

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

We create the technology to connect the world. Only Nokia offers a comprehensive portfolio of network equipment, software, services and licensing opportunities across the globe. With our commitment to innovation, driven by the award-winning Nokia Bell Labs, we are a leader in the development and deployment of 5G networks.

Our communications service provider customers support more than 6.4 billion subscriptions with our radio networks, and our enterprise customers have deployed over 1,300 industrial networks worldwide. Adhering to the highest ethical standards, we transform how people live, work and communicate. For our latest updates, please visit us online www.nokia.com

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1 2019	December 31 2019	No	<Not Applicable>

C0.3

(C0.3) Select the countries/areas for which you will be supplying data.

Please select

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

EUR

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Operational control

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board Chair	The Board's responsibilities 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 financial and non-financial commitments that may not be exceeded without a separate Board approval. In risk management policies and processes, 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 integral parts of Board deliberations and risk-related updates are provided to the Board on a recurring basis. Climate-related risks are integrated to the multi-disciplinary company-wide risk assessment and management processes.
Board-level committee	The primary purpose of the Board's Personnel Committee is to oversee the personnel-related policies and practices at Nokia, as described in the Committee charter. It assists the Board in discharging its responsibilities in relation to all compensation, including equity compensation, of the company's executives and their terms of employment. The Committee is responsible for overseeing compensation philosophy and principles and ensuring the above compensation programs are performance-based, and designed to contribute to long-term shareholder value creation and alignment to shareholders' interests, properly motivate management, and support overall corporate strategies. In 2019, the committee considered whether and how our incentive structures incentivize environmental, social and governance (ESG) priorities. The committee's view is that these key priorities are supported by a focus on the share price element of the long term incentives which forms a significant element of the overall compensation for our senior leaders. The interaction of ESG initiatives with the way we operate our business is complex and as no single ESG metric on its own defines our business, the view of the Board is that this is best managed by Nokia's senior leaders in consultation with key stakeholders.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – some meetings	Reviewing and guiding major plans of action Reviewing and guiding risk management policies Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable>	Climate issues are part of the board's annual sustainability review which includes e.g. review of the targets, key actions and performance. Nokia Enterprise Risk Management (ERM) system also includes climate-related risks and opportunities and the board has ERM review in their meetings minimum once a year.

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Sustainability committee	<Not Applicable >	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Annually
Chief Financial Officer (CFO)	<Not Applicable >	Other, please specify (Climate-related topics are reported in our external quarterly reports which are reviewed by the board's Audit Committee. CFO has also the role of CRO and is responsible for Enterprise Risk Management. The board has risk reviews on a recurring basis.)	<Not Applicable>	Quarterly
Other C-Suite Officer, please specify (Chief Marketing Officer (CMO))	<Not Applicable >	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Annually

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

Sustainability Committee

Our sustainability committee is called Sustainability Council. The role descriptions of the committee members can be found below:

Head of Sustainability

VP Investor Relations

VP Corporate Strategy

Head of Customer & Delivery Quality

VP Brand & Marketing Communications

VP Supply Network & Engineering

Chief Security Officer

Head of People and Organization Development

VP Nokia Procurement

VP, Chief Compliance Officer

Sustainability Council consists of senior representatives including management representatives with climate-related responsibilities from units such as product development, real estate, and procurement. The council is managed by Head of Sustainability who reports to Chief Marketing Officer (CMO). The Council typically meets at least bi-annually and more often at request. It ensures alignment of sustainability strategy, priorities, and the implementation of sustainability activities. It reviews the materiality, targets and overall performance of various sustainability related topics. This includes the assessment and monitoring of climate change related topic. Performance is evaluated both against short- and long-term targets. The board has annual sustainability reviews in their meetings with both CMO and Head of Sustainability as a representative of the Sustainability Council. These reviews include e.g. reviewing sustainability targets, key actions and performance (including climate-related issues).

CMO

Nokia Group Leadership Team and its members are responsible for the overall management of the company including climate related issues when relevant to their area of responsibility. Our Chief Marketing Officer (CMO) is a member of the Group Leadership Team and responsible for sustainability (including climate related topics) at the executive management level. CMO reviews the status and provides oversight of Nokia’s key sustainability programs and targets as part of quarterly business reviews. The board has annual sustainability reviews in their meeting with both CMO and Head of Sustainability as a representative of the Sustainability Council. These reviews include e.g. reviewing sustainability targets, key actions and performance (including climate-related issues).

CFO

Our Chief Financial Officer (CFO) is a member of the Group Leadership Team. Nokia reports on climate-related topics in our external quarterly financial reports which are reviewed by the board’s Audit Committee. CFO has also the role of Chief Risk Officer and is responsible for Enterprise Risk Management (ERM) and related reviews in the Nokia Group Leadership Team. Climate-related risks and opportunities are part of our ERM; i.e. integrated into multi-disciplinary company-wide risk assessment and management processes. The risk register is regularly updated, and risk-related updates are provided to the board on a recurring basis.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity incentivized	Comment
Procurement manager	Monetary reward	Emissions reduction target	Our Supply Quality office had targets and monetary incentives on Supplier Performance Evaluation (SPE). Suppliers' climate engagement via CDP Supplier - program is a key part of the Sustainability pillar of the SPE. 2019 progress: 404 of our key suppliers, an increase of 90 from 2018, responded to the CDPs request to disclose their climate performance information and 234 (an increase of 47) provided emission reduction targets.
Energy manager	Monetary reward	Emissions reduction target	Annual performance review directly associated with achieving 2019 energy and carbon footprint reduction objectives.
Environmental, health, and safety manager	Monetary reward	Emissions reduction target	Annual performance review directly associated with achieving 2019 energy and carbon footprint reduction objectives.
Environment/Sustainability manager	Monetary reward	Emissions reduction target	Annual performance review directly associated with achieving 2019 energy and carbon footprint reduction objectives.
Corporate executive team	Monetary reward	Other (please specify)	In 2019, our Board of Directors' Personnel Committee considered whether and how our incentive structures incentivize environmental, social and governance (ESG) priorities. Our view is that these key priorities are supported by a focus on the share price element of the long term incentives which forms a significant element of the overall compensation for our senior leaders (executive board). The interaction of ESG initiatives with the way we operate our business is complex and as no single ESG metric on its own defines our business, the view of the Board is that this is best managed by Nokia's senior leaders in consultation with key stakeholders.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	1	Covers our annual plan
Medium-term	1	3	Covers our long-range plan (LRP) period of 3 years
Long-term	3	10	Long term is typically up to 10 years but in some cases we consider also longer term time horizon

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

Nokia Enterprise Risk Management (ERM) covers strategic, operational, financial and hazard risks, including climate change risks. The significance of these risks is evaluated against qualitative criteria on a scale from 0 to 4. Typically, ERM risk register includes risks with value over EUR 20 million. We have used the risk register as the basis for our CDP disclosure and consider the same threshold of over EUR 20 million as 'substantive' when identifying and assessing climate-related risks. In the ERM framework, we typically consider risks and opportunities with the time horizon of four years (current year and three consecutive years) but in some cases a longer time horizon is applied. In our strategy planning we typically use a longer time horizon.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

More than once a year

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

Nokia Enterprise Risk Management (ERM) framework covers strategic, operational, financial and hazard risks, including climate change risks. The significance of these risks is evaluated against qualitative criteria on a scale from 0 to 4. Typically, ERM risk register includes risks with value over EUR 20 million which is considered as a threshold for substantive. Key risks and opportunities are identified, analyzed, managed and monitored as part of business performance management. One of the core principles of Nokia Enterprise Risk Management (ERM) 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. Nokia ERM framework includes sustainability related (e.g. climate change related) risks and opportunities. Sustainability Council gives additional exposure to sustainability related risks. The council typically meets quarterly and ensures alignment of sustainability strategy, priorities, and the implementation of sustainability activities across the business. It also reviews the materiality, targets and performance of various sustainability topics, including climate change. In Nokia ERM framework we consider risks and opportunities typically with the time horizon of three years and in some cases with a longer time horizon. We update the risk and opportunity assessment with identified management actions three times a year. Our overall risk management concept is based on managing risks that would prevent us from meeting our objectives, rather than solely focusing on eliminating risks. In our strategy planning we typically use longer time horizon and in our materiality analysis we consider risks and opportunities extending even to over 10 years. A case study of how the described process is applied to physical risks/opportunities: Physical risks such as cyclones and other natural catastrophes are identified predominantly by our HSE (health, safety & environment) unit. Risks with impact over EUR 20 million are included into the ERM risk register. Risk owners decide about operative treatment of risk and are responsible for driving action plans. In addition, environmental incidents are managed in our HSE incident management process. Nokia Business Continuity Plans (BCPs) support the continuity of critical business processes during a significant business disruption, regardless of the source of the disruption – man-made or environmental. Each plan includes risk assessment and response procedures for four different scenarios: Loss of Building, Loss of Personnel, Loss of Applications / Systems and Loss of Suppliers. This provides input also for the ERM process. Updates to BCPs are required twice each year and each plan is tested at least once every three to five years, based on risk. Plans covering manufacturing facilities and other time-sensitive critical functions are tested most often. When Nokia relies on a supplier to perform critical functions, the Nokia Supply Chain and Procurement Organization ensures that the supplier has a Business Continuity Plan. A case study of how the described process is applied to transitional risks/opportunities: An example of transitional risk is emerging regulation, such as the evolving scope of EU Green Deal, for example. Potential risk associated with relevant emerging regulation is identified predominantly e.g. by our Sustainability, Environment, Legal & Compliance and Government Relations teams. Risks with impact over EUR 20 million are included into the ERM risk register. Risk ownership follows business ownership and the risk owners are responsible for deciding about operative treatment of the risk and driving action plans.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Implementation of taxes/regulations may increase the cost of energy and components for Nokia as we procure components and manufacture goods on a global basis. Climate change related taxes and other regulations that have been implemented in various parts of the world may increase both our and our customers' operating costs, potentially impacting - to a lesser extent - also product pricing and demand. An example of a current regulation risk we consider is the EU energy efficiency directive on the energy performance of buildings.
Emerging regulation	Relevant, always included	Implementation of taxes/regulations may increase the cost of energy and components for Nokia as we procure components and manufacture goods on a global basis. Climate change related taxes and other regulations which may increase operating costs and to a lesser extent impact also product pricing or demand are being implemented in various parts of the world. Such new regulation might cause additional costs to Nokia. An example of a relevant emerging regulation risk that we consider is the evolving scope of EU Green Deal, including e.g. EU Taxonomy for sustainable activities.
Technology	Not relevant, explanation provided	Technology is not considered a relevant risk category in our business, as we consider developments in technology mainly as an opportunity. As an example of a technology related opportunity, we consider e.g. the impact of 5G technology on the energy use, and we have designed solutions such as ReefShark chipset to improve network energy efficiency.
Legal	Relevant, sometimes included	An example of a legal risk that we consider relates to providing information on the energy consumption of our products. Such information may be included in the bidding and customer legal documentation, and both disclosing or not disclosing such information may cause legal risks. Identified risks are assessed and ranked in our Enterprise Risk Management (ERM) framework's risk assessment process, based on the possible impact, probability and time frame.
Market	Relevant, always included	An example of a market risk that we consider is a possible increase of e.g. social unrest, war, and other political/economic risks as a result of climate change. Such events could have a negative impact on the economy and consumer/customer purchasing power. We evaluate the Market category also from the perspective of opportunities, as the demand for solutions that help our customers to reduce their GHG emissions and mitigate climate change impacts may increase.
Reputation	Relevant, sometimes included	Many of the climate change related issues like how we manage the energy efficiency of our products and buildings may cause reputational risks. Reputation and brand related environmental risks are assessed as a part of our certified externally audited ISO 14001:2015 EMS process.
Acute physical	Relevant, always included	The review of acute physical risks to our facilities, customers, supply chain etc. is part of our Enterprise Risk Management process. The identified risks are assessed and ranked in the ERM's risk assessment process based on the possible impact, probability and time frame. An example of an acute physical risk we consider includes e.g. tropical cyclones and related severe damage to a production facility of a critical supplier, our operations or our customer etc. Environmental incidents are additionally managed through our HSE incident management process. Nokia Business Continuity Plans (BCPs) support the continuity of critical business processes during a significant business disruption, regardless of the source of disruption – man-made or environmental. Each plan includes risk assessment and response procedures for four different scenarios: Loss of Building, Loss of Personnel, Loss of Applications / Systems and Loss of Suppliers. This provides input also for the ERM process. Updates to BCPs are required twice each year and each plan is tested at least once every three to five years, based on risk. Plans covering manufacturing facilities and other time-sensitive critical functions are tested most often. When Nokia relies on a supplier to perform critical functions, Nokia Supply Chain and Procurement Organization ensures that the supplier has a Business Continuity Plan in place.
Chronic physical	Relevant, sometimes included	The review of increased longer-term risk level to our facilities, customers, and supply chain is part of our Enterprise Risk Management process. Examples of chronic physical risks we consider include e.g. natural catastrophes and pandemics and related impacts on our operations. The identified risks are assessed and ranked in the ERM process based on the possible impact (€), probability and time frame.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Upstream

Risk type & Primary climate-related risk driver

Acute physical	Increased severity and frequency of extreme weather events such as cyclones and floods
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Primary potential financial impact

Decreased revenues due to reduced production capacity

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

In 2019, about 23% of our employees was located in Asia-Pacific and approximately 20% of our sales were made in the same region (EUR 4 556 million out of EUR 23 315 million). Some of our suppliers have their manufacturing plants in the areas like East and South East Asia that can be sensitive to tropical cyclones. The probability of tropical cyclone caused by the climate change causing severe damage to a production facility of a critical supplier, our operations or our customer is rather low. In case such a severe damage would happen, it could lead to impacts like lost or deferred sales and service failure, or it could have an impact on the supplier's operations so that the supplier or Nokia may need to look for alternative supply sources. Also our customers are in some cases vulnerable to changes in physical climate parameters.

Time horizon

Long-term

Likelihood

Unlikely

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

20000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Some of our suppliers have their manufacturing plants in the areas like East and South East Asia that can be vulnerable to tropical cyclones. In case such a severe event would happen, we estimate annualized financial impact of approximately EUR 20 million for a scenario of a regional, one week shutdown of internal business operations. The approximate impact of EUR 20 million has been estimated assuming less than EUR 3 million impact per day for a period of seven days (7*~3=20). Other potential scenarios could include lost or deferred sales, service failure (may result in potential contractual penalties) or rollout failure.

Cost of response to risk

1000000

Description of response and explanation of cost calculation

Looking for alternative supply sources is a part of our normal sourcing process. In addition, Nokia has insurance for property damage covering buildings, equipment and machinery. We also have coverage for certain business interruptions covered by applicable insurance policies, whereby Nokia aims to manage the impact of natural catastrophe perils such as tropical cyclones. We maintain business continuity plans to ensure that products, services and solutions continue to be delivered at acceptable levels during a significant disruption to operations. Business continuity includes e.g. easy transfer between sites. These management actions often involve specific case studies, such as deep dive to the conditions in India which suffered from severe flooding, to map the potential risk areas, impacts and risk management related to our internal IT operations. In addition, Real Estate considers both adaptation and mitigation of Climate Change in its site selection and operations. The impact of extreme weather conditions is considered as part of the selection with selecting new office locations. Sustainability criteria are included in the selection documentation. These activities are a part of our normal sourcing process without significant additional cost implication expected i.e. less than EUR 1 million annually. This cost of less than EUR 1 million has been estimated based on related labor costs of approximately 10 FTE (Full time equivalents), including also indirect cost.

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation	Carbon pricing mechanisms
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Primary potential financial impact

Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Climate change related taxes and other regulations are being implemented in various parts of the world. Although Nokia is not an energy-intensive company (annual energy costs are less than EUR 100 million, approximately EUR 95 million in 2019), such regulations may increase operating costs as well as to a lesser extent product pricing and have impact on demand. Implementation of taxes/regulations may result in an increase in cost of energy and components for Nokia, since we procure components and manufacture goods on a global basis. These regulations can also impact the whole value chain, increase the price of products and reduce the purchasing power of consumers/our customers. However, in our risk analysis the assumption is that the impact is long term and that the adverse impact on our industry or Nokia would not be disproportionately higher than on other industries or to our competitors at least to a significant extent.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

28500000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Our energy cost was approximately EUR 95 million in 2019 (vs. net sales of approximately EUR 23 315 million in 2019). Assuming a 30% increase in our energy cost due to a potential increase of fuel/energy taxes or other changes in regulations, our profits would decrease annually by approximately EUR 28.5 million. The estimate has been calculated as follows: $95 * 0.3 = 28.5$.

Cost of response to risk

1000000

Description of response and explanation of cost calculation

Our experts in functions like Legal, Sustainability and Procurement monitor related regulations and legislative developments, such as the EU energy efficiency directive on the energy performance of buildings, and work throughout our value chain to prepare for changes. We are continuously implementing measures to increase our own and our customers energy efficiency. As a case study on how we reduce the risk of increased energy costs related to potential carbon price increase, we can mention that in 2019 we continued to reduce our energy consumption and related emissions. Our GHG emissions from facilities decreased by 12% as compared to 2018. Our target for 2020 is the reduction of GHG emissions (Scope 1+2) from facilities by 4%, compared to 2019 level. In 2019 we joined the group of 87 first companies making a commitment of recalibrating their Science based Targets according to the 1.5 C warming scenario. We encourage our key suppliers to report their climate impacts and set carbon reduction targets through the CDP Supply Chain Program, which helps us to plan improvement programs with our suppliers and improve reporting of our Scope 3 emissions. We also run training workshops including topics like climate change for our suppliers. These on-going activities reduce our energy related cost and risk. Annual cost impact of risk management is less than EUR 1 million. The magnitude of impact has been estimated based on related labor costs of approximately 10 FTE (Full time equivalents), including also indirect cost. Often the benefits weight out the costs of management (e.g. reduction in energy use and air travel) and the actions are part of overall business conduct. Therefore no overall meaningful additional negative financial impact is observed.

Comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Market	Other, please specify (Increasing social unrest, war, or other political or economic risks as a result of climate change)
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Primary potential financial impact

Decreased revenues due to reduced demand for products and services

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

An example of a market risk that we consider is the possible increase of e.g. social unrest, war, or other political or economic risks as a result of climate change. This could have a negative impact on the economy and consumer/customer purchasing power, and in some cases lead to inability to continue business in certain areas. It could also have an impact on the telecommunications infrastructure market, but our assumption is that this is a long-term development and that the adverse impact on our industry or Nokia would not be disproportionately higher than on other industries or on our competitors, at least to significant extent. We also believe that certain opportunities may make our business less vulnerable and possibly mitigate the negative impacts. For example, we can take a look at COVID-19 and its impact on Nokia. During the period we were preparing this CDP response, we published our Q1 and Q2 2020 financial reports which stated: We expect the majority of this COVID-19 impact to be in Q2 and believe that our industry is fairly resilient to the crisis, although not immune. We did not see a decline in demand in the first quarter. As the COVID-19 situation develops, however, an increase in supply and delivery challenges in a number of countries is possible and some customers may reassess their spending plans. Q2 2020 net sales

were impacted by COVID-19 and unique dynamics in China. In Q2 2020, we estimate that COVID-19 had an approximately EUR 300 million negative net impact on our net sales; with the majority of these net sales expected to be shifted to future periods, rather than being lost.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

233000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

For example a 1% reduction in the demand of Nokia products would lead to about EUR 233 million reduction in our annual sales based on 2019 data (total sales were EUR 23 315 million in 2019). Thus explanation of financial impact figure is $0.01 \times 23315 = -233$ million. Our assumption is that adverse impact from such events on our industry or Nokia would not be disproportionately higher than on other industries or our competitors at least to significant extent.

Cost of response to risk

1000000

Description of response and explanation of cost calculation

Managing long term political risks is challenging, especially globally. However, the case example below describes activities that make our products more attractive and cost efficient for the customer and thus may help alleviate the risk of fluctuating socioeconomic conditions caused e.g. by social unrest and other political or economic risks. Product energy efficiency features may help alleviate impacts on customers purchasing power and preferences, as energy costs represent a significant part of the network operators' operating costs. In 2019, we further enhanced the energy efficiency of our AirScale radio products by delivering more powerful energy saving software features, such that higher savings can be achieved even in medium-to- busy traffic conditions. Over 150 customers have installed energy efficiency software features to our products. Over 16% of our radio products in the field have one or more energy efficiency software features activated. Our Single RAN (SRAN) solution typically enables 45% lower energy consumption compared to the traditional way of building separate 2G, 3G and 4G radio networks. The idea behind SRAN is that with a single software and shared common hardware we can build a network that can support any radio technology concurrently. Furthermore, due to sharing of resources between different technologies, we can build much more efficient networks compared to individual networks which have idle resources that consume energy without producing anything. Our total R&D spend was EUR 4411 million in 2019 and a part of this goes to activities like developing our AirScale Radio portfolio, new energy efficient fiber access solutions and chipset innovations. Providing these solutions can mitigate risks to some extent. These costs are incurred as part of normal product development process and no major extra cost is incurred because of the climate change related actions. Estimated annual cost impact of the response to risk is less than EUR 1 million , referring to related labor costs of approximately 10 FTE (Full Time Equivalents).

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

Climate change and high/increasing energy costs can increase the demand of Nokia products including our AirScale radio products. For example in 2019, we further enhanced the energy efficiency of our AirScale radio products by delivering more powerful energy saving software features, such that higher savings can be achieved even in medium-to- busy traffic conditions. Over 150 customers have installed energy efficiency software features to our products. Over 16% of our radio products in the field have one or more energy efficiency software features activated. Our Single RAN (SRAN) solution typically enables 45% lower energy consumption compared to the traditional way of building separate 2G, 3G and 4G radio networks. The idea behind SRAN is that with a single software and shared common hardware we can build a network that can support any radio technology concurrently. Furthermore, due to sharing of resources between different technologies, we can build much more efficient networks compared to individual networks which have idle resources that consume energy without producing anything. Reliable communications infrastructure is also essential in various catastrophic situations. An example of our solutions in this area is our Ultra Compact Network, a rapidly deployable 4G solution which enables vital

public safety communications to be implemented at emergency scenes where wide area network coverage is not available. Our products also improve connectivity and reduce the need for unnecessary travel and commuting e.g. by enabling virtual meetings and remote work.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

233000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

It is very difficult to estimate the impact as it relates to long-term development with various uncertainties. Based on our 2019 business volumes, for example a 1% growth in demand would lead to approximately EUR 233 million increase in our annual net sales (total sales were EUR 23 315 million in 2019), so explanation of financial impact figure is $0.01 \times 23315 = 233$ million. Possible increases on energy prices due to taxes and regulations could however have a negative impact on the world economy and at least partly offset the possibly increased demand for products and services

Cost to realize opportunity

1000000

Strategy to realize opportunity and explanation of cost calculation

Our main strategy to realize the opportunity is to develop energy efficient products. It is also visible in our target setting; we were the first telecommunications equipment vendor and one of the first 100 companies globally to get approval for their Science-based Targets to reduce GHG emissions. By 2030 we aim to reduce GHG emissions from sold products by 75% compared to 2014. In 2019, we committed to recalibrate our existing targets to be in line with the 1.5°C warming scenario. Following case examples describe activities/products aiming to realize the opportunity. In 2019, we further enhanced the energy efficiency of our AirScale radio products by delivering more powerful energy saving software features. Over 150 customers have installed energy efficiency software features to our products. Over 16% of our radio products in the field have one or more energy efficiency software features activated. Our Single RAN (SRAN) solution typically enables 45% lower energy consumption compared to the traditional way of building separate 2G, 3G and 4G radio networks. The idea behind SRAN is that with a single software and shared common hardware we can build a network that can support any radio technology concurrently. Due to sharing of resources between different technologies, we can build much more efficient networks compared to individual networks which have idle resources that consume energy without producing anything. Our products can also support climate change adaptation. In 2019, we and Sendai City successfully conducted a test flight of a Nokia drone on a private LTE network provided by Nokia Digital Automation Cloud. They tested the potential use of drones during a tsunami or other disasters to help in prevention and mitigation efforts. The test verified that using a private LTE network to control and communicate with the drones is an effective means for enhancing situational awareness and communicating with the affected population during a disaster. Our R&D spend was EUR 4411 million in 2019. Part of this goes to activities like developing our AirScale Radio portfolio, new energy efficient fiber access solutions and chipset innovations. These costs are incurred as part of normal product development process and no major extra cost is incurred because of climate change related actions. Estimated annual cost to realize the opportunity is less than EUR 1 million, referring to related labor costs of approximately 10 FTE (Full Time Equivalent).

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Development of new products or services through R&D and innovation

Primary potential financial impact

Increased revenues through access to new and emerging markets

Company-specific description

By 2025, we believe there will be more than 50 billion connected things in the form of devices, modules, and sensors. Nokia is well positioned to play a key role in this programmable world that can help people in various ways also in addressing climate change related challenges. Examples of possible opportunity areas are better use of scarce resources through precision agriculture and improved water management and mitigating risks of flood or drought. Reliable communications infrastructure is also essential in various catastrophic situations (e.g. destruction by typhoons or hurricanes). Examples of our solutions in this area include our Ultra Compact Network, a rapidly deployable 4G solution which enables vital public safety communications to be implemented at emergency scenes where wide area network coverage is not available, and our liquid-cooling base station solution that offer operators and owners of base station sites significant savings and potentially longer base station component life. Liquid cooling reduces energy consumption of a typical base station site compared to traditional air cooling systems and even provides an opportunity for operators to sell the heat as usable energy. The radio networks we have delivered to our customers serve over 6.4 billion subscriptions globally as we work towards our goal of connecting the next billion.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

233000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

It is very difficult to estimate the impact as it relates to long-term development with various uncertainties. Based on our 2019 business volumes, for example a 1% growth in demand would lead to approximately EUR 233 million increase in our annual net sales (total sales were EUR 23 315 million in 2019). $0.01 \times 23315 = \sim 233$ million

Cost to realize opportunity

1000000

Strategy to realize opportunity and explanation of cost calculation

By 2025, we believe there will be more than 50 billion connected things in the form of devices, modules, and sensors. Nokia is well positioned to play a key role in this programmable world that can help people in various ways also in addressing climate change related challenges. Examples of possible opportunity areas include better use of scarce resources through precision agriculture and improved water management and mitigating risks of flood or drought. Reliable communications infrastructure is also essential in various catastrophic situations (e.g. destruction by typhoons or hurricanes). Following case example describes activities/products to realize the opportunity. Our Ultra Compact Network is a rapidly deployable 4G solution which enables vital public safety communications to be implemented at emergency scenes where wide area network coverage is not available. Our R&D spend was EUR 4411 million in 2019 and a part of this goes to activities like developing our AirScale Radio portfolio, new energy efficient fiber access solutions and chipset innovations. These costs are incurred as part of normal product development process and no major extra cost is incurred because of the climate change related actions. Estimated annual cost to realize the opportunity is less than EUR 1 million, referring to related labor costs of approximately 10 FTE (Full Time Equivalents).

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Move to more efficient buildings

Primary potential financial impact

Reduced indirect (operating) costs

Company-specific description

Increasing the energy efficiency of buildings can bring reductions in facility energy costs. Energy saving measures are done primarily for business reasons like cost savings, and only secondarily because of the identified climate related risks and opportunities. We have a global Environmental Management System (EMS) through which we analyze our most significant environmental aspects annually. We take into account current and potential future regulatory and other related requirements, stakeholder interest, the size of the environmental impact, related risks and opportunities, and current and potential changes in our business. Our own operations are certified under the ISO 14001:2015 EMS standard. In 2019 the coverage of employees within the scope of that certification was 85%. In 2017, we set Science Based Targets (SBT) to reduce our long term scope 1, 2 and 3 GHG emissions. In 2019, we joined the group of 87 first companies making a commitment of recalibrating their SBTs according to the 1.5°C warming scenario. Energy efficiency related actions in our offices and factories to achieve these targets are on-going. In 2019, our Real Estate team maintained its focus on developing and delivering efficient facilities in line with our overall company goals and SBTs. We continued to reduce our energy consumption and emissions, and our GHG emissions from facilities decreased by 12% compared to 2018. Our target for 2020 is the reduction of GHG emission by 4% from facilities, compared to 2019 level (Scopes 1+2). We are taking actions on this opportunity and strive to improve energy efficiency e.g. through continuing following actions: larger capital investments on several major sites such as Espoo, Finland and Dallas, USA, incorporated energy efficient equipment and controls. In 2019, The Coolab project in China achieved overall savings of 12 600 MWh and 9 900 tons of CO2. Building audits (as required by the EU Energy Efficiency Directive) identified a number of improvement opportunities which are being evaluated. In addition, the inclusion of energy efficient equipment in maintenance replacement schedules and refurbishment projects continued to be deployed across our portfolio with projects implemented in all areas including Heating, Ventilation and Air Conditioning (HVAC) controls, all aimed at reducing our energy use.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

28500000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Our energy costs were approximately EUR 95 million in 2019. Assuming the energy efficiency increase of 30%, our energy costs would be reduced annually by approximately EUR 28.5 million based on 2019 data ($0.3 \times 95 = 28.5$ million)

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation

We were the first telecommunications equipment vendor to get the approval for our commitment to 2030 Science Based Targets (SBT) to reduce our long term scope 1, 2 and 3 emissions in 2017. In 2019, we also joined the group of 87 first companies making a commitment of recalibrating their SBTs according to the 1.5 C warming scenario. Energy efficiency related actions in our offices and factories - to achieve these targets - are on-going. Following case study examples describe activities with which we aim to realize the opportunity of energy efficiency related decreases in indirect operating costs: In 2019 our Real Estate team maintained its focus on developing and delivering efficient facilities in line with our overall company goals and Science Based Targets (SBT). We continued to reduce our energy consumption and emissions, and our GHG emissions from facilities decreased by 12% compared to 2018. Our target for 2020 is the reduction of GHG emission by 4% from facilities, compared to 2019 level (Scopes 1+2). In 2019 all our real estate regions made considerable contributions to the overall energy saving of 82 000 MWh representing a 7% reduction on our 2018 consumption. Larger capital investments in several major sites such as Espoo, Finland and Dallas, USA, incorporated energy efficient equipment and controls. The Coolab project in China achieved overall savings of 12 600 MWh and 9 900 tons of CO2. Building audits as required by the EU Energy Efficiency Directive identified a number of improvement opportunities which are being evaluated. The inclusion of energy efficient equipment in maintenance replacement schedules and refurbishment projects continued to be deployed across our portfolio with projects implemented in all areas including Heating, Ventilation and Air Conditioning (HVAC) controls, all aimed at reducing our energy use. Annual cost impact related to realizing the opportunity is less than EUR 1 million. The cost impact (referring to related labor costs), and typically the benefits weight out the costs with a net positive financial impact. The impact has been estimated based on related labor costs of approximately 10 FTE (Full time equivalents).

Comment

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization’s strategy and/or financial planning?

Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform its strategy?

Yes, qualitative and quantitative

C3.1b

(C3.1b) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios and models applied	Details
2DS Other, please specify (We have used IPCC RCP 2.6 scenarios of 1.5°C and 2.0°C to review our risks, opportunities and related implications to our business. In addition, we have used various scenarios and case studies related to energy price increases (e.g. 10 % and 30%).)	We have selected following scenarios: - IPCC scenarios of 1.5°C and 2.0°C to review our risks, opportunities and related implications to our business. - IEA's 2DS scenario was part of our Science Based Target (SBT) setting for Scope 1, 2 & 3. - In addition, we have used various scenarios and case studies related to energy price increase (such as 10% and 30%). We have also analyzed the possible financial impact from tropical cyclones caused by climate change, in case severe inflicted on a production facility of a critical supplier, our operations or our customer etc. Inputs: - Nokia climate, energy and business performance data, related projections and sensitivity analysis; data from our risk opportunity and strategy analysis; IPCC and IEA climate scenarios. - Key assumptions and analytical methods - Energy mix: IEA scenarios on energy mix development until 2030 - GDP development, abatement cost, population growth etc. assumptions included in the IEA ETP 2DS scenario - Carbon price/tax: Sensitivity analysis based on current cost vs. 30% increase - Increased severity of extreme weather events such as cyclones and floods - Climate change impact on the fluctuating socioeconomic conditions and related political and economic risks - Energy efficiency improvements & possible changes in technology, volumes etc. - Mix of quantitative and qualitative analysis - Most relevant physical and transition risks We have used various time horizons in our analysis including: - 2030 related scenario relevant as a basis for setting our science-based emission reduction targets - Time frame of 3-10 years (in some cases longer) in Nokia risk & opportunity management and in long term and strategy planning. In our scenario analysis we have considered the whole value chain and especially the most material areas: our own operations (where we have the highest operational control), and supply chain and product use (where the impact is highest). The results of the scenario analysis: 1) In IPCC 1.5°C and 2°C scenarios the most impactful results for us are: - The need for bigger and more urgent GHG emission reduction activities - Higher risk of extreme weather conditions: flood, precipitation, drought and water availability - Risks to health, livelihoods, food security, water supply, human security, cities and economic growth (&poverty) are projected to increase (1.5°C vs. 2°C scenarios) 2) IEA Scenario was used as a basis of our SBT target setting 3) We also used 10-30% increase in our energy cost as an additional scenario. A 30% increase in energy costs would lead to over €20 million decrease in our profit, therefore this risk is included in our Enterprise Risk Management risk register. There are also opportunities related to climate change as technology, connectivity and IoT can help reduce emissions and increase resilience to the negative consequences of climate change; e.g. reliable communications infrastructure is essential in various catastrophic situations. In addition, increase in energy cost would shorten the payback period for our facility energy efficiency investments. All in all, the various scenarios and analysis have not directly changed Nokia's business strategy as climate change mitigation and adaptation have been a part of our business planning and activities already earlier. However, following case study examples describe how the results of the scenario analysis have influenced business objectives. The analysis has provided information for our risk and opportunity analysis; stressed the need for more extensive and urgent GHG reduction activities (IPCC); and acted as the basis of our SBT target setting. The global warming of 1.5°C and 2°C would to some extent increase the likelihood and impact of the extreme weather conditions. However, the differences between the two scenarios would not significantly change the results of our risk assessment/financials and related mitigation plans such as business continuity, insurance etc.

C3.1d

(C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Demand from the customers side for products and services that generate lower emissions is identified as an opportunity with medium- and long-term impact. For mobile service providers most of their carbon emissions come from the radio access network. One of the most substantial strategic decisions made in this area that have been influenced by the climate-related risks and opportunities include development of energy efficient product such as our AirScale radio products and setting Science Based Targets to reduce GHG emissions from our sold products by 75% by 2030 (base year 2014). Our AirScale radio base station solution (BTS) spearheads our commitment to helping our customers build a sustainable business supported by a zero emissions network. Innovative hardware and intelligent software cut base station energy consumption. Over 150 customers have installed energy efficiency software features to our products. In 2019, over 16% (10% in 2018) of our radio products in the field had one or more energy efficiency software features activated.
Supply chain and/or value chain	Yes	Increase in energy cost has been identified as a potential risk with medium- and long-term impact, and that's why Nokia has requested also some 500 suppliers to disclose their climate performance and targets through CDP supply chain module. This engagement with our suppliers on climate change is an example of one of the most substantial strategic decisions made in this area that have been influenced by the climate-related risks and opportunities. It has impacted both Nokia and suppliers' cost and workload.
Investment in R&D	Yes	Energy efficiency of products has been identified as an important topic and an opportunity with medium- and long-term impact. Our Design for Environment (DfE) R&D process addresses energy efficiency of all our products. Most substantial strategic decisions made in this area that have been influenced by the climate-related risks and opportunities include the development of new more energy efficient hardware and software, such as our ReefShark chipset.
Operations	Yes	Energy savings in our operations has been identified as an opportunity with short-, medium- and long-term impact. Most substantial strategic decisions made in this area that have been influenced by the climate-related risks and opportunities include setting our Science Based Target to reduce scope 1 and 2 GHG emissions by 41% by 2030 (base year 2014). We have plans in place to achieve the target, and as an example of our achievements in 2019, our electricity consumption across our facilities has decreased by 4% in 2019 as compared to 2018. In 2019 we further committed to recalibrating our existing science-based target according to the 1.5°C warming scenario.

C3.1e

(C3.1e) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Indirect costs	Climate-related issues are only one of the many factors impacting our product competitiveness and its impact on revenue is difficult to quantify to the extent it would have a clear impact in the financial planning process. A case study example of how climate-related risks and opportunities have influenced our financial planning include e.g. significant new product introductions and related investments such as ReefShark chipset and AirScale radio products. Significant new product introductions are taken into consideration in the planning process in case they have significant impact on the sales margin development. However, it is impossible to factor the climate change related product revenue risks and opportunities in the financial planning. Time horizon covered by the financial planning is our long range plan, i.e. covering the current year and 3 consecutive years. Energy saving measures have some impact on operating costs and cost savings - for example in our facilities we speak about some millions of EUR annual impact (less than 30 MEUR). These activities are done primarily for business reasons like savings in energy costs, and only secondarily because of the identified climate related risks and opportunities. Time horizon covered is the annual financial planning.

C3.1f

(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Absolute target

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Year target was set

2017

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Base year

2014

Covered emissions in base year (metric tons CO2e)

710000

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

98

Target year

2030

Targeted reduction from base year (%)

41

Covered emissions in target year (metric tons CO2e) [auto-calculated]

418900

Covered emissions in reporting year (metric tons CO2e)

444000

% of target achieved [auto-calculated]

91.3775334936448

Target status in reporting year

Underway

Is this a science-based target?

Yes, this target has been approved as science-based by the Science-Based Targets initiative

Please explain (including target coverage)

Nokia submitted this target in April 2017 to the Science-Based Targets Initiative (SBTi), and SBTi approved the target in June 2017. We are on track with the target and this progress is externally assured as part of our sustainability assurance. The assurance report is available in our People & Planet 2019 report. In our Science Based Target (SBT), we wanted to include also car fleet emissions, but reporting for the car fleet emissions started only in 2015. Hence car fleet emissions from 2015 (44 900 tonnes) were used as a proxy for 2014 car fleet emissions to calculate the total Scope 1 emissions for the base year 2014. This explains why the total Scope 1 emissions reported for 2014 in our People & Planet report are 44 900 tonnes smaller than the base year 2014 emissions included in our SBT. We report 100% of emissions in our annual sustainability report People & Planet, but our SBT target coverage is 98% as it excludes following minor facility related emission sources: Emissions from hydrofluorocarbon (HFC) refrigerants, Emissions from fire suppression system losses, and Emissions from purchased cooling.

Target reference number

Abs 2

Year target was set

2017

Target coverage

Product-level

Scope(s) (or Scope 3 category)

Scope 3: Use of sold products

Base year

2014

Covered emissions in base year (metric tons CO2e)

33060000

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

80

Target year

2030

Targeted reduction from base year (%)

75

Covered emissions in target year (metric tons CO2e) [auto-calculated]

8265000

Covered emissions in reporting year (metric tons CO2e)

26629000

% of target achieved [auto-calculated]

25.9366807824158

Target status in reporting year

Underway

Is this a science-based target?

Yes, this target has been approved as science-based by the Science-Based Targets initiative

Please explain (including target coverage)

Scope 3 emissions included in our SBT are on track and are assured by a third-party. We have set a Science Based Target (SBT) for 2030 (base year 2014) to reduce by 75% our Scope 3 greenhouse gas emissions caused by the emissions from customer use of our sold products. We concentrate on the long-term trend line, as product development takes time and is a step by step process. The trend line is not linear and we can see that emissions are relatively stable during the first years but eventually decrease over time. Energy consumption and related GHG emissions from the products that we sold in 2019 were on track, and more specifically below the maximum allowed emissions in order to stay on track for 2019. This is due to significant energy efficiency improvements in our new products but also due to lower sales volumes of the products that are in the scope of our SBT Scope 3 target. Compared to the previous product generation, the energy efficiency improvements in our new product families result in much higher capacity for a small increase in energy consumption. The energy efficiency has increased by adding new power saving features.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to increase low-carbon energy consumption or production
Other climate-related target(s)

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number

Low 1

Year target was set

2018

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: energy carrier

Electricity

Target type: activity

Consumption

Target type: energy source

Renewable energy source(s) only

Metric (target numerator if reporting an intensity target)

Percentage

Target denominator (intensity targets only)

<Not Applicable>

Base year

2018

Figure or percentage in base year

25

Target year

2019

Figure or percentage in target year

30

Figure or percentage in reporting year

31.4

% of target achieved [auto-calculated]

128

Target status in reporting year

Achieved

Is this target part of an emissions target?

In 2019, 31.4% of our total purchased electricity was from renewable sources and we achieved our 2019 target. Target for the share of renewable electricity is set for one year at a time and the result is externally assured.

Is this target part of an overarching initiative?

Science-based targets initiative

Please explain (including target coverage)

Increasing the share of renewable electricity in the total purchased electricity supports us in achieving our Science-based target for Scope 1 and 2. Our new target for 2020 is to achieve at least 35% utilization of renewable electricity compared to total purchased electricity.

C4.2b

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number

Oth 1

Year target was set

2019

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Please select

Target denominator (intensity targets only)

<Not Applicable>

Base year

2018

Figure or percentage in base year

1217

Target year

2019

Figure or percentage in target year

1180

Figure or percentage in reporting year

1135

% of target achieved [auto-calculated]

221.621621621622

Target status in reporting year

Achieved

Is this target part of an emissions target?

Reducing total facility energy usage is one way for achieving science-based scope 1 and 2 target.

Is this target part of an overarching initiative?

Science Based Targets initiative

Please explain (including target coverage)

The total energy consumption across our facilities decreased by 7% (from 1217 GWh to 1135 GWh) compared to 2018. Our target for 2019 was to achieve a 3% reduction within one year so the target was well achieved. The result is externally assured. Our new target 2020 is to achieve total energy usage reduction of 3% in our facilities, compared to 2019 level.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	6	157212
To be implemented*	1	203
Implementation commenced*	0	0
Implemented*	14	147294
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Low-carbon energy consumption	Hydropower
-------------------------------	------------

Estimated annual CO2e savings (metric tonnes CO2e)

49876

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

0

Investment required (unit currency – as specified in C0.4)

40869

Payback period

No payback

Estimated lifetime of the initiative

<1 year

Comment

EACs purchased for Finland

Initiative category & Initiative type

Low-carbon energy consumption	Hydropower
-------------------------------	------------

Estimated annual CO2e savings (metric tonnes CO2e)

25027

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

0

Investment required (unit currency – as specified in C0.4)

8867

Payback period

No payback

Estimated lifetime of the initiative

<1 year

Comment

Green Tariffs with EACs-Germany

Initiative category & Initiative type

Low-carbon energy consumption	Hydropower
-------------------------------	------------

Estimated annual CO2e savings (metric tonnes CO2e)

70998

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

0

Investment required (unit currency – as specified in C0.4)

57840

Payback period

No payback

Estimated lifetime of the initiative

<1 year

Comment

RECs-United States of America

Initiative category & Initiative type

Energy efficiency in buildings	Building Energy Management Systems (BEMS)
--------------------------------	-------------------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

263

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

47967

Investment required (unit currency – as specified in C0.4)

56000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment**Initiative category & Initiative type**

Energy efficiency in buildings	Heating, Ventilation and Air Conditioning (HVAC)
--------------------------------	--------------------------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

1130

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

240454

Investment required (unit currency – as specified in C0.4)

402400

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment**C4.3c****(C4.3c) What methods do you use to drive investment in emissions reduction activities?**

Method	Comment
Compliance with regulatory requirements/standards	Carbon Reduction Commitment in UK
Dedicated budget for other emissions reduction activities	We have renewable energy purchase contracts for 1-3 years at a time.
Internal incentives/recognition programs	Monetary rewards based on at least annual target / performance review is the standard practice. Also monetary awards and other forms of recognition are used for the work well done.
Other	Our facilities have sustainability requirements that set out what is required during construction projects and major renovations. The requirements include e.g. specific targets, increased energy sub-metering and energy efficient equipment.

C4.5**(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?**

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Group of products

Description of product/Group of products

The technology we develop can help others decrease their negative impact by providing more energy efficient products, more efficient use of materials, greater automation, and the digitalization of industries and society that can reduce waste and resource consumption. The ICT sector has potential to generate higher GHG emission savings than the sector's own direct emissions. For example according to GSMA's 2019 report on the enablement effect, the use of mobile technology enabled almost ten times greater GHG emission reductions in 2018 than the carbon footprint of the mobile industry itself. We continue to minimize our footprint while also maximizing the beneficial handprint of the technology we produce. For example, 5G technology has been designed to build towards 100 times more energy efficient than other radio technology used before. This enables us to decouple the huge expected traffic growth from the energy consumption, which means there's potential for much more sustainable networks. Nokia is making considerable investments in product R&D and energy efficiency is one important design criteria for our products. We develop and offer our Nokia Zero Emission network offering which consists of a broad range of products. In 2019, we delivered zero emission products to over 150 customers worldwide, and the networks we modernized in 2019 used on average 46% less energy than those where customers did not modernize. Total energy savings achieved by these modernizations were 4 times bigger than in 2018. An example of Zero emission solutions includes e.g. our innovative AirScale radio base station solution (BTS) hardware and intelligent software which cut base station energy consumption. When we launched our AirScale base station in 2016 we promised 60% energy savings, and now we have delivered 69% energy savings through AirScale configurations. This not only reduces energy consumption and carbon footprint, but also brings financial savings for our customers. Some 80% of a mobile network's energy is consumed by base station sites. The typical payback time for base station modernization is two to three years. Another example of Nokia innovations is liquid cooling for base station which enables up to 80% reduction of CO2 emission. World's first liquid cooling 5G base station launched is in commercial operations since June 2020.

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product and avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify (ICT's potential to enable other industries avoid emissions)

% revenue from low carbon product(s) in the reporting year

% of total portfolio value

<Not Applicable>

Asset classes/ product types

<Not Applicable>

Comment

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1 2014

Base year end

December 31 2014

Base year emissions (metric tons CO2e)

124374

Comment

Scope 2 (location-based)

Base year start

January 1 2014

Base year end

December 31 2014

Base year emissions (metric tons CO2e)

599817

Comment

Scope 2 (market-based)

Base year start

January 1 2014

Base year end

December 31 2014

Base year emissions (metric tons CO2e)

554560

Comment

18% green electricity employed

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
The Greenhouse Gas Protocol: Scope 2 Guidance

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

124991.948

Start date

<Not Applicable>

End date

<Not Applicable>

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

421941.186

Scope 2, market-based (if applicable)

327245.995

Start date

<Not Applicable>

End date

<Not Applicable>

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

3063000

Emissions calculation methodology

Emissions from purchased goods and services are reported based on data collected from Nokia's biggest suppliers through CDP Climate change survey, representing 55% of our total purchase spend in 2019 (46% in 2018). We use a hybrid method combining emissions allocated to Nokia by the suppliers and intensity-based (GHG/€) allocation where supplier-based allocation is either not available or not reliable based on our internal quality measures. Collected data is then extrapolated to cover 100% of spend. In 2019 calculation we included only suppliers' Scope 1+2 emissions, not Scope 3 emissions, which were reported only by a small share of respondents. Suppliers providing transportation services for products are excluded as "emissions from transportation and distribution" are reported in their own Scope 3 category. Our 2019 disclosure is based on the latest CDP data representing suppliers' year 2018 emissions. We recognize that this emission category includes a lot of uncertainty as suppliers have different practices when it comes to their own reporting and allocating emissions to Nokia, and also due to the extrapolation of data we conduct in order to calculate the number that represents 100% of Nokia spend.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

49

Please explain

The suppliers who responded to CDP (404 suppliers) represented 55% of Nokia's supplier spend. Emission allocation or intensity data was available for suppliers representing 49% of the spend and used in the calculation of Nokia's Scope 3 emissions for Purchased goods and services. Calculations cover 100% of Nokia's supplier spend.

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

417000

Emissions calculation methodology

As capital goods purchases vary from year to year, we assess annually whether it's relevant to include emissions from this category to the total Scope 3 inventory. The threshold for inclusion is 0.5% of our total Scope 1+2+3 emissions. Emissions from capital goods are estimated by using the GHG Protocol Scope 3 Evaluator tool, and financial data fed into the tool is based on property, plant, and equipment additions during the reporting year.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Capital goods emission are calculated based on Nokia's financial numbers by GHG Protocol Scope 3 Evaluator tool

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Not relevant, explanation provided

Metric tonnes CO₂e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Fuel-and-energy-related activities are not considered relevant because, based on our calculations, emissions from such activities represent less than 0.1% of our total Scope 3 emissions.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

303600

Emissions calculation methodology

Upstream transportation and distribution data include emissions from inbound and outbound logistics and it is based on the delivery data (tonne-km) and information on the transportation modes from our top 19 (19 in 2018) logistics supply partners. Reporting is done with real weight by using EPA's CO₂e emission factors. Upstream emissions include emissions from transportation paid by Nokia.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Waste generated in operations

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Emissions from waste generated in operations are not considered relevant since, according to our calculations, such emissions represent less than 0.1% of our total Scope 3 emissions.

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO2e

71700

Emissions calculation methodology

Business travel covers emissions from business air travel which have the biggest impact out of all business travel modes. Travel information is obtained from our assigned Travel Agencies. Supplied data includes distance traveled, delineated by flight distance ranges and cabin class. Data from travel agencies is consolidated in a system which is used to calculate emissions from air travel. Emission factors are obtained from EPA.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Employee commuting

Evaluation status

Relevant, calculated

Metric tonnes CO2e

110900

Emissions calculation methodology

We conducted an employee commuting survey in 2018. The results of the survey are a representative sample from several countries, and these results are extrapolated to represent the commuting of all employees.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Upstream leased assets are not considered relevant as leased vehicles and facilities are presently assessed in Scope 1 emissions.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Emissions from downstream transportation and distribution are not considered relevant as the share of transportation and distribution paid by the customers is so small that emissions from this category represented less than 0.5% of our total Scope 3 emissions.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Not considered relevant because processing is not required for sold Nokia products.

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

35310000

Emissions calculation methodology

The calculation formula is following: Σ [total lifetime expected uses of products (hours) X number of products sold in reporting period X products power consumption (kW) X emission factor for electricity (kg CO2e/kWh)]. Data covers products from Nokia's Network business groups. Product use time varies between 6 and 15 years, depending on the products. Energy use calculations are based on product group specific standards, e.g. by ETSI, wherever standards have been published. The objective is to have a product coverage above 80%; in 2019 we are above 90%. Calculations are so far based on assumption that all products are powered by grid electricity. Since 2018 we use IEA's latest world average CO2e -emission factor. Earlier IEA's latest four-year world average CO2-emission factors were used.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Not considered relevant. Based on our Life Cycle Analysis (LCA) conducted for a typical Nokia mobile network product (urban base station site in Europe), the use-phase accounts for over 84% of global warming potential, production (supply chain and own operations) for 14%, logistics for 2% and end-of-life treatment rounds to 0%. End-of-life treatment emissions are not significant either in other Nokia product categories.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Emissions from downstream leased assets are not considered relevant because, based on our calculations, they represent less than 0.1% of our total Scope 3 emissions.

Franchises

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Not applicable, as Nokia does not have franchises.

Investments

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Investments category is designed primarily for private financial institutions. Not applicable, as Nokia is not a private financial institute.

Other (upstream)

Evaluation status

Please select

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Other (downstream)

Evaluation status

Please select

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.000019397

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

452237.94

Metric denominator

unit total revenue

Metric denominator: Unit total

23315000000

Scope 2 figure used

Market-based

% change from previous year

12.5

Direction of change

Decreased

Reason for change

The change is due to emission reduction activities, including increased purchases for renewable energy and reduction in the amount of total purchased electricity. 2018: 0.000022157 tCO2e/euro 2019: 0.000019397 tCO2e/euro

Intensity figure

4.77

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

452237.94

Metric denominator

full time equivalent (FTE) employee

Metric denominator: Unit total

94723

Scope 2 figure used

Market-based

% change from previous year

3.4

Direction of change

Decreased

Reason for change

The change is due to emission reduction activities, including increased purchases for renewable energy and reduction in the amount of total purchased electricity despite a decrease in headcount from 2018. 2018: 4.94 tCO2e/headcount 2019: 4.77 tCO2e/headcount

Intensity figure

0.1605

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

346303.04

Metric denominator

square meter

Metric denominator: Unit total

2157212.17

Scope 2 figure used

Market-based

% change from previous year

9.7

Direction of change

Decreased

Reason for change

The change is due to emission reduction activities, including increased purchases for renewable energy and reduction in the amount of total purchased electricity. The tCO2e value is facility-based only and does not include corporate fleet or marine vessel operations. 2018: 0.1778 tCO2e/m2 2019: 0.1605 tCO2e/m2

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	124007.082	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	158.284	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	512.014	IPCC Fifth Assessment Report (AR5 – 100 year)
HFCs	314.569	IPCC Fifth Assessment Report (AR5 – 100 year) HFC-407A: 205.475 tCO2e HFC-407C: 8.870 tCO2e HFC-410A: 100.224 tCO2e

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Asia Pacific (or JAPA)	0.887
Europe	3720.821
India	612.902
China	616.665
Latin America (LATAM)	1.764
Africa and Middle East	53.861
North America	16093.753
Other, please specify (Worldwide) <i>Includes company lease fleet and marine vessels</i>	103891.294

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By activity

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Emissions from combustion of gasoline in facility-associated mobile vehicles	37.032
Emissions from combustion of diesel in facility-associated mobile vehicles	0
Emissions from combustion of propane in facility-associated mobile vehicles	0
Emissions from combustion of natural gas in facility operations	19769.264
Emissions from combustion of diesel and fuel oil in facility operations	584.084
Emissions from combustion of LPG in facility operations	395.706
Emissions from fuel cell employing natural gas to generate electricity	0
Emissions from refrigerant leaks	314.569
Emissions from fire-fighting activities	0
Emissions from combustion of gasoline fuel in marine fleet	72288.675
Emissions from combustion of fuel oil in marine fleet	2058.988
Emissions from fuel combustion in car fleet	29543.632

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
Asia Pacific (or JAPA)	17552.398	17552.398	31671.06	0
Europe	110514.451	85440.909	408315.14	160619.62
Latin America (LATAM)	1469.777	1469.777	5938.15	0
Africa and Middle East	4210.455	4210.455	7248.35	0
China	89523.512	89523.512	146804.34	0
North America	107877.929	38256.28	297350.1	141062
India	90792.665	90792.665	124271.37	0

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By activity

C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Emissions from purchased electricity	405957.363	311262.172
Emissions from purchased chilled water	4709.514	4709.514
Emissions from delivered cooling	3554.005	3554.005
Emissions from delivered heating	7444.479	7444.479
Emissions from purchased steam	275.823	275.823

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	16175	Decreased	3.24	In 2018 268,517 MWh of Energy Attribute Certificates (EAC) were employed. Related avoided emissions were 129,725.93 tCO2e. In 2019, 301,682 MWh of EAC were employed and related emissions avoided were 145,900.77 tCO2e. 2018 Total Scope 1 and 2 emissions were 499,364.38 tCO2e. Thus, the change is -16,174.84 tCO2e, yielding a 3.24% decrease in emissions. $[(-145,900.77 \text{ tCO2e} - (-129,725.93 \text{ tCO2e})) / 499,364.38 \text{ tCO2e}] * 100 = -3.24\%$
Other emissions reduction activities	30951.6	Decreased	6.2	Electricity Consumption Reduction Activities: In 2018 1,005,418 MWh of electricity was purchased resulting in 477,061.05 tCO2e (without application of Energy Attribute Certificates). In 2019, 960,752 MWh of electricity was purchased resulting in 457,162.94 tCO2e (without application of EACs). The reduction in total electricity consumption resulted in an annual decrease of 19,898.11 tCO2e. HVAC Efficiency Optimization Projects: In 2018 211,461 MWh of energy was utilized for facility heating and cooling needs resulting in 46,409.33 tCO2e. In 2019 energy efficiency activities reduced total heating and cooling energy usage down to 174,111 MWh, resulting in 36,732.88 tCO2e. This reduction in energy consumption resulted in an annual decrease of 9,676.46 tCO2e. Fleet Vehicle Replacement Program: In 2018 vehicle usage generated 31,976.00 tCO2e. In 2019 newer, more efficient vehicles were introduced into the inventory, and emissions decreased to 29,543.63 tCO2e. This resulted in a net annual reduction of 2,432.37 tCO2e, Marine Fleet Fuel Usage: In 2018 278,292 MWh of fuel was employed generating 72,896.23 tCO2e. In 2019 285,212 MWh of fuel was employed and related emissions were 74,347.66 tCO2e. This resulted in a net increase of 1,451.43 tCO2e, Reduction in Refrigerant Losses: In 2018 refrigerant releases generated 584.64 tCO2e, while in 2019 facility system leakage was reduced to 314.57 tCO2e. This resulted in a net reduction of 270.07 tCO2e, Reduction In Facility-Associated Mobile Vehicle Fuel Usage: In 2018 611 MWh of fuel was employed, generating 163.06 tCO2e. In 2019 fuel usage needs were decreased to 141 MWh where related emissions were 37.03 tCO2e. This resulted in a net reduction of 126.03 tCO2e. The sum of all of these activities resulted in a reduction of 30,951.60 tCO2e, equivalent to a reduction of 6.20%. Change in tCO2e: $[-19,898.11 \text{ tCO2e} + 9,676.46 \text{ tCO2e} + -2,432.37 \text{ tCO2e} + 1,451.43 \text{ tCO2e} + -270.07 \text{ tCO2e} + -126.03 \text{ tCO2e}] = -30,951.60 \text{ tCO2e}$ 2018 Total Scope 1 and 2 emissions were 499,364.38 tCO2e $[-30,951.60 \text{ tCO2e} / 499,364.38 \text{ tCO2e}] * 100 = -6.20\%$
Divestment	0	No change	0	No activities.
Acquisitions	0	No change	0	No activities.
Mergers	0	No change	0	No activities.
Change in output	0	No change	0	No activities.
Change in methodology	0	No change	0	No activities.
Change in boundary	0	No change	0	No activities.
Change in physical operating conditions	0	No change	0	No activities.
Unidentified	0	No change	0	No activities.
Other	0	No change	0	No activities.

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	Yes
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	Yes
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	398616.88	398616.88
Consumption of purchased or acquired electricity	<Not Applicable>	301681.63	659070.53	960752.16
Consumption of purchased or acquired heat	<Not Applicable>	0	32858.77	32858.77
Consumption of purchased or acquired steam	<Not Applicable>	0	1217.44	1217.44
Consumption of purchased or acquired cooling	<Not Applicable>	0	26770.16	26770.16
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	301681.63	1118533.78	1420215.41

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	Yes
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Motor Gasoline

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

140.7

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.2632

Unit

metric tons CO2e per MWh

Emissions factor source

USEPA - Emission Factors for Greenhouse Gas Inventories (Last Modified: 9 March 2018)

Comment

Fuel employed by facility-associated mobile sources

Fuels (excluding feedstocks)

Marine Gas Oil

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

277708.79

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.2603

Unit

metric tons CO2e per MWh

Emissions factor source

USEPA - Emission Factors for Greenhouse Gas Inventories (Last Modified: 9 March 2018)

Comment

Fuel employed by Marine Vessels

Fuels (excluding feedstocks)

Marine Fuel Oil

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

7502.77

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.27443

Unit

metric tons CO2e per MWh

Emissions factor source

USEPA - Emission Factors for Greenhouse Gas Inventories (Last Modified: 9 March 2018)

Comment

Fuel employed by Marine Vessels

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

109085.84

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

98177.26

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

10908.58

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.18122

Unit

metric tons CO2e per MWh

Emissions factor source

USEPA - Emission Factors for Greenhouse Gas Inventories (Last Modified: 9 March 2018)

Comment

Natural gas usage pro-rated to 90% heat and 10% cooling for facility processes

Fuels (excluding feedstocks)

Liquefied Petroleum Gas (LPG)

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

1871.9

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

1871.9

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.21139

Unit

metric tons CO2e per MWh

Emissions factor source

USEPA - Emission Factors for Greenhouse Gas Inventories (Last Modified: 9 March 2018)

Comment

LPG employed for facility heating operations

Fuels (excluding feedstocks)

Fuel Oil Number 2

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

2306.89

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

230.69

MWh fuel consumed for self-generation of steam

2076.2

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Emission factor

0.25319

Unit

metric tons CO2e per MWh

Emissions factor source

USEPA - Emission Factors for Greenhouse Gas Inventories (Last Modified: 9 March 2018)

Comment

Fuel oil usage pro-rated to 90% steam and 10% heat for facility processes

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	0	0	0	0
Heat	100279.85	100279.85	0	0
Steam	2076.2	2076.2	0	0
Cooling	10908.58	10908.58	0	0

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero emission factor in the market-based Scope 2 figure reported in C6.3.

Sourcing method

Unbundled energy attribute certificates, Guarantees of Origin

Low-carbon technology type

Hydropower

Country/region of consumption of low-carbon electricity, heat, steam or cooling

Finland

MWh consumed accounted for at a zero emission factor

126515

Comment

Emissions cancelled by Vantaan Energia Oy

Sourcing method

Unbundled energy attribute certificates, Renewable Energy Certificates (RECs)

Low-carbon technology type

Hydropower

Country/region of consumption of low-carbon electricity, heat, steam or cooling

United States of America

MWh consumed accounted for at a zero emission factor

141062

Comment

Retirement confirmed by WREGIS admin

Sourcing method

Green electricity products (e.g. green tariffs) from an energy supplier, supported by energy attribute certificates

Low-carbon technology type

Hydropower

Country/region of consumption of low-carbon electricity, heat, steam or cooling

Germany

MWh consumed accounted for at a zero emission factor

34105

Comment

Energie Vertrieb Deutschland GmbH

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Energy usage

Metric value

301681626

Metric numerator

kWh of renewable electricity

Metric denominator (intensity metric only)

% change from previous year

12

Direction of change

Increased

Please explain

2019 Target: At least 30% utilization of renewable electricity, compared to total purchased electricity 2019 Result: 31% of our total purchased electricity was from renewable sources. The target was achieved and exceeded. Calculations: 2018: 268,516,892 kWh, renewable electricity 2019: 301,681,626 kWh, renewable electricity 2019: 1,134,841,023 kWh, facilities energy Increase of renewable electricity between 2018-2019: $((301,681,626 \text{ kWh} - 268,516,892 \text{ kWh}) / 268,516,892 \text{ kWh}) * 100 = 12\%$ Share of renewable electricity on 2019: $(301,681,626 \text{ kWh} / 1,134,841,023 \text{ kWh}) * 100 = 31\%$

Description

Energy usage

Metric value

1134841023

Metric numerator

kWh energy consumption in Nokia facilities

Metric denominator (intensity metric only)**% change from previous year**

7

Direction of change

Decreased

Please explain

2019 Target: Facility energy usage reduction of 3%, compared to 2018 level 2019 Result: Energy consumption across our facilities decreased by 7% compared to 2018. The target was achieved and exceeded. Calculations: 2018 facility energy consumption: 1,217,490,006 kWh 2019 facility energy consumption: 1,134,841,023 kWh Decrease of facility energy usage on 2019: $((1,134,841,023 \text{ kWh} - 1,217,490,006 \text{ kWh}) / 1,217,490,006 \text{ kWh}) * 100 = -7\%$

Description

Energy usage

Metric value

348347

Metric numerator

tCO2e

Metric denominator (intensity metric only)**% change from previous year**

12

Direction of change

Decreased

Please explain

2019 target: GHG emission reduction of 3% from facilities, compared to 2018 level (Scopes 1+2) 2019 result: GHG emissions from facilities decreased by 12% compared to 2018. Calculations: 2018: 394 492 tCO2, market based scope 1&2 for facilities 2019: 348 347 tCO2, market based scope 1&2 for facilities Emission reduction: $((348 \text{ 347 tCO2} - 394 \text{ 492 tCO2}) / 394 \text{ 492 tCO2}) * 100 = 12\%$

Description

Other, please specify (Water Conservation)

Metric value

1736719

Metric numerator

m3

Metric denominator (intensity metric only)**% change from previous year**

3

Direction of change

Decreased

Please explain

2019 target: Reduce the water use in our facilities by 1% compared to 2018. 2019 result: Water use decreased by 3% compared to 2018. Calculations: 2018: 1,790,783 m3 2019: 1,736,719 m3 Water withdrawal decrease: $((1,736,719 \text{ m3} - 1,790,783 \text{ m3}) / 1,790,783 \text{ m3}) * 100 = -3\%$

Description

Waste

Metric value

49

Metric numerator

utilization rate %

Metric denominator (intensity metric only)**% change from previous year**

1

Direction of change

Increased

Please explain

2019 target: Recycle at least 60% of facility waste 2019 result: While total facility waste decreased by 41%, we did not reach the recycling target. 49% of facility waste was recycled, reused or sent to energy recovery in 2019, compared to 48% in 2018

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Nokia_People_and_Planet_Report_2019(2).pdf

Page/ section reference

Pages 106-107

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Nokia_People_and_Planet_Report_2019(2).pdf

Page/ section reference

Pages 106-107

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Nokia_People_and_Planet_Report_2019(2).pdf

Page/ section reference

Pages 106-107

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category

Scope 3: Use of sold products

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Nokia_People_and_Planet_Report_2019(2).pdf

Page/section reference

Pages 106-107

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

90

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C4. Targets and performance	Progress against emissions reduction target	ISAE3000	Related to CDP C4.1a, our progress against our Science Based Targets (SBT) is externally assured. The SBTs are key environmental targets for us and they were also linked to the margin of our EUR 1,500 million five-year multicurrency revolving credit facility ("RCF") in 2019. Hence we want to continue to strengthen the reliability of the process and figures by getting a third-party assurance. Assurance statement is available on pages 106-107 of our sustainability report People & Planet 2019 (attached). Nokia_People_and_Planet_Report_2019(2).pdf
C8. Energy	Other, please specify (Energy consumption within Nokia, by types of energy (GWh) and change to 2018 (%) and "Renewable electricity amount (GWh) and portion of total electricity consumption (%)".)	ISAE3000	Related to CDP C8.2a, 8.2c and 8.2e, following indicators are externally assured: "Energy consumption within Nokia, by types of energy (GWh) and change to 2018 (%)" and "Renewable electricity amount (GWh) and portion of total electricity consumption (%)." This data is assured to strengthen the reliability of our energy and renewable electricity target tracking. Assurance statement is available in pages 106-107 of our sustainability report People & Planet 2019 (attached). Nokia_People_and_Planet_Report_2019(2).pdf
C12. Engagement	Emissions reduction activities	ISAE3000	Related to CDP C12.1b, a following indicator is externally assured: "Energy savings achieved in 2019 due to network modernization." Average energy savings for customers whose networks we modernized were 46% in 2019 (compared to non-modernized networks). Energy savings of this scale are also financially significant for our customers, and third-party assurance increases the credibility of these type of claims. Assurance statement is available on page 106 of our sustainability report People & Planet 2019 (attached). Nokia_People_and_Planet_Report_2019(2).pdf

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

No, but we anticipate being regulated in the next three years

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

At the moment we are not aware of our operations or activities becoming regulated by a carbon pricing system, especially as we are not in an energy intensive sector. However, as we have operations in around 120 countries and carbon pricing systems seem to become more common, we see it is possible that we could get impacted in the next three years, towards end of this time range. We do not anticipate any major financial impacts as our energy costs are less than 1% of our total operational spend.

Our strategy to be prepared to comply with the possible regulations is following: To reduce our energy consumption and operational carbon footprint we have contracted with a multinational corporation that specializes in energy management to assist us in designing potential approaches, which would help also if the regulation applied to us. This includes plan development, procurement of renewable energy and running tenders for power purchase agreements (PPAs).

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

No, but we anticipate doing so in the next two years

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers
Yes, our customers

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Engagement & incentivization (changing supplier behavior)

Details of engagement

Run an engagement campaign to educate suppliers about climate change
Climate change performance is featured in supplier awards scheme

% of suppliers by number

3

% total procurement spend (direct and indirect)

59

% of supplier-related Scope 3 emissions as reported in C6.5

Rationale for the coverage of your engagement

We use CDP Supply Chain -program as a means to engage with our suppliers. To make the greatest impact on GHG emissions caused by Nokia's supply chain, we prioritize suppliers based on three dimensions 1) energy intensity of their sector, 2) strategic relevance and 3) our spend with the suppliers. Related to dimension 1, energy intensive suppliers include e.g. component manufacturers, final assembly, transportation and data centers. Related to dimension 2, we have category strategies and our aim is to have all our "highly ranked", i.e. "preferred" and "allowed" suppliers covered by CDP and hence CDP covers also non-energy intensive suppliers. To recognize top performing suppliers, we have also Supplier Diamond Awards Sustainability Category. As part of the qualification criteria to Sustainability award, suppliers need to score >C in CDP. We are engaging with these suppliers to maximize our impact: we are targeting suppliers with the highest emissions as well as suppliers with which we have most spend and/or which are strategic to us, i.e. where we can influence most.

Impact of engagement, including measures of success

We measure the success of our supplier engagement via several CDP program metrics: 1) the number of suppliers we have invited to respond to CDP 2) the number of our suppliers that participate in CDP climate change webinars 3) the number of our suppliers that have set carbon reduction targets 4) whether Nokia's requests or initiatives prompted suppliers to take emission reduction initiatives and 5) how much savings (both in GHG emissions and in €) have been achieved. We also monitor whether our suppliers engage their own suppliers and if they propose collaborative climate projects with us. We have noticed a learning curve among our suppliers; some do not respond in the first year but start to report more advanced climate data and actions after a year or so. In 2019, we invited 675 (505 in 2018) suppliers to respond to the CDP Supply Chain questionnaire. Out of those, 121 suppliers attended CDP climate change webinars, 404 responded to the CDP questionnaire (314 in 2018) and 192 (211 in 2018) reported reductions in GHG emissions. 234 (187 in 2018) suppliers had active targets for emission reduction. During the reporting year the total savings from our suppliers' carbon reduction initiatives was 1333 million metric tons of CO₂e and approximately EUR 644 million. 184 (143 in 2018) suppliers reported that they engaged their own suppliers and 55 (63 in 2018) highlighted collaborative opportunities with us, such as increased logistics efficiency, shifting to more digitalized services and optimized business travelling with our service suppliers. In addition to engagement via the CDP Supply Chain program, energy efficiency is also part of our supplier requirements. Supplier requirements are applicable to all our suppliers and compliance is continually checked as part of our supplier audits. In 2019 we made 332 supply chain sustainability audits, including 45 in-depth onsite audits. There were 64 findings related to environmental management overall in those in-depth audits, some of them related to improvement needs on the energy programs.

Comment

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Collect climate change and carbon information at least annually from suppliers

% of suppliers by number

3

% total procurement spend (direct and indirect)

59

% of supplier-related Scope 3 emissions as reported in C6.5

5

Rationale for the coverage of your engagement

We use CDP Supply Chain -program as a means to engage with our suppliers. To make the greatest impact on GHG emissions caused by Nokia's supply chain, we prioritize suppliers based on three dimensions 1) energy intensity of their sector, 2) strategic relevance and 3) our spend with the suppliers. Related to dimension 1, energy intensive suppliers include e.g. component manufacturers, final assembly, transportation and data centers. Related to dimension 2, we have category strategies and our aim is to have all our "highly ranked", i.e. "preferred" and "allowed" suppliers covered by CDP and hence CDP covers also non-energy intensive suppliers. We are engaging with these suppliers to maximize our impact: we are targeting suppliers with the highest emissions as well as suppliers with which we have most spend and/or which are strategic to us, i.e. where we can influence most. In 2019 around 3% of our suppliers by number reported to us, covering anyhow around 59% of supplier spend and around 49% of emissions of GHG Scope 3 Category 1: Purchased good and services.

Impact of engagement, including measures of success

We measure the success via several CDP program metrics, especially with number of suppliers responding to CDP, coverage of spend by the responded suppliers and GHG data suppliers allocated for Nokia. As a result of the awareness and engagement campaign every year, the amount of the suppliers who disclose climate information through CDP to us is increasing year on year (from 66 in 2012 to 404 in 2019). In 2019, 137 (118 in 2018) of our suppliers calculated a Nokia allocation of their emissions based on the products and services we purchase from them and 82 (88 in 2018) suppliers provided emissions intensity data. Using hybrid methodology for calculation, based on supplier information, our emissions with participating suppliers totaled around 1,495,527 million metric tons of CO₂e (2, 100, 000 million in 2018). Altogether the collected GHG data represented 49% of total purchase spend in 2019 (46% in 2018). By scaling up the allocated emissions to 100% of our suppliers, we estimated our scope 3 emissions from our supply chain to be approximately 3.1 million metric tons of CO₂e (5.3 million in 2018).

Comment

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Education/information sharing

For more information, please visit <https://www.nokia.com/networks/technologies/zero-emission/>

Details of engagement

Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services

% of customers by number

50

% of customer - related Scope 3 emissions as reported in C6.5

Portfolio coverage (total or outstanding)

<Not Applicable>

Please explain the rationale for selecting this group of customers and scope of engagement

Over 88% of our total carbon footprint is caused by the use of sold products. The largest contributor is our Mobile Networks business group's products, so we are targeting especially our Mobile Networks customers with our Zero Emission offering. Mobile Networks represented approximately 50% of Nokia sales in 2019. In 2019 we continued our global marketing campaign about our key Zero Emission products, AirScale base station, single RAN and other software features reducing energy consumption and Nokia innovation liquid cooling. In 2019 we also began communication with customers on the benefits of 5G and the energy efficiency features related to 5G and the need to decouple data increase from potential energy increase. We are working on improving product energy efficiency in other business units as well.

Impact of engagement, including measures of success

In 2019, we continued to develop and offer our zero emissions radio network solutions, including energy saving software features and services. We delivered zero emission products to over 150 customers worldwide, and the networks we modernized in 2019 used on average 46% less energy than those that were not modernized, and the total energy savings of these modernizations were 4 times bigger (in MWh) than in 2018. Over 16% of our radio products in the field have one or more energy efficiency software features activated. When we launched our AirScale base station in 2016 we promised 60% energy savings, and now we have delivered 69% energy savings through AirScale configurations. This not only reduces energy consumption and carbon footprint, but also brings financial savings for our customers. We are making energy efficiency gains across our portfolio. In the fixed access networks segment, we have enhanced our fiber access node portfolio to include form factors better suited to smaller deployments, which decreases the power consumption per user in low density areas. Our Multi-PON solution is built on our new chipset Quillion which enables much lower power consumption (up to 50%). In copper infrastructure it helps reduce rack space by 50% and power consumption by 10%. Our Scope 3 Science-based target (SBT) of 75% reduction in emissions from products in use by 2030 is on track. We also have regular review meetings with key larger customers and sustainability issues are included in sales proposal responses.

Type of engagement

Collaboration & innovation

Details of engagement

Run a campaign to encourage innovation to reduce climate change impacts

% of customers by number

50

% of customer - related Scope 3 emissions as reported in C6.5

Portfolio coverage (total or outstanding)

<Not Applicable>

Please explain the rationale for selecting this group of customers and scope of engagement

We targeted these customers for the innovation campaign, as over 88% of our total carbon footprint is caused by the use of sold products in our customers communications networks and the largest contributor is our Mobile Networks business group which represented approximately 50% of Nokia sales in 2019. We believe we need to create and deliver innovations which can lead to the largest positive impact as part of our contribution to combatting climate change. In 2019 we enhanced our work on liquid cooling for mobile base stations, which replaces conventional aircon systems, by applying it to the latest 5G radio solutions. We also promoted other zero emissions solutions from our portfolio via online campaigns and as part of our commitment to recalibrate our science-based targets to 1.5 degrees.

Impact of engagement, including measures of success

At Mobile World Congress 2019 we showcased the Nokia AirScale future-proof site solution which provides multiple features for simpler, faster and lower-cost rollout of 5G in smart cities using a common Future X architecture for deployments of all mobile technologies and spectrum bands. Capabilities such as the world's first liquid-cooled 5G base station, including liquid-cooled 5G massive MIMO adaptive antenna, eliminate the need for expensive cooling systems, reducing site space, lowering energy consumption and cutting carbon emissions by up to 80%. We also promoted our latest chipsets for radio, optical and fixed networks which all bring big energy savings and help reduce emissions. Read more <https://www.nokia.com/about-us/sustainability/combating-climate-change/our-portfolio-energy-efficient-and-climate-driven/> We also work with and promote our solutions to enterprises and other industries such as manufacturing, energy, webscale companies to provide network solutions that enable them to cut their emissions. A recent study looking at the enabling effect of mobile communications, carried out by the GSMA (Global Mobile Association) and the Carbon Trust stated that compared to the global carbon footprint of mobile networks themselves, the level of avoided emissions enabled by mobile communications technologies is ten times greater. In 2019 we had over 150 customers who use one or more of our zero emission solutions actively. And the customer networks we modernized during 2019 used 46% less energy on average compared to those not modernized.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Trade associations

Funding research organizations

Other

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

DIGITALEUROPE

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

DIGITALEUROPE's vision is a Europe where digital technologies, innovation, and artificial intelligence can provide Europe's people with competitive jobs, better health, and better public services. A strong unfragmented DIGITAL EUROPE that takes leadership in creating digital Inclusion, Green growth, Innovation, Trust, Agile mission-based policy making that drives prosperity and creates benefits for the European society and leads globally in an open economy. As part of Green Growth DIGITALEUROPE advocates that Europe should continue to build a framework for a sustainable, low-carbon, and resource-efficient Europe that is fit for the fast-moving innovations in the ICT sector and leverages the true potential of digital technologies as key enablers for green growth. (See <https://www.digitaleurope.org/policies/strongerdigitaleurope/>) DIGITALEUROPE has a policy group dedicated to Digital Sustainability that deals with chemicals, eco-design, waste and supply chain transparency issues. This policy group also addresses climate change and circular economy policy. DIGITALEUROPE is convinced that digital technologies can make the big transformation for Europe happen, based on United Nations Sustainable Development Goals (SDGs), circular economy and decarbonisation objectives, and DIGITALEUROPE believes that the following key aspects should be considered by the incoming EU institutions. This position is further detailed in the Call to Action for Digitalisation as key for a sustainable Europe https://www.digitaleurope.org/wp/wp-content/uploads/2019/06/Narrative_Sustainability.pdf.

How have you influenced, or are you attempting to influence their position?

Through our active participation at all levels of the association we drive the vision of the association as well as help shape the individual positions in the Digital Sustainable Policy Group (DSPG). Notably, Nokia holds the position of President of the Executive Board as well as a vice-chair position in the DSPG.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

No

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

We are participating in standardization work related to energy efficiency measurement methodologies of the ICT sector in international standardization organizations in the ETSI Technical Committee EE (Environmental Engineering) and ITU-T Study Group 5 (Environment, climate change and circular economy) where we hold official positions (editors, associate rapporteurs, WP vice-chair). Commonly agreed measurement standards are the basis for reporting energy performance of the products.

We have been participating in ETSI standardization work for more than ten years. In 2019, measurement methodology work related to 5G radio energy efficiency continued as an addition to existing ETSI energy efficiency standards for mobile networks.

Nokia has been involved in the collaboration work between ITU-T, GESI, IEA and SBTi (joint initiative by CDP, the UN Global Compact, the World Resource Insitutue and WWF international), in order to work jointly on the development of GHG emission trajectories for the ICT sector, and sub-sectors with figures for 2025, 2030 and 2050. Nokia was also a co-editor in ITU-T work on a Methodology for assessing the aggregated positive sector-level impacts of ICT in other sectors.

Efficient material usage in Circular Economy has a positive effect on the climate as emissions can be reduced e.g. in material collection and manufacturing. Nokia has been involved in the ITU-T and ETSI Circular Economy standardization work.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

We have an active global network of people with global positions, and the messages are agreed jointly in regular meetings between all relevant colleagues. Processes-wise we have e.g. training and governance which support the consistency. Environmental management, including climate change topics, as well dealing with government officials are part of Nokia Code of Conduct (CoC) and there is an annual mandatory CoC training for all employees (96.7% of our employees conducted the training in 2019). As part of our certified Environmental management system we also arrange different environmental trainings and conduct internal audits, in addition to the external audits done by a third party to check consistency with our internal guidelines.

What comes to governance, our Government Relations (GR), and Sustainability and Environment teams all belong to the same organization and work regularly together. Specifically related to industry associations, which are developing joint industry views on various policy issues, GR team is centrally coordinating Nokia representation in the associations. This central coordination ensures consistency in messaging even when different experts across Nokia engage in different work streams of Industry associations across continents. Issues are discussed also at the management team level, for example in our Sustainability Council and including people who are in charge or both implementing and developing strategy and policy activities, to ensure consistency of messages with the strategy. All our policy engagements are consistent with the company's overall sustainability strategy.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

Nokia_People_and_Planet_Report_2019(2).pdf

Page/Section reference

Combatting climate change pages 25-40 and Environmental data pages 92-98.

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Publication

In other regulatory filings

Status

Complete

Attach the document

Nokia Form 20F 2019_0.pdf

Page/Section reference

Pages 62-68 Sustainability and corporate responsibility

Content elements

Governance
Strategy
Risks & opportunities
Emission targets
Other metrics

Comment

C15. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Chief Financial Officer	Chief Financial Officer (CFO)