of the delivery of the shares unless shareholder approval has been granted through an authorization to the Board, a maximum of five years earlier. The NYSE corporate governance standards require that the equity compensation plans are approved by the company's shareholders. Nokia aims to minimize the necessity for, or consequences of, conflicts between the laws of Finland and applicable non-domestic corporate governance standards.

In addition to the Corporate Governance Guidelines, the Committees of the Board have adopted charters that define each Committee's main duties and operating principles. The Board has also adopted the Code of Conduct that applies to directors, executives, and employees of Nokia, as well as employees of Nokia's subsidiaries and affiliated companies (such as joint ventures) in which Nokia owns a majority of the shares or exercises effective control. Furthermore, the Board has adopted the Code of Ethics applicable to our key executives, including the President and CEO, CFO and Corporate Controller.

Main corporate governance bodies of Nokia

Pursuant to the provisions of the Finnish Limited Liability Companies Act (2006/624, as amended) (the Finnish Companies Act) which is the legislation under which Nokia operates, and Nokia's Articles of Association, the control and management of Nokia are divided among shareholders at a general meeting of shareholders, the Board, the President and CEO and the Group Leadership Team, chaired by the President and CEO.

Corporate governance framework



General Meeting of Shareholders

Nokia's shareholders play a key role in corporate governance, with our Annual General Meeting offering a regular opportunity to exercise their decision-making power in Nokia. In addition, at the meeting the shareholders may exercise their right to speak and ask questions. During the years 2020-2022 the use of shareholder rights has taken, and will, take place by remote means only, due to the ongoing COVID-19 pandemic and related precautions taken to ensure the health and safety of our shareholders, employees and other stakeholders. Please refer to section "Introduction—Annual General Meeting 2021 and 2022". A working group set up by the Finnish Ministry of Justice is preparing an amendment to the Finnish Companies Act to enable fully virtual annual general meetings and exercise of shareholder rights to their full extent also by virtual means in the future.

Each Nokia share entitles a shareholder to one vote at general meetings of Nokia. The Annual General Meeting decides, among other things, on the election and remuneration of the Board, the adoption of annual accounts, the distribution of retained earnings shown on the balance sheet, discharging the members of the Board and the President and CEO from liability, as well as on the election and fees of the external auditor. As of the Annual General Meeting 2020, the Remuneration Policy is presented to the general meeting at least every four years and the Remuneration Report annually as of 2021. Resolutions of the general meeting regarding the policy and the report are advisory.

In addition to the Annual General Meeting, an Extraordinary General Meeting may be convened when the Board considers such a meeting to be necessary, or when the provisions of the Finnish Companies Act mandate that such a meeting must be held.

Board of Directors

The operations of Nokia are managed under the direction of the Board, within the framework set by the Finnish Companies Act and Nokia's Articles of Association as well as any complementary rules of procedure as defined by the Board, such as the Corporate Governance Guidelines and the charters of the Board's Committees.

Election and composition of the Board of Directors

Pursuant to the Articles of Association of Nokia Corporation, we have a Board that is composed of a minimum of seven and a maximum of 12 members. The members of the Board are elected at least annually at each Annual General Meeting with a simple majority of the shareholders' votes cast at the meeting. The term of a Board member begins at the close of the general meeting at which he or she was elected, or later as resolved by the general meeting, and expires at the close of the following Annual General Meeting. The Annual General Meeting convenes by 30 June annually.

Our Board's leadership structure consists of a Chair and Vice Chair elected annually by the Board, and confirmed by the independent directors of the Board from among the Board members upon the recommendation of the Corporate Governance and Nomination Committee. The Chair of the Board has certain specific duties as stipulated by Finnish law and our Corporate Governance Guidelines. The Vice Chair of the Board assumes the duties of the Chair of the Board in the event he or she is prevented from performing his or her duties.

The independent directors of the new Board also confirm the election of the members and chairs for the Board's Committees from among the Board's independent directors upon the recommendation of the Corporate Governance and Nomination Committee and based on each Committee's member qualification standards. These elections take place at the Board's assembly meeting following the general meeting.

The Corporate Governance and Nomination Committee's aim is to continually renew the Board to ensure an efficient Board of international professionals with a diverse mix of skills, experience and other personal qualities in line with the diversity principles established by the Board. The Corporate Governance and Nomination Committee considers potential director candidates based on the short- and long-term needs of the Company. In the process to identify and select the candidates matching these needs and desired profiles, the Committee engages search firms and external advisors.

Board diversity

The Board has adopted principles concerning Board diversity describing our commitment to promoting a diverse Board composition and how diversity is embedded into our processes and practices when identifying and proposing new Board candidates as well as proposing re-election of current Board members.

At Nokia, diversity is not a static concept but rather a relevant mix of required elements for the Board as a whole that evolves with time based on, among other things, the relevant business objectives and future needs of Nokia. The Board diversity is treated as a means of improvement and development rather than an end in itself. Diversity of our Board is considered from a number of aspects including, but not limited to, skills and experience, age, nationality, ethnicity, cultural and educational backgrounds, self-declared gender identity, sexual orientation as well as other individual qualities. The Board shall include representatives of more than one gender.

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Nokia acknowledges and supports the resolution adopted by the Finnish Government on 17 February 2015 on gender equality on the boards of directors of Finnish large and mid-cap listed companies. We report annually on our objectives relating to equal representation of both genders, the means to achieve them, and the progress we have made in achieving them. We aim to have representation of at least 40% of the non-prevailing gender on our Board.


Currently there are six different nationalities represented on the Board and 37.5% of the Board members are female. The Board composition proposed to the Annual General Meeting 2022 has representation of six nationalities and 40% of Board members are female.

	Gender	Year of Birth	Nationality	Tenure ⁽¹⁾	Independence of the company and major shareholders	Audit Committee ⁽²⁾	Corporate Governance and Nomination Committee ⁽²⁾	Personnel Committee ⁽²⁾	Technology Committee ⁽²⁾
Sari Baldauf (Board Chair)	Female	1955	Finnish	3	Independent		Member	Member	
Kari Stadigh (Board Vice Chair)	Male	1955	Finnish	10	Independent		Chair	Member	
Bruce Brown	Male	1958	American	9	Independent		Member	Chair	Member
Thomas Dannenfeldt	Male	1966	German	1	Independent	Member			Member
Jeanette Horan	Female	1955	British	4	Independent	Member			Member
Edward Kozel	Male	1955	American	4	Independent	Member			Chair
Søren Skou	Male	1964	Danish	2	Independent			Member	
Carla Smits-Nusteling	Female	1966	Dutch	5	Independent	Chair	Member		

(1) Terms as Nokia Board member before the Annual General Meeting on 8 April 2021.

(2) As of 8 April 2021.

Experience and skills of the Board members

General management and business operations		Finance and accounting	
Chief Executive Officer		Communications service provider market	
Chief Financial Officer		Enterprise business	
Chief Technology Officer		Technology	

Members of the Board of Directors

Until the Annual General Meeting held on 8 April 2021, the Board consisted of nine members: Sari Baldauf (Chair), Kari Stadigh (Vice Chair), Bruce Brown, Thomas Dannenfeldt, Jeanette Horan, Edward Kozel, Elizabeth Nelson, Søren Skou and Carla Smits-Nusteling.

The Annual General Meeting held on 8 April 2021 elected eight members to the Board for a term ending at the close of the next Annual General Meeting. Sari Baldauf, Bruce Brown, Thomas Dannenfeldt, Jeanette Horan, Edward Kozel, Søren Skou, Carla Smits-Nusteling and Kari Stadigh were re-elected as Board members. Following the meeting, the Board re-elected Sari Baldauf to serve as Chair and Kari Stadigh as Vice Chair of the Board for a term ending at the close of the next Annual General Meeting.

Proposals of the Board of Directors to the Annual General Meeting 2022 were published on 3 February 2022. On the recommendation of the Board's Corporate Governance and Nomination Committee, the Board proposes to the Annual General Meeting that the number of Board members be ten. Kari Stadigh has informed that he will no longer be available to serve on the Nokia Board of Directors after the Annual General Meeting. Consequently, the Board proposes, on the recommendation of the Board's Corporate Governance and Nomination Committee, that the following seven current Board members be re-elected as members of the Nokia Board of Directors for a term ending at the close of the next Annual General Meeting: Sari Baldauf, Bruce Brown, Thomas Dannenfeldt, Jeanette Horan, Edward Kozel, Søren Skou and Carla Smits-Nusteling.

Furthermore, the Board proposes, on the recommendation of the Corporate Governance and Nomination Committee, that the following new members be elected to the Board composition for a term ending at the close of the next Annual General Meeting: Lisa Hook, former President and CEO of Neustar, Inc., Thomas Saueressig, a member of the Executive Board of SAP SE and Global Head of SAP Product Engineering, and Kai Öistämö, President and CEO of Vaisala Corporation.

The Corporate Governance and Nomination Committee will propose in the assembly meeting of the new Board of Directors that Sari Baldauf be re-elected to serve as Chair of the Board and Søren Skou to serve as the new Vice Chair of the Board, subject to their election to the Board of Directors.

The current and proposed members of the Board are all non-executive. For the term that began at the Annual General Meeting 2021 and for the term beginning at the Annual General Meeting 2022, all Board member candidates have been determined to be independent of Nokia and its significant shareholders under the Finnish corporate governance rules and the rules of the NYSE, as applicable. Any possible changes impacting the independence assessment would be assessed as of the date of the Annual General Meeting.

As noted by the Chair of the Board in the Annual General Meeting 2021, the Corporate Governance and Nomination Committee monitors closely the time commitments of the Board members to ensure they are able to devote the appropriate time to carry out their duties and responsibilities. The Corporate Governance and Nomination Committee has prepared the proposed composition of the Board of Directors to the Annual General Meeting 2022 taking into account shareholders' expectations and feedback in this regard.

Further, while the Finnish market practice is to vote on the proposed Board composition as a slate, some of our investors have expressed their preference of being able to vote on directors individually. Nokia has been actively involved in the initiative to supplement the market practice as well as the Finnish Corporate Governance Code to enable also individual director election method in Finland. We plan to be among the first Finnish

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companies to introduce this election method once that will be feasible to implement in the future Annual General Meetings to be organized under the Finnish Companies Act instead of the temporary COVID-19 legislation followed in 2020–2022.

Biographical details of our current Board members

Chair Sari Baldauf

b. 1955

Chair of the Nokia Board since 2020. Board member since 2018. Member of the Corporate Governance and Nomination Committee and the Personnel Committee.

Master of Business Administration, Helsinki School of Economics and Business Administration, Finland. Bachelor of Science, Helsinki School of Economics and Business Administration, Finland. Honorary doctorates in Technology (Helsinki University of Technology, Finland) and Business Administration (Turku School of Economics and Business Administration and Aalto University School of Business, Finland).

Executive Vice President and General Manager, Networks Business Group, Nokia, 1998–2005. Various executive positions at Nokia in Finland and the United States 1983–1998.

Member of the Supervisory Board and Member of the Nomination Committee of Mercedes-Benz Group AG. Member of the Board of Directors of Aalto University. Senior Advisor of DevCo Partners Oy. Member of the Board of Directors of Demos Helsinki. Vice Chair of the Board of Directors and Member of the Executive Committee of Technology Industries of Finland.

Member of the Supervisory Board of Deutsche Telekom AG 2012–2018. Chair of the Board of Directors of Fortum Corporation 2011–2018. Member of the Board of Directors of Akzo Nobel 2012–2017.

Vice Chair Kari Stadigh

b. 1955

Vice Chair of the Nokia Board since 2020. Board member since 2011. Chair of the Corporate Governance and Nomination Committee and member of the Personnel Committee.

Master of Science (Eng.), Helsinki University of Technology, Finland. Bachelor of Business Administration, Hanken School of Economics, Helsinki, Finland.

Group CEO and President of Sampo plc 2009–2019. Deputy CEO of Sampo plc 2001–2009. President of Sampo Life Insurance Company Limited 1999–2000. President of Nova Life Insurance Company Ltd 1996–1998. President and COO of Jaakko Pöyry Group 1991–1996.

Chair of the Board of Directors of Metso Outotec Corporation and member of the Remuneration and HR Committee. Chair of the Board of Directors of Saxo Bank Group.

Chair of the Board of Directors of Mandatum Life Insurance Company Limited 2001–2019. Chair of the Board of Directors of If P&C Insurance Holding Ltd 2002–2019. Member of the Board of Directors of Nordea Bank AB (publ) 2010–2018. Chair of the Board Risk Committee (BRIC) of Nordea Bank AB (publ) 2011–2018.

Bruce Brown

b. 1958

Nokia Board member since 2012. Chair of the Personnel Committee. Member of the Corporate Governance and Nomination Committee and the Technology Committee.

MBA Xavier University, the United States. BS (Chemical Engineering), Polytechnic Institute of New York University, the United States.

Chief Technology Officer of the Procter & Gamble Company 2008–2014. Various executive and managerial positions in Baby Care, Feminine Care, and Beauty Care units of the Procter & Gamble Company since 1980 in the United States, Germany and Japan.

Member of the Board of Directors, Chair of the Compensation Committee and member of the Nominating and Corporate Governance Committee of the Glatfelter Company.

Member of the Board of Directors, the Audit Committee and the Compensation Committee of Medpace Inc 2016–2019. Member of the Board of Directors of Agency for Science, Technology & Research (A*STAR) in Singapore 2011–2018.

Thomas Dannenfeldt

b. 1966

Nokia Board member since 2020. Member of the Audit Committee and the Technology Committee.

Degree in Mathematics, University of Trier, Germany.

Chief Financial Officer of Deutsche Telekom AG 2014–2018. Chief Financial Officer of Deutsche Telekom's German operations 2010–2014. Various operational positions (sales, marketing, customer care, finance and procurement in fixed and mobile business, national and international positions) at Deutsche Telekom 1992–2010.

Chair of the Supervisory Board of Ceconomy AG and Chair of the Presidential Committee, Nomination Committee and Mediation Committee. Member of the Board of Advisors at axessio GmbH.

Member of the Board of Directors of T-Mobile US 2013–2018 and Buy-In 2013–2018. Chair of the Board of Directors of T-Systems International 2013–2018 and EE 2014–2016.

Jeanette Horan

b. 1955

Nokia Board member since 2017. Member of the Audit Committee and the Technology Committee.

MBA, Business Administration and Management, Boston University, the United States. BSc, Mathematics, University of London, the United Kingdom.

Various executive and managerial positions at IBM 1998–2015. Vice President of Digital Equipment Corporation 1994–1998. Vice President, Development of Open Software Foundation 1989–1994.

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Member of the Supervisory Board at Wolters Kluwer, and the Chair of the Remuneration Committee. Member of the Board of Advisors at Jane Doe No More, a non-profit organization. Member of the Board of Directors of the Ridgefield Symphony Orchestra, a non-profit organization.

Member of the Board of Advisors of Cybereason 2017–2018. Member of the Board of Directors of West Corporation 2016–2017 and Microvision 2006–2017.

Edward Kozel

b. 1955

Nokia Board member since 2017. Chair of the Technology Committee and member of the Audit Committee.

Degree in Electrical Engineering and Computer Science, University of California, the United States.

President and CEO of Range Networks 2013–2014. Owner of Open Range 2000–2013. Chief Technology and Innovation Officer and member of the Board of Management of Deutsche Telekom 2010–2012. CEO of Skyriders 2006–2008. Managing Director of Integrated Finance 2005–2006. Senior Vice President, Business development and Chief Technology Officer and Board member of Cisco 1989–2001.

Member of the Advisory Board at Telia Ventures.

Various Board memberships in 1999–2009.

Søren Skou

b. 1964

CEO of A.P. Møller - Mærsk A/S. Nokia Board member since 2019. Member of the Personnel Committee.

MBA (honours), IMD, Switzerland. Business Administration, Copenhagen Business School, Denmark. Maersk International Shipping Education (M.I.S.E.).

Chief Executive Officer of Maersk Line 2012–2016. Chief Executive Officer of Maersk Tankers 2001–2011. Variety of executive roles, senior positions and other roles at A.P. Møller - Mærsk since 1983.

Member of The European Round Table for Industry.

Carla Smits-Nusteling

b. 1966

Nokia Board member since 2016. Chair of the Audit Committee and member of the Corporate Governance and Nomination Committee.

Master's Degree in Business Economics, Erasmus University Rotterdam, the Netherlands. Executive Master of Finance and Control, Vrije University Amsterdam, the Netherlands.

Member of the Board of Directors and Chief Financial Officer of KPN 2009–2012. Various financial positions in KPN 2000–2009. Various financial and operational positions in TNT/PTT Post 1990–2000.

Chair of the Board of Directors of TELE2 AB. Member of the Board of Directors, Chair of the Audit Committee and member of the Remuneration and Nomination Committee of Allegro.eu SA. Member of the Board of Directors of the Stichting Continuïteit Ahold Delhaize (SCAD) foundation. Lay Judge in the Enterprise Court of the Amsterdam Court of Appeal since 2015.

Member of the Supervisory Board and Chair of the Audit Committee of ASML 2013–2021. Member of the Management Board of the Unilever Trust Office 2015–2019.

Operations of the Board of Directors

The Board represents and is accountable to the shareholders of Nokia. While its ultimate statutory accountability is to the shareholders, the Board also takes into account the interests of Nokia's other stakeholders. The Board's responsibilities are active, not passive, and include the responsibility to evaluate the strategic direction of Nokia, its management policies and the effectiveness of the implementation of such by the management on a regular basis. It is the responsibility of the members of the Board to act in good faith and with due care, so as to exercise their business judgment on an informed basis, in a manner that they reasonably and honestly believe to be in the best interests of Nokia and its shareholders. In discharging this obligation, the members of the Board must inform themselves of all relevant information reasonably available to them. The Board and each Board Committee also have the power to appoint independent legal, financial or other advisors as they deem necessary. The Company will provide sufficient funding to the Board and to each Committee to exercise their functions and provide compensation for the services of their advisors.

The Board is ultimately responsible for, and its duties include, monitoring and reviewing Nokia's financial reporting process, the effectiveness of related control and audit functions and the independence of Nokia's external auditor, as well as monitoring the Company's statutory audit. The Board's responsibilities also include overseeing the structure and composition of our top management and monitoring legal compliance and the management of risks related to our operations. In doing so, the Board may set annual ranges and/or individual limits for capital expenditures, investments and divestitures and other financial and non-financial commitments that may not be exceeded without a separate Board approval.

In risk management, the Board's role includes risk analysis and assessment in connection with financial, strategy and business reviews, updates and decision-making proposals. Risk management policies and processes are an integral part of Board deliberations and risk-related updates are provided to the Board on a recurring basis. For a more detailed description of our risk management policies and processes, refer to "Risk management, internal control and internal audit functions at Nokia—Main features of risk management systems".

The Board has the responsibility for appointing and discharging the President, the Chief Executive Officer, Chief Financial Officer and Chief Legal Officer. Since August 2020, Pekka Lundmark has served as the President and CEO. His rights and responsibilities include those allotted to the President under Finnish law and he also chairs the Group Leadership Team.

The Board approves and the independent directors of the Board confirm the compensation and terms of employment of the President and CEO, subject to the requirements of Finnish law, upon the recommendation of the Personnel Committee of the Board. The compensation and terms of employment of the other Group Leadership Team members are approved by the Personnel Committee upon the recommendation of the President and CEO.

Board oversight of environmental and social activities and governance practices (ESG)

Under our Corporate Governance Guidelines, the Board evaluates Nokia's environmental and social activities and governance practices (ESG), related risks and target setting as well as their implementation and effectiveness in the Company. In 2021, the Board approved the select key ESG targets on climate change and diversity included in the short-term incentive program and also reviewed the evolving ESG requirements and expectations, investor feedback and the disclosure approach. In addition, the Board Committees monitor environmental and social developments and activities in the Company in their respective areas of responsibilities. During 2021, the Audit Committee's responsibilities included, amongst others, the implementation planning of new climate and other sustainability reporting requirements, as well as oversight of the ethics and compliance program and cybersecurity risks and maturity. The Audit Committee also annually reviews sustainability disclosures as well as the use of conflict minerals in Nokia's products presented in the annual reports and the related regulatory filings. The Personnel Committee assists the Board in the incorporation of the ESG-related metrics in the incentive structures and oversees the human capital management, including personnel policies and practices related to Nokia culture, employee wellbeing, diversity, recruiting, development and retention. Corporate Governance and Nomination Committee assesses and advises the Board in the environmental, social and governance (ESG) related activities and practices aiming to enhance governance structure supporting them. The Technology Committee reviews how sustainability is embedded into our technology strategy and roadmaps.

Board evaluation

In line with our Corporate Governance Guidelines, the Board conducts an annual performance evaluation, which also includes evaluation of the Board Committees' work, the Board and Committee Chairs and individual Board members. The Board evaluation is conducted as a self-evaluation while an external evaluator is periodically engaged. Feedback is also requested from selected members of management as part of the Board evaluation process. Each year, the results of the evaluation are discussed and analyzed by the entire Board and improvement actions are agreed based on such discussion. In 2021, the evaluation process was carried out by an external evaluator and included both a written questionnaire and interviews.

Meetings of the Board of Directors

The Board held 12 meetings excluding Committee meetings during 2021. Approximately 67% of these meetings were regular meetings in person or by video connection. In 2021, the meetings were mainly conducted by video connection as a consequence of the COVID-19 pandemic. The other meetings were held in writing.

	Meetings in person/ by video	Meetings in writing	Attendance in all meetings %
Full Board	8	4	99
Audit Committee	7	0	96
Corporate Governance and Nomination Committee	4	0	100
Personnel Committee	5	0	100
Technology Committee	4	0	100

Directors' attendance at the Board and Committee meetings in 2021 is set forth in the table below:

	Board meetings %	Audit Committee meetings %	Corporate Governance and Nomination Committee meetings %	Personnel Committee meetings %	Technology Committee meetings %
Sari Baldauf (Board Chair)	100		100	100	100
Kari Stadigh (Board Vice Chair)	100		100	100	
Bruce Brown	100		100	100	100
Thomas Dannenfeldt	100	100			100
Jeanette Horan	100	100			100
Edward Kozel	92	86			100
Elizabeth Nelson (until 8 April 2021)	100	100		100	
Søren Skou	100			100	
Carla Smits-Nusteling	100	100	100		

Additionally, many of the directors attended, as non-voting observers, meetings of a Committee of which they were not a member.

Directors meet without the management in connection with each regularly scheduled meeting. According to Board practices, meetings without management present are only attended by non-executive directors. These meetings are chaired by the non-executive Chair of the Board. In case the non-executive Chair of the Board is unable to chair these meetings, the non-executive Vice Chair of the Board chairs the meeting. Additionally, the independent directors would meet separately at least once annually. In 2021, all members of the Board were non-executive and determined to be independent from Nokia and significant shareholders under the Finnish corporate governance standards and the rules of the NYSE.

In the continued effort to prevent the spread of the COVID-19 pandemic, the Board of Directors resolved pursuant to the temporary legislation approved by the Finnish Parliament on 3 October 2020, to hold the Annual General Meeting 2021 without the presence of shareholders, their proxy representatives, the Board and the senior management. Only the Chair of the Board Sari Baldauf and the President and CEO Pekka Lundmark were present in person.

Committees of the Board of Directors

The Board of Directors has four committees that assist the Board in its duties pursuant to their respective committee charters. The Board may also establish ad hoc committees for detailed reviews or consideration of particular topics to be proposed for the approval of the Board. Any director who so wishes may attend, as a non-voting observer, meetings of committees of which they are not members.

Board of Directors			
Audit Committee	Corporate Governance and Nomination Committee	Personnel Committee	Technology Committee
Oversees the accounting and financial as well as non-financial reporting processes of Nokia and the audits of its financial statements as well as the internal controls and compliance program.	Prepares the proposals for the general meetings in respect of the composition of the Board and the director remuneration to be approved by the shareholders, and monitors issues and practices related to corporate governance and proposes necessary actions in respect thereof.	Oversees the human capital management related policies and practices at Nokia. Assists the Board in discharging its responsibilities in relation to all compensation and related reporting, including equity compensation, of Nokia's executives and their terms of employment.	Reviews key innovation and technology initiatives of Nokia which are formulated by the management.

The Audit Committee

The Committee consists of a minimum of three members of the Board who meet all applicable independence, financial literacy and other requirements as stipulated by Finnish law and the rules of Nasdaq Helsinki and the NYSE. As of 8 April 2021, the Audit Committee has consisted of the following four members of the Board: Carla Smits-Nusteling (Chair), Thomas Dannenfeldt, Jeanette Horan and Edward Kozel.

The Committee is responsible for assisting the Board in the oversight of:

- the quality and integrity of the Company's financial and non-financial statements and related disclosures;
- the statutory audit of the Company's financial statements; including the sustainability reporting therein;
- the external auditor's qualifications and independence;
- the performance of the external auditor subject to the requirements of Finnish law;
- the performance of the Company's internal controls, risk management and the assurance function;
- the performance of the internal audit function;
- the Company's compliance with legal and regulatory requirements, including the performance of its ethics and compliance program; and
- the pension liabilities, taxation and cybersecurity of the Company.

In discharging its oversight role, the Audit Committee has full access to all Company books, records, facilities and personnel. The Audit Committee also maintains procedures for the receipt, retention and treatment of complaints received by Nokia regarding accounting, internal controls, or auditing matters and for the confidential, anonymous submission by our employees of concerns relating to accounting or auditing matters. Nokia's disclosure controls and procedures, which are reviewed by the Audit Committee and approved by the President and CEO and the Chief Financial Officer, as well as the internal controls over financial reporting, are designed to provide reasonable assurance regarding the quality and integrity of Nokia's financial statements and related disclosures. For further information on internal control over financial reporting, refer to "Risk management, internal control and internal audit functions at Nokia—Description of internal control procedures in relation to the financial reporting process".

Under Finnish law, an external auditor is elected by a simple majority vote of the shareholders at the Annual General Meeting for one year at a time. The Audit Committee prepares the proposal to the shareholders, upon its evaluation of the qualifications and independence of the external auditor, of the nominee for election or re-election. Under Finnish law, the fees of the external auditor are also approved by the shareholders by a simple majority vote at the Annual General Meeting. The Committee prepares the proposal to the shareholders in respect of the fees of the external auditor, and approves the external auditor's annual audit fees under the guidance given by the Annual General Meeting. For information about the fees paid to Nokia's external auditor, Deloitte Oy, during 2021 refer to "Auditor fees and services" below.

The Board has determined that all members of the Audit Committee, including its Chair, Carla Smits-Nusteling, are "audit committee financial experts" as defined in the requirements of Item 16A of the Annual Report on Form 20-F filed with the U.S. Securities and Exchange Commission (SEC). Ms. Smits-Nusteling and each of the other members of the Audit Committee are "independent directors" as defined by Finnish law, the Finnish Corporate Governance Code and in Section 303A.02 of the NYSE Listed Company Manual.

The Audit Committee meets a minimum of four times a year. The Committee meets separately with the representatives of Nokia's management, heads of the internal audit, and ethics and compliance functions, and the external auditor in connection with each regularly scheduled meeting. The head of the internal audit function has, at all times, direct access to the Audit Committee, without the involvement of management.

Audit Committee pre-approval policies and procedures

The Audit Committee of the Board is responsible, among other matters, for oversight of the external auditor's independence, subject to the requirements of applicable legislation. The Audit Committee has adopted a policy regarding an approval procedure of audit services performed by the external auditors of Nokia Group and permissible non-audit services performed by the principal external auditor of the Nokia Group (the "Pre-approval Policy").

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Under the Pre-approval Policy, proposed services either: (i) may be pre-approved by the Audit Committee in accordance with certain service categories described in the Pre-approval Policy (general pre-approval); or (ii) require the specific pre-approval of the Audit Committee (specific pre-approval). The Pre-approval Policy sets out the audit, audit-related, tax and other services that have received the general pre-approval of the Audit Committee. All other audit, audit-related (including services related to internal controls and significant mergers and acquisitions projects), tax and other services are subject to specific pre-approval by the Audit Committee. All service requests concerning generally pre-approved services are submitted to an appointed Audit Committee delegate within management, who determines whether the services are within the services generally pre-approved services. The Pre-approval Policy is subject to annual review by the Audit Committee.

The Audit Committee establishes budgeted fee levels annually for each of the categories of audit and non-audit services that are pre-approved under the Pre-approval Policy, namely, audit, audit-related, tax and other services. At each regular meeting of the Audit Committee, the auditor provides a report in order for the Audit Committee to review the services that the auditor is providing, as well as the cost of those services.

The Corporate Governance and Nomination Committee

The Committee consists of three to five members of the Board who meet all applicable independence requirements as stipulated by Finnish law and the rules of Nasdaq Helsinki and the NYSE. As of 8 April 2021 the Corporate Governance and Nomination Committee has consisted of the following four members of the Board: Kari Stadigh (Chair), Sari Baldauf, Bruce Brown and Carla Smits-Nusteling.

The Committee fulfills its responsibilities by:

- actively identifying individuals qualified to be elected members of the Board as well as considering and evaluating the appropriate level and structure of director remuneration;
- preparing and evaluating the principles regarding Board diversity;
- preparing proposals to the shareholders on the director nominees for election at the general meetings as well as director remuneration;
- monitoring significant developments in the law and practice of corporate governance, including the sustainability-related governance trends and of the directors' duties and responsibilities;
- assisting the Board and each Committee of the Board in its annual performance evaluations, including establishing criteria to be applied in connection with such evaluations;
- developing and administering Nokia's Corporate Governance Guidelines and giving recommendations regarding them to the Board; and
- reviewing Nokia's disclosure in the corporate governance statement.

The Committee has the power and practice to appoint a recruitment firm to identify appropriate new director candidates.

The Personnel Committee

The Committee consists of a minimum of three members of the Board who meet all applicable independence requirements as stipulated by Finnish law and the rules of Nasdaq Helsinki and the NYSE. As of 8 April 2021 the Personnel Committee has consisted of the following four members of the Board: Bruce Brown (Chair), Sari Baldauf, Søren Skou and Kari Stadigh.

The Committee has overall responsibility for evaluating, resolving and making recommendations to the Board regarding:

- preparing the Remuneration Policy and the Remuneration Report;
- compensation and terms of employment of the Company's senior management;
- all equity-based plans;
- incentive compensation plans, policies and programs of the Company affecting executives; and
- possible other significant incentive plans.

The Committee is responsible for preparing the Remuneration Policy, including Nokia's compensation philosophy and principles and ensuring that the Company's compensation programs are performance-based, designed to contribute to long-term shareholder value creation in line with shareholders' interests, properly motivate management, are aligned with the Remuneration Policy as well as support overall corporate strategies.

The Committee also oversees human capital management and periodically reviews the personnel policies and practices of Nokia related to human capital management and social responsibilities relating to its employees, including Company culture, occupational safety, employee wellbeing, morale, diversity, equity and inclusion, talent management and development, succession planning, resourcing, recruiting, attrition, retention and employee engagement.

The Technology Committee

The Committee consists of a minimum of three members of the Board who meet applicable independence requirements as stipulated by Finnish law and the rules of Nasdaq Helsinki and the NYSE and have such skills in innovation, technology and science matters as the Board determines adequate from time to time. As of 8 April 2021 the Technology Committee has consisted of the following four members of the Board: Edward Kozel (Chair), Bruce Brown, Thomas Dannenfeldt and Jeanette Horan.

In its dialogue with and provision of opinions and advice to the management, the Committee will periodically review:

- the Company's technological competitiveness and new strategic technology initiatives as well as market trends, considering both organic as well as inorganic options to retain or attain competitiveness;
- the Company's approach to major technological innovations;
- key technology trends that may result in disruptive threats or opportunities and the proposals on how to adequately address them;
- high-level risks and opportunities associated with the Company's Research and Development Programs; and
- embedding sustainability in the technology roadmaps.

Group Leadership Team and the President and CEO

We have a Group Leadership Team that is responsible for the operative management of Nokia. The Board appoints the Chair of the Group Leadership Team. The Group Leadership Team is chaired by the President and CEO. The President and CEO's rights and responsibilities include those allotted to the President under Finnish law.

On 31 December 2021, the Group Leadership Team consisted of 11 members, including the President and CEO, representing eight different nationalities. In total 27% of the Group Leadership Team members were female and 9% non-binary.

Name	Position	Gender	Year of birth	Nationality	On GLT since
Pekka Lundmark	President and CEO	Male	1963	Finnish	2020
Nassib Abou-Khalil	Chief Legal Officer	Non-binary	1972	Dutch	2019
Nishant Batra	Chief Strategy and Technology Officer	Male	1978	Indian	2021
Ricky Corker	Chief Customer Experience Officer	Male	1967	Australian	2019
Federico Guillén	President of Network Infrastructure	Male	1963	Spanish	2016
Jenni Lukander	President of Nokia Technologies	Female	1974	Finnish	2019
Raghav Sahgal	President of Cloud and Network Services	Male	1962	American	2020
Melissa Schoeb	Chief Corporate Affairs Officer	Female	1968	American	2021
Tommi Uitto	President of Mobile Networks	Male	1969	Finnish	2019
Stephanie Werner-Dietz	Chief People Officer	Female	1972	German	2020
Marco Wirén	Chief Financial Officer	Male	1966	Finnish/Swedish	2020

Biographical details of the current members of the Nokia Group Leadership Team

Pekka Lundmark

b. 1963

President and Chief Executive Officer (CEO) since 2020. Rejoined Nokia in 2020.

Master of Science, Department of Technical Physics, Helsinki University of Technology, Finland.

President and CEO, Fortum Corporation 2015–2020. President and CEO, Konecranes Plc 2005–2015 and Group Executive Vice President 2004–2005. President and CEO, Hackman Oyj Abp 2002–2004. Managing Partner, Startupfactory 2000–2002. Various executive positions at Nokia 1990–2000.

Commissioner, Broadband Commission for Sustainable Development. Member of the Board, Research Institute of the Finnish Economy (ETLA) and Finnish Business and Policy Forum (EVA). International Member of the Academy, Royal Swedish Academy of Engineering Sciences (IVA). Member of the Board, Finnish Athletics Federation.

Chairman of the Board, Confederation of Finnish Industries, 2019–2020. Member of the Board, East Office of Finnish Industries, 2009–2020. Chairman of the Board, Finnish Energy, 2016–2018.

Nassib Abou-Khalil

b. 1972

Chief Legal Officer (CLO). Group Leadership Team member since 2019. Joined Nokia in 2014.

Bachelor of Arts (Political Sciences), Civil Law (LL.L.), Common Law (LL.B.) and Master of Law (LL.M), University of Ottawa, Canada.

Deputy Chief Legal Officer, Business, Nokia 2019. General Counsel, Customer Operations, Nokia 2016–2019. Head of Legal & compliance, MEA, Nokia 2014–2015. Head of Public Policy, Europe, Middle East & Africa, and General Counsel, Middle East & Africa, Yahoo!, 2010–2014. Regional Counsel, Middle East & Africa and India, GE Oil & Gas, 2007–2010. Regulatory Counsel, Etisalat, 2006–2007. Various legal counsel roles, TMF Netherlands 2002–2006. Legal articling, Fasken Martineau 1999–2001.

Member of the Board, Vice Chair of the Governance Committee and Member of the Risk Committee, Global Legal Entity Foundation (GLEIF).

Nishant Batra

b. 1978

Chief Strategy and Technology Officer (CSTO). Group Leadership Team member since 2021. Joined Nokia in 2021.

MBA from INSEAD. Master's degree in Telecommunications and a master's degree in Computer Science, Southern Methodist University, Dallas, the United States. Bachelor's degree in Computer Applications, Devi Ahilya University, Indore, Madhya Pradesh, India.

Previously Executive Vice President and Chief Technology Officer, Veoneer, Inc. 2018–2021. Prior to Veoneer Inc. held several senior positions at Ericsson, 2006–2016 in the United States, Sweden and India.

Independent member of the Board of Directors of Sensys Gatso Group.

Ricky Corker

b. 1967

Chief Customer Experience Officer (CCXO). Group Leadership Team member since 2019. Joined Nokia in 1993.

Bachelor in Communications and Electronic Engineering from the Royal Melbourne Institute of Technology, Australia.

President of Customer Operations, Americas, Nokia, 2019–2020. Executive Vice President and President of North America, Nokia, 2011–2018. Head of Asia Pacific, Nokia Siemens Networks, 2009–2011. Head of Asia North Region, Nokia Siemens Networks, 2008–2009. Head of Hutchison Global Customer Business Team, Nokia Siemens Networks, 2007–2008. Vice President Asia Pacific, Nokia Networks, 2005–2007. Lead Sales Director Asia Pacific, Nokia Networks, 2004–2005. Account Director Telstra, Nokia Networks, 2002–2003. Account Director Vodafone Australia and New Zealand, and Sales Director Vodafone Asia Pacific Customer Business Team, Nokia Networks, 2001–2002. Commercial Director Global Accounts British Telecom, Nokia Networks, 2001. Senior sales and marketing positions at Nokia, 1993–2001.

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Federico Guillén

b. 1963

President of Network Infrastructure. Group Leadership Team member since 2016. Joined Nokia in 2016.

Degree in Telecommunications Engineering, ETSIT at Universidad Politécnica de Madrid, Spain. Master's degree in Switching & Communication Architectures, ETSIT at Universidad Politécnica de Madrid, Spain. Master's Degree in International Management, ESC Lyon and Alcatel, France.

President of Customer Operations, Europe, Middle East & Africa and Asia Pacific, Nokia, 2018–2020. President of Fixed Networks, Nokia, 2016–2018. President of Fixed Networks, Alcatel-Lucent, 2013–2016. President and Chief Senior Officer of Alcatel-Lucent Spain and Global Account Manager Telefónica, Alcatel-Lucent, 2009–2013. Vice President Sales of Vertical Market Sales in Western Europe, Alcatel-Lucent, 2009. Head of Regional Support Center, Fixed Access Division for South Europe, Middle East & Africa, India and Caribbean & Latin America, Alcatel-Lucent, 2007–2009. President and Chief Senior Officer, Alcatel Mexico and Global Account Manager, Telmex, 2003–2007. Various R&D, portfolio and sales management positions with Telettra in Spain, and then with Alcatel in Spain, Belgium and the United States 1989–2003.

Jenni Lukander

b. 1974

President of Nokia Technologies. Group Leadership Team member since 2019. Joined Nokia in 2007.

Master of Laws, University of Helsinki, Finland.

Senior Vice President, Head of Patent Business, Nokia 2018–2019. Vice President, Head of Patent Licensing, Nokia 2018. Vice President, Head of Litigation and Competition Law, Nokia 2016–2018. Director, Head of Regulatory and Competition Law, Nokia 2015–2016. Director, Head of Competition Law, Nokia 2011–2015. Senior Legal Counsel, Nokia 2007–2011. Visiting lawyer, Nokia, 2001. Lawyer, Roschier Ltd. 1999–2007.

Raghav Sahgal

b. 1962

President of Cloud and Network Services. Group Leadership Team member since 2020. Joined Nokia in 2017.

Master of Science in Computer Systems Management, University of Maryland, the United States. Bachelor of Science in Computer Engineering, Tulane University, New Orleans, the United States. Executive Business Certificate in General Management, Harvard University, the United States.

President of Nokia Enterprise, 2020. Senior Vice President, Nokia Software, 2017–2020. President, NICE Ltd. Asia Pacific and the Middle East, 2010–2017. Advisory Board Member, Orga Systems, 2010–2014. Vice President, Communications Business Unit, Asia Pacific & Japan, Oracle, 2008–2010. Chief Business Officer, Converse, 2005–2006. Executive Vice President, Asia Pacific, CSG, 2002–2005. Vice President, Software Products Group Asia Pacific, Lucent Technologies, 2000–2002.

Melissa Schoeb

b. 1968

Chief Corporate Affairs Officer (CCAO). Group Leadership Team member since 2021. Joined Nokia in 2021.

Bachelor of Arts in International Relations and Spanish, University of Mary Washington, Virginia, the United States. Fellowship Recipient, Four Freedoms Foundation, Rome, Italy.

Vice President, Corporate Affairs, Occidental, 2017–2021. Vice President, Communications and Public Affairs, Occidental, 2012–2017. Senior Director, Communications and Public Affairs, Occidental, 2007–2012. Senior Vice President and Senior Partner, General Manager and other senior positions, FleishmanHillard 2002–2007. Director of Global Communications, Nortel Networks, 2000–2002. Vice President, Technology, FleishmanHillard, 1998–2000. Business Director, The VenCom Group Inc, 1995–1997. Consultant, London United Kingdom and Washington DC, the United States, Gemini Consulting, 1991–1995.

Member of the Arthur Page Society and The Seminar. Member of Mary Washington University College of Business Executive Advisory Board.

Tommi Uitto

b. 1969

President of Mobile Networks. Group Leadership Team member since 2019. Joined Nokia in 1996.

Master's degree in industrial management, Helsinki University of Technology, Finland. Master's degree in operations management, Michigan Technological University, the United States.

Senior Vice President, Global Product Sales, Mobile Networks, Nokia 2016–2018. Senior Vice President, Global Mobile Broadband Sales, Customer Operations, Nokia Networks, 2015–2016. Senior Vice President, West Europe, Customer Operations, Nokia Networks, 2013–2015. Head of Radio Cluster (Senior Vice President), Mobile Broadband, Nokia Siemens Networks, 2012–2013. Head of Global LTE Radio Access Business Line (Vice President) and Quality, Mobile Broadband, Nokia Siemens Networks, 2011–2012. Head of Product Management, Network Systems, Nokia Siemens Networks, 2010. Head of Product Management, Radio Access, Nokia Siemens Networks, 2009. Head of WCDMA/HSPA and Radio Platforms Product Management, Nokia Siemens Networks, 2008. Head of WCDMA/HSPA Product Line Management, Nokia Siemens Networks, 2007. General Manager, Radio Controller Product Management, Nokia Networks, 2005–2007. Director, Sales & Marketing (Lead Sales Director), France Telecom/Orange Nokia Networks, 2002–2005. Operations Director, Northeast Europe, Central & Eastern Europe and Middle East, Nokia Networks, 1999–2002.

Stephanie Werner-Dietz

b. 1972

Chief People Officer (CPO). Group Leadership Team member since 2020. Joined Nokia in 1998.

Diploma in Applied business languages (Chinese) and International business studies, University of Applied Sciences, Bremen, Germany.

Vice President, Global HR Center of Expertise, Nokia, 2018–2019. Vice President, Business HR Head for Nokia Corporate Functions, Nokia, 2016–2018. Head of Business HR for Chief Finance and Operations Officer/Organization, Nokia, 2012–2015. Head of Nokia Siemens Networks Business Talent, Leadership & Organization Development, Nokia Siemens Networks, 2011–2012. Head of Business HR, Nokia Radio Access, 2007–2011. Head of HR Emerging Markets, Romania, Nokia, 2007. Senior HR Manager, Strategic Projects, US, Nokia, 2004–2006. HR Manager Global Platforms, Nokia, 2001–2004. HR Country Manager for the Philippines, Nokia, 1999–2001. HR Manager, Nokia Networks for Switzerland, Nokia, 1998–1999.

Marco Wirén

b. 1966

Chief Financial Officer (CFO). Group Leadership Team member since 2020. Joined Nokia in 2020.

Master's degree in Business Administration, University of Uppsala, Sweden. Studies in management and strategic leadership, including at Duke Business School, the United States, IMD, Switzerland and Stockholm School of Economics, Sweden.

President, Wärtsilä Energy and Executive Vice President, Wärtsilä Group, 2018–2020. Executive Vice President and CFO, Wärtsilä Group, 2013–2018. Executive Vice President and CFO, SSAB Group, 2008–2013. Vice President, Business Control, SSAB Group, 2007–2008. CFO, Eltel Networks, 2006–2007. Vice President of Business development, Eltel Networks, 2004–2005. Head of Service Division, Eltel Networks, 2003–2004. Vice President, Corporate Development, Eltel Networks, 2002–2003. Vice President, Strategy & Business Development, NCC Group, 1999–2002. Head of Strategic Planning, NCC Group, 1998–1999. Group Controller, NCC Group, 1996–1998.

Vice Chair of the Board of Directors and Chair of the Audit Committee, Neste Corporation.

Summary of changes in the Group Leadership Team in 2021 and thereafter

During 2021, the Group Leadership Team was complemented with two new appointments:

- Nishant Batra, Chief Strategy and Technology Officer as of 18 January 2021; and
- Melissa Schoeb, Chief Corporate Affairs Officer as of 12 April 2021.

Furthermore, the following changes took place within the Group Leadership Team:

- Ricky Corker, President of Customer Operations, Americas, was appointed Chief Customer Experience Officer as of 1 January 2021;
- Federico Guillén, President of Customer Operations, EMEA & APAC, was appointed President of Network Infrastructure as of 1 January 2021; and
- Raghav Sahgal, President of Nokia Enterprise, was appointed President of Cloud and Network Services as of 1 January 2021.

Share ownership of the Board of Directors and the Group Leadership Team

The following table sets forth the number of shares and American Depositary Shares (ADS) held by the members of the Board as at 31 December 2021, when they held a total of 1 116 075 shares and ADSs in Nokia, which represented approximately 0.02% of our total shares and voting rights excluding shares held by Nokia Group.

Name	Shares ⁽¹⁾	ADSs ⁽¹⁾
Sari Baldauf (Board Chair)	206 931	
Kari Stadigh (Board Vice Chair)	328 058	
Bruce Brown		185 656
Thomas Dannenfeldt	63 677	
Jeanette Horan		79 008
Edward Kozel		106 070
Søren Skou	49 092	
Carla Smits-Nusteling	97 583	

(1) The number of shares or ADSs includes shares and ADSs received as director compensation as well as shares and ADSs acquired through other means. Stock options or other equity awards that are deemed as being beneficially owned under the applicable SEC rules are not included.

The following table sets forth the number of shares and ADSs held by the President and CEO and the other members of the Group Leadership Team in office as at 31 December 2021, when they held a total of 2 724 205 shares and ADSs in Nokia, which represented approximately 0.05% of our total shares and voting rights excluding shares held by Nokia Group.

Name	Position in 2021	Shares ⁽¹⁾	ADSs ⁽¹⁾
Pekka Lundmark	President and CEO	1 232 333	
Nassib Abou-Khalil	Chief Legal Officer	89 446	
Nishant Batra	Chief Strategy and Technology Officer	23 528	
Ricky Corker	Chief Customer Experience Officer	272 966	
Federico Guillén	President of Network Infrastructure	317 262	
Jenni Lukander	President of Nokia Technologies	49 654	
Raghav Sahgal	President of Cloud and Network Services	303 925	
Melissa Schoeb	Chief Corporate Affairs Officer	86 606	
Tommi Uitto	President of Mobile Networks	86 048	
Stephanie Werner-Dietz	Chief People Officer	32 183	
Marco Wirén	Chief Financial Officer	230 254	

(1) As at 31 December 2021, no ADSs were held by the Group Leadership Team members. The number of shares or ADSs includes shares and ADSs received as compensation as well as shares and ADSs acquired through other means. Stock options or other equity awards that are deemed as being beneficially owned under the applicable SEC rules are not included.

Risk management, internal control and internal audit functions at Nokia

Main features of risk management systems

We have a systematic and structured approach to risk management. Key risks and opportunities are primarily identified against business targets either in business operations or as an integral part of strategy and financial planning. Risk management covers strategic, operational, financial, compliance and hazard risks. Key risks and opportunities are analyzed, managed and monitored as part of business performance management with the support of risk management personnel and the centralized Enterprise Risk Management function.

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The principles documented in the Nokia Enterprise Risk Management Policy, which is approved by the Audit Committee of the Board, require risk management and its elements to be integrated into key processes. One of the core principles is that the business or function head is also the risk owner, although all employees are responsible for identifying, analyzing and managing risks, as appropriate, given their roles and duties. Our overall risk management concept is based on managing the key risks that would prevent us from meeting our objectives, rather than focusing on eliminating all risks. In addition to the principles defined in the Nokia Enterprise Risk Management Policy, other key policies reflect implementation of specific aspects of risk management.

Key risks and opportunities are reviewed by the Group Leadership Team and the Board in order to create visibility on business risks as well as to enable prioritization of risk management activities. Overseeing risk is an integral part of the Board's deliberations. The Board's Audit Committee is responsible for, among other matters, risk management relating to the financial reporting process and assisting the Board's oversight of the risk management function. The Board's role in overseeing risk includes risk analysis and assessment in connection with financial, strategy and business reviews, updates and decision-making proposals.

Description of internal control procedures in relation to the financial reporting process

The management is responsible for establishing and maintaining adequate internal control over Nokia's financial reporting. Our internal control over financial reporting is designed to provide reasonable assurance to the management and the Board regarding the reliability of financial reporting and the preparation and fair presentation of published financial statements.

The management conducts a yearly assessment of Nokia's internal controls over financial reporting in accordance with the Committee of Sponsoring Organizations framework (the "COSO framework", 2013) and the Control Objectives for Information and Related Technology (COBIT) framework of internal controls. The assessment is performed based on a top-down risk assessment of our financial statements covering significant accounts, processes and locations, corporate-level controls and information systems' general controls.

As part of its assessment, the management has documented:

- the corporate-level controls, which create the "tone from the top" containing the Nokia values and Code of Conduct and which provide discipline and structure to decision-making processes and ways of working. Selected items from our operational mode and governance principles are separately documented as corporate-level controls;
- the significant processes: (i) give a complete end-to-end view of all financial processes; (ii) identify key control points; (iii) identify involved organizations; (iv) ensure coverage for important accounts and financial statement assertions; and (v) enable internal control management within Nokia;
- the control activities, which consist of policies and procedures to ensure the management's directives are carried out and the related documentation is stored according to our document retention practices and local statutory requirements; and
- the information systems' general controls to ensure that sufficient IT general controls, including change management, system development and computer operations, as well as access and authorizations, are in place.

Further, the management has also:

- assessed the design of the controls in place aimed at mitigating the financial reporting risks;
- tested operating effectiveness of all key controls; and
- evaluated all noted deficiencies in internal controls over financial reporting in the interim and as of year-end.

In 2021, Nokia has followed the procedures as described above and has reported on the progress and assessments to the management and to the Audit Committee of the Board on a quarterly basis.

Description of the organization of the internal audit function

We also have an internal audit function that examines and evaluates the adequacy and effectiveness of our system of internal control. Internal audit reports to the Audit Committee of the Board. The head of the internal audit function has direct access to the Audit Committee, without involvement of the management. The internal audit staffing levels and annual budget are approved by the Audit Committee. All authority of the internal audit function is derived from the Board. The internal audit aligns to the business by business group and function.

Annually, an internal audit plan is developed with input from the management, taking into account key business risks and external factors. This plan is approved by the Audit Committee. Audits are completed across the business focusing on site level, customer level, business project level, IT system implementation, IT security, operations activities or at a Group function level. The results of each audit are reported to the management identifying issues, financial impact, if any, and the correcting actions to be completed. Quarterly, the internal audit function communicates the progress of the internal audit plan completion, including the results of the closed audits, to the Audit Committee.

Internal audit also works closely with our Ethics and Compliance office to review any financial concerns brought to light from various channels and, where relevant, works with Enterprise Risk Management to ensure priority risk areas are reviewed through audits.

In 2021, the internal audit plan was materially completed. Due to some Covid-19 impacts, a very small number of audits had to be rescheduled to 2022. The results of these reviews, as well as the rescheduling to 2022 were reported to the management and to the Audit Committee.

Related party transactions

We determine and monitor related parties in accordance with the International Accounting Standards (IAS 24, Related Party Disclosures) and other applicable regulations. We maintain information on our related parties as well as monitor and assess related party transactions. As a main principle, all transactions should be conducted at arm's-length and as part of the ordinary course of business. In exceptional cases where these principles would be deviated from, Nokia would set up a separate process to determine the related parties in question and to seek relevant approvals in accordance with internal guidelines and applicable regulations.

Main procedures relating to insider administration

Our insider administration is organized according to the applicable European Union and Finnish laws and regulations. In addition, the Board of Directors has approved the Nokia Insider Policy, which sets out Nokia-wide rules and practices to ensure full compliance with applicable rules and that inside information is recognized and treated in an appropriate manner and with the highest integrity. The Nokia Insider Policy is applicable to all directors, executives and employees of the Company.

Persons discharging managerial responsibilities

Nokia has identified members of the Board of Directors and the Group Leadership Team as persons discharging managerial responsibilities who, along with persons closely associated with them, are required to notify Nokia and the Finnish Financial Supervisory Authority of their transactions with Nokia's financial instruments. Nokia publishes the transaction notifications.

In addition, according to the Nokia Insider Policy, persons discharging managerial responsibilities are obligated to clear with the Deputy Chief Legal Officer, Corporate, a planned transaction in Nokia's financial instruments in advance. It is also recommended that trading and other transactions in Nokia's financial instruments are carried out in times when the information available to the market is as complete as possible.

Closed window

Persons discharging managerial responsibilities are subject to a closed window period of 30 calendar days preceding the disclosure of Nokia's quarterly or annual result announcements, as well as the day of the disclosure. During the closed window period, persons discharging managerial responsibilities are prohibited from dealing in Nokia's financial instruments.

Nokia has imposed this closed window period also on separately designated financial reporting persons who are recurrently involved with the preparation of Nokia's quarterly and annual results announcements. These persons are separately notified of their status as designated financial reporting persons.

Insider registers

Nokia does not maintain a permanent insider register. Insiders are identified on a case-by-case basis for specific projects and are notified of their insider status. Persons included in a project-specific insider register are prohibited from dealing in Nokia's financial instruments until the project ends or is made public.

Supervision

Our insider administration's responsibilities include internal communications related to insider matters and trading restrictions, setting up and maintaining our insider registers, arranging related trainings as well as organizing and overseeing compliance with the insider rules.

Violations of the Nokia Insider Policy must be reported to the Deputy Chief Legal Officer, Corporate. Nokia employees may also use channels stated in the Nokia Code of Conduct for reporting incidents involving suspected violations of the Nokia Insider Policy.

Auditor fees and services

Deloitte Oy, based in Helsinki, Finland, served as our auditor for the financial year ended 31 December 2021 and for the financial year ended 31 December 2020. The auditor is elected annually by our shareholders at the Annual General Meeting for the financial year commencing next after the election. On an annual basis, the Audit Committee of the Board prepares a proposal to the shareholders regarding the appointment of the auditor based upon its evaluation of the qualifications and independence of the auditor to be proposed for election.

The following table presents fees by type paid to Deloitte's network of firms for the years ended 31 December:

EURm	2021	2020
Audit fees ⁽¹⁾	22.0	22.3
Audit-related fees ⁽²⁾	1.9	0.4
Tax fees ⁽³⁾	0.2	0.6
All other fees ⁽⁴⁾	0.1	1.6
Total	24.2	24.9

(1) Audit fees consist of fees incurred for the annual audit of the Group's consolidated financial statements and the statutory financial statements of the Group's subsidiaries.

(2) Audit-related fees consist of fees billed for assurance and related services that are reasonably related to the performance of the audit or review of the Group's financial statements or that are traditionally performed by the independent auditor, and include consultations concerning financial accounting and reporting standards; advice and assistance in connection with local statutory accounting requirements; due diligence related to mergers and acquisitions; and audit procedures in connection with investigations in the pre-litigation phase and compliance programs. They also include fees billed for other audit services, which are those services that only the independent auditor can reasonably provide, and include the provision of comfort letters and consents in connection with statutory and regulatory filings and the review of documents filed with the SEC and other capital markets or local financial reporting regulatory bodies.

(3) Tax fees include fees billed for: (i) services related to tax compliance including preparation and/or review of tax returns, preparation, review and/or filing of various certificates and forms and consultation regarding tax returns and assistance with revenue authority queries; compliance reviews, advice and assistance on other indirect taxes; and transaction cost analysis; (ii) services related to tax audits; (iii) services related to individual compliance (preparation of individual tax returns and registrations for employees (non-executives), assistance with applying visa, residency, work permits and tax status for expatriates); (iv) services related to technical guidance on tax matters; (v) services related to transfer pricing advice and assistance with tax clearances; and (vi) tax consultation and planning (advice on stock-based remuneration, local employer tax laws, social security laws, employment laws and compensation programs and tax implications on short-term international transfers).

(4) Other fees include fees billed for Company establishments; liquidations; forensic accounting, data security, other consulting services and reference materials and services.

Compensation

This section sets out our remuneration governance, policies and how they have been implemented within Nokia. It includes our Remuneration Report where we provide disclosure of the compensation of our Board members and the President and CEO for 2021.

The content of the Remuneration Report, which will be presented to an advisory vote at the Annual General Meeting 2022, is detailed below. A standalone version is published on a stock exchange release.

Other compensation-related information provided alongside the Remuneration Report for 2021 is not subject to a vote at the Annual General Meeting 2022, but provides further information on the compensation policies applied within Nokia as well as on the compensation of the rest of the Group Leadership Team.

We report information applicable to executive compensation in accordance with Finnish regulatory requirements and with requirements set forth by the U.S. Securities and Exchange Commission that are applicable to us.

Highlights

- 2021 was a transformational year for Nokia, including refocusing on and strengthening our technology leadership.
- 2021 was also the first complete year with Mr. Lundmark as President and CEO, the first year for many of the Group Leadership Team operating under Nokia's new operating model, and the first complete year operating under the new organization structure, culture and strategy.
- Mr. Lundmark's compensation remained unchanged during the year. The first tranche of restricted shares granted to him on joining (in respect of forfeited awards from his previous employer) vested and were released.
- Following on from his 2020 purchase of EUR 2.6 million of shares in the market, Mr. Lundmark committed a further EUR 2.0 million worth of shares to the co-investment plan, ensuring that his interests and the interests of Nokia's shareholders remain closely aligned.
- The business achieved excellent financial results during 2021, resulting in an above target incentive payment with Mr. Lundmark's short-term incentive award at 183% of target.
- The 2019 Performance Share Plan (in respect of performance during the years 2019-2021) paid out at 53% of target. Mr. Lundmark did not have any awards under this plan.
- Achievement of our incentivized Environmental, Societal and Governance (ESG) metrics was mixed with overall achievement of our emissions targets and under-performance against our diversity targets.
- Our pay policies and practices continue to ensure that there is no unexplained gender based pay gap in Nokia.

Word from the Chair of the Personnel Committee of the Board

Dear Fellow Shareholder,

I am delighted to present this year's compensation report, in a year that was transformational for Nokia and where Nokia reset itself and achieved strong financial performance with significantly improved profitability and cash generation. These results provide confidence that our new strategy, new operating model and new culture are delivering the types of results our shareholders expect.

Business context

The Letter from our President and CEO sets out more detail, with 2021 a year in which the new Nokia strategy delivered great results and our annual incentive plans paid out accordingly. Our performance was reflected in Nokia's share price as well. Our continued use in 2021 of a long-term performance metric based on shareholder return ensures that shareholders and executives are aligned for the short and long term and there are direct links between executive compensation and shareholder value.

In 2021, we maintained the compensation approach set by the policy approved by shareholders in 2020 and applied to Mr. Lundmark when he was appointed. The Remuneration Report, and all elements of the compensation delivered in 2021, are fully consistent with the approved policy.

Strategy and compensation

At the core of Nokia's philosophy lie two principles:

- Pay for performance and aligning the interests of employees with shareholders; and
- Ensuring that compensation programs and policies support the delivery of the corporate strategy and create long-term sustainable shareholder value.

Shareholder outreach

I was delighted that 93% of votes cast at the Annual General Meeting in 2021 supported the remuneration report. During 2021 we met with 15 of our largest shareholders and a number of other key stakeholders, discussing a range of issues, primarily focused on governance and ESG. These meetings have helped to inform our views and strengthen our belief that ESG measures are a core component of our incentive plans.

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The Personnel Committee reviewed our compensation peer group and adjusted this to reflect a group better aligned with our new direction, strategy and market focus. Full details of the changes are presented later in this section; in summary, of the previous group of 14 companies we removed two telecoms companies and added a further 15 (mostly technology) companies giving a new peer group of 27 comparators.

CEO compensation

During 2021, there was no increase to Pekka Lundmark's base salary and target incentives.

- Mr. Lundmark's bonus for 2021 was at 183% of target totaling EUR 2 975 781. This reflects the strong business performance and the progress made in transforming Nokia to deliver the types of results that our shareholders expect.
- Mr. Lundmark participated in the eLTI 2021 co-investment plan. His commitment of EUR 2.0 million worth of shares is a significant sign of his commitment to Nokia and helps to ensure his interest and the interest of our shareholders are closely aligned. As a reminder, the payout of this co-investment plan is determined by total shareholder return.
- The first tranche of Mr. Lundmark's restricted shares, awarded to him in 2020 in respect of forfeited compensation from his previous employer, vested in October 2021. This tranche totaled 117 467 shares and further tranches are due for release in 2022 and 2023 subject to his continued service.

2021 remuneration outcomes

The 2021 Short-Term Incentive outcome for the President and CEO at 183% of overall target reflects Nokia's excellent 2021 performance. The strong financial performance was, however, tempered by lower ESG outcomes, representing 56% of target for this portion of the annual incentive.

The 2019 Long-Term Incentive vested at the end of 2021. The outcome, at 53% of target, reflects the aggregate outcomes for the three-year performance period 2019–2021.

Share ownership requirement

Mr. Lundmark started his tenure with Nokia with a significant purchase of EUR 2.6 million of shares in 2020 and has continued to acquire Nokia shares during 2021. He now exceeds the shareholding requirement with a holding worth approximately five times his annual base salary. This is a sign of his commitment to and alignment with Nokia's long-term success.

Short- and long-term incentives in 2022

Our 2022 incentive plans follow this structure, which is the same as 2021:

Delivering sustainable value – Long-term incentive		
Absolute Total Shareholder Return 100%		
Focus on increase in share price and restoration of the dividend		
Delivering the next year's step in the strategic plan – Short-term incentive		
Comparable operating profit 70%	Strategic objective 20%	Environmental, social and governance aspects (ESG) 10%
Deliver comparable operating profit	Deliver meaningful strategic actions	Deliver on our responsibilities to reduce carbon emissions and become a more diverse employer

The 2022 long-term incentive is based on performance over the life of the three-year plan from the date of the award. The metric is absolute total shareholder return (TSR) measured by dividend adjusted share price at the end of the performance period. By using this metric, we will incentivize executives to deliver the desired business results and support the restoration of the dividend and the transparency for participants to see how the plan is performing. We believe that absolute TSR is a more suitable metric than relative TSR given the Company's turnaround phase where the most relevant benchmark is its own baseline.

Our compensation approach and structure is, has, and continues to play a key role in supporting Nokia's reset and sustainable share price growth.

In the Remuneration Report, we also show a comparison of the development of compensation for the Board members and the President and CEO, against average employee remuneration and Nokia's financial development over the last five years. The comparison shows a clear link between President and CEO pay and Company performance.

Bruce Brown, Chair of the Personnel Committee

Remuneration Policy

Nokia Corporation's Remuneration Policy was supported at the Annual General Meeting 2020 receiving 86% of votes in favor. This policy remained in force during 2021. The information below is provided as a summary for ease of reference.

In addition to applying the Remuneration Policy to our President and CEO, the principles of our policy extend to the Group Leadership Team. This includes caps to equity award amounts and provisions related to clawback.

The Board regularly monitors the effectiveness of the measures used in our incentive plans to ensure that they align with and drive the strategy of the Company.

Remuneration summary for the Board of Directors

The Board's Corporate Governance and Nomination Committee periodically reviews the remuneration for the Chair and members of the Board against companies of similar size and complexity. The objective of the Corporate Governance and Nomination Committee is to enable Nokia to compete for the top-of-the-class Board competence in order to maximize the value creation for the shareholders. The Committee's aim is to ensure that the Company has an efficient Board comprised of international professionals representing a diverse and relevant mix of skills, experience, background and other personal qualities in line with the diversity principles established by the Board. Competitive Board remuneration contributes to the achievement of this target.

The Annual General Meeting resolves annually on the remuneration to the Chair and members of the Board. The Chair of the Board's remuneration was last changed in 2008. The Board members' annual fees were last changed in 2016 and prior to that in 2007. The structure of the Board remuneration for the current term of the Board is set out in the table below.

Fees	<p>Fees consist of annual fees and meeting fees.</p> <p>Approximately 40% of the annual fee is paid in Nokia shares purchased from the market on behalf of the Board members or alternatively delivered as treasury shares held by the Company. The balance is paid in cash, most of which is typically used to cover taxes arising from the paid remuneration.</p> <p>Meeting fees are paid in cash.</p> <p>No meeting fees and no additional annual fees based on service in any of the Board Committees are paid to the Chair of the Board.</p>
Incentives	Non-executive directors are not eligible to participate in any Nokia incentive plans and do not receive performance shares, restricted shares or any other equity-based or other form of variable compensation for their duties as members of the Board.
Pensions	Non-executive directors do not participate in any Nokia pension plans.
Share ownership requirement	Members of the Board shall normally retain until the end of their directorship such number of shares that corresponds to the number of shares they have received as Board remuneration during their first three years of service in the Board (the net amount received after deducting those shares needed to offset any costs relating to the acquisition of the shares, including taxes).
Other	Directors are compensated for travel and accommodation expenses as well as other costs directly related to Board and Committee work. This compensation is paid in cash.

Remuneration for the term that began at the Annual General Meeting held on 8 April 2021 and ends at the close of the Annual General Meeting in 2022 consists of the following fees:

Annual fee ⁽¹⁾	EUR
Chair	440 000
Vice Chair	185 000
Member	160 000
Chair of Audit Committee	30 000
Member of Audit Committee	15 000
Chair of Personnel Committee	30 000
Member of Personnel Committee	15 000
Chair of Technology Committee	20 000
Member of Technology Committee	10 000
Meeting fee ⁽²⁾	EUR
Meeting requiring intercontinental travel	5 000
Meeting requiring continental travel	2 000

(1) The fees payable to the Committee Chairs and members are not paid to the Chair of the Board for her service in any of the Board Committees.

(2) Paid for a maximum of seven meetings per term. Not paid to the Chair of the Board.

Proposals of the Board of Directors to the Annual General Meeting 2022 were published on 3 February 2022. To ensure the competitiveness of the Board remuneration and reflecting the fee development in Nokia's global peer group, the Corporate Governance and Nomination Committee has recommended to the Board that the annual fees of Board members, save for the Chair, would be proposed to be increased with EUR 10 000. Other remuneration payable to the Board and Committee members would remain unchanged and thereby no additional annual fee is proposed to be paid to the members of the Corporate Governance and Nomination Committee or the Chair of the Board for her service in any of the Board Committees.

Consequently, on the recommendation of the Board's Corporate Governance and Nomination Committee and in line with Nokia's Remuneration Policy, the Board of Directors proposes to the Annual General Meeting 2022 that the annual fee payable for a term ending at the close of the next Annual General Meeting be as follows: EUR 440 000 for the Chair of the Board, EUR 195 000 for the Vice Chair of the Board, EUR 170 000 for each member of the Board, EUR 30 000 each for the Chairs of the Audit Committee and the Personnel Committee and EUR 20 000 for the Chair of the Technology Committee as an additional annual fee, EUR 15 000 for each member of the Audit Committee and Personnel Committee and EUR 10 000 for each member of the Technology Committee as an additional annual fee.

In order to align the interests of the Board members with those of the shareholders, it is proposed that, in line with the Company's Corporate Governance Guidelines, approximately 40% of the annual fee be paid in Nokia shares either purchased from the market on behalf of the Board members or alternatively delivered as treasury shares held by the Company. The Board also proposes that members of the Board of Directors shall be compensated for travel and accommodation expenses as well as other costs directly related to Board and Board Committee work. The meeting fee, travel expenses and other expenses would be paid in cash.

Remuneration summary for the President and CEO

Element	Year ending 31 December 2022, in accordance with the approved Remuneration Policy	Year ended 31 December 2021	Purpose	Operation	Opportunity
Name	Pekka Lundmark	Pekka Lundmark			
Base salary	EUR 1 300 000	EUR 1 300 000	Provide competitive base salary to attract and retain individual with the requisite level of knowledge, skills and experience to lead our businesses	Base pay is normally reviewed annually taking into consideration a variety of factors, including, for example, the following: <ul style="list-style-type: none"> ■ performance of the Company and the individual; ■ remuneration of our external comparator group; ■ changes in individual responsibilities; and ■ employee salary increases across Nokia and in the local market. 	Pay reviews are set within the context of employee increases and changes within the Nokia peer group. Changes reflect not only improving performance but also improving competence and skills as would be applied to any other employee in Nokia.
Short-term incentives	Measures: 100% Nokia scorecard - 70% comparable operating profit - 20% strategic objectives - 10% environment, social and governance	Measures: 100% Nokia scorecard - 70% comparable operating profit - 20% strategic objectives - 10% environment, social and governance	To incentivize and reward performance against delivery of the annual business plan	Short-term incentives are based on performance against single-year targets and normally paid in cash. Targets for the short-term incentives are set at the start of the year, in the context of analyst expectations and the annual plan, selecting measures that align to the delivery of Nokia's strategy. Achievement is assessed at the end of the year. Short-term incentives are subject to the clawback policy (see below).	Target award: 125% of base salary Minimum 0% of base salary Maximum 281.25% of base salary
Long-term incentives (Performance Shares)	Target award: 200% of base salary (EUR 2 600 000) Minimum 0% of base salary Maximum 400% of base salary ⁽¹⁾ Metric: Absolute Total Shareholder Return	Target award: 200% of base salary (EUR 2 600 000) Minimum 0% of base salary Maximum 400% of base salary ⁽¹⁾ Metric: Absolute Total Shareholder Return	To reward for delivery of sustainable long-term performance, align the President and CEO's interests with those of shareholders and aid retention.	Long-term incentive awards are normally made in performance shares and paid for performance against longer-term targets. Targets are set in the context of the Nokia long-term plans and analyst forecasts ensuring that they are considered both demanding and motivational. Long-term incentives are subject to the clawback policy (see below).	Target award: 200% of base salary Minimum 0% of base salary Maximum 400% of base salary ⁽¹⁾ . The Board's Personnel Committee retains discretion to make awards up to twice that level in exceptional circumstances such as for example upon recruitment, significant change in responsibilities, significant strategic change or other similar events. The use of discretion would be explained at the time.
Pension	Contribution to the mandatory TyEL pension plan in Finland.	Contribution to the mandatory TyEL pension plan in Finland.	To provide for retirement with a level of certainty.	Retirement age is defined and pensions are provided in line with local country arrangements; in Finland this is the statutory Finnish pension system (Finnish TyEL). Under the TyEL arrangements, base salary, incentives and other taxable benefits are included in the definition of earnings while gains from equity-related plans are not. No supplemental pension arrangements are provided in Finland.	Pursuant to Finnish legislation, Nokia is required to make contributions to the Finnish TyEL pension arrangements in respect of the President and CEO. Such payments can be characterized as defined contribution payments. The amount is disclosed in the Remuneration Report.
Benefits & mobility	Life and critical illness insurance, private medical insurance and company car.	Life and critical illness insurance, private medical insurance and company car.	To attract, retain and protect the President and CEO.	Benefits are made available as part of the same policy that applies to employees more broadly in the relevant country, with additional security provisions, as appropriate.	The value will be the cost to the company.
Total Target Remuneration	EUR 5 525 000	EUR 5 525 000 ⁽²⁾			
Share ownership requirement	Requirement: 3 times annual base salary Requirement (value): EUR 3 900 000	Requirement: 3 times annual base salary Requirement (value): EUR 3 900 000			

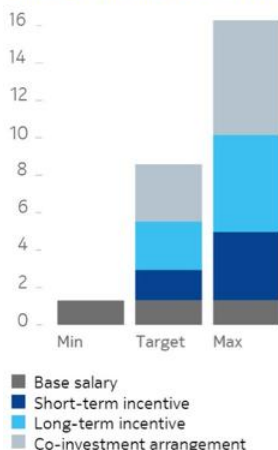
(1) Excluding share price growth

(2) Excluding 2020 and 2021 matching performance share awards under the eLTI co-investment arrangement

Illustration of the earning opportunity for the President and CEO

The illustration below shows the pay components of the President and CEO at minimum, target and maximum payout. It includes an annual apportionment of both 2020 and 2021 eLTI co-investment plans. Mr. Lundmark chose to invest in both years aligning a considerable proportion of his incentive directly to shareholder return.

Earning opportunity of the President and CEO (EURm)



Share ownership requirement

Nokia believes that it is desirable for its executives to own shares in Nokia to align their interests with those of shareholders and to ensure that their decisions are in the long-term interest of the company. The President and CEO is required to own three times his or her annual base salary in Nokia shares and is given a period of five years from appointment to achieve the required level of share ownership.

Remuneration on recruitment

Our policy on recruitment is to offer a compensation package that is sufficient to attract, retain and motivate the individual with the right skills for the required role.

On occasion, we may offer compensation to buy out awards or other lost compensation which the candidate held prior to joining Nokia, but which lapsed upon the candidate leaving their previous employer. Due consideration is given to the potential value and timing of such awards, taking into account any conditions attached to the awards and the likely performance against such conditions.

Clawback

The President and CEO is subject to a clawback policy where any restatement of financial results may result in the reclaiming of amounts previously paid, which had been based on numbers that have since been materially restated. Any such reclaimed amount, and the period over which payments can be reclaimed, will take into account the circumstances and duration of any misstatement. In the case of unintentional misstatement, payments made within the last three years may be subject to the policy at the discretion of the Personnel Committee.

Termination provisions

In the event of a termination of employment, any payable compensation is determined in line with legal advice regarding local legislation, country policies, contractual obligations and the rules of the applicable incentive and benefit plans. Current termination provisions of the President and CEO's service agreement are described in the Remuneration Report.

Change of control arrangements, if any, are based on a double trigger structure, which means that both a specified change of control event and termination of the individual's employment must take place for any change of control-based severance payment to materialize.

Remuneration Report 2021

Please note that the Remuneration Report, applicable to the Board and President and CEO, subject to an advisory vote at the Annual General Meeting 2022, starts below and is also published on a stock exchange release. Other compensation-related information provided before and after the Remuneration Report is not subject to a vote at the Annual General Meeting 2022, but provides further information on the compensation policies applied within Nokia and the compensation of the Group Leadership Team.

Introduction

This Remuneration Report of Nokia Corporation (the Report) has been approved by the company's Board of Directors (the Board) to be presented to the Annual General Meeting 2022. The resolution of the Annual General Meeting on the Report is advisory. The Report presents the remuneration of the Board members and the President and CEO for the financial year 2021 in accordance with the Finnish Decree of the Ministry of Finance 608/2019, the Finnish Corporate Governance Code of 2020 as well as other applicable Finnish laws and regulations. The members of the Board and the President and CEO have been remunerated in accordance with our approved Remuneration Policy during the financial year 2021. No temporary or other deviations from the Policy have been made and no clawback provisions have been exercised during the financial year 2021.

In 2021 our remuneration structure promoted the company's long-term financial success by setting the performance criteria for short- and long-term incentives to support the company's short- and long-term goals, as well as through shareholding requirements set for the President and CEO and the Board members. Aligned with Nokia's pay-for-performance remuneration principle, performance-based compensation was emphasized over fixed base salary. The setting and application of the performance criteria for incentive programs executed the philosophy of pay-for-performance and supported the delivery of the corporate strategy as well as the creation of long-term sustainable shareholder value.

The table below compares the development of the remuneration of our Board of Directors, President and CEO, average employee pay and company performance.

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Year	Aggregate remuneration of the Board of Directors (EUR) ⁽¹⁾	President and CEO actual remuneration (EUR) ⁽²⁾	Average Salaries and Wages (EUR) ⁽³⁾	Net sales (EURm)	Total Shareholder Return (Rebased to 100 at 31 Dec 2016) ⁽⁴⁾
2017	2 138 000	6 423 559	63 461	23 147	64,05
2018	2 203 000	4 651 009	63 220	22 563	85,92
2019	2 219 000	3 897 625	61 980	23 315	57,48
2020	2 016 000	3 587 781	65 787	21 852	54,95
2021	1 821 000	4 908 244	70 411	22 202	132,63

(1) Aggregate total remuneration paid to the members of the Board during the financial year as annual fee and meeting fee, as applicable, and as approved by general meetings of shareholders. The value depends on the number of members elected to the Board for each term as well as on the composition of the Board committees and travel required.

(2) The President and CEO actual remuneration represents the combined total in 2020, when Mr. Lundmark replaced Mr. Suri.

(3) Average salaries and wages are based on average employee numbers and total salaries and wages as reported in the Company's financial statements.

(4) Total shareholder return on last trading day of the previous year.

We also present this data graphically:

Comparative data (rebased year end 2016 = 100)



While the graph reflects the Euro values paid during each financial year, in practice the Board members' remuneration closely aligns with the performance of the Company and the total shareholder return. Approximately 40% of the Board members' annual fees were paid in Nokia shares purchased from the market on their behalf and the directors shall retain until the end of their directorship such number of shares that corresponds to the number of shares they have received as Board remuneration during their first three years of service on the Board. The rest of the annual fee was paid in cash, most of which is typically used to cover taxes arising from the remuneration. It is the Company's policy that the non-executive members of the Board do not participate in any of Nokia's equity programs and do not receive performance shares, restricted shares, or any other equity-based or other variable compensation for their duties as Board members. All members of the Board were non-executive during the financial years 2017–2021.

The pay-for-performance remuneration principle applied to the President and CEO as well as the shareholding requirement of the President and CEO and the Board members, as applicable, contribute to an alignment of interests with shareholders, while also promoting and incentivizing decisions that are in the long-term interest of the Company.

We look forward to our shareholders' support and confirmation that the Report is aligned with the Remuneration Policy.

Board of Directors

The shareholders resolve annually on director remuneration based on a proposal made by the Board of Directors on the recommendation of the Board's Corporate Governance and Nomination Committee.

At the Annual General Meeting held on 8 April 2021, Elizabeth Nelson stepped down from the Board and the Annual General Meeting resolved to elect eight members to the Board. The following Board members were re-elected for a term ending at the close of the Annual General Meeting 2022: Sari Baldauf, Bruce Brown, Thomas Dannenfeldt, Jeanette Horan, Edward Kozel, Søren Skou, Carla Smits-Nusteling and Kari Stadigh.

The aggregate amount of compensation paid to Board members in 2021 equaled EUR 1 821 000 of which EUR 1 770 000 consisted of annual fees and the rest of meeting fees. In accordance with the resolution by the Annual General Meeting 2021, approximately 40% of the annual fee from Board and Board Committee work was paid in Nokia shares purchased from the market on behalf of the Board members following the Annual General Meeting. The directors shall retain until the end of their directorship such number of shares that corresponds to the number of shares they have received as Board remuneration during their first three years of service in the Board. The rest of the annual fee was paid in cash, most of which is typically used to cover taxes arising from the remuneration. All meeting fees were paid in cash.

It is the Company's policy that the non-executive members of the Board do not participate in any of Nokia's equity programs and do not receive performance shares, restricted shares, or any other equity-based or other variable compensation for their duties as Board members. No such variable compensation was paid since all persons acting as Board members during the financial year 2021 were non-executive.

The following table outlines the total annual compensation paid in 2021 to the members of the Board for their services, as resolved by the shareholders at the Annual General Meeting.

	Annual fee (EUR)	Meeting fees (EUR) ⁽¹⁾	Total remuneration paid (EUR)	40% of annual fees paid in shares (EUR)	60% of annual fees and all meeting fees paid in cash (EUR)	Number of Shares Approximately 40% of the annual fee
Sari Baldauf (Board Chair)	440 000	—	440 000	176 000	264 000	43 711
Kari Stadigh (Board Vice Chair)	200 000	7 000	207 000	80 000	127 000	19 868
Bruce Brown	200 000	7 000	207 000	80 000	127 000	19 868
Thomas Dannenfeldt	185 000	7 000	192 000	74 000	118 000	18 378
Jeanette Horan	185 000	7 000	192 000	74 000	118 000	18 378
Edward Kozel	195 000	7 000	202 000	78 000	124 000	19 372
Elizabeth Nelson (until 8 April 2021) ⁽²⁾	—	—	—	—	—	—
Søren Skou	175 000	7 000	182 000	70 000	112 000	17 385
Carla Smits-Nusteling	190 000	9 000	199 000	76 000	123 000	18 875
Total	1 770 000	51 000	1 821 000	708 000	1 113 000	175 835

(1) Meeting fees include all meeting fees paid for the term that ended at the Annual General Meeting held on 8 April 2021 and meeting fees accrued and paid in 2021 for the term that began at the same meeting.

(2) Stepped down at the Annual General Meeting on 8 April 2021 and thus did not receive any annual fee in 2021.

The President and CEO

The following table shows the actual remuneration received by Mr. Lundmark in 2021 and aggregate figures for Pekka Lundmark and Rajeev Suri as President and CEO in 2020 (individual disclosure was contained in last year's report). The long-term incentive payments reflect actual payments in the respective years attributable to the vesting of the 2018 Nokia performance share plan in 2021 (comparative figures show the payment of the 2017 Nokia performance share plan in 2020).

EUR	2021 (Lundmark)	Pay mix ⁽¹⁾	2020 (Combined)	Pay mix ⁽¹⁾
Salary	1 300 000	27%	1 301 032	37%
Short-term incentive ⁽²⁾	2 975 781	61%	1 518 765	43%
Long-term incentive ⁽³⁾	596 732	12%	687 740	20%
Other compensation ⁽⁴⁾	35 731		80 244	
Total	4 908 244		3 587 781	

(1) Pay mix reflects the proportions of base salary, short-term incentive and long-term incentive of total compensation, excluding other compensation.

(2) Short-term incentives represent amounts earned in respect of the financial year, but that are paid in April of the following year.

(3) Mr. Suri's 2019 pro-rated LTI vested in 2021 and will be released in March 2022; this is estimated at EUR 1 281 535 and is excluded from the table above.

(4) Other compensation includes benefits such as telephone, car, driver, tax compliance support, and medical insurance.

Pursuant to Finnish legislation, Nokia is required to make contributions to the Finnish TyEL pension arrangements in respect of the President and CEO. Such payments can be characterized as defined contribution payments. In 2021, payments to the Finnish state pension system equaled EUR 314 457 for Mr. Lundmark in respect of his service as President and CEO (EUR 103 256 for Mr. Lundmark in 2020 as a split year). No supplementary pension arrangements were offered.

Short-term incentive

The 2021 short-term incentive framework for the President and CEO was based on financial, strategic and ESG objectives. Achievement against the 2021 targets was as follows:

Metric	Weight	Target	Achievement
Comparable Operating Profit	70%	1 823 EURm	225%
Diversity	5%	Diversity of new hires	0%
		411 125 tCO ₂ e (Scopes 1 and 2), 1 463 tCO ₂ e/EURm (Scope 3)	
Emissions Scopes 1,2 and 3	5%	Individual objectives	112.5%
Strategic Objectives	20%		100%

Accordingly, the short-term incentive of Mr. Lundmark as the President and CEO equaled EUR 2 975 781 or 183% of the target award.

Long-term incentives

In 2021, Mr. Lundmark was awarded the following equity awards under the Nokia equity program. The performance condition for the 2021 performance shares is based on absolute total shareholder return and the actual achievement will be detailed following the end of the three-year performance period. The eLTI plan is a co-investment plan applicable to the President and CEO and a select number of other senior executives, which provides for a 2:1 award of Nokia Performance Shares in return for purchase and continued holding of Nokia shares. This substantial personal investment in Nokia shares directly aligns Mr. Lundmark's interests with those of shareholders. The award payout is determined by absolute total shareholder return.

Performance share awards ⁽¹⁾	Units awarded	Grant date fair value (EUR)	Grant date	Vesting
Awarded as regular performance share award	769 200	2 607 588	25 March 2021	Q1 2024
Awarded as eLTI performance share award	962 180	4 089 265	1 June 2021	Q2 2024

(1) The 2021 performance shares (regular and eLTI) have a three-year performance period based on absolute total shareholder return. The maximum payout is 200% subject to maximum performance against the performance criterion. Vesting is subject to continued employment.

Vesting for President and CEO during the year

The first tranche of Mr. Lundmark's 2020 restricted share award, made to him on joining in recognition of forfeited awards from his previous employer, vested on 1 October 2021, releasing 117 467 shares to the value of EUR 596 732.

Share awards vesting during the year	Units awarded	Target	Achievement	Units vesting
2020 Restricted Share Award Tranche 1	117 467	N/A	N/A	117 467

Vesting for former President and CEO during the year

Mr. Suri's pro-rated 2019 Performance Share Award vested on 31 December 2021 and will be released in March 2022. The award was pro-rated to 66.67% reflecting his two years of service during the performance period, and vesting was at 53% resulting in a projected release of 229 913 shares with an estimated value of EUR 1 281 535 (using the 31 December 2021 share price). The Board decided this pro-rated vesting to Mr. Suri to ensure his full commitment to the successful leadership transition that was critical for the Company in the period before Mr. Lundmark was released by his previous employer, during the early stages of the COVID-19 pandemic.

Performance Share Award 2019	Units awarded	Target	Units vesting
2019 annual award	650 699	Market share, earnings per share, free cash flow	229 913

Share ownership

Our share ownership policy requires that the President and CEO holds a minimum of three times his or her annual base salary in Nokia shares in order to ensure alignment with shareholder interests over the long term. Mr. Lundmark significantly exceeds this requirement with a holding of approximately five times base salary, well within the five-year period permitted.

Mr. Lundmark	Units	Value ⁽¹⁾ (EUR)
Beneficially owned shares as of 31 December 2021	1 232 333	6 869 024
Unvested shares under outstanding Nokia equity plans ⁽²⁾	4 029 007	22 457 685
Total	5 261 340	29 326 709

(1) The values are based on the closing price of a Nokia share of EUR 5.574 on Nasdaq Helsinki on 31 December 2021.

(2) The number of units represents the number of unvested awards as of 31 December 2021.

Mr. Lundmark's termination provisions are as follows

Termination by	Reason	Notice	Compensation
Nokia	Cause	None	The President and CEO is entitled to no additional compensation and all unvested equity awards would be forfeited after termination.
Nokia	Reasons other than cause	Up to 12 months	The President and CEO is entitled to a severance payment equaling up to 12 months of compensation (including annual base salary, benefits, and target incentive) and unvested equity awards would be forfeited after termination.
President and CEO	Any reason	12 months	The President and CEO may terminate his service agreement at any time with 12 months' prior notice. The President and CEO would either continue to receive salary and benefits during the notice period or, at Nokia's discretion, a lump sum of equivalent value. Additionally, the President and CEO would be entitled to any short or long-term incentives that would normally vest during the notice period. Any unvested equity awards would be forfeited after termination.
President and CEO	Nokia's material breach of the service agreement	Up to 12 months	In the event that the President and CEO terminates his service agreement based on a final arbitration award demonstrating Nokia's material breach of the service agreement, he is entitled to a severance payment equaling up to 12 months of compensation (including annual base salary, benefits and target incentive). Any unvested equity awards would be forfeited after termination.

The President and CEO is subject to a 12-month non-competition and non-solicit obligation that applies after the termination of the service agreement or the date when he is released from his obligations and responsibilities, whichever occurs earlier.

Remuneration governance

We manage our remuneration through clearly defined processes, with well-defined governance principles, ensuring that no individual is involved in the decision-making related to their own remuneration and that there is appropriate oversight of any compensation decision. Remuneration of the Board is annually presented to shareholders for approval at the Annual General Meeting and the remuneration of the President and CEO is approved by the Board.

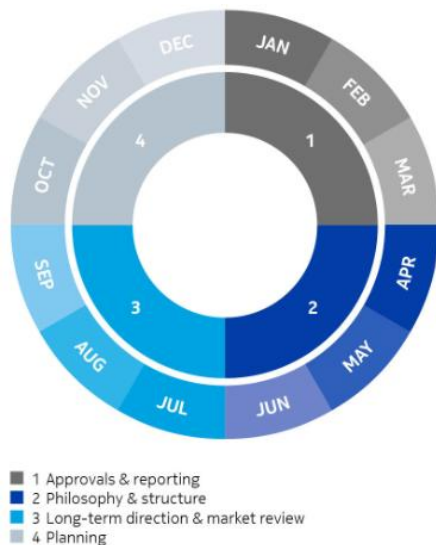
The Board submits its proposal to the Annual General Meeting on the recommendation of the Board's Corporate Governance and Nomination Committee, which actively considers and evaluates the appropriate level and structure of directors' remuneration. Shareholders also authorize the Board to resolve to issue shares, for example to settle Nokia's equity-based incentive plans, based on the proposal of the Board.

The Board of Directors approves, and the independent members of the Board confirm, the compensation of the President and CEO, upon recommendation of the Personnel Committee. The Personnel Committee consults regularly with the President and CEO and the Chief People Officer though they are not present when their own compensation is reviewed or discussed. This enables the Personnel Committee to be mindful of employee pay and conditions across the broader employee population. The Committee has the power, in its sole discretion, to retain compensation consultants to assist the Personnel Committee in evaluating executive compensation.

The Personnel Committee Chair regularly engages with shareholders on pay and broader matters to hear their views on our compensation policies, programs and associated disclosures and reflect on their feedback. In recent years this feedback has informed the increase in performance periods for the long-term incentive and the inclusion of ESG metrics.

Work of the Personnel Committee

The Personnel Committee convened five times during 2021 with a general theme for each meeting. All meetings were held in accordance with any COVID-19 restrictions in force at the time.



January

Incentive targets and objectives

- Nokia Equity Program
- Culture evolution
- Prior year incentive results
- President and CEO remuneration

May

- Culture update
- Shareholder feedback update
- GLT compensation review

July

- Succession
- People risks and opportunities
- LTI Development
- Status of incentive payouts and ESG goal achievement

September

- 2022 Incentive framework
- Analytics and demographics
- Equity plan direction

December

- Personnel Committee charter review
- 2022 Incentive metrics
- Proxy agency and shareholder feedback
- The Compensation Report for 2021

The President and CEO

The President and CEO has an active role in the compensation governance and performance management processes for the Group Leadership Team and the wider employee population at Nokia.

The President and CEO is not a member of the Personnel Committee and does not vote at Personnel Committee meetings, nor does he participate in any conversations regarding his own compensation.

Advisors

The Personnel Committee engaged Willis Towers Watson, an independent external consultant, to assist in the review and determination of executive compensation and program design and provide insight into market trends and regulatory developments.

Group Leadership Team

At the end of 2021, the Group Leadership Team consisted of 11 persons split between Finland, other European countries, Singapore and the United States. For information regarding the current Group Leadership Team composition refer to the Corporate Governance Statement.

Name	Position in 2021	Appointment date
Pekka Lundmark	President and CEO	1 August 2020
Nassib Abou-Khalil	Chief Legal Officer	1 August 2019
Nishant Batra	Chief Strategy & Technology Officer	18 January 2021
Ricky Corker	President, Customer Experience (new role as of 1 January 2021)	1 January 2019
Federico Guillén	President, Network Infrastructure (new role as of 1 January 2021)	8 January 2016
Jenni Lukander	President, Nokia Technologies	1 August 2019
Raghav Sahgal	President, Cloud and Network Services (new role as of 1 January 2021)	1 June 2020
Melissa Schoeb	Chief Corporate Affairs Officer	12 April 2021
Tommi Uitto	President, Mobile Networks	31 January 2019
Stephanie Werner-Dietz	Chief People Officer	1 January 2020
Marco Wirén	Chief Financial Officer	1 September 2020

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The remuneration of the members of the Group Leadership Team (excluding the President and CEO) consists of base salary, other benefits, and short- and long-term incentives. Short-term incentive plans are based on rewarding the delivery of business performance utilizing certain, or all, of the following metrics as appropriate to the member's role: revenue, comparable operating profit, free cash flow and defined strategic objectives.

Executives on the Group Leadership Team are subject to the same remuneration policy framework as the President and CEO. This includes being subject to clawback and shareholding requirements. The shareholding requirement for members of the Group Leadership Team is two times their base salary.

Remuneration of the Group Leadership Team in 2021

Remuneration of the Group Leadership Team (excluding the President and CEO) in 2020 and 2021, in the aggregate, was as follows:

	2021 EURm ⁽¹⁾	2020 EURm ⁽¹⁾
Salary, short-term incentives and other compensation ⁽²⁾	16.0	24.4
Long-term incentives ⁽³⁾	2.2	3.7
Total	18.2	28.1

(1) The values represent each member's time on the Group Leadership Team.

(2) Short-term incentives represent amounts earned in respect of 2021 performance. Other compensation includes mobility related payments, local benefits and pension costs.

(3) The amounts represent the value of equity awards that vested in 2021.

The members of the Group Leadership Team (excluding the President and CEO) were awarded the following equity awards under the Nokia equity program in 2021:

Award	Units awarded ⁽¹⁾	Grant date fair value (EUR)	Grant date	Vesting
Performance share award ⁽²⁾	1 998 300	6 850 125	25 March and 19 May 2021	Q1 2024 and Q2 2024
eLTI performance share award ⁽³⁾	1 584 852	6 735 621	1 June 2021	Q2 2024
Restricted share award ⁽⁴⁾	888 300	3 143 313	25 March and 19 May 2021	Q1 2022, Q2 2022, Q1 2023, Q3 2023

(1) Includes units awarded to persons who were Group Leadership Team members during 2021.

(2) The 2021 performance shares have a three-year performance period based on absolute total shareholder return. The maximum payout is 200% subject to maximum performance against the performance criterion. Vesting is subject to continued employment.

(3) The eLTI is a selective arrangement offered to senior leaders in 2021. In return for the purchase and continued holding of Nokia shares, a 2:1 match of Nokia 2021 performance shares was made. These vest after three years subject to absolute total shareholder return and continued employment, with a maximum payment at 200% subject to maximum performance.

(4) Vesting of the tranches of the 2021 restricted share award is conditional to continued employment.

Unvested equity awards held by the Nokia Group Leadership Team, including the President and CEO

The following table sets forth the potential aggregate ownership interest through the holding of equity-based incentives of the Group Leadership Team in office, including the President and CEO, as of 31 December 2021:

	Shares receivable through performance shares at grant	Shares receivable through performance shares at maximum ⁽⁴⁾	Shares receivable through restricted shares
Number of equity awards held by the Group Leadership Team ⁽¹⁾	9 619 108	19 238 216	1 392 775
% of the outstanding shares ⁽²⁾	0.17%	0.34%	0.02%
% of the total outstanding equity incentives (per instrument) ⁽³⁾	13.68%	13.68%	5.48%

(1) Includes the 11 members of the Group Leadership Team in office as of 31 December 2021.

(2) The percentages are calculated in relation to the outstanding number of shares and total voting rights of Nokia as of 31 December 2021, excluding shares held by Nokia Group. No member of the Group Leadership Team owns more than 1% of the outstanding Nokia shares.

(3) The percentages are calculated in relation to the total outstanding equity incentives per instrument.

(4) At maximum performance, under the performance share plans outstanding as of 31 December 2021, the payout would be 200% and the table reflects this potential maximum payout. The 2019 performance shares vested on 1 January 2022 and the shares released will be distributed in March 2022.

Review of our incentive plans

Each year we monitor the performance of our incentive plans against the targets for the plan, total shareholder return and the impact that the plans have on total compensation compared with market peers.

Target setting

Targets for the short-term incentives are set annually at or before the start of the year, balancing the need to deliver value with the need to motivate and drive performance of the Group Leadership Team. Targets are selected from a set of strategic metrics that align with driving sustainable value for shareholders and are set in the context of market expectations and analyst consensus forecasts. Targets for our long-term incentive plans are set in a similar context. The long-term incentive targets are set at the start of the performance period and locked in for the life of the plan.

Short-term incentives

In 2021 short-term incentive targets and achievements were based on a mix of metrics as shown below. Targets were measured either at a Nokia Group level or, alternatively, a mix of Nokia Group and business group level for business group presidents.

- Comparable operating profit of Nokia
- Operating profit / operating margin for the relevant business group
- Role related strategic objectives
- ESG (carbon emissions and diversity)

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Those Group Leadership Team members not leading a business group will have the equivalent proportion of their incentive based on Nokia's comparable operating profit.

Long-term incentives

We annually review compensation against key metrics such as total shareholder return and share price to validate the effectiveness of our equity plans.

The 2019 performance share plan vested on 1 January 2022 with 53% of the target award vesting based on the achievement against the revenue, earnings per share and free cash flow targets during the performance period (financial years 2019–2021).

The metric for the performance shares awarded in 2021 (under the Nokia LTI Plan 2021-2023) was based on total shareholder return in a similar manner to the 2020 awards. This reflects our commitment to driving the best direct, long-term results and closely aligns plan participants with the interests of shareholders. Awards to senior executives and leaders were made in March and for other employees in October. The performance periods were adjusted accordingly to ensure that a three-year vesting period was maintained and the awards will not vest until a corresponding date three years later in 2024. The performance conditions were not adjusted.

Nokia Long-Term Incentive Plan and Employee Share Purchase Plan 2021-2023

The long-term incentive plan (LTI Plan) intends to effectively contribute to the long-term value creation and sustainability of the Company and align the interests of the executives and employees with those of Nokia's shareholders. Nokia's long-term incentive plan for 2021-2023 is a key tool which supports these objectives. Under the LTI Plan the Company may grant eligible executives and other employees awards in the form of both performance shares and restricted shares.

Awards under the LTI Plan may be granted between the date the plan is approved and 31 December 2023 subject to applicable performance metrics as well as performance and/or restriction periods of up to 36 months depending on the award. Consequently, the restriction periods for the last awards granted under the LTI Plan would end in 2026. Performance metrics as well as weightings and targets for the selected metrics for performance shares are set by the Board of Directors annually to ensure they continue to support Nokia's long-term business strategy and financial success.

The potential maximum aggregate number of Nokia shares that may be issued based on awards granted under the LTI plan in 2021, 2022 and 2023 is 350 million. Until the Nokia shares are delivered, the participants will not have any shareholder rights, such as voting or dividend rights associated with the performance or restricted shares. If the participant's employment with Nokia terminates before the vesting date of the award or a part of an award, the individual is not, as a main rule, entitled to settlement based on the plan.

The approach for 2021 and the intended approach for 2022 is that the majority of long-term incentive plan participants receive restricted shares rather than performance shares although the executives, including the President and CEO, continued to receive performance shares as the main form of long-term incentives. The performance shares will be subject to performance criterion which will continue to be absolute total shareholder return and the plan vests no earlier than three years from the grant. The regular restricted share awards will have a three-year vesting period with cliff vesting but, in limited cases predominantly related to retention, the Company may introduce different vesting periods with tranche vesting. This will simplify plan participation for employees.

The purpose of the employee share purchase plan (ESPP) is to encourage share ownership within the Nokia employee population, increasing engagement and sense of ownership in the company. Under the ESPP 2021-2023, subject to the Board commencing annual plan cycles, the eligible employees may elect to make contributions from their monthly net salary to purchase Nokia shares at market value on pre-determined dates on a quarterly basis during the applicable plan period. Nokia would deliver one matching share for every two purchased shares that the participant still holds at the end of applicable plan cycle. In addition, the participants may be offered free shares subject to meeting certain conditions related to participation as determined by the Board.

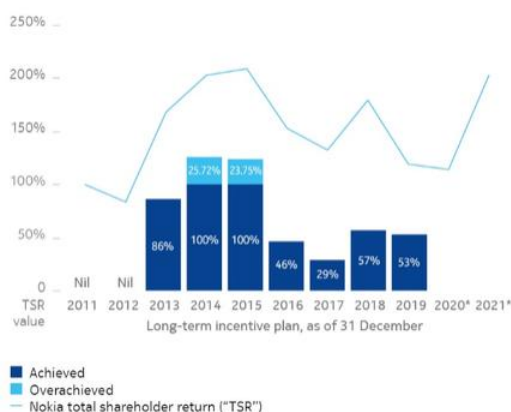
The maximum number of shares that can be issued under all plan cycles commencing under the ESPP in 2021, 2022 and 2023 is 35 million. Participants have immediate shareholder rights over all shares purchased from the market. Until the matching or free Nokia shares are delivered, the participants will not have any shareholder rights, such as voting or dividend rights associated with the matching or free shares.

Pay for performance

Core to our compensation philosophy is a desire to pay for performance.

Each year we review overall total shareholder return compared with long-term incentive payouts mapping the performance of the plans against the total shareholder return curve.

TSR vs LTI performance



* Performance period not yet completed.

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Looking at the performance of our long-term incentive plans against total shareholder return, there is a reasonable alignment with the performance of the plans declining as total shareholder return declines and the trend lines are reasonably aligned.

The Board continues to actively monitor the performance of our long-term incentive plans to ensure that they deliver value for shareholders.

Review of our comparator companies

In looking for suitable comparators, we have always considered businesses of similar size, global scale and complexity. During 2021, our core comparator group was reviewed and updated so that it consists of the following 27 companies (15 companies marked in italics were added, and two - BT, Deutsche Telekom - were removed). The Board feels that this comparator group now better reflects Nokia's business and human capital competitors.

ABB	<i>Ciena</i>	<i>IBM</i>	Philips
Adobe	<i>Cisco Systems</i>	Infineon Technologies	SAP
Airbus	<i>Corning</i>	<i>Juniper Networks</i>	<i>Siemens Healthineers</i>
ASML	<i>Dell Technologies</i>	Kone	<i>VMware</i>
Atos	Ericsson	<i>Motorola Solutions</i>	Vodafone Group
BAE Systems	<i>Hewlett Packard Enterprise</i>	<i>NXP Semiconductors</i>	<i>Wärtsilä</i>
Capgemini	<i>HP</i>	<i>Oracle</i>	

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Selected financial data

This section includes selected financial and other measures for the Nokia Group as of and for each of the years in the three-year period ended 31 December 2021. The information has been derived from, and should be read in conjunction with, our audited consolidated financial statements prepared in accordance with IFRS. The consolidated financial statements as of 31 December 2021 and 2020 and for the years ended 31 December 2021, 2020 and 2019 are included in this report.

	2021	2020	2019
For the year ended 31 December	(in EURm, except for percentage and personnel data)		
From the consolidated income statement			
Net sales	22 202	21 852	23 315
Operating profit	2 158	885	485
% of net sales	9.7%	4.0%	2.1%
Profit before tax	1 926	743	156
Profit/(loss) for the year from continuing operations	1 654	(2 513)	18
Loss for the year from discontinued operations	(9)	(3)	(7)
Profit/(loss) for the year	1 645	(2 516)	11
From the consolidated statement of financial position			
Non-current assets	20 452	17 976	22 320
Current assets	19 597	18 215	16 808
Total assets	40 049	36 191	39 128
Capital and reserves attributable to equity holders of the parent	17 360	12 465	15 325
Non-controlling interests	102	80	76
Total equity	17 462	12 545	15 401
Interest-bearing liabilities ⁽¹⁾	4 653	5 576	4 277
Lease liabilities ⁽¹⁾	1 009	910	1 030
Provisions ⁽¹⁾	1 569	1 532	1 209
Other liabilities ⁽¹⁾	15 356	15 628	17 211
Total shareholders' equity and liabilities	40 049	36 191	39 128
Other information			
Research and development expenses	(4 214)	(4 087)	(4 532)
% of net sales	(19.0)%	(18.7)%	(19.4)%
Capital expenditure	(560)	(479)	(690)
% of net sales	(2.5)%	(2.2)%	(3.0)%
Personnel expenses	(7 541)	(7 310)	(7 360)
Average number of employees	87 927	92 039	98 322
Order backlog, EUR billion	20.3	16.6	18.8
Key financial indicators and ratios			
Earnings per share attributable to equity holders of the parent			
Basic earnings per share, EUR			
Continuing operations	0.29	(0.45)	0.00
Profit/(loss) for the year	0.29	(0.45)	0.00
Diluted earnings per share, EUR			
Continuing operations	0.29	(0.45)	0.00
Profit/(loss) for the year	0.29	(0.45)	0.00
Proposed dividend per share, EUR ⁽²⁾	0.08	—	—
Return on capital employed %	10.13%	4.60%	1.31%
Return on shareholders' equity %	10.88%	neg.	0.05%
Equity ratio %	43.60%	34.66%	39.36%
Net debt to equity (gearing) %	(26.43)%	(19.81)%	(11.23)%
Cash and cash equivalents	6 691	6 940	5 910
Total cash and current financial investments ⁽³⁾	9 268	8 061	6 007
Net cash and current financial investments ⁽⁴⁾	4 615	2 485	1 730
Net cash from operating activities	2 625	1 759	390
Free cash flow	2 368	1 356	(297)

(1) Includes both current and non-current liabilities in the consolidated statement of financial position.

(2) The Board of Directors proposes to the Annual General Meeting to be authorized to decide in its discretion on the distribution of an aggregate maximum of EUR 0.08 per share as dividend and/or equity repayment.

(3) Total cash and current financial investments consist of the following line items from our consolidated statement of financial position: cash and cash equivalents and current financial investments.

(4) Net cash and current financial investments equal total cash and current financial investments less long-term and short-term interest-bearing liabilities.

Operating and financial review

The financial information included in this “Operating and financial review” section as of 31 December 2021 and 2020, and for the years ended 31 December 2021, 2020 and 2019 has been derived from our audited consolidated financial statements included in this report. The financial information should be read in conjunction with, and is qualified in its entirety by reference to, our audited consolidated financial statements.

Results of operations

This “Results of operations” section discusses the results of our continuing operations.

Impact of COVID-19 on our operations

The COVID-19 pandemic that started in early 2020 and had a severe impact on the global economy and financial markets during the year, continued to affect people and businesses around the world in 2021. While the situation is improving and economic recovery is on its way, certain parts of the world and certain sectors of the economy continue to be hit harder than others. In 2020, the impact of COVID-19 on our financial performance and financial position was primarily related to temporary factory closures in the first half of the year. The factory closures related primarily to Submarine Networks business in Network Infrastructure and had a negative impact on net sales, with the majority of these net sales shifting to future periods, rather than being lost. In addition, COVID-19 affected our operational costs and cash flows in 2020, for example as a result of temporarily lower travel, temporary delays in capital expenditure and lower cash outflows related to income taxes due to tax reliefs. In 2021, we saw some benefit related to an increase in demand in areas like Fixed Networks, where trends such as remote working drove communications service providers to increase investments in their broadband infrastructure.

As of 31 December 2021, potential risks and uncertainties continue to exist related to the scope and duration of the COVID-19 pandemic and the pace and shape of the economic recovery following it, and it is impossible to predict with accuracy the precise impact of such risks on us, our operations and our business.

Cost savings programs

In 2018, following the completion of the Alcatel-Lucent integration and the related cost savings program, we announced a cost reduction program to target substantial savings while continuing to make further investments to drive future growth and higher returns. The savings came from a wide range of areas, including investments in digitalization to drive more automation and productivity, further process and tool simplification, significant reductions in central support functions to reach best-in-class cost levels, prioritization of R&D programs to best create long-term value, a sharp reduction of R&D in legacy products, driving efficiency from further application of our Common Software Foundation and innovative software development techniques, the consolidation of selected cross-company activities and further reductions in real estate and other overhead costs. In 2020, we completed our cost savings program, generating the expected savings through the actions listed above. The cost savings program resulted in EUR 500 million of net benefits in full year 2020, compared to full year 2018.

In the first quarter of 2021, we announced plans to reset our cost base, targeting a reduction of approximately EUR 600 million by the end of 2023. Given the strength in our end markets in 2021, the pace of restructuring in 2021 has been slower than we initially planned. The overall size of the plan, however, remains unchanged, and continues to depend on the evolution of our end markets – consistent with our commentary when we announced the plan. In February 2022, we updated our expectations for restructuring and associated charges as well as cash outflows, compared to our original estimates. We expect the cost savings to result in approximately EUR 500-600 million of restructuring and associated charges by 2023, down from our previous estimate of EUR 600-700 million. We also expect total restructuring and associated cash outflows to be approximately EUR 1 050-1 150 million, down slightly from our previous estimate of EUR 1 100-1 200 million. This total includes approximately EUR 500 million of cash outflows related to our previous restructuring program.

For the year ended 31 December 2021 compared to the year ended 31 December 2020

The following table sets forth the results of Nokia and the percentage of net sales for the years indicated.

For the year ended 31 December	2021		2020		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	22 202	100.0	21 852	100.0	2
Cost of sales	(13 368)	(60.2)	(13 659)	(62.5)	(2)
Gross profit	8 834	39.8	8 193	37.5	8
Research and development expenses	(4 214)	(19.0)	(4 087)	(18.7)	3
Selling, general and administrative expenses	(2 792)	(12.6)	(2 898)	(13.3)	(4)
Other operating income and expenses	330	1.5	(323)	(1.5)	–
Operating profit	2 158	9.7	885	4.0	144
Share of results of associated companies and joint ventures	9	–	22	0.1	(59)
Financial income and expenses	(241)	(1.1)	(164)	(0.8)	47
Profit before tax	1 926	8.7	743	3.4	–
Income tax expense	(272)	(1.2)	(3 256)	(14.9)	–
Profit/(loss) for the year	1 654	7.4	(2 513)	(11.5)	–
Attributable to:					
Equity holders of the parent	1 632	7.4	(2 520)	(11.5)	–
Non-controlling interests	22	0.1	7	–	214

Net sales

Net sales in 2021 were EUR 22 202 million, an increase of EUR 350 million, or 2%, compared to EUR 21 852 million in 2020. The increase in net sales was primarily due to growth in Network Infrastructure and, to a lesser extent, Nokia Technologies. This was partially offset by a decline in Mobile Networks net sales.

The following table sets forth distribution of net sales by region for the years indicated.

For the year ended 31 December	2021 EURm	2020 ⁽¹⁾ EURm	Year-on-year change %
Asia Pacific	2 562	2 742	(7)
Europe ⁽²⁾	6 635	6 427	3
Greater China	1 545	1 510	2
India	1 039	954	9
Latin America	1 226	1 070	15
Middle East & Africa	1 915	1 981	(3)
North America	7 280	7 168	2
Total	22 202	21 852	2

(1) In 2021, we aligned how we externally report financial information on a regional basis with our internal reporting structure. As a result, India which was earlier presented as part of Asia Pacific region, is presented as a separate region. In addition, certain countries are now presented as part of a different region. The comparative net sales by region amounts for 2020 have been recast accordingly.

(2) All Nokia Technologies IPR and licensing net sales are allocated to Finland.

The following table sets forth distribution of net sales by customer type for the years indicated.

For the year ended 31 December	2021 EURm	2020 EURm	Year-on-year change %
Communication service providers	17 977	17 954	0
Enterprise	1 575	1 571	0
Licensees	1 502	1 402	7
Other ⁽¹⁾	1 148	925	24
Total	22 202	21 852	2

(1) Includes net sales of Submarine Networks which operates in a different market, and Radio Frequency Systems (RFS), which is being managed as a separate entity, and certain other items, such as elimination of inter-segment revenues and certain items related to purchase price allocation. Submarine Networks and RFS net sales also include revenue from communication service providers and enterprise customers.

Gross profit

Gross profit in 2021 was EUR 8 834 million, an increase of EUR 641 million, or 8%, compared to EUR 8 193 million in 2020. The increase in gross profit was primarily due to Network Infrastructure, Cloud and Network Services and Nokia Technologies, partially offset by Mobile Networks. Gross profit in 2021 also reflected lower restructuring and associated charges and the absence of a gain related to defined benefit plan amendments. In 2021, variable pay accruals within cost of sales were higher, compared to 2020. Gross margin in 2021 was 39.8%, compared to 37.5% in 2020. In 2021, gross profit included restructuring and associated charges of EUR 121 million, compared to EUR 393 million in 2020. In 2021, gross profit did not include a gain related to defined benefit plan amendments, compared to a gain of EUR 90 million in 2020.

Operating expenses

Our research and development expenses in 2021 were EUR 4 214 million, an increase of EUR 127 million, or 3%, compared to EUR 4 087 million in 2020. Research and development expenses represented 19.0% of our net sales in 2021 compared to 18.7% in 2020. The increase in research and development expenses was primarily related to increased investments in both Mobile Networks and Network Infrastructure. The higher research and development expenses also reflected lower restructuring and associated charges. In 2021, variable pay accruals within research and development expenses were higher, compared to 2020. In 2021, research and development expenses included restructuring and associated charges of EUR 62 million, compared to EUR 190 million in 2020.

Our selling, general and administrative expenses in 2021 were EUR 2 792 million, a decrease of EUR 106 million compared to EUR 2 898 million in 2020. Selling, general and administrative expenses represented 12.6% of our net sales in 2021 compared to 13.3% in 2020. The decrease in selling, general and administrative expenses was broad-based across businesses and largely reflected efforts to reduce our cost base. Additionally, the lower selling, general and administrative expenses in 2021 reflected lower amortization of acquired intangible assets, partially offset by the absence of a transaction and integration-related credits which benefited 2020 and slightly higher restructuring and associated charges. In 2021, variable pay accruals within selling, general and administrative expenses were higher, compared to 2020. In 2021, selling, general and administrative expenses included amortization of acquired intangible assets of EUR 335 million, compared to EUR 350 million in 2020. 2021 did not include any transaction and integration-related credits, compared to EUR 11 million in 2020. 2021 included restructuring and associated charges of EUR 74 million, compared to EUR 68 million in 2020.

Other operating income and expenses in 2021 was a net income of EUR 330 million, an increase of EUR 653 million, compared to a net expense of EUR 323 million in 2020. The net positive fluctuation in our other operating income and expenses was primarily due to a non-cash impairment loss on goodwill which negatively impacted 2020, a net positive fluctuation in the amount of loss allowances on trade receivables, increased net benefits from Nokia's venture fund investments, a gain related to the settlement of legal disputes and foreign exchange hedging.

Operating profit

Our operating profit in 2021 was EUR 2 158 million, an increase of EUR 1 273 million, compared to an operating profit of EUR 885 million in 2020. The increase in operating profit was primarily due to a net positive fluctuation in other operating income and expenses, higher gross profit and lower selling, general and administrative expenses, partially offset by higher research and development expenses. Our operating margin in 2021 was 9.7%, compared to 4.0% in 2020.

Financial income and expenses

Financial income and expenses were a net expense of EUR 241 million in 2021, an increase of EUR 77 million, or 47%, compared to a net expense of EUR 164 million in 2020. The net negative fluctuation in financial income and expenses was primarily due to a change in the financial liability to acquire Nokia Shanghai-Bell non-controlling interest, partially offset by lower loss allowances on customer financing loans. In 2021, the change in liability to acquire Nokia Shanghai-Bell non-controlling interest was negative EUR 33 million, compared to positive EUR 79 million in 2020. In 2021, loss allowances on customer financing loans recognized in the income statement were EUR 32 million, compared to EUR 58 million in 2020.

Profit before tax

Our profit before tax in 2021 was EUR 1 926 million, an increase of EUR 1 183 million compared to EUR 743 million in 2020.

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Income tax

Income taxes were a net expense of EUR 272 million in 2021, a decrease of EUR 2 984 million compared to a net expense of EUR 3 256 million in 2020. The decrease in net income taxes was primarily attributable to the derecognition of Finnish deferred tax assets of EUR 2.9 billion that negatively impacted 2020 and, to a lesser extent, tax benefits related to both past operating model integration, as well as a change in the recognition of deferred tax assets in 2021. The derecognition in 2020 was required due to a regular assessment of our ability to utilize the tax assets in Finland in the foreseeable future that is done primarily based on our historical performance. These tax assets are not lost, and the derecognition can be reversed. They can still be utilized in the taxation and the derecognition is not expected to affect the overall taxation of the Nokia Group or its cash taxes. For further information on the realizability assessment of Finnish deferred tax assets, please refer to Note 11, Income taxes, of our consolidated financial statements.

Profit/loss attributable to equity holders of the parent and earnings per share

The profit attributable to equity holders of the parent in 2021 was EUR 1 632 million, an increase of EUR 4 152 million, compared to a loss of EUR 2 520 million in 2020. The change in profit attributable to equity holders of the parent was primarily due to lower income tax expenses and an improvement in operating profit, partially offset by a net negative fluctuation in financial income and expenses.

Our EPS from continuing operations in 2021 was EUR 0.29 (basic) and EUR 0.29 (diluted) compared to negative EUR 0.45 (basic) and negative EUR 0.45 (diluted) in 2020.

For the year ended 31 December 2020 compared to the year ended 31 December 2019

The following table sets forth the results of Nokia and the percentage of net sales for the years indicated.

For the year ended 31 December	2020		2019		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	21 852	100.0	23 315	100.0	(6)
Cost of sales	(13 659)	(62.5)	(15 051)	(64.6)	(9)
Gross profit	8 193	37.5	8 264	35.4	(1)
Research and development expenses	(4 087)	(18.7)	(4 532)	(19.4)	(10)
Selling, general and administrative expenses	(2 898)	(13.3)	(3 219)	(13.8)	(10)
Other operating income and expenses	(323)	(1.5)	(28)	(0.1)	–
Operating profit	885	4.0	485	2.1	82
Share of results of associated companies and joint ventures	22	0.1	12	0.1	83
Financial income and expenses	(164)	(0.8)	(341)	(1.5)	(52)
Profit before tax	743	3.4	156	0.7	–
Income tax expense	(3 256)	(14.9)	(138)	(0.6)	–
(Loss)/profit for the year	(2 513)	(11.5)	18	0.1	–
Attributable to:					
Equity holders of the parent	(2 520)	(11.5)	14	0.1	–
Non-controlling interests	7	–	4	–	75

Net sales

Net sales in 2020 were EUR 21 852 million, a decrease of EUR 1 463 million, or 6%, compared to EUR 23 315 million in 2019. The decrease in net sales was primarily due to a decrease in Mobile Networks net sales, and, to a lesser extent, a decrease in Cloud and Network Services, Network Infrastructure, Group Common and Other and Nokia Technologies net sales.

The following table sets forth distribution of net sales by region for the years indicated.

For the year ended 31 December	2020 ⁽¹⁾	2019	Year-on-year change %
	EURm	EURm	
Asia Pacific	2 742	3 070	(11)
Europe ⁽²⁾	6 427	6 438	–
Greater China	1 510	1 970	(23)
India	954	1 359	(30)
Latin America	1 070	1 517	(29)
Middle East & Africa	1 981	1 977	–
North America	7 168	6 984	3
Total	21 852	23 315	(6)

(1) In 2021, we aligned how we externally report financial information on a regional basis with our internal reporting structure. As a result, India which was earlier presented as part of Asia Pacific region, is presented as a separate region. In addition, certain countries are now presented as part of a different region. The comparative net sales by region amounts for 2020 and 2019 have been recast accordingly.

(2) All Nokia Technologies IPR and licensing net sales are allocated to Finland.

The following table sets forth distribution of net sales by customer type for the years indicated.

For the year ended 31 December	2020	2019	Year-on-year change %
	EURm	EURm	
Communication service providers	17 954	19 558	(8)
Enterprise	1 571	1 409	11
Licensees	1 402	1 487	(6)
Other ⁽¹⁾	925	861	7
Total	21 852	23 315	(6)

(1) Includes net sales of Submarine Networks which operates in a different market, and Radio Frequency Systems (RFS), which is being managed as a separate entity, and certain other items, such as elimination of inter-segment revenues and certain items related to purchase price allocation. Submarine Networks and RFS net sales also include revenue from communication service providers and enterprise customers.

Gross profit

Gross profit in 2020 was EUR 8 193 million, a decrease of EUR 71 million, or 1%, compared to EUR 8 264 million in 2019. The decrease in gross profit was primarily due to lower gross profit in Cloud and Network Services, Network Infrastructure and Nokia Technologies, partially offset by Mobile Networks. The lower gross profits reflected higher restructuring and associated charges, a lower gain related to defined benefit plan amendments, and the absence of product portfolio strategy costs. Gross margin in 2020 was 37.5%, compared to 35.4% in 2019. In 2020, gross profit did not include any product portfolio strategy costs, compared to EUR 123 million of such costs in 2019. In 2020, gross profit included restructuring and associated charges of EUR 393 million, compared to EUR 287 million in 2019. In 2020, gross profit included a gain related to defined benefit plan amendments of EUR 90 million, compared to a gain of EUR 168 million in 2019.

Operating expenses

Our research and development expenses in 2020 were EUR 4 087 million, a decrease of EUR 445 million, or 10%, compared to EUR 4 532 million in 2019. Research and development expenses represented 18.7% of our net sales in 2020 compared to 19.4% in 2019. The decrease in research and development expenses was primarily due to Network Infrastructure and Cloud and Network Services. The lower research and development expenses reflected lower amortization of acquired intangible assets, the absence of product portfolio strategy costs and higher restructuring and associated charges. In 2020, research and development expenses included EUR 57 million of amortization of acquired intangible assets, compared to EUR 571 million in 2019. In 2020, research and development expenses did not include any product portfolio strategy costs, compared to EUR 22 million in 2019. In 2020, research and development expenses included restructuring and associated charges of EUR 190 million, compared to EUR 98 million in 2019.

Our selling, general and administrative expenses in 2020 were EUR 2 898 million, a decrease of EUR 321 million compared to EUR 3 219 million in 2019. Selling, general and administrative expenses represented 13.3% of our net sales in 2020 compared to 13.8% in 2019. The decrease in selling, general and administrative expenses was broad-based across businesses and reflected continued progress related to Nokia's cost savings program and lower travel and personnel-related expenses due to COVID-19. The lower selling, general and administrative expenses reflected lower transaction and integration-related costs and lower restructuring and associated charges. In 2020, selling, general and administrative expenses included transaction and integration-related credits of EUR 11 million, compared to costs of EUR 50 million in 2019. In 2020, selling, general and administrative expenses included restructuring and associated charges of EUR 68 million, compared to EUR 117 million in 2019.

Other operating income and expenses in 2020 was a net expense of EUR 323 million, an increase of EUR 295 million, compared to a net expense of EUR 28 million in 2019. The net negative fluctuation in our other operating income and expenses was primarily due to Network Infrastructure, related to a non-cash impairment charge, and to a lesser extent, Mobile Networks. In 2020, we recorded a non-cash impairment loss on goodwill to other operating income and expenses of EUR 200 million, compared to no charge in 2019.

Operating profit

Our operating profit in 2020 was EUR 885 million, an increase of EUR 400 million, compared to an operating profit of EUR 485 million in 2019. The increase in operating profit was primarily due to lower research and development expenses and lower selling, general and administrative expenses, partially offset by a net negative fluctuation in other operating income and expenses and lower gross profit. Our operating margin in 2020 was 4.0%, compared to 2.1% in 2019.

Financial income and expenses

Financial income and expenses were a net expense of EUR 164 million in 2020, a decrease of EUR 177 million, or 52%, compared to a net expense of EUR 341 million in 2019. The net positive fluctuation in financial income and expenses was primarily due to a decrease in the costs related to the sale of receivables and a net benefit related to foreign exchange results arising from the impact of foreign exchange volatility. We sell trade receivables to various financial institutions without recourse in the normal course of business, in order to manage our credit risk and working capital cycle.

Profit before tax

Our profit before tax in 2020 was EUR 743 million, an increase of EUR 587 million compared to EUR 156 million in 2019.

Income tax

Income taxes were a net expense of EUR 3 256 million in 2020, an increase of EUR 3 118 million compared to a net expense of EUR 138 million in 2019. The increase in net income taxes was primarily attributable to a EUR 2.9 billion charge related to the derecognition of Finnish deferred tax assets and, to a lesser extent, higher income taxes due to increased profitability in 2020 compared to 2019. The derecognition was required due to a regular assessment of our ability to utilize the tax assets in Finland in the foreseeable future that is done primarily based on our historical performance. These tax assets are not lost, and the derecognition can be reversed. They can still be utilized in the taxation and the derecognition is not expected to affect the overall taxation of the Nokia Group or its cash taxes. For further details of the derecognition of Finnish deferred tax assets, please refer to Note 11, Income taxes, of our consolidated financial statements.

Loss/profit attributable to equity holders of the parent and earnings per share

The loss attributable to equity holders of the parent in 2020 was EUR 2 520 million, a decrease of EUR 2 534 million, compared to a profit of EUR 14 million in 2019. The change in profit attributable to equity holders of the parent was primarily due to higher income tax expenses, partially offset by an improvement in operating profit, and net positive fluctuation in financial income and expenses.

Our EPS from continuing operations in 2020 was negative EUR 0.45 (basic) and negative EUR 0.45 (diluted) compared to EUR 0.00 (basic) and EUR 0.00 (diluted) in 2019.

Results of segments

In 2021, we had four operating and reportable segments for the financial reporting purposes: (1) Mobile Networks, (2) Network Infrastructure, (3) Cloud and Network Services and (4) Nokia Technologies. We also present segment-level information for Group Common and Other. We adopted our current operational and reporting structure on 1 January 2021. The reporting structure was revised to reflect our new strategy and operational model which is aligned with the way the management evaluates the operational performance of Nokia and allocates resources. Segment information for 2020 and 2019 has been recast for comparability purposes according to the new operating and reporting structure. For more information, refer to Note 5, Segment information, in the consolidated financial statements.

The amounts presented in this "Results of segments" section for each reportable segment and Group Common and Other represent the amounts reported to the management for the purpose of assessing performance and making decisions about resource allocation. Certain costs and revenue adjustments are not allocated to the segments for this purpose. For more information on our operational and reporting structure as well as the reconciliation of reportable segment measures to those of the Nokia Group, refer to Note 5, Segment information, in the consolidated financial statements.

Mobile Networks

For the year ended 31 December 2021 compared to the year ended 31 December 2020

The following table sets forth the segment operating results and the percentage of net sales for the years indicated.

For the year ended 31 December	2021		2020		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	9 717	100.0	10 398	100.0	(7)
Cost of sales	(6 080)	(62.6)	(6 666)	(64.1)	(9)
Gross profit	3 637	37.4	3 732	35.9	(3)
Research and development expenses	(2 078)	(21.4)	(1 881)	(18.1)	10
Selling, general and administrative expenses	(832)	(8.6)	(906)	(8.7)	(8)
Other operating income and expenses	38	0.4	(126)	(1.2)	–
Operating profit	765	7.9	819	7.9	(7)

Net sales

Mobile Networks net sales in 2021 were EUR 9 717 million, a decrease of EUR 681 million, or 7%, compared to EUR 10 398 million in 2020. The decrease in Mobile Networks net sales was primarily driven by the earlier communicated market share loss and price erosion in North America. In full year 2021, net sales were also impacted by supply constraints.

Gross profit

Mobile Networks gross profit in 2021 was EUR 3 637 million, a decrease of EUR 95 million, or 3%, compared to EUR 3 732 million in 2020. Mobile Networks gross margin in 2021 was 37.4%, compared to 35.9% in 2020. The decrease in Mobile Networks gross profit largely reflected lower net sales, partially offset by higher gross margin. The higher gross margin in Mobile Networks stems mainly from progress in our cost competitiveness, 5G growth, favorable regional mix and EUR 80 million positive impact of a one-time software deal that was completed in the second quarter of 2021. In 2021, variable pay accruals within Mobile Networks cost of sales were higher, compared to 2020.

Operating expenses

Mobile Networks research and development expenses were EUR 2 078 million in 2021, an increase of EUR 197 million, or 10% compared to EUR 1 881 million in 2020. This reflected higher investments in 5G R&D to accelerate our product roadmaps and cost competitiveness. In 2021, variable pay accruals within Mobile Networks research and development expenses were higher, compared to 2020.

Mobile Networks selling, general and administrative expenses were EUR 832 million in 2021, a decrease of EUR 74 million, or 8%, compared to EUR 906 million in 2020. The decrease in Mobile Networks selling, general and administrative expenses largely reflected efforts to reduce our cost base. In 2021, variable pay accruals within Mobile Networks selling, general and administrative expenses were higher, compared to 2020.

Mobile Networks other operating income and expenses was an income of EUR 38 million in 2021, a change of EUR 164 million compared to an expense of EUR 126 million in 2020. The change in other operating income and expenses was primarily due to a net positive fluctuation in the amount of loss allowances on trade receivables and gains from foreign exchange hedging.

Operating profit

Mobile Networks operating profit was EUR 765 million in 2021, a decrease of EUR 54 million, compared to EUR 819 million in 2020. Mobile Networks operating margin was 7.9% in both 2021 and 2020.

For the year ended 31 December 2020 compared to the year ended 31 December 2019

The following table sets forth the segment operating results and the percentage of net sales for the years indicated.

For the year ended 31 December	2020		2019		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	10 398	100.0	11 327	100.0	(8)
Cost of sales	(6 666)	(64.1)	(8 007)	(70.7)	(17)
Gross profit	3 732	35.9	3 320	29.3	12
Research and development expenses	(1 881)	(18.1)	(1 884)	(16.6)	(0)
Selling, general and administrative expenses	(906)	(8.7)	(988)	(8.7)	(8)
Other operating income and expenses	(126)	(1.2)	(64)	(0.6)	–
Operating profit	819	7.9	384	3.4	113

Net sales

Mobile Networks net sales in 2020 were EUR 10 398 million, a decrease of EUR 929 million, or 8%, compared to EUR 11 327 million in 2019. The decrease in Mobile Networks net sales was primarily due to network deployment and planning services and legacy radio technologies, partially offset by strong growth in 5G.

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Gross profit

Mobile Networks gross profit in 2020 was EUR 3 732 million, an increase of EUR 412 million, or 12%, compared to EUR 3 320 million in 2019. Mobile Networks gross margin in 2020 was 35.9%, compared to 29.3% in 2019. The increase in Mobile Networks gross profit was primarily due to higher gross margin, partially offset by lower net sales. The higher gross margin in Mobile Networks reflected improved 5G gross margin and, to a lesser extent, favorable mix, partially offset by project-related loss provisions. The favorable mix was primarily due to a lower proportion of network deployment net sales. In 2020, variable pay accruals within Mobile Networks cost of sales was higher, compared to 2019.

Operating expenses

Mobile Networks research and development expenses were EUR 1 881 million in 2020, a decrease of EUR 3 million, or approximately flat compared to EUR 1 884 million in 2019. This reflected progress related to Nokia's cost savings program, partially offset by higher investments in 5G R&D to accelerate our product roadmaps and cost competitiveness. In 2020, variable pay accruals within Mobile Networks research and development expenses were higher, compared to 2019.

Mobile Networks selling, general and administrative expenses were EUR 906 million in 2020, a decrease of EUR 82 million, or 8%, compared to EUR 988 million in 2019. The decrease in Mobile Networks selling, general and administrative expenses reflected continued progress related to Nokia's cost savings program and lower travel and personnel-related expenses due to COVID-19. In 2020, variable pay accruals within Mobile Networks selling, general and administrative expenses were higher, compared to 2019.

Mobile Networks other operating income and expenses was an expense of EUR 126 million in 2020, a change of EUR 62 million compared to an expense of EUR 64 million in 2019. The change in other operating income and expenses was primarily due to the net effect of loss allowances on certain trade receivables.

Operating profit

Mobile Networks operating profit was EUR 819 million in 2020, an increase of EUR 435 million, compared to EUR 384 million in 2019. Mobile Networks operating margin was 7.9% in 2020, compared to 3.4% in 2019. The increase in operating margin was primarily attributable to improved gross profit.

Network Infrastructure

For the year ended 31 December 2021 compared to the year ended 31 December 2020

The following table sets forth the segment operating results and the percentage of net sales for the years indicated.

For the year ended 31 December	2021		2020		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales⁽¹⁾	7 674	100.0	6 736	100.0	14
Cost of sales	(4 990)	(65.0)	(4 375)	(64.9)	14
Gross profit	2 684	35.0	2 361	35.1	14
Research and development expenses	(1 165)	(15.2)	(1 084)	(16.1)	7
Selling, general and administrative expenses	(765)	(10.0)	(777)	(11.5)	(2)
Other operating income and expenses	30	0.4	(43)	(0.6)	—
Operating profit	784	10.2	457	6.8	72

(1) In 2021, net sales include IP Networks net sales of EUR 2 679 million, Optical Networks net sales of EUR 1 708 million, Fixed Networks net sales of EUR 2 358 million and Submarine Networks net sales of EUR 929 million. In 2020, net sales include IP Networks net sales of EUR 2 585 million, Optical Networks net sales of EUR 1 695 million, Fixed Networks net sales of EUR 1 759 million and Submarine Networks net sales of EUR 697 million.

Net sales

Network Infrastructure net sales in 2021 were EUR 7 674 million, an increase of EUR 938 million, or 14%, compared to EUR 6 736 million in 2020. The increase in Network Infrastructure net sales reflected growth across all businesses, with particular strength in Fixed Networks and Submarine Networks. In full year 2021, net sales were also impacted by supply constraints.

IP Networks net sales were EUR 2 679 million in 2021, an increase of EUR 94 million, or 4%, compared to EUR 2 585 million in 2020. Net sales in IP Networks increased in 2021, despite some supply chain constraints, driven by ongoing technology leadership, with particular strength in North America and Latin America.

Fixed Networks net sales were EUR 2 358 million in 2021, an increase of EUR 599 million, or 34%, compared to EUR 1 759 million in 2020. The strong growth in Fixed Networks net sales resulted from continued growth in fiber technologies, broadband devices and Fixed Wireless Access, as CSPs continued to invest in broadband connectivity, particularly in North America.

Optical Networks net sales were EUR 1 708 million in 2021, an increase of EUR 13 million, or 1%, compared to EUR 1 695 million in 2020. The slight increase in Optical Networks net sales primarily reflects growth in North America and Latin America, partially offset by a decline in Asia Pacific.

Submarine Networks net sales were EUR 929 million in 2021, an increase of EUR 232 million, or 33%, compared to EUR 697 million in 2020. The increase in Submarine Networks net sales continued to be driven by large sub-sea telecommunications projects.

Gross profit

Network Infrastructure gross profit in 2021 was EUR 2 684 million, an increase of EUR 323 million, or 14%, compared to EUR 2 361 million in 2020. Network Infrastructure gross margin in 2021 was 35.0%, compared to 35.1% in 2020. The increase in Network Infrastructure gross profit primarily reflected higher net sales. In 2021, variable pay accruals within Network Infrastructure cost of sales were higher, compared to 2020.

Operating expenses

Network Infrastructure research and development expenses were EUR 1 165 million in 2021, an increase of EUR 81 million, or 7%, compared to EUR 1 084 million in 2020. The increase in research and development expenses primarily reflected continued investments in customer-focused technology leadership. In 2021, variable pay accruals within Network Infrastructure research and development expenses were higher, compared to 2020.

Network Infrastructure selling, general and administrative expenses were EUR 765 million in 2021, a decrease of EUR 12 million, or 2%, compared to EUR 777 million in 2020. The decrease in Network Infrastructure selling, general and administrative expenses largely reflected efforts to reduce our cost base. In 2021, variable pay accruals within Network Infrastructure selling, general and administrative expenses were higher, compared to 2020.

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Network Infrastructure other operating income and expenses was an income of EUR 30 million in 2021, a change of EUR 73 million compared to an expense of EUR 43 million in 2020. The change in other operating income and expenses was primarily due to a net positive fluctuation in the amount of loss allowances on trade receivables and gains from foreign exchange hedging.

Operating profit

Network Infrastructure operating profit was EUR 784 million in 2021, an increase of EUR 327 million, or 72%, compared to EUR 457 million in 2020. Network Infrastructure operating margin in 2021 was 10.2%, compared to 6.8% in 2020. The strong increase in operating margin was primarily attributable to higher net sales and the net positive fluctuation in other operating income and expense, partly offset by higher research and development expenses.

For the year ended 31 December 2020 compared to the year ended 31 December 2019

The following table sets forth the segment operating results and the percentage of net sales for the years indicated.

For the year ended 31 December	2020		2019		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales⁽¹⁾	6 736	100.0	6 903	100.0	(2)
Cost of sales	(4 375)	(64.9)	(4 446)	(64.4)	(2)
Gross profit	2 361	35.1	2 457	35.6	(4)
Research and development expenses	(1 084)	(16.1)	(1 085)	(15.7)	–
Selling, general and administrative expenses	(777)	(11.5)	(804)	(11.6)	(3)
Other operating income and expenses	(43)	(0.6)	(6)	(0.1)	–
Operating profit	457	6.8	562	8.1	(19)

(1) In 2020, net sales include IP Networks net sales of EUR 2 585 million, Optical Networks net sales of EUR 1 695 million, Fixed Networks net sales of EUR 1 759 million and Submarine Networks net sales of EUR 697 million. In 2019, net sales include IP Networks net sales of EUR 2 700 million, Optical Networks net sales of EUR 1 752 million, Fixed Networks net sales of EUR 1 881 million and Submarine Networks net sales of EUR 570 million.

Net sales

Network Infrastructure net sales in 2020 were EUR 6 736 million, a decrease of EUR 167 million, or 2%, compared to EUR 6 903 million in 2019. The decrease in Network Infrastructure net sales was primarily due to Fixed Networks, IP Networks and Optical Networks, partially offset by Submarine Networks.

IP Networks net sales were EUR 2 585 million in 2020, a decrease of EUR 115 million, or 4%, compared to EUR 2 700 million in 2019. The decrease in IP Networks net sales was in comparison to a particularly strong 2019, which benefited from pent-up demand for some of its newly introduced FP4 products.

Fixed Networks net sales were EUR 1 759 million in 2020, a decrease of EUR 122 million, or 6%, compared to EUR 1 881 million in 2019. The decrease in Fixed Networks net sales was primarily due to declines in copper access technologies, services and digital home, partially offset by growth in fiber access technologies.

Optical Networks net sales were EUR 1 695 million in 2020, a decrease of EUR 57 million, or 3%, compared to EUR 1 752 million in 2019. The decrease in Optical Networks net sales was in comparison to a particularly strong 2019 and was also driven by temporary supply chain constraints as a result of COVID-19, which impacted the first half of 2020.

Submarine Networks net sales were EUR 697 million in 2020, an increase of EUR 127 million, or 22%, compared to EUR 570 million in 2019. The increase in Submarine Networks net sales was driven by robust deployment activity.

Gross profit

Network Infrastructure gross profit in 2020 was EUR 2 361 million, a decrease of EUR 96 million, or 4%, compared to EUR 2 457 million in 2019. Network Infrastructure gross margin in 2020 was 35.1%, compared to 35.6% in 2019. The decrease in Network Infrastructure gross profit was primarily due to IP Networks and Fixed Networks, primarily due to lower net sales. In 2020, variable pay accruals within Network Infrastructure cost of sales was higher, compared to 2019.

Operating expenses

Network Infrastructure research and development expenses were EUR 1 084 million in 2020, a decrease of EUR 1 million, or approximately flat, compared to EUR 1 085 million in 2019. In 2020, variable pay accruals within Network Infrastructure selling, general and administrative expenses were higher, compared to 2019.

Network Infrastructure selling, general and administrative expenses were EUR 777 million in 2020, a decrease of EUR 27 million, or 3%, compared to EUR 804 million in 2019. The decrease in Network Infrastructure selling, general and administrative expenses reflected continued progress related to Nokia's cost savings program and lower travel and personnel-related expenses due to COVID-19. In 2020, variable pay accruals within Network Infrastructure selling, general and administrative expenses were higher, compared to 2019.

Network Infrastructure other operating income and expenses was an expense of EUR 43 million in 2020, a change of EUR 37 million compared to an expense of EUR 6 million in 2019.

Operating profit

Network Infrastructure operating profit was EUR 457 million in 2020, a decrease of EUR 105 million, or 19%, compared to EUR 562 million in 2019. Network Infrastructure operating margin in 2020 was 6.8% compared to 8.1% in 2019. The decrease in operating margin was primarily attributable to lower gross profit.

Cloud and Network Services

For the year ended 31 December 2021 compared to the year ended 31 December 2020

The following table sets forth the segment operating results and the percentage of net sales for the years indicated.

For the year ended 31 December	2021		2020		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	3 089	100.0	3 087	100.0	–
Cost of sales	(1 929)	(62.4)	(2 071)	(67.1)	(7)
Gross profit	1 160	37.6	1 016	32.9	14
Research and development expenses	(537)	(17.4)	(552)	(17.9)	(3)
Selling, general and administrative expenses	(477)	(15.4)	(518)	(16.8)	(8)
Other operating income and expenses	20	0.6	(13)	(0.4)	–
Operating profit	166	5.4	(67)	(2.2)	(348)

Net sales

Cloud and Network Services net sales in 2021 were EUR 3 089 million, an increase of EUR 2 million, or approximately flat, compared to EUR 3 087 million in 2020. The net sales performance in Cloud and Network Services reflected growth in Core Networks and Enterprise Solutions, which was offset by declines in Cloud and Cognitive Services and Business Applications.

Gross profit

Cloud and Network Services gross profit in 2021 was EUR 1 160 million, an increase of EUR 144 million, or 14%, compared to EUR 1 016 million in 2020. Cloud and Network Services gross margin in 2021 was 37.6%, compared to 32.9% in 2020. The increase in Cloud and Network Services gross profit was primarily due the absence of project-related loss provisions, which negatively impacted 2020. In 2021, variable pay accruals within Cloud and Network Services cost of sales were higher, compared to 2020.

Operating expenses

Cloud and Network Services research and development expenses were EUR 537 million in 2021, a decrease of EUR 15 million, or 3%, compared to EUR 552 million in 2020. The decrease in Cloud and Network Services research and development expenses largely reflected efforts to reduce our cost base. In 2021, variable pay accruals within Cloud and Network Services research and development expenses were higher, compared to 2020.

Cloud and Network Services selling, general and administrative expenses were EUR 477 million in 2021, a decrease of EUR 41 million, or 8%, compared to EUR 518 million in 2020. The decrease in Cloud and Network Services selling, general and administrative expenses largely reflected efforts to reduce our cost base. In 2021, variable pay accruals within Cloud and Network Services selling, general and administrative expenses were higher, compared to 2020.

Cloud and Network Services other operating income and expenses was an income of EUR 20 million in 2021, a change of EUR 33 million compared to an expense of EUR 13 million in 2020. The change in other operating income and expenses was primarily due to a net positive fluctuation in the amount of loss allowances on trade receivables.

Operating profit

Cloud and Network Services operating profit was EUR 166 million in 2021, a change of EUR 233 million, compared to an operating loss of EUR 67 million in 2020. Cloud and Network Services operating margin in 2021 was 5.4% compared to negative 2.2% in 2020. The increase in Cloud and Network Services operating margin in 2021 was primarily due to higher gross profit, lower operating expenses and a positive fluctuation in other operating income and expenses.

For the year ended 31 December 2020 compared to the year ended 31 December 2019

The following table sets forth the segment operating results and the percentage of net sales for the years indicated.

For the year ended 31 December	2020		2019		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	3 087	100.0	3 327	100.0	(7)
Cost of sales	(2 071)	(67.1)	(2 044)	(61.4)	1
Gross profit	1 016	32.9	1 283	38.6	(21)
Research and development expenses	(552)	(17.9)	(580)	(17.4)	(5)
Selling, general and administrative expenses	(518)	(16.8)	(580)	(17.4)	(11)
Other operating income and expenses	(13)	(0.4)	13	0.4	–
Operating profit	(67)	(2.2)	136	4.1	(149)

Net sales

Cloud and Network Services net sales in 2020 were EUR 3 087 million, a decrease of EUR 240 million, or 7%, compared to EUR 3 327 million in 2019. The decrease in Cloud and Network Services net sales was primarily due to Core Networks and Cloud and Cognitive Services.

Gross profit

Cloud and Network Services gross profit in 2020 was EUR 1 016 million, a decrease of EUR 267 million, or 21%, compared to EUR 1 283 million in 2019. Cloud and Network Services gross margin in 2020 was 32.9%, compared to 38.6% in 2019. The decrease in Cloud and Network Services gross profit was primarily due to lower net sales and the negative impact of project-related loss provisions. In 2020, variable pay accruals within Cloud and Network Services cost of sales were higher, compared to 2019.

Operating expenses

Cloud and Network Services research and development expenses were EUR 552 million in 2020, a decrease of EUR 28 million, or 5%, compared to EUR 580 million in 2019. The decrease in Cloud and Network Services research and development expenses reflected progress related to Nokia's cost savings program. In 2020, variable pay accruals within Cloud and Network Services research and development expenses were higher, compared to 2019.

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Cloud and Network Services selling, general and administrative expenses were EUR 518 million in 2020, a decrease of EUR 62 million, or 11%, compared to EUR 580 million in 2019. The decrease in Cloud and Network Services selling, general and administrative expenses reflected progress related to Nokia's cost savings program and lower travel and personnel-related expenses due to COVID-19. In 2020, variable pay accruals within Cloud and Network Services selling, general and administrative expenses were higher, compared to 2019.

Cloud and Network Services other operating income and expenses was an expense of EUR 13 million in 2020, a change of EUR 26 million compared to an income of EUR 13 million in 2019.

Operating profit

Cloud and Network Services operating loss was EUR 67 million in 2020, a change of EUR 203 million, compared to an operating profit of EUR 136 million in 2019. Cloud and Network Services operating margin in 2020 was negative 2.2% compared to 4.1% in 2019. The decrease in Cloud and Network Services operating margin in 2020 was primarily due to lower gross profit, partially offset by lower selling, general and administrative and research and development expenses.

Nokia Technologies

For the year ended 31 December 2021 compared to the year ended 31 December 2020

The following table sets forth the segment operating results and the percentage of net sales for the years indicated.

For the year ended 31 December	2021		2020		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	1 502	100.0	1 402	100.0	7
Cost of sales	(5)	(0.3)	(9)	(0.6)	(44)
Gross profit	1 497	99.7	1 393	99.4	7
Research and development expenses	(201)	(13.4)	(190)	(13.6)	6
Selling, general and administrative expenses	(92)	(6.1)	(81)	(5.8)	14
Other operating income and expenses	(19)	(1.3)	1	0.1	—
Operating profit	1 185	78.9	1 123	80.1	6

Net sales

Nokia Technologies net sales in 2021 were EUR 1 502 million, an increase of EUR 100 million, or 7%, compared to EUR 1 402 million in 2020. The increase in Nokia Technologies net sales primarily reflects new and renewed patent license agreements signed this year and, in 2020, positive traction in other patent license agreements in the consumer electronics and automotive sectors, as well as catch-up net sales related to new patent license agreements. This was partially offset by lower brand licensing net sales and lower net sales from one licensee, following the expiration of a patent licensing agreement in the third quarter of 2021.

Gross profit

Nokia Technologies gross profit in 2021 was EUR 1 497 million, an increase of EUR 104 million, or 7%, compared to EUR 1 393 million in 2020. The higher gross profit in Nokia Technologies was primarily due to higher net sales.

Operating expenses

Nokia Technologies research and development expenses in 2021 were EUR 201 million, an increase of EUR 11 million, or 6%, compared to EUR 190 million in 2020. The increase in Nokia Technologies research and development expenses was primarily due to higher investments to drive creation of intellectual property. In 2021, variable pay accruals within Nokia Technologies research and development expenses were higher, compared to 2020.

Nokia Technologies selling, general and administrative expenses in 2021 were EUR 92 million, an increase of EUR 11 million, or 14%, compared to EUR 81 million in 2020. The increase in Nokia Technologies selling, general and administrative expenses was primarily due to higher licensing-related costs. In 2021, variable pay accruals within Nokia Technologies selling, general and administrative expenses were higher, compared to 2020.

Nokia Technologies other operating income and expenses in 2021 was an expense of EUR 19 million, a change of EUR 20 million compared to an income of EUR 1 million in 2020. The change in other operating income and expense was primarily related to a settlement charge related to a one-time transaction.

Operating profit

Nokia Technologies operating profit in 2021 was EUR 1 185 million, an increase of EUR 62 million, or 6%, compared to an operating profit of EUR 1 123 million in 2020. The increase in Nokia Technologies operating profit was primarily due to higher net sales, partially offset by higher operating expenses and a net negative fluctuation in other operating income and expense. Nokia Technologies operating margin in 2021 was 78.9% compared to 80.1% in 2020.

For the year ended 31 December 2020 compared to the year ended 31 December 2019

The following table sets forth the segment operating results and the percentage of net sales for the years indicated.

For the year ended 31 December	2020		2019		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	1 402	100.0	1 487	100.0	(6)
Cost of sales	(9)	(0.6)	(28)	(1.9)	(68)
Gross profit	1 393	99.4	1 459	98.1	(5)
Research and development expenses	(190)	(13.6)	(151)	(10.2)	26
Selling, general and administrative expenses	(81)	(5.8)	(100)	(6.7)	(19)
Other operating income and expenses	1	0.1	(8)	(0.5)	—
Operating profit	1 123	80.1	1 200	80.7	(6)

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Net sales

Nokia Technologies net sales in 2020 were EUR 1 402 million, a decrease of EUR 85 million, or 6%, compared to EUR 1 487 million in 2019. The decrease in Nokia Technologies net sales was primarily due to lower brand licensing net sales and lower catch-up net sales.

Gross profit

Nokia Technologies gross profit in 2020 was EUR 1 393 million, a decrease of EUR 66 million, or 5%, compared to EUR 1 459 million in 2019. The lower gross profit in Nokia Technologies was primarily due to lower net sales, partially offset by higher gross margin. The higher gross margin reflects costs associated with a one-time sale of patent assets that negatively impacted 2019.

Operating expenses

Nokia Technologies research and development expenses in 2020 were EUR 190 million, an increase of EUR 39 million, or 26%, compared to EUR 151 million in 2019. The increase in Nokia Technologies research and development expenses was primarily due to higher investments to drive creation of intellectual property and higher costs to maintain our patent portfolio.

Nokia Technologies selling, general and administrative expenses in 2020 were EUR 81 million, a decrease of EUR 19 million, or 19%, compared to EUR 100 million in 2019. The decrease in Nokia Technologies selling, general and administrative expenses was primarily due to lower licensing-related costs.

Nokia Technologies other operating income and expenses in 2020 was an income of EUR 1 million, a change of EUR 9 million compared to an expense of EUR 8 million in 2019.

Operating profit

Nokia Technologies operating profit in 2020 was EUR 1 123 million, a decrease of EUR 77 million, or 6%, compared to an operating profit of EUR 1 200 million in 2019. The decrease in Nokia Technologies operating profit was primarily due to lower gross profit and higher research and development expenses, partially offset by lower selling, general and administrative expenses. Nokia Technologies operating margin in 2020 was 80.1% compared to 80.7% in 2019.

Group Common and Other

For the year ended 31 December 2021 compared to the year ended 31 December 2020

The following table sets forth the operating results for Group Common and Other, and the percentage of net sales for the years indicated.

For the year ended 31 December	2021		2020		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	257	100.0	269	100.0	(4)
Cost of sales	(270)	(105.1)	(262)	(97.4)	3
Gross profit	(13)	(5.1)	7	2.6	-
Research and development expenses	(103)	(40.1)	(110)	(40.9)	(6)
Selling, general and administrative expenses	(213)	(82.9)	(207)	(77.0)	3
Other operating income and expenses	204	79.4	59	21.9	-
Operating loss	(125)	(48.6)	(251)	(93.3)	(50)

Net sales

Group Common and Other net sales in 2021 were EUR 257 million, a decrease of EUR 12 million, or 4%, compared to EUR 269 million in 2020. The decrease in Group Common and Other net sales was due to Radio Frequency Systems, primarily driven by lower net sales in North America.

Gross profit

Group Common and Other gross profit in 2021 was negative EUR 13 million, compared to EUR 7 million in 2020. Group Common and Other gross margin in 2021 was negative 5.1% compared to 2.6% in 2020.

Operating expenses

Group Common and Other research and development expenses in 2021 were EUR 103 million, a decrease of EUR 7 million, or 6%, compared to EUR 110 million in 2020.

Group Common and Other selling, general and administrative expenses in 2021 were EUR 213 million, an increase of EUR 6 million, or 3%, compared to EUR 207 million in 2020. In 2021, variable pay accruals within Group Common and Other selling, general and administrative expenses were higher, compared to 2020.

Group Common and Other other operating income and expense in 2021 was an income of EUR 204 million, an increase of EUR 145 million compared to a net income of EUR 59 million in 2020. The net positive fluctuation in other operating income and expense in 2021 was primarily related to increased net benefits from Nokia's venture fund investments. In 2021, the net benefit related to Nokia's venture fund investments was EUR 190 million, compared to a net benefit of EUR 50 million in the year-ago period.

Operating loss

Group Common and Other operating loss in 2021 was EUR 125 million, a change of EUR 126 million, compared to an operating loss of EUR 251 million in 2020. The change in Group Common and Other operating loss was primarily attributable to the net positive fluctuation in other operating income and expense.

For the year ended 31 December 2020 compared to the year ended 31 December 2019

The following table sets forth the operating results for Group Common and Other, and the percentage of net sales for the years indicated.

For the year ended 31 December	2020		2019		Year-on-year change %
	EURm	% of net sales	EURm	% of net sales	
Net sales	269	100.0	371	100.0	(27)
Cost of sales	(262)	(97.4)	(367)	(98.9)	(29)
Gross profit	7	2.6	4	1.1	75
Research and development expenses	(110)	(40.9)	(124)	(33.4)	(11)
Selling, general and administrative expenses	(207)	(77.0)	(222)	(59.8)	(7)
Other operating income and expenses	59	21.9	63	17.0	–
Operating loss	(251)	(93.3)	(279)	(75.2)	(10)

Net sales

Group Common and Other net sales in 2020 were EUR 269 million, a decrease of EUR 102 million, or 27%, compared to EUR 371 million in 2019. The decrease in Group Common and Other net sales was due to Radio Frequency Systems, primarily driven by lower net sales in North America.

Gross profit

Group Common and Other gross profit in 2020 was EUR 7 million, compared to EUR 4 million in 2019. Group Common and Other gross margin in 2020 was 2.6% compared to 1.1% in 2019.

Operating expenses

Group Common and Other research and development expenses in 2020 were EUR 110 million, a decrease of EUR 14 million, or 11%, compared to EUR 124 million in 2019. The lower research and development expenses reflected progress related to Nokia's cost savings program.

Group Common and Other selling, general and administrative expenses in 2020 were EUR 207 million, a decrease of EUR 15 million, or 7%, compared to EUR 222 million in 2019. The selling, general and administrative expenses reflected progress related to Nokia's cost savings program and lower travel and personnel-related expenses due to COVID-19.

Group Common and Other other operating income and expense in 2020 was an income of EUR 59 million, a change of EUR 4 million compared to an income of EUR 63 million in 2019.

Operating loss

Group Common and Other operating loss in 2020 was EUR 251 million, a change of EUR 28 million, compared to an operating loss of EUR 279 million in 2019. The change in Group Common and Other operating loss was primarily attributable to lower selling, general and administrative and research and development expenses.

Liquidity and capital resources

Financial position

As of 31 December 2021, our total cash and current financial investments (defined as cash and cash equivalents and current financial investments) equaled EUR 9 268 million, an increase of EUR 1 207 million, compared to EUR 8 061 million as of 31 December 2020. The increase was primarily attributable to net cash inflow from operating activities of EUR 2 625 million, partially offset by capital expenditure of EUR 560 million, repayment of long-term borrowings of EUR 927 million, and payment of principal portion of lease liabilities of EUR 226 million. As of 31 December 2019, our total cash and current financial investments equaled EUR 6 007 million.

As of 31 December 2021, our net cash and current financial investments (defined as total cash and current financial investments less long-term and short-term interest-bearing liabilities) equaled EUR 4 615 million, an increase of EUR 2 130 million, compared to EUR 2 485 million as of 31 December 2020. The increase was mainly attributable to net cash inflow from operating activities of EUR 2 625 million, partially offset by capital expenditure of EUR 560 million, and payment of the principal portion of the lease liabilities of EUR 226 million. As of 31 December 2019, our net cash and current financial investments equaled EUR 1 730 million.

As of 31 December 2021, our cash and cash equivalents equaled EUR 6 691 million, a decrease of EUR 249 million compared to EUR 6 940 million as of 31 December 2020. As of 31 December 2019, our cash and cash equivalents equaled EUR 5 910 million.

Cash flow

2021

The cash inflow from operating activities in 2021 was EUR 2 625 million, an increase of EUR 866 million compared to a cash inflow of EUR 1 759 million in 2020. The increase was primarily attributable to an increase in net profit, adjusted for non-cash items, of EUR 3 358 million, an increase of EUR 607 million compared to EUR 2 751 million in 2020 and to a lesser extent in a decrease in cash tied-up to net working capital of EUR 268 million in 2021 compared to EUR 710 million cash tied-up in 2020. The primary driver for the decrease in net working capital tied-up compared to 2020 was related to a decrease in receivables of EUR 239 million compared to an increase in receivables of EUR 418 million in 2020 and to a lesser extent, a decrease in liabilities of EUR 459 million compared to a decrease of EUR 845 million in 2020, offset by an increase in inventories of EUR 48 million compared to a decrease of EUR 553 million in 2020. The decrease in liabilities during 2021 was primarily attributable to a decrease in contract liabilities and restructuring and associated cash outflows and partially offset by an increase in liabilities related to variable pay and an increase in trade payables.

The cash inflow from operating activities included in 2021 paid taxes of EUR 314 million, an increase of EUR 34 million compared to EUR 280 million in 2020, interest received of EUR 41 million compared to EUR 33 million in 2020 and interest paid of EUR 192 million compared to EUR 35 million in 2020.

The cash outflow from investing activities was EUR 1 795 million in 2021, an increase of EUR 357 million compared to EUR 1 438 million cash outflow in 2020. Cash outflow from investing activities was primarily driven by net cash outflow of EUR 1 447 million of current financial investments in 2021, compared to EUR 1 031 million in 2020 and cash outflow due to the capital expenditure of EUR 560 million in 2021 compared to EUR 479 million in 2020. This was partially offset by net cash inflow from non-current financial investments of EUR 200 million compared to EUR 63 million in 2020.

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Major items of capital expenditure in 2021 included investments in R&D equipment, test equipment, hardware for telecommunication and cloud environment, repair or improvements of sites, shipyards and vessels.

In 2021, our cash outflow from financing activities was EUR 1 212 million, compared to EUR 883 million cash inflow in 2020. The cash outflow was primarily driven by payments of long-term borrowings of EUR 927 million and payments of the principal portion of lease liabilities EUR 226 million in 2021 compared to EUR 234 million in 2020.

2020

Our cash inflow from operating activities in 2020 was EUR 1 759 million, an increase of EUR 1 369 million compared to a cash inflow of EUR 390 million in 2019. The increase was primarily attributable to a decrease in cash tied-up to net working capital of EUR 710 million in 2020 compared to EUR 1 788 million cash tied-up in 2019, and net profit, adjusted for non-cash items, of EUR 2 751 million, an increase of EUR 113 million compared to EUR 2 638 million in 2019. The primary driver for the decrease in net working capital tied-up was related to a decrease in liabilities of EUR 845 million compared to a decrease of EUR 2 232 million in 2019, and a decrease in inventories of EUR 553 million compared to a decrease of EUR 285 million in 2019. The decrease in liabilities was primarily attributable to a decrease in trade payables, driven by lower inventory levels, a decrease in deferred revenue and restructuring and associated cash outflows, partially offset by an increase in provisions and an increase in liabilities related to employee benefits. The decrease in inventories was attributable to improved inventory management and temporary dynamics related to COVID-19. In 2020, the increase in receivables was EUR 418 million compared to a decrease of EUR 159 million in 2019.

In 2020, cash inflow from operating activities included paid taxes of EUR 280 million, a decrease of EUR 236 million compared to EUR 516 million in 2019; interest received of EUR 33 million compared to EUR 57 million in 2019; and interest paid of EUR 35 million compared to EUR 1 million in 2019.

The cash outflow from investing activities equaled EUR 1 438 million in 2020, an increase of EUR 1 148 million compared to EUR 290 million cash outflow in 2019. Cash outflow from investing activities was primarily driven by cash outflow of EUR 1 154 million due to purchase of current financial investments in 2020, compared to EUR 473 million in 2019, and cash outflow due to the capital expenditure of EUR 479 million in 2020 compared to EUR 690 million in 2019.

Major items of capital expenditure in 2020 included investments in R&D equipment, test equipment, hardware for telecommunication and cloud environment, plants, buildings and construction for transformation projects, and repair or improvements of sites.

In 2020, our cash inflow from financing activities was EUR 883 million, compared to EUR 479 million cash used in 2019. The cash inflow was primarily driven by cash inflow from long-term borrowings of EUR 1 349 million, partially offset by paid dividends of EUR 148 million, paid by subsidiaries of the Group to non-controlling interest, compared to EUR 570 million in 2019, primarily relating to dividends to equity holders of the parent. The payments of the principal portion of lease liabilities were EUR 234 million in 2020 compared to EUR 221 million in 2019.

Financial assets and debt

As of 31 December 2021, our net cash and current financial investments equaled EUR 4 615 million consisting of EUR 9 268 million in total cash and current financial investments, and EUR 4 653 million of long-term and short-term interest-bearing liabilities.

We hold our total cash and current financial investments predominantly in euro. Our current financial investments mainly include high-quality money market and fixed income instruments with strict maturity limits. We also have a EUR 1 500 million revolving credit facility available for liquidity purposes. The facility has no financial covenants and remains undrawn.

As of 31 December 2021, our interest-bearing liabilities consisted of EUR 750 million notes due in 2024, EUR 500 million notes due in 2025, a EUR 500 million R&D loan from the European Investment Bank maturing in 2025, a EUR 250 million R&D loan from the Nordic Investment Bank with final maturity in 2025, EUR 750 million notes due in 2026, USD 500 million notes due in 2027, EUR 500 million notes due in 2028, USD 74 million notes due in 2028, USD 206 million notes due in 2029, USD 500 million notes due in 2039, and EUR 124 million of other liabilities. The EUR notes maturing in 2024, 2025, 2026 and 2028 as well as the USD notes maturing in 2027 and 2039, are issued by Nokia Corporation, while the USD notes maturing in 2028 and 2029 are issued by Lucent Technologies Inc., a predecessor to Nokia of America Corporation (Nokia's wholly-owned subsidiary, formerly known as Alcatel-Lucent USA Inc.). The loans from the Nordic Investment Bank and from the European Investment Bank are drawn by Nokia Corporation. For more information on our interest-bearing liabilities, refer to Note 21, Interest-bearing liabilities, of our consolidated financial statements.

In February 2021, we redeemed EUR 350 million of the 1.00% Senior Notes due March 2021.

In December 2021, we redeemed USD 500 million of the 3.375% Senior Notes due June 2022.

In June 2021, we exercised our option to extend the maturity date of the EUR 1 500 million revolving credit facility. Subsequent to the extension, EUR 1 412 million of the facility has its maturity in June 2026 and EUR 88 million of the facility has its maturity in June 2024.

We consider that with EUR 9 268 million of total cash and current financial investments, and with our undrawn revolving credit facility, we have sufficient funds to satisfy our future working capital needs, capital expenditure, R&D investments, structured finance, venture fund commitments, acquisitions and debt service requirements, at least through 2022. We further consider that with our current credit ratings of BB+ by Standard & Poor's, Ba2 by Moody's, and BBB- by Fitch, we have access to the capital markets should any funding needs arise in 2022.

We aim to re-establish investment grade credit ratings.

Off-balance sheet arrangements

There are no material off-balance sheet arrangements that have, or are reasonably likely to have, a current or future effect on our financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources that are material to investors, except for the purchase obligations and lease commitments, as well as guarantees and financing commitments disclosed in Note 28, Commitments, contingencies and legal proceedings, and in Note 34, Financial risk management, of our consolidated financial statements included.

Venture fund investments and commitments

We make financing commitments to a number of unlisted venture funds that make technology-related investments. The majority of the investments are managed by NGP Capital, a global venture capital firm backing entrepreneurs building a responsible and inclusive world where the confluence of sensors, mobility, software and cloud solutions will connect people and industries in new ways transforming how we live and work. In January 2022, Nokia agreed on capital commitment of USD 400 million to NGP Capital's new venture fund, Fund V, with Nokia as a sole investor. For more information on the new capital commitment, refer to Note 35, Subsequent events, of our consolidated financial statements.

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As of 31 December 2021, our venture fund investments equaled EUR 758 million, compared to EUR 745 million as of 31 December 2020. For more information on the fair value of our venture fund investments, refer to Note 22, Fair value of financial instruments, of our consolidated financial statements.

As of 31 December 2021, our venture fund commitments equaled EUR 137 million, compared to EUR 189 million as of 31 December 2020. As a limited partner in venture funds, we are committed to capital contributions and entitled to cash distributions according to the respective partnership agreements and underlying fund activities. For more information on venture fund commitments, refer to Note 28, Commitments, contingencies and legal proceedings, and Note 34, Financial risk management, of our consolidated financial statements.

Treasury policy

Treasury activities are governed by the Nokia Treasury Policy approved by the President and CEO within the authority granted by the Board of Directors and supplemented by operating procedures approved by the CFO, covering specific areas such as foreign exchange risk, interest rate risk, credit risk and liquidity risk. The objective of treasury's liquidity and capital structure management activities is to ensure that we have sufficient liquidity to go through unfavorable periods without being severely constrained by the availability of funds to execute Nokia's business plans and implement Nokia's long-term business strategy. We are risk-averse in our treasury activities.

Foreign exchange impact

We are a company with global operations and net sales derived from various countries, invoiced in various currencies. Therefore, our business and results from operations are exposed to changes in exchange rates between the euro, our reporting currency, and other currencies, such as the U.S. dollar. The magnitude of foreign exchange exposures changes over time as a function of our net sales and costs in different markets, as well as the prevalent currencies used for transactions in those markets. Significant changes in exchange rates may also impact our competitive position and related price pressures through their impact on our competitors.

To mitigate the impact of changes in exchange rates on our results, we hedge material net foreign exchange exposures (net sales less costs in a currency) typically with a hedging horizon of approximately 12 months. For the majority of these hedges, hedge accounting is applied to reduce income statement volatility.

In 2021, approximately 25% of Nokia's net sales and total costs were denominated in euro, and approximately 50% of Nokia's net sales and total costs were denominated in U.S. dollars. In 2021, approximately 5% of Nokia's net sales and total costs were denominated in Chinese yuan.

The average currency mix for Nokia's net sales and total costs:

Currency	2021		2020	
	Net sales	Total costs	Net sales	Total costs
EUR	~25 %	~25 %	~25 %	~25 %
USD	~50 %	~50 %	~50 %	~50 %
CNY	~5 %	~5 %	~5 %	~5 %
Other	~20 %	~20 %	~20 %	~20 %
Total	~100 %	~100 %	~100 %	~100 %

For the full year 2021 compared to the previous year, the U.S. dollar was weaker against the euro. The weaker U.S. dollar in 2021 on a year-on-year basis had a negative impact on our net sales reported in euros. However, the weaker U.S. dollar also contributed to slightly lower costs of sales and operating expenses on a year-on-year basis. In total, before hedging, the weaker U.S. dollar on a year-on-year basis had a slightly negative effect on our operating profit in 2021.

For a discussion of the instruments used by us in connection with our hedging activities, refer to Note 34, Financial risk management, of our consolidated financial statements. Refer also to "Operating and financial review and prospects – Risk factors".

Sustainability and corporate responsibility

We believe the positive impact of the technology we create and deliver provides our greatest contribution to the United Nations Sustainable Development Goals (SDGs) and considerably outweighs potential negative impacts.

Our products and solutions are designed to drive social, environmental, and economic progress and are essential to solving some of the world's greatest challenges including stalled productivity, climate change and unequal access to opportunity. They bring digitalization to physical industries, making them more efficient and sustainable, contribute to a more equitable, secure society, providing access to better healthcare, education and greater economic opportunity and a cleaner, safer planet with reduced carbon emissions and more efficient use of natural resources.

We aim to minimize the negative impact of our operations through continuous improvement in product design and responsible business practices that are underpinned by robust policies, processes and management systems that align with globally recognized frameworks. Our business model is described in the "Business overview" section of this report.

Our purpose, strategy and targets

Our sustainability approach aligns with the topics that are most material to our business and where we have most impact on sustainable development, providing structure and focus for our activities. At the core of our approach is the belief that our technology improves people's lives.

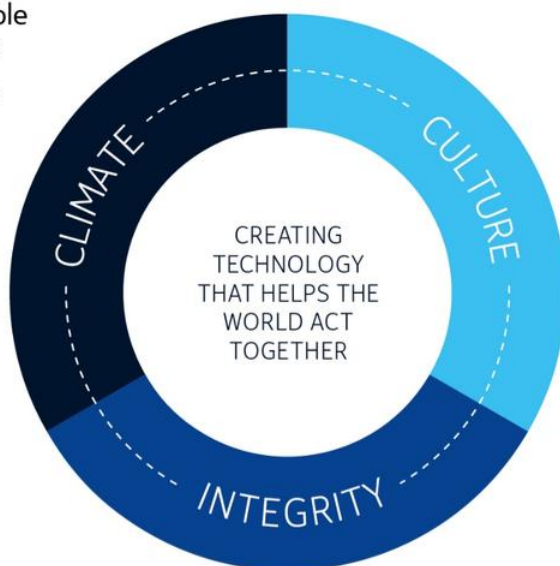
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Our technology connects people to the services, places, opportunities and other people that matter to them. This is aligned with our company purpose: Creating technology that helps the world act together.

Our sustainability focus is built around actions in three core areas where we believe we can have the greatest impact – Climate, Integrity and Culture. The three core areas are underpinned by well-managed fundamental responsible business processes, procedures and activities (see the picture below).

Fundamental responsible business requirements

- Environmental management
- Circularity
- Portfolio energy efficiency
- Supplier human and labor rights
- Health & safety
- Inclusion & diversity
- Labor practices in own operations
- Ethics & compliance
- Preventing misuse of technology
- Responsible sourcing
- Data privacy & security



In our sustainability work, we focus on 13 key topic areas based on the results of a thorough materiality analysis. Our materiality analysis is based on global macro trends that have an impact on sustainable development, our regular engagement with various stakeholders including our customers and investors, and benchmarking industry peers and leaders in sustainability. The diagram on the right shows the top right quadrant of our materiality matrix.

- Improving lives with technology
- Environment
- Our people
- Integrity

All the topics shown in this diagram are material to our sustainability work. Those in the top right corner of the diagram are most important to our business and sustainable development.



Our business and the UN Sustainable Development Goals

The United Nations Sustainable Development Goals (SDGs) and their targets are a key framework for our sustainability work. For us, goals 8, 9 and 13 are the most material and provide the areas in which we can have the greatest positive impact. More examples of how the work we do actively contributes to SDGs beyond these three goals can be found in our People & Planet report and on our website. We believe technology will continue to play a critical role in accelerating and achieving all 17 SDGs.

Goal 8: Promote inclusive and sustainable economic growth, employment and decent work:

As a global company we have significant direct and indirect economic impact. Our direct economic impact includes for example our purchasing from suppliers, wages and benefits paid to our employees, income taxes paid to the public sector, and community investments. The benefits of the technology we provide deliver our greatest indirect impact.

Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation:

Goal 9 remains the most material SDG for us in the area of helping the world act together and improving people's lives with our technology. It relates directly to the core of our business. The networks we supply to our customers provide access to people everywhere, connecting them to more information, more public services and greater economic opportunities. The connectivity and digitalization our products and solutions provide are critical enablers of sustainable transformation of asset heavy industries including manufacturing.

Goal 13: Take urgent action to combat climate change and its impacts

Climate change is the most significant sustainability challenge for our business and the planet and requires that we put in place the processes and concrete actions to do our part. Through the technology we provide we also help customers, other industries, individuals and society digitalize industrial processes so that they become more predictive and productive, with reduced emissions. We have set an ambitious science-based target (SBT) in line with the 1.5°C warming scenario to reduce our scope 1, 2 and 3 greenhouse gas emissions by 50% between 2019 and 2030. The SBT also includes reaching net zero by 2050.

Key sustainability targets

Our targets are determined based on our sustainability approach and scope and balanced between short, medium and long term targets. The key targets are listed in the table below. More information about new targets set in 2021 and details about our work towards achieving the targets can be found as part of our 2021 People & Planet report.

Focus area	Target year	Base year	Target	2021 results	Target status
Climate	2030	2019	Our Science-based target (SBT): Reduce our greenhouse gas (GHG) emissions across our value chain (Scope 1, 2 and 3) by 50% between 2019 and 2030, and reach net zero by 2050.	Emissions covered by our SBT were 37 598 000 tCO ₂ e* which, as anticipated, are 8% above our cumulative carbon budget for 2020–2021, if a linear reduction from 2019 is expected annually. However, we do not expect the reduction of emissions in our value chain to be a linear process. We plan to achieve our target of 50% reduction in emissions by 2030 as we see greater impact as more energy efficient products and features of our portfolio are adopted and decarbonization of the electricity grid continues globally.	Not on track
	2030	2019	Our final assembly suppliers reach net zero emissions by 2030.	Our final assembly suppliers' emissions were 59 000 tCO ₂ e which is a 22% decrease from 2019.	On track
	2030	2019	Our suppliers reduce GHG emissions by 50% by 2030.	Our suppliers' emissions were 1 571 600 tCO ₂ e which is a 49% decrease from 2019.	On track
	2021	2020	Reach 45% coverage of renewable electricity from the total purchased electricity.	53% of our purchased electricity was renewable.	Achieved
	2021	2019	Reduce GHG emissions from our facilities (Scope 1 and 2) by 20%.	Emissions from our facilities were 243 200 tCO ₂ e which is a 30% reduction from 2019.	Achieved
	2021	2020	Divert 70% of facility waste from landfill.	80% of facility waste was diverted from landfill.	Achieved
Culture	2030	2016	100% of suppliers delivering high risk activity to meet "H&S preferred supplier" status (score 4 or more out of 5) in our Health & Safety maturity assessment.	23% of relevant suppliers met H&S preferred supplier status.	On track
	2021	2020	Keep the unexplained pay-gap closed.	The unexplained pay-gap was closed for 2021.	Achieved
	2021	2020	Reach a minimum of 26% female hires in all global external recruits.	25% of external recruits were women. We aim to increase our marketing, communication and talent attraction activities to make Nokia's employer brand stand out for diversity-friendly employment policies.	Not achieved
	2021	2020	Direct 30% of our corporate social responsibility (CSR) program spend towards initiatives focused on empowering diversity.	33% of our CSR program spend was focused on empowering diversity.	Achieved
	2030	2016	Reach 85% favorability of employee/line manager engagement on ethics and compliance.	Progress against the target was measured as favorable responses to the following question in our employee survey: "My line manager sets a positive example by acting with integrity." 91% of the responses were favorable.	On track
Integrity	2025	2020	80% of suppliers receive satisfactory sustainability score from supplier performance evaluation (includes performance across our sustainability assessment programs such as EcoVadis, CDP, Conflict minerals).	68% of suppliers received satisfactory sustainability score.	On track
	2022	2020	Complete our second Global Network Initiative (GNI) assessment and, as a result, Nokia deemed to have shown good faith efforts to implement the GNI principles in freedom of expression and privacy.	Preparation to the assessment was started.	On track
	2021	2020	95% of our employees complete Ethical Business Training.	97% of employees completed the training.	Achieved

*tCO₂e = tons of carbon dioxide equivalents

Sustainability governance

The Board of Directors evaluates the Company's sustainability-related risks and target setting as well as their implementation and effectiveness in Nokia. In 2021, the Board approved the selected key sustainability targets on climate change and diversity (included in the short-term incentive program) and also reviewed the evolving ESG (environmental, social and governance) requirements and expectations, investor feedback and disclosure approach. In addition, the Board Committees monitor environmental and social developments and activities in the Company in their respective areas of responsibilities. In 2021, the Chief Corporate Affairs Officer had overall responsibility for sustainability in the Group Leadership Team (GLT). In line with our new mode of operation, GLT approves sustainability-related strategy, targets and operational frameworks, within which corporate functions and business groups can operate. This enables accountability and empowerment of each business group whilst maintaining

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appropriate strategic and operative oversight. Independent councils and committees, such as the Sustainability Council, are used to steer, align and ensure the implementation of these strategies, targets and frameworks and make recommendations to the GLT. Our overall sustainability governance framework and responsibilities are shown in the diagram below.



Risk management

Sustainability risks and opportunities are part of our Enterprise Risk Management framework with multi-disciplinary company-wide risk identification, assessment, and management processes. We recognize and aim to mitigate the potential risks and negative impacts associated with our business whether related to technology, supply chain, climate or people, while also driving the opportunities within and beyond our business in order to contribute to achieving the UN Sustainable Development Goals. Our Code of Conduct defines our way of working and we have clear policies and processes for each identified material sustainability risk.

The main features of our risk management systems are described as part of our Corporate governance statement (see Corporate Governance—Risk management, internal control and internal audit functions at Nokia). In addition, the “Risk factors” section of this report provides discussion on the most important risk factors affecting our operations. These risks include sustainability-related issues such as:

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- product safety
- environmental accidents
- health & safety
- privacy and security, including cybersecurity threats
- potential human rights abuse through misuse of the technology we provide
- potential lack of proper respect for human rights, fair labor conditions, the environment and communities in our operations and supply chains
- non-compliance with regulations or our supplier and customer requirements
- violation of ethical standards, including our Code of Conduct
- labor unrest and strikes
- inability to retain, motivate, develop and recruit appropriately skilled employees
- purchasing boycotts and public harm to our brand
- issues with tariffs and taxation, including tax disputes
- disruptions in our manufacturing, service creation, delivery, logistics or supply chain caused, for instance, by natural disasters, military actions, civil unrest, public health and safety threats (including disease outbreaks), many of which may be fueled by the adverse effects resulting from climate change.

How these risks are managed, including related key policies and actions, is further discussed in the following paragraphs, in the context of relevant topics.

Combating climate change

Climate change is a significant risk to society. We recognize that we provide products and services globally that may affect the environment and climate as manufacturing, distributing, and operating these products require energy and other resources. Our most material climate-related opportunities and risks are related to our ability to help other industries to reduce their emissions and the energy efficiency of our products. We believe that the opportunities our technology provides to customers, industry and society, and the measures we have taken in our operations can positively contribute to the fight against climate change.

Our own operations are not very sensitive to the changes in energy pricing or natural catastrophes and severe weather, but climate change can impact our customers and supply chain, as well as the global economy, political and social stability. We have aligned our climate-related disclosures in our CDP report according to the guidance of the Task Force on Climate-related Financial Disclosures (TCFD). CDP is a global organization that runs a bespoke global disclosure system for investors, companies, cities, states, and regions to manage their environmental impacts.

We have in place a robust environmental management system and environmental policy, supported by documented processes and procedures to ensure their implementation. The system helps us to monitor our progress and identify needed improvements. Our own operational footprint is certified under the ISO 14001 environmental management system standard and at the end of 2021 the coverage of employees within the scope of that certification was 88%.

Our climate ambition

We have set a science-based greenhouse gas (GHG) emission reduction target through the Science Based Target (SBT) initiative: our target is to reduce our emissions by 50% between 2019 and 2030 across our value chain (Scope 1, 2 and 3). Our Scope 1 GHG emissions were 124 300 tCO₂e and market-based Scope 2 emissions were 224 500 tCO₂e. At the end of 2021, our progress on scope 2 emissions has been faster than initially planned as we continue to make significant improvements in our own operations. To further accelerate improvements in our own operations we also announced our new target to purchase 100% renewable electricity in our facilities by 2025 and joined the RE100 initiative as communicated in January 2022.

Our Scope 3 emissions were 40 634 700 tCO₂e, increasing from the previous year due in part to our sales growth and sold product mix. This means we are not on track with our SBT if a linear reduction from 2019 is expected annually. However, we do not expect the reduction of emissions in our value chain to be a linear process. We plan to stay within the 2020-2030 cumulative carbon budget and achieve our target of 50% reduction in emissions by 2030 as we see greater impact as more energy efficient products and features of our portfolio are adopted and decarbonization of the electricity grid continues globally.

Improvements in our product energy efficiency in 2021 included for example FP5, our fifth generation of high-performance IP routing silicon, and the latest range of our AirScale 5G products. Implementing our AVA solution provides additional efficiency by powering down parts of the radio network when traffic levels are low. Modernization of legacy networks also drives improved energy efficiency, and the customer base station sites we modernized in 2021 used on average 46% less energy than those where our customers did not modernize. We also work with our suppliers to reduce our upstream indirect emissions – read more in the Responsible sourcing section of this chapter.

Circularity

Closing the circularity gap is essential in fighting climate change. We embed circularity into everything we do and our strategy to increase circularity follows the classic waste hierarchy. First, we focus on the avoidance of waste through digitalization, operational efficiency and product life extension. As we cannot dematerialize everything, we ensure robust waste management practices are in place, where we look for options for reuse and material recycling when reuse is not possible. The final options are recovery and landfill. We offer refurbishment and recycling of older equipment as an integral part of our product lifecycle management. In 2021, we sent around 3 270 metric tons of old telecommunications equipment for materials recovery and we refurbished or reused approximately 55 400 units with a combined total weight of 350 metric tons.

Conducting our business with integrity

We strive to conduct business in a manner consistent with the highest standards of business ethics and integrity. We work to earn and keep the trust of our customers, governments, employees and other stakeholders with whom we interact. Doing so requires a strong culture of integrity, driven by leaders and embraced by all our employees, and a robust compliance program that is agile, practical and effective, and that reflects Nokia's high standards.

Our Code of Conduct

Our Code of Conduct provides the framework for our commitment to integrity. It unites us behind a common vision and set of values. Our Code of Conduct sets out four straightforward defining principles: we follow the laws where we do business; we set an example for one another by being honest and fair; we promote a culture of integrity through mutual respect and trust; and we hold each other accountable to adhere to the Code of Conduct and report potential violations. These four straightforward, guiding principles are supplemented by 14 key business policy statements covering critical issues and risks we face (see the picture below).



A separate Code of Ethics sets out further expectations of our President and CEO, Chief Financial Officer and Corporate Controller. We also have a Third-Party Code of Conduct that applies to external third parties with whom we work, which clearly states our expectations regarding ethical conduct. Our codes are further supplemented by policies, procedures, and guidance documents covering a range of topics, such as third-party screening procedures and corporate hospitality.

In 2021, we continued our longstanding practice of providing annual training to our employees on ethical business practices, as well as other important topics such as inclusion and diversity and information security. Our Ethical Business Training was completed by 97% of our employees, surpassing the target of 95%. We provide a range of trainings and resources that include comprehensive online courses, targeted micro-learnings, compliance job aids, and live training. In 2021, anti-corruption training was delivered to business groups, regional groups, Nokia service companies, joint ventures and other stakeholders with close to 6 000 individuals trained.

Anti-corruption and bribery

We do not engage in, nor do we tolerate, corrupt behavior by our employees, partners, or suppliers. Improper payments are strictly prohibited. We employ a multi-faceted approach to prevent corruption. We have clear and unequivocal policies concerning improper payments, facilitation payments, gifts and hospitality, sponsorships and donations, and other areas of corruption risk.

We carry out training and regularly communicate to our employees regarding legal and compliance risks, and we review these risks and our mitigation measures with the company's senior leadership and Audit Committee of the Board of Directors. We conduct periodic audits and risk assessments to ensure that we identify and respond to corruption risks across our operations. Our Compliance Operations Reviews are comprehensive assessments of compliance risk within regions and business groups. We also carry out risk-based due diligence and monitoring procedures for different categories of third parties (such as suppliers and business partners) to assess and manage potential risks related to engaging and working with them. In addition, we screen our end customers to assess possible legal, compliance and reputational risks, including, but not limited to, sanctions and money laundering risks.

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The Anti-Corruption Center of Excellence (CoE) is a dedicated group within our compliance team that assesses, monitors, and approves or rejects engagement with high-risk third parties (including, but not limited to, commercial third parties and other high-risk suppliers), as well as practices such as gifts, entertainment, hospitality, sponsorships and donations. Potential customers are screened to identify risks related to such matters as money laundering, terrorism financing, and human rights abuses. The activities of the CoE are digitalized and tool-based, including, for example, monitoring and training of third parties. Third parties must adhere to our Third-Party Code of Conduct, and they are required to sign our anti-corruption certification annually.

[Oversight and grievance mechanisms](#)

Our Board of Directors and its Audit Committee and our executive leadership team all provide oversight of our ethics and compliance program. Our Chief Compliance Officer provides periodic reports and updates concerning compliance programs, investigations, and evolving external enforcement and risk trends to the Board, Audit Committee and others, as needed. Employees are expected and encouraged to report concerns about ethical misconduct, potential violations of law, our Code of Conduct, or our company policies. We provide numerous channels and mechanisms to facilitate such reporting, including the means to report anonymously (unless prohibited by local law), and we strive to ensure that employees feel comfortable reporting concerns. Our global Ombuds program helps drive our 'speak-up' culture and allays any concerns employees may feel about potential reprisal for having filed a report.

In 2021, we received 853 concerns, of which 361 were investigated by our Business Integrity Group (our investigations team in the compliance organization) as alleged violations of our Code of Conduct. In 2021, the Business Integrity Group closed 261 investigations into alleged violations of our Code of Conduct, 72 of which were substantiated with cause found after investigation. We also implemented corrective actions including 13 dismissals and 15 written warnings following investigations conducted by the Business Integrity Group. Beyond individual discipline, these investigations resulted in detailed root cause analysis, and remedial measures and improvements were identified and monitored for implementation.

[Data privacy and security](#)

We have established a comprehensive company-wide privacy program based on relevant laws, best practices, and standards. This program is supported by, and aligned with, corporate, business-group, and central functions-level policies and processes. We aim to mitigate privacy risk in relation to the data we collect, process and store. We observe the concept of data minimization, meaning we endeavor only to collect personal data that is necessary for the purposes for which it is collected and to retain such data for no longer than is necessary. We implement appropriate controls to ensure that only persons with a clear and justifiable need to know can access personal data. We have formal processes and procedures in place to manage and mitigate any related risk to data subjects in the event of a personal data breach. These processes also include mechanisms to communicate in a timely fashion with supervisory authorities, should that be required. We measure and monitor privacy maturity by undertaking privacy maturity assessments across the business. A program of privacy awareness and training ensures we continuously and effectively address areas of the highest privacy impact.

Security is a key concern in 5G, IoT and other new technologies. We aim to develop products and services that meet or surpass the applicable security standards. Hence, we build privacy and security into the design of our products and services and employ appropriate safeguards to protect data against unauthorized use or disclosure. Nevertheless, we and our products may be subject to cybersecurity incidents including those resulting from hacking, viruses, malicious software, unauthorized modifications, or other activities that may cause potential security risks and other harm to us, our customers or other end users of our products and services. Therefore, we have developed and implemented processes and tools for use in product development, referred to as Design for Security or DfSec, which underlies all product development. In 2021, product security and DfSec requirements have been further enhanced to meet the latest industry standards.

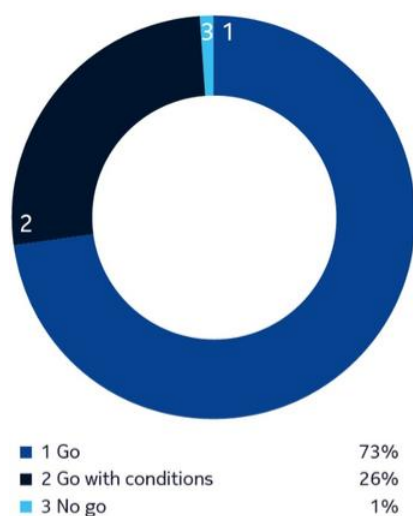
We have a Nokia-wide Information Security Policy in place to reduce business risks by protecting and managing Nokia information in a consistent way, to protect the rights and interests of Nokia customers and Nokia, and to enable transparency and accountability with respect to the treatment of all Nokia information. We are committed to comply with industry leading security practices and have ISO 27001 certifications for selected operations. We also continue improving our information security capabilities within people, technologies and processes, as well as expanding the scope of the ISO 27001 certification.

[Human rights – freedom of expression and privacy](#)

We are committed to the principles of the Universal Declaration of Human Rights, the United Nations Global Compact, and the Organisation for the Economic Co-operation and Development (OECD) guidelines for Multinational Enterprises. We encourage our suppliers and business partners to share these values. We endorsed the United Nations Guiding Principles on Business and Human Rights in 2011. Our Code of Conduct together with our Human Rights Policy sets out our approach to human rights. Our human rights processes cover the whole value chain, from supplier management to product end use and we have set clear requirements for all areas separately.

Our Human Rights Due Diligence (HRDD) process, which is embedded in our global sales process, provides the mechanism and tools to effectively deal with our most salient human rights risks arising from the potential misuse of the products and technology we provide. Before any sale is made, we aim to identify the level of possible risk to human rights through potential misuse of our technology and provide mitigation if any risk is identified. The HRDD process is initiated according to various triggers including technology type, customer, country and use case. Of the cases handled by HRDD in 2021, 73% were resolved as 'Go', 26% as 'Go with conditions', and 1% as 'No go'. In addition to potential product misuse, human rights risks appear in our global supply chain. Our supply chain risks and activities are further discussed in the Responsible Sourcing section below and in a separate modern slavery statement published on our website.

Human Rights Due Diligence cases reviewed in 2021



We are a member of the Global Network Initiative (GNI), a multi-stakeholder group of companies, civil society organizations (including human rights and press freedom groups), investors, and academics working together to protect and advance freedom of expression and privacy in the ICT sector. A condition of membership for companies is agreement to adhere to the GNI Principles and allowing GNI to conduct an independent assessment of the member company's progress towards implementing the GNI Principles. We have started initial engagement and preparation in the fourth quarter of 2021 for the next assessment and will undergo our second independent assessment during 2022.

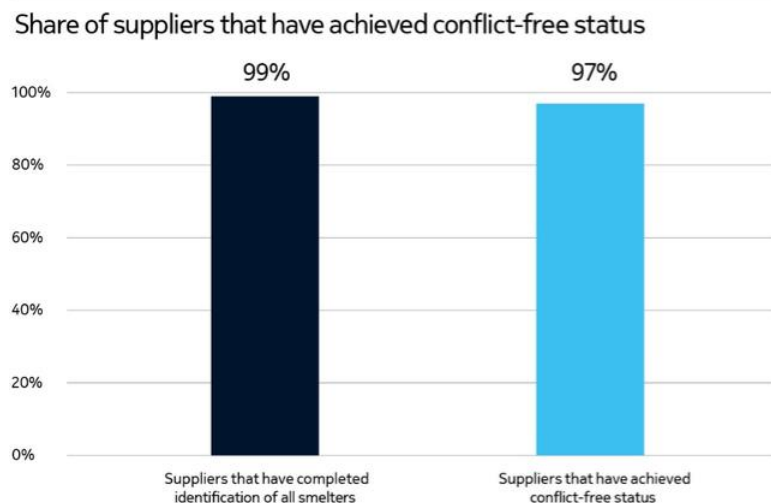
Responsible sourcing

We expect our suppliers to adhere to our Third Party Code of Conduct and provide them with our Supplier Requirements, including the Responsible Business Alliance (RBA) Code of Conduct and additional, Nokia-specific sustainability requirements. The requirements cover such topics as environment, health, safety and security, privacy, risk management, labor and human rights management, and ethics. We also run assessments and audits of our suppliers and provide training to ensure they meet our ethical requirements and continuously improve on their performance.

While COVID-19 and related precautions have limited the possibility of conducting onsite audits, we continue to assess and monitor our suppliers with more focus on remote activities. In 2021, we implemented 439 supply chain audits (391 in 2020), including 64 onsite in-depth audits on corporate responsibility topics, 36 onsite audits against our supplier requirements and 339 supplier assessments conducted using the EcoVadis scorecards. We also ran training workshops for suppliers including for example topics such as climate change, conflict-free/responsible minerals sourcing, modern slavery, and health and safety. Following growing concerns around mistreatment of ethnic and other minorities globally, we have conducted refresher training sessions regarding modern slavery and inclusion and diversity for our suppliers located in high-risk countries, conducted further risk assessments, and carried out a supplier survey around inclusion and diversity. We also continued our work with the Joint Audit Cooperation, a group of our major customers who collaborate to drive improvement and transparency in supply chain management, and we became an official member of the Responsible Business Alliance.

Traceability of our materials and ensuring our products are conflict-free are a priority for us, as evidenced in our Responsible Minerals Policy, which can be found online. The potential risks associated with the mining and trade of metals that provide key minerals in electronic components may include impacts related to military conflict, human rights violations, as well as negative environmental impacts. Tin, tantalum, tungsten, gold and cobalt are in scope of our due diligence. By the end of 2021, 99% of our suppliers had achieved full visibility to the smelters in our supply chain, and for 97% of our suppliers the entire supply chain consists of smelters that have been validated as conflict-free, active in the validation process or low risk. Our latest Conflict Minerals report was also updated during the year.

We continued our CDP Supply Chain Program, creating environmental improvement programs and improving our upstream indirect emissions that occur in the chain. In 2021, 441 of our key suppliers responded to the CDP's request to disclose their climate performance information and 296 also provided emission reduction targets. We also had 273 suppliers responding on the CDP Water security questionnaire. To move forward with climate-related targets, we also encouraged suppliers to set climate targets to be in line with the Science Based Targets initiative and recognized climate-related innovations as part of our Supplier Diamond Awards Program. With our final assembly suppliers, we worked on specifying the activities for realizing their 2030 net-zero roadmaps. To help us reduce our logistics emissions we partnered with our logistics service provider to implement net-zero flights using Sustainable Aviation Fuel. To accelerate industry collaboration on reaching 1.5°C ambition, we were one of the founding members in the World Economic Forum's First Movers Coalition. The Coalition is tasked to create the market and spur growth by leveraging collective demand and committing to buying zero-emission goods and services across eight critical industry sectors by 2030. At COP26 UN Climate change conference we were recognized for our capacity building work in supply chains through an award by Defra UK (Department for Environment, Food and Rural Affairs UK) and Responsible Business Alliance.



Our culture – Open, Fearless and Empowered

At Nokia, we care about our people. We aim to hire and retain the best talent and provide a work environment where each person can thrive.

Our essentials describe the foundation of our culture. There are three – open, fearless and empowered – which incorporate our values and determine how we, both as a company and as individuals, interact with each other and the world around us. The essentials reflect how it should feel to work at Nokia, and what we want our customers, suppliers and partners to experience working with us.

Open

I am open in mindset; to opportunity, to the future and evolving market needs, to new approaches, and to collaboration.

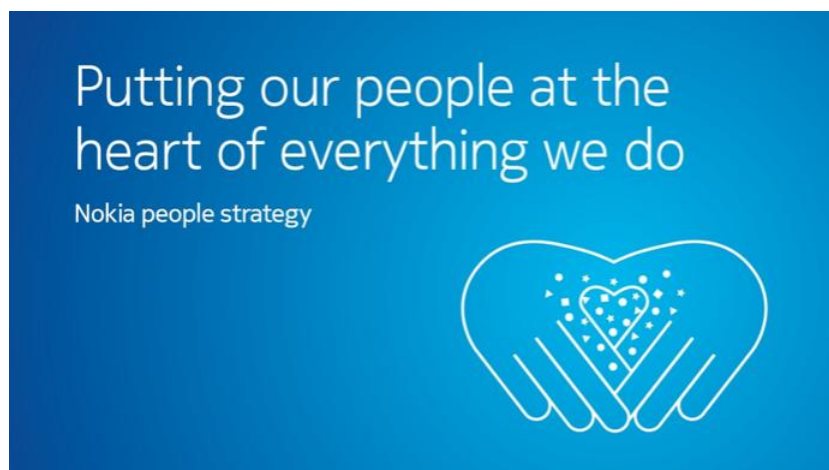
Fearless

I am fearless and bring my authentic self to work, sharing my ideas and opinions and knowing that mistakes are OK as long as we can learn from them.

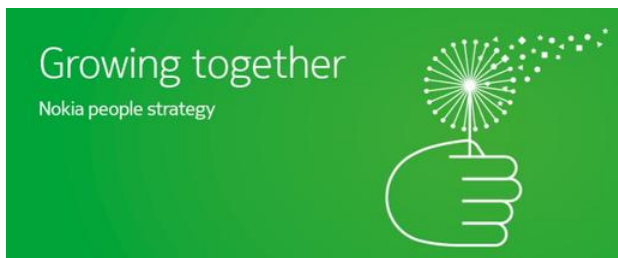
Empowered

I am empowered and supported to make decisions and own my work because I am trusted and I trust my colleagues, who have my back in success or failure.

Our essentials are brought to life through our people strategy.



The people strategy translates the essentials into ambitions and actions in four ways:



People need to develop and refresh their skills in order to succeed in their roles and grow their potential. Our objective is to enrich, recognize and reward individual experience and skills, matching personal and professional growth with the business needs of Nokia.

We are committed to employee development and growth by providing resources, learning opportunities and programs to enable employees and teams to grow and develop business-critical technical, leadership and professional skills and manage their personal wellbeing. We have around 280 internal coaches and around 400 mentors who are made available to all employees. In 2021, many of our face-to-face programs were impacted by COVID-19 and repurposed to be delivered virtually. On average our employees spent 30 hours in training during 2021.



In times of change and uncertainty, it is more important than ever to lead with the essentials, and with strong human skills that promote psychological safety. The new hybrid working environment requires connecting with employees in new ways, engaging through empathy, whilst retaining strategic and operational focus.

In 2021 we designed our leadership expectations around our essentials, embracing feedback and performance growth. The leadership approach also includes "informal leaders" such as project leads and scrum masters to ensure that anyone influencing the work of others is equipped to do so. We delivered programs for new line managers and leaders covering around 600 participants to ensure they are equipped to develop and retain our people, and to help them grow in this unprecedented environment.



We are building a culture of belonging and personal connection to the broader Nokia community. To truly act together, we must be inclusive, offering equal opportunities so that everyone feels valued, heard, and able to contribute.

In 2021, we renewed our D&I ambition, strategy, and targets to continuously improve the inclusion of all our employees with special focus on historically underrepresented groups. We introduced a mandatory training to help recognize exclusive behaviors and understand their consequences.

We continue to drive improvements in gender diversity by:

- Monitoring pay equity. Assessment of the unexplained pay gap, as well as any mitigations required, are built into our annual salary review to ensure that any pay gaps remain closed.
- Targeting 26% women in global external hiring, revising our recruitment process, and providing training to recruiters and managers on how to avoid bias. At the end of 2021, women represented 25% of the external hires. Although we did not meet our target, our actions increased the share of women hired in nearly every quarter compared to the previous quarter.
- Increasing our talent attraction activities to make Nokia's brand stand out for its diversity friendly policies.
- Running programs in collaboration with UN Women, our customers and internally to support women's careers.



To embed our new mode of operation we are shaping the Nokia environment to enable people to be empowered and productive. We strive for increased flexibility in how and where employees work, simplified policies and processes, psychological safety and the feeling of working in a united manner.

We announced our new flexible working approach that will be effective from 2022 and allows employees (subject to business need) to work up to three days a week remotely on average, provides greater acceptance of fully remote work, and greater flexibility in their working hours.

Employee demographics

The market for skilled employees in our business is extremely competitive, and even more so since the beginning of COVID-19. Our workforce has fluctuated over recent years as we have introduced changes in our strategy to respond to our business targets and our activities. These changes may in the future cause disruption and fatigue among employees, which, when coupled with our employee demographics and a dependence on key resources in some areas, make a focus on skill refresh, wellbeing, inclusivity and enabling personal and professional growth imperative.

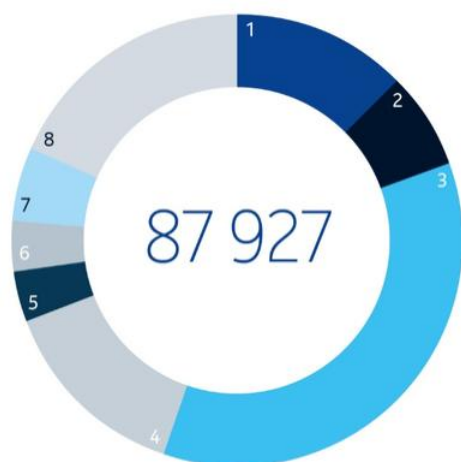
In 2021, the average number of employees was 87 927 (92 039 in 2020 and 98 322 in 2019). The graph on the right shows the average number of employees in 2021 by geographical location.

Region	Average number of employees
Finland	6 301
Other European countries	31 395
Middle East & Africa	3 244
China	12 244
Asia Pacific	20 520
North America	11 013
Latin America	3 210
Total	87 927

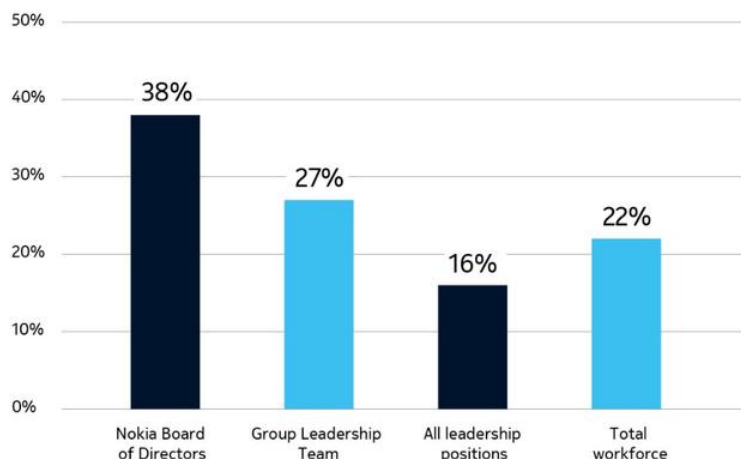
At the end of 2021, 27% of our leadership team's positions were held by women, while the share of women in all leadership positions across Nokia was 16%. In total, women accounted for 22% of our workforce.

Average number of employees in 2021
by geographical location

1 North America	11 013
2 Finland	6 301
3 Other European countries	31 395
4 Greater China	12 244
5 Latin America	3 210
6 Middle East & Africa	3 244
7 Asia Pacific	4 585
8 India	15 935



Share of women in 2021



Wellbeing

We act to equip employees to manage their personal well-being, feel safe talking about their mental health at work, and provide access to the support they need, when they need it most.

Even before the pandemic, we actively supported wellbeing and work-life balance. As the COVID-19 pandemic continued to pose challenges for many people during 2021 we reassessed our initiatives to ensure we are doing all we can to help people cope with the disruption, including:

- A new mental health training series, with regular trainings and resources covering a broad range of wellbeing topics, including emotional triggers and mindfulness, preventing digital burn-out and building resilient muscles, with around 10 000 engagements via the live and on-demand sessions to date.
- Our Personal Support Service continues to support all our employees and their families, in their native language. The service provides confidential support and guidance across a range of emotional, practical, and work-life issues, as well as mindfulness coaching to help with managing stress, and coaching to help navigate life transitions.
- We granted all our employees an extra day of paid annual leave as a 'Recharge Day' to recognize their dedication and hard work, offering a chance to switch off and reset.
- Ergonomic guidance to help our employees adjust their home working environments to support muscular-skeletal wellbeing.

Health, safety and labor conditions

Our Code of Conduct is the basis for labor conditions, enhanced by a full set of global human resources policies and procedures that enable fair employment. We adhere to the International Labor Organization (ILO) Declaration on Fundamental Principles and Rights at Work and we meet, or where possible exceed, the requirements of labor laws and regulations wherever we have operations. We work hard to ensure decent working conditions and fair employment, taking into account both international and local laws and guidelines. Our health and safety management system is the basis for our overall program and an integral part of how we manage health and safety. The management system is certified with the internationally recognized ISO 45001. The certification is provided by a third party, Bureau Veritas, and the share of our employees covered by the certification at the end of 2021 was 84%. We implement training, analysis, assessments and consequence management to address job-related health and safety risks. We run a wide range of programs targeted at constantly improving our health and safety performance, while also encouraging employees and contractors to report near misses and dangerous incidents.

We see the highest risk exposure to health and safety in the delivery of field work, which is predominantly delivered by our contractors through tasks such as working at height, driving for work and electrical installation and maintenance. Consequently, we have set stringent key performance indicators related to the supplier ability to deliver safely, which is evaluated by our Health and Safety Maturity Assessment process. By the end of 2021, 99% of suppliers delivering high-risk activity had been assessed using our H&S Maturity Assessment Process and 98% of the assessed suppliers met H&S compliant supplier status. We also carried out impact assessments on 100% of all high-risk projects. 98% of those projects were found to meet our minimum non-negotiable requirements.

Shares and shareholders

Share details

Shares and share capital

Nokia has one class of shares. Each Nokia share entitles the holder to one vote at general meetings of Nokia.

As of 31 December 2021, the share capital of Nokia Corporation equaled EUR 245 896 461.96 and the total number of shares issued was 5 675 461 159. As of 31 December 2021, the total number of shares included 40 467 555 shares owned by Group companies representing approximately 0.7% of the total number of shares and the total voting rights.

In 2021, under the authorization granted to the Board of Directors by the Annual General meeting, the Parent Company issued 21 575 000 new shares without consideration to itself to fulfill the company's obligation under the Nokia Equity Programs.

In 2021, under the authorization granted to the Board of Directors by the Annual General meeting, the Parent Company issued 17 497 244 treasury shares to employees, including certain members of the Group Leadership Team, as settlement under Parent Company equity-based incentive plans and the employee share purchase plan. The shares were issued without consideration and in accordance with the rules of the plans.

Information on the authorizations held by the Board of Directors in 2021 to issue shares and special rights entitling to shares, to transfer shares and repurchase own shares, as well as information on related party transactions, the shareholders, stock options, shareholders' equity per share, dividend yield, price per earnings ratio, share prices, market capitalization, share turnover and average number of shares is available in the "Corporate governance — Compensation" section, and in Note 19, Equity, of the consolidated financial statements.

The Board of Directors held at 31 December 2021 a total of 1 116 075 shares and ADSs in Nokia, which represented approximately 0.02% of our total shares and voting rights excluding shares held by Nokia Group. The CEO owned at 31 December 2021 a total of 1 232 333 shares.

There were no public takeover offers by third parties for Nokia's shares or by Nokia for other companies' shares during the 2020 and 2021 fiscal years.

Nokia does not have minimum or maximum share capital or a par value of a share.

As of 31 December	2021	2020	2019	2018	2017
Share capital, EURm	246	246	246	246	246
Shares, (000s)	5 675 461	5 653 886	5 640 536	5 635 945	5 839 404
Shares held by the Group, (000s)	40 468	36 390	34 955	42 783	259 887
Number of shares excluding shares held by the Group, (000s)	5 634 993	5 617 496	5 605 581	5 593 162	5 579 517
Average number of shares excluding shares held by the Group during the year					
Basic, (000s) ⁽¹⁾	5 630 025	5 612 418	5 599 912	5 588 020	5 651 814
Diluted, (000s) ⁽¹⁾	5 684 235	5 612 418	5 626 375	5 588 020	5 651 814
Number of registered shareholders ⁽²⁾	233 844	246 886	248 526	243 409	247 717

(1) Used in calculation of earnings per share for profit or loss for the year attributable to equity holders of the parent.

(2) Each account operator is included in the figure as only one registered shareholder.

Key ratios

For the year ended 31 December, Continuing operations	2021	2020	2019	2018	2017
Earnings per share, basic, EUR	0.29	(0.45)	0.00	(0.10)	(0.26)
Earnings per share, diluted, EUR	0.29	(0.45)	0.00	(0.10)	(0.26)
P/E ratio	19.22	neg.	—	neg.	neg.
Proposed dividend per share, EUR ⁽¹⁾⁽²⁾	0.08	0.00	0.00	0.20	0.19
Total dividends, EURm ⁽¹⁾⁽³⁾	456	—	—	560	1 063
Payout ratio ⁽¹⁾	0.28	—	—	neg.	neg.
Dividend yield % ⁽¹⁾	1.44	—	—	3.98	4.88
As of 31 December	2021	2020	2019	2018	2017
Shareholders' equity per share, EUR	3.08	2.22	2.73	2.73	2.89
Market capitalization, EURm	31 409	17 701	18 476	28 134	21 704

(1) The Board of Directors proposes to the Annual General Meeting to be authorized to decide in its discretion on the distribution of an aggregate maximum of EUR 0.08 per share as dividend and/or equity repayment.

(2) In 2019, Nokia's Annual General Meeting resolved to authorize the Board of Directors to resolve on the distribution of an aggregate maximum of EUR 0.20 per share as dividend for the financial year 2018 in four quarterly instalments. Finally, the Board of Directors resolved on the distribution of two quarterly instalments totaling EUR 0.10 per share.

(3) In 2021, dividends paid is calculated based on the proposed Annual General Meeting authorization to the Board of maximum distribution of EUR 0.08 per share for the financial year 2021, and the total number of shares on the date of issuing the financial statements for 2021. On the date of issuing the financial statements for 2021 the total number of Nokia shares is 5 696 261 159. Comparative amounts represent the actual total distribution to equity holders of the parent for the year presented.

Share turnover

For the year ended 31 December	2021	2020	2019	2018	2017
Number of shares traded during the year (000s) ⁽¹⁾	16 560 334	13 903 762	11 003 630	8 960 687	8 839 680
Average number of shares excluding shares held by the Group during the year (000s)	5 630 025	5 612 418	5 599 912	5 588 020	5 651 814
Share turnover %	294	248	196	160	156

(1) Source: Nasdaq Helsinki, the NYSE composite tape and Euronext Paris.

The principal trading markets for the shares are Nasdaq Helsinki and Euronext Paris, in the form of shares, and the NYSE, in the form of ADSs.

Share price development

Annual data	Nasdaq Helsinki			New York Stock Exchange			Euronext Paris		
	High	Low	Value	High	Low	Value	High	Low	Value
	EUR			USD			EUR		
2021 Full year High/Low	5.71	3.12		9.79	3.75		5.70	3.12	
2021 Full year Average (Volume-weighted)			4.22			5.06			4.20
Year-end value 31 December 2021			5.57			6.22			5.57
Year-end value 31 December 2020			3.15			3.91			3.14
Change from 31 December 2020 to 31 December 2021			76.8%			59.1%			77.4%

Stock option exercises

Year ⁽¹⁾	Stock option category	Subscription price EUR	Number of new shares 000s	Date of payment	Net proceeds EURm	New share capital EURm
2019	Nokia Stock Option Plan 2013 1Q	2.58	0	2019	0.00	—
	Nokia Stock Option Plan 2013 2Q	2.35	23	2019	0.05	—
	Nokia Stock Option Plan 2013 3Q	2.72	0	2019	0.00	—
	Nokia Stock Option Plan 2013 4Q	5.41	0	2019	0.00	—
	Total		23		0.05	

(1) After 2019 the Group no longer administered any global stock option plan. Refer to Note 24, Share-based payment.

Dividend and share buy-backs

The dividend to shareholders is Nokia's principal method of distributing earnings to shareholders. Beginning with the distribution for the financial year 2018, Nokia started paying dividends in quarterly instalments. On 24 October 2019, the Board resolved to pause dividend distributions, in order to: a) guarantee Nokia's ability to increase 5G investments, b) continue investing in growth in strategic focus areas of enterprise and software and c) strengthen Nokia's cash position.

The dividend policy was updated at the Capital Markets Day in March 2021 to be "We target recurring, stable and over time growing ordinary dividend payments, taking into account the previous year's earnings as well as the company's financial position and business outlook".

The Board proposes to the Annual General Meeting 2022 to be authorized to decide, in its discretion, on the distribution of an aggregate maximum of EUR 0.08 per share as dividend and/or as assets from the invested unrestricted equity fund. The authorization will be used to distribute dividend and/or equity repayment in four instalments during the period of validity of the authorization unless the Board of Directors decides otherwise for a justified reason. The proposed total authorization for dividend and/or equity repayment is in line with the Company's dividend policy. The authorization would be valid until the opening of the next Annual General Meeting. The Board would make separate resolutions on the amount and timing of each distribution of the dividend and/or equity repayment.

In 2020 and 2021, Nokia generated strong cash flow which has significantly improved the cash position of the company. To manage the company's capital structure, Nokia's Board of Directors initiated a share buyback program under the current authorization from the Annual General Meeting to repurchase shares, with purchases beginning in the first quarter of 2022. The program targets to return up to EUR 600 million of cash to shareholders in tranches over a period of two years, subject to continued authorization from the Annual General Meeting.

We distribute distributable funds, if any, within the limits set by the Finnish Companies Act as defined below. We make and calculate the distribution, if any, in the form of cash dividends, assets from the reserve for invested unrestricted equity, share buybacks, or in some other form, or a combination of these. There is no specific formula by which the amount of a distribution is determined, although some limits set by law are discussed below. The timing and amount of future distributions of retained earnings and/or assets from the reserve for invested unrestricted equity, if any, will depend on our future results and financial conditions.

Under the Finnish Companies Act, we may distribute retained earnings and/or assets from the reserve for invested unrestricted equity on our shares only upon a shareholders' resolution and subject to limited exceptions in the amount proposed by the Board. The amount of any distribution is limited to the amount of distributable earnings of the Parent Company pursuant to the last audited financial statements approved by our shareholders, taking into account the material changes in the financial situation of the Parent Company after the end of the last financial period and a statutory requirement that the distribution of earnings must not result in insolvency of the Parent Company. Subject to exceptions relating to the right of minority shareholders to request a certain minimum distribution, the distribution may not exceed the amount proposed by the Board of Directors.

Shareholders

As of 31 December 2021, shareholders registered in Finland represented approximately 22% and shareholders registered in the name of a nominee represented approximately 78% of the total number of shares of Nokia Corporation. The number of directly registered shareholders was 233 844 as of 31 December 2021. Each account operator (12) is included in this figure as only one registered shareholder.

Largest shareholders registered in Finland as of 31 December 2021⁽¹⁾

Shareholder	Total number of shares 000s	% of all shares	% of all voting rights
Solidium Oy	301 000	5.30	5.30
Keskinäinen Työeläkevakuutusyhtiö Varma	97 952	1.73	1.73
Keskinäinen Eläkevakuutusyhtiö Ilmarinen	69 695	1.23	1.23
Keskinäinen Työeläkevakuutusyhtiö Elo	30 520	0.54	0.54
Valtion Eläkerahasto	25 000	0.44	0.44
OP-Suomi -Sijoitusrahasto	17 681	0.31	0.31
Oy Lival Ab	16 697	0.29	0.29
Svenska Litteratursällskapet i Finland r.f.	15 678	0.28	0.28
Nordea Pro Finland Fund	10 838	0.19	0.19
Sijoitusrahasto Seligson & Co	9 513	0.17	0.17

(1) Excluding nominee registered shares and shares owned by Nokia Corporation. Nokia Corporation owned 29 008 894 shares as of 31 December 2021.

Breakdown of share ownership as of 31 December 2021⁽¹⁾

By number of shares owned	Number of shareholders	% of shareholders	Total number of shares	% of all shares
1–100	60 856	26.02	3 037 099	0.05
101–1 000	107 439	45.95	47 832 871	0.84
1 001–10 000	57 708	24.68	179 903 497	3.17
10 001–100 000	7 371	3.15	180 346 263	3.18
100 001–500 000	365	0.16	70 594 230	1.24
500 001–1 000 000	33	0.01	22 961 237	0.41
1 000 001–5 000 000	50	0.02	124 312 091	2.19
Over 5 000 000	22	0.01	5 046 473 871	88.92
Total	233 844	100.00	5 675 461 159	100.00

(1) The breakdown covers only shareholders registered in Finland, and each account operator (12) is included in the number of shareholders as only one registered shareholder. As a result, the breakdown is not illustrative of the entire shareholder base of Nokia.

By nationality	% of shares
Non-Finnish shareholders	77.80
Finnish shareholders	22.20
Total	100.00

By shareholder category (Finnish shareholders)	% of shares
Corporations	2.05
Households	7.15
Financial and insurance institutions	2.27
Non-profit organizations	1.25
Governmental bodies (incl. pension insurance companies)	9.48
Total	22.20

As of 31 December 2021, a total of 1 112 307 568 ADSs (equivalent to the same number of shares or approximately 19.6% of the total shares) were outstanding and held of record by 110 198 registered holders in the United States. We are aware that many ADSs are held of record by brokers and other nominees, and accordingly the above number of holders is not necessarily representative of the actual number of persons who are beneficial holders of ADSs or the number of ADSs beneficially held by such persons. Based on information available from Broadridge Financial Solutions, Inc., the number of beneficial owners of ADSs as of 31 December 2021 was 1 386 233.

Based on information known to us as of 2 February 2022, as of 31 December 2021, Blackrock, Inc. beneficially owned 367 636 592 Nokia shares, which at that time corresponded to approximately 6.5% of the total number of shares and voting rights of Nokia.

To the best of our knowledge, Nokia is not directly or indirectly owned or controlled by any other corporation or any government, and there are no arrangements that may result in a change of control of Nokia.

Shares and stock options owned by the members of the Board and the Nokia Group Leadership Team

As of 31 December 2021, the members of our Board and the Group Leadership Team held a total of 3 840 280 shares and ADSs in Nokia, which represented approximately 0.07% of our shares and total voting rights excluding shares held by the Nokia Group.

Offer and listing details

Our capital consists of shares traded on Nasdaq Helsinki under the symbol "NOKIA" and Euronext Paris under the symbol "NOKIA". Our ADSs, each representing one of our shares, are traded on the NYSE under the symbol "NOK". The ADSs are evidenced by American Depositary Receipts (ADRs) issued by Citibank, N.A.

Articles of Association

Articles of Association

Amendment of our Articles of Association requires a resolution of the general meeting of shareholders, supported by two-thirds of the votes cast and two-thirds of the shares represented at the meeting.

Registration

Nokia is organized under the laws of the Republic of Finland and registered in the Finnish Trade Register under the business identity code 0112038-9. Under its current Articles of Association, Nokia's corporate purpose is to research, develop, manufacture, market, sell and deliver products, software and services in a wide range of consumer and business-to-business markets. These products, software and services relate to, among others, network infrastructure for telecommunication operators and other enterprises, the IoT, human health and well-being, multimedia, big data and analytics, mobile devices and consumer wearables and other electronics. The company may also create, acquire and license intellectual property and software as well as engage in other industrial and commercial operations, including securities trading and other investment activities. The company may carry on its business operations directly, through subsidiary companies, affiliate companies and joint ventures.

Directors' voting powers

Under Finnish law, resolutions of the Board shall be made by a majority vote. A director shall refrain from taking any part in the consideration of an agreement between the director and the company or third party, or any other issue that may provide any material benefit to him or her, which may be contradictory to the interests of the company. Under Finnish law, there is no age limit requirement for directors, and there are no requirements under Finnish law that a director must own a minimum number of shares in order to qualify to act as a director. However, in accordance with the current company policy, approximately 40% of the annual fee payable to the Board members is paid in Nokia shares purchased from the market or alternatively by using treasury shares held by Nokia, and the directors shall retain until the end of their directorship such number of shares that corresponds to the number of shares they have received as Board remuneration during their first three years of service (the net amount received after deducting those shares used for offsetting any costs relating to the acquisition of the shares, including taxes).

Share rights, preferences and restrictions

Each share confers the right to one vote at general meetings. According to Finnish law, a company generally must hold an Annual General Meeting called by the Board within six months from the end of the financial year. Additionally, the Board is obliged to call an Extraordinary General Meeting, whenever such meeting is deemed necessary, or at the request of the auditor or shareholders representing a minimum of one-tenth of all outstanding shares. Under our Articles of Association, the Board is elected at least annually at the Annual General Meeting of the shareholders for a term ending at the end of the next Annual General Meeting.

Under Finnish law, shareholders may attend and vote at general meetings in person or by proxy. It is not customary in Finland for a company to issue forms of proxy to its shareholders. Accordingly, Nokia does not do so. However, registered holders and beneficial owners of ADSs are issued forms of proxy by the Depositary.

To attend and vote at a general meeting, a shareholder must be registered in the register of shareholders in the Finnish book-entry system on or prior to the record date set forth in the notice of the general meeting. A registered holder or a beneficial owner of the ADSs, like other beneficial owners whose shares are registered in the company's register of shareholders in the name of a nominee, may vote with their shares provided that they arrange to have their name entered in the temporary register of shareholders for the general meeting.

The record date is the eighth business day preceding the meeting. To be entered in the temporary register of shareholders for the general meeting, a holder of ADSs must provide the Depositary, or have his broker or other custodian provide the Depositary, on or before the voting deadline, as defined in the proxy material issued by the Depositary, a proxy with the following information: the name, address, and social security number or another corresponding personal identification number of the holder of the ADSs, the number of shares to be voted by the holder of the ADSs and the voting instructions. The register of shareholders as of the record date of each general meeting is public until the end of the respective meeting. Other nominee registered shareholders can attend and vote at the general meetings by instructing their broker or other custodian to register the shareholder in Nokia's temporary register of shareholders and give the voting instructions in accordance with the broker's or custodian's instructions.

By completing and returning the form of proxy provided by the Depositary, a holder of ADSs also authorizes the Depositary to give notice to us, required by our Articles of Association, of the holder's intention to attend the general meeting.

The rights of shareholders are related to the shares as set forth in the Finnish Companies Act and our Articles of Association. Neither Finnish law nor our Articles of Association sets limitations on the rights to own Nokia securities, including the rights of foreign shareholders to hold or exercise voting rights in the said securities. Amendment of the Articles of Association requires a decision of the general meeting, supported by two-thirds of the votes cast and two-thirds of the shares represented at the meeting.

Each of our shares confers equal rights to share in the distribution of the company's funds. Under Finnish law, dividend entitlement lapses after three years if a dividend remains unclaimed for that period, in which case the unclaimed dividend will be recognized as income by Nokia.

Disclosure of shareholder ownership or voting power

According to the Finnish Securities Market Act, a shareholder shall disclose his or her ownership or voting power to the company and the Finnish Financial Supervisory Authority when the ownership or voting power reaches, exceeds or falls below 5, 10, 15, 20, 25, 30, 50 or 90% of all the shares or the voting rights outstanding. The term "ownership" includes ownership by the shareholder, as well as selected related parties, and calculating the ownership or voting power covers agreements or other arrangements, which when concluded would cause the proportion of voting rights or number of shares to reach, exceed or fall below the aforementioned limits. Upon receiving such notice, the company shall disclose it by a stock exchange release without undue delay.

Purchase obligation

Our Articles of Association require a shareholder that holds one-third or one-half of all of our shares to purchase the shares of all other shareholders that so request. A shareholder who becomes subject to the purchase obligation is also obligated to purchase any subscription rights, stock options or convertible bonds issued by the company if so requested by the holder. The purchase price of the shares under our Articles of Association is the higher of: (a) the weighted average trading price of the shares on Nasdaq Helsinki during the ten business days prior to the day on which we have been notified by the purchaser that its holding has reached or exceeded the threshold referred to above or, in the absence of such notification or its failure to arrive within the specified period, the day on which our Board otherwise becomes aware of this; or (b) the average price, weighted by the number of shares, which the purchaser has paid for the shares it has acquired during the last 12 months preceding the date referred to in (a).

Under the Finnish Securities Market Act, a shareholder whose voting power exceeds 30% or 50% of the total voting rights in a company shall, within one month, offer to purchase the remaining shares of the company, as well as any other rights entitling to the shares issued by the company, such as subscription rights, convertible bonds or stock options issued by the company. The purchase price shall be the market price of the securities in question. Subject to certain exceptions, the market price is determined on the basis of the highest price paid for the security during the preceding six months by the shareholder or any party in close connection to the shareholder. Subject to certain exceptions, if the shareholder or any related party has not during the six months preceding the offer acquired any securities that are the target for the offer, the market price is determined based on the average of the prices paid for the security in public trading during the preceding three months weighted by the volume of trade.

Under the Finnish Companies Act, a shareholder whose holding exceeds nine-tenths of the total number of shares or voting rights in Nokia has both the right and, upon a request from the minority shareholders, the obligation to purchase all the shares of the minority shareholders for the then current market price. The market price is determined, among other things, on the basis of the recent market price of the shares. The purchase procedure under the Finnish Companies Act differs, and the purchase price may differ, from the purchase procedure and price under the Finnish Securities Market Act, as discussed above. However, if the threshold of nine-tenths has been exceeded through either a mandatory or a voluntary public offer pursuant to the Finnish Securities Market Act, the market price under the Finnish Companies Act is deemed to be the price offered in the public offer, unless there are specific reasons to deviate from it.

Pre-emptive rights

In connection with any offering of shares, the existing shareholders have a pre-emptive right to subscribe for shares offered in proportion to the amount of shares in their possession. However, a general meeting of shareholders may vote, by a majority of two-thirds of the votes cast and two-thirds of the shares represented at the meeting, to waive this pre-emptive right provided that, from the company's perspective, weighty financial grounds exist.

Monitoring of Foreign Corporate Acquisitions

Under the Finnish Act on the Monitoring of Foreign Corporate Acquisitions (2012/172 as amended), a notification to the Ministry of Economic Affairs and Employment is required for a non-resident of Finland, directly or indirectly, when acquiring one-tenth or more of the voting power or corresponding factual influence in a company. The Ministry of Economic Affairs and Employment has to confirm the acquisition unless the acquisition would jeopardize important national interests, in which case the matter is referred to the Council of State. If the company in question is operating in the defense sector, an approval by the Ministry of Economic Affairs and Employment is required before the acquisition is made. These requirements are not applicable if, for instance, the voting power is acquired in a share issue that is proportional to the holder's ownership of the shares. Moreover, the requirements do not apply to residents of countries in the European Economic Area or EFTA countries, except where at least one tenth of shares or other controlling right in such resident are held by a party not resident in the European Economic Area or EFTA.

Risk factors

Set forth below is a description of risk factors that could affect our business. Shareholders and potential investors should carefully review the following risk factors, in addition to other information contained in this report. The risk factors described below should not be construed as exhaustive. There may be additional risks that are unknown to us and other risks currently believed to be immaterial that could turn out to be material.

These risks, either individually or collectively, could adversely affect our business, competitiveness, market share, sales, costs, expenses, results of operations, profitability, financial condition, liquidity, reputation, brand and share price. Unless otherwise indicated or the context otherwise requires, references in these risk factors to “Nokia”, the “Nokia Group”, “Group”, “we”, “us” and “our” mean Nokia’s consolidated operating segments. Certain risks or events may be more prevalent with respect to the Group or a certain business group, business or part of the Group.

In evaluating the risks, one should not rely exclusively on the bullets in the below summary but read the full risk factor discussion. This report also contains forward-looking statements that involve risks and uncertainties presented in “Forward-looking statements” above.

Risk factors summary

Cost and performance remain the top priorities for our customers. Our capability to compete in the top-two-vendors field, as a trusted partner for critical networks, is dependent on multiple external and internal factors, partially outside our control, including such as:

Risks related to our strategy and its execution

- Our ability to become and remain as a leading provider of technology, software and services in the industries and markets in which we operate;
- Trends, such as cloudification, open RAN/openness, virtualization and disaggregation with potential impact on our portfolio of products and services, competitive landscape, business models and our margin profile;
- The degree our investments, including venture funds, result in technologies, products or services that achieve or retain broad or timely market acceptance, answer to the expanding needs or preferences of our customers or consumers, or in break-through innovations, research assets, digitalization and intellectual property that we could otherwise utilize for value creation;
- Our success in continuing to improve our operations and efficiencies through the new operating model;
- Our ability and success in acquiring or divesting businesses and technologies, in integrating acquisitions, entering into licensing arrangements, and in forming and managing joint ventures or partnerships; and
- Our ability to meet our sustainability targets, including with respect to our greenhouse gas emission commitments, and to comply with stakeholder expectations regarding sustainability activities and disclosures.

Surrounding economic, financial and competitive environment

- General economic and financial market conditions and other developments in the economies and industries where we, our customers and partners/suppliers operate;
- Duration of the COVID-19 outbreak, disruptiveness of the related measures to contain the virus and other prolonged impacts of the pandemic;
- The cyclical nature of the markets in which we operate, competitor behavior, customer consolidation, customer purchase and spending behavior, deployments and rollout timing;
- Accelerating inflation and our ability to pass increased costs to our customers;
- Price erosion largely driven by competition challenging the connectivity business models of our customers;
- Our dependency on a limited number of customers and large multi-year agreements;
- Competitiveness of or developments regarding pricing and agreement terms we offer, including developments with respect to customer financing or extended payment terms or credit lines that we provide our customers; and
- Willingness of banks or other institutions to purchase our receivables.

Our competitiveness

- Our ability to adapt to changing business models, technological changes and to meet new competition;
- Investing in new competitive high-quality products, services, upgrades and technologies that achieve or retain a broad market acceptance;
- Our success in the development of new technologies, their rollout and commercialization and bringing them to market in a timely manner;
- Our ability to retain, develop, reskill and recruit appropriately skilled employees in the right activities and locations;
- Our capabilities to manage end-to-end costs related to our portfolio of products and services;
- Adjusting our cost base by achieving savings to offset increased investments in R&D and future capabilities, including 5G, cloud and digitalization, including ability to manage the inflationary pressures regarding salary and other costs; and
- Identifying and implementing the appropriate measures to improve cost-efficiency or to maintain achieved efficiency levels.

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Intellectual property rights, technology and brand licensing

- Our ability to create new relevant technologies, products and services through our R&D, as well as our ability to protect our innovations and to maintain the relative strength of our intellectual property portfolio;
- Our ability to protect and monetize our intellectual property e.g. due to market, regulatory and other developments, or court rulings in intellectual property-related litigation and other disputes;
- Uncertainty relating to the evolving global regulatory and standardization landscape relating to intellectual property;
- Developments in the concentrated smartphone market, the source of a significant portion of our patent licensing income;
- Success and profitability of technology licensing, brand licensing and other business ventures, including venture fund investments where the valuation and proceeds of our venture fund investments may fluctuate;
- Claims that we have allegedly infringed third parties' IPR; and
- Our ability to renew or finalize licenses regarding technologies that are licensed to us on acceptable commercial terms.

Geopolitical, legal, regulatory and compliance environment

- Direct and indirect regulation and political developments regulating trade, taxes, national security, competition law, export controls and sanctions, cyber security, sustainability reporting and anti-corruption;
- Changes in regulations or in their application applicable to current or new technologies or products;
- Emerging new regulation applicable to current or new technologies or products;
- Our products, services and operations meeting all relevant quality, health, safety or security standards and other recommendations and regulatory requirements globally;
- Compliance with laws and regulations relating to privacy, data protection, and the protection or transfer of personal data; and
- Our ability to maintain an effective system of governance and compliance processes, disclosure controls and internal control over financial reporting.

Business operations

- Our manufacturing, service creation, delivery, logistics or supply chain to operate without significant interruptions or shortages, including the impacts of current global semiconductor components shortage constraint on our deliveries and the overall disruptance and continuing uncertainty in the global supply chain;
- Performance capabilities of our partners and suppliers and their high standards to meet product quality, health, safety or security requirements or comply with other regulations or local laws, such as environmental or labour laws;
- Inefficiencies, breaches, malfunctions or disruptions of our information technology systems and processes or disruptions of services relying on our or third-party IT;
- Actual or perceived security or privacy breaches, as well as defects, errors or vulnerabilities in our technology and that of third-party providers;
- Damage caused to existing undersea infrastructure during installation or maintenance of undersea telecommunications cable networks;
- The degree of control and level of influence in the joint ventures where Nokia is the minority partner and other affiliated companies where Nokia does not have direct management control or which are not fully integrated into its operational infrastructure; and
- Natural or man-made disasters, military actions, wars, labor unrest, civil unrest or health crises impacting our service delivery or production sites or the production sites of our suppliers, which are geographically concentrated.

Financial and taxes related uncertainties

- Complex tax laws and rules, including any changes in the aforesaid, as well as diverse tax authority practices and interpretations;
- Our ability to utilize our tax attributes and deferred tax assets;
- Access to sources of funding on favorable terms or at all;
- Our ability to re-establish investment grade rating or maintain our credit ratings;
- Exchange rate fluctuations impacting our net sales, costs and results of operations, as well as the US dollar value of our dividends and market price of our ADSs;
- Pension and post-employment cost-related risks and our ability to avoid or control costs resulting from a need for increased funding; and
- Recoverability of the carrying amount of our goodwill, which could result in significant impairment charges.

Ownership of our shares

- The amount of dividend and/or repayment of capital and other profit distributions such as share buybacks to shareholders for each financial period is uncertain;
- Volatility of the trading price of our shares and ADSs, including as a result of factors outside our control; and
- Non-Finnish shareholders are likely required to provide detailed information to obtain advantageous withholding tax treatment for dividends.

Full risk factor discussion

Risks related to our strategy and its execution

We may be unable to successfully implement our strategic plans, sustain or improve the operational and financial performance of our business groups, correctly identify or successfully pursue business opportunities, correctly anticipate or successfully mitigate technological disruptions that have adverse effects on our business, or otherwise grow our business.

Our strategic plans, which include targeted investments in our business and pursuing new business opportunities based on identified trends and opportunities, even if successful, may not yield a return on our investment as planned or at all. There can be no assurance that we will correctly identify trends, opportunities or threats to pursue or mitigate to be able to achieve the goals or targets we have set. Furthermore, there can be no assurance that our investments will result in technologies, products or services that achieve or retain broad or timely market acceptance, answer to the expanding needs or preferences of our customers or consumers, or breakthrough innovations that we could otherwise utilize for value creation. As an example, while we believe that the progress of cloudification and open RAN/openness creates an opportunity for us to differentiate with our products and to serve our customers better, it may lead to entry of new competitors with different business models to build multi-vendor RAN networks. The virtualization and cloudification of core and radio networks and the convergence of IT and telecommunications may lower barriers of entry for IT and webscale companies in the traditional telecommunications industry or they may build up tight strategic partnerships with our traditional competitors or our communication service provider customers. The enhanced competition might result in increased price competition and negatively affect our margins. Virtualization and disaggregation might also affect other parts of our portfolio and lead to changes in competitive landscape, business models, and margin profile. Our success is dependent on our ability to become and remain as a leading provider of technology, software and services in the industries and markets in which we operate.

We implement our strategic plans and continuously target various improvements in our operations and efficiencies through investing in R&D, acquiring businesses and technologies, partnering with third parties or forming joint ventures and entering into licensing agreements. We implemented a new operating model in the beginning of 2021 to drive accountability and financial discipline through the organization. However, there can be no assurance that our efforts will or continue to generate the expected results or improvements in our operations or that we will achieve our intended targets or financial objectives related to such efforts. For instance, the underlying rationale or the business case in terms of profits, revenue, strategic impact or otherwise justifying the creation or continuation of the arrangement may not be realized.

We may be unable to successfully implement planned transactions or transactions may result in liabilities. We may be unable to realize the anticipated benefits, synergies, cost savings or efficiencies from acquisitions, and we may encounter issues or inefficiencies related to our organizational and operational structure, including being unable to successfully implement our business plans.

As part of our strategy, we may engage in possible transactions, such as acquisitions, divestments, mergers, joint ventures or minority investments that could complement our existing operations and enable us to grow our business or shift focus via divestitures of our existing businesses or operations. Additionally, we may make investments in certain investment funds, including NGP Capital, that invest in other companies.

Such transactions may not ultimately be completed on favorable terms or at all or provide the anticipated benefits or return on investment. Furthermore, our initial assumptions may be incorrect in evaluating a transaction. Therefore, we may be exposed to unknown, larger or contingent liabilities of acquired businesses, such as those related to contractual obligations, taxes, pensions, environmental liabilities, disputes and compliance matters. Transactions may result in claims between the parties such as indemnification or breach of contract claims, which can consume time and management attention, and the outcome of any claims related to transactions may be difficult to predict.

There can be no assurance that we will be able to successfully integrate acquired businesses or assets or realize the intended benefits and potentially targeted cost savings related to our business plans as anticipated. The risks and uncertainties relating to the integration include, among others, the distraction of our management's attention from our business resulting in performance shortfalls, the disruption of our ongoing business, interference with our ability to maintain our relationships with customers, vendors, regulators and employees and inconsistencies in our services, standards, quality, product road maps, controls, procedures and policies, any of which could have a material adverse effect on our business, financial condition and results of operations.

Additionally, there are multiple other events or conditions that can hamper or delay a transaction or impact our ability to realize value from the transaction, including:

- Unanticipated costs, delays or inability to proceed with transactions as planned, for instance, due to issues in obtaining regulatory or shareholder approvals, completing public offers or proposals, the imposition of terms or obstacles by regulators or courts that result in changes required in the scope of the transaction or conditions on the acquirer of a business to divest certain assets or other obligations due to competition laws or other regulations;
- The potential loss of key employees, customers and suppliers;
- Disruption to or inability to rationalize or streamline our organization, product lines/service or to retire legacy products and related services;
- Unanticipated changes in business, industry or general economic conditions that affect the assumptions underlying the acquisition;
- Conditions and burdens imposed by laws, regulators or industry standards or adverse developments thereto or litigation affecting us;
- Impairments related to goodwill and intangible assets, for instance due to business performance after an acquisition or differences in evaluating the goodwill with respect to the acquired businesses;
- Unexpected costs associated with the integration or the separation of the business as applicable;
- Additional payment obligations and higher costs resulting from non-performance by divested businesses;
- Exposure to contingent liabilities in connection with any regulatory or compliance failures relating to divested products;
- Our dependence on some of the divested businesses as our suppliers in the future; and
- High transaction costs.

Additionally, the anticipated cost reductions and other benefits, as well as related implementation costs, are derived from our estimates. Where the underlying assumptions are inherently uncertain and subject to a variety of significant business, economic, and competitive factors, risks and uncertainties, that could cause our actual results to differ materially from those contained in the expected synergy benefits and related cost estimates.

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As previously disclosed, we were made aware of certain practices relating to compliance practices at the former Alcatel-Lucent business that have raised concerns. We voluntarily reported the matter to the relevant regulatory authorities and we continue to cooperate with them. We have seen no evidence that would suggest that criminal penalties would apply in this case, and we believe it is highly likely that any penalties that might apply would be limited and immaterial.

Performance failures of our partners, as well as failures to agree to partnering arrangements with third parties could adversely affect us.

We are increasingly collaborating and partnering with third parties to develop technologies, products and services, as well as seeking new revenue streams through partnering arrangements. We also depend on partners in our efforts to monetize our brands and technologies, including those of Nokia and Nokia Bell Labs, and we have outsourced various functions to third parties and are relying on them to provide certain services to us. Although the objective of the collaborative and partnering arrangements is a mutually beneficial outcome for each party, our ability to introduce and provide technologies, products and services in a timely manner and so that those are commercially viable and meet our, our customers' and consumers' quality, safety, security and other standards could be hampered by performance or other failures of our partners or the companies we collaborate with. For instance, if a partner acts inconsistently with our ethical, sustainability, compliance, brand, or quality standards, this can negatively affect our reputation, the value of our brand, and the business outcome of our partnerships. Furthermore, if we fail altogether to achieve the collaboration or partnering arrangements needed to succeed, we may be unable to bring our products, services or technologies to market successfully or in a timely manner. It is also possible that the parties we currently collaborate with, turn into our competitors.

In many areas, including IT, finance and human resources-related arrangements, a failure to maintain an efficient relationship with the selected partner may lead to ongoing operational problems or even to severe business disruptions, and the availability of the processes and services upon which we rely may be interrupted. Performance problems may result in missed reporting deadlines, internal controls challenges, financial losses, missed business opportunities and reputational harm. In addition, as management's focus shifts from a direct to an indirect operational control in these areas, there is a risk that without active management and monitoring of the relationship, the services provided may be below appropriate quality standards. Partners may not meet agreed service levels, in which case, depending on the impacted service, our contractual remedies may not fully cure all of the damages we may suffer. This is particularly true for any deficiencies that would impact the reporting requirements applicable to us as a company listed on multiple stock exchanges.

In outsourcing projects, we may encounter disruption to business resulting from broken processes and distraction of our employees that may need to train the partner's staff or be trained in the partner's systems. Adjustments to staff size and transfer of employees to the partner's companies could have an adverse effect on us, for instance through impacting the morale of our employees and raising complex labor law issues and resulting in the loss of key personnel. Additionally, partnering and outsourcing arrangements can create a dependency on the outsourcing company, causing issues in our ability to learn from day-to-day responsibilities, gain hands-on experience, adapt to changing business needs and properly transfer the specific know-how to the new outsourcing partners. Concerns could equally arise from giving third parties access to confidential data, strategic technology applications and books and records. There is also a risk that we may not be able to determine whether controls have been effectively implemented, and whether the partner company's performance-monitoring reports are accurate.

We may be subject to increased scrutiny related to our sustainability activities and disclosures, and our reputation and brand as well as the willingness of customers and suppliers to do business with us could be harmed if we fail to meet our sustainability goals.

Our business could be negatively impacted by a failure to appropriately address existing and emerging matters relating to sustainability and good corporate citizenship and diversity. We may fail or be unable to fully achieve one or more of our sustainability targets due to a range of factors within or beyond our control, and we may adjust or modify our targets in light of new information, adjusted projections, or a change in business strategy, any of which could negatively impact our brand, reputation, and business. It is also possible that stakeholders may not be satisfied with our sustainability practices or the speed of their adoption.

A failure to, or perception of a failure to, disclose metrics and set targets that are rigorous enough or in an acceptable format, or to prioritize the most relevant sustainability targets, could negatively impact our environmental, social and governance (ESG) related third party ratings, brand, reputation, and business. It is also possible that third-parties rating our ESG practices and performance will make inaccurate or unsubstantiated interpretations of our ESG practices and performance based on their own assessments and publish such interpretations with or without offering a possibility for us to comment. We could also incur additional costs and require additional resources to monitor and report on our sustainability performance programs and to comply with various sustainability practices and disclosure requirements. Also, our failure, or perceived failure, to meet sustainability disclosure standards, practices or targets could negatively impact our reputation, employee retention, and the willingness of our customers and suppliers to do business with us.

Risks related to the general economic and financial market conditions and the industries and markets in which we operate

We may be materially and adversely affected by general economic and financial market conditions and other developments in the economies where we operate.

As we are a company with global operations and sales in many countries around the world, our sales and profitability are dependent on general economic and financial market conditions both globally and locally. We have manufacturing facilities, partners and suppliers located in various countries around the world which may equally be impacted by these conditions. Adverse developments in, or the general weakness of, economic conditions, such as inflation or unemployment or any other events such as natural or man-made disasters, geopolitical conflicts or disruptions, or global trade related disruptions, civil unrest, or health crises including the current situation involving Russia and the Ukraine and any related tariffs, economic sanctions and import-export restrictions imposed by other nations as a result; that may have an adverse impact on economy, may in turn have an adverse effect on spending of our customers. These developments may affect demand for consumables, such as mobile devices, mobile subscriptions and both the services that end-users subscribe to and the usage levels of such services, which may lead, on the other hand, the communication service providers to invest less in related infrastructure and services or to invest in low-margin products and services, or may have an adverse effect on the business of our patent, technology or brand licensees and our patent licensing income. Likewise, adverse developments in economic conditions may lead certain customer segments, such as webscale companies, TXLE, transportation, energy and public safety, to invest less or delay spend in infrastructure and services to digitize their operations or to invest in low-margin products and services. Further, the purchasing power of our customers, particularly in developing markets, depends to a greater extent on the price development of basic commodities and currency fluctuations, which may render our products or services unaffordable. In addition, economic slowdown may lead to overcapacity in supply and inflated inventories, and to delays and shortages in case of sharp recovery and ramp-up of demand with a potentially adverse effect on our and suppliers' ability to deliver products and services in time. Current inflationary pressure is driving cost increase in raw materials and labor.

General uncertainty and adverse developments in the financial markets could have a material adverse effect on our, our customers', suppliers' and other partners' ability to obtain sufficient or affordable financing on satisfying terms. Uncertain market conditions may increase the price of financing

or decrease its availability if the banks were to tighten lending standards or increase interest rates, or if certain assets would decline in value, which could lead to difficulties in raising funds or accessing liquidity necessary to maintain financial condition and ongoing operations.

Depending on the duration of the COVID-19 outbreak and disruptiveness of the related measures to contain the virus, the pandemic could have further adverse effect on the results of our operations and financial condition.

Economic conditions since the beginning of the COVID-19 crisis are improving in many areas. However, the pandemic persists and is a risk to overall economic growth and business operations as new variants emerge, the impact of the already-given vaccinations start to wear off or have not started, and the long-term implications of lasting symptoms of COVID-19 are yet to be understood.

The impact of COVID-19 on our operations has been primarily related to temporary factory closures in the beginning of the outbreak and increased remote working and travel restrictions affecting our employees. The degree to which COVID-19 may further affect our employees, supply chain, product development, service delivery and other operations and our results, assets or financial condition will depend on developments, which are highly uncertain and cannot be predicted, including, but not limited to, the duration and spread of the outbreak, its severity, locations impacted, government's or our actions to contain the virus or treat its impact, and how quickly and to what extent normal economic and operating conditions can resume. Although we believe that our industry is relatively resilient to the effects of COVID-19, customers' demand and/or our suppliers' and other partners' capacity to meet customer demand could be further impacted in the future. Facility shut-downs or restrained manufacturing, testing or packing may again lead to shortages of critical components or logistics capacity worldwide having further negative impacts on the already existing component shortages and overall disruption in the global supply chain. Also the consumer business environment has been unstable and unpredictable due to the COVID-19 situation and poor performance by any of Nokia's patent, technology or brand licensees may impact Nokia financially. The impact of COVID-19 on the global economy and financial markets has also adversely affected and/or may further adversely affect the value of our financial, tax, pension and other assets. There is no certainty that the measures we or the governments take will be sufficient to mitigate the risks posed by the virus.

We face intense competition and are dependent on development of the industries and markets in which we operate. The markets are cyclical and are affected by many factors, including the general economic environment, technological changes, competitor behavior, customer consolidation, purchase and spending behavior of service providers and vertical customers, consumers and businesses, deployments and rollout timing. Our competition and new competition challenging the connectivity business models of our customers are driving price erosion.

The competitive environment in the markets where we operate, including the related services markets, continues to be intense and is characterized by maturing industry technologies, 5G and related new technologies, diversification of supplier ecosystems, equipment price erosion and aggressive price competition. Our competition endeavors to gain market share in selected regions where Nokia has a large footprint. Despite exponential growth in mobile data traffic, most of our customer base has been facing persistent revenue erosion and is reverting to vendors to compensate for it. Competition for new customers, as well as for new infrastructure deployment, is particularly intense and focused on the favorability of price and agreement terms. We compete with companies that have large overall scale, which affords such companies more flexibility compared to us. In addition, new competition may be entering the network infrastructure and related services business through adoption of new technologies or business models, such as virtualized RAN and O-RAN or products/services as-a-service models.

We are particularly dependent on the investments made by communication service providers in mobile connectivity, network infrastructure and related services. The pace and size of such investments are in turn dependent on the ability of communication service providers to increase their subscriber numbers, reduce churn, maintain or increase their average revenue per user, and compete with business models eroding revenue from traditional voice, messaging and data transport services, as well as the financial condition of such service providers. Their cost containment actions and merger activity have in the past constricted, and may continue to do so in the future, capital expenditure, resulting in further competition and pressure on pricing and profitability. In addition, the investments of the communication service providers in the new spectrum assets may reduce their funds available for investing in the new network infrastructure and related services. Furthermore, the level of demand by communication service providers and other customers that purchase our products and services can change quickly and can vary over short periods of time. In addition, a portion of our revenues is driven by the timing of completion and customer acceptances, which particularly in relation to 5G are further dependent on maturity of the whole 5G ecosystem. As a result of the uncertainty and variations in the telecommunications and vertical industries, accurately forecasting revenues, results and cash flow remains difficult. Furthermore, significant reduction of business with us could result in the loss of benefits related to economies of scale.

We may be unable to respond successfully to technological changes in the markets in which we operate. Market developments favoring new technological solutions, such as SDN, cloud and virtualization, may result in reduced spending to the benefit of our competitors who have, or may have, a stronger position in such technologies. The technological viability of standardized, low-margin hardware products in combination with the virtualization of functions can induce a change in purchase behavior, resulting in favoring other vendors or in higher bargaining power versus Nokia due to more alternative vendors. Our customers may prefer best-of-breed from multiple vendors or turn to alternative vendors to maintain end-to-end services. Additionally, new competitors may enter the industry as a result of acquisitions or shifts in technology. Furthermore, some companies, including webscale companies, may drive a faster pace of innovation in telecommunication infrastructure through more collaborative approaches and open technologies across access, backhaul, core and management.

We expect to generate a significant share of our growth from new customers, including webscale companies and vertical customers in energy, transport, public sector, manufacturing and TXLEs. Each of these sectors may face adverse industry developments, which may significantly impact the size of investments addressable by us and our ability to address these investments, in terms of both having the right products available and being able to obtain new customers and having the right go-to-market capabilities and expertise to address the specific needs of these sectors. Furthermore, there are various incumbent and new players competing with Nokia in these customer groups we strategically target. With these types of customers, the nature of competition and the required capabilities can be significantly different from the communication service provider market, including competition based on access network, core network, cloud infrastructure, platforms, applications and devices, and related services.

We are dependent on a limited number of customers and large multi-year agreements. The loss of a single customer or contract, operator consolidation, unfavorable contract terms or other issues related to a single agreement may have a material adverse effect on our business and financial condition.

A significant proportion of the net sales and profits that we generate have historically been derived from a limited number of customers. As consolidation among existing customers continues, it is possible that an even greater portion of our net sales will be attributable to a smaller number of large communication service providers operating in multiple markets. These developments are also likely to increase the impact on our net sales based on the outcome of certain individual agreement tenders. Communication service providers are also increasingly entering into asset sharing arrangements, as well as joint procurement agreements, which may reduce their investments and the number of networks available for us to service. Furthermore, procurement organizations of certain large communication service providers sell consulting services to enhance the negotiating position of small operators with their vendors.

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As a result of the intense competition in the industry, we may be required to agree to increasingly less favorable terms in order to remain competitive. Any unfavorable developments in relation to, or any change in the agreement terms applicable to, a major customer may have a material adverse effect on our business, results of operations and financial condition. Also, agreements in the networks business are typically complex and long-term in nature and it is possible that over time the contract terms of the agreement may prove less favorable to us than originally expected, for instance due to changes in costs and product portfolio decisions, and those may be difficult to amend promptly to address new developments such as the accelerating inflation that we are currently facing. Furthermore, in particular given the bargaining power of our customers or limited legal ability to deviate from the standard governmental contract terms, we may be exposed to onerous terms and liabilities in our customer contracts.

Loss of a single customer, its significant business or contract, or other issues related to a single agreement, may have a material adverse effect on our business and financial condition. We have lost customers and contracts in the past and the same may happen in the future. Furthermore, any suspension, termination or non-performance by us under an agreement's terms may have a material adverse effect on us, for example due to penalties for breaches, early termination or reduced orders or customer footprint. In addition, we may lose existing agreements, or we may be unable to renew or gain new agreements, for instance due to customer diversity policies that limit the ability of customers to have one network provider exceeding a certain threshold of business in a given market or as a result of merger activity where the customer may decide to concentrate their spending elsewhere.

The timing of sales and results of operations associated with large multi-year agreements or turnkey projects may differ significantly from expectations. For instance, recognition of sales and related costs in network implementation projects are often linked with achievement of customer acceptances, which may delay for reasons attributable or not contributable to us. Moreover, such agreements often require dedication of substantial amounts of working capital and other resources, which may adversely affect our cash flow, particularly in the early stages of an agreement's term, or may require us to continue to sell certain products and services, or to sell in certain markets that would otherwise be discontinued or exited, thereby diverting resources from developing more profitable or strategically important products and services, or focusing on more profitable or strategically important markets. Furthermore, our customer agreements may involve complex transformation of the networks as the customers deploy new technologies and the related costs and scope of required deliverables may differ from our expectations at the time we enter into such agreements.

We may be adversely affected by developments with respect to customer financing or extended payment terms that we provide to our customers. Unwillingness of banks or other institutions to provide guarantees or financing to our customers or purchase our receivables could impair our capability to enter new customers or markets, to mitigate payment risk and to manage our liquidity.

Requests for customer financing and extended payment terms are typical for our industry and uncertainty in the financial markets, among other things, may result in increased customer financing requests. In the event that export credit agencies face constraints on their ability or willingness to provide guarantees or financing to our customers, or there is insufficient demand from banks or other financial institutions to purchase receivables, such events could have a material adverse effect on our business and financial condition. Furthermore, reduced availability of credits by export credit agencies supporting our sales could affect our ability to attract customers and enter new markets thus facing the possibility of reduced sales.

In certain cases, the amounts and duration of these financings and trade credits, and the associated impact on our working capital, may be significant. We have agreed to extended payment terms for a number of our customers and may continue to do so in the future. Extended payment terms may result in a material aggregate amount of trade credits and even when the associated risk is mitigated by a diversified customer portfolio, defaults in the aggregate could have a material adverse effect on us.

All in all, our ability to manage our total customer financing and trade credit exposure depends on a number of factors, including capital structure, market conditions affecting our customers, the levels and terms of credit available to us and our customers, the cooperation of export credit agencies and our ability to mitigate exposure on acceptable terms. We may be unsuccessful in managing the challenges associated with the customer financing and trade credit exposure that we may face from time to time, particularly in difficult financial conditions on the market. While defaults under financings, guarantees and trade credits to our customers resulting in impairment charges and credit losses have not been significant for us in the past, these may increase in the future, in particular in markets such as India with increased risks potentially affecting our customers. Further, commercial banks may not continue to be able or willing to provide sufficient long-term financing, even if backed by export credit agency guarantees, due to their own constraints, and certain of our competitors may also have greater access to such financing, which could adversely affect our competitiveness. Additionally, we have sold certain receivables to banks or other financial institutions, and any significant change in our ability to continue this practice could impair our capability to mitigate such payment risk and to manage our liquidity.

Nokia also arranges bank guarantees and issues commercial guarantees in customers' favor in relation to our business. In the event we are unable to collect outstanding guarantees and bonds, it could limit our possibilities to issue new guarantees and/or bonds, which are required in customer agreements or practices. We also face risks that such commercial guarantees and bonds may be unfairly called.

Risks impacting our competitiveness

We may fail to invest effectively and profitably in new competitive high-quality products, services, upgrades and technologies or bring them to market in a timely manner. We also may fail to adapt to changing business models.

The industries in which we operate are characterized by rapidly evolving technologies, frequent new technological requirements, product feature introductions and evolving industry standards. The participants in the markets where we operate compete on the basis of product offerings, technical capabilities and quality in addition to price and affordability through consumer financing arrangements.

The R&D of new and innovative, technologically advanced products, as well as upgrades to current products and new generations of technologies, is a complex and uncertain process requiring high levels of innovation and investment, including trying to accurately anticipate the technological, regulatory and market trends. We may focus our resources on products and technologies that do not become widely accepted or ultimately prove unviable. Additionally, many of our current and planned products are highly complex and may contain defects or errors that are, for instance, detected only after deployment in telecommunications networks. Even if we invest in new competitive products, services, upgrades or technologies such as 5G, IoT, the cloud or software and manage proactively the costs related to our portfolio of products and services, including component sourcing, manufacturing, logistics and other operations, we may still fail to maintain or improve our market position, competitiveness or scale and keep prices and costs at competitive levels or provide high-quality products and services.

Our business performance and results of operations will depend to a significant extent on our ability to succeed in the following areas:

- maintaining and developing a competitive product portfolio and service capability that are attractive to our customers, for instance by keeping pace with technological advances in our industry and pursuing the technologies that become commercially accepted and price competitive;
- to introduce new products, services and upgrades of current products and to do so on a cost-efficient and timely basis;

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- developing new or enhancing existing tools for our service offerings;
- optimizing the amount of customer or market-specific technology, product and feature variants in our product portfolio;
- continuing to meet evolving expectations and enhance the quality of our products and services, comply with emerging industry standards as well as introducing products and services that have desired features and attributes, such as energy efficiency;
- maintaining and building up strategic partnerships in our value creation chain (e.g. in product creation and project delivery); and
- leveraging our technological strengths and addressing competing technological and product developments carried out by competitors while keeping prices and costs at competitive levels.

Certain of our competitors have significant resources to invest in market exploration and may seek new monetization models or drive industry development and capture value in areas where we may not currently be competitive or do not have similar resources available to us. These areas may include monetization models linked to large amounts of consumer data, large connected communities, home or other entertainment services, alternative payment mechanisms or marketing products. We also face competition from various companies that may be able to develop technologies or products that become preferred over those developed by us or result in adverse effects on us through, for instance, developing technological innovations that make our innovations less relevant. In addition, reduced government funding and support for our R&D activities could affect our ability to develop new technology or products.

We may encounter difficulties and challenges in the development of 5G technology and the rollout and commercialization of 5G services.

Our 5G-related R&D efforts as well as product rollouts require us to devote financial and operational resources, and we expect to continue to make substantial investments in 5G and 5G-related technology. However, the 5G rollout and commercialization has not and may not develop in the manner or in the time periods we anticipate. Further, competitive intensity remains high in the market as competitors seek to take share in the 5G rollouts, which is creating a risk of persistent high price erosion in the industry. If domestic and global economic conditions worsen, overall spending on 5G infrastructure may be reduced or delayed, and spending in our other networks products and services might be even more rapidly reduced to preserve the customer investment in 5G, which would adversely impact demand for our products and services in these markets.

Even if the 5G infrastructure market develops in the manner or in the time periods we anticipate, if we do not have timely, competitively priced, market-accepted products available to meet our customers' planned rollout of 5G networks, or if we have products below expected performance in the commercial networks, we may miss significant opportunities or, in the worst case, lose already awarded business. We have faced and may face challenges with respect to the R&D roadmaps, System-on-a-Chip development and cost competitiveness of our 5G products and our actions and investments to accelerate those roadmaps and improve our cost competitiveness to address those challenges may prove to be insufficient. Further, any reduction in our market share in 5G compared with our installed base in 4G due to decisions to protect our profitability, inability to meet the customers' requirements or other reasons, may have a material negative effect on our scale and profitability.

Global competition for employees and leaders is increasingly competitive. We may be unable to retain, motivate, develop, reskill and recruit appropriately skilled employees or we may fail in workforce balancing. Employees may face change fatigue, reduction in motivation and energy as our efforts to evolve our business and improve efficiency continue.

Our success in executing our strategy, to address opportunities in new technologies and business models and customer segments in particular, requires and is dependent on our ability to retain, motivate, develop, reskill and recruit appropriately skilled employees. At the same time, the market for skilled employees is increasingly competitive, particularly given the similar technology trends affecting various industries simultaneously and increased remote working expanding the job market for individual employees. We have encountered, and may in the future encounter, shortages of appropriately skilled employees or lose key employees or senior management. There can be no assurances that we will be able to implement measures successfully to retain or hire the employees we need. This may require significant time, attention and resources from our senior management and other key employees within our organization and may result in increased costs or otherwise have a material adverse effect on us.

In March 2021, we announced the plans to reset the cost base of our business groups to invest in future capabilities. We may fail in our efforts to rebalance our workforce as planned, for instance due to legal restrictions or collective bargaining agreements, which may result in a non-optimal workforce, larger than expected costs and not meeting our financial targets for such plans. Our inability to negotiate successfully with employee representatives or failures in our relationships with such representatives could result in strikes and other industrial actions by the employees which may in turn result in significant disruption in our day-to-day operations and higher ongoing labor costs.

We continue to have exposure to the health risks of the COVID-19 pandemic and to the control and mitigation measures deployed by governments to reduce the spread of the virus. We believe that this pandemic will permanently increase share of remote working, and we may be exposed to a larger extent than before to impacts related to remote work and arranging the home office, such as increased attrition, decreased creativity or productivity of employees, supervising working hours, challenges in identifying, assessing and supporting employees in stress or poor mental health, inability to help employees to work safely in their home office environment or developing and supervising the execution of related internal policies leading to potential health issues and litigation.

Our efforts aimed at managing and improving our competitiveness, financial or operational performance may not lead to targeted results, benefits, cost savings or improvements.

We are continuously targeting increased efficiency of our operations. For instance, in March 2021, we announced plans to reset our cost base offset by increased investments in R&D, future capabilities and cost-related salary inflation. We currently expect approximately EUR 500-600 million of restructuring and associated charges by 2023. Failure by us to determine the appropriate prioritization of operating expenses and other costs, to identify and implement the appropriate measures to improve cost-efficiency, increase simplicity or to adjust our operating expenses and other costs on timely basis, or to maintain achieved efficiency levels, could limit our future investments and have a material adverse effect on our business, results of operations and financial condition. Our current and future cost-saving measures may be costly, potentially disruptive to operations, and may not lead to sustainable improvements in our overall competitiveness and profitability and there can be no assurance that such measures will be met as planned in contemplated timeframes or at all. Our plans may be altered in the future, including adjusting any projected financial or other targets. The anticipated costs or the level of disruption expected from implementing such plans or restructurings may be higher than expected. Efforts to plan and implement cost-saving initiatives may divert management attention from the rest of the business and adversely affect our business.

There are also several other factors that may prevent or delay a successful implementation of any cost-saving initiatives, including, among others, the following:

- need to make additional investments in other areas such as 5G, cloud and automation/digitalization of our operations;

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- inaccuracy in our expectations with respect to market growth, customer demand and other trends;
- legislative constraints or unfavorable changes in legislation in the markets in which we operate may influence timing, costs and expected savings of certain initiatives contemplated;
- our ability to swap equipment of certain customers in line with our future product lines development and to secure continued business from such customers;
- our ability to align and adjust resources, systems, tools, including digitalization and automation of processes, related to implementation of planned organizational changes;
- our cost-saving initiatives, including R&D, may negatively affect our ability to develop new or improve existing products and compete effectively in certain markets, and there is no guarantee that we will continue to be able to successfully innovate or remain technologically competitive;
- intended business plans may require us to inform or consult with employees and labor representatives, and such processes may influence the timing, costs and extent of expected savings and the feasibility of certain of the initiatives contemplated;
- accelerating inflation driving increase in cost base; and
- bargaining power of our suppliers may prevent us from achieving targeted procurement savings.

Risks associated with intellectual property rights, technology and brand licensing

Our patent licensing income and other intellectual property-related revenues are subject to risks and uncertainties such as our ability to maintain our existing sources of intellectual property-related revenue, establish new sources of revenue and protect our intellectual property from infringement. A proportionally significant share of the current patent licensing income is generated from the smartphone market, which is rapidly changing and features a limited number of large vendors.

The continued strength of our intellectual property portfolios depends on our ability to create new relevant technologies, products and services through our R&D activities and to protect our intellectual property rights (IPR). If those technologies, products and services do not become relevant, and therefore attractive to licensees, the strength of our intellectual property portfolios could be reduced. Despite the steps that we have taken to protect our technology investments with IPR, we cannot be certain that any rights or pending applications will be granted or that the rights granted in connection with any future patents or other IPR will be sufficiently broad to protect our innovations and maintain the relative strength of our portfolio. Third parties may infringe our intellectual property relating to our proprietary technologies or disregard their obligation to seek necessary licenses under our patents or seek to pay less than reasonable license fees. As a result, we may be unable to continue to develop or protect our intellectual property-related revenue or establish new sources of revenue.

Regulatory and other developments regarding protection awarded to technology innovations or compensation trends with respect to licensing may impact our ability to protect, monetize or divest our intellectual property. Any patents or other IPR may be challenged, invalidated or circumvented, and any right granted under our patents may not provide competitive advantages for us. In the technology sector generally, certain licensees are actively avoiding license payments, while some licensors are using aggressive methods to collect license payments, with both behaviors attracting regulatory attention. Authorities in various countries have increasingly monitored patent monetization and may aim to influence the terms on which patent licensing arrangements or patent divestments may be executed, which could compromise control over or protection of our technology and proprietary information. Such terms may be limited to a certain country or region; however, authorities could potentially seek to widen the scope and even impose global terms, potentially resulting in an adverse effect on us or limiting our ability to monetize our patent portfolios.

There is no assurance that past levels are indicative of future levels of intellectual property-related revenue. Poor performance by any of Nokia's patent, technology or brand licensees may impact Nokia financially, for example, if a licensee's ability to pay is reduced, the licensee decides to divest or scale back a particular part of its business or it becomes insolvent or bankrupt. Additionally, poor performance of potential or current licensees may limit a licensee's motivation to seek new or renew existing licensing arrangements with us. Furthermore, patent license agreements can cover licensees' both past and future sales, and the portion of the income that relates to licensees' past sales is not expected to have a recurring benefit. Ongoing patent income from licensing is generally subject to various factors (for instance, sales by the licensees) that we have little or no control over, and it can vary considerably from time to time based on factors such as the terms of agreements we enter into with licensees.

We seek to expand the scope of our licensing activities to other industries, in particular those that implement mobile communication and multimedia technologies, such as the automotive, consumer electronics and IoT industries. The players in some of these industries may not have traditionally paid intellectual property-related royalties and the expansion of our licensing activities into such industries may involve litigation. In addition, entering highly fragmented markets or markets with a high volume of licensees may affect our effectiveness and/or profitability.

We retained our patent portfolio after the sale of Devices & Services business in 2014. Following the sale of Devices & Services business, Nokia is no longer required to agree upon cross-licenses to cover Nokia's handset business, which has contributed to growing our licensing revenue. While this has been our practice, there can be no guarantee that this can be continued in the future. Also, in the past, parts of our intellectual property development were driven by innovation from the Devices & Services Business. As we no longer own this business, our future intellectual property relating to the mobile phone sector may lessen and our ability to influence industry trends and technology selections may reduce.

We also enter into business agreements separately by our business groups, which may grant certain licenses to our patents. Some of these agreements may inadvertently grant licenses to our patents with a broader scope than intended, or they may otherwise make the enforcement of our patents more difficult.

To enforce our intellectual property rights against unlawful infringement, we may engage in legal actions, the outcomes of which are uncertain.

Intellectual property-related disputes are common in the technology industry. Litigation and arbitration are often used to enforce patents or other rights, or to set licensing fees. In certain cases, we have initiated litigation or arbitration proceedings to enforce our rights, for instance to enforce our patents or to establish the terms of a patent license between the parties. Due to the nature of any litigation or arbitration proceedings, there can be no assurances as to the final outcome or timing of any outcome of litigation, or arbitration.

In other cases, other companies have commenced and may continue to commence actions against us seeking to establish the invalidity of our intellectual property, including our patents, or to contest our licensing practices or file competition law complaints with courts or competition authorities. In the event that one or more of our patents is challenged, a court may invalidate the patent or determine that the patent is not enforceable. The outcome of court proceedings is difficult to predict and, consequently, our ability to use intellectual property for revenue generation may from time to time depend on favorable court rulings. Additionally, if any of our patents is invalidated, or if the scope of the claims in

any patents is limited by a court decision, we could be prevented from using such patents as a basis for product differentiation or from licensing the invalidated or limited portion of our IPR. Even if such a patent challenge is not successful, the related proceedings could be expensive and time-consuming, divert the attention of our management and technical experts from our business and have an adverse effect on our reputation. Any diminution in the protection of our IPR could cause us to lose certain benefits of our R&D investments.

While the primary source of Nokia Technologies business group net sales and profits is licensing of the Nokia patents, we are also engaged with technologies and the Nokia brand licensing and other business ventures, including technology innovation and incubation. Expected net sales and profitability for these businesses may not materialize as planned or at all.

Nokia Technologies has a strategic agreement covering branding rights and intellectual property licensing with HMD Global Oy (HMD). Under the agreement, Nokia receives royalty payments from HMD for sales of Nokia-branded mobile phones and tablets, covering both brand and patent licensing. Following a loan conversion in 2020, Nokia currently has a non-controlling interest in HMD.

Nokia also has a small number of territorially restricted brand licensing agreements beyond mobile devices and is exploring further opportunities to license the brand in new categories. However, there can be no assurance that we will successfully reach additional new brand licensing arrangements at all or on terms that prove satisfactory to us. The agreement with HMD limits Nokia's possibilities to license the Nokia brand for certain types of devices over an agreed time and is as such limiting Nokia's licensing possibilities with respect to such devices.

Nokia has limitations in its ability to influence HMD or other brand licensees in their business and other operations, exposing us to potential adverse effects from the use of the Nokia brand by HMD or other brand licensees or other adverse developments encountered by brand licensees that become attributable to Nokia. For instance, in case the licensee acts inconsistently with our ethical, compliance or quality standards, it could negatively affect our reputation and the value of our brand, thus diminishing the business potential with respect to utilizing our brand for licensing opportunities or otherwise having a negative effect on our business.

There can be no assurances that our Nokia Technologies business group, or any other part of Nokia, will be successful in innovation and incubation or in generating net sales and profits through its business plans, for instance in patent, technology and brand licensing. The industries in which we operate, or may operate in the future, are generally fast paced, rapidly evolving, innovative and at different levels of maturity. Additionally, we are entering into new business areas based on our technology assets and may explore new business ventures. Such business areas or plans may be adversely affected by adverse industry and market developments in the numerous diverse markets in which we operate, and the investments we make may not achieve the targeted scale, intended benefits or yield expected rates of return.

Our products, services and business models depend on technologies that we have developed as well as technologies that are licensed to us by certain third parties. As a result, evaluating the rights related to the technologies we use or intend to use is increasingly challenging, and we expect to continue to face claims that we have allegedly infringed third parties' IPR. The use of these technologies may also result in increased licensing costs for us, restrictions on our ability to use certain technologies in our products and/or costly and time-consuming litigation.

Our products and services include increasingly complex technologies that we have developed or that have been licensed to us by certain third parties. The amount of such proprietary technologies and the number of parties claiming to own relevant IPR continue to increase. The holders of patents and other IPR potentially relevant to these complex technologies may be unknown to us, may have different business models, may refuse to grant licenses to their proprietary rights or may otherwise make it difficult for us to acquire a license on commercially acceptable terms. If licensing agreements are not available on commercially acceptable terms, we could be precluded from making and selling the affected products, or could face increased licensing costs. As new features are added to our products, we may need to acquire further licenses, including from new and sometimes unidentified owners of intellectual property. The lack of availability of licenses for copyrighted content, delayed negotiations or restrictive IPR license terms may have a material adverse effect on the cost or timing of content-related services and products offered by us, mobile network operators or third-party service providers. The cumulative costs of obtaining any necessary licenses are difficult to predict and may be significant.

Additionally, although we endeavor to ensure that we and the companies collaborating with us possess appropriate IPR or licenses, we cannot fully avoid the risks of IPR infringement by suppliers of components, processes and other various layers in our products, or by companies with which we collaborate. Similarly, we and our customers may face claims of infringement in connection with the use of our products. Any restrictions on our ability to sell our products due to expected or alleged infringements of third-party IPR and any IPR claims, regardless of merit, could result in a material loss of profits, costly litigation, the obligation to pay damages and other compensation, the diversion of the attention of our key employees, product shipment delays or the need for us to develop non-infringing technology or to enter into a licensing agreement on unfavorable commercial terms.

In line with standard practice in our industry, we generally indemnify our customers for certain intellectual property-related infringement claims initiated by third parties relating to products or services purchased from us. These may include claims from non-practicing entities having no product or service business. If such claims are made directly against our customers, we may have limited opportunities to participate in the processes including in negotiations and in defenses, or to evaluate the outcomes and resolutions in advance. All IPR indemnifications can result in significant payment obligations for us that are difficult to estimate in advance. Moreover, our indemnification responsibilities typically arise whether or not the IPR assertions against our customers have merit.

Since all technology standards that we use and rely on, including mobile communication technologies such as UMTS, LTE and 5G, or fixed line communication technologies, include certain IPR, we cannot avoid risks of facing claims for infringement of such rights due to our reliance on such standards. We believe the number of third parties declaring their patents to be potentially relevant to these standards is increasing, which may increase the likelihood that we will be subject to such claims in the future. As the number of market entrants and the complexity of technologies increase, it remains likely that we will need to obtain licenses with respect to existing and new standards from other licensors. While we believe most of such IPR declared or actually found to be essential to a particular standard carries an obligation to be licensed on fair, reasonable and non-discriminatory terms, not all intellectual property owners agree to apply such terms, nor do all owners agree on what is fair, reasonable and non-discriminatory. As a result, we have experienced costly and time-consuming litigation proceedings against us and our customers or suppliers over such issues and we may continue to experience such litigations in the future.

From time to time, certain existing patent licenses may expire or otherwise become subject to renegotiation. The inability to renew or finalize such arrangements or renew licenses with acceptable commercial terms may result in litigation, which may be expensive and time-consuming and divert the efforts of our management and technical experts from our business and, if decided against us, could result in unfavorable judgments, restrictions on our ability to sell certain of our products, require us to pay increased licensing fees, costly settlements, fines or other penalties and expenses.

Our patent license agreements may not cover all the future businesses that we may enter, our existing business may not necessarily be covered by our patent license agreements if there are changes in our corporate structure or our subsidiaries, or our newly acquired businesses may already

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have patent license agreements with terms that differ from similar terms in our patent license agreements. This may result in increased costs, restrictions in the use of certain technologies or time-consuming and costly disputes whenever there are changes in our corporate structure or our subsidiaries, or whenever we enter into new business areas or acquire new businesses.

We make accruals and provisions to cover our estimated total direct IPR costs for our allegedly infringing products. Our estimated total direct IPR costs take into account items such as payments to licensors, accrued expenses under existing agreements and provisions for potential liabilities. We believe our accruals and provisions are at an appropriate level. The ultimate outcome, however, may differ from the provided level, which could have an adverse impact on us.

Risks stemming from geopolitical, legal, regulatory and compliance environment

Current international trends show increased enforcement activity in areas such as national security, competition law, export control and sanctions, privacy, cybersecurity, climate change, human rights and anti-corruption. Furthermore, we have observed an increase in the adoption of surveillance, data localization, national sourcing and national hiring requirements, regulations and policies, as well as regulators' increased interest in regulatory reform and reorganization and their growing appetite for tackling topics such as non-personal data, artificial intelligence, open access and net neutrality.

We conduct our business globally, being subject to direct and indirect regulation and exposed to geopolitical and regulatory risks, such as unfavorable or unpredictable treatment in relation to trade sanctions, tariffs, tax matters, export controls, exchange controls, and other restrictions.

Our business and activities cover multiple jurisdictions and are subject to complex regulatory frameworks, political turmoil, regulatory and economic developments such as trade barriers, tariffs, military actions, labor unrest, civil unrest, and public health and safety threats, which could have a material adverse effect on us, and our supply chain, our ability to sell or supply products and services, including network infrastructure equipment manufactured in such countries. Export controls, tariffs or other fees or levies imposed on our products and environmental, health, product safety and data protection, security, consumer protection, money laundering and other regulations that adversely affect the export, import, technical design, pricing or costs of our products could also adversely affect our sales and results of operations. Further, Nokia relies on a multilateral trade regime underpinned by the World Trade Organization and its Information Technology Agreement. Implementation of or uncertainties with respect to any tariffs or other measures limiting free trade may affect our customers' ability or willingness to invest in capital expenditures and may increase our costs or have adverse impacts on Nokia's operations.

The regulatory, trade controls and sanctions legal environment can be difficult to navigate for companies with global operations, impacting ability to grow or maintain business in specific markets or enter new markets. For example, the diverging EU and US regulatory frameworks governing business activities in Iran continue to be complex and as a European company, it will require reconciling the often opposing foreign policy regimes of the US and the EU. As a global operator, Nokia conducts business subject to export controls regulations and in countries subject to various sanctions and our business may be impacted by new, existing or tightened export control regulations, sanctions, embargoes or other forms of economic and trade restrictions imposed on certain countries, regions and entities. Although we strive to conduct all operations of Nokia, and in particular any operations undertaken in countries targeted by sanctions in accordance with our compliance program, we cannot ensure that breaches will not occur. We have a significant presence in emerging markets in which the political, economic, legal and regulatory systems are less predictable than in countries with more developed institutions. These markets represent a significant portion of our total sales, and a significant portion of expected future industry growth. Most of our suppliers are located in, and our products are manufactured and assembled in, emerging markets, particularly in Asia. Our business and investments in emerging markets may also be subject to risks and uncertainties, including unfavorable or unpredictable treatment in relation to tax matters, exchange controls, restrictions affecting our ability to make cross-border transfers of funds, regulatory proceedings, unsound or unethical business practices, challenges in protecting our IPR, information security, nationalization, inflation, currency fluctuations or the absence of or unexpected changes in regulation, as well as other unforeseeable operational risks.

In recent years, we have witnessed political unrest in various markets in which we conduct business or in which we have operations, which in turn has adversely affected our sales, profitability or operations in these markets, and also in certain cases affected us outside these countries or regions. Any reoccurrence or escalation of such unrest could have a further material adverse effect on our sales or results of operations. Should we decide to exit or otherwise alter our presence in a particular market, this may have an adverse effect on us through, for example, triggering investigations, tax audits by authorities, claims by contracting parties or reputational damage. The results and costs of investigations or claims against our international operations may be difficult to predict and could lead to lengthy disputes, fines or fees, indemnities or costly settlements.

Our business and results of operations may be adversely affected by regulation favoring the local industry participants, as well as other measures with potentially protectionist objectives or outcomes that host governments in various countries may take. Governments and regulators, particularly after changes in political regimes, may make legal and regulatory changes, slow down or reverse the adoption of favorable policy measures, or interpret and apply existing laws in ways that make our products and services less appealing to customers or require us to incur substantial costs, change our business practices or prevent us from offering our products and services. In particular, there is a growing trend in many countries to require minimum local content in products and/or services, and we may be required to invest in certain movement of operations or joint ventures to retain market share. Restrictive government policies or actions, such as COVID-19-related measures, limitations on visas or work permits for certain foreign workers, may make it difficult for us to move our employees into and out of these jurisdictions. Our operations and employee recruitment and retention depend on our ability to obtain the necessary visas and work permits for our employees to travel and work in the jurisdictions in which we operate. The impact of changes in or uncertainties related to general regulation and trade policies could adversely affect our business and results of operations even in cases where the regulations do not directly apply to us or our products and services.

Changes in various types of regulations or in their application, or emerging new regulation in areas such as security, privacy, digital economy or sustainable finance, applicable to current or new technologies or products, may adversely affect us.

We develop our products based on existing regulations and technical standards, our predictions for, and interpretation of, unfinished technical standards and upcoming or draft regulations or, in certain cases, in the absence of applicable regulations and standards. Fragmentation of rules and unpredictability of regulatory changes present a particular challenge. Changes in various existing regulations or in their application, applicable to current or new technologies, products or telecommunication and technology sectors in general, may adversely affect our business and results of operations.

An increase in regulation of the digital economy and telecommunications following the European Commission's ambitious Green Deal and Path to Digital Decade could fail to find the right balance between political ambitions and practical considerations, which might negatively affect Nokia. From a spectrum policy perspective, unrealistic spectrum pricing for 5G development, failure to enable access to additional spectrum in various bands and/or failure to achieve frequency band harmonization could also adversely impact Nokia's customers and Nokia itself.

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Changes in applicable privacy-related regulatory frameworks, such as EU General Data Protection Regulation, the upcoming EU eEvidence and e-Privacy Regulations and similar regulations in other countries or their application may adversely affect our business, including possible changes that increase costs, limit or restrict possibilities to offer products or services, or reduce or could be seen to reduce the privacy aspects of our offerings. For instance, countries could require governmental interception capabilities or issue regulations aimed at allowing direct governmental access to data for the products and services we offer. Such requirements or regulations could adversely affect us, if, among other things, we decide to reduce our sales to such markets or if such requirements or regulations would be limiting our ability to use components, products or software that we have developed or sourced from other companies. Our current business models and operations rely on certain centralized data processing solutions and cloud or remote delivery-based services for distribution of services and software or data storage, which have certain inherent risks, including those stemming from applicable regulatory regimes, including data protection or data localization, that may cause limitations in implementing such business models or conducting business. An increase in the protectionist stances of governments around the world, which impact the free flow of data across borders, has affected and may further affect our global service delivery model. Furthermore, we observe that enforcement actions and investigations by regulatory authorities related to data security incidents and privacy violations continue to increase. Unauthorized disclosure, transfer or loss of sensitive or confidential data, whether through systems failure, employee negligence, fraud or misappropriation, by the Company, our vendors or other parties with whom we do business (if they fail to meet the standards we impose) could subject us to significant litigation, monetary damages, regulatory enforcement actions, fines and criminal prosecution in one or more jurisdictions.

We are seeing an increase in climate and other sustainability-related regulations and customer requirements globally. In the longer term, such regulations or requirements could impact, for instance, our energy, component and logistic costs or competitiveness of our product offering. Emerging regulation coming from the European Union related to Sustainable Finance, such as the EU Taxonomy Regulation and the new EU Corporate Sustainability Reporting Directive, will lead to more detailed reporting obligations and could also affect how our products and sustainability footprint are perceived by the markets. For example, the EU Taxonomy Regulation aims to define rules for which economic activities contribute to sustainability objectives and mandates companies to report the share of their turnover and capital and operating expenses aligned with specified technical criteria. The EU has first focused on the most polluting industries and therefore not all economic activities have yet been considered in the taxonomy work. Our view is that the role of the technology we provide as an enabler of decarbonization in other sectors, such as R&D investments to improve the energy efficiency of connectivity solutions, is currently not recognized by the Taxonomy. If this potential is left out from the Taxonomy also in the future, or if our offering is not recognized by other similar standards developed, it could potentially have some impact on our financing costs, share price or brand value in the longer term, depending on how such standards are interpreted and used by the markets, financial and investors institutions in the future.

We operate in many jurisdictions around the world, and we are subject to various legal frameworks regulating corruption, fraud, competition, privacy, trade policies and other risk areas. At any given time, we may be subject to inspections, investigations, claims, and government proceedings, and the extent and outcome of such proceedings may be difficult to estimate with any certainty. We may be subject to material fines, penalties and other sanctions as a result of such investigations.

Bribery and anti-corruption laws in effect in many countries prohibit companies and their intermediaries from making improper payments to public officials or private individuals for the purpose of obtaining new business, maintaining existing business relationships or gaining any business advantage. Certain anti-corruption laws such as the United States Foreign Corrupt Practices Act (FCPA) also require the maintenance of proper books and records, and the implementation of controls and procedures in order to ensure that a company's operations do not involve corrupt payments. Since we operate throughout the world, and given that some of our customers are government-owned entities and that our projects and agreements often require approvals from public officials, there is a risk that our employees, suppliers, consultants or commercial third-party representatives may take actions that are in violation of our compliance policies and of applicable anti-corruption laws.

In many parts of the world where we operate, local practices and customs may be inconsistent with our policies, including the Nokia Code of Conduct, and could violate anti-corruption laws, including the FCPA and the UK Bribery Act 2010, and applicable European Union regulations, as well as applicable economic sanctions, embargoes and applicable competition and privacy laws. Our employees, or other parties acting on our behalf, could violate policies and procedures intended to promote compliance with anti-corruption laws, economic sanctions, competition or privacy laws or other applicable regulations. Violations of these laws by our employees or other parties acting on our behalf, regardless of whether we had participated in such acts or had knowledge of such acts, could result in us or our employees becoming subject to criminal or civil enforcement actions, including fines or penalties, disgorgement of profits and suspension or disqualification of sales. Additionally, violations of law or allegations of violations may result in reputational harm and loss of business and adversely affect our brand and reputation. Detecting, investigating and resolving such situations may also result in significant costs, including the need to engage external advisors, and consume significant time, attention and resources from our management and other key employees. The results and costs of such investigations or claims may be difficult to predict and could lead to, for instance, lengthy disputes, fines, fees or indemnities, costly settlement or the deterioration of the Nokia brand. Furthermore, even without allegations of misconduct against us, our employees or other parties acting on our behalf, we may face loss of business as a result of improper conduct or alleged improper conduct by our competitors.

We may be subject to claims, fines, investigations or assessments for conduct that we failed to or were unable to discover or identify in the course of performing our due diligence investigations of Alcatel-Lucent, including unknown or unasserted liabilities and issues relating to fraud, trade compliance, non-compliance with applicable laws and regulations, improper accounting policies or other improper activities. With the acquisition of Alcatel-Lucent, any historical issues with Alcatel-Lucent's operations may be attributed to or the responsibility of Nokia. In the past, Alcatel-Lucent has experienced both actual and alleged violations of anti-corruption laws. As a result of FCPA violations in the past, Alcatel-Lucent had to pay substantial amounts in fines, penalties and disgorgement of profits to government enforcement agencies in the United States and elsewhere.

Our governance, internal controls and compliance processes could fail to detect errors or wrongdoings and to prevent regulatory penalties at corporate level, in operating subsidiaries and joint ventures.

Nokia is a publicly listed company and, as such, subject to various securities and accounting rules and regulations. For instance, we must monitor and assess our internal control over financial reporting and its compliance with the applicable rules and regulations. A failure of our corporate functions, our business groups, our operating subsidiaries or our joint ventures to maintain effective internal controls over financial reporting, or to comply with the applicable securities and accounting rules and regulations, could adversely affect the accuracy and timeliness of our financial reporting, which could result, for instance, in loss of confidence in us or in the accuracy and completeness of our financial reports, or otherwise in the imposition of fines or other regulatory measures, which could have a material adverse effect on us.

Integrity and high ethical standards are an integral part of our culture. However, despite of our Group-wide compliance measures, including ethical business trainings and other measures, we may not be able to prevent breaches of law or governance standards within our business, subsidiaries or joint ventures. If we fail to or are unable to comply with applicable law and regulations, we could experience penalties and adverse rulings in enforcement and other proceedings.

We are subject to litigation proceedings, which may be disruptive and expensive. In addition, an unfavorable outcome of litigation, arbitrations, agreement-related disputes or product liability-related allegations against our business could have a material adverse effect on us.

We are a party to lawsuits, arbitrations, agreement-related disputes and product liability-related allegations in the normal course of our business. Litigation, arbitration or agreement-related disputes can be expensive, lengthy and disruptive to normal business operations and divert the efforts of our management. Moreover, the outcomes of complex legal proceedings or agreement-related disputes are difficult to predict. An unfavorable resolution of a particular lawsuit, arbitration or agreement-related dispute could have a material adverse effect on us. The investment or acquisition decisions we make may subject us to litigation arising from minority shareholders' actions and investor dissatisfaction with the activities of our business. Shareholder disputes, if resolved against us, could have a material adverse effect on us.

We record provisions for pending claims when we determine that an unfavorable outcome is likely and the loss can reasonably be estimated. Although we believe our provisions for pending claims are appropriate, due to the inherent uncertain nature of legal proceedings, the ultimate outcome or actual cost of settlement may materially differ from estimates.

Although our products are designed to meet all relevant safety standards and other recommendations and regulatory requirements globally, we cannot guarantee we will not become subject to product liability claims or be held liable for such claims, which could have a material adverse effect on us. We have been involved in several lawsuits alleging adverse health effects associated with our products, including those caused by electromagnetic fields, and the outcome of such procedures is difficult to predict, including potentially significant fines or settlements. Even a perceived risk of adverse health effects of mobile devices or base stations could have a material adverse effect on us, for instance, through a reduction in the demand for mobile devices, and a decreased demand for mobile networks or increased difficulty in obtaining sites for base stations.

For a more detailed discussion of litigation to which we are a party, refer to Note 28, Commitments, contingencies and legal matters, of our consolidated financial statements.

Risks related to business operations

We may face problems or disruptions in our or our partners' manufacturing, service creation, delivery, logistics or supply chain. Such challenges include securing adequate volumes to meet the demand, adapting supply, defects in products or related software or services and achieving required efficiencies and flexibility. Our supplier or suppliers/partners may fail to meet product quality, health, safety or security requirements or comply with other regulations or local laws, such as environmental or labor laws. Additionally, adverse events, such as geopolitical disruptions, natural or man-made disasters, civil unrest or health crises, may have a profound impact on our service delivery or production sites or the production sites of our suppliers/partners, which are geographically concentrated.

We have an extensive supply network. We, or third parties that we outsource manufacturing/services to, may experience difficulties in adapting supply to meet the changing demand for our products and services, ramping up and down production, adjusting network implementation capabilities as needed on a timely basis, maintaining an optimal inventory level, adopting new manufacturing processes, finding the most timely way to develop the best technical solutions for new products, managing the increasingly complex manufacturing process, service creation and delivery process or achieving required efficiencies and flexibility. In addition, these operations are exposed to various risks and potential liabilities, including those related to geopolitics, compliance with laws and regulations, exposure to environmental liabilities or other claims.

Our manufacturing operations depend on obtaining sufficient quantities of fully functional products, components, sub-assemblies, software, services, energy and other resources on a timely basis. For example, the global semiconductor components shortage has constrained our deliveries and the continuing uncertainty around components, raw material availability and potential energy shortages in the market limit our visibility and may continue to have an impact on our ability to supply to our customers and increase our costs. We are working closely not only with our suppliers to ensure component availability but also with our customers to ensure we can meet their needs and mitigate the unprecedented component cost increase our industry faces. In certain cases, a particular component or service may be available only from a limited number of suppliers or from a single supplier in the supply chain. Suppliers may from time to time extend lead times, limit supplies, change their partner preferences, increase prices, provide poor quality supplies or be unable to adapt to changes in demand due to capacity constraints or other factors, which could adversely affect our ability to deliver our products and services on a timely basis or increase our costs. If we fail to properly anticipate customer demand, an over-supply or under-supply of components and production or services delivery capacity could occur. Many of our competitors and also companies from other industries utilize the same contract manufacturers, component suppliers and service vendors. If they have purchased capacity or components ahead of us, or if there is significant consolidation in the relevant supplier base, this could prevent us from acquiring the required components or services, which could limit our ability to supply our customers and increase our costs.

Our products are highly complex and defects in their design, manufacture and associated hardware, software, content and installation have occurred in the past and may continue to occur in the future. Quality issues may cause, for instance, delays in deliveries, loss of intellectual property, liabilities for network outages, court fees and fines due to breaches of significantly increasing regulatory privacy requirements and related negative publicity, and additional repair, product replacement or warranty costs to us, and harm our reputation and our ability to sustain or obtain business with our current and potential customers. With respect to our services, quality issues may relate to the challenges of having the services fully operational at the time they are made available to our customers and maintaining them on an ongoing basis. We may also be subject to damages due to product liability claims arising from defective products and components. We make provisions to cover our estimated warranty costs for our products and pending liability claims. We believe our provisions are appropriate, although the ultimate outcome may materially differ from the provisions that are provided for, which could have a material adverse effect on us.

A large proportion of Nokia manufacturing, service creation and delivery is carried out by third-party suppliers. These vary in size and often engage a number of tiers of suppliers, which limits Nokia's direct control. Our suppliers or a supplier may fail to meet our supplier requirements, such as our and our customers' product quality, safety, security and other standards. Certain suppliers may not comply with local laws, including, among others, local labor law, health and safety or environmental requirements. The activities we manage or that are managed by third parties for us may also be subject to negative publicity and purchasing boycotts, strikes or other forms of social, political, economic or environmental activism. These all can lead to exposure in the form of litigation, product recalls or brand damage through association.

Many of our production sites or the production sites of our suppliers/partners are geographically concentrated, with a majority of such suppliers/partners based in Asia. We rely on efficient logistic chain elements, such as regional distribution hubs or transport chain elements (main ports, streets, and airways). In the event that any of these geographic areas are affected by any adverse conditions, such as severe impacts of environmental events, man-made or natural disasters (for instance, flooding, heavy rain or extreme heat that the climate change is expected to further intensify), civil unrest or health crises (such as the COVID-19 pandemic) that disrupt production or deliveries from our suppliers/partners, our ability to deliver our products on a timely basis could be adversely affected. In a similar manner, these adverse conditions may also cause disruption to our service creation and delivery, which, in either case, may lead to a material adverse effect on our business and results of operations.

Inefficiencies, breaches, malfunctions or disruptions of information technology systems and processes could have a material adverse effect on our business and results of operations. As our business operations, including those we have outsourced, rely on complex IT systems, networks and related services, our reliance on the precautions taken by external companies to ensure the reliability of our and their IT systems, networks and related services is increasing. Consequently, certain disruptions in IT systems and networks affecting our external providers could also have a material adverse effect on our business.

All IT systems, networks and processes are potentially vulnerable to damage, breaches, malfunction or interruption from a variety of sources. Our operations rely on the efficient and uninterrupted operation of complex and centralized IT systems, networks and processes, which are integrated with those of third parties. The ongoing migration to cloud-based architectures and network function virtualization has introduced further complexity and associated risk.

We are, to a significant extent, relying on third parties for the provision of IT services. While we have outsourced certain functions, we have also increased our dependence on the reliability of external providers as well as on the security of communication with them. We may experience disruptions if our partners do not deliver as expected or if we are unable to successfully manage systems and processes together with our business partners. We will often need to use new service providers and may, due to technical developments or choices regarding technology, increase our reliance on certain new technologies, such as cloud and certain other services that are used over the internet rather than using a traditional licensing model. Switching to new service providers and introducing new technologies is inherently risky and may expose us to an increased risk of disruptions in our operations, for instance due to network inefficiency or outage, a cybersecurity or a compliance breach, malfunctions, failure in disaster recovery/IT service continuity or other disruptions resulting from IT systems and processes.

We are constantly seeking to improve the quality and security of our IT systems. However, despite precautions taken by us, we may fail to successfully secure our IT and any malfunction or disruption of our current or future systems or networks, such as an outage in a telecommunications network used by any of our IT systems, or a breach of our cybersecurity, such as an attack, malware, ransomware or other event that leads to an unanticipated interruption or malfunction of our IT systems, processes, networks or data leakages, could have a material adverse effect on our business, results of operations and brand value. As an example, we recognize that this pandemic has significantly increased the number of employees and suppliers working from home or remotely, which inherently raises the vulnerability of the IT security environment. A disruption of services relying on our IT, for instance, could cause significant discontent among customers and their end-users resulting in claims, contractual penalties or deterioration of our brand value. Further, while we are increasing our investments in digitalizing our operations and transforming our IT, the legacy IT systems may be gradually more vulnerable to malfunction, disruptions or security breaches than the new IT systems replacing them.

We are exposed to risks related to information security. Our business model relies on solutions for distribution of services and software or data storage, which entail inherent risks relating not only to applicable regulatory regimes, but also to cybersecurity breaches and other unauthorized access to network data or other potential security risks that may adversely affect our business and/or compromise personal data. Our business and operations rely on confidentiality of proprietary and other sensitive information, for instance related to our employees, consumers and our customers, including our government customers. Our business models rely on certain centralized data processing solutions and cloud or remote delivery-based services for distribution of services and software or data storage, accessible by our partners or subcontractors according to the roles and responsibilities defined.

We, our subsidiaries and joint ventures, products and online services, marketing and developer sites and third parties that we contract have been and may in the future be subject to cybersecurity breaches, including hacking, ransomware, viruses, worms and other malicious software, unauthorized modifications, or illegal activities that may cause potential security risks and other harm to us, our customers or consumers and other end-users of our products and services. IT is rapidly evolving, the techniques used to obtain unauthorized access or sabotage systems change frequently and the parties behind cyber-attacks and other industrial espionage are believed to be sophisticated and have extensive resources, and it is not commercially or technically feasible to mitigate all known vulnerabilities in a timely manner or to eliminate all risk of cyber-attacks and data breaches. Additionally, we contract with multiple third parties in various jurisdictions who collect and use certain data on our behalf. Although we have processes in place designed to ensure appropriate collection, handling and use of such data, third parties may use the data inappropriately or breach laws and agreements in collecting, handling or using or leaking such data. Our business is also vulnerable to theft, fraud or other forms of deception, sabotage and intentional acts of vandalism by third parties and employees. Further, compared to our fully integrated group companies, our ability to mitigate and oversee risk of cyber-attacks and data breaches may be more limited in our joint venture companies and other group companies having their own governance and system infrastructure, such as our local service companies focusing on networks field services.

The cybersecurity breaches may lead to lengthy and costly incident response, remediation of the attack or breach, legal proceedings and fines imposed on us, as well as adverse effects to our reputation and brand value. Additionally, cyber-attacks can be difficult to prevent, detect or contain. We cannot rule out the possibility that there may have been cyber-attacks that have been successful and/or evaded our detection. We continue to invest in risk mitigating actions; however, there can be no assurance that such investments and actions will prevent or detect future cyber-attacks. Additionally, the cost and operational consequences of implementing further information system protection measures, especially if prescribed by national authorities, could be significant. We may not be successful in implementing such measures in due time, which could cause business disruptions and be more expensive, time-consuming and resource intensive.

In connection with providing products and services to our customers and consumers, certain personal and consumer data are collected, stored and processed through us, either by us or by our business partners or subcontractors in various jurisdictions. We have outsourced a significant portion of our IT operations, as well as the network and information systems that we sell to third parties or for whose security and reliability we may otherwise be accountable. Loss, improper disclosure or processing or leakage of any personal or consumer data collected by us or which is made available to us or our partners or subcontractors or stored in or through our products and services, could have a material adverse effect on us and harm our reputation and brand. Additionally, governmental authorities may use our networks products to access the personal data of individuals without our involvement; for example, through the so-called lawful intercept capabilities of network infrastructure, impairing our reputation.

We engage in the installation and maintenance of undersea telecommunications cable networks. During this activity, we may cause damage to existing undersea infrastructure, for which we may ultimately be held responsible.

We supply, install and maintain submarine optical fiber cable networks linking mainland to islands, island to island or several points along a coast. Our activities also include the provision of optical fiber infrastructure to oil and gas platforms and other offshore installations. Despite the precautionary measures, there is a risk that previously laid infrastructure, such as third-party fiber optic cables, electrical power lines or hydrocarbon pipelines, may go undetected despite such precautions, and be damaged during the process of laying or maintaining the telecommunications cables. Such an event could potentially cause temporary business interruption to third parties operating in the same area, environmental incidents, safety accidents, unwanted media or regulatory attention, loss of reputation, litigation, repair costs or compensation

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payments for the affected parties. While we have contractual limitations in place and maintain insurance coverage to limit our exposure, these protections may be insufficient to cover such exposure entirely.

We are involved in joint ventures and other affiliated companies with their own governance and system infrastructure and are exposed to risks inherent to companies under joint management or not having direct management control.

We have a number of joint ventures, including those where Nokia is the minority partner, and other affiliated companies with their own governance and system infrastructure where Nokia does not have direct management control. The agreements related to our joint ventures may require unanimous consent or the affirmative vote of a qualified majority of the shareholders to take certain actions, thereby possibly slowing down the decision-making process or impairing our ability to implement our key policies and practices, such as our compliance processes and culture, in a comprehensive or timely manner. In addition, joint venture companies and other affiliated companies having their own governance and system infrastructure, such as our local service companies focusing on networks field services, involve inherent risks such as those associated with a complex corporate governance structure, lack of transparency or uniform controls and procedures and consequent risks of compliance breaches or other similar issues, or issues in dissolving such entities or divesting their shareholdings, assets and liabilities, and also may involve negative public perceptions caused by the joint venture partner that are adverse to us.

Financial and tax-related uncertainties

We have operations in many countries with different tax laws and rules, which may result in complex tax issues and disputes.

Taxation or other fees collected by governments or governmental agencies may result in unexpected payment obligations, and in response to prevailing difficult economic conditions in the public sector, coupled with already enacted and proposed fundamental changes in international tax regulations, there may be an increased aggressiveness in collecting such fees or taxes. We may be obliged to pay additional taxes for past periods as a result of changes in law, or changes of tax authority practice or interpretation (possibly with retroactive effect in certain cases), or inaccurate interpretations of tax laws by us resulting potentially in a material adverse effect on our cash flow and financial position. In particular, potential changes in re-allocation of taxing rights and other fundamental international tax principles, the OECD Pillar project and digital business-related initiatives, changes in tax laws or global laws regarding transfer pricing could adversely impact our business, operating results and overall tax burden. There may also be unforeseen tax expenses that turn out to have an unfavorable impact on us, adverse tax consequences related to past acquisitions and divestments, and potential tax liabilities that we are currently not aware of. As a result, and given the inherently unpredictable nature of taxation, our tax rate may change from its current level and our cash flows regarding taxes may not be stable.

As a company with global operations, we are subject to tax investigations in various jurisdictions, and such proceedings can be lengthy, involve actions that can hinder local operations and affect unrelated parts of our business, and the outcome of such proceedings is difficult to predict. While we have made provisions for certain tax issues, the provisions we have made may not be adequate to cover such increases.

In the context of our sale of Devices & Services business to Microsoft, we are required to indemnify Microsoft for certain tax liabilities, including (i) tax liabilities of the Nokia entities acquired by Microsoft in connection with the closing of the sale of Devices & Services business, (ii) tax liabilities associated with the assets acquired by Microsoft and attributable to tax periods ending on or prior to the closing date of the sale of Devices & Services business, and (iii) tax liabilities relating to the pre-closing portion of any taxable period that includes the closing date of the sale of Devices & Services business.

Our actual or anticipated performance, among other factors, could reduce our ability to utilize our tax attributes and deferred tax assets.

Deferred tax assets recognized on tax losses, unused tax credits and tax-deductible temporary differences are dependent on our ability to offset such items against future taxable income within the relevant tax jurisdiction. Such deferred tax assets are also based on our assumptions on future taxable earnings and these may not be realized as expected which may cause the deferred tax assets to be materially reduced. In 2020, Nokia derecognized EUR 2.9 billion deferred tax assets related to Finland. There can be no assurances that reductions in deferred tax assets will not occur in the future. Any such reduction could have a material adverse effect on us. Additionally, our earnings have been unfavorably affected in the past, and may continue to be in the future, in the event that no tax benefits are recognized for certain deferred tax items.

We may not have access to sources of funding on favorable terms, or at all.

Our business requires a significant amount of cash and we continue to invest in our R&D and other future capabilities, including 5G, cloud and digitalization. We rely on multiple sources of funding for short-term and long-term capital and aim to minimize the liquidity risk by maintaining a sufficient cash position and having committed credit lines in place. However, there can be no assurances that we will be able to generate sufficient amounts of capital or to maintain an efficient capital structure from time to time.

We also may not be able to have access to additional sources of funds that we may need from time to time with reasonable terms, or at all. If we cannot access capital or sell receivables on a commercially viable basis, our business, financial condition and cash flow could materially suffer.

We may not be able to re-establish investment grade rating or maintain our credit ratings.

Moody's, Standard & Poor's, Fitch and other credit rating agencies have assigned credit ratings to us and we have set a goal of re-establishing investment grade credit ratings. There can be no assurances that we will be able to achieve investment grade credit ratings.

In the event our credit rating is downgraded, it could have a material adverse effect, for instance on our cost of funds and related margins, our business and results of operations, financial condition, liquidity, or access to capital markets.

Due to our global operations, our net sales, costs and results of operations, as well as the US dollar value of our dividends and market price of our ADSs, are affected by exchange rate fluctuations.

We operate globally and are therefore exposed to foreign exchange risks in the form of both transaction risks and translation risks. Our policy is to monitor and hedge foreign exchange rate exposures within defined exposure identification horizons. We manage our operations to mitigate, but not to eliminate, the impacts of exchange rate fluctuations and our hedging activities may prove unsuccessful in mitigating the potentially negative impact of exchange rate fluctuations. Additionally, significant volatility in the relevant exchange rates and interest rates may increase our hedging costs, as well as limit our ability to hedge our exchange rate exposure including, in particular certain emerging market currencies. Furthermore, exchange rate fluctuations may have an adverse effect on our net sales, costs and results of operations, as well as our competitive position, through their impact on our customers, suppliers and competitors.

We also experience other financial market-related risks, including changes in interest rates and in prices of marketable securities that we own. We may use derivative financial instruments to reduce certain of these risks. If our strategies to reduce such risks are not successful, our financial condition and results of operation may be harmed.

Additionally, exchange rate fluctuations may materially affect the US dollar value of any dividends or other distributions that are paid in euro, as well as the market price of our ADSs.

We are exposed to pension and other post-employment cost-related risks and we may be unsuccessful in our ability to avoid or control costs resulting from a need for increased funding.

We are exposed to various employee cost-related risks, including those related to pension and post-employment healthcare and life insurance cost-related risks. In the US, we maintain significant employee pension benefit plans and a significant retiree welfare benefit plan (providing post-employment healthcare benefits and post-employment life insurance coverage). Outside the US, we contribute to pension schemes for large numbers of current and former employees. The US and non-US plans and schemes have funding requirements that depend on, among other things, various legal requirements, how assets set aside to pay for those obligations are invested, the performance of financial markets, interest rates, assumptions regarding the life expectancy of covered employees and retirees, and medical cost inflation and medical care utilization. To the extent that any of those variables change, the funding required for those plans/schemes may increase, and we may be unsuccessful in our ability to avoid or control costs resulting from such increased funding requirements.

With respect to our pension and post-employment obligations, we face the following risks, among others:

- financial market performance and volatility in asset values and discount rates affect the funded status of our pension obligations and could increase funding requirements, including legally required minimum contributions;
- our pension plan participants and post-employment health plan participants may live longer than has been assumed, which would result in an increase in our benefit obligations. We cannot be certain that the longevity of the participants in our pension plans or retiree healthcare plan will not exceed that indicated by the mortality tables we currently use or that future updates to those tables will not reflect materially longer life expectancies;
- we currently fund, and expect to be able to continue to fund, our US post-employment healthcare and group life insurance costs for our formerly represented retirees through transfers of excess pension assets from our (U.S.) formerly represented pension plan, as permitted under Section 420 of the U.S. Internal Revenue Code. A deterioration in the funded status of that pension plan could negatively affect our ability to continue making Section 420 transfers. Section 420 currently provides that no transfers of excess pension assets may be made after 31 December 2025; and
- we currently provide post-employment group life insurance coverage for a closed group of former non-represented employees who meet stated age and service criteria. This benefit obligation is largely insured through an experience-rated group life insurance policy issued by a reputable insurer, the premiums for which are paid from a voluntary employees' beneficiary association (veba) trust. Based on current actuarial and return-on-asset assumptions and the present level and structure of this group life insurance obligation, we believe that we can continue to fund the premiums for this policy from the veba trust and from transfers of excess pension assets from our (U.S.) non-represented pension plan, as permitted under Section 420 of the U.S. Internal Revenue Code. A deterioration in the funded status of that pension plan could negatively affect our ability to continue making Section 420 transfers. As noted, Section 420 currently provides that no transfers of excess pension assets may be made after 31 December 2025.

The carrying amount of our goodwill may not be recoverable.

We assess the carrying amount of goodwill annually, or more frequently if events or changes in circumstances indicate that such carrying amount may not be recoverable. We assess the carrying amount of other identifiable assets if events or changes in circumstances indicate that their carrying amounts may not be recoverable, for instance, if we would not generate revenues from our businesses as anticipated, or if our businesses would not generate sufficient positive operating cash flows. These, or other factors, may lead to a decrease in the value of our assets, including intangible assets and the goodwill attributed to our businesses, resulting in impairment charges that may adversely affect our net profit for the year. While we believe the estimated recoverable values are reasonable, actual performance in the short and long term and our assumptions on which we base our calculations could materially differ from our forecasts, which could impact future estimates of our businesses' recoverable values, and may result in impairment charges.

Risks associated with ownership of our shares

Our share and/or ADS price may be volatile and subject to fluctuations.

Our share and/or ADS price may be volatile and could be subject to fluctuations in response to various factors, some of which are beyond our control. In addition to the factors described in this section, Risk Factors, other factors that could cause fluctuations in our share price include, among others, high volatility in the securities markets generally and volatility in telecommunications and technology companies' securities in particular, trading volumes, speculation in the media or retail or institutional investment communities regarding the company and our prospects, future developments in our industry and competitors, our financial results and the expectations of financial analysts, as well as the timing or content of any public communications, including reports of operating results, by us or our competitors. Further, factors in the public trading market for our stock may produce price movements that may or may not comport with macro, industry or company-specific fundamentals, including, without limitation, the sentiment of retail investors (including as may be expressed on financial trading and other social media sites and online forums), the direct access by retail investors to broadly available trading platforms, the amount and status of short interest in our securities, access to margin debt, trading in options and other derivatives on our common stock and any related hedging and other trading factors.

The market price of, and trading volume for, our shares and/or ADSs may change for reasons not necessarily related to our actual operating performance. The capital markets have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. In addition, in the past, following periods of volatility in the market price of a company's securities, stockholders often institute securities class action litigation against that company. This type of litigation could result in substantial costs and divert our management's attention and resources, which could have a material adverse effect on our cash flows, our ability to execute our business strategy and our ability to make distributions to our stockholders.

The amount of dividend and/or repayment of capital and other profit distributions such as share buybacks to shareholders for each financial period is uncertain.

As announced on 3 February 2022, our Board proposes that the Annual General Meeting authorizes the Board to resolve on a dividend of EUR 0.08 per share be paid to investors in respect of financial year 2021. If the resolution is approved the dividend would be paid in quarterly installments starting after the AGM. Furthermore, our Board initiated a share buyback program under the current authorization granted by Nokia's Annual General Meeting on 8 April 2021 to return up to EUR 600 million of cash to shareholder in tranches over a period of two years. We cannot assure that we will distribute dividends and/or capital repayments on the shares issued by us, nor is there any assurance as to the amount of any dividend and/or repayment of capital we may pay, including but not limited to situations where we make commitments to increase our dividends. Neither can we guarantee that we finalize the announced share buyback program. The payment and the amount of any dividend and/or repayment of capital as well as additional share buyback programs is subject to the discretion of the general meeting of our shareholders and our Board, and will depend on available cash balances, expected cash flow generation, anticipated cash needs, retained earnings, the results of our operations

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and our financial condition and terms of outstanding indebtedness, as well as other relevant factors such as restrictions, prohibitions or limitations imposed by applicable law. Further, even if any conditions or factors covering the issuance or distribution of dividends are met, the Board or the shareholders have in the past decided, and may going forward decide, not to issue or distribute dividends or initiate additional buyback programs.

Non-Finnish shareholders are likely required to provide detailed information to obtain advantageous withholding tax treatment for dividends.

As described in more detail under General facts on Nokia–Taxation section, non-Finnish shareholders are required to provide certain information in order to benefit from the reduced dividend withholding tax rates set out in the applicable tax treaties. Furthermore, custodians are required to fulfill certain strict requirements and take over certain responsibilities and assume liability for incorrectly applied withholding tax, or a higher withholding tax rate will apply. Such requirements will likely impose an additional administrative burden on shareholders or result in the higher withholding rate becoming applicable for non-Finnish shareholders.

Significant subsequent events

Capital commitment

In January 2022, we agreed on capital commitment of USD 400 million to NGP Capital's Fund V. The fund's emphasis on companies developing emerging 5G use cases for industrial and business transformation aligns closely with Nokia's technology leadership vision and its efforts to maximize the value shift towards cloud. Per industry standard practice, the capital will be called throughout the 10 year lifecycle of the fund.

Share buyback program

On 3 February 2022, we announced that its Board of Directors is initiating a share buyback program under the current authorization from the AGM to repurchase shares. The program targets to return up to EUR 600 million of cash to shareholders in tranches over a period of two years, subject to continued authorization from the Annual General Meeting. Nokia launched the first phase of the program on 11 February 2022 with repurchases starting on 14 February 2022. For more details about the share buyback program and how Nokia plans to distribute funds to its shareholders, refer to Note 19, Equity.

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American Depositary Shares

Fees and charges

ADS holders may have to pay the following service fees to the Depositary:

Service	Fees, USD
Issuance of ADSs	Up to 5 cents per ADS ⁽¹⁾
Cancellation of ADSs	Up to 5 cents per ADS ⁽¹⁾
Distribution of cash dividends or other cash distributions	Up to 2 cents per ADS
Distribution of ADSs pursuant to (i) stock dividends, free stock distributions or (ii) exercises of rights to purchase additional ADSs	Up to 5 cents per ADS
Distribution of securities other than ADSs or rights to purchase additional ADSs	Up to 5 cents per ADS ⁽¹⁾
ADS transfer fee	1.50 cents per transfer ⁽¹⁾

(1) These fees are typically paid to the Depositary by the brokers on behalf of their clients receiving the newly issued ADSs from the Depositary and by the brokers on behalf of their clients delivering the ADSs to the Depositary for cancellation. The brokers in turn charge these transaction fees to their clients.

Additionally, ADS holders are responsible for certain fees and expenses incurred by the Depositary on their behalf and certain governmental charges such as taxes and registration fees, transmission and delivery expenses, conversion of foreign currency and fees relating to compliance with exchange control regulations. The fees and charges may vary over time.

In the event of refusal to pay the depositary fees, the Depositary may, under the terms of the deposit agreement, refuse the requested service until payment is received or may set off the amount of the depositary fees from any distribution to be made to the ADS holder.

Payments

In 2021, our Depositary made the following payments on our behalf in relation to our ADS program.

Category	Payment, USD
Settlement infrastructure fees (including the Depositary Trust Company fees)	668 915.46
Proxy process expenses (including printing, postage and distribution)	2 049 849.23
ADS holder identification expenses	109 988.93
Legal fees	-
NYSE listing fees	500 000.00
Total	3 328 753.62

Additionally for 2021, our Depositary reimbursed us USD 19 000 000 mainly related to contributions towards our investor relations activities, including investor meetings and conferences and fees of investor relations service vendors, and other miscellaneous expenses related to the United States listing of our ADSs.

Controls and procedures

Our management, with the participation of our President and CEO and our Chief Financial Officer, conducted an evaluation pursuant to Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the Exchange Act), of the effectiveness of our disclosure controls and procedures as of 31 December 2021. Based on such evaluation, our President and CEO and our Chief Financial Officer have concluded that our disclosure controls and procedures were effective.

Disclosure controls and procedures mean controls and other procedures that are designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Commission's rules and forms, and that such information required to be disclosed by us in the reports that we file or submit under the Exchange Act is accumulated and communicated to our management, including our President and CEO and our Chief Financial Officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosures.

Management's annual report on internal control over financial reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting for Nokia. Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation and fair presentation of published financial statements. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our management evaluated the effectiveness of our internal control over financial reporting using the criteria described in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, our management has assessed the effectiveness of Nokia's internal control over financial reporting at 31 December 2021 and concluded that such internal control over financial reporting is effective.

The effectiveness of our internal control over financial reporting as of 31 December 2021 has been audited by Deloitte Oy, an independent registered public accounting firm. Refer to section "Reports of independent registered public accounting firms".

Changes in internal control over financial reporting

There have been no changes in our internal control over financial reporting during 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Attestation report of the registered public accounting firm

Refer to section "Reports of independent registered public accounting firms".

Exchange controls

There are currently no Finnish laws that may affect the import or export of capital, or the remittance of dividends, interest or other payments.

Government regulation

Nokia and its businesses are subject to direct and indirect regulation in each of the countries in which we and our customers do business. As a result, changes in or uncertainties related to various types of regulations applicable to current or new technologies, intellectual property, products, services, company operations and business environment (e.g. labor laws, taxation) could affect our business adversely. Moreover, the implementation of technological or legal requirements could impact our products and services, technology and patent licensing activities, manufacturing and distribution processes, and could affect the timing of product and services introductions and the cost of our production, products and services, as well as their commercial success. Also, our business is subject to the impacts of changes in economic and trade policies. Export control, tariffs or other fees or levies imposed on our products and services, environmental, product safety and security and other regulations that adversely affect the export, import, pricing or costs of our products and services as well as export prohibitions (sanctions) enacted by the EU, the United States or other countries or regions could adversely affect our net sales and results of operations. Further, potential governmental intervention in supply chain (e.g. prohibiting imports from certain geographies or imposing certain criteria on selection of suppliers) may impact Nokia's operations.

For example, depending on the geography, our products and services are subject to a wide range of government regulations that might have a direct impact on our business, including, but not limited to, regulation related to product certification, standards, spectrum management, provision of telecommunications services, privacy and data protection, competition and sustainability. The EU-level or local member state regulation has a direct impact on many areas of our business, markets and customers within the EU. The European regulation influences, for example, conditions for innovation for telecommunications infrastructure and internet and related services, as well as technology and patent licensing; investment in fixed and wireless broadband communication infrastructure and operation of global data flows. Additionally, with respect to certain developing market countries, the business environment we operate in can be affected by localization requirements.

We proactively exchange views and address the impact of any planned changes to the regulatory environment on our business activities with state agencies, regulators and other decision-makers either through our government relations representatives in various geographies and through our experts, or indirectly through memberships in industry associations.

Sales in United States-sanctioned countries

General

We are a global company and have sales in most countries of the world. Nokia is committed to the highest standards of ethical conduct, and adheres to all applicable national and international trade-related laws. As a leading international telecommunications company with global operations, Nokia has a presence also in countries subject to international sanctions. All operations of Nokia, and in particular any operations undertaken in countries targeted by sanctions, are conducted in accordance with our comprehensive and robust internal compliance program to ensure that they are in full compliance with all applicable laws and regulations. In addition, we continuously monitor international developments and assess the appropriateness of our presence and business in these, and all, markets. Nevertheless, business in these markets is marked by complexity and uncertainty.

We cannot exclude the possibility that third parties may unlawfully divert our products to these countries from other countries in which we sell them, or that, for services distributed through the internet, third parties could have accessed them in markets or countries for which they are not intended by circumventing the industry standard protective mechanisms, such as IP address blocks, despite our efforts in implementing measures to prevent such actions.

Disclosure pursuant to Section 219 of the Iran Threat Reduction and Syria Human Rights Act of 2012

We operate in Iran in compliance with applicable economic sanctions and other trade-related laws. We provide telecommunications equipment with ancillary services to network operator customers and internet service providers. We do not deliver equipment and services to Iran for military purposes, or for the purpose of limiting political discourse, blocking legitimate forms of free speech or conducting surveillance of individuals.

In connection with the business activities relating to Iran, we have two local offices in Iran that employed approximately 18 employees at the end of 2021 through a branch of a Finnish subsidiary. Nokia is the controlling shareholder in Pishahang Communications Network Development Company (Pishahang). The other minority shareholder in Pishahang is Information Technology Application Development TACFAM Company (Tacfam).

We continue to maintain routine contacts with governmental agencies in Iran as required, for example, to maintain a legal presence and office facilities in Iran, pay taxes and employ Iranian nationals.

To our knowledge, none of our sales in Iran in 2021 are required to be disclosed pursuant to ITRA Section 219, with the possible exception of the following.

In 2021, we continued only with our existing contractual obligations in compliance with applicable economic sanctions and other trade-related laws including limited local delivery of radio products and transmission licenses, including associated services, to MTN Irancell and some software and features to Mobile Communications Company of Iran (MCCI).

Although it is difficult to evaluate with any reasonable degree of certainty, we have concluded that we cannot exclude the possibility that MCCI, MTN Irancell or Tacfam is owned or controlled, directly or indirectly, by the government of Iran. None of these activities involve US affiliates of Nokia, or any persons from the United States.

Nokia does not normally allocate net profit on a country-by-country or activity-by-activity basis, other than as set forth in Nokia's consolidated financial statements prepared in accordance with IFRS. Therefore, for this exercise Nokia will reflect its sales margin in lieu of the net profit/loss. In 2021 we recognized net sales of EUR 2 million from business with MTN Irancell and EUR 1 million from business with MCCI. Sales margin from these two customers amounted to 70%.

Although we evaluate our business activities on an ongoing basis, we intend to continue not accepting any new business in Iran in 2022 and intend to only complete existing contractual obligations in Iran in compliance with applicable economic sanctions and other trade-related laws.

Taxation

General

The statements of the United States and Finnish tax laws set out below are based on the laws in force as of the date of this report and may be subject to any changes in US or Finnish law, and in any double taxation convention or treaty between the United States and Finland, occurring after that date, possibly with retroactive effect.

For purposes of this discussion, "US Holders" are beneficial owners of ADSs that: (i) hold the ADSs as capital assets; (ii) are citizens or residents of the United States, corporations created in or organized under US law, estates whose income is subject to US federal income tax, or trusts that elect to be treated as a US person or are both subject to the primary supervision of a US court and controlled by a US person; and (iii) in each case, are considered residents of the United States for purposes of the current income tax convention between the United States and Finland, referred to as the "Treaty", and the limitation on benefits provisions therein. Special rules apply to US Holders that are also residents of Finland and to citizens or residents of the United States that do not maintain a substantial presence, permanent home or habitual abode in the United States. For purposes of this discussion, it is assumed that the Depositary and its custodian will perform all actions as required by the deposit agreement with the Depositary and other related agreements between the Depositary and Nokia.

If a partnership holds ADSs (including for this purpose any entity or arrangement treated as a partnership for US federal income tax purposes), the tax treatment of a partner will depend upon the status of the partner and activities of the partnership. If a US Holder is a partnership or a partner in a partnership that holds ADSs, the holder is urged to consult its own tax advisor regarding the specific tax consequences of owning and disposing of its ADSs.

Because this summary is not exhaustive of all possible tax considerations - such as situations involving financial institutions, banks, tax-exempt entities, pension funds, US expatriates, real estate investment trusts, persons that are dealers in securities, persons who own (directly, indirectly or by attribution) 10% or more of the share capital or voting stock of Nokia, persons who acquired their ADSs pursuant to the exercise of employee stock options or otherwise as compensation, or US Holders whose functional currency is not the US dollar, who may be subject to special rules that are not discussed herein - holders of shares or ADSs that are US Holders are advised to satisfy themselves as to the overall US federal, state and local tax consequences, as well as to the overall Finnish and other applicable non-US tax consequences, of their ownership of ADSs and the underlying shares by consulting their own tax advisors. This summary does not discuss the treatment of ADSs that are held in connection with a permanent establishment or fixed base in Finland, and it does not address the US Medicare tax on certain investment income.

For the purposes of both the Treaty and the US Internal Revenue Code of 1986, as amended, referred to as the "Code", US Holders of ADSs will be treated as the owners of the underlying shares that are represented by those ADSs. Accordingly, the following discussion, except where otherwise expressly noted, applies equally to US Holders of ADSs, on the one hand, and to shares on the other.

The holders of ADSs will, for Finnish tax purposes, be treated as the owners of the shares that are represented by the ADSs. The Finnish tax consequences to the holders of shares, as discussed below, also apply to the holders of ADSs.

US taxation of cash dividends

For US federal income tax purposes, the gross amount of dividends paid to US Holders of shares or ADSs out of our current or accumulated earnings and profits, including any related Finnish withholding tax, generally will be included in gross income as foreign source dividend income. We do not expect to maintain calculations of our earnings and profits under US federal income tax principles; therefore, US Holders should expect that the entire amount of any distribution generally will be reported as dividend income. Dividends will not be eligible for the dividends received deduction allowed to corporations under the Code. The amount includible in income (including any Finnish withholding tax) will equal the US dollar value of the payment, determined at the time such payment is received by the Depositary (in the case of ADSs) or by the US Holder (in the case of shares), regardless of whether the payment is in fact converted into US dollars. Generally, any gain or loss resulting from currency exchange rate fluctuations during the period between the time such payment is received and the date the dividend payment is converted into US dollars will be treated as US source ordinary income or loss to a US Holder.

Special rules govern and specific elections are available to accrual method taxpayers to determine the US dollar amount includible in income in the case of a dividend paid (and taxes withheld) in foreign currency. Accrual basis taxpayers are urged to consult their own tax advisors regarding the requirements and elections applicable in this regard.

Dividends received generally will constitute foreign source "passive category income" for foreign tax credit purposes. Subject to certain limitations, Finnish taxes withheld may be eligible for credit (not in excess of the applicable Treaty rate) against a US Holder's US federal income tax liability. Additionally, if Nokia makes a distribution from its SVOP-reserve (discussed below) when it does not have current or accumulated earnings and profits, a US Holder may not be able to claim such credit.

In lieu of a credit, a US Holder may elect to claim a deduction in respect of its Finnish income taxes provided the deduction is claimed for all of the foreign taxes paid by the US Holder in that particular taxable year. A deduction does not reduce US tax on a dollar-for-dollar basis like a tax credit. The deduction, however, is not subject to the limitations applicable to foreign tax credits.

Provided that certain holding period and other requirements are met, individuals and certain other non-corporate US Holders are eligible for reduced rates of US federal income tax at a maximum rate of 20% in respect of "qualified dividend income". Dividends that Nokia pays with respect to its shares and ADSs generally will be qualified dividend income if certain holding periods are met and Nokia was neither a passive foreign investment company (PFIC) in the taxable year prior to the year in which the dividend was paid nor in the taxable year in which the dividend is paid. Nokia currently believes that dividends it pays with respect to its shares and ADSs will constitute qualified dividend income for US federal income tax purposes; however, this is a factual matter and is subject to change. Nokia anticipates that its dividends will be reported as qualified dividends on Forms 1099-DIV delivered to US Holders. US Holders of shares or ADSs are urged to consult their own tax advisors regarding the availability to them of the reduced dividend tax rate in light of their own particular situation and the computations of their foreign tax credit limitation with respect to any qualified dividends paid to them, as applicable.

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We believe we should not be classified as a PFIC for US federal income tax purposes for the taxable year ended 31 December 2021 and we do not expect to become a PFIC in the foreseeable future. US Holders are advised, however, that this conclusion is a factual determination that must be made annually and thus may be subject to change. If we were to be classified as a PFIC, the tax on distributions on our shares or ADSs and on any gains realized upon the disposition of our shares or ADSs generally would be less favorable than as described herein. Dividends paid by a PFIC are not "qualified dividend income" and are not eligible for reduced rates of taxation. Additionally, US persons who are shareholders in a PFIC generally will be required to file an annual report disclosing the ownership of such shares and certain other information. US Holders should consult their own tax advisors regarding the application of the PFIC rules, including the related reporting requirements, to their ownership of our shares or ADSs.

[Finnish withholding taxes on cash dividends](#)

Under the Finnish Income Tax Act and Act on Taxation of Non-residents' Income, non-residents of Finland are generally subject to a withholding tax at a rate of 30% on dividends paid by a Finnish resident company. Further, under the Finnish Prepayment Act, 50% preliminary tax must be withheld on dividends paid in certain situations. However, pursuant to the Treaty, dividends paid to US Holders are generally subject to Finnish withholding tax at reduced rates.

Under the Finnish Income Tax Act and tax court practice, the distribution of funds from reserves for invested unrestricted equity (an "SVOP-reserve") by a listed company such as Nokia is taxed as a distribution of a dividend.

As of 1 January 2021, nominee registered shares are generally subject to a withholding tax at a rate of 35% on dividends paid by Nokia. This new withholding tax regime is based on OECD's TRACE (Treaty Relief and Compliance Enhancement) model. Under the new rules, the 35% withholding tax will generally be applied on dividend distributions on nominee registered shares by listed companies such as Nokia, unless custodians fulfill certain strict requirements and are willing to take over certain responsibilities (e.g. registration with the Finnish Tax Administration (so-called authorized intermediary), identification of the beneficial owner of the dividend and collecting and submitting detailed recipient information to the Finnish Tax Administration using specific filing procedures). Furthermore, application of reduced withholding tax rates at source require that the custodian and dividend distributor are willing to assume liability of incorrectly applied withholding tax. If the custodian only registers with the Finnish Tax Administration and submits (or undertakes to submit) the detailed recipient details to the Finnish Tax Administration, 30% withholding tax rate can be applied, instead of 35%.

Any tax withheld in excess can be reclaimed after the calendar year of the dividend payment by submitting a refund application to the Finnish Tax Administration no later than by the end of the third calendar year following the dividend payment year. During the year of dividend payment, the refund can be processed if custodians and dividend distributor fulfill the above-mentioned requirements laid down for actual dividend distribution.

It is exceptionally also possible that any tax not withheld at source is later assessed directly to the shareholder by the Finnish Tax Administration, in case the failure to withhold tax at source is not due to negligence of the custodian or the dividend distributor.

Holders of shares or ADSs are urged to consult their own custodian regarding the availability of reduced withholding tax rates in light of their own particular situation and approach their custodian in terms of their responsibilities, as well as consult their own tax advisors regarding the availability to them of the tax credit from dividend withholding tax.

[US and Finnish tax on sale or other disposition](#)

A US Holder generally will recognize taxable capital gain or loss on the sale or other disposition of ADSs in an amount equal to the difference between the US dollar value of the amount realized and the adjusted tax basis (determined in US dollars) in the ADSs. If the ADSs are held as a capital asset, this gain or loss generally will be long-term capital gain or loss if, at the time of the sale, the ADSs have been held for more than one year. Any capital gain or loss, for foreign tax credit purposes, generally will constitute US source gain or loss. In the case of a US Holder that is an individual, long-term capital gain generally is subject to US federal income tax at preferential rates. The deductibility of capital losses is subject to significant limitations.

The deposit or withdrawal by a US Holder of shares in exchange for ADSs or of ADSs for shares under the deposit agreement generally will not be subject to US federal income tax or Finnish income tax.

The sale by a US Holder of the ADSs or the underlying shares, other than an individual who, by reason of his residence in Finland for a period exceeding six months, is or becomes liable for Finnish income tax according to the relevant provisions of Finnish tax law, generally will not be subject to income tax in Finland, in accordance with Finnish tax law and the Treaty.

[Finnish transfer tax](#)

The transfer of our shares and ADSs for cash through a broker or other appropriate intermediary is generally not subject to Finnish transfer tax. Non-brokered transfers will generally be exempted from the transfer tax if the transferee has been approved as a trading party in the market where the transfer is executed, or other conditions are met. Transfers of ADSs on the New York Stock Exchange are exempt. Where the transfer does not fulfill the above requirements, and either the buyer or the seller is a Finnish resident or a Finnish branch office of a specified foreign financial service provider, the buyer is liable to pay transfer tax of 1.6% of the transaction price where the resulting tax is at least EUR 10. Selling shareholders should consult their tax advisors regarding the specific tax considerations of a sale of our shares or ADSs.

[Finnish inheritance and gift taxes](#)

A transfer of an underlying share by gift or by reason of the death of a US Holder and the transfer of an ADS are not subject to Finnish gift or inheritance tax provided that none of the deceased person, the donor, the beneficiary of the deceased person or the recipient of the gift is resident in Finland.

[Non-residents of the United States](#)

Beneficial owners of ADSs that are not US Holders will not be subject to US federal income tax on dividends received with respect to ADSs unless such dividend income is effectively connected with the conduct of a trade or business within the United States. Similarly, non-US Holders generally will not be subject to US federal income tax on any gain realized on the sale or other disposition of ADSs, unless (a) the gain is effectively connected with the conduct of a trade or business in the United States or (b) in the case of an individual, that individual is present in the United States for 183 days or more in the taxable year of the disposition and other conditions are met.

The United States information reporting and backup withholding

Dividend payments with respect to shares or ADSs and proceeds from the sale or other disposition of shares or ADSs may be subject to information reporting to the Internal Revenue Service and possible US backup withholding. Backup withholding will not apply to a holder if the holder furnishes a correct taxpayer identification number or certificate of foreign status and makes any other required certification in connection therewith, or if it is a recipient otherwise exempt from backup withholding (such as a corporation). Any US persons required to establish their exempt status generally must furnish a duly completed IRS Form W-9 (Request for Taxpayer Identification Number and Certification). Non-US holders generally are not subject to US information reporting or backup withholding. However, such holders may be required to provide certification of non-US status (generally on IRS Form W-8BEN for individuals and Form W-8BEN-E for corporations) in connection with payments received in the United States or through certain US-related financial intermediaries. Backup withholding is not an additional tax. Amounts withheld as backup withholding may be credited against a holder's US federal income tax liability, and the holder may obtain a refund of any excess amounts withheld under the backup withholding rules by timely filing the appropriate claim for refund with the Internal Revenue Service and furnishing the proper required information.

Key ratios

Earnings per share (basic)

Profit/(loss) attributable to equity holders of the parent
Weighted average number of shares outstanding

Earnings per share (diluted)

Profit/(loss) attributable to equity holders of the parent adjusted for the effect of dilution
Adjusted weighted average number of shares

P/E ratio

Closing share price as of 31 December
Earnings per share (basic) for continuing operations

Payout ratio

Proposed dividend per share
Earnings per share (basic) for continuing operations

Dividend yield %

Proposed dividend per share
Closing share price as of 31 December

Shareholders' equity per share

Capital and reserves attributable to equity holders of the parent
Number of shares as of 31 December - number of treasury shares as of 31 December

Market capitalization

(Number of shares as of 31 December - number of treasury shares as of 31 December) x closing share price as of 31 December

Share turnover %

Number of shares traded during the year
Average number of shares during the year

Alternative performance measures

Certain financial measures presented in this report are not measures of financial performance, financial position or cash flows defined in IFRS. As these measures are not defined in IFRS, they may not be directly comparable with financial measures used by other companies, including those in the same industry. The primary rationale for presenting these measures is that the management uses these measures in assessing the financial performance of Nokia and believes that these measures provide meaningful supplemental information on the underlying business performance of the Nokia. These financial measures should not be considered in isolation from, or as a substitute for, financial information presented in compliance with IFRS.

Return on capital employed %

Definition

Return on capital employed is defined as Profit before tax + Interest expense on interest-bearing liabilities / Average capital and reserves attributable to equity holders of the parent + average non-controlling interests + average interest-bearing liabilities.

Purpose

Return on capital employed indicates how efficiently Nokia uses its capital to generate profits.

Composition of return on capital employed %:

EURm	2021	2020	2019
Profit before tax	1 926	743	156
Interest expense on interest-bearing liabilities	113	127	99
Total	2 039	870	255
Average capital and reserves attributable to equity holders of the parent ⁽¹⁾	14 913	13 895	15 307
Average non-controlling interests ⁽¹⁾	91	78	79
Average interest-bearing liabilities ⁽¹⁾	5 115	4 927	4 049
Total capital employed	20 119	18 900	19 435
Return on capital employed %	10.13%	4.60%	1.31%

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(1) Calculated as the average of opening and closing balance for the year as presented in the consolidated statement of financial position. Refer to the consolidated financial statements.

Return on shareholders' equity %

Definition

Return on shareholders' equity is defined as Profit/(loss) for the year attributable to equity holders of the parent / Average capital and reserves attributable to equity holders of the parent.

Purpose

Return on shareholders' equity indicates how efficiently Nokia uses the capital invested by its shareholders to generate profits.

Composition of return on shareholders' equity %:

EURm	2021	2020	2019
Profit/(loss) for the year attributable to equity holders of the parent	1 623	(2 523)	7
Average capital and reserves attributable to equity holders of the parent ⁽¹⁾	14 913	13 895	15 307
Return on shareholders' equity %	10.88%	(18.16)%	0.05%

(1) Calculated as the average of opening and closing balance for the year as presented in the consolidated statement of financial position. Refer to the consolidated financial statements.

Equity ratio %

Definition

Equity ratio % is defined as Total capital and reserves attributable to equity holders of the parent + non-controlling interests / Total assets.

Purpose

Equity ratio indicates the proportion of assets financed by the capital provided by the equity holders of the parent to total assets of Nokia.

Composition of equity ratio %:

EURm	2021	2020	2019
Total capital and reserves attributable to the equity holders of the parent	17 360	12 465	15 325
Non-controlling interests	102	80	76
Shareholders' equity	17 462	12 545	15 401
Total assets	40 049	36 191	39 128
Equity ratio %	43.60%	34.66%	39.36%

Total cash and current financial investments

Definition

Total cash and current financial investments consist of cash and cash equivalents and current financial investments.

Purpose

Total cash and current financial investments is used to indicate funds available to Nokia to run its current and invest in future business activities as well as provide return for security holders.

Composition of total cash and current financial investments:

EURm	2021	2020	2019
Cash and cash equivalents	6 691	6 940	5 910
Current financial investments	2 577	1 121	97
Total cash and current financial investments	9 268	8 061	6 007

Net cash and current financial investments

Definition

Net cash and current financial investments equals total cash and current financial investments less long-term and short-term interest-bearing liabilities.

Purpose

Net cash and current financial investments is used to indicate Nokia's liquidity position after cash required to settle the interest-bearing liabilities.

Composition of net cash and current financial investments:

EURm	2021	2020	2019
Total cash and current financial investments			
Cash and cash equivalents	6 691	6 940	5 910
Current financial investments	2 577	1 121	97
Interest-bearing liabilities			
Long-term interest-bearing liabilities	(4 537)	(5 015)	(3 985)
Short-term interest-bearing liabilities	(116)	(561)	(292)
Net cash and current financial investments	4 615	2 485	1 730

Net debt to equity (gearing) %

Definition

Net debt to equity (gearing) % is defined as Long-term and short-term interest-bearing liabilities less total cash and current financial investments / (Total capital and reserves attributable to the equity holders of the parent + Non-controlling interests).

Purpose

Net debt to equity ratio presents the relative proportion of shareholders' equity and interest-bearing liabilities used to finance Nokia's assets and indicates the leverage of Nokia's business.

Composition of net debt to equity (gearing) %:

EURm	2021	2020	2019
Interest-bearing liabilities			
Long-term interest-bearing liabilities	4 537	5 015	3 985
Short-term interest-bearing liabilities	116	561	292
Total cash and current financial investments			
Cash and cash equivalents	(6 691)	(6 940)	(5 910)
Current financial investments	(2 577)	(1 121)	(97)
Net debt	(4 615)	(2 485)	(1 730)
Total capital and reserves attributable to the equity holders of the parent	17 360	12 465	15 325
Non-controlling interests	102	80	76
Shareholders' equity	17 462	12 545	15 401
Net debt to equity (gearing) %	(26.43)%	(19.81)%	(11.23)%

Free cash flow

Definition

Free cash flow is defined as Net cash from operating activities - purchases of property, plant and equipment and intangible assets (capital expenditures) + proceeds from sale of property, plant and equipment and intangible assets – purchase of non-current financial investments + proceeds from sale of non-current financial investments.

Purpose

Free cash flow is the cash that Nokia generates after net investments to tangible, intangible and non-current financial investments and it represents the cash available for distribution among its security holders. It is a measure of cash generation, working capital efficiency and capital discipline of the business.

Composition of free cash flow:

EURm	2021	2020	2019
Net cash from operating activities	2 625	1 759	390
Net capital expenditures			
Purchases of property, plant and equipment and intangible assets (capital expenditures)	(560)	(479)	(690)
Proceeds from sale of property, plant and equipment and intangible assets	103	13	39
Purchase of non-current financial investments	(77)	(59)	(180)
Proceeds from sale of non-current financial investments	277	122	144
Free cash flow	2 368	1 356	(297)

Capital expenditure

Definition

Purchases of property, plant and equipment and intangible assets (excluding assets acquired under business combinations).

Purpose

Capital expenditure is used to describe investments in profit-generating activities in the future.

Composition of capital expenditure:

EURm	2021	2020	2019
Purchases of property, plant and equipment and intangible assets	(560)	(479)	(690)
Capital expenditure	(560)	(479)	(690)

Comparable operating profit

Definition

Comparable operating profit excludes intangible asset amortization and other purchase price fair value adjustments, goodwill impairments, restructuring related charges and certain other items affecting comparability.

Purpose

We believe that our comparable operating profit provides meaningful supplemental information to both management and investors regarding Nokia's underlying business performance by excluding certain items of income and expenses that may not be indicative of Nokia's business operating results. Comparable operating profit is used also in determining management remuneration.

Composition of comparable operating profit:

EURm	2021	2020	2019
Operating profit	2 158	885	485
Amortization of acquired intangible assets	391	407	924
Restructuring and associated charges	263	651	502
Settlement of legal disputes	(80)	—	—
Gain on sale of fixed assets	(53)	—	—
Impairment and write-off of assets, net of reversals	45	241	29
Change in provisions related to past acquisitions	26	—	—
Fair value changes of legacy IPR fund	23	—	—
Gain on defined benefit plan amendment	—	(90)	(168)
Transaction and related costs, including integration costs	—	(11)	48
Product portfolio strategy costs	—	—	163
Operating model integration	—	—	12
Other	2	(2)	8
Comparable operating profit	2 775	2 081	2 003

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Consolidated income statement

For the year ended 31 December	Notes	2021 EURm	2020 EURm	2019 EURm
Net sales	5, 6	22 202	21 852	23 315
Cost of sales	7	(13 368)	(13 659)	(15 051)
Gross profit		8 834	8 193	8 264
Research and development expenses	7	(4 214)	(4 087)	(4 532)
Selling, general and administrative expenses	7	(2 792)	(2 898)	(3 219)
Other operating income ⁽¹⁾	9	443	126	173
Other operating expenses ⁽¹⁾	7, 9	(113)	(449)	(201)
Operating profit		2 158	885	485
Share of results of associated companies and joint ventures	32	9	22	12
Financial income ⁽¹⁾	10	43	165	169
Financial expenses ⁽¹⁾	10	(284)	(329)	(510)
Profit before tax		1 926	743	156
Income tax expense	11	(272)	(3 256)	(138)
Profit/(loss) for the year from continuing operations		1 654	(2 513)	18
Loss for the year from discontinued operations		(9)	(3)	(7)
Profit/(loss) for the year		1 645	(2 516)	11
Attributable to:				
Equity holders of the parent		1 623	(2 523)	7
Non-controlling interests		22	7	4
Earnings per share attributable to equity holders of the parent	12	EUR	EUR	EUR
Basic				
Continuing operations		0.29	(0.45)	0.00
Profit/(loss) for the year		0.29	(0.45)	0.00
Diluted				
Continuing operations		0.29	(0.45)	0.00
Profit/(loss) for the year		0.29	(0.45)	0.00

(1) In 2021 Nokia changed the presentation of certain items within other operating income and expenses and financial income and expenses. The comparative amounts for 2020 and 2019 have been recast accordingly. For more information, refer to Note 2, Significant accounting policies.

The notes are an integral part of these consolidated financial statements.

Consolidated statement of comprehensive income

For the year ended 31 December	Notes	2021 EURm	2020 EURm	2019 EURm
Profit/(loss) for the year		1 645	(2 516)	11
Other comprehensive income				
Items that will not be reclassified to profit or loss				
Remeasurements of defined benefit plans		3 040	624	414
Income tax related to items that will not be reclassified to profit or loss		(755)	(140)	(95)
Items that may be reclassified subsequently to profit or loss				
Translation differences		1 153	(1 232)	260
Net investment hedges		(249)	266	(58)
Cash flow and other hedges		–	15	(2)
Financial assets at fair value through other comprehensive income		7	47	8
Other increase, net		–	3	–
Income tax related to items that may be reclassified subsequently to profit or loss		2	25	11
Other comprehensive income/(loss), net of tax	20	3 198	(392)	538
Total comprehensive income/(loss) for the year		4 843	(2 908)	549
Attributable to:				
Equity holders of the parent		4 814	(2 914)	545
Non-controlling interests		29	6	4

The notes are an integral part of these consolidated financial statements.

Consolidated statement of financial position

As of 31 December	Notes	2021 EURm	2020 EURm
ASSETS			
Non-current assets			
Goodwill and intangible assets	13, 16	7 051	7 027
Property, plant and equipment	14, 16	1 924	1 783
Right-of-use assets	15, 16	884	805
Investments in associated companies and joint ventures	16, 32	243	233
Non-current financial investments	22	758	745
Deferred tax assets	11	1 272	1 822
Other non-current financial assets	22, 34	325	306
Defined benefit pension assets	25	7 740	5 038
Other non-current receivables	18	255	217
Total non-current assets		20 452	17 976
Current assets			
Inventories	17	2 392	2 242
Trade receivables	22, 34	5 382	5 503
Contract assets	6, 34	1 146	1 080
Other current receivables	18	859	850
Current income tax assets	11	214	265
Other current financial assets	22, 23, 34	336	214
Current financial investments	22, 34	2 577	1 121
Cash and cash equivalents	22, 34	6 691	6 940
Total current assets		19 597	18 215
Total assets		40 049	36 191
SHAREHOLDERS' EQUITY AND LIABILITIES			
Capital and reserves attributable to equity holders of the parent			
Share capital		246	246
Share premium		454	443
Treasury shares		(352)	(352)
Translation differences		(396)	(1 295)
Fair value and other reserves		4 219	1 910
Reserve for invested unrestricted equity		15 726	15 656
Accumulated deficit		(2 537)	(4 143)
Total capital and reserves attributable to equity holders of the parent		17 360	12 465
Non-controlling interests		102	80
Total equity	19	17 462	12 545
Non-current liabilities			
Long-term interest-bearing liabilities	21, 22, 34	4 537	5 015
Long-term lease liabilities	21	824	721
Deferred tax liabilities	11	282	260
Defined benefit pension and post-employment liabilities	25	3 408	4 046
Contract liabilities	6	354	566
Deferred revenue and other non-current liabilities	22, 26	436	541
Provisions	27	645	736
Total non-current liabilities		10 486	11 885
Current liabilities			
Short-term interest-bearing liabilities	21, 22, 34	116	561
Short-term lease liabilities	21	185	189
Other financial liabilities	22, 23, 34	762	738
Current income tax liabilities	11	202	188
Trade payables	22, 34	3 679	3 174
Contract liabilities	6	2 293	2 394
Deferred revenue and other current liabilities	22, 26	3 940	3 721
Provisions	27	924	796
Total current liabilities		12 101	11 761
Total liabilities		22 587	23 646
Total shareholders' equity and liabilities		40 049	36 191

The notes are an integral part of these consolidated financial statements.

Consolidated statement of cash flows

For the year ended 31 December	Notes	2021 EURm	2020 EURm	2019 EURm
Cash flow from operating activities				
Profit/(loss) for the year		1 645	(2 516)	11
Adjustments, total	29	1 713	5 267	2 627
Change in net working capital ⁽¹⁾				
Decrease/(Increase) in receivables		239	(418)	159
(Increase)/Decrease in inventories		(48)	553	285
Decrease in non-interest-bearing liabilities		(459)	(845)	(2 232)
Cash from operations		3 090	2 041	850
Interest received		41	33	57
Interest paid	15, 21	(192)	(35)	(1)
Income taxes paid, net		(314)	(280)	(516)
Net cash from operating activities		2 625	1 759	390
Cash flow from investing activities				
Purchase of property, plant and equipment and intangible assets		(560)	(479)	(690)
Proceeds from sale of property, plant and equipment and intangible assets		103	13	39
Acquisition of businesses, net of cash acquired		(33)	(104)	–
Proceeds from disposal of businesses, net of disposed cash		–	11	19
Purchase of current financial investments		(1 845)	(1 154)	(473)
Proceeds from maturities and sale of current financial investments		398	123	991
Purchase of non-current financial investments		(77)	(59)	(180)
Proceeds from sale of non-current financial investments		277	122	144
Foreign exchange hedging of cash and cash equivalents ⁽²⁾		(77)	79	(123)
Other		19	10	(17)
Net cash used in investing activities		(1 795)	(1 438)	(290)
Cash flow from financing activities				
Purchase of equity instruments of subsidiaries		–	(1)	(1)
Proceeds from long-term borrowings	21	17	1 595	1 039
Repayment of long-term borrowings	21	(927)	(246)	(766)
(Repayment of)/proceeds from short-term borrowings	21	(67)	(83)	40
Payment of principal portion of lease liabilities	15, 21	(226)	(234)	(221)
Dividends paid		(9)	(148)	(570)
Net cash (used in)/from financing activities		(1 212)	883	(479)
Translation differences ⁽²⁾		133	(174)	28
Net (decrease)/increase in cash and cash equivalents		(249)	1 030	(351)
Cash and cash equivalents as of 1 January		6 940	5 910	6 261
Cash and cash equivalents as of 31 December		6 691	6 940	5 910

(1) Net working capital includes both short-term and long-term items.

(2) In 2021, Nokia changed the presentation of the cash flows relating to foreign exchange hedging of cash and cash equivalents from translation differences to cash flow from investing activities. The comparative amounts for 2020 and 2019 have been reclassified accordingly. Refer to Note 2, Significant accounting policies.

The items in the consolidated statement of cash flows do not directly correspond to the changes in the respective items in the consolidated statement of financial position due to several reasons such as presentation not on accrual basis in the consolidated statement of cash flows, the effects of foreign exchange differences arising on consolidation and changes in the consolidation scope. The consolidated statement of cash flows combines cash flows from both the continuing and the discontinued operations.

The notes are an integral part of these consolidated financial statements.

Consolidated statement of changes in shareholders' equity

EURm	Notes	Share capital	Share premium	Treasury shares	Translation differences	Fair value and other reserves	Reserve for invested unrestricted equity	Accumulated deficit	Attributable to equity holders of the parent	Non-controlling interests	Total equity
As of 1 January 2019		246	436	(408)	(592)	1 063	15 606	(1 058)	15 293	82	15 375
Profit for the year								7	7	4	11
Other comprehensive income	19, 20				220	319		(1)	538		538
Total comprehensive income for the year		–	–	–	220	319	–	6	545	4	549
Share-based payments			81						81		81
Excess tax benefit on share-based payments			(7)						(7)		(7)
Settlement of share-based payments			(83)	56			1		(26)		(26)
Dividends	19							(560)	(560)	(10)	(570)
Other movements								(1)	(1)		(1)
Total transactions with owners		–	(9)	56	–	–	1	(561)	(513)	(10)	(523)
As of 31 December 2019		246	427	(352)	(372)	1 382	15 607	(1 613)	15 325	76	15 401
Loss for the year								(2 523)	(2 523)	7	(2 516)
Other comprehensive loss	19, 20				(922)	528		3	(391)	(1)	(392)
Total comprehensive loss for the year		–	–	–	(922)	528	–	(2 520)	(2 914)	6	(2 908)
Share-based payments			76						76		76
Excess tax benefit on share-based payments			2						2		2
Settlement of share-based payments			(62)				49		(13)		(13)
Dividends	19								–	(5)	(5)
Acquisition of non-controlling interests								(10)	(10)		(10)
Investment in subsidiary by non-controlling interest									–	2	2
Other movements					(1)				(1)	1	–
Total transactions with owners		–	16	–	(1)	–	49	(10)	54	(2)	52
As of 31 December 2020		246	443	(352)	(1 295)	1 910	15 656	(4 143)	12 465	80	12 545
Profit for the year								1 623	1 623	22	1 645
Other comprehensive income	19, 20				899	2 309		(17)	3 191	7	3 198
Total comprehensive income for the year		–	–	–	899	2 309	–	1 606	4 814	29	4 843
Share-based payments			108						108		108
Settlement of share-based payments			(97)				70		(27)		(27)
Dividends	19								–	(7)	(7)
Total transactions with owners		–	11	–	–	–	70	–	81	(7)	74
As of 31 December 2021		246	454	(352)	(396)	4 219	15 726	(2 537)	17 360	102	17 462

The notes are an integral part of these consolidated financial statements.

Notes to consolidated financial statements

1. Corporate information

Nokia Corporation, a public limited liability company incorporated and domiciled in Helsinki, Finland, is the parent company (Parent Company or Parent) for all its subsidiaries (Nokia or the Group). Nokia is a global provider of mobile, fixed and cloud network solutions combining hardware, software and services, as well as licensing of intellectual property, including patents, technologies and the Nokia brand. Nokia's operational headquarters are located in Espoo, Finland. The shares of Nokia Corporation are listed on the Nasdaq Helsinki Stock Exchange, the New York Stock Exchange and the Euronext Paris Stock Exchange.

These consolidated financial statements for the year ended 31 December 2021 were authorized for issuance and filing by the Board of Directors on 3 March 2022.

2. Significant accounting policies

Basis of presentation and statement of compliance

The consolidated financial statements are prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB) and as adopted by the European Union (EU). The consolidated financial statements are presented in millions of euros (EURm), except as otherwise noted, and are prepared under the historical cost convention, except as disclosed in the accounting policies below. The notes to the consolidated financial statements also conform to the Finnish accounting and company legislation.

In 2021, Nokia reviewed the presentation of certain items in its consolidated income statement and consolidated statement of cash flows. As a result, Nokia made the following reclassifications to enhance the relevance of information provided:

In respect of the consolidated income statement, Nokia reclassified certain items between other operating income and expenses. Gains and losses from unlisted venture funds that were previously presented as other operating income and other operating expenses, respectively, are presented on a net basis as other operating income. Foreign exchange gains and losses on hedging forecasted sales and purchases that were previously presented as other operating income and other operating expenses, respectively, are presented on a net basis as other operating expenses. Expected credit losses on trade receivables that were presented as other operating income if the amount of expected credit losses decreased and as other operating expenses if the amount of expected credit losses increased, are presented as other operating expenses regardless of the direction of change. The comparative amounts for 2020 and 2019 have been recast accordingly. In total other operating income and other operating expenses decreased by EUR 24 million and EUR 64 million in 2020 and 2019, respectively, as a result of the reclassifications.

Additionally, in respect of the consolidated income statement, Nokia reclassified certain items between financial income and expenses. Negative interest on financial investments that were previously presented as part of interest income on financial investments, are presented as a separate line item in financial expenses. The comparative amounts for 2020 and 2019 have been recast accordingly. Financial income and financial expenses increased by EUR 9 million and EUR 4 million, in 2020 and 2019, respectively, as a result of the reclassifications.

In respect of the consolidated statement of cash flows, Nokia reclassified the results of foreign exchange hedging of cash and cash flows that were previously presented in translation differences to the cash flow from investing activities. The comparative amounts for 2020 and 2019 have been reclassified accordingly. Related to 2020, as a result of the reclassification, the net cash used in investing activities decreased by EUR 79 million and translation differences changed by EUR -79 million compared to the previously reported amounts. Related to 2019, as a result of the reclassification, the net cash used in investing activities increased by EUR 123 million and translation differences changed by EUR 123 million compared to the previously reported amounts.

In 2020, Nokia reviewed the presentation of income and expenses related to its restructuring plans, pension plan curtailments and amendments as well as certain asset impairments. As a result, Nokia reclassified the restructuring and associated charges, pension curtailment and plan amendment income and expenses as well as certain impairment charges that were previously presented in other operating income and expenses to the functional line items to enhance the relevance of information provided in its consolidated income statement. The comparative amounts for 2019 were reclassified accordingly. As a result, cost of sales increased by EUR 62 million, research and development expenses increased by EUR 121 million, selling, general and administrative expenses increased by EUR 118 million, other operating income decreased by EUR 187 million and other operating expenses decreased by EUR 488 million compared to the amounts presented in Nokia's consolidated financial statements for 2019.

Other information

This paragraph is included in connection with statutory reporting requirements in Germany. The fully consolidated German subsidiary, Nokia Solutions and Networks GmbH & Co. KG, registered in the commercial register of Munich under HRA 88537, has made use of the exemption available under § 264b and § 291 of the German Commercial Code (HGB).

Principles of consolidation

The consolidated financial statements comprise the financial statements of the Parent Company, and each of those companies over which it exercises control. Control over an entity exists when Nokia is exposed, or has rights, to variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. When Nokia has less than a majority of voting or similar rights in an entity, it considers all relevant facts and circumstances in assessing whether it has power over an entity, including the contractual arrangements, and voting rights and potential voting rights. Nokia reassesses whether or not it controls an entity if facts and circumstances indicate that there are changes to the elements of control.

Consolidation of a subsidiary begins when Nokia obtains control over the subsidiary and ceases when it loses control over the subsidiary. Assets, liabilities, income and expenses of a subsidiary acquired or disposed of during the year are included in the consolidated financial statements from the date Nokia gains control until the date Nokia ceases to control the subsidiary. A change in the ownership interest of a subsidiary, without a loss of control, is accounted for as an equity transaction. If Nokia loses control in a subsidiary, the related assets, liabilities, non-controlling interest and other components of equity are derecognized with any gain or loss recognized in the consolidated income statement. Any investment retained in the former subsidiary is measured at fair value.

All intercompany transactions are eliminated as part of the consolidation process. Non-controlling interests are presented separately as a component of net profit or loss and are shown as a component of shareholders' equity in the consolidated statement of financial position.

Business combinations

Business combinations are accounted for using the acquisition method. The consideration transferred in a business combination is measured as the aggregate of the fair values of the assets transferred, liabilities incurred towards the former owners of the acquired entity or business and equity instruments issued. Acquisition-related costs are recognized as expenses in the consolidated income statement in the period in which the costs are incurred and the related services are received with the exception of costs directly attributable to the issuance of equity instruments that are accounted for as a deduction from equity.

Identifiable assets acquired and liabilities assumed are measured at the acquisition date fair values. Nokia elects whether to measure the non-controlling interests in the acquiree at fair value or at the proportionate share of the acquiree's identifiable net assets on a business combination by business combination basis. The excess of the aggregate of the consideration transferred and the amount recognized for non-controlling interests over the acquisition date fair values of the identifiable net assets acquired is recorded as goodwill.

Investments in associates and joint ventures

An associate is an entity over which Nokia exercises significant influence. Significant influence is the power to participate in the financial and operating policy decisions of the entity, but is not control or joint control over those policies.

A joint venture is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the arrangement. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about relevant activities require the unanimous consent of the parties sharing control.

Nokia's investments in associates and joint ventures are accounted for using the equity method. Under the equity method, the investment in an associate or joint venture is initially recognized at cost. The carrying amount of the investment is adjusted to recognize changes in Nokia's share of net assets of the associate or joint venture since the acquisition date. Nokia's share of profits and losses of associates and joint ventures is included in the consolidated income statement outside operating profit or loss. Any change in other comprehensive income of associates and joint ventures is presented as part of Nokia's other comprehensive income.

After application of the equity method, as of each reporting date, Nokia determines whether there is objective evidence that the investment in an associate or joint venture is impaired. If there is such evidence, Nokia recognizes an impairment loss that is calculated as the difference between the recoverable amount of the associate or joint venture and its carrying value. The impairment loss is presented within share of results of associated companies and joint ventures in the consolidated income statement.

Non-current assets (or disposal groups) held for sale and discontinued operations

Non-current assets or disposal groups are classified as assets held for sale if their carrying amounts will be recovered principally through a sale transaction rather than through continuing use. For this to be the case, the asset, or the disposal group, must be available for immediate sale in its present condition subject only to terms that are usual and customary for sales of such assets or disposal groups, and the sale must be highly probable. These assets, or in the case of disposal groups, assets and liabilities, are presented separately in the consolidated statement of financial position and measured at the lower of the carrying amount and fair value less costs to sell. Non-current assets classified as held for sale, or included in a disposal group classified as held for sale, are not depreciated or amortized.

Discontinued operation is reported when a component of Nokia, comprising operations and cash flows that can be clearly distinguished both operationally and for financial reporting purposes from the rest of Nokia, has been disposed of or is classified as held for sale, and that component represents a major line of business or geographical area of operations or is part of a single coordinated plan to dispose of a separate major line of business or geographical area of operations. Profit or loss from discontinued operations is reported separately from income and expenses from continuing operations in the consolidated income statement, with prior periods presented on a comparative basis. Intra-group revenues and expenses between continuing and discontinued operations are eliminated.

Discontinued operations presented in the consolidated income statement for 2021, 2020 and 2019 comprise the financial results related to the HERE business and the D&S business. Nokia sold its HERE digital mapping and location services business to a German automotive industry consortium comprised of AUDI AG, BMW Group and Daimler AG in a transaction that was completed on 4 December 2015. Nokia sold substantially all of its Devices & Services business to Microsoft in a transaction that was completed on 25 April 2014. The timing and amount of financial effects related to these operations are largely dependent upon external factors such as final outcomes of uncertain tax positions.

Revenue recognition

Nokia accounts for a contract with a customer when the contract has been approved in writing, which is generally when both parties are committed to perform their respective obligations, the rights, including payment terms, regarding the goods and services to be transferred can be identified, the contract has commercial substance, and collection of the consideration to which Nokia expects to be entitled is probable. Management considers only legally enforceable rights in evaluating the accounting for contracts with customers. As such, frame agreements that do not create legally enforceable rights and obligations are accounted for based on the issuance of subsequent legally binding purchase orders under the frame agreements.

A contract modification or a purchase order is accounted for as a separate contract if the scope of the contract increases by additional distinct goods or services, and the price of the contract increases by an amount that reflects the standalone selling price of those additional goods or services. In case the additional goods or services are distinct but not sold at a standalone selling price, the contract modification is accounted for prospectively. In cases where the additional goods or services are not distinct, the modification is accounted for through a cumulative catch-up adjustment.

Nokia recognizes revenue from contracts with customers to reflect the transfer of promised goods and services to customers for amounts that reflect the consideration to which Nokia expects to be entitled in exchange for those goods and services. The consideration may include a variable

amount, which Nokia estimates based on the most likely amount. Items causing variability include volume discounts and sales-based or usage-based royalties. Nokia includes variable consideration into the transaction price only to the extent that it is highly probable that a significant revenue reversal will not occur. The transaction price also excludes amounts collected on behalf of third parties.

Nokia's payment terms are 80 days on average. Invoices are generally issued as control transfers and/or as services are rendered. When this is not the case, Nokia recognizes a contract asset or a contract liability depending on the timing of payment versus transfer of control. In case the timing of payments provides either the customer or Nokia with a significant benefit of financing, the transaction price is adjusted for the effect of financing and the related interest revenue or interest expense is presented separately from revenue. As a practical expedient, Nokia does not account for financing components if, at contract inception, the consideration is expected to be received within one year before or after the goods or services have been transferred to the customer.

Nokia enters into contracts with customers consisting of any combination of hardware, services and intellectual property. The associated revenue recognized for such contracts depends on the nature of the underlying goods and services provided. The promised goods or services in the contract might include sale of goods, license of intellectual property and grant of options to purchase additional goods or services that may provide the customer with a material right. Nokia conducts an assessment at contract inception to determine which promised goods and services in a customer contract are distinct and accordingly identified as performance obligations. Nokia considers that goods and services are distinct if the customer can benefit from the good or service either on its own or together with other resources readily available, and if Nokia's promise to transfer the good or service is separately identifiable from other promises in the contract.

Nokia allocates the transaction price to each distinct performance obligation on the basis of their standalone selling prices, relative to the overall transaction price. If a standalone selling price is not observable, it is estimated. The transaction price may include a discount or a variable amount of consideration that is generally allocated proportionately to all performance obligations in the contract unless Nokia has observable evidence that the entire discount relates to only one or more, but not all, performance obligations in a contract.

Revenue is recognized when, or as, Nokia satisfies a performance obligation by transferring a promised good or service to a customer, which is when the customer obtains control of that good or service. The amount of revenue recognized is the amount allocated to the satisfied performance obligation based on the relative standalone selling prices. A performance obligation may be satisfied at a point in time or over time.

Hardware and software sold by Nokia includes warranty, which can either be assurance-type for repair of defects and recognized as a centralized warranty provision (refer to Note 27, Provisions), or service-type for scope beyond the repair of defects or for a time period beyond the standard assurance-type warranty period and considered a separate performance obligation within the context of the contract. Revenue is allocated to each performance obligation based on its standalone selling price in relation to the overall transaction price. The standalone selling price of each performance obligation is determined by considering factors such as the price of the performance obligation if sold on a standalone basis and the expected cost of the performance obligation plus a reasonable margin when price references are not available. The portion of the transaction price allocated to each performance obligation is then recognized when the revenue recognition criteria for that performance obligation have been met.

Nokia presents its customer contracts in the consolidated statement of financial position as either a contract asset or a contract liability, depending on the relationship between Nokia's performance and the customer's payment for each individual contract. On a net basis, a contract asset position represents where Nokia has performed by transferring goods or services to a customer before the customer has provided the associated consideration or before payment is due. Conversely, a contract liability position represents where a customer has paid consideration or payment is due, but Nokia has not yet transferred goods or services to the customer. Contract assets presented in the consolidated statement of financial position are current in nature while contract liabilities can be either current or non-current. Invoiced receivables represent unconditional rights to payment and are presented separately as trade receivables in the consolidated statement of financial position.

Sale of products

Nokia manufactures and sells a range of networking equipment, covering the requirements of network operators. Revenue for these products is recognized when control of the products has transferred, the determination of which may require judgment. Typically, for standard equipment sales, control transfers upon delivery. For more complex solutions, control generally transfers upon acceptance.

In some arrangements, mainly within the Submarine Networks business, Nokia's performance does not create an asset with an alternative use and Nokia recognizes revenue over time using the output method, which faithfully depicts the manner in which the asset is transferred to the customer as well as Nokia's enforceable rights to payment for the work completed to date. The output measure selected by Nokia for each contract may vary depending on the nature of the contract.

Sale of services

Nokia provides services related to the provision of networking equipment, ranging from managing a customer's network and product maintenance services to network installation, integration and optimization. Revenue for each separate service performance obligation is recognized as or when the customer obtains the benefits of Nokia's performance. Service revenue is recognized over time for managed and maintenance services, as in these cases Nokia performs throughout a fixed contract term and the customer simultaneously receives and consumes the benefits as Nokia performs. In some cases, Nokia performs services that are subject to customer acceptance where revenue is recognized when the customer acceptance is received.

Sale of intellectual property licenses

Nokia provides its customers with licenses to intellectual property (IP) owned by Nokia by granting software licenses and rights to benefit from Nokia's IP in their products. When a software license is sold, revenue is recognized upon delivery or acceptance of the software, as Nokia has determined that each software release is distinct and the license is granted for software as it exists when the control transfers to the customer.

When Nokia grants customers a license to use IP owned by Nokia, the associated license fee revenue is recognized in accordance with the substance of the relevant agreements. In the majority of cases, Nokia retains obligations to continue to develop and make available to the customer the latest IP in the licensed assets during the contract term, and therefore revenue is recognized pro rata over the period during which Nokia is expected to perform. Recognition of the revenue as pro rata over the term of the license is considered the most faithful depiction of Nokia's satisfaction of the performance obligation as the IP being licensed towards the customer includes new inventions patented by Nokia that are highly

interdependent and interrelated and created through the course of continuous research and development (R&D) efforts that are relatively stable throughout the year. In some contracts, Nokia has no remaining obligations to perform after granting a license to the initial IP, and licensing fees are non-refundable. In these cases, revenue is recognized at the beginning of the license term.

Government grants

Government grants are recognized when there is reasonable assurance that Nokia will comply with the conditions attached to them and the grants will be received. Government grants received as compensation for expenses or losses incurred are recognized in the consolidated income statement as a deduction against the related expenses except for certain non-recurring grants that are recognized as other operating income. Government grants related to assets are presented in the consolidated statement of financial position as deferred income and recognized as income over the same period the asset is depreciated or amortized.

Government grants received in the form of R&D tax credits are recognized as a deduction against R&D expenses if the amount of the tax credit is linked to the amount of R&D expenditures incurred by Nokia and the tax credit is a fully collectible asset that will be paid in cash by the government in case Nokia is not able to offset it against its income tax payable. R&D tax credits that do not meet both conditions are recognized as income tax benefit.

Employee benefits

Pensions and other post-employment benefits

Nokia has various post-employment plans in accordance with the local conditions and practices in the countries in which it operates. The plans are generally funded through payments to insurance companies or contributions to trustee-administered funds as determined by periodic actuarial calculations.

In a defined contribution plan, Nokia's legal or constructive obligation is limited to the amount that it agrees to contribute to the fund. Nokia's contributions to defined contribution plans, multi-employer and insured plans are recognized in the consolidated income statement in the period to which the contributions relate. If a pension plan is funded through an insurance contract where Nokia does not retain any legal or constructive obligations, the plan is treated as a defined contribution plan. All arrangements that do not fulfill these conditions are considered defined benefit plans.

For defined benefit plans, including pension and post-employment healthcare and life insurance, costs are assessed using the projected unit credit method: the cost is recognized in the consolidated income statement so as to spread the benefit over the service lives of employees. The defined benefit obligation is measured as the present value of the estimated future cash outflows using interest rates on high-quality corporate bonds or government bonds with maturities that most closely match expected payouts of benefits. The defined benefit plan asset is measured at fair market value as of the reporting date. Assets invested in alternative asset classes such as private equity, real estate and absolute return, are measured using latest available valuations provided by the asset managers, reviewed by Nokia, and adjusted for subsequent cash flows. The liability or asset recognized in the consolidated statement of financial position is the present value of the defined benefit obligation as of the reporting date less the fair value of plan assets including effects of any asset ceiling.

Service cost related to employees' service in the current period as well as past service cost resulting from plan amendments, curtailments, and gains and losses on settlements are all presented within cost of sales, research and development expenses or selling, general and administrative expenses in the consolidated income statement. Past service costs are recognized immediately in the consolidated income statement when the plan amendment, curtailment or settlement occurs. Net interest, consisting of interest calculated by applying a discount rate to the net defined benefit liability or asset and the effect of asset ceiling, as well as pension plan administration costs not taken into account in determining the return on plan assets, are presented within financial income and expenses in the consolidated income statement. Remeasurements, comprising actuarial gains and losses, the effect of the asset ceiling and the return on plan assets, excluding amounts recognized in net interest, are recognized immediately in the consolidated statement of financial position with a corresponding debit or credit to pension remeasurements reserve within shareholders' equity through other comprehensive income in the period in which they occur. Remeasurements are not reclassified to profit or loss in subsequent periods.

Actuarial valuations for Nokia's defined benefit post-employment plans are performed annually or when a material plan amendment, curtailment or settlement occurs.

Termination benefits

Termination benefits are payable when employment is terminated before the normal retirement date, or whenever an employee accepts voluntary redundancy in exchange for these benefits. Nokia recognizes termination benefits when it is demonstrably committed to either terminating the employment of current employees according to a detailed formal plan without possibility of withdrawal, or providing termination benefits as a result of an offer made to encourage voluntary redundancy. These benefits are recorded as termination benefits as a component of the restructuring provision. Local laws may provide employees with the right to benefits from the employer upon termination whether the termination is voluntary or involuntary. For these specific benefits, the difference between the value of the higher benefit for involuntary termination and the lower benefit for voluntary termination is treated as a termination benefit and the portion of the benefit that Nokia would be required to pay to the employee in the case of voluntary termination is treated as a contractual or legal obligation determined by local law and accounted for as a defined benefit arrangement as described in the pensions section above.

Share-based payments

Nokia offers three types of global equity-settled share-based compensation plans for employees: performance shares, restricted shares and the employee share purchase plan.

Employee services received and the corresponding increase in equity are measured by reference to the fair value of the equity instruments as of the grant date, excluding the impact of any non-market vesting conditions. Non-market vesting conditions attached to the performance shares are included in assumptions about the number of shares that the employee will ultimately receive. Nokia reviews the assumptions made on a regular basis and, where necessary, revises its estimates of the number of performance shares that are expected to be settled. Plans that apply tranching

vesting are accounted for under the graded vesting model. Share-based compensation is recognized as an expense in the consolidated income statement over the relevant service periods.

Income taxes

Income tax expense comprises current tax and deferred tax. Tax is recognized in the consolidated income statement except to the extent that it relates to items recognized in other comprehensive income, or directly in equity, in which case the related tax is recognized in other comprehensive income or equity, respectively.

Current taxes are based on the results of the Group companies and are calculated using the local tax laws and tax rates that are enacted or substantively enacted as of the reporting date. Corporate taxes withheld at the source of the income on behalf of the Group companies are accounted for as income taxes when determined to represent a tax on net income.

Deferred tax assets and liabilities are determined using the balance sheet liability method for all temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. Deferred tax assets are recognized to the extent it is probable that future taxable profit will be available against which the unused tax losses, unused tax credits and deductible temporary differences can be utilized in the relevant jurisdictions. Deferred tax assets are assessed for realizability as of each reporting date. When facts and circumstances indicate it is no longer probable that deferred tax assets will be utilized, adjustments are made as necessary. Deferred tax liabilities are recognized for taxable temporary differences, and for temporary differences that arise between the fair value and the tax base of identifiable net assets acquired in business combinations.

Deferred tax liabilities are not recognized if they arise from the initial recognition of goodwill. Deferred tax liabilities are provided on taxable temporary differences arising from investments in subsidiaries, associates and joint arrangements, except for deferred tax liability where the timing of the reversal of the temporary difference is controlled by Nokia, and it is probable that the temporary difference will not reverse in the foreseeable future.

Deferred tax assets and deferred tax liabilities are measured using the enacted or substantively enacted tax rates as of the reporting date that are expected to apply in the period when the asset is realized or the liability is settled. Deferred tax assets and liabilities are not discounted.

Deferred tax assets and deferred tax liabilities are offset for presentation purposes when there is a legally enforceable right to set off current tax assets against current tax liabilities, and the deferred tax assets and deferred tax liabilities relate to income taxes levied by the same taxation authority on either the same taxable entity or different taxable entities, which intend either to settle current tax liabilities and assets on a net basis, or to realize the assets and settle the liabilities simultaneously in each future period in which significant amounts of deferred tax liabilities or deferred tax assets are expected to be settled or recovered.

Nokia periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation. It adjusts the amounts of current and deferred tax assets and liabilities recorded, where it is considered probable, i.e. more likely than not, that certain tax positions may not be fully sustained upon review by tax authorities. The amounts recorded are based on the most likely amount or the expected value, depending on which method Nokia expects to better predict the resolution of the uncertainty, as of each reporting date.

Foreign currency translation

Functional and presentation currency

The financial statements of all Group companies are measured using functional currency, which is the currency of the primary economic environment in which the entity operates. The consolidated financial statements are presented in euro, the functional and presentation currency of the Parent Company.

Transactions in foreign currencies

Transactions in foreign currencies are recorded at exchange rates prevailing at the dates of the individual transactions. For practical reasons, a rate that approximates the actual rate at the date of the transaction is often used. Monetary assets and liabilities denominated in foreign currency are valued at the exchange rates prevailing at the end of the reporting period. Foreign exchange gains and losses arising from monetary assets and liabilities as well as fair value changes of related hedging instruments are recognized in financial income and expenses in the consolidated income statement. Unrealized foreign exchange gains and losses related to non-monetary non-current financial investments are included in the fair value measurement of these investments and recognized in other operating income and expenses in the consolidated income statement.

Foreign Group companies

On consolidation, the assets and liabilities of foreign operations whose functional currency is other than euro are translated into euro at the exchange rates prevailing at the end of the reporting period. The income and expenses of these foreign operations are translated into euro at the average exchange rates for the reporting period. The exchange differences arising from translation for consolidation are recognized as translation differences in the consolidated statement of comprehensive income. On disposal of a foreign operation the cumulative amount of translation differences relating to that disposal is reclassified to profit or loss.

Intangible assets

Intangible assets acquired separately are measured on initial recognition at cost. The cost of intangible assets acquired in a business combination is their fair value as of the date of acquisition. Internally generated intangibles, except for development costs that may be capitalized, are expensed as incurred. Development costs are capitalized only if Nokia has the technical feasibility to complete the asset; has an ability and intention to use or sell the asset; can demonstrate that the asset will generate future economic benefits; has resources available to complete the asset; and has the ability to measure reliably the expenditure during development.

The useful life of Nokia's intangible assets, other than goodwill, is finite. Following initial recognition, finite intangible assets are carried at cost less accumulated amortization and accumulated impairment losses. Intangible assets are amortized over their useful lives, generally three to ten years, using the straight-line method, which is considered to best reflect the pattern in which the asset's future economic benefits are expected to be consumed. Depending on the nature of the intangible asset, the amortization charges are presented within cost of sales, research and development expenses or selling, general and administrative expenses in the consolidated income statement.

Property, plant and equipment

Property, plant and equipment are stated at cost less accumulated depreciation and accumulated impairment losses. Depreciation is recorded on a straight-line basis over the expected useful lives of the assets as follows:

Buildings and constructions	
Buildings and constructions	20–33 years
Light buildings and constructions	3–20 years
Vessels	
Cable-laying vessels	15–40 years
Cable-laying accessories	4–10 years
Machinery and equipment	
Production machinery, measuring and test equipment	1–5 years
Other machinery and equipment	3–10 years

Land and water areas are not depreciated.

Maintenance, repairs and renewals are generally expensed in the period in which they are incurred. However, major renovations are capitalized and included in the carrying amount of the asset when it is probable that future economic benefits in excess of the originally assessed standard of performance of the existing asset will flow to Nokia. Major renovations are depreciated over the remaining useful life of the related asset. Leasehold improvements are depreciated over the shorter of the lease term and the useful life. Gains and losses on the disposal of property, plant and equipment are included in other operating income or expenses.

Leases

On 1 January 2019, Nokia adopted IFRS 16, Leases, which provides a single lessee accounting model, requiring lessees to recognize right-of-use assets and lease liabilities for all leases in the consolidated statement of financial position. The right-of-use asset represents the lessee's right to use the underlying leased asset while the lease liability represents the lessee's obligation to make lease payments.

Nokia assesses at contract inception whether a contract is, or contains, a lease i.e. Nokia assesses whether the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration. At the commencement date of the lease, Nokia recognizes a right-of-use asset and a lease liability for all leases with a lease term exceeding 12 months. The commencement date is the date when the lessor makes the underlying leased asset available for use by Nokia.

Nokia applies a practical expedient whereby leases for which the lease term is 12 months or less at the lease commencement date (short-term leases) are not recognized in its consolidated statement of financial position. Instead, Nokia recognizes the lease payments associated with short-term leases as an operating expense on a straight-line basis over the lease term. In addition, as a practical expedient, Nokia does not separate certain non-lease components from lease components but instead accounts for each lease component and associated specified non-lease component as a single lease component. Non-lease components such as payments for maintenance and services made in conjunction with the leased asset are included in the lease liability whenever these payments are fixed and defined in the lease contract. Other payments for non-lease components that are variable based on consumption, eg. property taxes, insurance payments and variable property service costs, are recognized as an expense when incurred.

The majority of Nokia's leased assets relate to commercial and industrial properties such as R&D facilities, production facilities and office buildings. Nokia also leases vehicles provided as employee benefits and service vehicles.

Right-of-use assets are measured at cost less accumulated depreciation and impairment losses, and adjusted for any remeasurements of the lease liabilities. The cost of right-of-use assets includes the amount of lease liabilities recognized, initial direct costs incurred, and lease payments made at or before the commencement date less any lease incentives received. Right-of-use assets are depreciated on a straight-line basis over the lease term as follows:

Buildings	3–15 years
Other	3–5 years

Lease liabilities are measured at the present value of lease payments to be made over the lease term. Nokia determines the lease term as the non-cancellable term of the lease, together with any periods covered by an option to extend the lease if it is reasonably certain to be exercised, as well as any periods covered by an option to terminate the lease if it is reasonably certain not to be exercised. The lease payments include fixed lease payments and certain fixed non-lease components less any lease incentives receivable, variable lease payments that depend on an index or a rate, and appropriate termination fees whenever the lease term has been determined based on the expectation that Nokia will exercise its option to terminate. Nokia does not generally enter into lease contracts with variable lease payments linked to future performance or use of an underlying asset.

After the commencement date, the amount of lease liabilities is measured on an amortized cost basis using the effective interest method where the lease liabilities increase related to the accretion of interest and decrease for lease payments made. In addition, the carrying amounts for the right-of-use asset and lease liability are remeasured if there is a modification, a change in the lease term or a change in the future lease payments resulting from a change in an index or rate used to determine such lease payments. The interest component of the lease payments is recognized as interest expense within financial expenses.

Nokia uses its incremental borrowing rate to calculate the present value of lease payments as the interest rate implicit in the lease is not readily determinable. Nokia estimates its incremental borrowing rate quarterly based on the rate of interest that Nokia would pay to borrow over the lease term with a similar security to obtain an asset of a similar value to the leased asset in a similar economic environment. Nokia measures all leases at amortized cost based on the appropriate discount rate available in the quarter when lease commencement occurred. Where a lease contract

modification or reassessment of the lease liability resulting from a change in the lease term occurs, Nokia remeasures the present value of the lease liability based on the appropriate discount rate available in the quarter when the reassessment or modification occurs.

Nokia acts primarily as a lessee in its leasing transactions. However, Nokia will enter into contracts to sublease vacant leasehold or freehold properties for sublease terms up to 10 years to offset or mitigate the unavoidable costs associated with those properties. In these cases, Nokia classifies each sublease as a finance lease whenever the sublease contract transfers substantially all the risks and rewards incidental to ownership to the subtenant. All other subleases are classified as operating leases.

Included within other financial assets in its consolidated statement of financial position, Nokia recognizes a net investment asset for all finance subleases based on the present value of future sublease payments at the sublease commencement date. After the commencement date, the net investment asset is measured on an amortized cost basis using the effective interest method where the net investment asset increases related to the accretion of interest income and decreases for sublease payments received. Sublease payments received from operating subleases is recognized as other operating income on a straight-line basis over the lease term.

Impairment of goodwill, intangible assets, property, plant and equipment and right-of-use assets

Nokia assesses the recoverability of the carrying value of goodwill, intangible assets, property, plant and equipment and right-of-use assets if events or changes in circumstances indicate that the carrying value may be impaired. In addition, Nokia tests the carrying value of goodwill for impairment annually even if there is no indication of impairment.

Factors that Nokia considers when it reviews indications of impairment include, but are not limited to, underperformance of the asset relative to its historical or projected future results, significant changes in the manner of using the asset or the strategy for the overall business, and significant negative industry or economic trends.

Goodwill is allocated to the cash-generating units or groups of cash-generating units that are expected to benefit from the synergies of the related business combination and that reflect the lowest level at which goodwill is monitored for internal management purposes. A cash-generating unit, as determined for the purposes of Nokia's goodwill impairment testing, is the smallest group of assets generating cash inflows that are largely independent of the cash inflows from other assets or groups of assets. The carrying value of a cash-generating unit includes its share of relevant corporate assets allocated to it on a reasonable and consistent basis. When the composition of one or more groups of cash-generating units to which goodwill has been allocated is changed, the goodwill is reallocated based on the relative fair value of the affected groups of cash-generating units.

Nokia conducts its impairment testing by determining the recoverable amount for an asset, a cash-generating unit or groups of cash-generating units. The recoverable amount of an asset, a cash-generating unit or groups of cash-generating units is the higher of its fair value less costs of disposal and its value-in-use. The recoverable amount is compared to the asset's, cash-generating unit's or groups of cash-generating units' carrying value. If the recoverable amount for the asset, cash-generating unit or groups of cash-generating units is less than its carrying value, the asset is considered impaired and is written down to its recoverable amount. Impairment losses are presented in cost of sales, research and development expenses or selling, general and administrative expenses in the consolidated income statement, except for impairment losses on goodwill, which are presented in other operating expenses.

Inventories

Inventories are stated at the lower of cost and net realizable value. Cost is determined using standard cost, which approximates actual cost on a first-in first-out (FIFO) basis. Net realizable value is the amount that can be realized from the sale of the inventory in the normal course of business after allowing for the costs of realization. In addition to the cost of materials and direct labor, an appropriate proportion of production overhead is included in the cost of inventory. An allowance is recorded for excess inventory and obsolescence based on the lower of cost and net realizable value.

Nokia classifies its inventories to raw materials and semi-finished goods, finished goods, and contract work in progress. Raw materials and semi-finished goods include purchased materials, components and supplies to be used in production. Finished goods include goods manufactured by Nokia or by subcontractors that are ready for sale and goods purchased for resale. Contract work in progress includes costs incurred to date for customer contracts where the contractual performance obligations are not yet satisfied. Contract work in progress will be recognized as cost of sales when control of the related performance obligation is transferred to the customer.

Fair value measurement of financial instruments

A number of financial instruments are measured at fair value as of each reporting date after initial recognition. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The fair value of an asset or a liability is measured using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest, by using quoted market rates, discounted cash flow analyses and other appropriate valuation models. Nokia uses valuation techniques that are appropriate in the circumstances and for which sufficient data is available to measure fair value, maximizing the use of relevant observable inputs and minimizing the use of unobservable inputs. All financial assets and liabilities for which fair values are being measured or disclosed in the consolidated financial statements are categorized within the fair value hierarchy, described as follows, based on the lowest level input that is significant to the fair value measurement as a whole:

Level 1—Quoted (unadjusted) market prices for exchange-traded products in active markets for identical assets or liabilities;

Level 2—Valuation techniques for which significant inputs other than quoted prices are directly or indirectly observable; and

Level 3—Valuation techniques for which significant inputs are unobservable.

Nokia categorizes assets and liabilities that are measured at fair value on a recurring basis into an appropriate level of the fair value hierarchy at the end of each reporting period.

Classification and measurement of financial assets

Nokia has classified its financial assets that are debt instruments in the following three categories: financial assets measured at amortized cost, financial assets measured at fair value through other comprehensive income, and financial assets measured at fair value through profit and loss. Nokia has classified its financial assets that are equity instruments to financial assets measured at fair value through profit and loss. The selection of the appropriate category is made based on both Nokia's business model for managing the financial asset and on the contractual cash flow characteristics of the asset.

Nokia's business model for managing financial assets is defined on a portfolio level. The business model must be observable on a practical level by the way the business is managed. The cash flows of financial assets measured at amortized cost are solely payments of principal and interest. These assets are held within a business model that has an objective to hold assets to collect contractual cash flows. Financial assets measured at fair value through other comprehensive income have cash flows that are solely payments of principal and interest and these assets are held within a business model that has an objective that is achieved both by holding financial assets to collect contractual cash flows and selling financial assets. Financial assets measured at fair value through profit and loss are assets that do not fall in either of these two categories. In addition to the classification as described above, the accounting for financial assets is impacted if the financial asset is part of a hedging relationship (see below the section on Hedge accounting).

All purchases and sales of financial assets are recorded on the trade date, that is, when Nokia commits to purchase or sell the asset. A financial asset is derecognized when substantially all the risks and rewards related to the financial asset have been transferred to a third party that assumes control of the financial asset.

Non-current financial investments

Non-current financial investments include investments in unlisted private equity shares and unlisted venture funds. As these equity and debt investments do not fulfil the criteria of being solely payments of principal and interest, they are classified as fair value through profit and loss and are initially recognized and subsequently remeasured at fair value.

Fair value is estimated using a number of methods, including, but not limited to: quoted market rates; the current market value of similar instruments; prices established from a recent arm's-length financing transaction of target companies; and analysis of market prospects and operating performance of target companies, taking into consideration public market comparable companies in similar industry sectors. Nokia uses judgment in selecting the appropriate valuation methodology as well as underlying assumptions based on existing market practice and conditions.

Fair value adjustments, foreign exchange gains and losses as well as realized gains and losses from the disposal of these investments are recognized within other operating income and expenses in the consolidated income statement.

Other non-current financial assets

Other non-current financial assets include restricted assets and other receivables, customer and vendor financing related loan receivables and certain other investments of a long-term nature.

Restricted assets and other receivables include restricted bank deposits primarily related to employee benefits as well as other loan receivables. These assets are initially measured at fair value and in subsequent periods at amortized cost using the effective interest method. Interest calculated using the effective interest method as well as foreign exchange gains and losses are recognized in financial income and expenses in the consolidated income statement. For these assets, a loss allowance is calculated on a quarterly basis based on a review of collectability and available collateral, recorded as an adjustment to the carrying amount of the investment and recognized in other financial expenses in the consolidated income statement.

Customer- and vendor-related loan receivables are managed in a portfolio with a business model of holding investments to collect principal and interest as well as selling investments. They are initially recognized and subsequently remeasured at fair value determined using the discounted cash flow method. The changes in fair value are recognized in fair value reserve in other comprehensive income. Interest calculated using the effective interest method as well as foreign exchange gains and losses are recognized in financial income and expenses in the consolidated income statement. Estimated credit loss is typically based on 12-month expected credit loss for existing loans and estimated additional draw-downs during that period; refer to Impairments section for further detail. Loss allowance is calculated on a quarterly basis based on a review of collectability and available collateral, and recorded in other financial expenses in the consolidated income statement reducing fair value loss recorded in other comprehensive income. In case a receivable is sold, the impact of expected credit loss is reversed, and the full gain or loss incurred for the sale is recorded in financial income and expenses in the consolidated income statement.

The cash flows of other investments of a long-term nature do not fulfill the criteria of being solely payments of principal and interest. These investments are initially recognized and subsequently remeasured at fair value using quoted market rates, discounted cash flow models or other appropriate valuation methods as of the reporting date. Fair value adjustments, foreign exchange gains and losses as well as realized gains and losses from the disposal of these investments are mainly recognized within financial income and expenses in the consolidated income statement.

Other current financial assets

Other current financial assets include current part of other non-current financial assets and short-term loan receivables as well as derivative assets that are discussed separately in the Derivative financial instruments section below.

Short-term loan receivables are initially measured at fair value and in subsequent periods measured at amortized cost using the effective interest method. Interest calculated using the effective interest method as well as foreign exchange gains and losses are recognized in financial income and expenses in the consolidated income statement. For these loans, a loss allowance is calculated on a quarterly basis based on a review of collectability and available collateral, recorded as an adjustment to the carrying amount of the investment and recognized in other financial expenses in the consolidated income statement.

Trade receivables

Trade receivables arise from contracts with customers and represent an unconditional right to receive the consideration and only the passage of time is required before the consideration is received. Nokia sells trade receivables to various financial institutions without recourse in the normal course of business, in order to manage credit risk and working capital cycle, and the business model for managing trade receivables is holding receivables to collect contractual cash flows and selling receivables. Trade receivables are initially recognized and subsequently remeasured at fair value, determined using the discounted cash flow method. The changes in fair value are recognized in fair value reserve in other comprehensive income. If trade receivables are sold, the difference between the carrying amount derecognized and the consideration received is recognized in financial expenses in the consolidated income statement.

Current financial investments

Nokia invests a portion of the corporate cash needed to cover the projected cash outflows of its ongoing business operations in highly liquid, interest-bearing investments. Current financial investments may include investments measured at amortized cost and investments measured at fair value through profit and loss.

Corporate cash investments in bank deposits used as collateral for derivative transactions are initially measured at fair value and in subsequent periods measured at amortized cost using the effective interest method. Interest calculated using the effective interest method as well as foreign exchange gains and losses are recognized in financial income and expenses in the consolidated income statement.

Corporate cash investments in bank deposits, as well as fixed income and money market securities with initial maturity or put feature longer than three months that have characteristics of solely payments of principal and interest and are not part of structured investments, are managed in a portfolio with a business model of holding investments to collect principal and interest, and are initially measured at fair value and in subsequent periods measured at amortized cost using the effective interest method. These investments are executed with the main purpose of collecting contractual cash flows and principal repayments. However, investments are sold from time to time for liquidity management and market risk mitigation purposes.

For these investments interest calculated using the effective interest method, as well as foreign exchange gains and losses, are recognized in financial income and expenses in the consolidated income statement. When an investment is disposed of, the difference between the carrying amount derecognized and the consideration received is recognized in financial income and expenses in the consolidated income statement. The FIFO method is used to determine the cost basis of fixed income securities being disposed of.

Due to the high credit quality of Nokia's investment portfolio, the estimated credit loss is normally based on 12-month expected credit loss. Loss allowance is calculated on a quarterly basis, recorded as an adjustment to the carrying amount of the investment and recognized in other financial expenses in the consolidated income statement.

Corporate cash investments may also include money market funds that do not qualify as cash equivalents, investments acquired for trading purposes, investment structures consisting of securities traded in combination with derivatives with complementing and typically offsetting risk factors and other investments that have cash flows not being solely payments of principal and interest. These investments are executed with the purpose of collecting contractual cash flows and principal repayments as well as for capital appreciation and can be sold at any time.

These investments are initially recognized and subsequently remeasured at fair value determined using quoted market rates, discounted cash flow models or other appropriate valuation methods as of the reporting date. Fair value adjustments, foreign exchange gains and losses and realized gains and losses are recognized in financial income and expenses in the consolidated income statement.

Cash and cash equivalents

Cash and cash equivalents include cash at bank and in hand as well as highly liquid, fixed income and money market investments that are readily convertible to known amounts of cash with maturities at acquisition of three months or less, as well as bank deposits with maturities or contractual call periods at acquisition of three months or less. Due to the high credit quality and short-term nature of these investments, there is an insignificant risk of change in value. Investments in money market funds that have a risk profile consistent with the aforementioned criteria are also classified as cash equivalents. Investments that have cash flows that are solely payments of principal and interest are measured at amortized cost. All other investments are measured at fair value through profit and loss.

Classification and measurement of financial liabilities

Nokia has classified its financial liabilities in the following categories: financial liabilities measured at amortized cost and financial liabilities measured at fair value through profit and loss. Nokia classifies derivative liabilities as well as the conditional obligation related to Nokia Shanghai Bell at fair value through profit and loss and all other financial liabilities at amortized cost.

All financial liabilities are initially recognized at fair value and, in case of borrowings and payables, net of transaction costs. Financial liabilities are derecognized when the related obligation is discharged or cancelled or expired. Additionally, a substantial modification of the terms of an existing financial liability is accounted for as a derecognition of the original financial liability and the recognition of a new financial liability. On derecognition of a financial liability, the difference between the carrying amount extinguished and the consideration paid is recognized in interest expenses in the consolidated income statement.

Interest-bearing liabilities

Long-term interest-bearing liabilities are measured at amortized cost using the effective interest method. Short-term interest-bearing liabilities, including the current part of long-term interest-bearing liabilities and collaterals for derivative transactions, are measured at amortized cost using the effective interest method.

Transaction costs, interest calculated using the effective interest method as well as foreign exchange gains and losses are recognized in financial income and expenses in the consolidated income statement.

Other financial liabilities

Other financial liabilities mainly include a conditional obligation to China Huaxin as part of the Nokia Shanghai Bell definitive agreements where China Huaxin obtained the right to fully transfer its ownership interest in Nokia Shanghai Bell to Nokia in exchange for a future cash settlement. The financial liability related to the conditional obligation is measured based on the expected future cash settlement with any changes recorded in financial income and expenses in the consolidated income statement.

Other financial liabilities also include derivative liabilities that are discussed separately in the Derivative financial instruments section below.

Trade payables

Trade payables are carried at invoiced amount, which is considered to be equal to the fair value due to the short-term nature of Nokia's trade payables.

Impairments of financial assets

Impairment requirements apply to the recognition of a loss allowance for expected credit losses (ECL) on financial assets measured at amortized cost, financial assets measured at fair value through other comprehensive income, financial guarantee contracts and loan commitments. Nokia continuously assesses its financial instruments on a forward-looking basis and accounts for the changes in ECL on a quarterly basis using the following method:

■ $ECL = PD \times LGD \times EAD$

- Probability of Default (PD) is estimated separately for the centralized investment portfolio and non-centralized investments. The estimate is based on the credit rating profile of these investments as well as specific local circumstances as applicable, unless there are specific events that would indicate that the credit rating would not be an appropriate basis for estimating credit risk at the reporting date.
- For Loss Given Default (LGD), the recovery rate is also estimated separately for centralized investment portfolios and non-centralized investments and is based on the type of investment, specific local circumstances as applicable as well as related collateral arrangements, if any.
- Exposure at Default (EAD) is normally the nominal value of the investment or financial guarantee. For loan commitments, EAD is based on estimated draw-down amounts for the next 12 months.

All Nokia's current investments at amortized cost and fair value through other comprehensive income are considered to have low credit risk, and the loss allowance recognized during the period is therefore limited to 12 months' expected losses. Financial instruments that are rated as investment grade are considered to have low credit risk for the purposes of this assessment.

For other non-current financial assets, loans, loan commitments and financial guarantees extended to third parties, the ECL is calculated separately for each significant counterparty using the method described above, including the impact of any collateral arrangements or other credit enhancements to LGD. The estimate is based on 12-month ECL unless there has been a significant increase in credit risk for the specific counterparty since the initial recognition, in which case lifetime ECL is estimated. Breaches of contract, credit rating downgrades and other credit measures are typical indicators that Nokia takes into consideration when assessing whether the credit risk on a financial instrument has increased significantly since initial recognition.

For trade receivables and contract assets, an expected credit loss allowance is calculated and provided for each customer using the model described above where the key considerations include the credit rating of the customer and the aging of the related balances. A simplified approach is applied where the allowance is determined at an amount equal to the lifetime expected credit losses for each customer.

The change in the amount of loss allowance for ECL for trade receivables and contract assets is recognized in other operating expenses and for other financial assets in financial expenses in the consolidated income statement. For assets carried at amortized cost, the loss allowance is recorded as an adjustment to the carrying amount. For assets carried at fair value through other comprehensive income, the loss allowance is recorded as an adjustment in other comprehensive income instead of adjusting the carrying amount that has already been recorded at fair value. For financial guarantee contracts, the loss allowance is recognized as another liability in the statement of financial position.

Derivative financial instruments

All derivatives are recognized initially at fair value on the date a derivative contract is entered into and subsequently remeasured at fair value. The method of recognizing the resulting gain or loss varies according to whether the derivatives are designated and qualify under hedge accounting.

The cash flows of a hedge are classified as cash flows from operating activities in the consolidated statement of cash flows in case the underlying hedged items relate to Nokia's operating activities. When a derivative contract is accounted for as a hedge of an identifiable position relating to financing or investing activities, the cash flows of the contract are classified in the same way as the cash flows of the position being hedged. Certain derivatives are hedging the foreign exchange risk of Nokia's cash position and their cash flows are included in cash flows from investing activities in the consolidated statement of cash flows.

Derivatives not designated in hedge accounting relationships carried at fair value through profit and loss

Foreign exchange forward contracts are valued at market-forward exchange rates. Changes in fair value are measured by comparing these rates with the original contract-forward rate. Currency options are valued as of each reporting date by using the Garman & Kohlhagen option valuation model. Changes in fair value are recognized in the consolidated income statement.

Fair values of forward rate agreements, interest rate options, futures contracts and exchange-traded options are calculated based on quoted market rates as of each reporting date. The discounted cash flow method is used to value interest rate and cross-currency swaps. Changes in fair value are recognized in the consolidated income statement.

For derivatives not designated under hedge accounting but hedging identifiable forecast exposures such as anticipated foreign currency denominated sales and purchases, the gains and losses are recognized in other operating income or expenses in the consolidated income statement. The gains and losses on all other derivatives not designated under hedge accounting are recognized in financial income and expenses in the consolidated income statement.

Embedded derivatives included in contracts are identified and monitored by Nokia. For host contracts that are not financial assets containing embedded derivatives that are not closely related, the embedded derivatives are separated and measured at fair value as of each reporting date with changes in fair value recognized in financial income and expenses in the consolidated income statement. For host contracts that are financial assets containing embedded derivatives, the whole contract is measured at fair value as of each reporting date with changes in fair value recognized in financial income and expenses in the consolidated income statement.

Hedge accounting

Nokia applies hedge accounting on certain foreign exchange forward contracts, options or option strategies, and interest rate derivatives. Qualifying options and option strategies have zero net premium, or a net premium paid. For option structures, the critical terms of the purchased and written options are the same and the notional amount of the written option component is not greater than that of the purchased option.

In the fair valuation of foreign exchange forward contracts, Nokia separates the spot element and the forward element including the impact of foreign currency basis spread and forward points, which is considered as the cost of hedging for foreign exchange forward contracts. In the fair valuation of foreign exchange option contracts, Nokia separates the intrinsic value and time value, which is considered as the cost of hedging for foreign exchange option contracts. In the fair valuation of cross-currency swaps, Nokia separates the foreign currency basis spread that is considered as the cost of hedging for cross-currency swaps.

Cash flow hedges: hedging of forecast foreign currency denominated sales and purchases

Nokia applies cash flow hedge accounting primarily to forecast business foreign exchange exposure that arises from highly probable forecast operative business transactions. The risk management strategy is to hedge material net exposures (identified standard sales exposure minus identified standard costs exposure) by using foreign exchange forwards and foreign exchange options in a layered hedging style that follows defined hedging level ranges and hedge maturities in quarterly time buckets. The hedged item must be highly probable and present an exposure to variations in cash flows that could ultimately affect profit or loss.

Nokia only designates the spot element of the foreign exchange forward contract as the hedging instrument. Currency options, or option strategies, may also be used for cash flow hedging, in which case the intrinsic value of the option is designated as the hedging instrument. Hedge effectiveness is assessed at inception and quarterly during the hedge relationship to ensure that an economic relationship exists. As Nokia only enters in hedge relationships where the critical terms match, the assessment of effectiveness is done on a qualitative basis.

For qualifying foreign exchange forwards and foreign exchange options, the change in fair value that reflects the change in spot exchange rates on a discounted basis is recognized in hedging reserve in other comprehensive income. The changes in the forward element of the foreign exchange forwards and the time value of the options that relate to hedged items are deferred in the cost of hedging reserve in other comprehensive income and are subsequently accounted for in the same way as the spot element or intrinsic value.

In each quarter, Nokia evaluates whether the forecast sales and purchases are still expected to occur. If a portion of the hedged cash flow is no longer expected to occur, all related deferred gains or losses are derecognized from other comprehensive income and recognized in other operating income and expenses in the consolidated income statement as hedge accounting criteria is no longer met. If the hedged cash flow ceases to be highly probable, but is still expected to occur, accumulated gains and losses remain in other comprehensive income until the hedged cash flow affects profit or loss.

Nokia's risk management objective is to hedge forecast cash flows until the related revenue has been recognized. Each hedge relationship is discontinued during the quarter when the hedge matures, which is also the quarter that it has been designated to hedge. At this point, the accumulated profit or loss of cash flow hedges is recycled to other operating income and expenses in the consolidated income statement. In case the forecast amount of revenue is not recognized during a quarter, the full accumulated profit or loss of cash flow hedges designated for said quarter is still recycled and the portion related to forecast revenue that was not recognized is disclosed as hedge ineffectiveness.

As cash flow hedges primarily mature in the same quarter as the hedged item, there is no significant ineffectiveness resulting from time value of money. Nokia will validate the magnitude of the impact of discounting related to the amount of profit or loss recognized in other comprehensive income on a quarterly basis.

Nokia has also entered into foreign exchange forwards in relation to forecast sales and purchases that do not qualify as highly probable forecast transactions and hence do not satisfy the requirements for hedge accounting. For these foreign exchange forwards, the gains and losses are recognized in other operating income and expenses in the consolidated income statement.

Cash flow hedges: hedging of future interest cash flows

Nokia also applies cash flow hedging to future interest cash flows in foreign currency related to issued bonds. These future interest cash flows are hedged with cross-currency swaps that have been bifurcated and designated partly as fair value hedges to hedge both foreign exchange and the interest rate benchmark risk component of the issued bond and partly as cash flow hedges to hedge the foreign exchange risk related to the remaining portion of interest cash flows on the issued bond. The accumulated profit or loss for the part of these cross-currency swaps designated as cash flow hedges is initially recorded in hedging reserve and recycled to profit or loss at the time when the related interest cash flows are settled. Nokia separates the foreign currency basis spread from cross-currency swaps and excludes it from the hedge relationship as cost of hedging that is initially recognized and subsequently measured at fair value and recorded in cost of hedging reserve in other comprehensive income.

Fair value hedges: hedging of foreign exchange exposure

In certain cases, mainly related to long-term construction projects, Nokia applies fair value hedge accounting for foreign exchange risk with the objective to reduce the exposure to fluctuations in the fair value of firm commitments due to changes in foreign exchange rates. Changes in the fair value of both spot and forward elements of the derivatives designated and qualifying as fair value hedges, together with any changes in the fair value of the hedged firm commitments attributable to the hedged risk, are recorded in financial income and expenses in the consolidated income statement.

Fair value hedges: hedging of interest rate exposure

Nokia applies fair value hedge accounting to reduce exposure to fair value fluctuations of interest-bearing liabilities due to changes in interest rates and foreign exchange rates. Nokia uses interest rate swaps and cross-currency swaps aligned with the hedged items to hedge interest rate risk and associated foreign exchange risk.

Nokia has entered into long-term borrowings mainly at fixed rate and swapped a portion of them into floating rates in line with a defined target interest profile. Nokia aims to mitigate the adverse impacts from interest rate fluctuations by continuously managing net interest exposure resulting from financial assets and liabilities by setting appropriate risk management benchmarks and risk limits. The hedged item is identified as a proportion of the outstanding loans up to the notional amount of the swaps as appropriate to achieve the risk management objective. Nokia enters into interest rate swaps that have similar critical terms as the hedged item, such as reference rate, reset dates, payment dates, maturities and notional amount and hence Nokia expects that there will be no significant ineffectiveness. Nokia has not entered into interest rate swaps where it would be paying fixed rate.

Nokia's borrowings are carried at amortized cost. Changes in the fair value of derivatives designated and qualifying as fair value hedges, together with any changes in the fair value of hedged liabilities attributable to the hedged risk, are recorded in financial income and expenses in the consolidated income statement. Nokia separates the foreign currency basis spread from cross-currency swaps and excludes it from the hedged risk as cost of hedging that is initially recognized and subsequently measured at fair value and recorded in cost of hedging reserve in other comprehensive income. If a hedge relationship no longer meets the criteria for hedge accounting, hedge accounting ceases, cost of hedging recorded in cost of hedging reserve is immediately expensed and any fair value adjustments made to the carrying amount of the hedged item while the hedge was effective are recognized in financial income and expenses in the consolidated income statement based on the effective interest method.

Hedges of net investments in foreign operations

Nokia applies hedge accounting for its foreign currency hedging of selected net investments. Hedged item can be an amount of net assets equal to or less than the carrying amount of the net assets of the foreign operation in Nokia consolidated financial statements. The risk management strategy is to protect the euro counter value of the portion of this exposure expected to materialize as non-euro cash repatriation in the foreseeable future.

Nokia only designates the spot element of the foreign exchange forward contract as the hedging instrument. Currency options, or option strategies, may also be used for net investment hedging, in which case the intrinsic value of the option is designated as the hedging instrument. Hedge effectiveness is assessed at inception and quarterly during the hedge relationship to ensure that an economic relationship exists. As Nokia only enters in hedge relationships where the critical terms match, the assessment of effectiveness is done on a qualitative basis with no significant ineffectiveness expected.

For qualifying foreign exchange forwards, foreign exchange options and option strategies, the change in fair value that reflects the change in spot exchange rates is recognized in translation differences within consolidated shareholders' equity. The changes in the forward element of foreign exchange forwards as well as the changes in the time value of options (collectively known as the "cost of hedging") is recognized in cost of hedging reserve in other comprehensive income. The cost of hedging at the date of designation of the foreign exchange forward or option contract as a hedging instrument is amortized to financial income and expenses in the consolidated income statement over the duration of the contract. Hence, in each reporting period, the change in fair value of forward element of the foreign exchange forward contract or the time value of the option contract is recorded in cost of hedging reserve, while the amortization amount is reclassified from cost of hedging reserve to profit or loss.

Accumulated changes in fair value from qualifying hedges are derecognized from translation differences within consolidated shareholders' equity on the disposal of all or part of a foreign subsidiary by sale, liquidation, repayment of share capital or abandonment. The cumulative amount or proportionate share of changes in the fair value of qualifying hedges deferred in translation differences is recognized as income or expense on disposal.

Provisions

Provision is recognized when Nokia has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources will be required to settle the obligation and a reliable estimate of the amount can be made. Management judgment may be required in determining whether it is probable that an outflow of economic benefits will be required to settle the obligation. The amount recognized as a provision is based on the best estimate of unavoidable costs required to settle the obligation at the end of the reporting period.

When estimating the amount of unavoidable costs, management may be required to consider a range of possible outcomes and their associated probabilities, risks and uncertainties surrounding the events and circumstances as well as making assumptions of the timing of payment. Changes in estimates of timing or amounts of costs required to settle the obligation may become necessary as time passes and/or more accurate information becomes available. Nokia assesses the adequacy of its existing provisions and adjusts the amounts as necessary based on actual experience and changes in facts and circumstances as of each reporting date. For descriptions of different classes of provisions, refer to Note 27, Provisions.

Contingent liabilities

Nokia discloses ongoing legal matters that relate to possible obligations whose existence will be confirmed by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of Nokia. These matters are assessed continually to determine whether an outflow of resources embodying economic benefits has become probable so as to recognize a provision.

Treasury shares

Nokia recognizes its own equity instruments that are acquired (treasury shares) as a reduction of equity at cost of acquisition. When cancelled or reissued, the acquisition cost of treasury shares is recognized in retained earnings or other distributable reserves of the equity.

Dividend and equity repayment

Nokia pays dividend and/or makes equity repayments to its shareholders in quarterly instalments. Each quarterly distribution is resolved by the Board of Directors separately in accordance with the authorization granted by the Annual General Meeting. Dividends and/or equity repayments are recognized in the consolidated financial statements when the Board of Directors has resolved on the quarterly payment.

3. New and amended standards and interpretations

On 1 January 2021, Nokia adopted the following amendments to the accounting standards issued by the IASB and endorsed by the EU:

- Amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16: Interest Rate Benchmark Reform – Phase 2.

The amendments had no material impact on Nokia's consolidated financial statements.

Nokia has not early adopted any new and amended standards and interpretations that have been issued but are not yet effective. The new and amended standards and interpretations issued by the IASB that are effective in future periods are not expected to have a material impact on the consolidated financial statements of Nokia when adopted. Nokia intends to adopt these new and amended standards and interpretations, if applicable, when they become effective and are endorsed by the EU.

4. Use of estimates and critical accounting judgments

The preparation of financial statements requires use of management judgment in selecting and applying accounting policies as well as making estimates and assumptions about the future. These judgments, estimates and assumptions may have a significant effect on the amounts recognized in the financial statements.

The estimates and assumptions used in determining the carrying amounts of assets and liabilities are based on historical experience, expected outcomes and various other factors that were available when these consolidated financial statements were prepared, and they are believed to be reasonable under the circumstances. The estimates and assumptions are reviewed continually and revised if changes in circumstances occur, or as a result of new information or more experience. As estimates and assumptions inherently contain a varying degree of uncertainty, actual outcomes may differ resulting in adjustments to the carrying amounts of assets and liabilities in the subsequent periods.

The accounting matters presented in this note are determined to involve the most difficult, subjective or complex judgments, or are considered as key sources of estimation uncertainty.

Pension and other post-employment benefit obligations and expenses

Key source of estimation uncertainty

The determination of pension and other post-employment benefit obligations and expenses for defined benefit plans is dependent on a number of estimates and assumptions, including the discount rate, future mortality rate, annual rate of increase in future compensation levels, and healthcare costs trend rates and usage of services in the United States where the majority of our post-employment healthcare plans are maintained. Changes in assumptions and actuarial estimates may materially affect the benefit obligation, future expense and future cash flow. Based on these estimates and assumptions, as of 31 December 2021, defined benefit obligations amount to EUR 22 704 million (EUR 23 501 million in 2020) and the fair value of plan assets amounts to EUR 27 128 million (EUR 25 688 million in 2020).

Critical accounting judgment

Where a surplus on a defined benefit scheme arises, Nokia analyzes the recoverability of the surplus through either a refund or through reduction of future contributions in determining whether it is necessary to restrict the amount of the surplus that is recognized. Nokia has two plans in the US, one plan in the UK and one in Belgium with material surplus positions with a combined surplus of EUR 7 718 million as of 31 December 2021 (EUR 6 147 million in 2020). In 2021, Nokia modified the terms of all pension plans in the US after which it has made the judgment that all plans with material surplus positions meet the requirements of recoverability. The remaining pension plans for which Nokia has determined that the surplus assets are not recoverable are considered to be not material. The resulting asset ceiling limitation is recorded at EUR 92 million as of 31 December 2021 (EUR 1 195 million in 2020).

Refer to Note 25, Pensions and other post-employment benefits.

Income taxes

Critical accounting judgment

Nokia uses judgment in determining the extent to which deferred tax assets can be recognized. The recognition of deferred tax assets is based on the assessment of whether it is probable that sufficient taxable profit will be available in the future to utilize the deductible temporary differences, unused tax losses and unused tax credits before the unused tax losses and unused tax credits expire. This assessment requires estimates of the future financial performance of a particular legal entity or a tax group that has recognized the deferred tax asset.

As of 31 December 2021, Nokia has EUR 33 222 million (EUR 33 620 million in 2020) of temporary differences, tax losses carry forward and tax credits for which no deferred tax assets are recognized due to uncertainty of utilization. The majority of these unrecognized deferred tax assets relate to France and Finland. As it relates to Finland, in 2020 Nokia derecognized EUR 2 918 million of deferred tax assets based on the assessment that was done primarily based on the historical performance. At 31 December 2021, Nokia continues to conclude that it is not probable that it will be able to utilize the deferred tax assets in Finland in the foreseeable future. This conclusion is based on the weighting of objective negative evidence against more subjective positive evidence. The primary factors in this weighting were the more objective record of a pattern of financial performance compared to the more inherently subjective expectations regarding future financial performance in Finland.

Nokia continues to assess the realizability of deferred tax assets including in particular its actual profit record and may re-recognize deferred tax assets related to Finland where a clear pattern of tax profitability can be established.

Refer to Note 11, Income taxes, for further information on income taxes.

5. Segment information

Nokia has four operating and reportable segments for the financial reporting purposes: (1) Mobile Networks, (2) Network Infrastructure, (3) Cloud and Network Services and (4) Nokia Technologies.

In addition, Nokia provides net sales disclosure for the following business divisions within the Network Infrastructure segment: (i) IP Networks, (ii) Optical networks, (iii) Fixed Networks and (iv) Submarine Networks.

Nokia adopted its current operational and reporting structure on 1 January 2021. The reporting structure was revised to reflect Nokia's new strategy and operational model and is aligned with the way the management evaluates the operational performance of Nokia and allocates resources. Previously Nokia had three reportable segments: (1) Networks, (2) Nokia Software and (3) Nokia Technologies. Furthermore, Networks reportable segment consisted of four aggregated operating segments: (1) Mobile Networks, (2) Global Services, (3) Fixed Networks and (4) IP/Optical Networks. The most significant changes to the operational and reporting structure are the reclassifications of the following product areas:

- Network management was reclassified from Nokia Software to Mobile Networks
- Submarine Networks was reclassified from Group Common and Other to Network Infrastructure
- Packet Core was reclassified from IP/Optical Networks to Cloud and Network Services
- Managed Services, Network Cognitive Services and Enterprise Solution Services were reclassified from Global Services to Cloud and Network Services
- Digital Automation and Analytics & IoT was reclassified from Group Common and Other to Cloud and Network Services

Segment information for 2020 and 2019 has been recast for comparability purposes according to the new operating and reporting structure.

The President and CEO is the chief operating decision-maker monitoring the operating results of segments for the purpose of assessing performance and making decisions about resource allocation. Key financial performance measures of the segments comprise primarily net sales and segment operating profit. The evaluation of segment performance and allocation of resources is primarily based on segment operating profit which the management believes is the most relevant measure for this purpose. Segment operating profit excludes acquired intangible asset amortization and other purchase price fair value adjustments, goodwill impairments, restructuring related charges and certain other items of income and expenses that may not be indicative of the business operating results.

Accounting policies of the segments are the same as those described in Note 2, Significant accounting policies, except that certain above-mentioned items of income and expenses are not allocated to the segments. Inter-segment revenues and transfers are accounted for as if the revenues were to third parties, that is, at current market prices.

Segment descriptions

Mobile Networks

The Mobile Networks segment offers technologies for Radio Access Networks (RAN) as well as Microwave Radio Links (MWR) for transport networks. RAN includes 3GPP radio technologies ranging from 2G/GSM to 5G/NR in licensed and unlicensed spectrum for both macro and small cell deployments. In addition to RAN and MWR products, the Mobile Networks segment provides associated network management solutions as well as network planning, network optimization, network deployment and technical support services.

Network Infrastructure

The Network Infrastructure segment serves communication service providers, enterprises, webscales and public sector customers. It comprises the following business divisions: (i) IP Networks, which provides IP networks and services for residential, mobile, enterprise and cloud applications; (ii) Optical Networks, which provides optical transport networks for metro, regional, longhaul and ultra-longhaul applications; (iii) Fixed Networks, which provides fiber, fixed wireless access, and copper technologies; and (iv) Submarine Networks, which offers undersea cable transmission.

Cloud and Network Services

The Cloud and Network Services segment is built around software and the cloud and is focused on driving leadership in cloud-native software and as-a-service delivery models, as demand for critical networks accelerates; and with strong market positions in communications software, private wireless networks, and cognitive (or intelligent) services. The Cloud and Network Services portfolio encompasses core network solutions, including both voice and packet core; business applications covering areas like security and digital operations; cloud and cognitive services; and enterprise solutions covering private wireless and industrial automation.

Nokia Technologies

The Nokia Technologies segment, building on decades of innovation and R&D leadership in technologies used in virtually all mobile devices used today, is expanding the Nokia patent licensing business, reintroducing the Nokia brand to smartphones through brand licensing, and establishing a technology licensing business. The majority of net sales and related costs and expenses attributable to licensing and patenting the patent portfolio of Nokia is recorded in Nokia Technologies, while each segment separately records its own research and development expenses.

Nokia also provides segment-level information for Group Common and Other. Group Common and Other includes Radio Frequency Systems which is managed as a separate entity. In addition, Group Common and Other includes certain corporate-level and centrally managed operating expenses, as well as fair value gains and losses on investments in unlisted venture funds, including investments managed by NGP Capital.

Segment information

EURm	Mobile Networks	Network Infrastructure ⁽¹⁾	Cloud and Network Services	Nokia Technologies	Group Common and Other	Eliminations and unallocated items ⁽²⁾	Nokia Group
2021							
Net sales to external customers	9 711	7 673	3 088	1 490	240	–	22 202
Net sales to other segments	6	1	1	12	17	(37)	–
Operating profit/(loss)	765	784	166	1 185	(125)	(617)	2 158
Share of results of associated companies and joint ventures	6	(1)	6	(2)	–		9
Financial income and expenses							(241)
Profit before tax							1 926
Other segment items							
Depreciation and amortization	(338)	(208)	(95)	(33)	(30)	(391)	(1 095)
2020							
Net sales to external customers	10 394	6 735	3 086	1 389	250	(2)	21 852
Net sales to other segments	4	1	1	13	19	(38)	–
Operating profit/(loss)	819	457	(67)	1 123	(251)	(1 196)	885
Share of results of associated companies and joint ventures	22	(1)	5	1	(5)		22
Financial income and expenses							(164)
Profit before tax							743
Other segment items							
Depreciation and amortization	(347)	(200)	(114)	(39)	(25)	(407)	(1 132)
2019							
Net sales to external customers	11 325	6 902	3 327	1 473	317	(29)	23 315
Net sales to other segments	2	1	–	14	54	(71)	–
Operating profit/(loss)	384	562	136	1 200	(279)	(1 518)	485
Share of results of associated companies and joint ventures	9	(1)	4	–	–		12
Financial income and expenses							(341)
Profit before tax							156
Other segment items							
Depreciation and amortization	(228)	(129)	(66)	(33)	(280)	(924)	(1 660)

(1) Includes IP Networks net sales of EUR 2 679 million (EUR 2 585 million in 2020 and EUR 2 700 million in 2019), Optical Networks net sales of EUR 1 708 million (EUR 1 695 million in 2020 and EUR 1 752 million in 2019), Fixed Networks net sales of EUR 2 358 million (EUR 1 759 million in 2020 and EUR 1 881 million in 2019) and Submarine Networks net sales of EUR 929 million (EUR 697 million in 2020 and EUR 570 million in 2019).

(2) Unallocated items comprise costs related to the acquired intangible asset amortization and other purchase price fair value adjustments, goodwill impairments, restructuring related charges and certain other items.

Material reconciling items between total segment operating profit and operating profit for the Group

EURm	2021	2020	2019
Total segment operating profit	2 775	2 081	2 003
Amortization of acquired intangible assets	(391)	(407)	(924)
Restructuring and associated charges	(263)	(651)	(502)
Settlement of legal disputes	80	–	–
Gain on sale of fixed assets	53	–	–
Impairment and write-off of assets, net of reversals	(45)	(241)	(29)
Change in provisions related to past acquisitions	(26)	–	–
Fair value changes of legacy IPR fund	(23)	–	–
Gain on defined benefit plan amendment	–	90	168
Transaction and related costs, including integration costs	–	11	(48)
Product portfolio strategy costs	–	–	(163)
Operating model integration	–	–	(12)
Other	(2)	2	(8)
Operating profit for the Group	2 158	885	485

Information by geographies and customer concentration

Net sales to external customers by country

EURm	Net sales ⁽¹⁾		
	2021	2020	2019
Finland ⁽¹⁾	1 605	1 480	1 552
United States	6 791	6 792	6 645
Japan	1 030	904	977
India	1 022	945	1 350
Other	11 754	11 731	12 791
Total	22 202	21 852	23 315

(1) Net sales to external customers by country are based on the location of the customer, except for Nokia Technologies IPR and licensing net sales which are allocated to Finland. In 2021, Nokia aligned how it externally reports financial information on a geographical basis with its internal reporting structure. As a result, a portion of net sales has been reallocated between countries. The comparative information for 2020 and 2019 has been recast accordingly.

Major customers

As is typical for our industry, Nokia's net sales are largely driven by multi-year customer agreements with limited amount of significant customers. Net sales from Nokia's largest customer were 11% (11% in 2020 and less than 10% in 2019) of net sales to external customers. Net sales from the largest customer were reported by Mobile Networks, Networks Infrastructure, Cloud and Network Services as well as Group Common and Other.

Non-current assets by country

EURm	Non-current assets ⁽¹⁾	
	2021	2020
Finland	1 348	1 382
United States	5 083	4 843
France	2 029	1 857
Other	1 399	1 533
Total	9 859	9 615

(1) Consists of goodwill and intangible assets, property, plant and equipment and right-of-use assets.

6. Revenue recognition

Management has determined that Nokia's geographic areas depict how the nature, amount, timing and uncertainty of revenue and cash flows are affected by economic factors. Nokia's primary customer base consists of companies that operate on a country-specific or a regional basis. Although Nokia's technology cycle is similar around the world, different countries and regions are inherently in a different stage of that cycle, often influenced by macroeconomic conditions specific to those countries and regions.

Each reportable segment, as described in Note 5, Segment information, consists of customers that operate in all geographic areas. No reportable segment has a specific revenue concentration in any geographic area other than Nokia Technologies, which is included within Europe.

Net sales to external customers by region⁽¹⁾

EURm	2021	2020	2019
Asia Pacific	2 562	2 742	3 070
Europe	6 635	6 427	6 438
Greater China	1 545	1 510	1 970
India	1 039	954	1 359
Latin America	1 226	1 070	1 517
Middle East & Africa	1 915	1 981	1 977
North America	7 280	7 168	6 984
Total	22 202	21 852	23 315

(1) Net sales to external customers by region are based on the location of the customer, except for Nokia Technologies IPR and licensing net sales which are allocated to Europe. In 2021, Nokia aligned the way it externally reports financial information on a regional basis with its internal reporting structure. As a result, India which was earlier presented as part of the Asia Pacific region is now presented as a separate region. In addition, certain countries are now presented as part of a different region. The comparative net sales to external customers by region for 2020 and 2019 have been recast accordingly.

Contract assets and contract liabilities

Contract asset balances decrease upon reclassification to trade receivables when Nokia's right to payment becomes unconditional. Contract liability balances decrease when Nokia satisfies the related performance obligations and revenue is recognized. There were no material cumulative adjustments to revenue recognized arising from changes in transaction prices, changes in measures of progress or changes in estimated variable consideration.

During the year, Nokia recognized EUR 1.7 billion (EUR 2.1 billion in 2020) of revenue that was included in the current contract liability balance at the beginning of the period.

Order backlog

As of 31 December 2021, the aggregate amount of the transaction price allocated to partially or wholly unsatisfied performance obligations arising from fixed contractual commitments amounted to EUR 20.3 billion (EUR 16.6 billion in 2020), which included the amounts related to the completed contract disclosed below. Management has estimated that these unsatisfied performance obligations will be recognized as revenue as follows:

	2021	2020
Within 1 year	73%	68%
2-3 years	24%	31%
More than 3 years	3%	1%
Total	100%	100%

The estimated timing of the satisfaction of these performance obligations is subject to change owing to factors beyond Nokia's control such as customer and network demand, market conditions and, in some cases, restrictions imposed by the weather or other factors impacting project logistics. Revenue recognized in the reporting period from performance obligations satisfied (or partially satisfied) in previous periods (for example, due to changes in transaction price) was not material.

Completed Contracts

In April 2014, Nokia entered into an agreement to license certain technology patents and patent applications owned by Nokia on the effective date of that agreement, on a non-exclusive basis, to a licensee, for a period of 10 years (the "License Agreement"). Contemporaneously and under the terms of the License Agreement, Nokia issued to the licensee an option to extend the technology patent license for the remaining life of the licensed patents. Nokia received all cash consideration due for the sale of the 10-year license and option upon closing of the License Agreement. Management has determined that, upon transition to IFRS 15, Revenue from Contracts with Customers, the License Agreement is a completed contract. As such, in accordance with the transition requirements of the standard, Nokia continues to apply its prior revenue accounting policies, based on IAS 18, Revenue, and related interpretations, to the License Agreement. Under those policies, Nokia is recognizing revenue over the term of the License Agreement.

As of 31 December 2021, the balance of deferred revenue related to the License Agreement of EUR 360 million (EUR 515 million in 2020), recognized in deferred revenue in the consolidated statement of financial position, is expected to be recognized as revenue through 2024.

7. Expenses by nature

EURm	2021	2020	2019
Personnel expenses	7 541	7 310	7 360
Cost of material	6 320	6 016	8 148
Project subcontracting and other customer contract expenses	4 225	4 887	4 003
Depreciation and amortization	1 095	1 132	1 660
IT services	230	343	362
Impairment charges	39	241	38
Other ⁽¹⁾	1 037	1 164	1 432
Total operating expenses⁽¹⁾	20 487	21 093	23 003

(1) In 2021 Nokia changed the presentation of certain items within other operating income and expenses, impacting the total operating expense amount. The comparative amounts for 2020 and 2019 have been recast accordingly. For more information, refer to Note 2, Significant accounting policies.

Operating expenses include government grant income and R&D tax credits of EUR 111 million (EUR 98 million in 2020 and EUR 83 million in 2019) most of which have been recognized in the consolidated income statement as a deduction against research and development expenses.

Restructuring charges by function⁽¹⁾:

EURm	2021	2020	2019
Cost of sales	133	245	227
Research and development expenses	73	189	105
Selling, general and administrative expenses	78	67	117
Total restructuring charges	284	501	449

(1) Restructuring charges include defined benefit plan curtailment income and expenses.

8. Personnel expenses

EURm	2021	2020	2019
Salaries and wages ⁽¹⁾	6 191	6 055	6 094
Share-based payment expense ⁽²⁾	118	76	77
Pension and other post-employment benefit expense, net ⁽³⁾	406	362	242
Social security costs	826	817	947
Total	7 541	7 310	7 360

(1) Includes termination benefits.

(2) Presented net of related social costs.

(3) Includes net gain on pension plan amendments, curtailments and settlements of EUR 13 million (net gains of EUR 58 million in 2020 and EUR 131 million in 2019).

The average number of employees is 87 927 (92 039 in 2020 and 98 322 in 2019).

9. Other operating income and expenses

EURm	2021	2020	2019
Other operating income			
Gains from unlisted venture funds ⁽¹⁾	188	61	50
Settlements and resolutions of legal disputes	90	—	—
Profit on sale of property, plant and equipment	66	3	18
Subsidies and government grants	43	3	8
Other	56	59	97
Total	443	126	173
Other operating expenses			
Changes in provisions	(77)	(5)	(47)
Foreign exchange gains/(losses) on hedging forecasted sales and purchases ⁽¹⁾	45	5	(88)
VAT and other indirect tax write-offs	(21)	(5)	—
Retirements and loss on sale of property, plant and equipment	(20)	(10)	(27)
Expected credit losses on trade receivables ⁽¹⁾	16	(171)	28
Goodwill impairment	—	(200)	—
Other	(56)	(63)	(67)
Total	(113)	(449)	(201)

(1) In 2021 Nokia changed the presentation of certain items within other operating income and expenses. The comparative amounts for 2020 and 2019 have been recast accordingly. For more information, refer to Note 2, Significant accounting policies.

10. Financial income and expenses

EURm	2021	2020	2019
Financial income			
Interest income on financial investments ⁽¹⁾	21	30	35
Interest income on financing components of other contracts	28	38	42
Other financial income ⁽²⁾	(6)	97	92
Total	43	165	169
Financial expenses			
Interest expense on interest-bearing liabilities	(113)	(127)	(99)
Negative interest on financial investments ⁽¹⁾	(29)	(9)	(4)
Interest expense on financing components of other contracts ⁽³⁾	(40)	(83)	(172)
Interest expense on lease liabilities	(24)	(25)	(28)
Net interest income/(expense) on defined benefit plans	26	—	(9)
Net fair value losses on investments at fair value through profit and loss	—	—	(2)
Net fair value gains/(losses) on hedged items under fair value hedge accounting	25	(122)	(133)
Net fair value (losses)/gains on hedging instruments under fair value hedge accounting	(25)	118	141
Net foreign exchange losses	(60)	(8)	(106)
Other financial expenses ⁽⁴⁾⁽⁵⁾	(44)	(73)	(98)
Total	(284)	(329)	(510)

(1) In 2021 Nokia changed the presentation of negative interest on financial investments within financial income and expenses. The comparative amounts for 2020 and 2019 have been recast accordingly. For more information, refer to Note 2, Significant accounting policies.

(2) In 2021, includes an expense of EUR 33 million (in 2020 and 2019 income of EUR 79 million and EUR 64 million, respectively) due to a change in the fair value of the financial liability related to Nokia Shanghai Bell. Refer to Note 31, Significant partly-owned subsidiaries.

(3) In 2021, includes EUR 12 million (EUR 31 million in 2020 and EUR 94 million in 2019) related to the sale of receivables.

(4) In 2021, includes an increase in loss allowance of EUR 32 million (EUR 58 million in 2020) related to loans extended to an emerging market customer.

(5) In 2019, includes an impairment of EUR 64 million related to a loan extended to a certain emerging market customer recognized upon contract exit.

11. Income taxes

Components of the income tax expense

EURm	2021	2020	2019
Current tax	(409)	(295)	(367)
Deferred tax	137	(2 961)	229
Total	(272)	(3 256)	(138)

Income tax reconciliation

Reconciliation of the difference between income tax computed at the statutory rate in Finland of 20% and income tax recognized in the consolidated income statement:

EURm	2021	2020	2019
Income tax expense at statutory rate	(385)	(149)	(31)
Permanent differences	47	90	53
Non-creditable withholding taxes	(37)	(37)	(31)
Income taxes for prior years ⁽¹⁾	95	26	(13)
Effect of different tax rates of subsidiaries operating in other jurisdictions	(57)	(39)	(8)
Effect of deferred tax assets not recognized ⁽²⁾	(77)	(3 202)	(99)
Benefit arising from previously unrecognized deferred tax assets	187	105	29
Net increase in uncertain tax positions	(29)	(12)	(6)
Change in income tax rates	17	(12)	(30)
Income taxes on undistributed earnings	(33)	(26)	(2)
Total	(272)	(3 256)	(138)

(1) In 2021, relates primarily to a tax benefit related to past operating model integration.

(2) In 2020, includes a derecognition of deferred tax assets related to Finland.

Income tax liabilities and assets include a net liability of EUR 192 million (EUR 149 million in 2020) relating to uncertain tax positions with inherently uncertain timing of cash outflows.

Prior period income tax returns for certain Group companies are under examination by local tax authorities. Nokia has ongoing tax investigations in various jurisdictions, including the United States, Canada, India, Brazil, Saudi Arabia and South Korea. Nokia's business and investments, especially in emerging market countries, may be subject to uncertainties, including unfavorable or unpredictable tax treatment. Management judgment and a degree of estimation are required in determining the tax expense or benefit. Even though management does not expect that any significant additional taxes in excess of those already provided for will arise as a result of these examinations, the outcome or actual cost of settlement may vary materially from estimates.

Deferred tax assets and liabilities

EURm	2021			2020		
	Deferred tax assets	Deferred tax liabilities	Net balance	Deferred tax assets	Deferred tax liabilities	Net balance
Tax losses carried forward and unused tax credits	794	–		720	–	
Undistributed earnings	–	(136)		–	(104)	
Intangible assets and property, plant and equipment	1 167	(176)		1 020	(291)	
Right-of-use assets	–	(210)		–	(197)	
Defined benefit pension assets	–	(2 052)		3	(1 233)	
Other non-current assets	49	(34)		27	(40)	
Inventories	79	(13)		120	(8)	
Other current assets	152	(81)		98	(46)	
Lease liabilities	165	–		164	(3)	
Defined benefit pension and other post-employment liabilities	1 023	–		1 045	(7)	
Other non-current liabilities	1	–		–	–	
Provisions	82	(87)		251	(86)	
Other current liabilities	300	(55)		200	(63)	
Other temporary differences	36	(14)		5	(13)	
Total before netting	3 848	(2 858)	990	3 653	(2 091)	1 562
Netting of deferred tax assets and liabilities	(2 576)	2 576	–	(1 831)	1 831	–
Total after netting	1 272	(282)	990	1 822	(260)	1 562

Movements in the net deferred tax balance during the year:

EURm	2021	2020	2019
As of 1 January	1 562	4 734	4 561
Adoption of new IFRS standards ⁽¹⁾	–	–	(1)
Recognized in income statement, continuing operations	137	(2 961)	229
Recognized in income statement, discontinued operations	–	1	–
Recognized in other comprehensive income	(753)	(115)	(84)
Recognized in equity	–	2	(7)
Acquisitions through business combinations and disposals	(6)	4	–
Translation differences	50	(103)	36
As of 31 December	990	1 562	4 734

(1) In 2019, adoption of IFRS 16, Leases.

Amount of temporary differences, tax losses carried forward and tax credits for which no deferred tax asset was recognized due to uncertainty of utilization:

EURm	2021	2020
Temporary differences	13 487	14 258
Tax losses carried forward	19 393	19 021
Tax credits	342	341
Total	33 222	33 620

Deferred tax assets are recognized to the extent it is probable that future taxable profit will be available against which the unused tax losses, unused tax credits and deductible temporary differences can be utilized in the relevant jurisdictions.

Nokia continually evaluates the probability of utilizing its deferred tax assets and considers both positive and negative evidence in its assessment. At 31 December 2020, Nokia concluded based on its assessment that it is not probable that it will be able to utilize the unused tax losses, unused tax credits and deductible temporary differences in Finland in the foreseeable future. This assessment was done primarily based on the historical performance. Consequently, Nokia derecognized EUR 2 918 million of deferred tax assets related to Finland.

At 31 December 2021, Nokia continues to conclude that such utilization is not probable. When an entity has incurred losses in recent years in a certain jurisdiction, additional caution should be exercised before a deferred tax asset is recognized. The entity recognizes a deferred tax asset arising from unused losses or tax credits only to the extent the entity has sufficient taxable temporary differences or there is convincing other evidence that sufficient tax profit will be available against which the unused tax losses or unused tax credits can be utilized in the future. Positive evidence of future taxable profits may be assigned less weight in assessing the appropriateness of recording a deferred tax asset when there is other negative evidence such as cumulative losses, which are considered strong evidence that future taxable profits may not be available.

In 2021, Nokia generated accounting and taxable profit in Finland and there were improvements in financial performance compared to the previous periods. At 31 December 2021, Nokia does not consider that it has generated an established pattern of sufficient tax profitability to conclude that it is probable that Nokia will be able to utilize the deferred tax assets in Finland. This conclusion is based on the weighting of objective negative evidence against more subjective positive evidence. The primary factors in this weighting were the more objective record of a pattern of financial performance compared to the more inherently subjective expectations regarding future financial performance in Finland.

Nokia continues to assess the realizability of deferred tax assets including in particular its actual profit record and may re-recognize deferred tax assets related to Finland where a clear pattern of tax profitability can be established.

The majority of the unrecognized temporary differences, tax losses and tax credits relate to France and Finland. Based on the pattern of losses in the past years in France and the lack of convincing enough evidence of sufficient taxable profit in the future years in Finland, it is uncertain whether these deferred tax assets can be utilized in the foreseeable future. A significant portion of the French unrecognized deferred tax assets are indefinite in nature and available against future French tax liabilities, subject to a limitation of 50% of annual taxable profits. The majority of Finnish unrecognized deferred tax assets are not subject to expiry and are available against future Finnish tax liabilities.

Expiry of tax losses carried forward and unused tax credits:

EURm	2021			2020		
	Recognized	Unrecognized	Total	Recognized	Unrecognized	Total
Tax losses carried forward						
Within 10 years	132	2 508	2 640	163	2 364	2 527
Thereafter	–	3	3	7	–	7
No expiry	2 172	16 882	19 054	1 810	16 657	18 467
Total	2 304	19 393	21 697	1 980	19 021	21 001
Tax credits						
Within 10 years	32	325	357	29	326	355
Thereafter	49	4	53	36	2	38
No expiry	177	13	190	206	13	219
Total	258	342	600	271	341	612

Nokia has undistributed earnings of EUR 422 million (EUR 645 million in 2020) for which a deferred tax liability has not been recognized as these earnings will not be distributed in the foreseeable future.

12. Earnings per share

	2021 EURm	2020 EURm	2019 EURm
Profit or loss attributable to equity holders of the parent			
Continuing operations	1 632	(2 520)	14
Discontinued operations	(9)	(3)	(7)
Profit/(loss) for the year	1 623	(2 523)	7
	000s shares	000s shares	000s shares
Weighted average number of shares outstanding	5 630 025	5 612 418	5 599 912
Effect of potentially dilutive shares			
Performance shares	50 300	19 780	24 072
Restricted shares and other	3 910	3 884	2 391
Total effect of potentially dilutive shares	54 210	23 664	26 463
Adjusted weighted average number of shares	5 684 235	5 636 082	5 626 375
Earnings per share	EUR	EUR	EUR
Basic earnings per share			
Continuing operations	0.29	(0.45)	0.00
Discontinued operations	0.00	0.00	0.00
Profit/(loss) for the year	0.29	(0.45)	0.00
Diluted earnings per share			
Continuing operations	0.29	(0.45)	0.00
Discontinued operations	0.00	0.00	0.00
Profit/(loss) for the year	0.29	(0.45)	0.00

Basic earnings per share is calculated by dividing the profit or loss attributable to equity holders of the parent by the weighted average number of shares outstanding during the year. Diluted earnings per share is calculated by adjusting the profit or loss attributable to equity holders of the parent, and the weighted average number of shares outstanding, for the effects of all dilutive potential ordinary shares. Potential ordinary shares are excluded from the calculation of diluted earnings per share when they are determined to be antidilutive.

In 2020, the effect of potentially dilutive shares was excluded from the calculation of diluted earnings per share as it was determined to be antidilutive due to the loss from continuing operations.

13. Goodwill and intangible assets

EURm	Goodwill	Intangible assets	Total
Acquisition cost as of 1 January 2020	6 435	9 466	15 901
Translation differences	(331)	(359)	(690)
Additions	–	39	39
Acquisitions through business combinations ⁽¹⁾	78	72	150
Disposals and retirements	–	(31)	(31)
Acquisition cost as of 31 December 2020	6 182	9 187	15 369
Accumulated amortization and impairment charges as of 1 January 2020	(908)	(7 037)	(7 945)
Translation differences	–	256	256
Impairment charges	(200)	(9)	(209)
Disposals and retirements	–	28	28
Amortization	–	(472)	(472)
Accumulated amortization and impairment charges as of 31 December 2020	(1 108)	(7 234)	(8 342)
Net book value as of 1 January 2020	5 527	2 429	7 956
Net book value as of 31 December 2020	5 074	1 953	7 027
Acquisition cost as of 1 January 2021	6 182	9 187	15 369
Translation differences	307	325	632
Additions	–	15	15
Acquisitions through business combinations ⁽¹⁾	63	24	87
Disposals and retirements	–	(52)	(52)
Acquisition cost as of 31 December 2021	6 552	9 499	16 051
Accumulated amortization and impairment charges as of 1 January 2021	(1 108)	(7 234)	(8 342)
Translation differences	(13)	(243)	(256)
Disposals and retirements	–	47	47
Amortization	–	(449)	(449)
Accumulated amortization and impairment charges as of 31 December 2021	(1 121)	(7 879)	(9 000)
Net book value as of 1 January 2021	5 074	1 953	7 027
Net book value as of 31 December 2021	5 431	1 620	7 051

(1) In 2021, Nokia acquired 100% ownership interest in Zyzyx. In 2020, Nokia acquired 100% ownership interest in Elenion Technologies. Goodwill of these acquisitions was allocated to the Network Infrastructure operating segment.

Net book value of intangible assets by type of asset⁽¹⁾:

EURm	2021	2020
Customer relationships	1 178	1 401
Patents and licenses	183	232
Technologies and IPR&D	133	155
Tradenames and trademarks	47	90
Other	79	75
Total	1 620	1 953

(1) The largest movements are due to amortization and translation differences, with the exception of Technologies and IPR&D, which includes the acquired technology EUR 24 million in 2021 (EUR 72 million in 2020).

As of 31 December 2021, the weighted average for the remaining amortization periods is approximately four years for customer relationships, five years for patents and licenses, three years for technologies and IPR&D, one year for tradenames and trademarks and three years for others.

14. Property, plant and equipment

EURm	Land, buildings, constructions and vessels	Machinery, equipment and other	Assets under construction	Total
Acquisition cost as of 1 January 2020	1 267	3 018	143	4 428
Translation differences	(63)	(102)	(4)	(169)
Additions	36	290	123	449
Acquisitions through business combinations	–	2	–	2
Reclassifications	61	64	(125)	–
Disposals and retirements	(36)	(137)	–	(173)
Acquisition cost as of 31 December 2020	1 265	3 135	137	4 537
Accumulated depreciation as of 1 January 2020	(451)	(2 121)	–	(2 572)
Translation differences	33	72	–	105
Disposals and retirements	22	128	–	150
Depreciation	(86)	(351)	–	(437)
Accumulated depreciation as of 31 December 2020	(482)	(2 272)	–	(2 754)
Net book value as of 1 January 2020	816	897	143	1 856
Net book value as of 31 December 2020	783	863	137	1 783
Acquisition cost as of 1 January 2021	1 265	3 135	137	4 537
Translation differences	53	88	7	148
Additions	27	333	214	574
Reclassifications	28	41	(69)	–
Disposals and retirements	(145)	(226)	(9)	(380)
Acquisition cost as of 31 December 2021	1 228	3 371	280	4 879
Accumulated depreciation as of 1 January 2021	(482)	(2 272)	–	(2 754)
Translation differences	(26)	(59)	–	(85)
Impairment charges	(14)	–	–	(14)
Disposals and retirements	114	216	–	330
Depreciation	(87)	(345)	–	(432)
Accumulated depreciation as of 31 December 2021	(495)	(2 460)	–	(2 955)
Net book value as of 1 January 2021	783	863	137	1 783
Net book value as of 31 December 2021	733	911	280	1 924

15. Leases

Right-of-use assets

Right-of-use assets represent Nokia's right to use the underlying leased assets.

EURm	Buildings	Other	Total
Acquisition cost as of 1 January 2020	1 048	121	1 169
Net additions ⁽¹⁾	89	59	148
Retirements	(31)	–	(31)
Acquisition cost as of 31 December 2020	1 106	180	1 286
Accumulated depreciation as of 1 January 2020	(209)	(48)	(257)
Impairment charges	(32)	–	(32)
Retirements	31	–	31
Depreciation	(176)	(47)	(223)
Accumulated depreciation as of 31 December 2020	(386)	(95)	(481)
Net book value as of 1 January 2020	839	73	912
Net book value as of 31 December 2020	720	85	805
Acquisition cost as of 1 January 2021	1 106	180	1 286
Translation differences	47	3	50
Net additions ⁽¹⁾	209	76	285
Retirements	(44)	(36)	(80)
Acquisition cost as of 31 December 2021	1 318	223	1 541
Accumulated depreciation as of 1 January 2021	(386)	(95)	(481)
Translation differences	(15)	(2)	(17)
Impairment charges	(25)	–	(25)
Retirements	44	36	80
Depreciation	(151)	(63)	(214)
Accumulated depreciation as of 31 December 2021	(533)	(124)	(657)
Net book value as of 1 January 2021	720	85	805
Net book value as of 31 December 2021	785	99	884

(1) Net additions comprise new lease contracts as well as modifications and remeasurements of existing lease contracts.

Amounts recognized in the income statement

EURm	2021	2020	2019
Depreciation expense of right-of-use assets	(214)	(223)	(225)
Expenses relating to short-term leases	(13)	(22)	(26)
Interest expense on lease liabilities	(24)	(25)	(28)
Income from subleasing leasehold and freehold properties ⁽¹⁾	8	4	9
Gains arising from sale and leaseback transactions	15	–	9
Total⁽²⁾	(228)	(266)	(261)

(1) Sublease income comprises rent income from operating subleases and financial income on the net investment in the lease related to finance subleases.

(2) Total recognized in the income statement excludes impairment of right-of-use assets, which is presented in Note 16, Impairment, and deferred taxes discussed in Note 11, Income taxes.

Amounts reported in the statement of cash flows

EURm	2021	2020	2019
Payment of principal portion of lease liabilities	(226)	(234)	(221)
Interest portion of lease liabilities	(24)	(25)	(28)
Total	(250)	(259)	(249)

The maturity analysis of lease liabilities is presented in Note 34, Financial risk management. Commitments related to future lease contracts are presented in Note 28, Commitments, contingencies and legal proceedings.

16. Impairment

Goodwill

Nokia has allocated goodwill to the operating segments corresponding to groups of cash-generating units (CGUs) that are expected to benefit from goodwill in line with Nokia's operational and reporting structure. Refer to Note 5, Segment information.

Allocation of goodwill

The following table presents the allocation of goodwill to groups of CGUs as of 31 December⁽¹⁾:

EURm	Carrying amount
2021	
Mobile Networks	2 191
Network Infrastructure	2 690
Cloud and Network Services	550
2020	
Mobile Networks	729
Fixed Networks	609
Global Services	958
IP/Optical Networks	1 865
Nokia Software	914

(1) Nokia adopted its current operational and reporting structure on 1 January 2021. Goodwill was reallocated to current groups of CGUs based on relative fair value.

Recoverable amounts

The recoverable amounts of the groups of CGUs were based on fair value less costs of disposal that was determined using a level 3 fair value measurement based on a discounted cash flow calculation. The cash flow projections used in calculating the recoverable amounts were based on financial plans approved by management covering an explicit forecast period of three years.

Seven additional years of cash flow projections subsequent to the explicit forecast period of three years reflect a gradual progression towards the steady state cash flow projections modeled in the terminal year. The terminal growth rate assumptions reflect long-term average growth rates for the industries and economies in which the groups of CGUs operate. The discount rates reflect current assessments of the time value of money and relevant market risk premiums reflecting risks and uncertainties for which the future cash flow estimates have not been adjusted. Other key variables in future cash flow projections include assumptions on estimated sales growth, gross margin and operating margin. All cash flow projections are consistent with market participant assumptions.

Terminal growth rate and post-tax discount rate applied in the impairment test for the groups of CGUs:

Key assumption %	Terminal growth rate	Post-tax discount rate
2021		
Mobile Networks	1.2	7.7
Network Infrastructure	1.4	7.7
Cloud and Network Services	1.6	6.9
2020		
Mobile Networks	1.2	8.0
Fixed Networks	0.8	7.4
Global Services	1.1	7.6
IP/Optical Networks	1.4	7.9
Nokia Software	1.5	7.0

The results of the impairment testing indicate adequate headroom for each group of CGUs in 2021.

Impairment charges by asset category

EURm	2021	2020	2019
Goodwill	–	200	–
Intangible assets	–	9	12
Property, plant and equipment	14	–	4
Right-of-use assets ⁽¹⁾	25	32	20
Investments in associated companies and joint ventures	–	4	2
Total	39	245	38

(1) Nokia adopted IFRS 16, Leases, on 1 January 2019. In 2019, a EUR 20 million impairment charge is presented net of onerous lease contract provision releases.

Based on the long-range plan prepared in the fourth quarter of 2020, Nokia conducted an impairment test and concluded that the carrying amount exceeded the recoverable amount for its Fixed Networks group of CGUs. As a result, Nokia recorded a non-cash impairment charge of EUR 200 million within other operating expenses to reduce the goodwill within its Fixed Networks operating segment.

Other impairments recorded by Nokia in 2021, 2020 and 2019 are immaterial.

17. Inventories

EURm	2021	2020
Raw materials and semi-finished goods	673	552
Finished goods	1 039	940
Contract work in progress	680	750
Total	2 392	2 242

The cost of inventories recognized as an expense during the year and included in the cost of sales is EUR 6 427 million (EUR 6 115 million in 2020 and EUR 8 181 million in 2019).

Movements in allowances for excess and obsolete inventory for the years ended 31 December:

EURm	2021	2020	2019
As of 1 January	480	505	521
Charged to income statement	49	71	83
Deductions ⁽¹⁾	(71)	(96)	(99)
As of 31 December	458	480	505

(1) Deductions include utilization and releases of allowances.

18. Other receivables

Non-current

EURm	2021	2020
R&D tax credits and other indirect tax receivables	148	129
Deposits	47	47
Other	60	41
Total	255	217

Current

EURm	2021	2020
R&D tax credits, VAT and other indirect tax receivables	480	483
Divestment-related receivables	23	23
Deposits	22	19
Other	334	325
Total	859	850

19. Equity

Shares and share capital

Share capital

Nokia Corporation has one class of shares. Each share entitles the holder to one vote at general meetings. The shares have no par value nor is there a minimum or maximum share capital or number of shares under the Articles of Association of Nokia Corporation. As of 31 December 2021, the share capital amounted to EUR 245 896 461.96 (EUR 245 896 461.96 in 2020) and consisted of 5 675 461 159 (5 653 886 159 in 2020) issued and fully paid shares.

Share premium

Share premium reserve consists of the share premium account of the Parent Company. In addition, the equity impact corresponding to the employee services received related to the equity-settled share-based compensation plans is recorded in the share premium reserve.

Treasury shares

As of 31 December 2021, the number of Nokia shares held by the Group companies was 40 467 555 (36 389 799 in 2020) representing 0.7% (0.6% in 2020) of the share capital and total voting rights.

In 2021, under the authorization held by the Board of Directors, Nokia Corporation issued 21 575 000 new shares to itself to fulfill the company's obligation under the Nokia Equity Programs and 17 497 244 treasury shares to employees, including certain members of the Group Leadership Team, as settlement under Nokia's equity-based incentive plans and the employee share purchase plan. The shares were issued without consideration.

Reconciliation of the number of shares outstanding at the beginning and at the end of the period:

Number of shares 000s	2021	2020	2019
As of 1 January	5 617 496	5 605 581	5 593 162
Settlement of share-based payments	17 497	11 915	12 396
Stock options exercised	—	—	23
As of 31 December	5 634 993	5 617 496	5 605 581

Authorizations given to the Board of Directors related to issue and repurchase of shares

Authorization to issue shares and special rights entitling to shares

At the Annual General Meeting held on 8 April 2021, the shareholders authorized the Board of Directors to issue a maximum of 550 million shares through one or more issues of shares or special rights entitling to shares. The Board of Directors is authorized to issue either new shares or shares held by Nokia. The authorization included the right for the Board of Directors to resolve on all the terms and conditions of such share and special rights issuances, including issuance in deviation from the shareholders' pre-emptive rights. The authorization may be used to develop Nokia's capital structure, diversify the shareholder base, finance or carry out acquisitions or other arrangements, settle Nokia's equity-based incentive plans, or for other purposes resolved by the Board of Directors. The authorization is effective until 7 October 2022, and terminated the previous authorizations to issue shares and special rights entitling to shares.

Authorization to repurchase shares

At the Annual General Meeting held on 8 April 2021, the shareholders authorized the Board of Directors to repurchase a maximum of 550 million shares. The amount corresponds to less than 10% of the total number of Nokia's shares. Shares may be repurchased to be cancelled, held to be reissued, transferred further or for other purposes resolved by the Board. The shares may be repurchased otherwise than in proportion to the shares held by the shareholders. The price paid for the shares under the authorization shall be based on the market price of Nokia shares on the securities markets on the date of the repurchase. The Board shall resolve on all other matters related to the repurchase of Nokia shares. The authorization is effective until 7 October 2022, and terminated the previous authorization to repurchase shares.

Distribution of funds

Nokia distributes funds to its shareholders in two ways: a) as dividends from retained earnings and/or as equity repayment from the reserve of invested unrestricted equity, and b) by repurchasing its own shares using funds in the unrestricted equity. The dividend and/or equity repayment is distributed in quarterly instalments subject to the Board of Directors' resolution as authorized by the Annual General Meeting (AGM). The amount of any distribution is limited to the amount of distributable earnings of the Parent Company, and subject to exceptions relating to the right of minority shareholders to request a certain minimum distribution, the distribution may not exceed the amount proposed by the Board of Directors.

Nokia's Board of Directors proposes that the AGM in 2022 authorizes the Board to decide in its discretion on the distribution of an aggregate maximum of EUR 0.08 per share as dividend and/or as assets from the reserve of invested unrestricted equity. On the date of issuing the financial statements for 2021 the total number of Nokia shares is 5 696 261 159 and consequently the total amount of distribution would be EUR 456 million. Total number of shares includes shares held by the Group companies which are not entitled to distribution. The AGMs in 2021 and 2020 resolved that no dividend is distributed for the financial years 2020 and 2019, respectively. In 2019, Nokia paid a total dividend of EUR 560 million, corresponding to EUR 0.10 per share, to its shareholders related to the financial year 2018.

Nokia's Board of Directors has also initiated a share buyback program under the current authorization from the AGM to repurchase shares. The program targets to return up to EUR 600 million of cash to shareholders in tranches over a period of two years, subject to continued authorization from the AGM. The aggregate purchase price of all shares to be acquired in the first tranche, which began in February 2022 and which is expected to end in December 2022, shall not exceed EUR 300 million. The maximum number of shares that can be repurchased under the first phase of the program is 275 000 000 shares corresponding to approximately 5% of the total number of shares in Nokia. The repurchased shares will be cancelled.

Nokia has appointed a third-party broker as the lead-manager for the first phase of the buyback program. The lead-manager will make trading decisions independently of and without influence from Nokia. Nokia may terminate the program prior to its scheduled end date.

Nature and purpose of other equity reserves

Translation differences

Translation differences consist of foreign exchange differences arising from translation of foreign operations into euro, the presentation currency of the consolidated financial statements as well as gains and losses related to hedging of net investments in foreign operations.

Fair value and other reserves

Pension remeasurements

Pension remeasurements reserve includes actuarial gains and losses as well as return on plan assets and changes in the effect of the asset ceiling, excluding amounts recognized in net interest, related to Nokia's defined benefit plans.

Hedging reserve

Hedging reserve includes the change in fair value that reflects the change in spot exchange rates for certain foreign exchange forward contracts that are designated as cash flow hedges to the extent that the hedge is effective.

Cost of hedging reserve

Cost of hedging reserve includes forward element of foreign exchange forward contracts and the time value of foreign exchange options related to cash flow hedging of forecasted foreign currency sale and purchase transactions. Additionally, cost of hedging reserve includes the difference between the change in fair value of forward element of foreign exchange forward contracts and the time value of option contracts and the amortization of forward element of foreign exchange forward contracts and time value of option contracts related to net investment hedging. Cost of hedging reserve also includes changes in fair value from foreign currency basis spread related to fair value hedging of foreign currency denominated bonds.

Fair value reserve

Fair value reserve includes the changes in fair value of financial instruments that are managed in a portfolio with a business model of holding financial instruments to collect contractual cash flows including principal and interest as well as selling financial instruments. The fair values recorded in fair value reserve for these instruments are reduced by amounts of loss allowances.

Reserve for invested unrestricted equity

The reserve for invested unrestricted equity includes that part of the subscription price of issued shares that according to the share issue decision is not to be recorded to the share capital as well as other equity inputs that are not recorded to some other reserve. The amounts received for treasury shares are recorded to the reserve for invested unrestricted equity, unless it is provided in the share issue decision that it is to be recorded in full or in part to the share capital.

Other equity

Accumulated deficit

Accumulated deficit is the net total of previous years' profits and losses less dividends paid to the shareholders.

Non-controlling interests

Non-controlling interests represent the share of net assets of certain subsidiaries attributable to their minority shareholders. For more information on the contractual arrangement related to the ownership interests in the Nokia Shanghai Bell Group, refer to Note 31, Significant partly-owned subsidiaries.

Changes in other comprehensive income by component of equity

EURm	Translation differences	Fair value and other reserves			
		Pension remeasurements	Hedging reserve	Cost of hedging reserve	Fair value reserve
As of 1 January 2019	(592)	1 137	(21)	8	(61)
Foreign exchange translation differences	259	–	–	–	–
Net investment hedging losses	(40)	–	–	(6)	–
Remeasurements of defined benefit plans	–	319	–	–	–
Net fair value losses	–	–	(17)	(34)	(101)
Transfer to income statement	1	–	32	18	107
Other increase	–	1	–	–	–
As of 31 December 2019	(372)	1 457	(6)	(14)	(55)
Foreign exchange translation differences	(1 231)	–	–	–	–
Net investment hedging gains	307	–	–	1	–
Remeasurements of defined benefit plans	–	484	–	–	–
Net fair value gains/(losses)	–	–	13	(13)	(175)
Transfer to income statement	–	–	(5)	16	208
Other decrease	(1)	–	–	–	–
Movement attributable to non-controlling interests	2	(1)	–	–	–
As of 31 December 2020	(1 295)	1 940	2	(10)	(22)
Foreign exchange translation differences	1 162	–	–	–	–
Net investment hedging losses	(249)	–	–	–	–
Remeasurements of defined benefit plans	–	2 302	–	–	–
Net fair value (losses)/gains	–	–	(15)	5	(25)
Transfer to income statement	(7)	–	6	4	32
Movement attributable to non-controlling interests	(7)	–	–	–	–
As of 31 December 2021⁽¹⁾	(396)	4 242	(7)	(1)	(15)

(1) In 2021, translation differences includes EUR 226 million (EUR 475 million in 2020 and EUR 168 million in 2019) of gains related to net investment hedging.

Capital management

For capital management purposes Nokia defines capital as total equity and interest-bearing liabilities less cash and cash equivalents and current financial investments. The main objectives of Nokia's capital management are to maintain a solid overall financial position and to ensure sufficient financial flexibility to execute Nokia's long-term business strategy and to provide returns to shareholders. From a liquidity perspective, Nokia intends to maintain a level of cash and cash equivalents and current financial investments at 30% or more of annual net sales. Nokia targets investment grade credit ratings with the long-term credit ratings being BBB- (stable) by Fitch, Ba2 (positive) by Moody's, and BB+ (stable) by S&P Global Ratings as of 31 December 2021. With regards to shareholder remuneration, Nokia targets recurring, stable and over time growing ordinary dividend payments, taking into account the previous year's earnings as well as the company's financial position and business outlook. Nokia is also using share repurchases as a tool to manage its capital structure through the reduction of capital and distribute excess cash to the shareholders.

20. Other comprehensive income

EURm	2021			2020			2019		
	Gross	Tax	Net	Gross	Tax	Net	Gross	Tax	Net
Pension remeasurements⁽¹⁾									
Remeasurements of defined benefit plans	3 040	(755)	2 285	624	(140)	484	414	(95)	319
Net change during the year	3 040	(755)	2 285	624	(140)	484	414	(95)	319
Translation differences									
Exchange differences on translating foreign operations	1 160	2	1 162	(1 232)	1	(1 231)	259	–	259
Transfer to income statement	(7)	–	(7)	–	–	–	1	–	1
Net change during the year	1 153	2	1 155	(1 232)	1	(1 231)	260	–	260
Net investment hedges⁽²⁾									
Net investment hedging (losses)/gains	(249)	–	(249)	266	42	308	(58)	12	(46)
Net change during the year	(249)	–	(249)	266	42	308	(58)	12	(46)
Cash flow and other hedges⁽³⁾									
Net fair value (losses)/gains	(10)	–	(10)	1	(1)	–	(64)	13	(51)
Transfer to income statement	10	–	10	14	(3)	11	62	(12)	50
Net change during the year	–	–	–	15	(4)	11	(2)	1	(1)
Financial assets at fair value through other comprehensive income									
Net fair value (losses)/gains	(25)	–	(25)	(213)	38	(175)	(126)	25	(101)
Transfer to income statement on loss allowance	19	–	19	229	(46)	183	40	(8)	32
Transfer to income statement on disposal	13	–	13	31	(6)	25	94	(19)	75
Net change during the year	7	–	7	47	(14)	33	8	(2)	6
Other increase	–	–	–	3	–	3	–	–	–
Total	3 951	(753)	3 198	(277)	(115)	(392)	622	(84)	538

(1) In 2021, remeasurement of defined benefit plans includes the impact of the modification of the terms of the US defined benefit pension plans. For more information, refer to Note 25, Pensions and other post-employment benefits.

(2) In 2020, income tax related to net investment hedging gains includes EUR 94 million related to the derecognition of deferred tax assets in Finland. For more information, refer to Note 11, Income taxes.

(3) Includes movements in cash flow hedging reserve and related cost of hedging reserve.

21. Interest-bearing liabilities

Issuer/borrower	Instrument	Currency	Nominal (million)	Final maturity	Carrying amount EURm ⁽¹⁾	
					2021	2020
Nokia Corporation	1.00% Senior Notes ⁽²⁾	EUR	350	March 2021	–	350
Nokia Corporation	3.375% Senior Notes ⁽³⁾	USD	500	June 2022	–	417
Nokia Corporation	2.00% Senior Notes	EUR	750	March 2024	759	762
Nokia Corporation	EIB R&D Loan	EUR	500	February 2025	500	500
Nokia Corporation	NIB R&D Loan ⁽⁴⁾	EUR	250	May 2025	250	250
Nokia Corporation	2.375% Senior Notes	EUR	500	May 2025	497	497
Nokia Corporation	2.00% Senior Notes	EUR	750	March 2026	760	762
Nokia Corporation	4.375% Senior Notes	USD	500	June 2027	464	448
Nokia of America Corporation	6.50% Senior Notes	USD	74	January 2028	66	61
Nokia Corporation	3.125% Senior Notes	EUR	500	May 2028	497	497
Nokia of America Corporation	6.45% Senior Notes	USD	206	March 2029	183	169
Nokia Corporation	6.625% Senior Notes	USD	500	May 2039	553	541
Nokia Corporation and various subsidiaries	Other liabilities				124	322
Total					4 653	5 576

(1) Carrying amount includes EUR 166 million (EUR 224 million in 2020) of fair value gains related to fair value hedge accounting relationships, out of which EUR 203 million (EUR 235 million in 2020) are fair value gains related to discontinued fair value hedge accounting relationships that are amortized over the life of the respective Senior Notes.

(2) In January 2021, Nokia exercised its issuer call option to redeem 1.00% Senior Notes due March 2021 for the full amount of EUR 350 million. The redemption date for the notes was 15 February 2021.

(3) In December 2021, Nokia exercised its issuer call option to redeem 3.375% Senior Notes due June 2022 for the full amount of USD 500 million. The redemption date for the notes was 16 December 2021.

(4) The loan from the Nordic Investment Bank (NIB) is repayable in three equal annual instalments in 2023, 2024 and 2025.

Nokia's significant credit facilities and funding programs as of 31 December:

Committed / uncommitted	Financing arrangement	Currency	Nominal (million)	Utilized (million)	
				2021	2020
Committed	Revolving Credit Facility ⁽¹⁾	EUR	1 500	–	–
Uncommitted	Finnish Commercial Paper Programme	EUR	750	–	–
Uncommitted	Euro-Commercial Paper Programme	EUR	1 500	–	–
Uncommitted	Euro Medium Term Note Programme ⁽²⁾	EUR	5 000	2 500	2 850
Total				2 500	2 850

(1) Nokia exercised its option to extend the maturity date of the Revolving Credit Facility in June 2021. Subsequent to the extension, the facility has its maturity in June 2026, except for EUR 88 million having its maturity in June 2024.

(2) All euro-denominated bonds have been issued under the Euro Medium Term Note Programme.

All borrowings and credit facilities presented in the tables above are senior unsecured and have no financial covenants.

To manage interest rate and foreign exchange risks related to Nokia's interest-bearing liabilities, Nokia has designated the following cross- currency swaps as hedges under both fair value hedge accounting and cash flow hedge accounting, and interest rate swaps as hedges under fair value hedge accounting as of 31 December:

Entity	Instrument ⁽¹⁾	Currency	Maturity	Notional (million)		Fair value EURm	
				2021	2020	2021	2020
Nokia Corporation	Cross-currency swaps	USD	June 2022	–	500	–	(48)
Nokia Corporation	Interest rate swaps	EUR	March 2024	185	–	–	–
Nokia Corporation	Cross-currency swaps	USD	June 2027	500	250	(7)	(28)
Nokia Corporation	Cross-currency swaps	USD	May 2039	300	250	(46)	(78)
Total						(53)	(154)

(1) All cross-currency swaps and interest rate swaps are fixed-to-floating swaps.

Changes in lease liabilities, interest-bearing liabilities and associated derivatives arising from financing activities:

EURm	Long-term interest- bearing liabilities	Short-term interest- bearing liabilities	Derivatives held to hedge long-term borrowings ⁽³⁾	Lease liabilities ⁽²⁾	Total
As of 1 January 2020	3 985	292	50	1 030	5 357
Cash flows	1 401	(83)	(52)	(234)	1 032
Non-cash changes:					
Acquisitions through business combinations	10	30	–	–	40
Changes in foreign exchange rates	(133)	(7)	123	(37)	(54)
Changes in fair value	102	–	(102)	–	–
Reclassification between long-term and short-term	(350)	350	–	–	–
Net additions ⁽³⁾	–	–	–	147	147
Other ⁽⁴⁾	–	(21)	135	4	118
As of 31 December 2020	5 015	561	154	910	6 640
Cash flows	(923)	(67)	13	(226)	(1 203)
Non-cash changes:					
Changes in foreign exchange rates	122	2	(104)	36	56
Changes in fair value	(53)	–	(10)	–	(63)
Reclassification between long-term and short-term	380	(380)	–	–	–
Net additions ⁽³⁾	–	–	–	296	296
Other	(4)	–	–	(7)	(11)
As of 31 December 2021	4 537	116	53	1 009	5 715

(1) Includes derivatives designated in fair value and cash flow hedge accounting relationships as well as derivatives not designated in hedge accounting relationship but hedging identifiable long-term borrowing exposure.

(2) Includes non-current and current lease liabilities.

(3) Net additions comprise new lease contracts as well as modifications and remeasurements of existing lease contracts.

(4) In 2020, includes EUR 135 million cash inflow from settlements of certain interest rate derivatives held to hedge long-term borrowings that is included in operating activities as interest paid in the consolidated statement of cash flows.

22. Fair value of financial instruments

Financial assets and liabilities recorded at fair value are categorized based on the amount of unobservable inputs used to measure their fair value. Three hierarchical levels are based on an increasing amount of judgment associated with the inputs used to derive fair valuation for these assets and liabilities, level 1 being market values for exchange traded products, level 2 being primarily based on publicly available market information, and level 3 requiring most management judgment. At the end of each reporting period, Nokia categorizes its financial assets and liabilities to the appropriate level of fair value hierarchy. Items carried at fair value in the following table are measured at fair value on a recurring basis.

EURm	Carrying amounts							Fair value ⁽¹⁾	
	Amortized cost	Fair value through profit or loss			Fair value through other comprehensive income			Total	Total
		Level 1	Level 2	Level 3	Level 1	Level 2	Level 3		
2021									
Non-current financial investments	–	8	–	750	–	–	–	758	758
Other non-current financial assets	130	–	101	–	–	94	–	325	325
Other current financial assets including derivatives	115	–	200	–	–	21	–	336	336
Trade receivables	–	–	–	–	–	5 382	–	5 382	5 382
Current financial investments	526	–	2 051	–	–	–	–	2 577	2 577
Cash and cash equivalents	4 627	–	2 064	–	–	–	–	6 691	6 691
Total financial assets	5 398	8	4 416	750	–	5 497	–	16 069	16 069
Long-term interest-bearing liabilities	4 537	–	–	–	–	–	–	4 537	4 775
Other long-term financial liabilities	–	–	–	68	–	–	–	68	68
Short-term interest-bearing liabilities	116	–	–	–	–	–	–	116	116
Other short-term financial liabilities including derivatives	–	–	240	522	–	–	–	762	762
Discounts without performance obligations	479	–	–	–	–	–	–	479	479
Trade payables	3 679	–	–	–	–	–	–	3 679	3 679
Total financial liabilities	8 811	–	240	590	–	–	–	9 641	9 879

EURm	Carrying amounts							Fair value ⁽¹⁾	
	Amortized cost	Fair value through profit or loss			Fair value through other comprehensive income			Total	Total
		Level 1	Level 2	Level 3	Level 1	Level 2	Level 3		
2020									
Non-current financial investments	–	31	–	714	–	–	–	745	745
Other non-current financial assets	115	–	99	5	–	87	–	306	306
Other current financial assets including derivatives	22	–	169	8	–	15	–	214	214
Trade receivables	–	–	–	–	–	5 503	–	5 503	5 503
Current financial investments	134	–	882	–	–	105	–	1 121	1 121
Cash and cash equivalents	4 333	–	2 607	–	–	–	–	6 940	6 940
Total financial assets	4 604	31	3 757	727	–	5 710	–	14 829	14 829
Long-term interest-bearing liabilities	5 015	–	–	–	–	–	–	5 015	5 140
Other long-term financial liabilities	–	–	–	19	–	–	–	19	19
Short-term interest-bearing liabilities	561	–	–	–	–	–	–	561	561
Other short-term financial liabilities including derivatives	–	–	318	420	–	–	–	738	738
Discounts without performance obligations ⁽²⁾	747	–	–	–	–	–	–	747	747
Trade payables	3 174	–	–	–	–	–	–	3 174	3 174
Total financial liabilities	9 497	–	318	439	–	–	–	10 254	10 379

(1) The following fair value measurement methods are used for items not carried at fair value: The fair values of long-term interest-bearing liabilities, including current part, are primarily based on publicly available market information (level 2). The fair values of other assets and liabilities, including loan receivables and loans payable, are primarily based on discounted cash flow analysis (level 2). The fair value is estimated to equal the carrying amount for short-term financial assets and financial liabilities due to limited credit risk and short time to maturity. Refer to Note 2, Significant accounting policies.

(2) In 2021, Nokia has revised the classification of discounts without performance obligations and included this financial liability in the table. The comparative amounts for 2020 have been adjusted accordingly.

Lease liabilities are not included in the fair value of financial instruments.

The level 1 category includes financial assets and liabilities that are measured in whole by reference to published quotes in an active market. A financial instrument is regarded as quoted in an active market if quoted prices are readily and regularly available from an exchange, and those prices represent actual and regularly occurring market transactions on an arm's-length basis. This category includes only exchange traded products.

The level 2 category includes financial assets and liabilities measured using a valuation technique based on assumptions that are supported by prices from observable current market transactions. These include assets and liabilities with fair values based on publicly available market information, financial assets with fair values based on broker quotes and assets that are valued using Nokia's own valuation models whereby the material assumptions are market observable. The majority of Nokia's cash equivalents, current investments, over-the-counter derivatives, trade receivables and certain other products are included within this category.

The level 3 financial assets category includes a large number of investments in unlisted equities and unlisted venture funds, including investments managed by NGP Capital specializing in growth-stage investing. The fair value of level 3 investments is determined using one or more valuation techniques where the use of the market approach generally consists of using comparable market transactions, while the use of the income approach generally consists of calculating the net present value of expected future cash flows. For unlisted funds, the selection of appropriate valuation techniques by the fund managing partner may be affected by the availability and reliability of relevant inputs. In some cases, one valuation technique may provide the best indication of fair value while in other circumstances multiple valuation techniques may be appropriate.

The inputs generally considered in determining the fair value of level 3 investments include the original transaction price, recent transactions in the same or similar instruments, completed or pending third-party transactions in the underlying investment or comparable issuers, subsequent rounds of financing, recapitalizations or other transactions undertaken by the issuer, offerings in the equity or debt capital markets, and changes in financial ratios or cash flows, adjusted as appropriate for liquidity, credit, market and/or other risk factors. The fair value may be adjusted to reflect illiquidity and/or non-transferability, with the amount of such discount estimated by the managing partner in the absence of market information.

The level 3 investments are remeasured for each reporting date taking into consideration any changes in estimates, projections and assumptions, as well as any changes in economic and other relevant conditions. Level 3 investments include approximately 40 separate venture funds investing in hundreds of individual companies in various sectors and geographies, focusing on digital health, software and enterprise sectors. Hence, specific estimates and assumptions used by managing partners due to the lack of observable inputs do impact the fair value of individual investments, but no individual input has a significant impact on the aggregated fair value of level 3 investments.

Level 3 financial liabilities include a conditional obligation to China Huaxin as part of the Nokia Shanghai Bell definitive agreements where China Huaxin obtained the right to fully transfer its ownership interest in Nokia Shanghai Bell to the Group in exchange for a future cash settlement. The fair value of the liability is measured based on the expected future cash settlement. The measurement of the financial liability involves estimation of the option exercise price and the distribution of excess cash balances upon exercise. Unobservable valuation inputs include certain financial performance metrics of Nokia Shanghai Bell. No individual input has a significant impact on the total fair value of the level 3 financial liability. Refer to Note 31, Significant partly-owned subsidiaries.

Reconciliation of the opening and closing balances of level 3 financial assets and liabilities:

EURm	Level 3 financial assets	Level 3 financial liabilities
As of 1 January 2020	746	(659)
Net gains in income statement	19	94
Additions ⁽¹⁾	49	–
Deductions ⁽¹⁾	(85)	2
Transfers out of level 3	(5)	126
Other movements	3	(2)
As of 31 December 2020	727	(439)
Net gains/(losses) in income statement	177	(107)
Acquisitions through business combination	–	(48)
Additions ⁽¹⁾	69	–
Deductions ⁽¹⁾	(218)	7
Transfers out of level 3	(7)	–
Other movements	2	(3)
As of 31 December 2021	750	(590)

(1) For level 3 financial assets, additions mainly include capital contributions to venture funds and deductions mainly include distributions from venture funds.

The gains and losses from venture fund and similar investments categorized in level 3 are included in other operating income and expenses. The gains and losses from other level 3 financial assets and liabilities are recorded in financial income and expenses. A net gain of EUR 85 million (net gain of EUR 102 million in 2020) related to level 3 financial instruments held at 31 December 2021 was included in the profit and loss during 2021.

23. Derivative financial instruments

EURm	Assets		Liabilities	
	Fair value ⁽¹⁾	Notional ⁽²⁾	Fair value ⁽¹⁾	Notional ⁽²⁾
2021				
Hedges on net investment in foreign subsidiaries				
Foreign exchange forward contracts	1	1 568	(11)	1 394
Cash flow hedges				
Foreign exchange forward contracts	28	1 521	(47)	1 571
Currency options bought	–	7	–	–
Fair value hedges				
Interest rate swaps	–	185	–	–
Foreign exchange forward contracts	22	577	(80)	2 182
Firm commitments	58	2 069	(11)	397
Cash flow and fair value hedges⁽³⁾				
Cross-currency swaps	15	265	(68)	441
Derivatives not designated in hedge accounting relationships carried at fair value through profit and loss				
Foreign exchange forward contracts	74	6 432	(23)	6 390
Currency options bought	–	10	–	–
Other derivatives	2	25	–	–
Total	200	12 659	(240)	12 375
2020				
Hedges on net investment in foreign subsidiaries				
Foreign exchange forward contracts	1	1 423	(3)	559
Cash flow hedges				
Foreign exchange forward contracts	34	933	(16)	736
Currency options bought	1	108	–	–
Currency options sold	–	–	–	6
Fair value hedges				
Foreign exchange forward contracts	83	1 340	(14)	588
Firm commitments	19	468	(101)	1 105
Cash flow and fair value hedges⁽³⁾				
Cross-currency swaps	–	–	(154)	815
Derivatives not designated in hedge accounting relationships carried at fair value through profit and loss				
Foreign exchange forward contracts	29	3 716	(16)	3 917
Currency options bought	2	171	–	–
Other derivatives	–	–	–	9
Total	169	8 159	(304)	7 735

(1) Included in other current financial assets and other financial liabilities in the consolidated statement of financial position.

(2) Includes the gross amount of all notional values for contracts that have not yet been settled or cancelled. The amount of notional value outstanding is not necessarily a measure or indication of market risk as the exposure of certain contracts may be offset by that of other contracts.

(3) Cross-currency swaps have been designated partly as fair value hedges and partly as cash flow hedges.

24. Share-based payments

Nokia has several equity-based incentive programs for executives and other eligible employees for the purposes of retention and recruitment. Under the programs, employees may be granted performance shares or restricted shares, or be invited to purchase Nokia shares and receive matching shares under Nokia's voluntary all-employee share purchase program. Starting in 2021, Nokia granted restricted shares to selected employees as the primary method of equity compensation whereas grants under performance share plans were targeted on a more limited basis to senior level employees and executives. The equity-based incentive grants are expected to be settled with equity, and are generally conditional on continued employment as well as the fulfillment of any performance conditions specified in the award terms. In 2021, the share-based payment expense, including social security costs, for all equity-based incentive grants in the consolidated income statement amounts to EUR 118 million (EUR 76 million in 2020 and EUR 77 million in 2019). All amounts relate to equity-settled awards.

Active share-based payment plans by instrument

	Performance shares		Restricted shares	
	Number of performance shares outstanding at target	Weighted average grant date fair value EUR ⁽¹⁾	Number of restricted shares outstanding	Weighted average grant date fair value EUR ⁽¹⁾
As of 1 January 2019	83 143 531		3 582 048	
Granted	31 979 747	4.02	2 060 342	4.18
Forfeited	(4 964 055)		(451 540)	
Vested ⁽²⁾	(18 933 700)		(1 915 675)	
As of 31 December 2019	91 225 523		3 275 175	
Granted	38 753 394	2.63	3 830 700	3.06
Forfeited	(4 752 172)		(1 100 107)	
Vested ⁽²⁾	(25 754 552)		(1 478 175)	
As of 31 December 2020	99 472 193		4 527 593	
Granted	17 749 650	5.11	25 046 200	5.05
Forfeited	(5 783 031)		(783 950)	
Vested ⁽²⁾	(31 611 804)		(2 026 150)	
As of 31 December 2021⁽³⁾	79 827 008		26 763 693	

(1) The fair value for the 2019 performance shares and all restricted shares are estimated based on the grant date market price of the Nokia share less the present value of dividends expected to be paid during the vesting period. The fair value for the 2020 and 2021 performance shares is estimated based on the dividend-adjusted price of the Nokia share at the settlement date of the plan and the target payout levels.

(2) Vested performance shares at target are multiplied by the confirmed payout (% of target) to calculate the total number of Nokia shares settlement.

(3) Includes 26 267 664 performance shares for the Performance Share Plan 2019 and 401 514 Restricted Shares that vested on 1 January 2022.

Performance shares

In 2021, Nokia administered four global performance share plans, the Performance Share Plans of 2018, 2019, 2020 and 2021. The performance shares represent a commitment by Nokia to deliver Nokia shares to eligible participants at a future point in time, subject to the fulfillment of predetermined criteria. Performance shares are granted on a limited basis for purposes related to retention and recruitment of individuals deemed critical to Nokia's future success. Until the Nokia shares are delivered, the participants do not have any shareholder rights, such as voting or dividend rights, associated with the performance shares. The performance share grants are generally forfeited if the employment relationship with Nokia terminates prior to vesting.

The 2020 and 2021 Performance Share Plans are three-year plans where Nokia's actual total shareholder return ("TSR") is compared to the target TSR to determine the number of Nokia shares that will be delivered at settlement. TSR is calculated based on the growth in the Nokia share price plus any dividends paid during the plan period. The 2020 and 2021 Performance Share Plans do not include a minimum payout guarantee.

Global performance share plans as of 31 December 2021:

Plan	Performance shares outstanding at target	Confirmed payout (% of target)	Performance period	Restriction period	Settlement year
2018	—	57	2018-2019	2020	2021
2019	26 267 664	53	2019-2021	N/A	2022
2020	35 973 694	—	2020-2023	N/A	2023
2021	17 585 650	—	2021-2024	N/A	2024

For the 2019 performance share plan, the number of performance shares at target is the amount of performance shares granted to an individual that will be settled if the target performance is achieved. At maximum performance, the settlement amounts to two times the amount at target. The 2019 performance share plan has a three-year performance period (2019-2021) and the performance criteria are: earnings per share (diluted), free cash flow and revenue relative to market (market share). The criteria exclude costs related to the acquisition of Alcatel-Lucent and related integration, goodwill impairment charges, intangible asset amortization and other purchase price fair value adjustments, restructuring and associated charges and certain other items. The Performance Share Plan 2019 includes a minimum payout guarantee for performance shares granted to non-executive participants, such that 25% of the performance shares granted will settle, regardless of the satisfaction of the applicable performance criteria. Performance shares granted to executive participants under the Performance Share Plan 2019 do not include a minimum payout guarantee.

Restricted shares

In 2021, there were outstanding Restricted Shares from grants made in 2018, 2019, 2020 and 2021. Restricted Shares represent a commitment by Nokia to deliver Nokia shares to eligible participants at a future point in time, subject to the fulfillment of predetermined service conditions. Restricted Shares will either vest on the third anniversary of the award or follow a tranche vesting schedule whereby each plan vests in one-three tranches determined at the award date. Restricted Shares are subject to continued employment with Nokia and participants do not have any shareholder rights, such as voting or dividend rights, until the Nokia shares are delivered. The restricted share grants are generally forfeited if the employment relationship with Nokia terminates prior to vesting of the applicable tranche or tranches.

Employee share purchase plan

Nokia offers a voluntary Employee Share Purchase Plan to its employees. Participating employees make contributions from their net salary to purchase Nokia shares on a monthly basis during a 12-month savings period. Nokia intends to deliver one matching share for every two purchased shares the employee holds as of the end of the Plan cycle. In 2021, 4 851 070 matching shares were issued as a settlement to the participants of

the Employee Share Purchase Plan 2020 (6 340 859 matching shares issued under the 2019 Plan in 2020 and 4 524 101 matching shares issued under the 2018 Plan in 2019).

Legacy equity compensation programs

Stock options

In 2021, Nokia no longer administered any stock option plan. The last stock option plan administered by Nokia was the Stock Option Plan 2011. The last stock options under this Plan were granted in 2013. During 2019, the last remaining 23 000 outstanding and exercisable stock options were exercised with weighted average exercise price of EUR 2.35 and at a weighted average share price of EUR 5.34. The final subscription period ended on 27 December 2019.

Each stock option entitled the holder to subscribe for one new Nokia share. The stock options were non-transferable and could be exercised for shares only. Shares were eligible for dividends for the financial year in which the share subscription took place. Other shareholder rights commenced on the date on which the subscribed shares were entered in the Trade Register. The stock option grants were generally forfeited if the employment relationship with Nokia was terminated.

25. Pensions and other post-employment benefits

Nokia maintains a number of post-employment plans in various countries including both defined benefit and defined contribution plans. Nokia's defined benefit plans comprise significant pension programs and schemes as well as material other post-employment benefit plans providing post-employment healthcare and life insurance coverage to certain employee groups. Defined benefit plans expose Nokia to various risks such as investment risk, interest rate risk, life expectancy risk, and regulatory/compliance risk. The characteristics and extent of these risks vary depending on the legal, fiscal, and economic requirements in each country. In 2021, the amount recognized in the consolidated income statement related to defined benefit plans was EUR 157 million (EUR 153 million in 2020 and EUR 31 million in 2019).

Nokia also participates in defined contribution plans, multi-employer and insured plans for which Nokia contributions are recognized as expense in the consolidated income statement in the period to which the contributions relate. In a defined contribution plan, Nokia's legal or constructive obligation is limited to the amount that it agrees to contribute to the fund. In 2021, the amount recognized in the consolidated income statement related to defined contribution plans was EUR 223 million (EUR 209 million in 2020 and EUR 220 million in 2019).

Defined benefit plans

Nokia's most significant defined benefit pension plans are in the United States, Germany, and the United Kingdom. Together they account for 91% (91% in 2020) of Nokia's total defined benefit obligation and 91% (91% in 2020) of Nokia's total plan assets.

The defined benefit obligations, the fair value of plan assets, the effects of the asset ceiling and the net defined benefit balance as of 31 December:

EURm	2021				2020			
	Defined benefit obligation	Fair value of plan assets	Effects of asset ceiling	Net defined benefit balance	Defined benefit obligation	Fair value of plan assets	Effects of asset ceiling	Net defined benefit balance
United States	(16 907)	21 746	–	4 839	(17 379)	20 328	(1 125)	1 824
Germany	(2 630)	1 295	–	(1 335)	(2 847)	1 244	–	(1 603)
United Kingdom	(1 235)	1 652	–	417	(1 231)	1 716	–	485
Other	(1 932)	2 435	(92)	411	(2 044)	2 400	(70)	286
Total	(22 704)	27 128	(92)	4 332	(23 501)	25 688	(1 195)	992

United States

Nokia has significant defined benefit pension plans and a significant post-employment welfare benefit plan (Opeb) providing post-employment healthcare benefits and life insurance coverage in the United States. The pension plans include both traditional service-based programs and cash-balance plans. Salaried, non-union-represented employees are covered by a cash-balance program. All other legacy programs, including legacy service-based programs, were frozen by 31 December 2009. For former employees who, when actively employed, were represented by a union, Nokia maintained two defined benefit pension plans, both of which are traditional service-based programs. On 31 December 2021, these two plans were merged. The post-employment plans provide welfare benefits for certain retired former employees. Pursuant to an agreement with the Communications Workers of America (CWA) and the International Brotherhood of Electrical Workers (IBEW) unions, Nokia provides post-employment healthcare benefits and life-insurance coverage for employees formerly represented by these two unions. That agreement was renewed in 2020 and the contract expires on 31 December 2027.

Germany

Nokia maintains two primary plans in Germany which cover the majority of active employees: the cash-balance plan Beitragsorientierter Altersversorgungsplan (BAP) for the Group's former Nokia employees and a similar cash-balance program (AVK Basis-/Matchingkonto) for the Group's former Alcatel-Lucent employees. Individual benefits are generally dependent on eligible compensation levels, ranking within the Group and years of service. These plans are partially funded defined benefit pension plans, the benefits being subject to a minimum return guaranteed by the Group. The funding vehicle for the BAP plan is the NSN Pension Trust e.V. The trust is legally separate from the Group and manages the plan assets in accordance with the respective trust agreements.

All other plans have been frozen or closed in prior years and replaced by the cash-balance plans. Benefits are paid in annual instalments, as monthly retirement pension, or as a lump sum on retirement in an amount equal to accrued pensions and guaranteed interest.

United Kingdom

Nokia maintains one primary plan in the UK, "Nokia Retirement Plan for former NSN & ALU employees", which is the result of the 2019 merger of the legacy Nokia plan where the plan was merged and members' benefits were transferred to the legacy Alcatel-Lucent plan. The combined plan consists of both money purchase sections with Guaranteed Minimum Pension (GMP) underpin and final salary sections. All final salary sections are closed to future benefit accrual: the legacy Nokia plan closed on 30 April 2012 and the legacy Alcatel-Lucent plan on 30 April 2018. Individual benefits for final salary sections are dependent on eligible compensation levels and years of service. For the money purchase sections with GMP underpin, individual benefits are dependent on the greater of the value of GMP at retirement date or the pension value resulting from the individual's invested funds. Nokia engages the services of an external Trustee service provider to manage all investments for the combined pension plan.

Impact on the consolidated financial statements

Movements in the defined benefit obligation, fair value of plan assets and the impact of the asset ceiling

The movements in the present value of the defined benefit obligation for the years ended 31 December:

EURm	2021				2020			
	United States pension	United States Opeb	Other pension	Total	United States pension	United States Opeb	Other pension	Total
As of 1 January	(15 340)	(2 039)	(6 122)	(23 501)	(16 449)	(2 325)	(6 006)	(24 780)
Current service cost	(106)	—	(90)	(196)	(118)	—	(93)	(211)
Interest expense	(308)	(41)	(61)	(410)	(375)	(54)	(83)	(512)
Past service cost ⁽¹⁾	(5)	—	22	17	(55)	89	29	63
Settlements	—	—	38	38	—	—	10	10
Total	(419)	(41)	(91)	(551)	(548)	35	(137)	(650)
Remeasurements:								
(Loss)/gain from change in demographic assumptions	(7)	6	(12)	(13)	202	20	66	288
Gain/(loss) from change in financial assumptions	640	82	267	989	(1 427)	(203)	(377)	(2 007)
Experience gain/(loss)	75	(1)	(44)	30	30	85	(15)	100
Total	708	87	211	1 006	(1 195)	(98)	(326)	(1 619)
Translation differences	(1 184)	(157)	(135)	(1 476)	1 451	196	125	1 772
Contributions from plan participants	—	(71)	(27)	(98)	—	(92)	(29)	(121)
Benefits paid	1 343	219	240	1 802	1 401	260	245	1 906
Other	—	(13)	127	114	—	(15)	6	(9)
Total	159	(22)	205	342	2 852	349	347	3 548
As of 31 December	(14 892)	(2 015)	(5 797)	(22 704)	(15 340)	(2 039)	(6 122)	(23 501)

(1) Consists primarily of gain on plan amendment in France in 2021. In 2020, these values consist of curtailment due to global restructuring, special termination benefits for certain US employees and extension of US retiree healthcare benefits related to US union negotiations for formerly represented employees.

Present value of obligations includes EUR 16 788 million (EUR 16 959 million in 2020) of wholly funded obligations, EUR 4 723 million (EUR 5 412 million in 2020) of partly funded obligations and EUR 1 193 million (EUR 1 130 million in 2020) of unfunded obligations.

The movements in the fair value of plan assets for the years ended 31 December:

EURm	2021				2020			
	United States pension	United States Opeb	Other pension	Total	United States pension	United States Opeb	Other pension	Total
As of 1 January	19 869	459	5 360	25 688	20 560	464	5 273	26 297
Interest income	411	12	56	479	480	8	77	565
Administrative expenses and interest on asset ceiling	(16)	–	(5)	(21)	(19)	–	(7)	(26)
Settlements	–	–	(42)	(42)	–	–	(15)	(15)
Total	395	12	9	416	461	8	55	524
Remeasurements:								
Return on plan assets, excluding amounts included in interest income	760	47	46	853	2 227	16	233	2 476
Total	760	47	46	853	2 227	16	233	2 476
Translation differences	1 625	50	159	1 834	(1 832)	(41)	(139)	(2 012)
Contributions:								
Employers	25	(6)	60	79	26	6	67	99
Plan participants	–	71	27	98	–	92	29	121
Benefits paid	(1 343)	(219)	(147)	(1 709)	(1 401)	(260)	(152)	(1 813)
Section 420 Transfer ⁽¹⁾	(348)	348	–	–	(160)	160	–	–
Other	4	(3)	(131)	(130)	(12)	14	(6)	(4)
Total	(37)	241	(33)	171	(3 379)	(29)	(201)	(3 609)
As of 31 December	20 987	759	5 382	27 128	19 869	459	5 360	25 688

(1) Section 420 Transfer. Refer to Future cash flows section below.

The movements in the impact of the asset ceiling limitation for the years ended 31 December:

EURm	2021				2020			
	United States pension	United States Opeb	Other pension	Total	United States pension	United States Opeb	Other pension	Total
As of 1 January	(1 125)	–	(70)	(1 195)	(975)	–	(55)	(1 030)
Interest expense	(22)	–	–	(22)	(27)	–	–	(27)
Remeasurements:								
Change in asset ceiling, excluding amounts included in interest expense	1 198	–	(17)	1 181	(216)	–	(17)	(233)
Translation differences	(51)	–	(5)	(56)	93	–	2	95
As of 31 December	–	–	(92)	(92)	(1 125)	–	(70)	(1 195)

Net balances as of 31 December:

EURm	2021				2020			
	United States pension	United States Opeb	Other pension	Total	United States pension	United States Opeb	Other pension	Total
As of 31 December	6 095	(1 256)	(507)	4 332	3 404	(1 580)	(832)	992
Consisting of:								
Net Pension Assets	6 422	–	1 318	7 740	3 738	–	1 300	5 038
Net Pension Liabilities	(327)	(1 256)	(1 825)	(3 408)	(334)	(1 580)	(2 132)	(4 046)

Asset ceiling limitation

Nokia may recognize the surplus of a pension plan to the amount of economic benefit that the entity can realize, either through a refund or as a reduction in future contributions. The most significant limitation of asset recognition for Nokia has been from the overfunded US formerly union-represented pension plan. All other countries where asset ceiling limits apply are not considered material.

In 2021, Nokia modified the terms of all three of its US defined benefit pension plans to provide that, in the event of a termination of the plan, any remaining balance in the Pension Fund, after settling plan liabilities, shall be distributed to Nokia. As a result of the adoption of this modification, Nokia has recognized a reduction during 2021 in the effect of the asset ceiling by EUR 1 369 million.

Movements in asset ceiling limitation are recognized directly in the consolidated statement of comprehensive income, excluding amounts included in interest expense. Following the modification to the terms of the US plans Nokia recognized an asset ceiling limitation in the amount of EUR 92 million (EUR 1 195 million in 2020).

Recognized in the income statement

Recognized in the consolidated income statement for the years ended 31 December:

EURm	2021	2020	2019
Current service cost ⁽¹⁾	196	211	153
Past service cost ⁽¹⁾	(17)	(63)	(140)
Net Interest ⁽²⁾	(26)	—	9
Settlements ⁽¹⁾	4	5	9
Total	157	153	31

(1) Included in operating expenses within the consolidated income statement.

(2) Included in financial expenses within the consolidated income statement.

Recognized in other comprehensive income

Recognized in other comprehensive income for the years ended 31 December:

EURm	2021	2020	2019
Return on plan assets, excluding amounts included in interest income	853	2 476	2 291
(Loss)/gain from change in demographic assumptions	(13)	288	813
Gain/(loss) from change in financial assumptions	989	(2 007)	(2 391)
Experience gain	30	100	71
Change in asset ceiling, excluding amounts included in interest expense	1 181	(233)	(370)
Total	3 040	624	414

Actuarial assumptions and sensitivity analysis

Actuarial assumptions

Assumptions regarding future mortality are set based on actuarial advice in accordance with published statistics and experience in each country.

The discount rates and mortality tables used for the significant plans:

	2021	2020	2021
	Discount rate %		Mortality table
United States	2.4	1.9	Pri-2012 w/MP-2020
Germany	0.9	0.4	mortality projection scale
United Kingdom ⁽¹⁾	1.9	1.3	Heubeck 2018G
Total weighted average for all countries	2.2	1.7	CMI 2020

(1) Tables are adjusted with 1.5% long-term rate of improvement.

The principal actuarial weighted average assumptions used for determining the defined benefit obligation:

%	2021	2020
Discount rate for determining present values	2.2	1.7
Annual rate of increase in future compensation levels	2.0	1.9
Pension growth rate	0.4	0.3
Inflation rate	1.8	1.8
Healthcare costs trend rate assumed for next year ⁽¹⁾	8.6	4.9
Healthcare cost trend rate assumed for next year (excluding post-employment dental benefits) ⁽¹⁾	8.9	5.0
Terminal growth rate ⁽¹⁾	4.4	4.4
Year that the rate reaches the terminal growth value ⁽¹⁾	2029	2028
Weighted average duration of defined benefit obligations	10 yrs	11 yrs

(1) Actuarial assumptions used for determining the defined benefit obligation - United States.

Sensitivity analysis

When calculating the sensitivity of the defined benefit obligation to significant actuarial assumptions, the present value of the defined benefit obligation is calculated using the projected unit credit method. The sensitivity analyses are based on a change in an assumption while holding all other assumptions constant and may not be representative of the actual impact of changes. If more than one assumption is changed simultaneously, the combined impact of changes would not necessarily be the same as the sum of the individual changes. If the assumptions change to a different level compared with that presented, the effect on the defined benefit obligation may not be linear. Increases and decreases in the principal assumptions, which are used in determining the defined benefit obligation, do not have a symmetrical effect on the defined benefit obligation primarily due to the compound interest effect created when determining the net present value of the future benefit.

The sensitivity of the defined benefit obligation to changes in the principal assumptions:

	Change in assumption	Increase in assumption ⁽¹⁾ EURm	Decrease in assumption ⁽¹⁾ EURm
Discount rate for determining present values	1.0%	2 047	(2 480)
Annual rate of increase in future compensation levels	1.0%	(121)	103
Pension growth rate	1.0%	(468)	406
Inflation rate	1.0%	(530)	448
Healthcare cost trend rate	1.0%	(17)	15
Life expectancy	1 year	(998)	932

(1) Positive movement indicates a reduction in the defined benefit obligation; a negative movement indicates an increase in the defined benefit obligation.

Investment strategies

The overall pension investment objective of Nokia is to preserve or enhance the pension plans' funded status through the implementation of an investment strategy that maximizes return within the context of minimizing funded status risk. In formulating the asset allocation for the plans, multiple factors are considered, including, but not limited to, the long-term risk and return expectations for a variety of asset classes as well as current and multi-year projections of the pension plans' demographics, benefit payments, contributions and funded status. Local trustee boards are responsible for conducting Asset-Liability studies, when appropriate; overseeing the investment of plan assets; and monitoring and managing associated risks under company oversight and in accordance with local law. The results of the Asset-Liability framework are implemented on a plan level.

Nokia's pension investment managers may use derivative financial instruments including futures contracts, forward contracts, options and interest rate swaps to manage market risk. The performance and risk profile of investments is regularly monitored on a standalone basis as well as in the broader portfolio context. One risk is a decline in the plan's funded status as a result of the adverse performance of plan assets and/or defined benefit obligations. The application of the Asset-Liability Model study focuses on minimizing such risks.

Disaggregation of plan assets

	2021				2020			
EURm	Quoted	Unquoted	Total	%	Quoted	Unquoted	Total	%
Equity securities	1 359	–	1 359	5	1 198	110	1 308	5
Fixed income securities	18 732	164	18 896	70	18 666	139	18 805	73
Insurance contracts	–	981	981	4	–	793	793	3
Real estate	–	1 224	1 224	4	101	1 094	1 195	5
Short-term investments	1 646	–	1 646	6	738	173	911	4
Private equity and other	107	2 915	3 022	11	130	2 546	2 676	10
Total	21 844	5 284	27 128	100	20 833	4 855	25 688	100

United States plan assets

The majority of Nokia's United States pension plan assets are held in a master pension trust. The Opeb plan assets are held in two separate trusts. The Pension & Benefits Investment Committee formally approves the target allocation ranges every few years on the completion of the asset-liability study by external advisors and internal investment management. The overall United States pension plan asset portfolio, as of 31 December 2021, reflects a balance of investments split of approximately 20/80 between equity, including alternative investments for this purpose, and fixed income securities.

Most short-term investments including cash, equities and fixed-income securities have quoted market prices in active markets. Equity securities represent investments in equity funds and direct investments, which have quoted market prices in an active market. Fixed income securities represent direct investments in government and corporate bonds, as well as investments in bond funds, which have quoted market prices in an active market. Insurance contracts are customary pension insurance contracts structured under domestic law in the respective countries. Real estate investments are investments in commercial properties or real estate funds, which invest in a diverse range of real estate properties. Short-term investments are liquid assets or cash, which are being held for a short period of time, with the primary purpose of controlling the tactical asset allocation. Private equity net asset values (NAVs) are determined by the asset managers based on inputs such as operating results, discounted future cash flows and market based comparable data. Private equity fair values reflect the latest available NAVs received from the asset managers, reviewed by Nokia, and adjusted for subsequent cash flows.

Future cash flows

Contributions

Group contributions to the pension and other post-employment benefit plans are made to facilitate future benefit payments to plan participants. The funding policy is to meet minimum funding requirements as set forth in the employee benefit and tax laws, as well as any such additional amounts as Nokia may determine appropriate. Contributions are made to benefit plans for the sole benefit of plan participants. Employer contributions expected to be paid in 2022 total EUR 76 million.

United States pension plans

Funding methods

Funding requirements for the three United States qualified defined benefit pension plans are determined by the applicable statutes, namely the Employee Retirement Income Security Act of 1974 (ERISA), the Internal Revenue Code of 1986, and regulations issued by the Internal Revenue Service (IRS). In determining funding requirements, ERISA allows assets to be either market value or an average value over a period of time; and liabilities to be based on spot interest rates or average interest rates over a period of time. For the non-represented, represented and formerly represented pension plans, Nokia does not foresee any future funding requirement for regulatory funding purposes, given the plans' asset allocation and the level of assets compared to liabilities.

Post-employment healthcare benefits for both non-represented and formerly union represented retirees are capped for those who retired on or before 1 March 1990. The benefit obligation associated with this group of retirees is 94% of the total United States retiree healthcare obligation as of 31 December 2021. The US government's Medicare program is the primary payer for those aged 65 and older, comprising almost all uncapped retirees.

Section 420 transfers

Section 420 of the U.S. Internal Revenue Code (Section 420) allows for the transfer of pension assets in excess of specified thresholds above the plan's funding obligation (excess pension assets) to a retiree health benefits account, a retiree life insurance account, or both, maintained within the pension plan and to use the assets in such accounts to pay for, or to reimburse the employer for the cost of providing, applicable health or life insurance benefits, each as defined in Section 420, for retired employees, and with respect to health benefits, their spouses and dependants. Employers making such transfers are required to continue to provide healthcare benefits or life insurance coverage, as the case may be, for a certain period of time (cost maintenance period) at levels prescribed by regulations.

For retirees who, when actively employed, were represented by the CWA or the IBEW, Nokia expects to fund the entire current retiree healthcare and group life insurance obligations with Section 420 transfers from excess pension assets in the formerly represented pension plan. For retirees who were not represented by the CWA or IBEW (non-represented retirees), Nokia expects to be able to fund some portion of the current retiree group life insurance obligation with Section 420 transfers from excess pension assets in the non-represented pension plan. Section 420 is currently set to expire on 31 December 2025.

Benefit payments

The following table summarizes expected benefit payments from the pension plans and other post-employment benefit plans until 2031. Actual benefit payments may differ from expected benefit payments.

EURm	US Pension			US Opeb		Other countries	Total
	Management	Occupational	Supplemental plans	Formerly union represented	Non-union represented		
2022	1 131	243	25	111	55	287	1 852
2023	990	226	24	96	56	263	1 655
2024	944	212	24	76	56	279	1 591
2025	899	199	23	68	57	284	1 530
2026	855	187	23	58	57	290	1 470
2027-2031	3 627	755	102	318	292	1 491	6 585

Benefits are paid from plan assets where there is sufficient funding available to the plan to cover the benefit obligation. Any payments in excess of the plan assets are paid directly by Nokia. Direct benefit payments expected to be paid in 2022 total EUR 119 million.

26. Deferred revenue and other liabilities

Non-current

EURm	2021	2020
Deferred revenue ⁽¹⁾	305	460
Salaries, wages and social charges	46	45
Other	85	36
Total	436	541

Current

EURm	2021	2020
Deferred revenue ⁽¹⁾	155	155
Salaries, wages and social charges	1 780	1 362
VAT and other indirect taxes	349	337
Discounts without performance obligations	479	747
Accrued expenses related to customer projects	517	475
Other	660	645
Total	3 940	3 721

(1) Non-current deferred revenue of EUR 305 million (EUR 460 million in 2020) and current deferred revenue of EUR 155 million (EUR 155 million in 2020) relates to an IP licensing contract which was determined to be a completed contract as defined in the transition guidance of IFRS 15, Revenue from Contracts with Customers.

Other accruals include accrued logistics, research and development, IT, interest and royalty expenses, as well as various amounts that are individually insignificant.

27. Provisions

EURm	Restructuring	Warranty	Litigation	Environmental	Project losses	Divestment-related	Material liability	Other	Total
As of 1 January 2021	441	220	73	113	276	49	130	230	1 532
Translation differences	1	1	2	8	3	–	–	14	29
Reclassification	(5)	–	(1)	–	–	(12)	–	70	52
Charged to income statement:									
Additions	221	197	81	36	22	12	35	141	745
Reversals	(38)	(17)	(20)	(1)	(3)	(3)	(36)	(27)	(145)
Total charged to income statement	183	180	61	35	19	9	(1)	114	600
Utilized during year ⁽¹⁾	(308)	(147)	(33)	(7)	(63)	–	(40)	(46)	(644)
As of 31 December 2021	312	254	102	149	235	46	89	382	1 569
Non-current	156	19	14	133	124	43	13	143	645
Current	156	235	88	16	111	3	76	239	924

(1) The utilization of restructuring provision includes items transferred to accrued expenses, of which EUR 69 million remained in accrued expenses as of 31 December 2021.

Restructuring provision

Nokia provides for the estimated cost to restructure when a detailed formal plan of restructuring has been completed, approved by management, and announced. Restructuring costs consist primarily of personnel restructuring charges. The other main components are costs associated with exiting real estate locations, and costs of terminating certain other contracts directly linked to the restructuring. As of 31 December 2021, the restructuring provision amounted to EUR 312 million including personnel and other restructuring costs. The provision consists primarily of amounts related to the announcements made by Nokia on 6 April 2016, 25 October 2018 and 16 March 2021. The majority of the restructuring cash outflows is expected to occur over the next two years.

Warranty provision

Nokia provides for the estimated liability to repair or replace products under standard warranty at the time revenue is recognized. The provision is an estimate based on historical experience of the level of repairs and replacements. Cash outflows related to the warranty provision are generally expected to occur within the next 18 months.

Litigation provision

Nokia provides for the estimated future settlements related to litigation based on the probable outcome of the claims. Cash outflows related to the litigation provision are inherently uncertain and generally occur over several periods. For a presentation of certain legal matters potentially affecting Nokia, refer to Note 28, Commitments, contingencies and legal proceedings.

Environmental provision

Nokia provides for estimated costs of environmental remediation relating to soil, groundwater, surface water or sediment contamination when Nokia becomes obliged, legally or constructively, to rectify the environmental damage, or to perform restorative work. The environmental provision includes estimated costs to sufficiently clean and refurbish contaminated sites, to the extent necessary and, where necessary, continue surveillance at sites where the environmental remediation exposure is less significant. Cash outflows related to the environmental liability are inherently uncertain and generally occur over several periods.

Project loss provision

Nokia provides for onerous contracts based on the lower of the expected cost of fulfilling the contract and the expected cost of terminating the contract. An onerous contract is a contract in which the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received under it. Project loss provisions relate to contracts with customers and are evaluated at a contract level. The majority of the project loss provision utilization is expected to occur over the next two years.

Divestment-related provision

Nokia provides for indemnifications it is required to make to the buyers of its disposed businesses. Cash outflows related to the divestment-related provision are inherently uncertain.

Material liability provision

Nokia recognizes the estimated liability for non-cancellable purchase commitments for inventory in excess of forecasted requirements at each reporting date. Cash outflows related to the material liability provision are expected to occur over the next 12 months.

Other provisions

Nokia provides for various legal and constructive obligations such as indirect tax provisions, employee-related provisions other than restructuring provisions and asset retirement obligations. Cash outflows related to other provisions are generally expected to occur over the next two years.

28. Commitments, contingencies and legal proceedings

Contractual obligations

EURm	Within 1 year	Between 1 and 3 years	Between 3 and 5 years	More than 5 years	Total
Purchase obligations as of 31 December 2021 ⁽¹⁾	4 328	398	198	82	5 006

(1) Includes inventory purchase obligations, service agreements and outsourcing arrangements.

Additionally, Nokia has committed lease contracts that have not yet commenced as of 31 December 2021. The future lease payments for these non-cancellable lease contracts are EUR 31 million within five years and EUR 192 million thereafter.

As of 31 December 2021, Nokia has potential (undiscounted) future lease payments of EUR 718 million (EUR 468 million in 2020) relating to extension options not expected to be exercised and EUR 48 million (EUR 51 million in 2020) relating to termination options expected to be exercised that are not included in the lease liability.

Guarantees and other contingent commitments

EURm	2021	2020
Contingent liabilities on behalf of Group companies		
Guarantees issued by financial institutions		
Commercial guarantees ⁽¹⁾	1 281	1 107
Non-commercial guarantees	442	450
Corporate guarantees ⁽²⁾		
Commercial guarantees ⁽¹⁾	457	453
Non-commercial guarantees	35	53
Financing commitments		
Customer finance commitments ⁽³⁾	21	180
Venture fund commitments ⁽⁴⁾	137	189
Other contingent liabilities and financing commitments⁽⁵⁾		
Other guarantees and financing commitments	4	11

(1) In commercial guarantees, Nokia reports guarantees that are issued in the normal course of business to Nokia's customers for the performance of Nokia's obligations under supply agreements, including tender bonds, performance bonds and warranty bonds.

(2) In corporate guarantees, Nokia reports guarantees with primary obligation that have been issued to Nokia's customers and other third parties.

(3) Customer finance commitments are available under loan facilities negotiated with customers. Availability of the facility is dependent upon the borrower's continuing compliance with the agreed financial and operational covenants, and compliance with other administrative terms of the facility. The loan facilities are primarily available to fund capital expenditure relating to purchases of network infrastructure equipment and services. Refer to Note 34, Financial risk management.

(4) As a limited partner in NGP Capital and certain other funds making technology-related investments, Nokia is committed to capital contributions and entitled to cash distributions according to the respective partnership agreements and underlying fund activities.

(5) Other contingent liabilities and financing commitments exclude committed lease contracts that have not yet commenced and purchase obligations.

The amounts in the table above represent the maximum principal amount of commitments and contingencies, and these amounts do not reflect management's expected outcomes.

Legal matters

A number of Group companies are and will likely continue to be subject to various legal proceedings and investigations that arise from time to time, including proceedings regarding intellectual property, product liability, sales and marketing practices, commercial disputes, employment and wrongful discharge, antitrust, securities, health and safety, environmental, tax, international trade, privacy matters and compliance. As a result, Nokia may incur substantial costs that may not be covered by insurance and could affect business and reputation. While management does not expect any of the legal proceedings it is currently aware of to have a material adverse effect on Nokia's financial position, litigation is inherently unpredictable and Nokia may in the future incur judgments or enter into settlements that could have a material adverse effect on its profitability and cash flows.

Litigation and proceedings

Mass labor litigation in Brazil

Nokia is defending against a number of labor claims in various Brazilian labor courts. Plaintiffs are former employees whose contracts were terminated after Nokia exited from certain managed services contracts. The claims mainly relate to payments made under, or in connection with, the terminated labor contracts. Nokia has closed the majority of the court cases through settlement or judgment.

Asbestos litigation in the United States

Nokia is defending approximately 300 asbestos-related matters, at various stages of litigation. The claims are based on premises liability, products liability, and contractor liability. The claims also involve plaintiffs allegedly diagnosed with various diseases, including but not limited to asbestosis, lung cancer, and mesothelioma.

Securities Class Action

A litigation was filed in 2019 against Nokia and certain executives in the United States relating to allegations of Nokia making false and misleading statements and omissions concerning its progress of integration of Alcatel-Lucent, including compliance practices identified during the integration process and disclosed in Nokia's Annual Report on Form 20-F filed on 21 March 2019. In 2021, the court granted Nokia's motion to dismiss and, as no appeal was filed, the decision is final.

Intellectual property rights litigation

Continental

In 2019, Continental Automotive Systems (Continental) filed a lawsuit in the United States against Nokia and three other defendants relating to an alleged breach of FRAND obligations and a refusal to license component suppliers. In 2020, all antitrust and state law claims were dismissed in a district court in favour of Nokia and other defendants. Continental has filed a notice of appeal. In 2021, Continental also filed a lawsuit against Nokia alleging breach of contract as well as seeking a declaratory judgment relating to certain FRAND licensing issues.

Daimler

In 2019, Nokia commenced patent infringement proceedings against Daimler in Germany regarding ten Nokia patents relevant to the 3G and 4G cellular standards used in Daimler's connected cars. In 2020, one of the cases was referred to the Court of Justice of the European Union on questions relating to standard essential patent litigation. In 2021, Nokia and Daimler announced that they have signed a patent licensing agreement under which Nokia licenses mobile telecommunications technology to Daimler and receives payment in return. The parties have agreed to settle all pending litigation between Daimler and Nokia, including the complaint by Daimler against Nokia to the European Commission. Invalidation actions brought by Daimler's suppliers and their respective complaints to the European Commission regarding Nokia's licensing practice continue.

Lenovo

In 2019 and 2020, Nokia filed patent infringement lawsuits against Lenovo in four countries, including United States, regarding 19 Nokia patents used in Lenovo's products. Lenovo responded with counterclaims and nullity proceedings, and in 2020, Lenovo filed an action in the United States against Nokia alleging breach of RAND obligations and other claims. In 2021, Nokia concluded a multi-year, multi-technology patent cross-license agreement with Lenovo. The agreement resolves all pending patent litigation and other proceedings between the two parties, in all jurisdictions. Under the agreement, Lenovo will make a net balancing payment to Nokia.

Oppo

In 2021, Nokia commenced patent infringement proceedings against Oppo, OnePlus and Realme in several countries in Asia and Europe. Across these actions, more than 30 patents are in suit, covering a mix of cellular standards and technologies such as connectivity, user interface and security. Oppo responded by filing invalidation actions against certain Nokia patents, a number of patent infringement actions against Nokia equipment in Germany and China and actions in China against Nokia relating to standard essential patent licensing issues.

29. Notes to the consolidated statement of cash flows

EURm	2021	2020	2019
Adjustments for⁽¹⁾			
Depreciation and amortization	1 095	1 132	1 660
Share-based payments	108	76	81
Impairment charges	40	246	102
Restructuring charges ⁽²⁾	183	454	397
Profit from non-current investments	(188)	(61)	(50)
Profit on sale of property, plant and equipment, net	(59)	(3)	(15)
Share of results of associated companies and joint ventures	(9)	(26)	(12)
Financial income and expenses	240	167	283
Income tax expense	273	3 254	140
Gain on the sale of businesses	–	–	(4)
Other operating income and expenses	30	28	45
Total	1 713	5 267	2 627

(1) Includes continuing and discontinued operations.

(2) Adjustments represent the non-cash portion of the restructuring charges recognized in the consolidated income statement.

Nokia had no material non-cash investing or financing transactions in any of the years presented.

30. Principal Group companies

Nokia's significant subsidiaries as of 31 December 2021:

Company name	Country of incorporation	Parent holding %	Group ownership interest %
Nokia Solutions and Networks Oy	Finland	100.0	100.0
Nokia of America Corporation	United States	–	100.0
Nokia Shanghai Bell Co., Ltd ⁽¹⁾	China	–	50.0
Nokia Solutions and Networks B.V.	Netherlands	–	100.0
Nokia Technologies Oy	Finland	100.0	100.0
Alcatel-Lucent Participations	France	–	100.0
Alcatel Lucent	France	–	100.0
Alcatel-Lucent International	France	–	100.0
Nokia Solutions and Networks India Private Limited	India	–	100.0
Nokia Solutions and Networks Japan G.K.	Japan	–	100.0
Nokia Solutions and Networks Branch Operations Oy	Finland	–	100.0
Alcatel Submarine Networks	France	–	100.0
Nokia Arabia Limited	Saudi Arabia	–	100.0
Nokia Solutions and Networks do Brasil Telecomunicações Ltda.	Brazil	–	100.0
Nokia Solutions and Networks Taiwan Co., Ltd.	Taiwan	–	100.0
Nokia Spain, S.A.	Spain	–	100.0
Nokia UK Limited	United Kingdom	–	100.0
Nokia Solutions and Networks System Technology (Beijing) Co., Ltd.	China	–	50.0
Nokia Canada Inc.	Canada	–	100.0
Nokia Solutions and Networks Italia S.p.A.	Italy	–	100.0
Nokia Solutions and Networks Australia Pty Ltd	Australia	–	100.0
OOO "Nokia Solutions and Networks"	Russian Federation	–	100.0

(1) Nokia Shanghai Bell Co., Ltd. is the parent company of the Nokia Shanghai Bell Group of which the Nokia Group owns 50% plus one share with China Huaxin, an entity controlled by the Chinese government, holding the remaining ownership interests. Refer to Note 31, Significant partly-owned subsidiaries.

31. Significant partly-owned subsidiaries

Nokia holds an ownership interest of 50% plus one share in Nokia Shanghai Bell's parent company, Nokia Shanghai Bell Co., Ltd. (NSB), with China Huaxin Post & Telecommunication Economy Development Center (China Huaxin) holding the remaining ownership interests. Nokia applied judgment to conclude that it is able to control NSB based on an assessment of various factors including the ability to nominate key management personnel, decision-making related to the management of NSB operations and Nokia's exposure to variable returns from NSB.

In 2017, Nokia entered into a contractual arrangement providing China Huaxin with the right to fully transfer its ownership interest in NSB to Nokia and Nokia with the right to purchase China Huaxin's ownership interest in NSB in exchange for a future cash settlement. To reflect this, Nokia derecognized the non-controlling interest balance related to NSB and recognized a financial liability based on the estimated future cash settlement.

The financial liability is measured based on the expected future cash settlement to acquire the non-controlling interest in NSB. The measurement of the financial liability is complex as it involves estimation of the option exercise price and the distribution of excess cash balances upon exercise. In 2021, Nokia increased the value of the financial liability to reflect a change in estimate of the future cash settlement resulting in the recognition of a EUR 33 million loss (EUR 79 million gain in 2020) in financial income and expenses. As of 31 December 2021, the expected future cash settlement amounted to EUR 504 million (EUR 420 million in 2020).

Financial information for the Nokia Shanghai Bell Group⁽¹⁾:

EURm	2021	2020
Summarized income statement		
Net sales ⁽²⁾	1 174	1 376
Operating loss	(8)	(3)
Loss for the year	(24)	(14)
Loss for the year attributable to:		
Equity holders of the parent	(24)	(14)
Non-controlling interests ⁽³⁾	–	–
Summarized statement of financial position		
Non-current assets	575	577
Non-current liabilities	(161)	(150)
Non-current net assets	414	427
Current assets ⁽⁴⁾	2 144	1 984
Current liabilities	(1 284)	(1 228)
Current net assets	860	756
Net assets⁽⁵⁾	1 274	1 183
Non-controlling interests ⁽³⁾	–	–
Summarized statement of cash flows		
Net cash from operating activities	143	189
Net cash used in investing activities	0	(26)
Net cash used in financing activities ⁽⁶⁾	(82)	(376)
Translation differences	67	(1)
Net increase/(decrease) in cash and cash equivalents	128	(214)

(1) Financial information for the Nokia Shanghai Bell Group is presented before elimination of intercompany transactions with the rest of the Group but after elimination of intercompany transactions between entities within the Nokia Shanghai Bell Group.

(2) Includes EUR 61 million (EUR 104 million in 2020) net sales to other Group entities.

(3) Based on the contractual arrangement with China Huaxin, Nokia does not recognize any non-controlling interest in NSB.

(4) Includes a total of EUR 733 million (EUR 604 million in 2020) of cash and cash equivalents.

(5) The distribution of the profits of NSB requires the passing of a special resolution by more than two-thirds of its shareholders, subject to a requirement that at least 50% of the after-tax distributable profits are distributed as dividends each year.

(6) Includes EUR 144 million dividend paid to China Huaxin in 2020

32. Investments in associated companies and joint ventures

EURm	2021	2020
Net carrying amount as of 1 January	233	165
Translation differences	12	(10)
Acquisitions and additions ⁽¹⁾	3	68
Disposals and deductions	(6)	(7)
Impairments ⁽²⁾	–	(4)
Share of results ⁽²⁾	9	26
Dividends	(8)	(5)
Net carrying amount as of 31 December	243	233

(1) In 2020, Nokia acquired an ownership interest in HMD Global Oy as a result of the equity conversion of the convertible loan. For more information, refer to Note 33, Related party transactions.

(2) In 2020, impairments and share of results are presented in the share of results of associated companies and joint ventures line in the consolidated income statement.

Shareholdings in associated companies and joint ventures comprise investments in unlisted companies.

33. Related party transactions

Nokia has related party transactions with pension funds, associated companies and joint ventures, and the management and the Board of Directors. Transactions and balances with companies over which Nokia exercises control are eliminated on consolidation. Refer to Note 2, Significant accounting policies, and Note 30, Principal Group companies.

Transactions with pension funds

Nokia has borrowings of EUR 40 million (EUR 43 million in 2020) from Nokia Unterstützungsgesellschaft mbH, Nokia's German pension fund, a separate legal entity. The loan bears interest at the rate of 6% per annum and its duration is pending until further notice by the loan counterparties even though they have the right to terminate the loan with a 90-day notice. In 2020, an amendment in the loan agreement was reached allowing an off-set to the loan balance of contributions, interest and benefit payments paid. The loan is included in short-term interest-bearing liabilities in the consolidated statement of financial position. For more information on Nokia's pension plans, refer to Note 25, Pensions and other post-employment benefits.

Transactions with associated companies and joint ventures

EURm	2021	2020	2019
Share of results	9	22	12
Dividend income	8	5	6
Share of shareholders' equity	243	233	165
Sales	87	115	153
Purchases	(144)	(177)	(193)
Trade receivables	45	31	22
Trade payables	(29)	(26)	(38)

Nokia has a financing commitment of EUR 4 million (EUR 6 million in 2020) to an associated company.

In 2016, Nokia engaged in a strategic agreement with HMD Global Oy based on which Nokia determined that it exercised significant influence over HMD Global Oy despite holding no voting power in it. The agreement covers branding rights and intellectual property licensing to grant HMD Global Oy an exclusive global license to create Nokia-branded mobile phones and tablets for ten years. In 2019, Nokia granted a convertible loan of EUR 60 million to HMD Global Oy containing both a mandatory equity conversion element, and a call option held by Nokia, to convert the loan into equity interest in HMD Global Oy. In 2020, Nokia acquired an ownership interest in HMD Global Oy as a result of the equity conversion of the convertible loan and recorded an investment in associated companies of EUR 63 million.

Management compensation

Compensation information for the President and CEO:

EUR	Base salary/fee	Cash incentive payments	Share-based payment expenses ⁽¹⁾	Pension expenses	Total ⁽²⁾
2021					
Pekka Lundmark	1 300 000	2 975 781	4 263 505	589 873	9 129 159
2020					
Pekka Lundmark, from 1 August 2020	541 667	573 068	1 063 164	211 050	2 388 949
Rajeev Suri, until 31 July 2020 ⁽³⁾	759 365	945 697	1 276 825	341 591	3 323 478
2019					
Rajeev Suri	1 300 000	637 163	2 265 547	353 846	4 556 556

(1) Represents the expense for all outstanding equity grants recorded during the year.

(2) Additionally, the CEO has received EUR 35 731 (EUR 80 244 in 2020 and EUR 118 619 in 2019) other compensation such as telephone, car, driver, mobility, tax compliance support and medical insurance.

(3) Upon stepping down from his role as CEO in 2020, Nokia recorded termination benefits, EUR 5 122 317, for Rajeev Suri according to terms of his exit agreement. During 2021, the details of Rajeev Suri's exit agreement were revised and incentive payout factor was finalized, resulting into a credit of EUR 96 201 recorded to the income statement in 2021.

Total remuneration awarded to the Group Leadership Team for their time as members of the Group Leadership Team:

EURm	2021	2020	2019
Short-term benefits	20	27	24
Post-employment benefits ⁽¹⁾	2	2	1
Share-based payments	12	9	8
Termination benefits ⁽²⁾	—	10	—
Total	34	48	33

(1) The members of the Group Leadership Team participate in the local retirement programs applicable to employees in the country where they reside.

(2) Includes both termination payments and payments made under exceptional contractual arrangements for lapsed equity awards.

Board of Directors' compensation

The annual remuneration paid to the members of the Board of Directors, as decided by the Annual General Meetings in the respective years:

	2021			2020			2019		
	Annual fee ⁽¹⁾ EUR	Meeting fees ⁽²⁾ EUR	Shares received ⁽³⁾ number	Annual fee ⁽¹⁾ EUR	Meeting fees EUR	Shares received ⁽³⁾ number	Annual fee ⁽¹⁾ EUR	Meeting fees EUR	Shares received ⁽³⁾ number
Sari Baldauf, Chair	440 000	—	43 711	440 000	5 000	48 523	185 000	12 000	16 261
Kari Stadigh, Vice Chair ⁽⁴⁾	200 000	7 000	19 868	185 000	11 000	20 401	160 000	12 000	14 063
Bruce Brown ⁽⁴⁾⁽⁵⁾	200 000	7 000	19 868	190 000	22 000	20 953	190 000	27 000	16 700
Thomas Dannenfeldt ⁽⁵⁾⁽⁶⁾	185 000	7 000	18 378	175 000	—	19 299	—	—	—
Jeanette Horan ⁽⁵⁾⁽⁶⁾	185 000	7 000	18 378	175 000	20 000	19 299	175 000	22 000	15 382
Louis R. Hughes	—	—	—	—	—	—	—	22 000	—
Edward Kozel ⁽⁵⁾⁽⁶⁾	195 000	7 000	19 372	195 000	17 000	21 504	195 000	20 000	17 140
Elizabeth Nelson	—	—	—	175 000	17 000	19 299	175 000	25 000	15 382
Olivier Piou	—	—	—	—	11 000	—	175 000	14 000	15 382
Risto Siilasmaa	—	—	—	—	—	—	440 000	—	38 675
Søren Skou ⁽⁴⁾	175 000	7 000	17 385	160 000	11 000	17 644	160 000	—	14 063
Carla Smits-Nusteling ⁽⁶⁾	190 000	9 000	18 875	190 000	17 000	20 953	190 000	20 000	16 700
Total	1 770 000	51 000		1 885 000	131 000		2 045 000	174 000	

(1) Annual fees consist of Board member fees and Committee chair and member fees.

(2) Meeting fees include all meeting fees paid for the term that ended at the Annual General Meeting held on 8 April 2021, and meeting fees accrued and paid in 2021 for the term that began at the same meeting.

(3) Approximately 40% of each Board member's annual compensation is paid in Nokia shares purchased from the market, and the remaining approximately 60% is paid in cash.

(4) Annual fees in 2021 include EUR 30 000 for Bruce Brown as Chair and EUR 15 000 for Søren Skou and Kari Stadigh as members of the Personnel Committee.

(5) Annual fees in 2021 include EUR 20 000 for Edward Kozel as Chair and EUR 10 000 for Bruce Brown, Thomas Dannenfeldt and Jeanette Horan as members of the Technology Committee.

(6) Annual fees in 2021 include EUR 30 000 for Carla Smits-Nusteling as Chair and EUR 15 000 for Thomas Dannenfeldt, Jeanette Horan, and Edward Kozel as members of the Audit Committee.

Transactions with the Group Leadership Team and the Board of Directors

No loans were granted to the members of the Group Leadership Team and the Board of Directors in 2021, 2020 or 2019.

Terms of termination of employment of the President and CEO

Rajeev Suri stepped down from his position as President and CEO on 31 July 2020. Nokia's Board of Directors appointed Pekka Lundmark as President and CEO of Nokia and he started in his new role on 1 August 2020.

The President and CEO, Pekka Lundmark, may terminate his service agreement at any time with 12 months' prior notice. The President and CEO would either continue to receive salary and benefits during the notice period or, at Nokia's discretion, a lump sum of equivalent value. Additionally, the President and CEO would be entitled to any short- or long-term incentives that would normally vest during the notice period. Any unvested equity awards would be forfeited after termination.

In the event that the President and CEO terminates his service agreement based on a final arbitration award demonstrating Nokia's material breach of the service agreement, he is entitled to a severance payment equaling up to 12 months of compensation, including annual base salary, benefits and target incentive. Any unvested equity awards would be forfeited after termination.

34. Financial risk management

General risk management principles

We have a systematic and structured approach to risk management. Key risks and opportunities are primarily identified against business targets either in business operations or as an integral part of strategy and financial planning. Risk management covers strategic, operational, financial, compliance and hazard risks. Key risks and opportunities are analyzed, managed and monitored as part of business performance management with the support of risk management personnel and the centralized Enterprise Risk Management function. The principles documented in the Nokia Enterprise Risk Management Policy, which is approved by the Audit Committee of the Board, require risk management and its elements to be integrated into key processes. One of the core principles is that the business or function head is also the risk owner, although all employees are responsible for identifying, analyzing and managing risks, as appropriate, given their roles and duties. Our overall risk management concept is based on managing the key risks that would prevent us from meeting our objectives, rather than solely focusing on eliminating risks. In addition to the principles defined in the Nokia Enterprise Risk Management Policy, other key policies and operating procedures reflect the implementation of specific aspects of risk management, including financial risk management.

Financial risks

The objective for treasury activities is to guarantee sufficient funding at all times and to identify, evaluate and manage financial risks. Treasury activities support this aim by mitigating the adverse effects on the profitability of the underlying business caused by fluctuations in the financial markets, and by managing the capital structure by balancing the levels of liquid assets and financial borrowings. Treasury activities are governed by the Nokia Treasury Policy approved by the President and CEO, which provides principles for overall financial risk management and determines the allocation of responsibilities for financial risk management activities. Operating procedures approved by the Chief Financial Officer (CFO) cover specific areas such as foreign exchange risk, interest rate risk, credit risk and liquidity risk as well as the use of derivative financial instruments in managing these risks. Nokia is risk averse in its treasury activities.

Financial risks are divided into market risk covering foreign exchange risk and interest rate risk; credit risk covering business-related credit risk and financial credit risk; and liquidity risk.

Market risk

Foreign exchange risk

Nokia operates globally and is exposed to transaction and translation foreign exchange risks. The objective of foreign exchange risk management is to mitigate adverse impacts from foreign exchange fluctuations on Nokia's profitability and cash flows. Treasury applies a global portfolio approach to manage foreign exchange risks within approved guidelines and limits.

Transaction risk arises from foreign currency denominated assets and liabilities together with foreign currency denominated future cash flows. Transaction exposures are managed in the context of various functional currencies of Group companies. Material transactional foreign exchange exposures are hedged, unless hedging would be uneconomical due to market liquidity and/or hedging cost. Exposures are defined using transaction nominal values. Exposures are mainly hedged with derivative financial instruments, such as foreign exchange forward contracts and foreign exchange options with most of the hedging instruments having a duration of less than a year.

Layered hedging approach is typically used for hedging of highly probable forecast foreign currency denominated cash flows with quarterly hedged items defined based on set hedge ratio ranges for each successive quarter. Hedged items defined for successive quarters are hedged with foreign exchange forward contracts and foreign exchange options with a hedge ratio of 1:1. Hedging level ranges are adjusted on a monthly basis including hedging instrument designation and documentation as appropriate. In case hedges exceed the hedge ratio range for any specific quarter, the hedge portfolio for that specific quarter is adjusted accordingly.

In certain cases, mainly related to long-term construction projects, Nokia applies fair value hedge accounting for foreign exchange risk with the objective to reduce the exposure to fluctuations in the fair value of the related firm commitments due to changes in foreign exchange rates. Exposures are mainly hedged with foreign exchange forward contracts with most of the hedging instruments matching the duration of the underlying projects. Nokia continuously manages the portfolio of hedging instruments to ensure appropriate alignment with the portfolio of hedged items at a hedging ratio of 1:1.

As Nokia has entities where the functional currency is other than the euro, the shareholders' equity is exposed to fluctuations in foreign exchange rates. Changes in shareholders' equity caused by movements in foreign exchange rates are shown as currency translation differences in the consolidated financial statements. The risk management strategy is to protect the euro counter value of the portion of this exposure expected to materialize as foreign currency repatriation cash flows in the foreseeable future. Exposures are mainly hedged with derivative financial instruments, such as foreign exchange forward contracts and foreign exchange options with most of the hedging instruments having a duration of less than a year. Hedged items are defined based on conservative expectations of repatriation cash flows based on a range of considerations. Net investment exposures are reviewed, hedged items designated, and hedging levels adjusted at minimum on a quarterly basis with a hedge ratio of 1:1. Additionally, hedging levels are adjusted whenever there are significant events impacting expected repatriation cash flows.

The foreign exchange risk arising from foreign currency denominated interest-bearing liabilities is primarily hedged using cross-currency swaps that are also used to manage Nokia's interest rate profile (refer to the interest rate risk section below).

Notional amounts in currencies that represent a significant portion of the currency mix in outstanding financial instruments and other hedged items as of 31 December:

EURm	USD	CNY	JPY	INR
2021				
Foreign exchange exposure designated as hedged item for cash flow hedging, net ⁽¹⁾	601	(484)	500	(219)
Foreign exchange exposure designated as hedged item for fair value hedging for FX risk, net ⁽²⁾	1 580	–	–	–
Foreign exchange exposure designated as hedged item for net investment hedging ⁽³⁾	1 540	920	–	201
Foreign exchange exposure from interest-bearing liabilities ⁽⁴⁾	(841)	–	–	–
Foreign exchange exposure from items on the statement of financial position, excluding interest-bearing liabilities, net	(1 602)	(938)	155	(404)
Other foreign exchange derivatives, carried at fair value through profit and loss, net ⁽⁵⁾	1 372	896	(109)	322
EURm	USD	GBP	CNY	JPY
2020				
Foreign exchange exposure designated as hedged item for cash flow hedging, net ⁽¹⁾	313	238	–	369
Foreign exchange exposure designated as hedged item for fair value hedging for FX risk, net ⁽²⁾	705	(52)	–	–
Foreign exchange exposure designated as hedged item for net investment hedging ⁽³⁾	392	136	746	–
Foreign exchange exposure from interest-bearing liabilities ⁽⁴⁾	(1 207)	–	–	–
Foreign exchange exposure from items on the statement of financial position, excluding interest-bearing liabilities, net	88	(148)	(894)	130
Other foreign exchange derivatives, carried at fair value through profit and loss, net ⁽⁵⁾	(324)	120	714	(95)

(1) Includes foreign exchange exposure from forecasted cash flows related to sales and purchases. In some currencies, especially the US dollar, Nokia has substantial foreign exchange exposures in both estimated cash inflows and outflows. These underlying exposures have been hedged.

(2) Includes foreign exchange exposure from contractual firm commitments. These underlying exposures have been substantially hedged.

(3) Includes net investment exposures in foreign operations. These underlying exposures have been hedged.

(4) Includes interest-bearing liabilities that have been hedged with cross-currency swaps and foreign exchange forwards. Refer to Note 21, Interest-bearing liabilities.

(5) Items on the statement of financial position are hedged by a portion of foreign exchange derivatives not designated in a hedge relationship and carried at fair value through profit and loss.

The methodology for assessing foreign exchange risk exposures: Value-at-Risk

Nokia uses the Value-at-Risk (VaR) methodology to assess exposures to foreign exchange risks. The VaR-based methodology provides estimates of potential fair value losses in market risk-sensitive instruments as a result of adverse changes in specified market factors, at a specified confidence level over a defined holding period. Nokia calculates the foreign exchange VaR using the Monte Carlo method, which simulates random values for exchange rates in which Nokia has exposures and takes the non-linear price function of certain derivative instruments into account. The VaR is determined using volatilities and correlations of rates and prices estimated from a sample of historical market data, at a 95% confidence level, using a one-month holding period. To put more weight on recent market conditions, an exponentially weighted moving average is performed on the data with an appropriate decay factor. This model implies that, within a one-month period, the potential loss will not exceed the VaR estimate in 95% of possible outcomes. In the remaining 5% of possible outcomes, the potential loss will be at minimum equal to the VaR figure and, on average, substantially higher. The VaR methodology relies on a number of assumptions, which include the following: risks are measured under average market conditions, changes in market risk factors follow normal distributions, future movements in market risk factors are in line with estimated parameters and the assessed exposures do not change during the holding period. Thus, it is possible that, for any given month, the potential losses at a 95% confidence level are different and could be substantially higher than the estimated VaR.

The VaR calculation includes foreign currency denominated monetary financial instruments, such as current financial investments, loans and trade receivables, cash, loans and trade payables; foreign exchange derivatives carried at fair value through profit and loss that are not in a hedge relationship and are mostly used to hedge the statement of financial position foreign exchange exposure; and foreign exchange derivatives designated as forecasted cash flow hedges, fair value hedges and net investment hedges as well as the exposures designated as hedged items for these hedge relationships.

The VaR risk measures for Nokia's sensitivity to foreign exchange risks are presented in the Total VaR column and the simulated impact to financial statements presented in profit, other comprehensive income (OCI) and cumulative translation adjustment (CTA) columns in the table below.

EURm	2021				2020			
	Simulated impact on financial statements				Simulated impact on financial statements			
	Total VaR	Profit	OCI	CTA	Total VaR	Profit	OCI	CTA
As of 31 December	11	12	31	–	9	15	21	–
Average for the year	7	12	19	–	9	18	30	–
Range for the year	4-13	10-15	14-31	0-0	6-18	8-32	15-41	0-0

Interest rate risk

Nokia is exposed to interest rate risk either through market value fluctuations of items on the consolidated statement of financial position (price risk) or through changes in interest income or expenses (refinancing or reinvestment risk). Interest rate risk mainly arises through interest-bearing liabilities and assets. Estimated future changes in cash flows and the structure of the consolidated statement of financial position also expose Nokia to interest rate risk.

The objective of interest rate risk management is to mitigate adverse impacts arising from interest rate fluctuations on the consolidated income statement, cash flow, and financial assets and liabilities while taking into consideration Nokia's target capital structure and the resulting net interest rate exposure. Nokia has entered into long-term borrowings mainly at fixed rates and swapped a portion of them into floating rates, in line with a defined target interest profile. Nokia has not entered into interest rate swaps where it would be paying fixed rates. Nokia aims to mitigate the adverse impacts from interest rate fluctuations by continuously managing net interest rate exposure arising from financial assets and liabilities, by setting appropriate risk management benchmarks and risk limits.

Interest rate profile of items under interest rate risk management including Nokia's net cash and current financial investments as well as related derivatives as of 31 December:

EURm	2021		2020	
	Fixed rate	Floating rate ⁽¹⁾	Fixed rate	Floating rate ⁽¹⁾
Current financial investments	182	2 395	104	1 017
Cash and cash equivalents	499	6 192	324	6 616
Interest-bearing liabilities	(3 871)	(782)	(4 687)	(889)
Financial assets and liabilities before derivatives	(3 190)	7 805	(4 259)	6 744
Interest rate derivatives	838	(838)	661	(661)
Financial assets and liabilities after derivatives	(2 352)	6 967	(3 598)	6 083

(1) All cash equivalents and derivative transaction-related collaterals with initial maturity of three months or less are considered floating rate for the purposes of interest rate risk management.

Treasury monitors and manages interest rate exposure centrally. Nokia uses selective sensitivity analyses to assess and measure interest rate exposure arising from interest-bearing assets, interest-bearing liabilities and related derivatives. Sensitivity analysis determines an estimate of potential fair value changes in market risk-sensitive instruments by varying interest rates in currencies in which Nokia has material amounts of financial assets and liabilities while keeping all other variables constant. Sensitivities to credit spreads are not reflected in the numbers.

Nokia's sensitivity to interest rate exposure in the investment and debt portfolios is presented in the fair value column in the table below with simulated impact to financial statements presented in profit and OCI columns.

EURm	2021			2020		
	Impact on fair value	Impact on profit	Impact on OCI	Impact on fair value	Impact on profit	Impact on OCI
Interest rates – increase by 100 basis points	140	1	2	190	1	4
Interest rates – decrease by 50 basis points	(77)	–	(1)	(100)	(1)	(2)

Effects of hedge accounting on the financial position and performance

Nokia is using several types of hedge accounting programs to manage its foreign exchange and interest rate risk exposures; refer to Note 2, Significant accounting policies. The effect of these programs on Nokia's financial position and performance as of 31 December:

EURm	Cash flow hedges ⁽¹⁾	Net investment hedges ⁽¹⁾	Fair value hedges for FX risk ⁽¹⁾	Fair value and cash flow hedges ⁽¹⁾
2021				
Carrying amount of hedging instruments	(19)	(11)	(57)	(54)
Notional amount of hedging instruments	(1 196)	(2 949)	(1 579)	891
Notional amount of hedged items	1 201	2 949	1 577	(891)
Change in intrinsic value of hedging instruments since 1 January	(43)	(249)	(95)	(25)
Change in value of hedged items used to determine hedge effectiveness	40	249	92	25
2020				
Carrying amount of hedging instruments	19	(2)	69	(154)
Notional amount of hedging instruments	(787)	(1 620)	(636)	815
Notional amount of hedged items	787	1 620	635	(815)
Change in intrinsic value of hedging instruments since 1 January	33	265	79	118
Change in value of hedged items used to determine hedge effectiveness	(35)	(265)	(87)	(116)

(1) No significant ineffectiveness has been recorded during the periods presented and economic relationships have been fully effective.

The most significant foreign exchange hedging instruments under cash flow, net investment and fair value hedge accounting as of 31 December:

					Maturity breakdown of notional amounts (EURm) ⁽¹⁾			
Currency	Fair value (EURm)	Weighted average hedged rate	Total	Within 3 months	Between 3 and 12 months			Beyond 3 years
					Between 3 and 12 months	Between 1 and 3 years		
2021								
Cash flow hedge accounting								
GBP	(4)	0.8574	(209)	(55)	(154)	–	–	
GBP	4	0.8570	203	(6)	92	110	7	
JPY	(1)	130.3819	(392)	(100)	(292)	–	–	
USD	(25)	1.1586	(1 042)	(358)	(684)	–	–	
USD	14	1.1643	457	6	201	235	15	
Net investment hedge accounting								
CNY	(4)	7.2106	(920)	(920)	–	–	–	
INR	(4)	85.8900	(201)	(201)	–	–	–	
USD	1	1.1290	(1 540)	(1 540)	–	–	–	
Fair value hedge accounting for FX risk								
USD	(61)	1.1689	(1 580)	(73)	(238)	(1 130)	(139)	
2020								
Cash flow hedge accounting								
GBP	0	0.9039	(238)	(66)	(144)	(28)	–	
JPY	7	122.5961	(204)	(47)	(157)	–	–	
USD	17	1.1809	(268)	(64)	(204)	–	–	
Net investment hedge accounting								
CNY	4	7.9625	(746)	(746)	–	–	–	
USD	(6)	1.2158	(392)	(392)	–	–	–	
Fair value hedge accounting for FX risk								
USD	70	1.1490	(705)	(114)	(66)	(487)	(38)	

(1) Negative notional amounts indicate that hedges sell currency, and positive notional amounts indicate that hedges buy currency.

For information on the impact of hedge accounting on equity, refer to Note 19, Equity. For information on hedging instruments used for fair value and cash flow hedge accounting related to Nokia's interest-bearing liabilities, refer to Note 21, Interest-bearing liabilities. For information on derivative instruments, refer to Note 23, Derivative financial instruments.

Credit risk

Credit risk refers to the risk that a counterparty will default on its contractual obligations resulting in financial loss to Nokia. Credit risk arises from credit exposures to customers, including outstanding receivables, financial guarantees and committed transactions, as well as financial institutions, including bank and cash, fixed income and money market investments, and derivative financial instruments. Credit risk is managed separately for business-related and financial credit exposures.

Business-related credit risk

Nokia aims to ensure the highest possible quality in trade receivables and contract assets as well as customer or third-party loan receivables. The Credit Risk Management Standard Operating Procedure, approved by the CFO, lays out the framework for the management of the business-related credit risks. The Credit Risk Management Standard Operating Procedure sets out that credit decisions are based on credit evaluation in each business, including credit rating and limits for larger exposures, according to defined principles. Group level limit approvals are required for material credit exposures. Credit risks are monitored in each business and, where appropriate, mitigated on a case-by-case basis with the use of letters of credit, collaterals, sponsor guarantees, credit insurance, and sale of selected receivables.

Nokia applies a simplified approach to recognizing a loss allowance on trade receivables and contract assets based on measurement of lifetime expected credit losses arising from trade receivables without significant financing components. Based on quantitative and qualitative analysis, Nokia has determined that the credit risk exposure arising from its trade receivables is low risk. Quantitative analysis focuses on historical loss rates, historic and projected sales and the corresponding trade receivables, and overdue trade receivables including indicators of any deterioration in the recovery expectation. Qualitative analysis focuses on all relevant conditions, including customer credit rating, country credit rating and political situation, to improve the accuracy of estimating lifetime expected credit losses.

For customer financing related loan receivables, the credit loss estimate is typically based on a 12-month expected credit loss for outstanding loans and estimated additional draw-downs during this period. However, in case there has been a significant increase in credit risk for the specific counterparty since the initial recognition, expected credit loss estimate is based on lifetime expected credit loss. The loss allowance is calculated based on a review of collectability, including customer credit rating and available collateral. Typically customer loan credit risk is higher than credit risk of trade receivables and contract assets on average.

Credit exposure is measured as the total of trade receivables, contract assets and loans outstanding from customers and committed credits. Trade receivables do not include any major concentrations of credit risk by customer. The top three customers account for 5.6%, 5.5% and 3.2% (10.5%, 5.1% and 4.6% in 2020) of trade receivables, contract assets and loans due from customers and other third parties as of 31 December 2021. The top three credit exposures by country account for 17.6%, 9.3% and 8.4% (24.0%, 9.6% and 8.6% in 2020) of Nokia's trade receivables, contract assets and loans due from customers and other third parties as of 31 December 2021. The 17.6% relates to credit exposure in the United States (24.0% in 2020 from United States).

The total of trade receivables, contract assets and loans due from customers is EUR 7 084 million (EUR 7 124 million in 2020) and customer financing related loan commitments undrawn is EUR 21 million (EUR 180 million in 2020) as of 31 December 2021.

The aging of trade receivables, contract assets and customer finance loans as of 31 December 2021:

EURm	Current	Past due 1-30 days	Past due 31-180 days	Past due More than 180 days	Total
Trade receivables	5 043	131	249	232	5 655
Contract assets	1 146	—	—	—	1 146
Customer financing related loan receivables	216	—	1	66	283
Total gross receivables	6 405	131	250	298	7 084
Expected credit loss allowance	(202)	(9)	(44)	(189)	(444)
Total net receivables	6 203	122	206	109	6 640

The expected credit loss allowance and amount charged to the consolidated income statement for trade receivables, contract assets and customer financing related loan receivables for the years ended 31 December:

EURm	2021	2020	2019
Expected credit loss allowance	444	434	223
Expected credit loss charged to income statement	10	211	21

Financial credit risk

Financial instruments contain an element of risk resulting from changes in the market price due to counterparties becoming less creditworthy or risk of loss due to counterparties being unable to meet their obligations. Financial credit risk is measured and monitored centrally by Treasury. Financial credit risk is managed actively by limiting counterparties to a sufficient number of major banks and financial institutions, and by monitoring the creditworthiness and the size of exposures continuously. Additionally, Nokia enters into netting arrangements with all major counterparties, which give the right to offset in the event that the counterparty would not be able to fulfill its obligations. Nokia enters into collateral agreements with certain counterparties, which require counterparties to post collateral against derivative receivables.

Investment decisions are based on strict creditworthiness and maturity criteria as defined in the Treasury-related policies and procedures. As a result of this investment policy approach and active management of outstanding investment exposures, Nokia has not been subject to any material credit losses in its financial investments in the years presented. Due to the high credit quality of Nokia's financial investments, the expected credit loss for these investments is deemed insignificant based on 12 months' expected credit losses as of 31 December 2021.

Outstanding current financial investments, cash equivalents and cash classified by credit rating grades ranked in line with Standard & Poor's rating categories as of 31 December:

EURm	Rating ⁽¹⁾	Cash	Due within 3 months	Due between 3 and 12 months	Due between 1 and 3 years	Due between 3 and 5 years	Due beyond 5 years	Total ⁽²⁾⁽³⁾
2021								
	AAA	–	1 819	–	–	–	–	1 819
	AA+ - AA-	1 073	567	–	–	–	–	1 640
	A+ - A-	1 534	2 376	371	125	229	–	4 635
	BBB+ - BBB-	180	879	2	–	–	–	1 061
	BB+ - BB-	44	–	–	–	–	–	44
	B+ - B-	25	–	–	–	–	–	25
	CCC+ - CCC-	–	–	–	–	–	–	–
	Non-rated	32	12	–	–	–	–	44
Total		2 888	5 653	373	125	229	–	9 268
2020								
	AAA	–	1 411	–	–	–	–	1 411
	AA+ - AA-	895	352	–	–	–	–	1 247
	A+ - A-	1 685	2 593	50	70	155	50	4 603
	BBB+ - BBB-	106	490	100	–	–	–	696
	BB+ - BB-	36	–	1	–	–	–	37
	B+ - B-	26	–	–	–	–	–	26
	CCC+ - CCC-	3	–	–	–	–	–	3
	Non-rated	30	8	–	–	–	–	38
Total		2 781	4 854	151	70	155	50	8 061

(1) Bank Parent Company ratings are used here for bank groups. Actual bank subsidiary ratings may differ from the Bank Parent Company rating.

(2) Current financial investments and cash equivalents include bank deposits, structured deposits, investments in money market funds and investments in fixed income instruments.

(3) Instruments that include a call feature have been presented at their final maturities. Instruments that are contractually due beyond three months include EUR 424 million (EUR 325 million in 2020) of instruments that have a call period of less than three months.

Nokia has restricted bank deposits primarily related to employee benefits of EUR 119 million (EUR 107 million in 2020) that are presented in other non-current financial assets. Nokia has assessed the counterparty credit risk for these financial assets and concluded that expected credit losses are not significant.

The following table sets out financial assets and liabilities subject to offsetting under enforceable master netting agreements and similar arrangements as of 31 December. To reconcile the items shown in the table below to the consolidated statement of financial position, items that are not subject to offsetting would need to be included, refer to Note 23, Derivative financial instruments.

EURm	Gross amounts of financial assets/ (liabilities) ⁽¹⁾	Gross amounts of financial liabilities/ (assets) set off in the statement of financial position	Net amounts of financial assets/ (liabilities) presented in the statement of financial position	Related amounts not set off in the statement of financial position		
				Financial instruments assets/(liabilities)	Cash collateral (received)/pledged	Net amount
2021						
Derivative assets	139	–	139	(102)	(26)	11
Derivative liabilities	(229)	–	(229)	102	126	(1)
Total	(90)	–	(90)	–	100	10
2020						
Derivative assets	149	–	149	(53)	(89)	7
Derivative liabilities	(204)	–	(204)	53	134	(17)
Total	(55)	–	(55)	–	45	(10)

(1) In 2020 gross amounts of financial assets and liabilities have been adjusted to include only derivative contracts that are under enforceable master netting agreements.

The financial instruments subject to enforceable master netting agreements and similar arrangements are not offset in the consolidated statement of financial position where there is no intention to settle net or realize the asset and settle the liability simultaneously.

Liquidity risk

Liquidity risk is defined as financial distress or extraordinarily high financing costs arising from a shortage of liquid funds in a situation where outstanding debt needs to be refinanced or where business conditions unexpectedly deteriorate and require financing. Transactional liquidity risk is defined as the risk of executing a financial transaction below fair market value or not being able to execute the transaction at all within a specific period of time. The objective of liquidity risk management is to maintain sufficient liquidity, and to ensure that it is readily available without endangering its value in order to avoid uncertainty related to financial distress at all times.

Nokia aims to secure sufficient liquidity at all times through efficient cash management and by investing primarily in highly liquid money market investments. Depending on its overall liquidity position, Nokia may pre-finance or refinance upcoming debt maturities before contractual maturity dates. The transactional liquidity risk is minimized by entering into transactions where proper two-way quotes can be obtained from the market. Nokia aims to ensure flexibility in funding by maintaining committed and uncommitted credit lines. Refer to Note 21, Interest-bearing liabilities.

The following table presents an undiscounted, contractual cash flow analysis for lease liabilities, financial liabilities and financial assets that are presented on the consolidated statement of financial position as well as loan commitments given and obtained. The line-by-line analysis does not directly reconcile with the consolidated statement of financial position.

EURm	Total	Due within 3 months	Due between 3 and 12 months	Due between 1 and 3 years	Due between 3 and 5 years	Due beyond 5 years
2021						
Non-current financial assets						
Other non-current financial assets ⁽¹⁾	236	15	13	110	86	12
Current financial assets						
Other current financial assets excluding derivatives ⁽¹⁾	128	110	18	–	–	–
Current financial investments	2 576	2 274	302	–	–	–
Cash and cash equivalents ⁽²⁾	6 695	6 268	71	126	230	–
Cash flows related to derivative financial assets net settled:						
Derivative contracts – receipts	2	–	(2)	4	–	–
Cash flows related to derivative financial assets gross settled:						
Derivative contracts – receipts	10 498	7 907	1 774	462	49	306
Derivative contracts – payments	(10 291)	(7 835)	(1 713)	(434)	(35)	(274)
Trade receivables	5 673	4 829	812	32	–	–
Non-current financial and lease liabilities						
Long-term interest-bearing liabilities	(5 409)	(39)	(86)	(1 171)	(2 038)	(2 075)
Long-term lease liabilities	(882)	–	–	(353)	(225)	(304)
Other non-current financial liabilities	(34)	–	–	(34)	–	–
Current financial and lease liabilities						
Short-term interest-bearing liabilities	(116)	(89)	(27)	–	–	–
Short-term lease liabilities	(236)	(62)	(174)	–	–	–
Other financial liabilities excluding derivatives ⁽³⁾	(522)	(504)	(18)	–	–	–
Cash flows related to derivative financial liabilities gross settled:						
Derivative contracts – receipts	12 100	8 483	1 629	1 179	180	629
Derivative contracts – payments	(12 220)	(8 556)	(1 663)	(1 231)	(176)	(594)
Discounts without performance obligations	(664)	(419)	(175)	(70)	–	–
Trade payables	(3 679)	(3 522)	(152)	(4)	–	(1)
Commitments given and obtained						
Loan commitments given undrawn ⁽⁴⁾	(21)	(3)	(18)	–	–	–
Loan commitments obtained undrawn ⁽⁵⁾	1 482	(1)	(3)	80	1 406	–
Leases committed but not yet commenced	(223)	–	–	(8)	(23)	(192)

(1) Other non-current financial assets and other current financial assets excluding derivatives include mainly customer financing related loan receivables.

(2) Instruments that include a call feature have been presented at their final maturities. Instruments that are contractually due beyond three months include EUR 424 million of instruments that have a call period of less than three months.

(3) Other financial liabilities include a conditional obligation to China Huaxin presented in the earliest period as the exercise period is open.

(4) Loan commitments given undrawn have been included in the earliest period in which they could be drawn or called.

(5) Loan commitments obtained undrawn have been included based on the period in which they expire. These amounts include related commitment fees.

EURm	Total	Due within 3 months	Due between 3 and 12 months	Due between 1 and 3 years	Due between 3 and 5 years	Due beyond 5 years
2020						
Non-current financial assets						
Other non-current financial assets ⁽¹⁾	188	–	–	66	79	43
Current financial assets						
Other current financial assets excluding derivatives ⁽¹⁾	39	2	37	–	–	–
Current financial investments	1 121	1 020	101	–	–	–
Cash and cash equivalents ⁽²⁾	6 944	6 618	50	70	156	50
Cash flows related to derivative financial assets gross settled:						
Derivative contracts – receipts	7 810	5 873	1 299	599	39	–
Derivative contracts – payments	(7 682)	(5 813)	(1 258)	(573)	(38)	–
Trade receivables	5 802	4 674	974	154	–	–
Non-current financial and lease liabilities						
Long-term interest-bearing liabilities	(5 920)	(39)	(97)	(794)	(2 194)	(2 796)
Long-term lease liabilities	(750)	–	–	(338)	(220)	(192)
Current financial and lease liabilities						
Short-term interest-bearing liabilities	(564)	(552)	(12)	–	–	–
Short-term lease liabilities	(232)	(65)	(167)	–	–	–
Other financial liabilities excluding derivatives ⁽³⁾	(434)	(420)	(14)	–	–	–
Cash flows related to derivative financial liabilities gross settled:						
Derivative contracts – receipts	6 926	4 870	883	525	45	603
Derivative contracts – payments	(6 999)	(4 906)	(882)	(563)	(35)	(613)
Discounts without performance obligations ⁽⁴⁾	(747)	(421)	(310)	(13)	(3)	–
Trade payables	(3 174)	(3 049)	(122)	(2)	–	(1)
Commitments given and obtained						
Loan commitments given undrawn ⁽⁵⁾	(180)	(26)	(26)	(128)	–	–
Loan commitments obtained undrawn ⁽⁶⁾	1 482	(1)	(3)	(8)	1 494	–
Leases committed but not yet commenced	(182)	(1)	(3)	(43)	(29)	(106)

(1) Other non-current financial assets and other current financial assets excluding derivatives include mainly customer financing related loan receivables.

(2) Instruments that include a call feature have been presented at their final maturities. Instruments that are contractually due beyond three months include EUR 325 million of instruments that have a call period of less than three months.

(3) Other financial liabilities include a conditional obligation to China Huaxin presented in the earliest period as the exercise period is open.

(4) In 2021, Nokia has revised the classification of discounts without performance obligations and included this financial liability in the table. The comparative amounts for 2020 have been adjusted accordingly.

(5) Loan commitments given undrawn have been included in the earliest period in which they could be drawn or called.

(6) Loan commitments obtained undrawn have been included based on the period in which they expire. These amounts include related commitment fees.

35. Subsequent events

Non-adjusting events after the reporting period

Capital commitment

In January 2022, Nokia agreed on capital commitment of USD 400 million to NGP Capital's Fund V. The fund's emphasis on companies developing emerging 5G use cases for industrial and business transformation aligns closely with Nokia's technology leadership vision and its efforts to maximize the value shift towards cloud. Per industry standard practice, the capital will be called throughout the 10-year lifecycle of the fund.

Share buyback program

On 3 February 2022, Nokia announced that its Board of Directors is initiating a share buyback program under the current authorization from the AGM to repurchase shares. The program targets to return up to EUR 600 million of cash to shareholders in tranches over a period of two years, subject to continued authorization from the Annual General Meeting. Nokia launched the first phase of the program on 11 February 2022 with repurchases starting on 14 February 2022. For more details about the share buyback program and how Nokia plans to distribute funds to its shareholders, refer to Note 19, Equity.

Reports of independent registered public accounting firms

Reports of independent registered public accounting firms

To the shareholders and the Board of Directors of Nokia Corporation.

Opinion on the Financial Statements

We have audited the accompanying consolidated statement of financial position of Nokia Corporation and subsidiaries (the "Company") as of December 31, 2021 and 2020, and the related consolidated income statement, consolidated statement of comprehensive income, consolidated statement of changes in shareholders' equity and consolidated statement of cash flows for each of the two years in the period ended December 31, 2021, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2021, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board and International Financial Reporting Standards as adopted by the European Union.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated 3 March 2022 expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Revenue recognition - Accounting for significant and complex contracts — Refer to Notes 2 and 6 to the financial statements

Critical Audit Matter Description

The Company recognises revenue in accordance with International Financial Reporting Standard 15 *Revenue from Contracts with Customers from contracts*.

A number of the contracts that the Company enters into are particularly significant in value, and contain highly complex terms and conditions which impact revenue recognition.

Such complexities included the assessment of whether to combine two contracts entered into at similar times, accounting for modifications to existing contracts and accounting for contractual discounts.

Given the level of complexity and management judgement involved in the accounting for significant and complex contracts, performing audit procedures to evaluate the reasonableness of these accounting judgements required a high degree of auditor judgement, and there was a significant audit effort in obtaining sufficient audit evidence.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the determination of the appropriateness of the accounting for significant and complex contracts included the following, among others:

- We assessed management's accounting policy in relation to the areas of complexity identified in all significant and complex contracts to determine compliance of the policy with IFRS 15;

- We tested the operating effectiveness of controls over revenue recognition of significant and complex contracts, specifically focusing on controls relating to the areas of accounting complexity;
- We utilised data analytics to identify those contracts with higher levels of risk based on size and complexity;
- We analysed the terms and conditions of significant and complex contracts, and obtained and read the Company's accounting paper setting out management's accounting conclusions;
- We met with senior management in the finance and operations teams relevant to the significant and complex contracts to make inquiries regarding commercial and financial considerations relating to those contracts;
- We consulted with our revenue recognition accounting experts to assess the accounting for certain complex elements within these contracts; and
- We assessed whether management's conclusions were in accordance with the terms and conditions of the contract and compliant with IFRS 15.

/s/ Deloitte Oy

Helsinki, Finland

3 March 2022

We have served as the Company's auditor since 2020.

Reports of independent registered public accounting firms

To the shareholders and the Board of Directors of Nokia Corporation.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Nokia Corporation and subsidiaries (the "Company") as of 31 December 2021, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of 31 December 2021, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended 31 December 2021, of the Company and our report dated 3 March 2022 expressed an unqualified opinion on those financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's annual report on internal control over financial reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte Oy

Helsinki, Finland

3 March 2022

Report of independent registered public accounting firm

To the Board of Directors and shareholders of Nokia Corporation

Opinion on the Financial Statements

We have audited the consolidated income statement, consolidated statement of comprehensive income, consolidated statement of changes in shareholders' equity and consolidated statement of cash flows of Nokia Corporation and its subsidiaries (the "Company") for the year ended December 31, 2019, including the related notes (collectively referred to as the "consolidated financial statements").

In our opinion, the consolidated financial statements present fairly, in all material respects, the results of operations and cash flows of the Company for the year ended December 31, 2019 in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board and International Financial Reporting Standards as adopted by the European Union.

Change in Accounting Principles

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit of these consolidated financial statements in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud.

Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ PricewaterhouseCoopers Oy

Helsinki, Finland

March 5, 2020, (i) except for the change in the manner in which the Company accounts for other operating income and expenses discussed in Note 2 to the consolidated financial statements, as to which the date is March 4, 2021 and (ii) except for the change in the manner in which the Company accounts for foreign exchange hedging of cash and cash flows and the change in the manner in which the Company reports its segment information discussed in Note 2 and Note 5 to the consolidated financial statements, as to which the date is March 3, 2022.

We served as the Company's auditor from 1987 to 2020.

Other information

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Exhibits

1	<u>Articles of Association of Nokia Corporation (incorporated by reference to Exhibit 1 of our Annual Report on Form 20-F filed with the Securities and Exchange Commission on 23 March 2017 (File No. 1-13202)).</u>
8	Refer to Note 30, Principal Group companies, of our consolidated financial statements for more information on our significant subsidiaries.
11	<u>Code of Ethics.</u>
12.1	<u>Certification of Pekka Lundmark, President and Chief Executive Officer of Nokia Corporation, pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.</u>
12.2	<u>Certification of Marco Wiren, Group Chief Financial Officer of Nokia Corporation, pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.</u>
13	<u>Certification, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.</u>
15.1	<u>Consent of Deloitte Oy.</u>
15.2	<u>Consent of PricewaterhouseCoopers Oy.</u>
101	Interactive Data Files (Inline XBRL – Related Documents).
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101).

Glossary

2G (Second Generation Mobile Communications): Also known as GSM (Global System for Mobile Communications): A digital system for mobile communications that is based on a widely-accepted standard and typically operates in the 900 MHz, 1800 MHz and 1900 MHz frequency bands.

3G (Third Generation Mobile Communications): The third generation of mobile communications standards designed for carrying both voice and data generally using WCDMA or close variants. See also WCDMA.

3GPP (The Third Generation Partnership Project): A consortium comprising several standards organizations which develop protocols for mobile telecommunications. The initial goal was to develop a global technical specification for a 3G mobile phone system. Since then, the operations have been extended and today the main focus is on 5G networks.

4G (Fourth Generation Mobile Communications): The fourth generation of mobile communications standards based on LTE, offering IP data connections only and providing true broadband internet access for mobile devices. See also LTE.

5G (Fifth Generation Mobile Communications): The next major phase of mobile telecommunications standards. 5G is a complete redesign of network architecture with the flexibility and agility to support upcoming service opportunities. It delivers higher speeds, higher capacity, extremely low latency and greater reliability.

6G (Sixth Generation Mobile Communications): The cellular industry introduces a new generation about every ten years. The next generation of technology is expected to be introduced by 2030 and is generally referred to as 6G.

Access network: A telecommunications network between a local exchange and the subscriber station.

Airframe: Our 5G-ready, end-to-end data center solution that combines the benefits of cloud computing technologies with the requirements of the core and radio telecommunications world. It is available in Rackmount and Open Compute Project (OCP) form factors. This enables the solution to be very scalable: from small distributed latency-optimized data centers to massive centralized hyperscale data center deployment.

AirScale Radio Access: A 5G-ready complete radio access generation that helps operators address the increasing demands of today and tomorrow. The solution comprises: Nokia AirScale Base Station with multiband radio frequency elements and system modules; Nokia AirScale Active Antennas; Cloud RAN with Nokia AirScale Cloud Base Station Server and the cloud-based AirScale RNC (Radio Network Controller) for 3G; Nokia AirScale Wi-Fi; common software; and services which use intelligent analytics and extreme automation to maximize the performance of hybrid networks.

Alcatel-Lucent: Alcatel-Lucent Group, that has been part of the Nokia Group since 2016.

Anyhaul: Mobile transport solution for 5G networks covering microwave, IP, optical and broadband.

Artificial Intelligence (AI): Autonomous and adaptive intelligence of machines, where machines have the ability to perform tasks in complex environments without constant guidance by a user and have the ability to improve performance by learning from experience.

Bandwidth: The width of a communication channel, which affects transmission speeds over that channel.

Base station: A network element in a mobile network responsible for radio transmission and reception to or from the mobile station.

Broadband: The delivery of higher bandwidth by using transmission channels capable of supporting data rates greater than the primary rate of 9.6 Kbps.

Churn: A measure of the number of customers or subscribers who leave their service provider, e.g. a mobile operator, during a given time period.

Cloud: Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort.

Cloud and Network Services: Our Cloud and Network Services business group enables CSPs and enterprises to deploy and monetize 5G, cloud-native software and as-a-Service delivery models.

CloudBand: Our cloud management and orchestration solutions enabling a unified cloud engine and platform for Network Functions Virtualization (NFV). See also NFV.

Cloud RAN: Cloud RAN refers to all or some of the baseband functions being run on a commercial off-the-shelf (COTS) computing platform rather than purpose-built hardware.

Common Software Foundation (CSF): As a coherent software suite, Nokia's cloud-native Common Software Foundation is designed to deliver applications that are hardware- and vendor-agnostic, and easy to deploy, integrate, use and upgrade.

Converged core: Wireless and fixed access convergence within the core. As we move towards a 5G standalone core, service providers will be able to use a common set of control plane functions within the core to manage both wireless and fixed user plane functions. The ability of a unified control plane will simplify operations and provide independent location, scaling and lifecycle management capabilities.

Convergence: The coming together of two or more disparate disciplines or technologies. Convergence types are, for example, IP convergence, fixed-mobile convergence and device convergence.

Core network: A combination of exchanges and the basic transmission equipment that together form the basis for network services.

CSPs: Communications service providers. One of Nokia's customer segments.

Customer Experience Management: Software suite used to manage and improve the customer experience, based on customer, device and network insights.

Digital: A signaling technique in which a signal is encoded into digits for transmission.

Discontinued operations: The continuing financial effects of the HERE business and the Devices & Services business. HERE was divested to an automotive consortium and substantially all of the Devices & Services business was sold to Microsoft.

Ecosystem: An industry term to describe the increasingly large communities of mutually beneficial partnerships that participants such as hardware manufacturers, software providers, developers, publishers, entertainment providers, advertisers and ecommerce specialists form in order to bring their offerings to market. At the heart of the major ecosystems in the mobile devices and related services industry is the operating system and the development platform upon which services are built.

Enterprise verticals: One of Nokia's customer segments. An enterprise vertical represents a grouping of companies by an industry (like energy or transportation) that offers products and services that meet specific needs of that industry. Within the enterprise verticals segments, we primarily focus on transportation, energy, manufacturing, logistics and the public sector.

ETSI (European Telecommunications Standards Institute): Standards produced by the ETSI contain technical specifications laying down the characteristics required for a telecommunications product.

Fixed Wireless Access (FWA): Uses wireless networks to connect fixed locations such as homes and businesses with broadband services.

FP5: Nokia's fifth generation of high-performance IP routing silicon, and the latest range of our AirScale 5G products.

Future X: A network architecture - a massively distributed, cognitive, continuously adaptive, learning and optimizing network connecting humans, senses, things, systems, infrastructure and processes.

G.fast: A fixed broadband technology able to deliver up to 1Gbps over very short distances (for example, for in-building use, also called "Fiber-to-the-Building"). Launched in 2014, G.fast uses more frequencies and G.fast Vectoring techniques to achieve higher speeds.

GPON (Gigabit Passive Optical Network): A fiber access technology that delivers 25Gbps over a single optical fiber to multiple end points including residential and enterprise sites.

GSM (Global System for Mobile Communications): A digital system for mobile communications that is based on a widely accepted standard and typically operates in the 900 MHz, 1800 MHz and 1900 MHz frequency bands. See also 2G.

GSM-R (GSM-Railway): An international wireless communications standard for railway communication and applications. A sub-system of European Rail Traffic Management System (ERTMS), it is used for communication between train and railway regulation control centers.

Hexa-X: European Commission's flagship 6G initiative for research into the next generation of wireless networks. The initiative began in January 2021 with Nokia as project lead, working closely with a strong consortium of European partners.

Hyperscalers: One of Nokia's customer segments. Hyperscaler refers to companies like Alphabet (Google), Amazon (Amazon Web Services), Microsoft and Meta Platforms (Facebook) that provide cloud solutions at a global scale leveraging massive connected data centers.

Internet of Things (IoT): All things such as cars, the clothes we wear, household appliances and machines in factories connected to the internet and able to automatically learn and organize themselves.

IP (Internet Protocol): A network layer protocol that offers a connectionless internet work service and forms part of the (Transmission Control Protocol) TCP/IP protocol.

IP (Intellectual Property): Intellectual property results from original creative thought, covering items such as patents, copyright material and trademarks, as well as business models and plans.

IPR (Intellectual Property Rights): Legal rights protecting the economic exploitation of intellectual property, a generic term used to describe products of human intellect, for example patents, that have an economic value.

IP/MPLS (IP Multiprotocol Label Switching): IP/MPLS is a routing technique in telecommunications networks that directs data from one node to the next based on short path labels rather than long network addresses, thus avoiding complex lookups in a routing table and speeding traffic flows.

IPR licensing: Generally an agreement or an arrangement where a company allows another company to use its intellectual property (such as patents, trademarks or copyrights) under certain terms.

LTE (Long-Term Evolution): 3GPP radio technology evolution architecture and a standard for wireless communication of high-speed data. Also referred to as 4G.

Mission-critical networks/communications: One of the key elements of 5G. Mission-critical communications meets the needs of emergency responders such as emergency operations centers, fire departments, emergency vehicles, police, and search and rescue services, replacing traditional radio with new communications capabilities available to smartphone users.

Mobile broadband: Refers to high-speed wireless internet connections and services designed to be used from multiple locations.

Mobile Networks: Our Mobile Networks business group offers products and services for radio access networks covering technologies from 2G to 5G, and microwave radio links for transport networks.

MPLS: Multiprotocol Label Switching, a routing technique for networks.

MSO: Multiple System Operators (MSO) are operators of multiple cable television systems. The majority of system operators run cable systems in more than one community and hence most of them are multiple system operators.

Network Infrastructure: Our Network Infrastructure business group provides fiber, copper, fixed wireless access technologies, IP routing, data center, subsea and terrestrial optical networks – along with related services – to customers including communications service providers, webscales (including hyperscalers), digital industries and governments.

NFV (Network Functions Virtualization): Principle of separating network functions from the hardware they run on by using virtual hardware abstraction.

Nokia Bell Labs: Our research arm engaged in discovering and developing the technological shifts needed for the next phase of human existence as well as exploring and solving complex problems to radically redefine networks.

Nokia Technologies: Our Nokia Technologies business group is responsible for managing Nokia's patent portfolio and monetizing Nokia's intellectual property, including patents, technologies and the Nokia brand.

Non-Standalone (NSA): Network architecture that is built over an existing 4G network.

Operating System (OS): Software that controls the basic operation of a computer or a mobile device, such as managing the processor and memory. The term is also often used to refer more generally to the software within a device, for example, the user interface.

O-RAN: The term O-RAN refers to interfaces and architecture elements as specified by the O-RAN alliance. O-RAN Alliance is a specification group defining next-generation RAN infrastructures, empowered by principles of intelligence and openness.

Packet: Part of a message transmitted over a packet-switched network.

Platform: Software platform is a term used to refer to an operating system or programming environment, or a combination of the two.

PON (Passive Optical Network): A fiber access architecture in which unpowered fiber optic splitters are used to enable a single optical fiber to serve multiple endpoints without having to provide individual fibers between the hub and customer.

Private wireless network: Private wireless is a standalone network focused on industrial operational assets and users. A private wireless network provides broadband connectivity, similar to a public wireless network, but is owned and controlled by the organization that built or purchased it.

Programmable world: A world where connectivity will expand massively, linking people as well as billions of physical objects - from cars, home appliances and smartphones, to wearables, industrial equipment and health monitors. What distinguishes the Programmable World from the Internet of Things (IoT) is the intelligence that is added to data to allow people to interpret and use it, rather than just capture it.

PSE-3: The PSE-3 chipset is the first coherent digital signal processor to implement Probabilistic Constellation Shaping (PCS), a modulation technique pioneered by Nokia Bell Labs.

RAN (Radio Access Network): A mobile telecommunications system consisting of radio base stations and transmission equipment.

SDAN: Software Defined Access Network.

SDN (Software-Defined Network): Decoupling of network control and data forwarding to simplify and automate connections in data centers, clouds and across the wide area.

SD-WAN: Software-Defined Networking in a Wide Area Network (WAN) that simplifies and automates enterprise networks, seamlessly connecting users and applications, from branch office to cloud.

SEP (Standard-Essential Patent): Generally, patents needed to produce products which work on a standard which companies declare as essential and agree to license on Fair, Reasonable and Non-Discriminatory (FRAND) terms. Can also be referred to as essential patent.

Single RAN: Single RAN (S-RAN) allows different radio technologies to be provided at the same time from a single base station, using a multi-purpose platform.

Small cells: Low-powered radio access nodes (micro cells or picocells) that are a vital element in handling very dense data traffic demands. 3G and LTE small cells use spectrum licensed by the operator; wi-fi uses unlicensed spectrum which is therefore not under the operator's exclusive control.

Standalone (SA): Network architecture that allows independent operation of a 5G service without interaction with an existing 4G core and 4G radio network.

Technology licensing: Generally refers to an agreement or arrangement where under certain terms a company provides another company with its technology and possibly know-how, whether protected by intellectual property or not, for use in products or services offered by the other company.

Telco cloud: Applying cloud computing, SDN and NFV principles in telecommunications environment, for example separating application software from underlying hardware with automated, programmable interfaces while still retaining telecommunications requirements such as high availability and low latency.

Transmission: The action of conveying signals from one point to one or more other points.

TXLE (Technical Extra-Large Enterprise): Technically sophisticated companies, such as banks, that invest heavily in their own network infrastructures to gain a key competitive advantage.

VDSL2 (Very High Bit Rate Digital Subscriber Line 2): A fixed broadband technology, the successor of ADSL. Launched in 2007, it typically delivers a 30Mbps broadband service from a street cabinet (also called a Fiber to the Node deployment) over existing telephone lines.

VDSL2 vectoring: A fixed broadband technology launched in 2011, able to deliver up to 100Mbps over a VDSL2 line by applying noise cancellation techniques to remove cross-talk between neighboring VDSL2 lines.

Virtual Reality (VR): The simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as a helmet with a screen inside or gloves fitted with sensors.

VoLTE (Voice over LTE): Required to offer voice services on an all-IP LTE network and generally provided using IP Multimedia Subsystem, which is an architectural framework designed to deliver IP-based multimedia services on telecommunications networks; standardized by 3GPP.

WAN (Wide Area Network): A geographically distributed private telecommunications network that interconnects multiple local area networks.

WCDMA (Wideband Code Division Multiple Access): A third-generation mobile wireless technology that offers high data speeds to mobile and portable wireless devices. Also referred to as 3G.

Webscale companies: Companies which are investing in cloud technology and network infrastructure on an increasing scale to fulfill their needs for massive, mission-critical networks.

WING: Worldwide IoT Network Grid is a managed service that offers CSPs the ability to support their enterprise customers with global IoT connectivity across borders and technologies.

WLAN (Wireless Local Area Network): A local area network using wireless connections, such as radio, microwave or infrared links, in place of physical cables.

Investor information

Information on the internet

www.nokia.com

Available on the internet: financial reports, members of the Group Leadership Team, other investor-related materials and events, and press releases as well as environmental and social information, including our People & Planet Report, Code of Conduct, Corporate Governance Statement and Remuneration Statement.

SEC maintains an internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC (<http://www.sec.gov>).

Investor Relations contacts

investor.relations@nokia.com

Annual General Meeting

Date: 5 April 2022

Place: Espoo, Finland

Dividend

The Board proposes to the Annual General Meeting 2022 to be authorized to decide, in its discretion, on the distribution of an aggregate maximum of EUR 0.08 per share as dividend and/or as assets from the invested unrestricted equity fund.

Financial reporting

Our interim reports in 2022 are planned to be published on 28 April 2022, 21 July 2022 and 20 October 2022. The full-year 2022 results are planned to be published in February 2023.

Information published in 2021

All our global press releases and statements published in 2021 are available on the internet at www.nokia.com/en_int/news/releases.

Stock exchanges

The Nokia Corporation share is quoted on the following stock exchanges:

	Symbol	Trading currency
Nasdaq Helsinki (since 1915)	NOKIA	EUR
New York Stock Exchange (since 1994)	NOK	USD
Euronext Paris (since 2015)	NOKIA	EUR

Documents on display

The documents referred to in this Annual Report on Form 20-F can be read at the Securities and Exchange Commission's internet site at <http://www.sec.gov>.

Contact information

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FINLAND

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Fax +358 (0) 10 44 81 002

Signatures

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this Annual Report on Form 20-F on its behalf.

Nokia Corporation

By: **/S/ STEPHAN PROSI**
Name: Stephan Prosi
Title: Vice President, Corporate Controlling and Accounting

By: **/S/ ESA NIINIMÄKI**
Name: Esa Niinimäki
Title: Deputy Chief Legal Officer, Corporate

3 March 2022



CODE OF ETHICS

FOR THE PRINCIPAL EXECUTIVE OFFICERS AND THE SENIOR FINANCIAL OFFICERS

1 Purpose

The purpose of this Code of Ethics (the “Code”) is to reinforce ethical behavior and promote high standards of corporate governance. This Code complements Nokia’s Code of Conduct, Nokia Insider Policy and other guidelines and policies applicable at Nokia.

2 Applicability

The Code applies to Nokia’s President and Chief Executive Officer, Chief Financial Officer, Deputy Chief Financial Officer and Corporate Controller (the “Officers”).

3 Good corporate practices

3.1 Honest and ethical conduct

The Officers shall act honestly and ethically in all their business activities in their respective roles. They shall comply with and promote compliance with the highest standards of ethical conduct, including the principles set out in Nokia’s Code of Conduct, in all their business activities at Nokia.

3.2 Conflicts of interest

Situations involving an actual or apparent conflict of interest between personal and professional relationships of the Officers with Nokia, or any doubt thereof, shall be handled in an ethical way. An Officer shall not participate in consideration of a matter in which he/she has a conflict of interest or even a perceived conflict of interest between his/her personal and professional relationships with respect to Nokia.

For the avoidance of doubt, the Officers shall comply with the provisions on conflicts of interest included in various Nokia guidelines and policies (e.g., Nokia Insider Policy, Conflict of Interest Policy and external board membership related standard operating procedures).

3.3 Fair and timely disclosure

The Officers shall take all measures generally required from a prudent principal executive officer or senior financial officer, including measures in accordance with Nokia's disclosure controls and procedures, to promote full, fair, accurate, timely and understandable disclosure in reports and documents filed with or submitted to financial and regulatory authorities or stock exchanges by Nokia.

3.4 Compliance with laws and regulations

The Officers shall comply in all their business activities in their respective roles with all applicable governmental laws, rules and regulations of Finland and other applicable jurisdictions, as well as the rules of stock exchanges on which Nokia shares are listed, including the New York Stock Exchange. These obligations include cooperating, appropriately, with governmental investigations of Nokia's business and operations.

4 Accountability

4.1 Clearances

Nokia regards adherence to this Code as well as accountability for such adherence as important.

The Chief Compliance Officer may, upon request, advise the Officers whether a particular situation or behavior is in compliance with this Code or not, and give a clearance for a situation or behavior that is obviously and evidently compliant. The determination whether a conflict of interest exists or not, shall be made by the Chief Compliance Officer or, upon the request of the Officer or the Chief Compliance Officer, by the Chair of the Audit Committee.

4.2 Reporting of illegal or unethical behavior

Any suspected failures to adhere to, and suspected violations of this Code by any of the Officers, shall be reported to the Chief Compliance Officer or to the Chair of the Audit Committee. Except for such matters that are beyond question frivolous, each such matter shall be reviewed and considered by the Audit Committee. The matter shall be prepared for such consideration by the Chief Compliance Officer or another officer as instructed by the Audit Committee.

4.3 Violations

The Audit Committee shall consider and determine if a violation of this Code has occurred, and possible consequences, if any, for such violation. The consequences may vary from a

written reprimand to a recommendation to the corporate body entitled to discharge the Officer in question to discharge him/her from his/her duties, and may include other measures that the Audit Committee deems appropriate, depending on the circumstances of the case.

4.4 Recording

The Chief Compliance Officer shall keep records of all clearances given by him/her or the Vice Chair of the Board, as well as of all reports made under this Code on suspected failures by the Officers to adhere to the Code or suspected violations thereof. In addition, records shall be kept on all decisions taken by the Audit Committee in respect of matters considered under this Code.

5 Assignments

The Audit Committee may authorize its Chair to resolve a specific matter, or a specific category of matters, under this Code.

Any reference to the Chief Compliance Officer in this Code is equally applicable to his/her deputy.

6 Waivers

Any waiver of this Code may be made only by the Audit Committee and must be disclosed as set forth below.

7 Disclosure

This Code will be published on the Nokia's website. Amendments to, and waivers of, this Code will be disclosed in a similar way.

8 Approval and amendments

This Code is approved, and may be amended, by the Board of Directors of Nokia.

CERTIFICATION

I, PEKKA LUNDMARK, certify that:

1. I have reviewed this Annual Report on Form 20-F of Nokia Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c. Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d. Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: 3 March 2022

/s/ PEKKA LUNDMARK

PEKKA LUNDMARK

President and Chief Executive Officer

CERTIFICATION

I, MARCO WIRÉN, certify that:

1. I have reviewed this Annual Report on Form 20-F of Nokia Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c. Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d. Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: 3 March 2022

/s/ MARCO WIRÉN

MARCO WIRÉN

Chief Financial Officer

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 20-F of Nokia Corporation (the “Company”) for the period ended December 31, 2021, as filed with the Securities and Exchange Commission on the date hereof (the “Report”), pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, the undersigned hereby certify that, to the best of our knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: 3 March 2022

/s/ PEKKA LUNDMARK

Name: PEKKA LUNDMARK

Title: President and Chief Executive Officer

/s/ MARCO WIRÉN

Name: MARCO WIRÉN

Title: Chief Financial Officer

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement Nos. 333-253253, 333-236903, 333-230467, 333-223848, and 333-187096 on Form S-8 of our reports dated 3 March 2022 relating to the financial statements of Nokia Corporation and the effectiveness of Nokia Corporation's internal control over financial reporting appearing in this Annual Report on Form 20-F for the year ended 31 December 2021.

/s/ Deloitte Oy

Deloitte Oy
Helsinki, Finland
3 March 2022

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-253253, 333-236903, 333-230467, 333-223848, and 333-187096) of Nokia Corporation of our report dated 5 March 2020 relating to the consolidated financial statements, (i) except for the change in the manner in which the Company accounts for other operating income and expenses discussed in Note 2 to the consolidated financial statements, as to which the date is 4 March 2021 and (ii) except for the change in the manner in which the Company accounts for foreign exchange hedging of cash and cash flows and the change in the manner in which the Company reports its segment information discussed in Note 2 and Note 5 to the consolidated financial statements, as to which the date is 3 March 2022, which appears in this Form 20-F.

/s/ PricewaterhouseCoopers Oy

PricewaterhouseCoopers Oy
Helsinki, Finland
3 March 2022
