1 March 2021

Elisa Energy and CO_2 Emission Disclosure

2020

Contents

1 IMPLEMENTATION AND RELIABILITY OF MEASUREMENTS

Elisa's emission savings calculations are based on *ISO 14040: 2006* principles. The independent assurance for emission savings meters in 2020 was carried out by KPMG Oy Ab. These included assessment of the requirements and objectives set for the calculations, and the risks affecting correctness of the information. They also included reviews of the reporting and data formation processes, as well as the systems and data collection instructions. The objective was to ensure that the policies, practices and information systems allow for sufficiently accurate and reliable calculations.

For the sake of clarity, we always imply CO_2 equivalents when we throughout the *Corporate Responsibility Report* for greenhouse gas emissions overall use the simplified term *CO_2 emissions*.

Elisa has set 2016 as the baseline year for its *Science Based Targets*, as this is when environmental reporting had fully integrated early measures, such as use of exclusively renewable electricity.

This "*Elisa Energy and CO_2 Emission Disclosure*" document itself, is not assured by a third party.

1.1 Significant adjustments to previous accounting period

The Corporate Responsibility Report for 2020 reflects the contextual environment and its effects on among other things commuting, which is thoroughly described in section 2.1 below. Elisa continuously develops its measurements, which has enabled us to retrospectively update the energy intensity data for Elisa's mobile network, starting from 2016. Also emission factors, especially for purchased goods and services (*Scope 3*), have been updated based on the latest existing knowledge (see overview in chapter 4). Elisa has during 2020 started to sell energy for district heating, originating from data centre waste heat, and we will disclose this for the environmental report after its first full year of operations. Becoming the first carbon neutral Nordic operator in 2020 was for Elisa an important stepping stone into the next decade of environmental sustainability in action. Having already for several years reported energy efficiency data (see section 2.2), we are in addition to that now also including the amount of carbon compensation. This is described further in section 2.3.

2 ELISA'S OWN CARBON FOOTPRINT

Elisa's carbon footprint, that is, the amount of carbon dioxide (CO_2) caused by the operations, is based on most recent annual statistics and actual data obtained. The calculation methodology is based on The *Greenhouse Gas Protocol* (GHG) developed by *World Resources Institute* and *World Business Council for Sustainable Development*. The underlying principles of corporate financial calculations and reporting are used also for the calculations and reporting of the GHG protocol. These are about relevance, comprehensiveness, consistency, transparency and accuracy.

Elisa takes general principles of calculations into account in its calculations. The boundaries of the calculation are defined for the operations so that they best correspond to Elisa's operations, products and services. The calculation is carried out in such a way that the method is transparent and verifiable by a third party. All assumptions and steps in the calculation have been clearly reported. Data collection and reporting systems and the reliability of existing controls, as well as the method of calculation and data risks related to data collection have been evaluated by a third party.

2.1 Commuting in exceptional circumstances

The COVID-19 pandemic has affected us all. We have during the exceptional circumstances in 2020 to a limited degree found it necessary to visit company premises. The results from our yearly commuting survey therefore radically differs from previous years and all usual analyses are not worthwhile. *Elisa Ideal Work* related metrics, such as office space efficiency while employees are given recommendations of remote working, or amount of virtual conferencing, when there are no practical alternatives to arrange meetings between people, are curiosities during a pandemic period.

To better understand the extraordinary situation and gain foresight on what might lay ahead, we have shared selected results from our analysis on how commuting at Elisa has changed in 2020.

The *Commuting Survey for 2020*, conducted by the Elisa Corporate Responsibility Team, involved employees from Elisa's offices in several countries. The total number of respondents was 1,897, with a response rate of 45%. Results were expanded in accordance with e.g. gender and location.

2.1.1 Adaptation of work habits

In our Commuting Survey for 2020, we asked *Elisians* (Elisa employees) ”How many times do you estimate that you have visited the office since mid-March?”, with the following answering options:

”0 times; I have felt that it is best to do purely remote work”
”1-9 times; mainly for taking care of absolutely necessary things”
”10-29 times; occasionally at the office for handling specific work tasks”
”30-69 times; on average at the office up to a couple of times per week”
”70-99 times; on average working remotely up to a couple of times per week”
”100 times or more; practically almost daily at the office”

We found out that 47% of Elisians between approximately March 16th and November 16th had visited the office only 1-9 times, which on average would be only 3% of work days during this period.

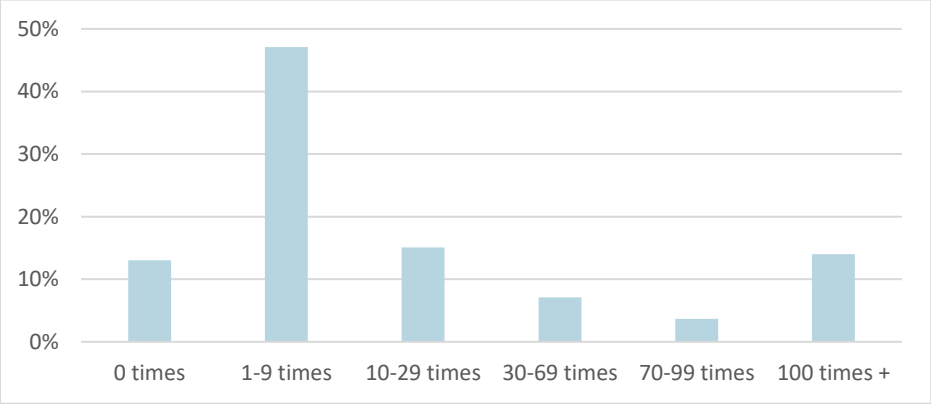

Figure 1 Estimated number of visits to the office by Elisa employees

For 2019, we reported an average of 53 remote work days, which corresponds to 1.13 days per week on average. When we for the 2020 report asked “How many days a week did you on average work remotely before the pandemic?”, the average had risen to 1.76, which is an increase of 56%. This extrapolates to an average of 83 remote working days for 2020 before the pandemic hit. International news feeds possibly made people cautious even before recommendations of remote work.

The main impact of remote work is the avoidance of travel, so in our analysis it is not relevant if visits to the office are quick stops or last for a full work day. Our chosen definition of a remote working day is hence more precisely “a work day without travelling caused by working at another location”.

When comparing the pre-pandemic period before mid-March 2020 with the remaining part of the year, we see the average number of remote work days per week rising to 3.35, which is an increase of 90%. This means that during the pandemic period of 2020, Elisians on average worked remotely 140 days out of 177 days available, which means that almost 80% of our work happened remotely.

When combining remote work estimates from the pre-pandemic and pandemic period in 2020, we get an average of 158 remote work days for Elisians during the whole year. This is a 198% increase compared to the remote work days of the previous year. It means that out of a total number of 228 available yearly work days, we all in all used 69% of them for remote work during the whole of 2020.

To recognise future scenarios, it is of special interest to understand emerging behavioural changes. When in the figure below looking at correlations between our questions on “remote work days per week before the pandemic” and “visits to the office during the pandemic”, we can see that people visiting the office to a lesser extent during the pandemic already had higher numbers of pre-pandemic remote work days. Even for organisations like Elisa that for a long time already have enabled new forms of work, this kind of switch to almost entirely working remotely is still a huge change.

We furthermore asked ”Do you believe that experiences and possible new habits mentioned above, will affect your post-pandemic ways of working, so that you work more remotely than before?”. We see that 45% predict an either high or decisive impact on post-pandemic personal ways of working.

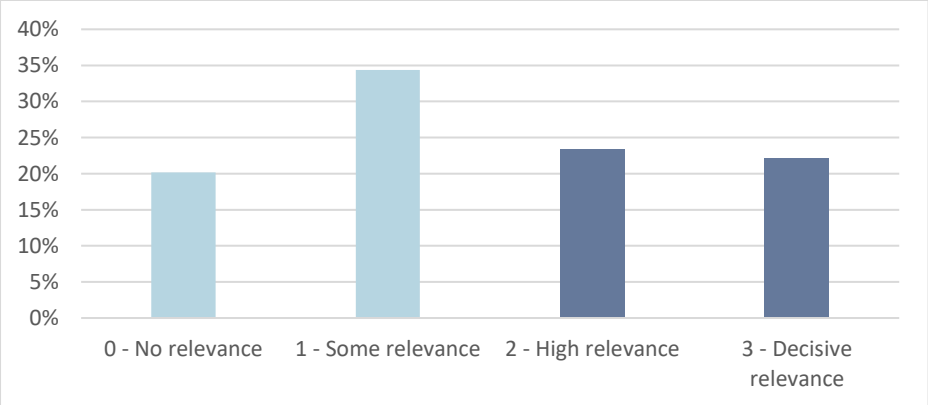

Figure 2 Estimate of pandemic effect on personal ways of working

We also separately compared these future scenarios related to age group and gender cohorts. Here we do not see real correlations to age groups, but a clear indication of higher impact among women.

2.1.2 Ways of transportation to work

During the pandemic in 2020, people still had to commute and travel in their work to some extent.

We asked how people usually arrange their commute, the commuting distance and the time used. From this we were able to calculate the carbon footprint of profiles of Elisians and the average of all.

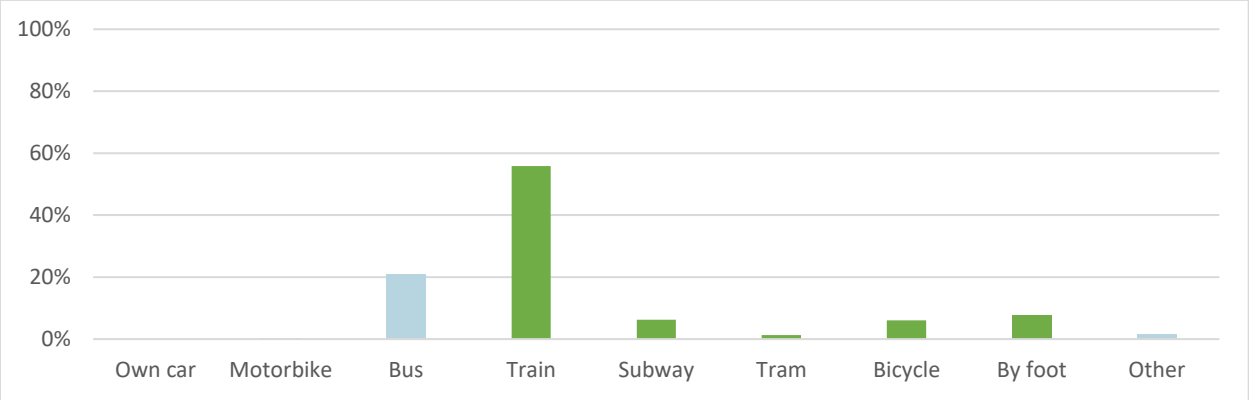

Figure 3 Commuting behaviour of Elisian not using own car

Average profile of Elisian not using own car when commuting:

- Daily commuting distance: 32.4 km
- Daily commuting time: 66 min
- Emissions for daily commuting: 557 gCO_2e

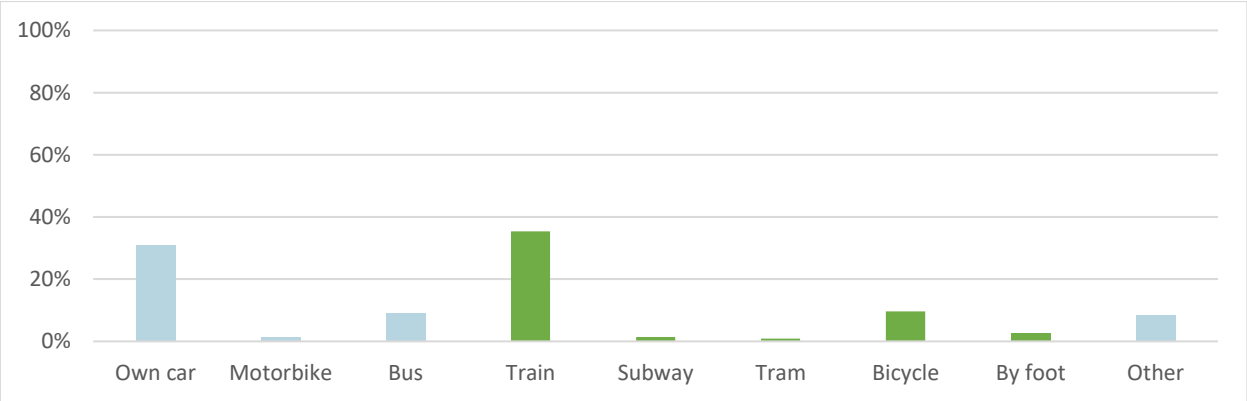

Figure 4 Commuting behaviour of Elisian using own car less than 80%

Average profile of Elisian using own car less than 80% when commuting:
- Daily commuting distance: 35.5 km
- Daily commuting time: 64 min
- Emissions for daily commuting: 2,222 gCO_2e

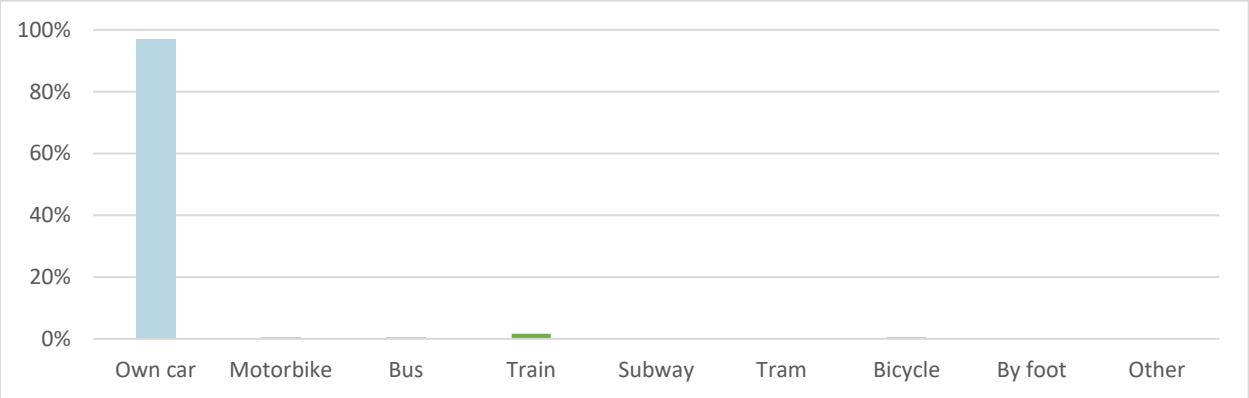

Figure 5 Commuting behaviour of Elisian using own car 80% or more

Average profile of Elisian using own car 80% or more when commuting:
- Daily commuting distance: 45.1 km
- Daily commuting time: 59 min
- Emissions for daily commuting: 6,675 gCO_2e

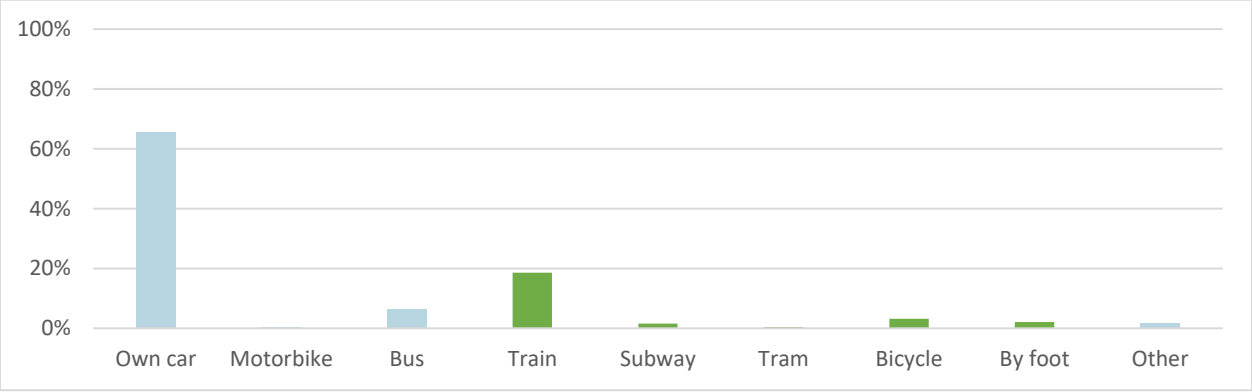

Figure 6 Commuting behaviour of all Elisians on average

Average profile for all Elisians when commuting:
- Daily commuting distance: 39.8 km
- Daily commuting time: 63 min
- Emissions for daily commuting: 4,075 gCO_2e

2.2 Reducing emissions in Elisa's operations

Elisa is determined to make every effort in realising its mission of *a sustainable future through digitalisation*. To minimise emission in our day-to-day operations, we for example purchase renewable energy and continuously improve energy and material efficiency, as well as our ways of working.

2.2.1 Emission savings from Elisa Ideal Work

Elisa Ideal Work model describes how Elisians are pioneers in a changing work life. Each of us knows one's own work and needs best, and therefore choose tools and work spaces that best support our work needs. The tools and spaces are increasingly in a digital environment and the workplace can also be outside the office. Mobile work solutions have a clear role also in climate action.

The objective of calculating the effect of Elisa Ideal Work is to verify how mobile work solutions reduce carbon emissions in Elisa's operations. Mobile work means accessibility of people, services and data regardless of time and place. As explained earlier, due to the exceptional COVID-19 pandemic circumstances, and recommendations to work remotely whenever possible, we have for 2020 not accounted for emissions savings that arrive from neither emission reductions with the help of remote working, nor emission reductions in business travel with the help of virtual conferences.

2.2.2 Emission savings in the mobile network

The purpose of the calculation is to monitor the carbon emission savings resulting from the continuous improvements that reduce mobile network power consumption in the mobile network of Elisa.

Regarding the electricity saving features, the savings are based on the measured energy consumption of base station sites and difference in energy consumptions before and after the procedure.

Other measures are the physical base station configurations changes. For those measures, the savings are calculated based on the number of actions in the calculation period. The actions are multiplied by the amount of electricity savings per action, which are based on measured electricity consumption in the mobile network. This results in electricity savings for the calculated period. Electricity savings for the calculated period are multiplied by a coefficient of carbon dioxide emissions.

2.2.3 Energy consumption of mobile data

The objective is to calculate energy consumption of the mobile network per package data volume (gigabyte) transmitted through the network. The energy consumption of the radio network is divided by the amount of data transferred. The amount of mobile data transmitted in the mobile network will be obtained from maintenance statistics. These calculations are dependent on a large number of network elements. As related parameters over time are defined on a more granular level, we are able to increase the accuracy of our calculations. For 2020 we have therefore updated this meter retroactively, to more accurately reflect our actions in energy efficiency, starting from 2016.

2.2.4 Renewable energy as a means in climate action

The purpose of the calculation is to monitor carbon dioxide emission savings resulting from the purchase of carbon free energy. This emission saving is calculated by multiplying the amount of renewable energy with the market-based energy emission factor. In 2020 certificates of origin were purchased for renewable energy in Finland (250 GWh) and in Estonia (29.85 GWh).

2.3 Carbon compensation

Elisa has worked on energy efficiency measures for over ten years, and uses only renewable electricity in Finland and Estonia. We compensate for remaining direct (*Scope 1*) and indirect (*Scope 2*) greenhouse gas emissions, as well as waste, business travels, and commuting (Scope 3).

Carbon offsetting for 2020 happens through a project for improved cookstoves in Uganda, compliant with the *Gold Standard* (Uganda GS ID: 447, more information available at https://registry.goldstandard.org/projects/details/793), from which Elisa has retired 5,770 tCO2 as compensation (more register information is available at https://registry.goldstandard.org/credit-blocks/details/161539).

The project reduces global greenhouse gas emissions and promotes the *UN Sustainable Development Goals*. By supporting the procurement of more energy-efficient cookstoves for families in Uganda, we can reduce the need for firewood and the local eradication of forests. Indirectly, the project also assists in improving the position of women and children and reduces the incidence of chronic respiratory diseases in poor communities.

3 ELISA'S CARBON HANDPRINT

We assist our customers in reducing their CO2 emissions by providing services that help our customers act effectively and in an environmentally friendly manner. Elisa Videra's virtual conferencing services allow our customers to reduce their amount of travel. Elisa and Fonum stores offer customers an efficient way to recycle and repair their devices, as well as new, environmentally friendly options when purchasing devices. With Elisa Automate, network devices from our operator customers will not remain switched on unnecessarily and waste electricity. Elisa Smart Factory allows our customers to improve the energy and material efficiency of their operating units.

3.1 Emission reductions from virtual conferencing

Elisa's chosen video conference solutions are Cloud Connect by Elisa Videra and Teams by Microsoft. Skype is currently being phased out, but was still used to some extent in 2020. In virtual meetings and webinars organized by external stakeholders, employees might use also other forms of solutions, both for video conferencing and remote collaboration e.g. through online whiteboards. The strategy of Elisa Videra is to support all leading conferencing technologies, e.g. enabling interoperable gateways for Google Hangouts Meet and room systems for Zoom enterprise customers.

The Commuting Survey for 2020 included a question where we asked respondents to take a look at their calendar for the previous two working weeks and assess how much they during that time used remote working tools and services such as Elisa Videra Cloud Connect or Microsoft Teams. The answers showed use of these or other similar tools for 42.61 hours per two weeks, or 4.3 hours per day on average. It is evident that this estimate due to the exceptional pandemic circumstances is much higher than when we did a similar survey in 2019. We anticipate 2020 to be a watershed moment regarding remote work adaptation. While the situation eventually will settle at a new post-pandemic normal, we will still calculate avoided emissions from less commutes and travels in 2020.

From our previous commuting survey for employees in 2019, we learned to what extent virtual meetings replaced meetings on site. It was nevertheless not relevant to ask an identical question for 2020, as Elisa for the major part of the year recommended remote work and to avoid most travels. Even though we, compared to 2019, saw indications of higher remote work adaptation for 2020 even before when the pandemic started to affect work, we will still use our estimates from 2019.

This means that in the 48% of cases where virtual conferencing indeed replaced travelling, respondents would have specifically travelled to such on-site meetings in 72% of the cases. Taking this into consideration, 34% of Elisa employee participation in virtual meetings replaced travelling before the pandemic broadly altered the situation. Elisa employees participated in a total of 5,685 virtual meetings during the day in 2019, which means that virtual meetings replaced almost 1,900 travels a day.

As mentioned previously in section “Impact of the corona pandemic on the results”, almost 80% of our work at Elisa happened remotely after mid-March 2020.

Virtual meetings mainly replace private car travels as shown previously in section “Getting to work”. Estimation of flight replacement with virtual meetings is uncertain due to low amount of such observations in the 2019 survey. Calculations based on the 2019 survey gave an average emission reduction by virtual meetings of 3.58 kgCO_2e per participant in Elisa. If 50% of participants are travelling, this average emission reduction will be 2.49 kgCO_2e per participant.

Replaced travels by virtual meetings by travel modes

	n	Average length [km]	Emission factor [gCO_2/pkm)	Share of travels	Share of performance	Share of CO_2 emissions
Private car*	216	92	134	59%	45%	73%
Long-distance train or bus	51	332	11	14%	38%	4%
Flight	3	1,867	158	1%	13%	21%
Local public transport or other modes of transport	95	22	34	26%	5%	2%

* 152 gCO_2/km, average weight 1.14

Table 1**Error! No text of specified style in document.** Virtual meetings replacing modes of travel

Emissions for business travel by car are based on reports by leasing companies or approved mileage logs and expense reports. The same applies to other forms of business travel, such as flights.

Flight emissions are reported directly in travel agency reports or to a small degree calculated separately from expense reports. The same flight emission factors are used for Finland and Estonia. Train travel in Finland, as well as commuting by rail in the Helsinki metropolitan region, is carbon neutral. Other commuting emissions are calculated from employee survey data gathered by Elisa, for instance for hotel lodging. Emission and other factors in use are described in the chapter below.

4 FACTORS USED IN CALCULATIONS

Factors used in calculations are regularly updated by Elisa, involving expertise of third parties. Key conversion, energy and emission factors, including sources used, are disclosed in the below tables.

CONVERSION FACTORS

1 kWh = 0.0036 GJ

PRIMARY ENERGY FUEL AND GHG EMISSION FACTORS (Scope 1)

Sources:
Statistics Finland (2020), http://www.stat.fi/polttoaineluokitus

Fuel	Density	Net calorific value	GHG emission coefficient
Gasoline	0.744 t/m³	41.9 GJ/t	66.8 t/TJ
Diesel	0.806 t/m³	42.8 GJ/t	63.9 t/TJ
Burning oil	0.834 t/m³	43.2 GJ/t	73.1 t/TJ

SECONDARY ENERGY AND GHG EMISSION FACTORS (Scope 2)

ELECTRICITY

Sources:
Market-based factors: Finnish Energy Authority (2019), https://energiavirasto.fi/-/vuoden-2019-jaannosjakauma-julkaistu
Location-based factors: Statistics Finland (2019), https://pxhopea2.stat.fi/sahkoiset_julkaisut/energia2019/html/suom0011.htm
AIB (2019), https://www.aib-net.org/sites/default/files/assets/facts/residual-mix/2019/AIB_2019_Residual_Mix_Results_1_1.pdf

Country	CO_2 (market-based)	CO_2 (location-based)
Finland	249.3 g/kWh	144.1 g/kWh
Estonia	757.7 g/kWh	723.3 g/kWh

Spain	342.7 g/kWh	220.3 g/kWh
Great Britain	347.5 g/kWh	226.7 g/kWh
Sweden	50.2 g/kWh	11.9 g/kWh
Norway	396.3 g/kWh	11.2 g/kWh

DISTRICT HEAT

Sources:

Statistics Finland (2019), https://pxhopea2.stat.fi/sahkoiset_julkaisut/energia2019/html/suom0011.htm

GOV.UK (2020) https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020

Country	CO_2
Finland	150.3 g/kWh
Estonia	172.6 g/kWh
International avg.	172.6 g/kWh

DISTRICT COOLING

Sources:

Helen Ltd (2021), https://www.helen.fi/en/company/energy/energy-production/specific-emissions-of-energy-production

Fortum Oyj (2021), https://www.fortum.fi/yrityksille-ja-yhteisoille/lammitys/kaukokylma

Provider	CO_2
Helen (Helsinki)	18.0 g/kWh
Fortum (Helsinki)	0 g/kWh

ALL OTHER INDIRECT GHG EMISSION FACTORS (Scope 3)

PRODUCTS AND SERVICES

Sources:

Anders S. G. Andrae & Otto Andersen Int J Life Cycle Assess (2010)

Apple products' environmental reports (2015-2020), https://www.apple.com/environment/

Elisa Corporation, inhouse product analysis

Finnish Environment Institute SYKE (2011), Julia 2030 project

TRANSPORTATION

Sources:

Defra conv. factors (2020), https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020

LIPASTO (2016), http://lipasto.vtt.fi/yksikkopaastot/henkiloliikennee/tieliikennee/henkiloautote/hayhte.htm

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LIPASTO (2016), http://lipasto.vtt.fi/yksikkopaastot/henkiloliikennee/tieliikennee/linja-autote/bussilinjaautokeskimaarine.htm

Traficom (2017), https://www.traficom.fi/sites/default/files/media/file/julkisen_liikenteen_suoritetilasto2017-netti.pdf

Transport means	CO_2
Private car	152 g/km

Long distance train		0 g/pkm	(per person per kilometre)
Long distance bus		41 g/pkm	
Share of bus in long distance travels:	26%		
Average for long distance train or bus		11 g/pkm	(0.74 x 0 + 0.26 x 41)
Train, metro, tram		0 g/pkm	
Local public bus		53 g/pkm	
Share of bus in local public transport:	64%		
Average for local public transport		34 g/pkm	(0.36 x 0 + 0.64 x 53)
Flight, short haul up to 3,700 km		158 g/pkm	