

C0. Introduction

C0.1

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

We create the technology to connect the world. We develop and deliver the industry's only end-to-end portfolio of network equipment, software, services and licensing that is available globally. Our customers include communications service providers whose combined networks support 6.1 billion subscriptions, as well as enterprises in the private and public sector that use our network portfolio to increase productivity and enrich lives.

Through our research teams, including the world-renowned Nokia Bell Labs, we are leading the world to adopt end-to-end 5G networks that are faster, more secure and capable of revolutionizing lives, economies and societies. We adhere to the highest ethical business standards as we create technology with social purpose, quality and integrity. 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 |
|-------|----------------|------------------|---|--|
| Row 1 | January 1 2018 | December 31 2018 | No | <Not Applicable> |

C0.3

(C0.3) Select the countries/regions 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 consolidation approach to your Scope 1 and Scope 2 greenhouse gas 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 |
|---------------------------|---|
| Other C-Suite Officer | Nokia Group Leadership Team (executive board) and its members are responsible for the overall management of the company including climate related issues when relevant to their area of responsibility. The Chief Marketing Officer is a member of the Group Leadership Team, and is responsible for corporate responsibility at the executive management level. Corporate responsibility includes overall sustainability including climate change related topics. The CFO is a member of the executive board and as the Chief Risk Officer is responsible for the Enterprise Risk Management (ERM) and related reviews in the Nokia board minimum twice a year. Nokia ERM system also includes climate change related risks and opportunities. |

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 | Please explain |
|---|---|---|
| Scheduled – some meetings | <ul style="list-style-type: none"> 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 | Climate issues are one part of the annual board sustainability review including targets, key actions and performance. Nokia Enterprise Risk Management system also includes climate related risks and opportunities and the board has ERM review in their meetings at minimum twice 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) | Responsibility | Frequency of reporting to the board on climate-related issues |
|---|---|---|
| Sustainability committee | Both assessing and managing climate-related risks and opportunities | 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).

Our sustainability committee is called the "Corporate Responsibility Council." Our Corporate Responsibility Council consists of senior representatives from our business units and support functions including management representatives with climate change related responsibilities from units such as product development, real estate, procurement and environment.

The Council is managed by the Corporate Responsibility team which belongs to the Marketing & Corporate Affairs (MCA) function under the Chief Marketing Officer who is responsible for corporate responsibility at the executive management level. Corporate Responsibility includes also climate change related topics.

The Council typically meets quarterly and ensures alignment across the business on responsibility strategy, priorities, and the implementation of responsibility activities. It reviews the materiality, targets and performance (overall and against the short and long term targets) of various corporate responsibility - including climate change - related topics.

C1.3

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

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).

Who is entitled to benefit from these incentives?

Procurement manager

Types of incentives

Monetary reward

Activity incentivized

Supply chain engagement

Comment

Our Procurement 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. 2018 progress: 314 of our key suppliers, an increase of 22 from 2017, responded to the CDPs request to disclose their climate performance information and 187 provided emission reduction targets.

Who is entitled to benefit from these incentives?

Energy manager

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

Annual performance review directly associated with achieving 2018 energy and carbon footprint reduction objectives.

Who is entitled to benefit from these incentives?

Environmental, health, and safety manager

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

Annual performance review directly associated with achieving 2018 energy and carbon footprint reduction objectives.

Who is entitled to benefit from these incentives?

Environment/Sustainability manager

Types of incentives

Monetary reward

Activity incentivized

Energy reduction target

Comment

Annual performance review directly associated with achieving 2018 energy and carbon footprint reduction objectives.

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term 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. |

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

| | Frequency of monitoring | How far into the future are risks considered? | Comment |
|-------|--------------------------------|---|--|
| Row 1 | Six-monthly or more frequently | >6 years | In our Enterprise Risk Management we monitor the risks three times a year, typically using three years time horizon. Exceptionally, when needed also longer-term risks are monitored. In our strategy planning we typically use longer time horizon and in our materiality analysis we consider risks and opportunities extending also to over 10 years. |

C2.2b

(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

Nokia Enterprise Risk Management (ERM) covers strategic, operational, financial and hazard risks, including climate change risks. Key risks and opportunities are primarily identified against business targets either in business operations or as an integral part of strategy and financial planning.

Prioritization is made for instance using Nokia risk and opportunity mapping and analysis processes and also utilizing tools where identified risks and opportunities are ranked based on the possible impact (€), probability and time frame.

One of the core principles is that the business or function head is also the risk owner although all employees are responsible for identifying, analyzing and managing risks as appropriate given their roles and duties. Key risks and opportunities are analyzed, managed and monitored as part of business performance management with the support of risk management personnel and the centralized Enterprise Risk Management function.

Key risks and opportunities are reviewed by the Group Leadership Team and the Board of Directors in order to create visibility on business risks as well as to enable the prioritization of risk management activities. The Board of Directors' role in overseeing risk includes risk analysis and assessment related to financial strategy and business reviews, updates, and decision-making proposals.

The Corporate Responsibility Council meets typically quarterly and ensures alignment across the business on responsibility strategy, priorities, and the implementation of responsibility activities. It reviews the materiality, targets and performance (overall and against the short- and long-term targets) of various corporate responsibility topics, including climate change. In materiality analysis, the risks and opportunities are considered as one element.

In ERM we consider risks and opportunities typically with the time horizon of 3 years and in exceptional cases longer term. In our strategy planning we typically use longer time horizon and in our materiality analysis we consider risks and opportunities extending also to over 10 years.

ERM's risk register includes risks with value of over 20 MEUR. We have used the register as the basis for our CDP disclosure and consider the same threshold as substantive in our climate disclosure. We update the risk and opportunity assessment 3 times a year.

C2.2c

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

| | Relevance & inclusion | Please explain |
|---------------------|------------------------------------|---|
| Current regulation | Relevant, always included | We consider current regulation like the recent EU energy efficiency directive on the energy performance of buildings. Climate change related taxes and other regulations which may increase operating costs as well as to a lesser extent product pricing and negatively impact on demand are being implemented in various parts of the world. 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. As Nokia is not an energy intensive company - our energy cost in 2018 was approximately € 92 million and our scope 1 and 2 CO2 (location based) emissions in 2018 were about 571 400 tonnes - indicating that the direct impact would not be material (20% increase in the energy cost would lead to € 18 million decrease in our profits.) The identified risks are assessed and ranked in the ERM's risk assessment process based on the possible impact (€), probability and time frame. As the value of the risk is currently estimated at less than 20 MEUR, it is not included in the ERM risk register, which only includes risks of over 20 MEUR. |
| Emerging regulation | Relevant, always included | We consider emerging regulation like the evolving scope of EU Eco Design directive. New regulation might cause additional costs to Nokia. Climate change related taxes and other regulations which may increase operating costs as well as to a lesser extent product pricing and negatively impact on demand are being implemented in various parts of the world. 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. As Nokia is not an energy intensive company - our energy cost in 2018 was approximately € 92 million and our scope 1 and 2 CO2 (location based) emissions in 2018 were about 571 400 tonnes - indicating that the direct impact would not be material (20% increase in the energy cost would lead to € 18 million decrease in our profits.) The identified risks are assessed and ranked in the ERM's risk assessment process based on the possible impact (€), probability and time frame. As the value of the risk is currently estimated at less than 20 MEUR, it is not included in the ERM risk register, which only includes risks of over 20 MEUR. |
| Technology | Not relevant, explanation provided | Developments in technology are considered mainly as an opportunity. We consider the impact of e.g. 5G technology on the energy use and have designed solutions like "ReefShark chipset" to improve the energy efficiency. |
| Legal | Relevant, sometimes included | We provide our customers information on the energy consumption of our products which is included in the bidding and customer legal documentation. The disclosure/ non-disclosure may cause legal risks. The identified risks are assessed and ranked in the ERM's risk assessment process based on the possible impact (€), probability and time frame. |
| Market | Not relevant, explanation provided | We evaluate this category mainly from the perspective of opportunities. Our customers are interested in the energy use of our products and we have designed solutions like "ReefShark chipset" to improve the energy efficiency. |
| Reputation | Relevant, sometimes included | Many of the climate change related issues like how we handle 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 natural catastrophes and related risks to our facilities, customers, supply chain etc. is a key part of our climate related Enterprise Risk Management process. 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 – manmade 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. |
| Chronic physical | Relevant, sometimes included | The review of increased longer-term risk level to our facilities, customers, supply chain etc. related to natural catastrophes, e.g. sea level rise, is a key part of our climate related 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. |
| Upstream | Relevant, always included | Our supply chain related climate risks are a key part of our climate related Enterprise Risk Management process. As an example the acute physical risks related to our suppliers' factories. Nokia Business Continuity Plans (BCPs) support the continuity of critical business processes during a significant business disruption, regardless of the source of the disruption – manmade or environmental. Each plan includes risk assessment and response procedures for 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. |
| Downstream | Relevant, always included | Our customer related climate risks are a key part of our climate related Enterprise Risk Management process. As an example the acute physical risk / loss of business due to natural catastrophe related to our customers operations. The identified risks are assessed and ranked in the ERM's risk assessment process based on the possible impact (€), probability and time frame. |

C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

1) Description of a process for managing climate-related risks and opportunities:

Key risks and opportunities are analyzed, managed and monitored as part of business performance management. One of the core principles is that the business or function head is also the risk owner, although all employees are responsible for identifying, analyzing and managing risks, as appropriate, given their roles and duties. Also sustainability related e.g. climate change risks and opportunities are a part of the process (integrated into our overall risk management). The Corporate Responsibility Council meets quarterly and ensures alignment across the business on responsibility strategy, priorities, and the implementation of responsibility activities. It reviews the materiality, targets and performance of various corporate responsibility topics, including climate change.

Our overall risk management concept is based on managing the key risks that would prevent us from meeting our objectives, rather than solely focusing on eliminating risks. We update the risk and opportunity assessment with identified management actions 3 times a year.

In ERM we consider risks and opportunities typically with the time horizon of 3 years and in exceptional cases longer term. In our strategy planning we typically use longer time horizon and in our materiality analysis we consider risks and opportunities extending also to over 10 years.

Nokia Business Continuity Plans (BCPs) support the continuity of critical business processes during a significant business disruption, regardless of the source of the disruption – manmade 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. 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.

2) Case study/example of how process is applied to:

a) Physical risks and opportunities

Risk: Extreme weather or serious natural event leading to inability to maintain normal business operations. For instance, some of our suppliers and to some extent also Nokia have manufacturing plants in the areas like East and South East Asia that can be sensitive to tropical cyclones.

These suppliers and / or Nokia need to look for alternative supply sources. Looking for alternative supply sources is a part of our normal on-going sourcing process. Additionally, Nokia has in place insurance for property damage that includes buildings, equipment and machinery, as well as coverage for certain business interruptions covered by the insurance policies, whereby Nokia aims to manage the impact of natural catastrophe perils such as tropical cyclones (hurricanes and typhoons) on Nokia through the applicable insurance policies.

Nokia maintains crisis management / business continuity plans to ensure that products, services and solutions continue to be delivered at acceptable levels during a significant disruption to operations.

Also, Real Estate considers both adaptation and mitigation of Climate Change in its site selection and operations. The impact of extreme weather conditions are considered as part of the selection with selecting new office locations. Sustainability criteria are

included in the selection documentation.

Opportunity: This is also a revenue/reputation related opportunity if we are able to handle the critical customer deliveries well and satisfy the network requirements to host nations own crisis response and mitigation capability.

b) Transitional risks and opportunities

Risk: climate change related taxes and other regulations may increase our operating costs.

Opportunity: effort to reduce our GHG emissions and energy use may provide benefits in form of reduced energy costs. Our experts in functions like Legal, Sustainability and Procurement monitor related regulations and legislative developments (like EU energy efficiency directive on the energy performance of buildings) and work throughout our value chain to prepare for changes. In 2018 we continued to reduce our energy consumption and emissions, and our GHG emissions from facilities decreased by 18% as compared to 2017. Our target for 2019 is the reduction of GHG emission by 3% from facilities, compared to 2018 level (Scopes 1+2). We were also the first telco equipment vendor to get the approval for our commitment to 2030 Science-Based Targets to reduce our long-term scope 1, 2 and 3 emissions. These on-going activities reduce our energy related cost and risk.

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?

Supply chain

Risk type

Physical risk

Primary climate-related risk driver

Acute: Increased severity of extreme weather events such as cyclones and floods

Type of financial impact

Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)

Company- specific description

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 small. However, in case such would happen, it can lead to impacts like lost or deferred sales, service failure and it can have an impact on the supplier's operations and the supplier / Nokia may need to look for alternative supply sources. Also our customers are in some cases vulnerable to changes in physical climate parameters like tropical cyclones.

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. The probability of tropical cyclone caused by climate change causing severe damage to a production facility of a critical supplier, our operations or our customer is rather small. However, in case such would happen, we estimate annualized financial impact of approximately MEUR 20 for a scenario of regional, one week shut-down of internal business operations. Other potential scenarios could be lost or deferred sales, service failure (potential contractual penalties) or rollout failure.

Management method

Looking for alternative supply sources is a part of our normal on-going sourcing process. Additionally, Nokia has in place insurance for property damage that includes buildings, equipment and machinery, as well as 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. Nokia maintains business continuity plans to ensure that products, services and solutions continue to be delivered at acceptable levels during a significant disruption to operations. Real Estate considers both adaptation and mitigation of Climate Change in its site selection and operations. The impact of extreme weather conditions are considered as part of the selection with selecting new office locations. Sustainability criteria are included in the selection documentation. 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. The activity is a part of our normal sourcing process without significant additional cost implication expected i.e. less than MEUR 1 annually (referring to related labor costs), and additionally Nokia purchases certain insurance for various purposes, including managing property damage and business disruptions.

Cost of management

1000000

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Increased pricing of GHG emissions

Type of financial impact

Abrupt and unexpected shifts in energy costs

Company- specific description

Climate change related taxes and other regulations which may increase operating costs as well as to a lesser extent product pricing and negatively impact on demand are being implemented in various parts of the world. 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. As Nokia is not an energy intensive company - our energy cost in 2018 was approximately € 92 million and our scope 1 and 2 CO₂ (location based) emissions in 2018 were about 571 400 tonnes - indicating that the direct impact would not be material

(20% increase in the energy cost would lead to € 18 million decrease in our profits.) However, this can also impact the whole value chain, increase the price of products and reduce consumer / our customers purchasing power. However in our risk analysis the assumption is that the impact is long term and 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)

9000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Nokia is not an energy intensive company - our 2018 energy cost equalled approximately € 92 million (vs. net sales of approximately € 23 billion.) Assuming the energy cost increase of 10% due to fuel/energy tax increases or regulations would decrease our profits annually by approximately € 9 million based on 2018 data. Our scope 1 and 2 CO2 (location based) emissions in 2018 were about 571 400 tonnes and as such carbon taxes or other carbon costs are not likely to have significant financial impact on Nokia.

Management method

Our experts in functions like Legal, Sustainability and Procurement monitor related regulations and legislative developments (like 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. In 2018 we continued to reduce our energy consumption and emissions, and our GHG emissions from facilities decreased by 18% as compared to 2017. Our target for 2019 is the reduction of GHG emission by 3% from facilities, compared to 2018 level (Scopes 1+2). We were also the first telco equipment vendor to get the approval for our commitment to 2030 Science-Based Targets to reduce our long-term scope 1, 2 and 3 emissions. We encourage 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 management is less than €1 million (referring to related labor costs). Often the benefits weight out the costs (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.

Cost of management

1000000

Comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Market: Other

Type of financial impact

Change in revenue mix and sources resulting in decreased revenues

Company- specific description

One scenario is that social unrest, war and other political risks increase as a result of climate change. This would impact negatively

on the economy, consumer/customer purchasing power, and in some cases lead to inability to continue business in certain areas. 1% reduction in the demand of Nokia products would lead to about €226 million reduction in our annual sales based on 2018 data. This would also have an impact on the telecommunications infrastructure market but our assumption is that this is a long-term development and 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.

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)

226000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Climate change impact on the fluctuating socio-economic conditions and related political and economic risks is difficult to estimate especially over the long term. 1% reduction in the demand of Nokia products would lead to about €226 million reduction in our annual sales based on 2018 data. Our assumption is that the adverse impact on our industry or Nokia would not be disproportionately higher than on other industries or 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. The financial impact is very difficult to quantify.

Management method

Managing long term political risks is challenging, especially globally. However our following activities may make our products more attractive and cost efficient and help alleviate the risk of fluctuating socioeconomic conditions and impacts on customers purchasing power and preferences: In 2018, we have dramatically expanded our AirScale Radio portfolio (4x more references), by introducing a wide range of single-and multiband Remote Radio Heads, as well as 6-pipe AirScale Radio Frequency Module, exhibiting a peak energy efficiency at unit level as high as 34 % across various frequency bands. AirScale portfolio deliveries have represented more than 40 % of all our Macro BTS deliveries over the year, and shipped baseband capacity has increased by over 50 percent while keeping the energy footprint almost unchanged (+2 percent). Our Single RAN (SRAN) solution typically enables 45 percent lower energy consumption compared to the traditional way of building separate 2G, 3G and 4G radio networks. Our total R&D spend was € 4620 million in 2018 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 to some extent mitigate risks. 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 (=less than € 1 million annual cost impact, referring to related labor costs).

Cost of management

1000000

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?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

Climate change and high energy cost can increase the demand of Nokia products including: Through 2018, we have dramatically expanded our AirScale Radio portfolio (4x more references), by introducing a wide range of single-band and multiband Remote Radio Heads, as well as 6-pipe AirScale Radio Frequency Module, exhibiting a peak energy efficiency at unit level as high as 34 percent across various frequency bands. AirScale portfolio deliveries have represented more than 40 percent of all our Macro BTS deliveries over the year, and shipped baseband capacity has increased by over 50 percent while keeping the energy footprint almost unchanged (+2 percent). Our Single RAN (SRAN) solution typically enables 45 percent lower energy consumption compared to the traditional way of building separate 2G, 3G and 4G radio networks. 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. Nokia's target for 2018 – which was also achieved – was to provide and support 2-3 Nokia Saving Lives solution kits - based on Ultra Compact Networks. 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)

226000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The impact is very difficult to estimate as it relates to long-term development with various uncertainties. Based on our 2018 business volumes a 1% growth in demand would lead to approximately €226 million increase in our annual net sales. The increased energy price - due to taxes and regulations - could be expected to have a negative impact on the world economy and at least partly offset the possibly increased demand for products and services. The financial impact is very difficult to quantify.

Strategy to realize opportunity

The main product related strategy is to develop energy efficient products. This is also visible in our target setting. We were the first telco equipment vendor and one of the first 100 companies globally to have the Science-Based Targets for GHG emissions reductions approved. By 2030 we aim to reduce GHG emission compared to 2014 level with 75% reduction in the energy use of sold products. Through 2018, we have dramatically expanded our AirScale Radio portfolio (4x more references), by introducing a wide range of single-band and multiband Remote Radio Heads, as well as 6-pipe AirScale Radio Frequency Module, exhibiting a peak energy efficiency at unit level as high as 34 % across various frequency bands. AirScale portfolio deliveries have represented more than 40 % of all our Macro BTS deliveries over the year, and shipped baseband capacity has increased by over 50 percent while keeping the energy footprint almost unchanged (+2 percent). 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. Our total R&D spend was

€ 4620 million in 2018 and a part of this goes to developing energy efficiency solutions like the AirScale Radio portfolio. 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 (=less than € 1 million annual cost impact, referring to related labor costs.)

Cost to realize opportunity

1000000

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

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

Type of financial impact

Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services)

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). 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. Nokia's target for 2018 – which was also achieved – was to provide and support 2-3 Nokia Saving Lives solution kits - based on Ultra Compact Networks.

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)

226000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The impact is very difficult to estimate as it relates to long term development with various opportunities and uncertainties. Based on our 2018 business volumes a 1% growth in demand would lead to approximately €226 million increase in our annual net sales.

Strategy to realize opportunity

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). 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. Nokia's target for 2018 (achieved) was to provide and support 2-3 Nokia Saving Lives solution kits - based on Ultra Compact Networks. Our total R&D spend was € 4620 million in 2018 and a part of this goes to activities like: R&D related to "internet of things and programmable world", developing better even more

reliable communications networks infrastructure technology and solutions like the Ultra Compact Network. These costs are incurred as part of normal product development process and thus no major extra cost is incurred because of the climate change related actions (=less than € 1 million annual cost impact, referring to related labor costs).

Cost to realize opportunity

1000000

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

Type of financial impact

Reduced operating costs (e.g., through efficiency gains and cost reductions)

Company-specific description

Our 2018 energy cost equalled approximately € 92 million; assuming the energy efficiency increase of 10% would increase our profits annually by approximately € 9 million based on 2018 data. We plan to capitalise on this opportunity through continuing the following actions: Energy efficiency related actions in our offices and factories - to achieve these targets - are on-going ("being implemented"). In 2018, larger capital investments included total cost of ownership techniques, the delivery of energy efficient and environmentally friendly projects such as new chillers in India and China, and boilers in the UK and France, as well as building envelope upgrades in Finland and France. We also investigated and installed solar panels at our site in Portugal. LED lighting continued to be deployed across our portfolio in both new and refurbished buildings with projects implemented in all regions along with improved Heating, Ventilation and Air Conditioning (HVAC) controls including products such as Ultrabox and Aironics, all aimed at reducing energy use. In 2018 we continued to reduce our energy consumption and emissions, and our GHG emissions from facilities decreased by 18% compared to 2017. Our target for 2019 is the reduction of GHG emission by 3% from facilities, compared to 2018 level (Scopes 1+2).

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)

9000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Our 2018 energy cost equaled approximately € 92 million; assuming the energy efficiency increase of 10% would increase our profits annually by approximately € 9 million based on 2018 data.

Strategy to realize opportunity

In 2018 we continued to reduce our energy consumption and emissions, and our GHG emissions from facilities decreased by 18% compared to 2017. Our target for 2019 is the reduction of GHG emission by 3% from facilities, compared to 2018 level (Scopes 1+2). We were also the first telco equipment vendor to get the approval for our commitment to 2030 Science-Based Targets to reduce our long term scope 1, 2 and 3 emissions. Energy efficiency related actions in our offices and factories - to achieve these targets - are on-going. In 2018, larger capital investments included total cost of ownership techniques, the delivery of energy efficient and environmentally friendly projects such as new chillers in India and China, and boilers in the UK and France, and

building envelope upgrades in Finland and France. We also investigated and installed solar panels at our site in Portugal. LED lighting continued to be deployed across our portfolio in both new and refurbished buildings with projects implemented in all regions along with improved Heating, Ventilation and Air Conditioning (HVAC) controls including products such as Ultrabox and Aironics, all aimed at reducing energy use. Annual cost impact related to the energy efficiency increases is less than €1 million (referring to related labor costs), and typically the benefits weight out the costs with a net positive financial impact.

Cost to realize opportunity

1000000

Comment

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

| | Impact | Description |
|--------------------------------------|---|---|
| Products and services | Impacted for some suppliers, facilities, or product lines | Demand from the customers side for lower emissions products and services is identified as an opportunity. For mobile service providers most of their carbon emissions come from the radio access network. 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 140 customers have installed energy efficiency software features to our products. In 2018 we experienced clear increase in market demand and for the first time ever over 10% of the Nokia radio products in the field have one or more energy efficiency software features activated. Magnitude of impact: medium |
| Supply chain and/or value chain | Impacted for some suppliers, facilities, or product lines | As increase in energy cost has been identified as a potential risk Nokia has requested some 500 suppliers to disclose their climate performance and targets through CDP supply chain module. This has impacted on both Nokia and suppliers' cost and workload. Magnitude of impact: low |
| Adaptation and mitigation activities | Impacted for some suppliers, facilities, or product lines | As energy efficiency of our products and facilities has been identified as a risk and opportunity we have initiated some mitigation activities like electricity consumption across our facilities (decreased by 3% in 2018 as compared to 2017) and products (average 43% energy savings for customers whose networks we modernized in 2018). Also, Real Estate considers both adaptation and mitigation of Climate Change in its site selection and operations. The impact of extreme weather conditions are considered as part of the selection with selecting new office locations. Sustainability criteria are included in the selection documentation. Magnitude of impact: low |
| Investment in R&D | Impacted for some suppliers, facilities, or product lines | As energy efficiency of products has been identified as an important topic and an opportunity our design for environment R&D process addresses energy efficiency of all our products. We have developed new more energy efficient HW and SW and set SBT to reduce GHG emission of our products by 75% by 2030 (base year 2014). Magnitude of impact: medium |
| Operations | Impacted | As energy savings in our operations has been identified as an opportunity e.g. our electricity consumption across our facilities decreased by 3% in 2018 as compared to 2017. We have also set SBT to reduce scope 1 + 2 GHG emission by 41% by 2030 (base year 2014). Magnitude of impact: low |
| Other, please specify | Please select | |

C2.6

(C2.6) Describe where and how the identified risks and opportunities have been factored into your financial planning process.

| | Relevance | Description |
|---|---|--|
| Revenues | Impacted for some suppliers, facilities, or product lines | Climate change related matters are only one of the many factors in our product competitiveness and its revenue impact is difficult to quantify to the extent it would have a clear impact in the financial planning process. Significant new products introductions, like ReefShark/AirScale are taken into consideration in planning process in case those have significant impact on sales margin development, however it is impossible to factor the climate change related product revenue risks and opportunities in the financial planning. Magnitude of impact: low |
| Operating costs | Impacted for some suppliers, facilities, or product lines | Energy savings measures have some operating cost and cost savings impacts - for example in our facilities we speak about some millions of EUR annual impact (less than 10 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. Magnitude of impact: low |
| Capital expenditures / capital allocation | Not impacted | Climate change related matters are only one of the many factors in our product competitiveness and its impact on our capital allocation is difficult to quantify, but we have not experienced a clear, quantifiable impact on this area of our financial planning process. |
| Acquisitions and divestments | Not impacted | The identified climate change related risks and opportunities have not been factored into our acquisition and divestments related financial planning process as separate items. |
| Access to capital | Not impacted | We have disclosed our climate change related risk and opportunities to various financial institutions but so far we have not seen any meaningful implication to our access to capital. |
| Assets | Not impacted | Climate-related issues have not affected our financial planning process concerning our assets as our own operations are not energy intensive. |
| Liabilities | Not impacted | Climate change-related liabilities have not affected our financial planning process because with our current processes and management methods we do not expect to have such liabilities to materialize. Also, we are not in an energy intensive business. |
| Other | Please select | |

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

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

Yes, qualitative and quantitative

C3.1c

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

i) How our business strategy has been influenced by climate-related issues:

We take a systematic approach to identifying the opportunities and risks sustainability presents, and we aim to minimize the negative impact of our operations and to find new opportunities for revenue increase and cost savings. Sustainability and climate change with targets, activities and follow-up process is included in various business activities and related strategies. One of the key topics in our materiality analysis is “the Product energy efficiency and GHG emissions”. This is strategically important area as a major part of our customers’ operating costs are related to the energy use of communications networks and the following examples describe our strategy, targets and product decisions relevant especially to this area during 2018.

ii) How our business strategy is linked to an emissions reductions target or energy reduction target:

We were the first telco equipment vendor and one of the first 100 companies globally to have the Science-Based Targets for GHG emissions reductions approved. By 2030 we aim to reduce GHG emission compared to 2014 level: 41% reduction in our own operations (Scopes 1+2) and 75% reduction in the energy use of sold products (Scope 3). This decision has strategic importance as it helps our operator customers to reduce energy consumption and costs in their networks.

iii) The most substantial business decisions relevant to the reporting year made as a result of the integration of climate-related issues were:

For mobile service providers most of their carbon emissions come from the radio access network. 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.

Through 2018, we have dramatically expanded our AirScale Radio portfolio (4x more references), by introducing a wide range of single-band and multiband Remote Radio Heads, as well as 6-pipe AirScale Radio Frequency Module, exhibiting a peak energy efficiency at unit level as high as 34 percent across various frequency bands. AirScale portfolio deliveries have represented more than 40 percent of all our Macro BTS deliveries over the year, and shipped baseband capacity has increased by over 50 percent while keeping the energy footprint almost unchanged (+2 percent). Our Single RAN (SRAN) solution typically enables 45 percent lower energy consumption compared to the traditional way of building separate 2G, 3G and 4G radio networks.

Over 140 customers have installed energy efficiency software features to our products. In 2018 we experienced clear increase in market demand and for the first time ever over 10% of the Nokia radio products in the field have one or more energy efficiency software features activated.

During 2018 we also launched two key chipset innovations. Firstly, the new ReefShark chipsets, which leverage in-house silicon expertise to dramatically reduce the size, cost and power consumption of operators’ networks and meet the massive compute and radio requirements of 5G. We followed this up with the announcement of the Photonic Service Engine 3 chipset which enables maximum capacity over any distance and on any fiber - from metro to subsea - increasing capacity up to 65% over currently deployed networks while reducing power by 60%. Power savings support the challenge of reducing carbon footprint.

These and similar activities continue in 2019 in line with our 2030 Science-Based Targets to reduce our long term scope 1, 2 and 3 emissions.

C3.1d

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

| Climate-related scenarios | Details |
|--|---|
| <p>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 20%).)</p> | <p>We have selected the following scenarios: - IPCC scenarios of 1.5°C and 2.0°C to review our risks, opportunities and related implications to our business. - Scenario 2DS of IAE was a part of our Science Based 2030 Target setting for scope 1, 2 & 3. - In addition we have used various scenarios and case studies related to the energy price increases (such as 10% and 20%) and also analysed the possible financial impact of tropical cyclones caused by the climate change causing severe damage to 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 IAE ETP 2DS scenario - Carbon price / tax: sensitivity analysis based on current cost vs. 20% increase - Increased severity of extreme weather events such as cyclones and floods - Climate change impact on the fluctuating socio-economic conditions and related political and economic risks - Energy efficiency improvements & possible changes in technology, volumes etc. (as in SBTs) - 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 our Science Based Target (SBT) setting for emissions; - time frames 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 & product use (where the impact is the highest) The results of the conducted 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 - The higher risk of the extreme weather conditions: flood, precipitation, drought and water availability - The 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) IAE Scenario: was used as a basis of our SBT target setting 3) We also used 10-20% increase in our energy cost as an additional scenario - indicating that the direct impact would not be material for us as 20% increase in the energy cost would lead to €18million decrease in our profit. There are also some opportunities as technology, connectivity and IoT can help in reducing emissions and increase resilience against the negative consequences of the climate change (e.g. reliable communications infrastructure is essential in various catastrophic situations). Also the increased energy cost would shorten the payback time in our facility related energy efficiency investments. Overall the various scenarios and related analysis did not directly change Nokia’s business strategy, but the results have provided information for our risks and opportunity analysis and stressed the need for bigger and more urgent GHG reduction activities (IPCC) and acted as the basis of our Science Based Target (SBT) setting. The global warming of 1.5°C and increase further with 2°C would to some extent increase the likelihood and impact of the extreme weather conditions however this would not significantly change the results of our risk assessment/financials and related mitigation plans (business continuity, insurance etc.).</p> |

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

Scope

Scope 1 +2 (market-based)

% emissions in Scope

98

Targeted % reduction from base year

41

Base year

2014

Start year

2017

Base year emissions covered by target (metric tons CO2e)

710000

Target year

2030

Is this a science-based target?

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

% of target achieved

72.3

Target status

Underway

Please explain

Our organization submitted this target in April 2017 for Science-based Targets Initiative (SBTi) and SBTi successfully approved it in June 2017. We are on track with the target and result is assured as part of our sustainability assurance, as stated in our People and Planet 2018 report. We wanted to include also car fleet emission in our Science-based target (SBT), which has 2014 as base-year. Car fleet reporting anyhow started only in 2015 and hence 2015 emission value (44 900 tonnes) was used as proxy of 2014 car fleet value, to get a total Scope 1 base year 2014 value. This is explaining why our year 2014 total Scope 1 emissions reported in our People and Planet report is 44 900 tonnes smaller than the SBT 2014 baseline value. Target coverage is 98% as it excludes following minor facility related emission sources: Emissions from Hydro-Fluoro-Carbon (HFC) refrigerants; Emissions from fire suppression system losses; Non-combustion related CO2e from manufacturing, R&D and product development; Emissions from purchased cooling

Target reference number

Abs 2

Scope

Scope 3: Use of sold products

% emissions in Scope

80

Targeted % reduction from base year

75

Base year

2014

Start year

2017

Base year emissions covered by target (metric tons CO2e)

33060000

Target year

2030

Is this a science-based target?

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

% of target achieved

0

Target status

Underway

Please explain

Scope 3 emissions included in SBT are on target and are assured. We have set a Science Based Target (SBT) for 2030 (baseline 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 initial years, but over time emissions will decrease. For 2018, while product energy consumption and related emissions decreased due to our active research and development efforts, the amount of sold products increased. We also introduced new products on the markets, some of them with additional functionalities and improved energy efficiency but consuming more energy for some of them compared to previous generation, because of these new features. Our SBT for scope 3 includes the majority of product use time emissions, covering more than 80% of all scope 3 emissions. The SBT scope is smaller than our total Scope 3 emissions from use of sold products, and products within the scope of

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

Target

Renewable electricity consumption

KPI – Metric numerator

Achieve at least 25% utilization of renewable electricity, as compared to total purchased electricity.

KPI – Metric denominator (intensity targets only)

Base year

2018

Start year

2018

Target year

2018

KPI in baseline year

25

KPI in target year

25

% achieved in reporting year

100

Target Status

Achieved

Please explain

In 2018, 27% of our total purchased electricity was from renewable sources and we achieved our one year target. Result is assured. Renewable electricity target is set for one year at a time.

Part of emissions target

Renewable electricity percentage is one way for achieving SBT scope 1 and 2 target. New target 2019: Achieve at least 30% utilization of renewable electricity, compared to total purchased electricity.

Is this target part of an overarching initiative?

Science-based targets initiative

Target

Energy usage

KPI – Metric numerator

GWh. Achieve a total facility energy usage reduction of 3%, as compared to 2017 levels (Scopes 1+2).

KPI – Metric denominator (intensity targets only)

Base year

2017

Start year

2018

Target year

2018

KPI in baseline year

1285

KPI in target year

1217

% achieved in reporting year

100

Target Status

Achieved

Please explain

Our total energy consumption across our facilities decreased by 5% (from 1285 GWh to 1217 GWh) as compared to 2017 and we achieved our one year target. Result is assured. NEW target 2018: Achieve a facility electricity usage reduction of 3%, compared to 2018 level.

Part of 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

Target

Engagement with suppliers

KPI – Metric numerator

180 suppliers setting emission reduction targets by the end of 2020.

KPI – Metric denominator (intensity targets only)

Base year

2014

Start year

2016

Target year

2020

KPI in baseline year

71

KPI in target year

180

% achieved in reporting year

100

Target Status

Achieved

Please explain

In 2018, 187 of our suppliers had emission reduction targets in place via CDP Supply Chain program. Result is assured.

Part of emissions target

Is this target part of an overarching initiative?

Other, please specify (Supplier engagement target)

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 | 1 | 50000 |
| To be implemented* | 58 | 150000 |
| Implementation commenced* | 3 | 129725 |
| Implemented* | 58 | 138650 |
| 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 type

Low-carbon energy purchase

Description of initiative

Hydro

Estimated annual CO2e savings (metric tonnes CO2e)

72542

Scope

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)

36000

Payback period

No payback

Estimated lifetime of the initiative

<1 year

Comment

Finland and Germany GOO GOO Sites Green Power: 2,842 tCO2e Not Employing Green Power: 75,385 tCO2e Difference: 72,542 tCO2e Difference 72,542

Initiative type

Low-carbon energy purchase

Description of initiative

Wind

Estimated annual CO2e savings (metric tonnes CO2e)

54310

Scope

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)

45000

Payback period

No payback

Estimated lifetime of the initiative

<1 year

Comment

China iRECs

Initiative type

Low-carbon energy purchase

Description of initiative

Hydro

Estimated annual CO2e savings (metric tonnes CO2e)

2873

Scope

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)

6000

Payback period

No payback

Estimated lifetime of the initiative

<1 year

Comment

Belgium and Switzerland Green Tariffs

Initiative type

Energy efficiency: Building fabric

Description of initiative

Insulation

Estimated annual CO2e savings (metric tonnes CO2e)

23

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

2000

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

6000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Initiative type

Energy efficiency: Building services

Description of initiative

Building controls

Estimated annual CO2e savings (metric tonnes CO2e)

67

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

11000

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

27000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Initiative type

Energy efficiency: Building services

Description of initiative

HVAC

Estimated annual CO2e savings (metric tonnes CO2e)

1455

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

161000

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

402000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Initiative type

Energy efficiency: Building services

Description of initiative

Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

595

Scope

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

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

60000

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

151000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Initiative type

Energy efficiency: Building services

Description of initiative

Motors and drives

Estimated annual CO2e savings (metric tonnes CO2e)

453

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

95000

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

236000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

4102

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

628000

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

1570000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment**Initiative type**

Energy efficiency: Processes

Description of initiative

Machine replacement

Estimated annual CO2e savings (metric tonnes CO2e)

2230

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

227000

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

567000

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 1-3 year renewable energy purchase contracts. |
| Internal incentives/recognition programs | Monetary rewards based on normal (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 a set of sustainability requirements that set out what is required during construction projects and major renovations. These include 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

Nokia Zero Emission network offering is consisting of broad range of Nokia products. For mobile service providers most of their carbon emissions come from the radio access network, and 84% global warming potential comes from use phase of base station sites. Innovative AirScale radio base station solution (BTS) hardware and intelligent software cut base station energy consumption. The combination of greater energy efficiency and more cost-effective renewable energy sources are transforming the economics of radio access. Telecommunications networks are essential part of digital society, where Nokia's vision is to make it with zero emissions. Nokia is making considerable investments on low-carbon products. One example of Nokia innovations is liquid cooling for base station which enables up to 80% reduction of CO2 emission. World's first liquid cooling base station is in commercial operations in Elisa Finland network.

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 (Product energy efficiency, ETSI standard)

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

Comment

In 2018, the customer base station sites we modernized used on average 43% less energy than those where our customers did not modernize. This reduces the environmental impact from electricity consumption and is directly reflected as reduced costs for our customers, and a reduced carbon footprint. Nokia does not disclose individual product sales figures.

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)

169226

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 Scope 1 and Scope 2 emissions.

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

US EPA Climate Leaders: Direct HFC and PFC Emissions from Use of Refrigeration and Air Conditioning Equipment

US EPA Climate Leaders: Indirect Emissions from Purchases/ Sales of Electricity and Steam

US EPA Climate Leaders: Direct Emissions from Stationary Combustion

US EPA Climate Leaders: Direct Emissions from Mobile Combustion Sources

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)

135012.28

Start date

January 1 2018

End date

December 31 2018

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

436944.31

Scope 2, market-based (if applicable)

364914.69

Start date

January 1 2018

End date

December 31 2018

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 Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

5284000

Emissions calculation methodology

Emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers, representing 46% of total purchase spend in 2018 (53% in 2017). In 2018 we used a hybrid method, using emissions allocated for Nokia by the suppliers and also intensity based (GHG/€) allocation, where allocated emissions were not available or allocation was not reliable based on different internal quality measures. Collected data is then multiplied to cover 100% of spend. In 2018 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 a separate scope 3 category. 2018 disclosure is based on the latest CDP data representing suppliers' year 2017 emissions. We recognize that this emission category includes a lot of uncertainty, as suppliers have different qualities in their own reporting and in allocating emissions to Nokia, and due to the extrapolation Nokia does for data to represent 100% of Nokia spend.

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

46

Explanation

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

398200

Emissions calculation methodology

The relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. The threshold for inclusion is 0.5% of total Scope 1+2+3 emissions. Emissions from capital goods are based on financial data on property, plant, and equipment additions during the reporting year and estimated by using the GHG Protocol Scope 3 Evaluator tool.

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

0

Explanation

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>

Explanation

Fuel-and-energy-related activities are not considered relevant, because emissions are by calculation less than 0.1% of total Scope 3 emissions.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

384300

Emissions calculation methodology

Data includes emissions from inbound and outbound logistics. Data is based on the top 19 (17 in 2017) logistics supply partners (LSP) delivery data (tonne-km) and transportation mode. 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

Explanation

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>

Explanation

Emissions from waste generated in operations are not considered relevant, since emissions are as per screening exercise less than 0.1% of total Scope 3 emissions.

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO2e

81500

Emissions calculation methodology

Emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Supplied data includes distance travelled, 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. Emissions factors are obtained from EPA.

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

100

Explanation

Employee commuting

Evaluation status

Relevant, calculated

Metric tonnes CO2e

118400

Emissions calculation methodology

We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees.

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

0

Explanation

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>

Explanation

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>

Explanation

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 of this category were below 0.5% of 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>

Explanation

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

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

38410000

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 2018 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

Explanation

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>

Explanation

Not considered relevant. Based on an LCA done by Nokia 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>

Explanation

Emissions from downstream leased assets are not considered relevant because emissions are by calculation less than 0.1% of 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>

Explanation

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>

Explanation

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

Other (upstream)

Evaluation status

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>

Explanation

Other (downstream)

Evaluation status

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>

Explanation

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered 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

0.00002216

Metric numerator (Gross global combined Scope 1 and 2 emissions)

499926.97

Metric denominator

unit total revenue

Metric denominator: Unit total

22563000000

Scope 2 figure used

Market-based

% change from previous year

13.1

Direction of change

Decreased

Reason for change

The change is due to emission reduction activities, including the increased purchase of renewable energy and reduced amount of total purchased electricity. 2017: 25.51 tCO₂e/million euro 2018: 22.16 tCO₂e/million euro $((22.16 \text{ tCO}_2\text{e/million euro} - 25.51 \text{ tCO}_2\text{e/million euro})/25.51 \text{ tCO}_2\text{e/million euro}) * 100 = -13.1\%$

Intensity figure

0.24

Metric numerator (Gross global combined Scope 1 and 2 emissions)

499926.97

Metric denominator

square meter

Metric denominator: Unit total

2082326

Scope 2 figure used

Market-based

% change from previous year

12.2

Direction of change

Decreased

Reason for change

The change is due to emission reduction activities, including the increased purchase of renewable energy and reduced amount of total purchased electricity. 2017: 0.274 tCO₂e/m² 2018: 0.240 tCO₂e/m² $((0.240 \text{ tCO}_2\text{e/m}^2 - 0.274 \text{ tCO}_2\text{e/m}^2)/0.274 \text{ tCO}_2\text{e/m}^2) * 100 = -12.2\%$

Intensity figure

4.94

Metric numerator (Gross global combined Scope 1 and 2 emissions)

499926.97

Metric denominator

full time equivalent (FTE) employee

Metric denominator: Unit total

101203

Scope 2 figure used

Market-based

% change from previous year

14

Direction of change

Decreased

Reason for change

The change is due to emission reduction activities, including the increased purchase of renewable energy and reduced amount of total purchased electricity. 2017: 5.75 tCO2e/employee 2018: 4.94 tCO2e/employee $((4.94 \text{ tCO}_2\text{e/employee} - 5.75 \text{ tCO}_2\text{e/employee}) / 5.75 \text{ tCO}_2\text{e/employee}) * 100 = -14.0\%$

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 | 133174.52 | IPCC Fifth Assessment Report (AR5 – 100 year) |
| CH4 | 147.35 | IPCC Fifth Assessment Report (AR5 – 100 year) |
| N2O | 543.24 | IPCC Fifth Assessment Report (AR5 – 100 year) |
| HFCs | 584.59 | IPCC Fifth Assessment Report (AR5 – 100 year) |
| Other, please specify (HFCs) | 562.58 | IPCC Fifth Assessment Report (AR5 – 100 year) |

C7.2

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

| Country/Region | Scope 1 emissions (metric tons CO2e) |
|---------------------------------------|--------------------------------------|
| Americas | 18978.57 |
| Europe, Middle East and Africa (EMEA) | 7910.32 |
| Asia Pacific (or JAPA) | 45.8 |
| India | 2328.78 |
| China | 876.58 |
| Other, please specify (Worldwide) | 104872.23 |

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 | 91.41 |
| Emissions from combustion of diesel in facility-associated mobile vehicles | 71.44 |
| Emissions from combustion of propane in facility-associated mobile vehicles | 0.22 |
| Emissions from combustion of natural gas in facility operations | 25030.72 |
| Emissions from combustion of diesel and fuel oil in facility operations | 2731.7 |
| Emissions from combustion of LPG in facility operations | 176.45 |
| Emissions from fuel cell employing natural gas to generate electricity | 890.9 |
| Emissions from refrigerant leaks | 1147.17 |
| Emissions from fire-fighting activities | 0.05 |
| Emissions from combustion of gasoline fuel in marine fleet | 64041.06 |
| Emissions from combustion of fuel oil in marine fleet | 8855.16 |
| Emissions from fuel combustion in car fleet | 31976 |

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 in market-based approach (MWh) |
|---------------------------------------|--|--|--|--|
| Americas | 113430.93 | 115049.57 | 311495.36 | 0 |
| Asia Pacific (or JAPA) | 12098.46 | 12098.46 | 20687.38 | 0 |
| Europe, Middle East and Africa (EMEA) | 127645.78 | 108307.93 | 451541.58 | 182309.89 |
| China | 105781.04 | 51470.63 | 174440.38 | 86207 |
| India | 77988.1 | 77988.1 | 106745.28 | 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 emissions (metric tons CO2e) | Scope 2, market-based emissions (metric tons CO2e) |
|--|--|--|
| Emissions from purchased electricity | 419364.75 | 347335.12 |
| Emissions from purchased chilled water | 442.27 | 442.27 |
| Emissions from delivered cooling | 7419.06 | 7419.06 |
| Emissions from delivered heating | 9443.84 | 9443.84 |
| Emissions from purchased steam | 274.39 | 274.39 |

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 | 39773 | Decreased | 6.7 | $(-39,773 \text{ tCO}_2\text{e}/590,427 \text{ tCO}_2\text{e}) * 100 = -6.7\%$ |
| Other emissions reduction activities | 46133 | Decreased | 7.8 | $(-46,133 \text{ tCO}_2\text{e}/590,427 \text{ tCO}_2\text{e}) * 100 = -7.8\%$ |
| Divestment | 0 | No change | 0 | |
| Acquisitions | 0 | No change | 0 | |
| Mergers | 0 | No change | 0 | |
| Change in output | 4594 | Decreased | 0.8 | $(-4,594 \text{ tCO}_2\text{e}/590,427 \text{ tCO}_2\text{e}) * 100 = -0.8\%$ |
| Change in methodology | 0 | No change | 0 | |
| Change in boundary | 0 | No change | 0 | |
| Change in physical operating conditions | 0 | No change | 0 | |
| Unidentified | 0 | No change | 0 | |
| Other | 0 | No change | 0 | |

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 undertakes this energy-related activity |
|--|--|
| 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 MWh |
|---|---------------------------|----------------------------|--------------------------------|------------|
| Consumption of fuel (excluding feedstock) | LHV (lower heating value) | 0 | 430871.69 | 430871.69 |
| Consumption of purchased or acquired electricity | <Not Applicable> | 268516.89 | 736900.65 | 1005417.54 |
| Consumption of purchased or acquired heat | <Not Applicable> | 0 | 41683.66 | 41683.66 |
| Consumption of purchased or acquired steam | <Not Applicable> | 0 | 1211.15 | 1211.15 |
| Consumption of purchased or acquired cooling | <Not Applicable> | 0 | 16597.63 | 16597.63 |
| Consumption of self-generated non-fuel renewable energy | <Not Applicable> | 0 | <Not Applicable> | 0 |
| Total energy consumption | <Not Applicable> | 268516.89 | 1227264.78 | 1495781.67 |

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)**

Diesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

262.96

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>

Comment

Fuel employed for facility mobile sources. Fuel is not employed for car fleet. Direct CO2e emissions from our mobile fleet are tracked by obtaining information from country specific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO2 emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation.

Fuels (excluding feedstocks)

Motor Gasoline

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

347.28

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>

Comment

Fuel employed for facility mobile sources. Fuel is not employed for car fleet. Direct CO2e emissions from our mobile fleet are tracked by obtaining information from country specific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO2 emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation.

Fuels (excluding feedstocks)

Propane Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

1

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>

Comment

Fuel employed for facility mobile sources

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

140345.01

MWh fuel consumed for self-generation of electricity

2221.83

MWh fuel consumed for self-generation of heat

124310.86

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

13812.32

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

90% heat, 10% cooling

Fuels (excluding feedstocks)

Distillate Oil

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

10789.06

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

1078.91

MWh fuel consumed for self-generation of steam

9710.15

MWh fuel consumed for self-generation of cooling

0

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

90% steam, 10% heat

Fuels (excluding feedstocks)

Liquefied Petroleum Gas (LPG)

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

834.71

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

834.71

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>

Comment

Fuels (excluding feedstocks)

Marine Gas Oil

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

246024.25

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>

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

32267.42

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>

Comment

Fuel employed by marine vessels

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Diesel

Emission factor

0.00272

Unit

metric tons CO₂e per liter

Emission factor source

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

Comment

0.01029 tCO₂e/gal

Distillate Oil

Emission factor

0.0742

Unit

metric tons CO₂e per million Btu

Emission factor source

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

Comment

Liquefied Petroleum Gas (LPG)

Emission factor

0.06195

Unit

metric tons CO₂e per million Btu

Emission factor source

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

Comment

Marine Fuel Oil

Emission factor

0.00273

Unit

metric tons CO₂e per liter

Emission factor source

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

Comment

0.01033 tCO₂e/gal

Marine Gas Oil

Emission factor

0.00234

Unit

metric tons CO2e per liter

Emission factor source

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

Comment

0.00886 tCO2e/gal

Motor Gasoline

Emission factor

0.00234

Unit

metric tons CO2e per liter

Emission factor source

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

Comment

0.00885 tCO2e/gal

Natural Gas

Emission factor

0.05311

Unit

metric tons CO2e per million Btu

Emission factor source

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

Comment

2,221,833 kwh of natural gas employed in fuel cell: 0.401 tCO2e/MWh Bloom Energy

Propane Gas

Emission factor

0.00152

Unit

metric tons CO2e per liter

Emission factor source

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

Comment

0.00575 tCO2e/gal

C8.2e

(C8.2e) 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 | 2221.83 | 2221.83 | 0 | 0 |
| Heat | 126224.48 | 126224.48 | 0 | 0 |
| Steam | 9710.15 | 9710.15 | 0 | 0 |
| Cooling | 13812.32 | 13812.32 | 0 | 0 |

C8.2f

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

Basis for applying a low-carbon emission factor

Energy attribute certificates, I-RECs

Low-carbon technology type

Wind

Region of consumption of low-carbon electricity, heat, steam or cooling

Asia Pacific

MWh consumed associated with low-carbon electricity, heat, steam or cooling

86207

Emission factor (in units of metric tons CO2e per MWh)

0

Comment

Basis for applying a low-carbon emission factor

Energy attribute certificates, Guarantees of Origin

Low-carbon technology type

Hydropower

Region of consumption of low-carbon electricity, heat, steam or cooling

Europe

MWh consumed associated with low-carbon electricity, heat, steam or cooling

159689.67

Emission factor (in units of metric tons CO2e per MWh)

0

Comment

Basis for applying a low-carbon emission factor

Contract with suppliers or utilities (e.g. green tariff), not supported by energy attribute certificates

Low-carbon technology type

Hydropower

Region of consumption of low-carbon electricity, heat, steam or cooling

Europe

MWh consumed associated with low-carbon electricity, heat, steam or cooling

22620.22

Emission factor (in units of metric tons CO2e per MWh)

0

Comment

C9. Additional metrics

C9.1

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

Description

Energy usage

Metric value

268516892

Metric numerator

kwh of renewable electricity

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

28.4

Direction of change

Increased

Please explain

2018 Goal: Achieve at least 25% utilization of renewable electricity as compared to total purchased electricity. 2018 Result: 26.7% of our total purchased electricity was from renewable sources. Exceeded Goal $(268,516,892 \text{ kwh}/1,005,417,542 \text{ kwh}) * 100 = 26.7\%$
 2017: 209,178,816 kwh renewable electricity 2018: 268,516,892 kwh renewable electricity $((268,516,892 \text{ kwh}-209,178,816 \text{ kwh})/209,178,816 \text{ kwh}) * 100 = 28.4\%$

Description

Energy usage

Metric value

1005417542

Metric numerator

kwh purchased electricity

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

3.3

Direction of change

Decreased

Please explain

2018 Goal: Achieve a facility electricity usage reduction of 3%, compared to 2017 usage. 2018 Result: Electricity consumption across our facilities decreased by 3.3 % as compared to 2017. Exceeded Goal 2017: 1,039,455,290 kwh 2018: 1,005,417,542 kwh $((1,005,417,542 \text{ kwh}-1,039,455,290 \text{ kwh})/1,039,455,290 \text{ kwh}) * 100 = -3.3\%$

Description

Energy usage

Metric value

347335

Metric numerator

tCO2e

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

18

Direction of change

Decreased

Please explain

2018 Goal: Achieve a GHG emission reduction of 1.8% from electricity usage, compared to 2017 level. 2018 Result: GHG emissions from electricity usage decreased by 18.0% as compared to 2017. Exceeded Goal 2017: 423,384 tCO2e 2018: 347,335 tCO2e $((347,335 \text{ kwh}-423,384 \text{ kwh})/423,384 \text{ kwh}) * 100 = 18.0\%$

Description

Other, please specify (Water Conservation)

Metric value

1790783

Metric numerator

m3

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

22

Direction of change

Decreased

Please explain

2018 Goal: Reduce the water use in our facilities by 2% compared to 2017. 2018 Result: Water use decreased by 22% as compared to 2017. Exceeded Goal 2017: 2,305,063 m3 2018: 1,790,783 m3 $((1,790,783 \text{ m}^3 - 2,305,063 \text{ m}^3) / 2,305,063 \text{ m}^3) * 100 = 22\%$

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 and/or Scope 2 emissions and attach the relevant statements.

Scope

Scope 1

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_2018.pdf

Page/ section reference

Pages 186-187

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

Scope

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_2018.pdf

Page/ section reference

Pages 186-187

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

Scope

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_2018.pdf

Page/ section reference

Pages 186-187

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

C10.1b

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

Scope

Scope 3- at least one applicable category

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Attach the statement

Nokia_People_and_Planet_Report_2018.pdf

Page/section reference

Pages 186-187

Relevant standard

ISAE3000

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 (Revised) | Related to CDP C4.1a, Progress against 2030 Science-based targets (both Scope1&2 and Scope3) are assured. These are key environmental targets for us and hence we wanted to get further strength on our progress reporting by getting third party confirmation. Assurance statement is available in page 186 of attached People&Planet 2018 Report. Nokia_People_and_Planet_Report_2018.pdf |
| C12. Engagement | Emissions reduction activities | ISAE3000 (Revised) | Related to CDP C12.1b, we wanted below claim to be assured: "Energy savings achieved in 2018 due to network modernization." Average energy savings for customers whose networks we modernized were 43% in 2018 (compared to non-modernized networks): energy savings in this scale are also financially significant for our customers. Third party assurance brings more credibility for this kind of big claims. Assurance statement is available in page 186 of attached People&Planet 2018 Report. Nokia_People_and_Planet_Report_2018.pdf |
| C8. Energy | Other, please specify | ISAE3000 (Revised) | Related to CDP C8.2a, 8.2c and 8.2f following statements are assured: "Energy consumption within Nokia, by types of energy (GWh) and change to 2017 (%)" and "Renewable electricity amount (GWh) and portion of total electricity consumption (%)." This data is assured to provide further confidence on our energy and renewable electricity targets. Assurance statement is available in page 186 of attached People&Planet 2018 Report. Nokia_People_and_Planet_Report_2018.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 in which you participate or anticipate participating?

We are at the moment not aware of our operations or activities becoming regulated by a carbon pricing system, especially as we are not in an energy intensive sector. Anyhow, as we have operations in around 120 countries and carbon pricing systems seem to get 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, while 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, which would help also if we would get regulated, we have contracted with a multinational corporation that specializes in energy management to assist us in designing potential approaches. 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

% total procurement spend (direct and indirect)

52

% Scope 3 emissions as reported in C6.5

6

Rationale for the coverage of your engagement

How we are engaging: 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. As part of the qualification criteria to diamond awards, we have sustainability score which includes CDP performance of the supplier. Why we are engaging: 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 6) whether our suppliers engage their own suppliers and 6) if they propose collaborative climate projects with us. We have noticed a learning curve among our suppliers; some do not even respond in the first year but start to report more advanced climate data and actions after a year or so. In 2018, we invited 505 (508 in 2017) suppliers to respond to the CDP Supply Chain questionnaire. Out of those, 132 suppliers attended CDP climate change webinars, 314 responded to the CDP questionnaire (292 in 2017) and 211 (153 in 2017) reported reductions in GHG emissions. 178 out of the respondents stated that Nokia's requests or initiatives prompted them to take climate actions (20 in 2017). 187 (153 in 2017) suppliers had active targets for emission reduction. During the reporting year the total savings from our suppliers' carbon reduction initiatives was 15 million metric tons of CO₂e and approximately EUR 637 million. 143 (97 in 2017) suppliers reported that they engaged their own suppliers and 63 (89 in 2017) 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 2018 we made 364 supply chain sustainability audits, including 75 in-depth onsite audits. There were 99 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

2

% total procurement spend (direct and indirect)

46

% Scope 3 emissions as reported in C6.5

5

Rationale for the coverage of your engagement

How we are engaging: 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. Why we are engaging: 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 2018 around 2% suppliers by number reported to us, covering anyhow around 46% of supplier spend and around 40% 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 314 in 2018). In 2018, 118 (130 in 2017) of our suppliers calculated a Nokia allocation of their emissions based on the products and services we purchase from them and 88 (49 in 2017) suppliers provided emissions intensity data. Using hybrid methodology for calculation, based on supplier information, our emissions with participating suppliers totaled around 2.1 million metric tons of CO₂e (592 288 in 2017). Altogether the collected GHG data represented 46% of total purchase spend in 2018 (53% in 2017). By scaling up the allocated emissions to 100% of our suppliers, we estimated our scope 3 emissions from our supply chain to be approximately 5.3 million metric tons of CO₂e (1.4 million in 2017).

Comment

The emissions discussed in this response are covering Scope 3 Category 1, Purchased good and services. Suppliers providing transportation services for products are excluded from the provided statistics, as "emissions from transportation and distribution" are reported in a separate scope 3 category (#4) and we have a separate process to manage logistics service providers (LSPs), even though some of LSPs are covered also by our CDP Supply chain program.

C12.1b

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

Type of engagement

Education/information sharing

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

80

% Scope 3 emissions as reported in C6.5

66

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

85% of our total carbon footprint is caused by the use of sold products and the largest contributor is our Mobile Networks business group. So we are targeting with our Zero Emission offering especially our Mobile Networks customers. In 2018 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, with which we targeted all our Mobile Networks customers. In 2018 we also had in United States with our North American operator customers a climate dialogue, where we shared our science-based targets approach, shared best practises on climate and environmental programs and discussed on energy efficiency features and roadmaps of Nokia's products and services. We are working on improving product energy efficiency in other business units as well and our Science-based targets cover also other Nokia's Networks business related business units.

Impact of engagement, including measures of success

We have extended our zero-emissions radio network offering, which includes over thirty products and services. Our AirScale radio base station solution (BTS) spearheads our commitment to helping our customers build a sustainable business supported by a zero emissions network. For mobile service providers most of their carbon emissions come from the radio access network. We measured success e.g. by following the sales leads consequential from the marketing campaign, tracking the amount of base stations our customers modernized with our new, efficient equipment and energy savings achieved with the modernization. We follow also number of customers using our Zero Emissions products, like AirScale base stations and number of customers using energy efficiency software features, as well share of radio products in the field (i.e. in use by our customers) having energy efficiency features activated. Through 2018, we have dramatically expanded our AirScale Radio portfolio (4x more references), by introducing a wide range of single-band and multiband Remote Radio Heads, as well as 6-pipe AirScale Radio Frequency Module, exhibiting a peak energy efficiency at unit level as high as 34 percent across various frequency bands. AirScale portfolio deliveries have represented more than 40 percent (20% in 2017) of all our Macro base station deliveries over the year, and compared to 2017, shipped baseband capacity has increased by over 50 percent while keeping the energy footprint almost unchanged. We have 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/busy traffic conditions. Over 140 customers have installed energy efficiency software features to our products. In 2018 we experienced clear increase in market demand and for the first time ever over 10% of the Nokia radio products in the field have one or more energy efficiency software features activated. In 2018, the customer base station sites we modernized used on average 43% less energy than those where our customers did not modernize. For further information, please access a video at <https://networks.nokia.com/airscale/target-zero-emissions>

Type of engagement

Collaboration & innovation

Details of engagement

Run a campaign to encourage innovation to reduce climate change impacts

% of customers by number**% Scope 3 emissions as reported in C6.5**

66

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

In 2018 we were demonstrating liquid cooling for mobile base stations for our Mobile Networks customers. We targeted these customers for the innovation campaign, as 85% of our total carbon footprint is caused by the use of sold products and the largest contributor is our Mobile Networks business group. We believe we need to lead innovations which can lead to considerable positive changes in the fight against the climate change.

Impact of engagement, including measures of success

About 90% of the energy used by base stations is converted to waste heat. We can convert with liquid cooling 80% of that waste heat to usable heat. We measure the success of the innovation campaign by number of successful customer pilots where we further continue to develop innovative approaches and which will lead to new commercial products and services and will then reduce carbon emissions further. In 2018 we implemented the world's first liquid cooled 2G, 3G and 4G base stations in commercial operations in Elisa Finland network, in Satakuntatalo Helsinki. In addition we had ongoing pilot discussions with several customers around the world.

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. 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 2018, measurement methodology work related to 5G radio energy efficiency continued as an addition to existing ETSI energy efficiency standards for mobile networks. Nokia contributed also to the work of Special Task Force STF16, which was finalised in 2018, with 13 standards related to energy consumption and energy efficiency test methods for mobile networks and their components.

When it comes to ITU-T standardization, Nokia is co-editor of the work on "Methodologies for the assessment of the environmental impact of the information and communication technology sector". This recommendation defines the methodologies needed to calculate the footprint of the ICT sector with respect to life cycle GHG emissions and as such represents a major step towards a potential sectoral guidance document for the ICT sector.

In mid-2018, Nokia was involved in initiating contacts between ITU-T and SBTi (joint initiative by CDP, the UN Global Compact, the World Resource Institute and WWF international), in order to work jointly on development of GHG emission trajectories for the ICT sector, and sub-sectors with figures for 2025, 2030 and 2050.

Nokia is also involved as co-editor in ITU-T work on a methodology for assessing the aggregated positive contributions of ICT to other business 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 contributing to the ITU-T 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, 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.

First of all, on high-level, environmental management, including climate change topics, as well "working with governments" are part of Nokia Code of Conduct (CoC) and there is an annual mandatory CoC training for all employees. (95% completion rate in 2018). As part of our certified Environmental management system we also conduct different environmental trainings and conduct internal audits, in addition to the external audits done by a third party, to check consistency against our internal guidelines.

When it comes to governance, Government Relations (GR), Corporate Responsibility and Environmental 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 of messaging even different experts across Nokia may engage in different work streams of different industry associations across continents.

Issues are discussed also at management team level, for example in the Responsibility 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 voluntary sustainability report

Status

Complete

Attach the document

Nokia_People_and_Planet_Report_2018.pdf

Page/Section reference

Please refer especially to sections: Page 12 onwards: Our sustainability priorities and impacts Page 33 onwards: Managing sustainability Page 54 onwards: Protecting the environment Page 111 onwards: Climate impacts – helping suppliers reduce and report Page 164 onwards: Key data and reporting principles

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Publication

In mainstream reports

Status

Complete

Attach the document

nokia_ar18_en.pdf

Page/Section reference

Please refer to pages 50-54, 56

Content elements

Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

C14. 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.

C14.1

(C14.1) 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) |

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

Nokia recognizes its social role and responsibilities as a key telecommunications equipment and services supplier to its global customer base, and therefore supports its customers' sustainability goals. We continued our work with our customers, both communication service providers and enterprise, in a number of key areas of sustainability including energy and resource efficiency, efficient manufacturing, and supply chain transparency. Our greatest positive impact in the fight against climate change comes through the products we supply to our customers, helping them reduce their carbon footprint with more energy efficient products.

The integrity of our supply chain is a critical but complex component of our own reputation and we work hard to collaborate with both customers and suppliers to drive transparency, sustainability and good ethical and business practice in the supply chain. The majority of our manufacturing suppliers are based in Asia, whereas our services suppliers are located around the world.

In 2018, we had business with approximately 14 000 suppliers, 80 percent of our total supplier spend was distributed across approximately 450 suppliers. Our final assembly included our own factories in Finland, India and Poland as well as Flextronics, Foxconn, Jabil and Sanmina supplier sites. Our Supplier Requirements are communicated to our

suppliers as part of our supplier contracts, and we expect our suppliers to commit to these as part of their contractual obligations. An overview of those requirements can be found on our website. The requirements cover social, ethical and environmental issues. In addition, we have detailed appendices covering environmental requirements including Nokia

Substance List applicable for hardware suppliers and health and safety for services suppliers.

All our suppliers, except those with very low environmental impact, are required to have a documented Environmental Management System (EMS) in place. For key suppliers and for those with greater impacts, we require certification to ISO 14001, which we track through our audits and assessments. We jointly create environmental improvement programs in order to improve our upstream Scope 3 emissions reporting through the CDP Supply Chain Program (overall Scope 3 equals all indirect emissions that occur in our value chain, including upstream and downstream). We encourage our key suppliers to report their climate impacts and set carbon reduction targets through CDP and work with them to build improvement programs.

In 2018, 314 of our key suppliers, an increase of 22 from 2017, representing 46 percent of our total procurement spend, responded to the CDPs request to disclose their climate performance information. Of these 247 disclosed their carbon emissions (an increase of 33 from 2017) and 187 also provided emission reduction targets (an increase of 34 from 2017). The total saving from these carbon reduction initiatives was 14.6 million metric tons CO2e and around USD 726.3 million during the course of the year. It should also be noted that 143 suppliers engaged their next tier in CO2 reporting. In addition, 118 of our suppliers calculated a Nokia allocation of their emissions based on the products and services we purchase from them and 88 suppliers provided emissions intensity data. Using a hybrid methodology for calculation, based on supplier information for Scope 1 and 2 emissions, our emissions with participating suppliers totaled 2.1 million metric tons of CO2e. By scaling up the allocated emissions to 100 percent of our suppliers, we estimated our scope 3 emissions from our supply chain to be approximately 5.3 million metric tons of CO2e.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

| | Annual Revenue |
|-------|----------------|
| Row 1 | 22643000000 |

SC0.2

(SC0.2) Do you have an ISIN for your company that you would be willing to share with CDP?

Yes

SC0.2a

(SC0.2a) Please use the table below to share your ISIN.

| | ISIN country code (2 letters) | ISIN numeric identifier and single check digit (10 numbers overall) |
|-------|-------------------------------|---|
| Row 1 | FI | 0009000681 |

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

Requesting member

Alphabet, Inc.

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

481.7

Uncertainty (±%)

10

Major sources of emissions

Direct CO2e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO2e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO2), Hydrofluorocarbons (HFCs), Methane (CH4), Nitrous oxide (N2O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF6). CO2 equivalent (CO2e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO2e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO2 emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the

case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO₂e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

AT&T Inc.

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

8827.5

Uncertainty (±%)

10

Major sources of emissions

Direct CO₂e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO₂e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO₂), Hydrofluorocarbons (HFCs), Methane (CH₄), Nitrous oxide (N₂O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆). CO₂ equivalent (CO₂e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO₂e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO₂ emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO₂e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

BT Group

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

1897.8

Uncertainty (±%)

10

Major sources of emissions

Direct CO2e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO2e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO2), Hydrofluorocarbons (HFCs), Methane (CH4), Nitrous oxide (N2O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF6). CO2 equivalent (CO2e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO2e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO2 emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO2e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

California Department of General Services (DGS)

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

3.6

Uncertainty (±%)

10

Major sources of emissions

Direct CO2e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO₂e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO₂), Hydrofluorocarbons (HFCs), Methane (CH₄), Nitrous oxide (N₂O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆). CO₂ equivalent (CO₂e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO₂e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO₂ emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO₂e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

Cellnex Telecom SA

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

8.3

Uncertainty (±%)

10

Major sources of emissions

Direct CO₂e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO₂e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO₂), Hydrofluorocarbons (HFCs), Methane (CH₄), Nitrous oxide (N₂O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆). CO₂ equivalent (CO₂e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO₂e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage

and official CO2 emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO2e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

Chunghwa Telecom

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

221.6

Uncertainty (±%)

10

Major sources of emissions

Direct CO2e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO2e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO2), Hydrofluorocarbons (HFCs), Methane (CH4), Nitrous oxide (N2O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF6). CO2 equivalent (CO2e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO2e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO2 emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO2e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

Deutsche Telekom AG

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

9030

Uncertainty (±%)

10

Major sources of emissions

Direct CO2e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO2e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO2), Hydrofluorocarbons (HFCs), Methane (CH4), Nitrous oxide (N2O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF6). CO2 equivalent (CO2e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO2e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO2 emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO2e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

Endesa

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

3

Uncertainty (±%)

10

Major sources of emissions

Direct CO2e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO₂e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO₂), Hydrofluorocarbons (HFCs), Methane (CH₄), Nitrous oxide (N₂O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆). CO₂ equivalent (CO₂e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO₂e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO₂ emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO₂e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

Fujitsu Limited

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

231.7

Uncertainty (±%)

10

Major sources of emissions

Direct CO₂e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO₂e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO₂), Hydrofluorocarbons (HFCs), Methane (CH₄), Nitrous oxide (N₂O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆). CO₂ equivalent (CO₂e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the

emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO₂e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO₂ emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO₂e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

Sky plc

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

79.6

Uncertainty (±%)

10

Major sources of emissions

Direct CO₂e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO₂e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO₂), Hydrofluorocarbons (HFCs), Methane (CH₄), Nitrous oxide (N₂O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆). CO₂ equivalent (CO₂e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO₂e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO₂ emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO₂e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

Swisscom

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

124.7

Uncertainty (±%)

10

Major sources of emissions

Direct CO2e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO2e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO2), Hydrofluorocarbons (HFCs), Methane (CH4), Nitrous oxide (N2O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF6). CO2 equivalent (CO2e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO2e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO2 emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO2e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

Vodafone Group

Scope of emissions

Scope 1

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

5764.2

Uncertainty (±%)

10

Major sources of emissions

Direct CO2e emissions from Nokia facilities include GHG emissions resulting from the combustion of oil and gas within Nokia facilities, along with minor direct releases of GHGs associated with refrigerant leakage from facilities' cooling systems. Emissions are calculated by using emission factors published by United States Environmental Protection Agency (EPA).

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Greenhouse gases: We report the emissions as CO₂e as per GHG Protocol's guidance. GHG Protocol is including six groups of greenhouse gases related to the Kyoto Protocol: Carbon dioxide (CO₂), Hydrofluorocarbons (HFCs), Methane (CH₄), Nitrous oxide (N₂O), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆). CO₂ equivalent (CO₂e) is the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Operational boundaries and emission calculation We use the "operational control" approach for setting organizational boundaries for our GHG emissions inventory. We use emission factors available at the end of the reporting year. From 2018 reporting onwards we have decided to follow GHG Protocol recommendation to use IPCC 5th Assessment Report (AR5) GWP100 values. These values do not include climate-carbon feedbacks. Some emission factor data sources still use GWP100 values from AR4 as a data source of their emission factors. The expectation is that all data sources will start to use AR5 values in the coming years. Where we use IEA Emission factors developed by the International Energy Agency, OECD/IEA, the emission calculations have been prepared by Nokia and do not necessarily reflect the views of the International Energy Agency. Scope 1 Emissions (additional notes): Direct CO₂e emissions from our mobile fleet are tracked by obtaining information from countryspecific leasing suppliers, which are consolidated into one system. Emissions calculation is based on actual driven mileage and official CO₂ emission value per km of each car make and model. Applicable emission factors are sourced from car manufacturers. As an exception, in the USA emissions are calculated based on driven mileages and actual fuel consumption. In the case that the distance travelled is not available from the leasing supplier, the budgeted annual mileage in the leasing contract is used for calculation. Direct CO₂e emissions from our marine fleet are calculated based on the fuel type and fuel usage of marine vessels. Alcatel Submarine Networks maintains a listing of all owned vessels with associated fuel consumption. All GHG estimation procedures are based on individual vessel assessments.

Requesting member

Alphabet, Inc.

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

1307

Uncertainty (±%)

10

Major sources of emissions

Indirect CO₂e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

AT&T Inc.

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

23949

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

BT Group

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

5148.9

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

California Department of General Services (DGS)

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

9.7

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

Cellnex Telecom SA

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

22.6

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

Chunghwa Telecom

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

601.1

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

Deutsche Telekom AG

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

24498.6

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

Endesa

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

8.1

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

Fujitsu Limited

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

628.5

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

Sky plc

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

215.9

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

Swisscom

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

338.4

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

Vodafone Group

Scope of emissions

Scope 2

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

15638.3

Uncertainty (±%)

10

Major sources of emissions

Indirect CO2e emissions include emissions from purchased electricity, heating, and cooling.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

GHG emissions associated with purchased steam and heat are calculated employing the applicable EPA emission factor, which is based on the assumption that natural gas was used to fuel a boiler exhibiting an efficiency of 80%. GHG emissions associated with purchased chilled water and cooling are calculated employing the same country emissions factors as electricity, based on an assumed efficiency of 100%. Emissions avoided due to the purchase of renewable energy are verified utilizing Guarantees of Origin (GOs) and Green Tariffs in Europe, as well as International Renewable Energy Certificates (I-REC) in China.

Requesting member

Alphabet, Inc.

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

160006.2

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is

obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: 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. Since 2018 we use IEA's latest world average CO₂e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

AT&T Inc.

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2932000.5

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: 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. Since 2018 we use IEA's latest world average CO₂e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

BT Group

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

630357.4

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: The calculation formula is following: $\sum [\text{total lifetime expected uses of products (hours)} \times \text{number of products sold in reporting period} \times \text{products power consumption (kW)} \times \text{emission factor for electricity (kg CO2e/kWh)}]$. Data covers products from Nokia's Network business groups. Product use time varies between 6 and 15 years, depending on the products. Since 2018 we use IEA's latest world average CO2e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

California Department of General Services (DGS)

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

1183.8

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: The calculation formula is following: $\sum [\text{total lifetime expected uses of products (hours)} \times \text{number of products sold in reporting period} \times \text{products power consumption (kW)} \times \text{emission factor for electricity (kg CO}_2\text{e/kWh)}]$. Data covers products from Nokia's Network business groups. Product use time varies between 6 and 15 years, depending on the products. Since 2018 we use IEA's latest world average CO₂e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

Cellnex Telecom SA

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

2762.1

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream

transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: 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. Since 2018 we use IEA's latest world average CO₂e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

Chunghwa Telecom

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

73591

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: 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. Since 2018 we use IEA's latest world average CO₂e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not

applicable, as this category is designed primarily for private financial institutions.

Requesting member

Deutsche Telekom AG

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

2999278.1

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: 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. Since 2018 we use IEA's latest world average CO2e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

Endesa

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

986.5

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: The calculation formula is following: \sum [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. Since 2018 we use IEA's latest world average CO₂e-emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

Fujitsu Limited

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

76945

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each

year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: 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. Since 2018 we use IEA's latest world average CO₂e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

Sky plc

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO₂e

26437.5

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: 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. Since 2018 we use IEA's latest world average CO₂e -emission factor. 12. End-of-life treatment of sold

products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

Swisscom

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

41431.9

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: 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. Since 2018 we use IEA's latest world average CO2e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

Requesting member

Vodafone Group

Scope of emissions

Scope 3

Allocation level

Company wide

Allocation level detail

<Not Applicable>

Emissions in metric tonnes of CO2e

1914550.4

Uncertainty (±%)

20

Major sources of emissions

Purchased goods and services, upstream transportation and distribution, business travel, employee commuting, downstream transportation and distribution, use of sold products.

Verified

No

Allocation method

Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

1. Purchased goods and services: emissions are reported based on data collected with CDP Climate Survey from Nokia's biggest suppliers. 2. Capital goods: the relevance of emissions from this category to be included in the Scope 3 inventory is assessed each year, as capital goods purchases vary from year to year. 3. Fuel and energy related activities not included in Scope 1 and 2: not presently being assessed, because emissions are by calculation less than 0.1% of total Scope 3 emissions. 4. Upstream transportation and distribution: Data includes emissions from inbound and outbound logistics. 5. Waste generated in operations: not presently being assessed because emissions are by calculation less than 0.1% of total Scope 3 emissions. 6. Business travel: emissions are reported for business air travel, which has the biggest impact out of business travel modes. Travel information is obtained from our assigned Travel Agencies. Emissions factors are obtained from EPA. 7. Employee commuting: We conducted an employee commuting survey in 2018. Survey results are a representative sample from several countries. Those results are prorated to represent commuting of all employees. 8. Upstream leased assets: not presently being assessed as leased vehicles and facilities are presently assessed in Scope 1 emissions. 9. Downstream transportation and distribution: not presently being assessed as the share of transportation and distribution paid by the customers is so small that emissions of this category were below 0.5% of total Scope 3 emissions. 10. Processing of sold products: not considered relevant because processing is not required for sold Nokia products. 11. Use of sold products: The calculation formula is following: $\Sigma [\text{total lifetime expected uses of products (hours)} \times \text{number of products sold in reporting period} \times \text{products power consumption (kW)} \times \text{emission factor for electricity (kg CO}_2\text{e/kWh)}]$. Data covers products from Nokia's Network business groups. Product use time varies between 6 and 15 years, depending on the products. Since 2018 we use IEA's latest world average CO₂e -emission factor. 12. End-of-life treatment of sold products: not considered relevant. 13. Downstream leased assets: not presently being assessed because emissions are less than 0.1% of total Scope 3 emissions. 14. Franchises: not applicable, as Nokia does not have franchises. 15. Investments: not applicable, as this category is designed primarily for private financial institutions.

SC1.2**(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).**

Please refer to the Nokia People & Planet Report 2018, available publicly on the web URL: http://www.nokia.com/en_int/about-us/sustainability/downloads (see section 8 - Key Data and Reporting Principles, pages 164 thru 176).

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

| Allocation challenges | Please explain what would help you overcome these challenges |
|---|--|
| Customer base is too large and diverse to accurately track emissions to the customer level | We continue to recognize the current challenges of allocating emissions to different customers. The use of revenue allocation as a means of allocating our Scope 1, 2 and 3 emissions to customers yields a good approximation, but has inherent flaws, most notably that all revenue sources are not alike. There are significant differences in the emissions associated with revenues that are derived from hardware products, software, services, royalties / licensing, etc. Overcoming this challenge and differentiating emissions from these revenue sources would require new methodologies to analyze emissions from the portions of operations associated with these revenue sources. |
| Diversity of product lines makes accurately accounting for each product/product line cost ineffective | Goods and services require a significant degree of customization. Therefore, we are concentrating especially on "typical" high-energy consuming products and use-time energy, which is the highest impact area for GHG emissions. Nokia has partnered with others in the industry to develop a common framework for measuring environmental impacts (refer to the "Guidance Built on the GHG Protocol" – ICT Sector Guidance found at: http://www.ghgprotocol.org/guidance-built-ghg-protocol). Nokia in co-working to create this industry guidance, has been promoting its use within the industry to have our supply chain report on their GHG emissions, and provide the granularity that can more accurately account for product customization. |

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?

Yes

SC1.4a

(SC1.4a) Describe how you plan to develop your capabilities.

Nokia continues to work within industry consortia to develop capabilities to obtain more accurate data on the biggest impact areas and develop our software tools to help track key environmental data at the customer level.

Over the last few years, Nokia has partnered with others in the ICT industry to develop a common framework for measuring environmental impacts (refer to the "Guidance Built on the GHG Protocol" - ICT Sector Guidance found at: <http://www.ghgprotocol.org/guidance-built-ghg-protocol>). This guidance document was published by the GHG Protocol in July 2017. Nokia in co-working to create this industry guidance, has been promoting its use within the industry to have our supply chain report on their GHG emissions, and to provide the granularity that can more accurately account for product customization.

In 2018, we continued to work towards our Science Based Targets. The targets were formally approved in June 2017. We have also aligned our climate related disclosures, including risks, in our CDP report according to the guidance of the Task Force on Climate-related Financial Disclosures (TCFD). In 2018 we continued analyzing various climate related scenarios and their impact on Nokia business. Some of the conclusions of this scenario analysis are included in our CDP disclosure covering year 2018.

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

Requesting member

Alphabet, Inc.

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings**Estimated payback**

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with Alphabet, Inc whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to Alphabet that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help Alphabet in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to "create time" for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

Requesting member

AT&T Inc.

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings**Estimated payback**

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with AT&T whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to AT&T that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help AT&T in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center

architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to “create time” for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

Requesting member

BT Group

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings

Estimated payback

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with BT Group whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to BT that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help BT in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to “create time” for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

Requesting member

Cellnex Telecom SA

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings

Estimated payback

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with Cellnex Telecom SA whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to Cellnex that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help Cellnex in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to "create time" for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

Requesting member

Chunghwa Telecom

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings

Estimated payback

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with Chunghwa Telecom whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to Chunghwa that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help Chunghwa in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to "create time" for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

Requesting member

Requesting member

Deutsche Telekom AG

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings**Estimated payback**

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with Deutsche Telekom AG whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to Deutsche Telekom that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help Deutsche Telekom in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to "create time" for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

Requesting member

Fujitsu Limited

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings**Estimated payback**

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with Fujitsu Limited whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to Fujitsu that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help Fujitsu in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently

researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to “create time” for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

Requesting member

Sky plc

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings

Estimated payback

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with Sky plc whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to Sky that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help Sky in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to “create time” for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

Requesting member

Swisscom

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings

Estimated payback

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with Swisscom whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to Swisscom that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help Swisscom in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to "create time" for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

Requesting member

Vodafone Group

Group type of project

Other, please specify (Carbon abatement / enablement effect)

Type of project

Other, please specify (Carbon abatement via ICT digital economy)

Emissions targeted

Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized

Other, please specify (Varies depending on project scope)

Estimated lifetime CO2e savings

Estimated payback

Other, please specify (Varies depending on project scope)

Details of proposal

Nokia proposes additional collaboration with Vodafone Group whereby carbon abatement can be fully assessed and documented for targeted ICT projects. The carbon abatement is associated with the enablement effect, i.e. avoidance of GHG emissions using an ICT solution, and which can be attributed back to the ICT solution as the prime cause of that avoidance. Nokia offers and has sold ICT product solutions to Vodafone that provide net environmental and sustainability benefits to end customers in the form of smart applications, which reduces or avoids the need to perform more carbon intensive activities (business as usual). Nokia can help Vodafone in assessing their carbon abatement net benefits by using the expertise within its research organization, Bell Labs. Currently researchers are working on projects to disrupt the field by a factor of 10x. What that means is 10x more capacity, 10x lower latency, 10x better energy consumption, 10x better reliability or 10x performance in some dimension. Every researcher works on a 10x challenge somewhere in the end-to-end network, from device to compute and applications as well as the control plane systems in between. This individual research is bundled into what we call Future X projects that seek to create innovations across all the major dimensions of the network; from wireline and wireless access into optical transport, IP routing, the control systems, data center architectures, and a common network operating system that controls everything and makes the different parts of the network look like one seamless whole. The ultimate goal is to "create time" for humans through the automation of everything. People will be able to interact with any media, object or person, anytime anywhere and mundane tasks can be handled by the network. Creating such a Future X Network from an environmentally sustainable point of view means, at the very least, minimizing the environmental impact of our products in use. This contributes to reducing the greater part of our carbon footprint, but we also try

to maximize the use of our products and services to bring positive impacts through automation, connectivity, efficiency, resource management, and digitalization. The emerging challenge will be to address the energy demand of these exponentially increasing data-intensive services as they become more thoroughly embedded into normal, everyday life.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?

Yes

SC2.2a

(SC2.2a) Specify the requesting member(s) that have driven organizational-level emissions reduction initiatives, and provide information on the initiatives.

Requesting member

Alphabet, Inc.

Initiative ID

2018-ID1

Group type of project

New product or service

Type of project

New product or service that reduces customers products / services operational emissions

Description of the reduction initiative

For mobile service providers most of their carbon emissions come from the radio access network. 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. In 2018, 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 around 140 customers worldwide, and the networks we modernized brought on average energy savings of 43 percent for our customers. This not only reduces energy consumption and reduces carbon footprint, but also brings financial savings for our customers. More information on zero emissions is available at <https://networks.nokia.com/airscale/target-zeroemissions>.

Emissions reduction for the reporting year in metric tons of CO2e

Did you identify this opportunity as part of the CDP supply chain Action Exchange?

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

Requesting member

AT&T Inc.

Initiative ID

2018-ID1

Group type of project

New product or service

Type of project

New product or service that reduces customers products / services operational emissions

Description of the reduction initiative

For mobile service providers most of their carbon emissions come from the radio access network. 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. In 2018, 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 around 140 customers worldwide, and the networks we modernized brought on average energy savings of 43 percent for our customers. This not only reduces energy consumption and reduces carbon footprint, but also brings financial savings for our customers. More information on zero emissions is available at <https://networks.nokia.com/airscale/target-zeroemissions>.

Emissions reduction for the reporting year in metric tons of CO₂e

Did you identify this opportunity as part of the CDP supply chain Action Exchange?

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

Requesting member

Cellnex Telecom SA

Initiative ID

2018-ID1

Group type of project

New product or service

Type of project

New product or service that reduces customers products / services operational emissions

Description of the reduction initiative

For mobile service providers most of their carbon emissions come from the radio access network. 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. In 2018, 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 around 140 customers worldwide, and the networks we modernized brought on average energy savings of 43 percent for our customers. This not only reduces energy consumption and reduces carbon footprint, but also brings financial savings for our customers. More information on zero emissions is available at <https://networks.nokia.com/airscale/target-zeroemissions>.

Emissions reduction for the reporting year in metric tons of CO₂e

Did you identify this opportunity as part of the CDP supply chain Action Exchange?

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

Requesting member

Chunghwa Telecom

Initiative ID

2018-ID1

Group type of project

New product or service

Type of project

New product or service that reduces customers products / services operational emissions

Description of the reduction initiative

For mobile service providers most of their carbon emissions come from the radio access network. 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. In 2018, 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 around 140 customers worldwide, and the networks we modernized brought on average energy savings of 43 percent for our customers. This not only reduces energy consumption and reduces carbon footprint, but also brings financial savings for our customers. More information on zero emissions is available at <https://networks.nokia.com/airscale/target-zeroemissions>.

Emissions reduction for the reporting year in metric tons of CO₂e

Did you identify this opportunity as part of the CDP supply chain Action Exchange?

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

Requesting member

Deutsche Telekom AG

Initiative ID

2018-ID1

Group type of project

New product or service

Type of project

New product or service that reduces customers products / services operational emissions

Description of the reduction initiative

For mobile service providers most of their carbon emissions come from the radio access network. 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. In 2018, 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 around 140 customers worldwide, and the networks we modernized brought on average energy savings of 43 percent for our customers. This not only reduces energy consumption and reduces carbon footprint, but also brings financial savings for our customers. More information on zero emissions is available at <https://networks.nokia.com/airscale/target-zeroemissions>.

Emissions reduction for the reporting year in metric tons of CO2e

Did you identify this opportunity as part of the CDP supply chain Action Exchange?

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

Requesting member

Fujitsu Limited

Initiative ID

2018-ID1

Group type of project

New product or service

Type of project

New product or service that reduces customers products / services operational emissions

Description of the reduction initiative

For mobile service providers most of their carbon emissions come from the radio access network. 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. In 2018, 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 around 140 customers worldwide, and the networks we modernized brought on average energy savings of 43 percent for our customers. This not only reduces energy consumption and reduces carbon footprint, but also brings financial savings for our customers. More information on zero emissions is available at <https://networks.nokia.com/airscale/target-zeroemissions>.

Emissions reduction for the reporting year in metric tons of CO2e

Did you identify this opportunity as part of the CDP supply chain Action Exchange?

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

Requesting member

Sky plc

Initiative ID

2018-ID1

Group type of project

New product or service

Type of project

New product or service that reduces customers products / services operational emissions

Description of the reduction initiative

For mobile service providers most of their carbon emissions come from the radio access network. 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. In 2018, 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 around 140 customers worldwide, and the networks we modernized brought on average energy savings of 43 percent for our customers. This not only reduces energy consumption and reduces carbon footprint, but also brings financial savings for our customers. More information on zero emissions is available at <https://networks.nokia.com/airscale/target-zeroemissions>.

Emissions reduction for the reporting year in metric tons of CO2e**Did you identify this opportunity as part of the CDP supply chain Action Exchange?**

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

Requesting member

Swisscom

Initiative ID

2018-ID1

Group type of project

New product or service

Type of project

New product or service that reduces customers products / services operational emissions

Description of the reduction initiative

For mobile service providers most of their carbon emissions come from the radio access network. 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. In 2018, 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 around 140 customers worldwide, and the networks we modernized brought on average energy savings of 43 percent for our customers. This not only reduces energy consumption and reduces carbon footprint, but also brings financial savings for our customers. More information on zero emissions is available at <https://networks.nokia.com/airscale/target-zeroemissions>.

Emissions reduction for the reporting year in metric tons of CO2e**Did you identify this opportunity as part of the CDP supply chain Action Exchange?**

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

Requesting member

Vodafone Group

Initiative ID

2018-ID1

Group type of project

New product or service

Type of project

New product or service that reduces customers products / services operational emissions

Description of the reduction initiative

For mobile service providers most of their carbon emissions come from the radio access network. 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. In 2018, 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 around 140 customers worldwide, and the networks we modernized brought on average energy savings of 43 percent for our customers. This not only reduces energy consumption and reduces carbon footprint, but also brings financial savings for our customers. More information on zero emissions is available at <https://networks.nokia.com/airscale/target-zeroemissions>.

Emissions reduction for the reporting year in metric tons of CO2e

Did you identify this opportunity as part of the CDP supply chain Action Exchange?

No

Would you be happy for CDP supply chain members to highlight this work in their external communication?

Yes

SC3.1

(SC3.1) Do you want to enroll in the 2019-2020 CDP Action Exchange initiative?

No

SC3.2

(SC3.2) Is your company a participating supplier in CDP's 2018-2019 Action Exchange initiative?

No

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?

Yes, I will provide data

SC4.1a

(SC4.1a) Give the overall percentage of total emissions, for all Scopes, that are covered by these products.

10

SC4.2a

(SC4.2a) Complete the following table for the goods/services for which you want to provide data.

Name of good/ service

Wavence (Release 18) - product portfolio from Nokia covering the microwave application for backhauling

Description of good/ service

Microwave transport application for network data backhauling - Configuration: MSS-8 with EAC card connected to UBT-T

Type of product

Final

SKU (Stock Keeping Unit)

Not applicable

Total emissions in kg CO2e per unit

5881

±% change from previous figure supplied

-20

Date of previous figure supplied

May 31 2018

Explanation of change

Wavence is a new product portfolio that replaces Nokia's previous 9500 series products. Energy savings features include: radio board power is reduced when the transmitted power is reduced. This saving is achieved through optimization of PA bias. This saving is applicable to all frequency bands from 13 GHz up to 42 GHz and available both in RTPC/ATPC and FCM/ACM. Several steps of power saving have been defined: up to 4W can be saved for UBT-S at PTx min; and up to 8W for UBT-T at PTx min. Other mechanisms will be in place to minimize UBT power consumption, to be introduced in the coming releases, for example, for the UBT-T, additional 25-30W power saving will be achieved when one carrier is switched off.

Methods used to estimate lifecycle emissions

Other, please specify (Power estimation based on bench test data; 10 years' product life time; embodied emissions per ISO 14040 & 14044.)

Name of good/ service

AirScale BTS with AirScale Radio

Description of good/ service

Nokia Airscale BTS is a high-capacity, Single RAN capable BTS, it supports the following radio access technologies: • GSM/EDGE • WCDMA, HSPA, and HSPA evolution • LTE and LTE-Advanced TDD/FDD For this configuration example, there is included the Base Transceiver Station in 3 sectors operation (3x AZNA @ 4x40W).

Type of product

Final

SKU (Stock Keeping Unit)

Not applicable

Total emissions in kg CO2e per unit

33926

±% change from previous figure supplied

-2

Date of previous figure supplied

May 31 2018

Explanation of change

Product has lower energy consumption due to: new system module, new radio units, energy efficiency features such as: envelope tracking; enhanced μDTX, RF power pooling, energy saving by muting the SM resources not in use

Methods used to estimate lifecycle emissions

Other, please specify (Power estimation based on bench test data; 10 years' product life time; embodied emissions per ISO 14040 & 14044.)

Name of good/ service

1830 PSS-32 (Release 11)

Description of good/ service

Photonic Service Switch

Type of product

Final

SKU (Stock Keeping Unit)

Not applicable

Total emissions in kg CO2e per unit

64279

±% change from previous figure supplied

-39

Date of previous figure supplied

May 31 2018

Explanation of change

in 2018 Nokia announced the next generation of our Photonic Service Engine (PSE) family of super-coherent digital signal processors, underscoring our leading position in the industry and our innovation pedigree. The Nokia PSE-3 is instrumental in the evolution of communication service provider networks to meet the surging traffic demands of video, cloud and 5G, by maximizing the capacity and performance of every link in their optical networks. The new PSE-3 chipset is the first coherent digital signal processor to implement probabilistic constellation shaping modulation technique pioneered by Nokia Bell Labs. This modulation scheme pushes optical fiber transmission capacity to very near the Shannon Limit.

Methods used to estimate lifecycle emissions

Other, please specify (Power estimation based on bench test data; 15 years' product life time; embodied emissions per ISO 14040 & 14044.)

SC4.2b

(SC4.2b) Complete the following table with data for lifecycle stages of your goods and/or services.

Name of good/ service

Wavence Release 18

Please select the scope

Scope 1, 2 & 3

Please select the lifecycle stage

Manufacturing

Emissions at the lifecycle stage in kg CO2e per unit

425

Is this stage under your ownership or control?

Yes

Type of data used

Primary

Data quality

Nokia follows the GHG Protocol Product Standard - Chapter 8, regarding data quality standards. Primary data – we use, site-specific data associated with the processes within the system boundary.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

Wavence Release 18

Please select the scope

Scope 1, 2 & 3

Please select the lifecycle stage

Distribution

Emissions at the lifecycle stage in kg CO2e per unit

40

Is this stage under your ownership or control?

Yes

Type of data used

Primary and secondary

Data quality

Nokia follows the GHG Protocol Product Standard - Chapter 8, regarding data quality standards. Primary data – we use, site-specific data associated with the processes within the system boundary. Secondary data – we use generic process data, which represents quantified values of unit processes or activities within the product system. Another source for secondary data is Environmentally Extended Input-Output (EEIO) data. Proxy data – we may use data from similar processes that are used as a stand-in for a specific process. Scope 2 emissions are location-based.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

Wavence Release 18

Please select the scope

Scope 3

Please select the lifecycle stage

Consumer Use

Emissions at the lifecycle stage in kg CO2e per unit

5628

Is this stage under your ownership or control?

No

Type of data used

Secondary

Data quality

Nokia follows the GHG Protocol Product Standard - Chapter 8, regarding data quality standards. Secondary data – we use generic process data, which represents quantified values of unit processes or activities within the product system. Another source for secondary data is Environmentally Extended Input-Output (EEIO) data. Proxy data – we may use data from similar processes that are used as a stand-in for a specific process.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

Wavence Release 18

Please select the scope

Scope 3

Please select the lifecycle stage

End of life/Final disposal

Emissions at the lifecycle stage in kg CO2e per unit

0

Is this stage under your ownership or control?

No

Type of data used

Secondary

Data quality

LCA method used by Nokia for the End-of-Life emissions at this lifecycle stage resulted in -212 kg CO2e per unit, due to the environmental benefits from the recycling. As a non-negative value can only be reported in this table, we have entered a "0" (zero) value. Total emissions for all LCA stages reflects this end-of-life negative value. Nokia follows the GHG Protocol Product Standard - Chapter 8, regarding data quality standards. Secondary data – we use generic process data, which represents quantified values of unit processes or activities within the product system. Another source for secondary data is Environmentally Extended Input-Output (EEIO) data. Proxy data – we may use data from similar processes that are used as a stand-in for a specific process.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

AirScale BTS with AirScale Radio

Please select the scope

Scope 1, 2 & 3

Please select the lifecycle stage

Manufacturing

Emissions at the lifecycle stage in kg CO2e per unit

3988

Is this stage under your ownership or control?

Yes

Type of data used

Secondary

Data quality

For this specific product LCA, data quality was as defined in ISO 14040 and ISO 14044 standards.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

AirScale BTS with AirScale Radio

Please select the scope

Scope 3

Please select the lifecycle stage

Distribution

Emissions at the lifecycle stage in kg CO2e per unit

350

Is this stage under your ownership or control?

Yes

Type of data used

Secondary

Data quality

For this specific product LCA, data quality was as defined in ISO 14040 and ISO 14044 standards.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

AirScale BTS with AirScale Radio

Please select the scope

Scope 3

Please select the lifecycle stage

Consumer Use

Emissions at the lifecycle stage in kg CO2e per unit

29752

Is this stage under your ownership or control?

No

Type of data used

Secondary

Data quality

For this specific product LCA, data quality was as defined in ISO 14040 and ISO 14044 standards.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

AirScale BTS with AirScale Radio

Please select the scope

Scope 3

Please select the lifecycle stage

End of life/Final disposal

Emissions at the lifecycle stage in kg CO2e per unit

0

Is this stage under your ownership or control?

No

Type of data used

Secondary

Data quality

LCA method used by Nokia for the End-of-Life emissions at this lifecycle stage resulted in -164 kg CO2e per unit, due to the environmental benefits from the recycling. As a non-negative value can only be reported in this table, we have entered a "0" (zero) value. Total emissions for all LCA stages reflects this end-of-life negative value. For this specific product LCA, data quality was as defined in ISO 14040 and ISO 14044 standards.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

1830 PSS-32; R11

Please select the scope

Scope 1, 2 & 3

Please select the lifecycle stage

Manufacturing

Emissions at the lifecycle stage in kg CO2e per unit

3235

Is this stage under your ownership or control?

Yes

Type of data used

Primary and secondary

Data quality

Nokia follows the GHG Protocol Product Standard - Chapter 8, regarding data quality standards. Primary data – we use, site-specific data associated with the processes within the system boundary. Secondary data – we use generic process data, which represents quantified values of unit processes or activities within the product system. Another source for secondary data is Environmentally Extended Input-Output (EEIO) data. Proxy data – we may use data from similar processes that are used as a stand-in for a specific process. Scope 2 emissions are location-based.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2

and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

1830 PSS-32; R11

Please select the scope

Scope 1, 2 & 3

Please select the lifecycle stage

Distribution

Emissions at the lifecycle stage in kg CO2e per unit

305

Is this stage under your ownership or control?

Yes

Type of data used

Primary and secondary

Data quality

Nokia follows the GHG Protocol Product Standard - Chapter 8, regarding data quality standards. Primary data – we use, site-specific data associated with the processes within the system boundary. Secondary data – we use generic process data, which represents quantified values of unit processes or activities within the product system. Another source for secondary data is Environmentally Extended Input-Output (EEIO) data. Proxy data – we may use data from similar processes that are used as a stand-in for a specific process. Scope 2 emissions are location-based.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

1830 PSS-32; R11

Please select the scope

Scope 3

Please select the lifecycle stage

Consumer Use

Emissions at the lifecycle stage in kg CO2e per unit

61249

Is this stage under your ownership or control?

No

Type of data used

Secondary

Data quality

Nokia follows the GHG Protocol Product Standard - Chapter 8, regarding data quality standards. Secondary data – we use generic process data, which represents quantified values of unit processes or activities within the product system. Another source for secondary data is Environmentally Extended Input-Output (EEIO) data. Proxy data – we may use data from similar processes that are used as a stand-in for a specific process.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

Name of good/ service

1830 PSS-32; R11

Please select the scope

Scope 3

Please select the lifecycle stage

End of life/Final disposal

Emissions at the lifecycle stage in kg CO2e per unit

0

Is this stage under your ownership or control?

No

Type of data used

Secondary

Data quality

LCA method used by Nokia for the End-of-Life emissions at this lifecycle stage resulted in -510 kg CO2e per unit, due to the environmental benefits from the recycling. As a non-negative value can only be reported in this table, we have entered a "0" (zero) value. Total emissions for all LCA stages reflects this end-of-life negative value. Nokia follows the GHG Protocol Product Standard - Chapter 8, regarding data quality standards. Secondary data – we use generic process data, which represents quantified values of unit processes or activities within the product system. Another source for secondary data is Environmentally Extended Input-Output (EEIO) data. Proxy data – we may use data from similar processes that are used as a stand-in for a specific process.

If you are verifying/assuring this product emission data, please tell us how

LCA calculation is not externally assured. However, Nokia has performed a limited assurance of its annually reported Scope 1, 2 and major part of 3 emissions by an independent (third-party) auditor, PricewaterhouseCoopers, employing the international standard ISAE3000 (revised). See the Nokia People & Planet Report 2018; pages 170-176 for further information.

SC4.2c**(SC4.2c) Please detail emissions reduction initiatives completed or planned for this product.**

| Name of good/service | Initiative ID | Description of initiative | Completed or planned | Emission reductions in kg CO2e per unit |
|----------------------------------|---------------|--|----------------------|---|
| Wavence Release 18 | Initiative 1 | Wavence R18 was released in late 2018 and includes new family components, which provide significant reduction in energy consumption. | Completed | 1154 |
| AirScale BTS with Airscale Radio | Initiative 2 | Compared to the Airscale BTS with Flexi Radio (3x FZNI or FZNI @ 4x30W), the AirScale BTS with AirScale Radio (3x AZNA @ 4x40W) configuration offers savings primarily due to further energy efficiency improvements in envelope tracking, enhanced μDTX, RF power pooling, and energy saving by muting the SM resources not in use. | Completed | 692 |
| 1830 PSS-32 (Release 11) | Initiative 3 | 1830 PSS-32; R11 was released in late 2018, and includes the new Photonic Service Engine (PSE-3) chipset, which will provide significant energy savings over the previous release (R 9.1). | Completed | 41096 |

SC4.2d**(SC4.2d) Have any of the initiatives described in SC4.2c been driven by requesting CDP Supply Chain members?**

No

Submit your response**In which language are you submitting your response?**

English

Please confirm how your response should be handled by CDP

| | Public or Non-Public Submission | I am submitting to | Are you ready to submit the additional Supply Chain Questions? |
|-----------------------------|--|---------------------------|---|
| I am submitting my response | Public | Investors Customers | Yes, submit Supply Chain Questions now |

Please confirm below

I have read and accept the applicable Terms