Elisa Oyj

Elisa´s energy and calculation document for CO_2 emissions

Public

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Contents

1 IMPLEMENTATION AND RELIABILITY OF MEASUREMENTS

Elisa's emission savings calculations are based on ISO 14040: 2006 principles.

Calculations are assured by a third party. The independent assurance for emission savings meters in 2019 was carried out by KPMG Oy Ab. These included assessment of the requirements and objectives set for the calculations, and the risks affecting the correctness of the information. They also included review of the reporting and data formation processes, the systems and data collection instructions. The objective was to ensure that the policies, practices and information systems created will allow for a sufficiently accurate and reliable calculation. This calculation document has not been assured.

2 SIGNIFICANT ADJUSTEMENTS TO PREVIOUS ACCOUNTING PERIOD

Emissions caused by business travel in Finland are reported by travel agency emission report. Estonian flight emissions have been calculated by using emission factors in Finland.
Emission savings and delivered by commuting are based on research done by third party. There were 2146 responses and response activity was 40%. Survey results have been expanded according to gender and working location or according to individual to illustrate employment in Elisa.
Emissions in logistics (e.g. UPS, Posti, DHL) are reported fully according to logistics service companies' reports.

3 EMISSION REDUCTIONS FROM VIRTUAL CONFERENCING

Elisa uses Videra conference solutions and MS Teams -service (replacing Skype -service) in virtual conferencing.

3.1 Calculating emission savings

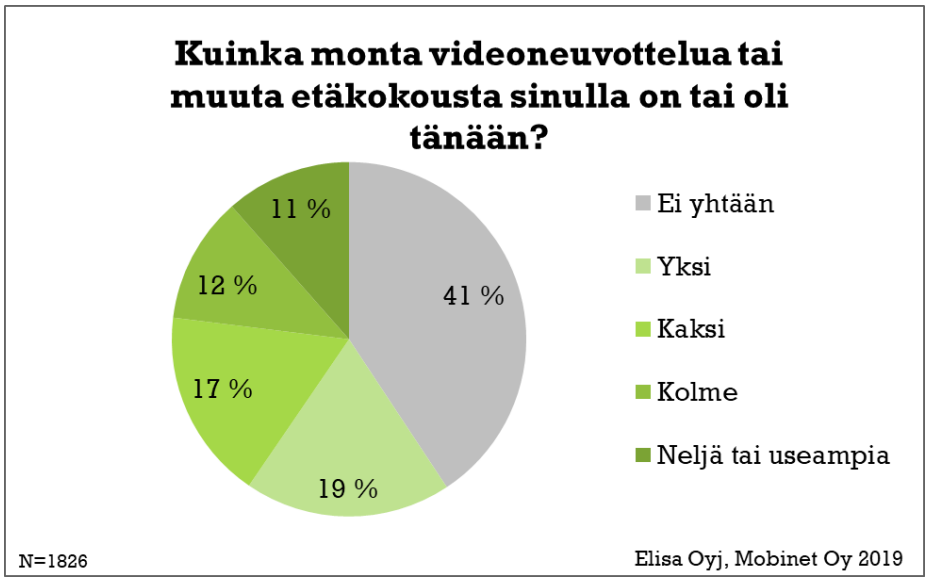
Emission saving calculation is based on changes in traveling behaviour, estimated by employee survey on modes of transport and emission factors of modes of transport as well as total amount of virtual meetings extracted from virtual conferencing solution.

3.2 Survey material

Virtual conferencing emission savings (handprint) from virtual meeting were estimated by using survey results concerning Finland (Elisa Oyj, Enia and Fonum). There were altogether 1826 respondents and the response activity was 41%. Out of 1178 of respondents participated virtual meeting during survey date where they were asked to explain how virtual meeting has impacted on the need to travel.

3.3 Amount of virtual conferencing

According to the survey total of 5 685 virtual meetings were participated by Elisa employees during the precise day resulting approximately 1,34 meetings/employee.



Question: How many virtual meetings or other remote meetings you had or have today?

41% None
19% One
17% Two
12% Three
11% For or more

3.4. Impact of virtual conferencing on traveling

In case virtual meeting would not have been possible, in 48% of the cases most probable transportation mode would have been on site meeting. In other cases, it is expected that virtual meeting does not replace traveling.

In those cases where virtual conferencing replaces traveling, respondent would have travelled to on site meeting in 72% of the cases. Taking this into consideration, 34% of Elisa employees' participation on virtual meeting have replaced traveling. Virtual meetings are replacing close to 1900 travels per day. Calculations include an alternative general factor as well if 50% of survey participants would travel.

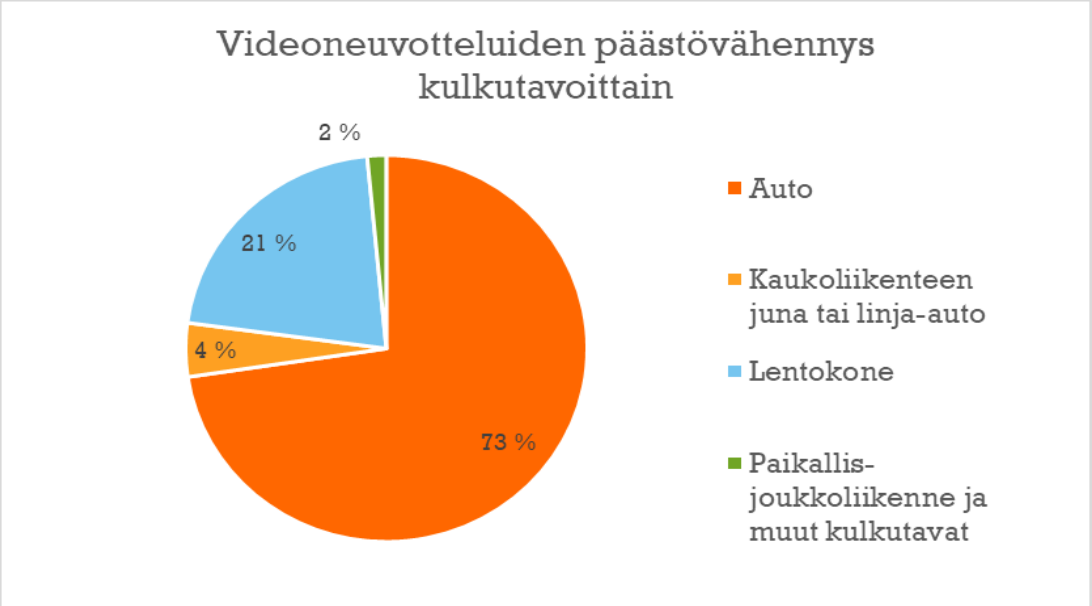
Amount of replacement of flights is low, according to survey only three observations, but share of flights in emission reduction is significant. Estimation of replacement of flights with virtual meetings is uncertain due to low observation amount. In the survey total emissions of replacement of travels (N=365) with virtual meetings were 4148 $kgCO_2$. Average emission of travel replacement is 11,4 $kgCO_2$/travel.

Average emission reduction by virtual meeting is 3,58 $kgCO_2$ / participant in Elisa.

If 50% of participants are traveling, average emission reduction by virtual meeting is 2,49 $kgCO_2$/participant.

Replaced travels by virtual meetings by travel modes						
	N	Average lenght (km)	Emission factor (gCO2e/personkm)	Share of travels	Share of performance	Share of CO2 emissions
Private car*	216	92	134	59 %	45 %	73 %
Long distance train or bus	51	332	11	14 %	38 %	4 %
Plane (flight)	3	1867	158	1 %	13 %	21 %
Local public transport or other modes of transport	95	22	34	26 %	5 %	2 %

*152 gCO2/km, average weight 1,14



Emission savings of video conferencing
Car 73%, Long distance train or bus 4%, Flights 21%,Public transportation 2%

3.5 Emission factors used in calculation

Private car 152 gCO2e/km (LIPASTO 2016)
Private car 134 gCO2e/personkm

Based on commuting survey 40% of private car travels are done by ride sharing. If 65% of ride sharing travels are done alone and 35% have 2 persons in car, average weight of private car in Elisa business travels would be 1,14 g. In comparison of commuting between home and working location, average weight is also 1,14 g, if there are 2 persons in the ride sharing car.

Long distance train or bus 10,66 g/personkm

- long distance bus in average 41 g/personkm (LIPASTO: Linja-auto (pitkän matkan), keskimäärin v. 2016)
- long distance train 0 g/personkm (VR)
- share of bus in long distance travels 26 % (Traficom: Julkisen liikenteen suoritetilasto 2017)
- average for long distance travels 0,26 x 41 + 0,74 x 0 = 10,66 gCO2e/personkm

Flight 158,32 gCO2e/personkm (Defra 2019, short haul, flights up to 3700 km – excluding domestic flights, average passenger)

Local public transport and other modes of transportation 33,80 gCO2e/personkm

- city public transport bus 53 gCO2e/personkm (LIPASTO: Kaupunkibussi, keskimäärin v. 2016), share of 64 % (Traficom: Julkisen liikenteen suoritetilasto 2017)
- train, metro, tram 0 g/personkm, share of 36 % (Traficom: Julkisen liikenteen suoritetilasto 2017)
- walk, bicycle, estimated share 0 %
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4 EMISSION SAVINGS IN SERVICE PRODUCTION

Elisa is determined to make every effort to reduce its own emissions throughout the 2010s . In day-to-day operations, Elisa is reducing its carbon footprint by improving energy efficiency, making the most of its own services, and changing its operating methods as well as purchasing renewable energy.

4.1 Ideal work

The objective is to verify the extent to which mobile work solutions have reduced carbon dioxide emissions in Elisa's operations. Mobile work means accessibility of people, services and data regardless of time and place. Emission reductions were calculated for three lower level metrics: (1) emission reductions with the help of remote working, (2) emission reductions in business travel with the help of virtual conferences, and (3) emission reductions with the help of a multi-functional office solution (space efficiency).

4.1.1 Lower level metric 1: Remote working (virtual conferencing)

Commuting survey was sent to all Elisa employees in September 2019. there was 2146 respondents and the response activity was 40% Survey was done by third party and it covered commuting methods and remote days.

Based on the survey results, Elisa employee had in average of 4,29 remote working days per month during 2019. Survey collected information as well about length of commuting (average approximately 17,6 km) and mode of transport.

4.1.2 Lower level metric 2: Business travel avoidance

The objective is to calculate the extent of Elisa's employees reduced carbon dioxide emissions by avoiding business travel by using video conferencing tools.

4.1.3 Lower level metric 3: Space efficiency

There are no dedicated desks for any employees Elisa's multi-functional offices. As a result of mobile working, Elisa has reduced the office space and the number of desks. The calculation of the space efficiency metrics aimed to show the carbon dioxide emission savings for the office space that otherwise would have required heating. In the calculation Elisa´s space efficiency is compared with the average space efficiency estimate by Rapal Workplace research.

The result is the assumed emissions for space saved during the calculation period. The floor area in square meters and the number of employees is obtained from Elisa's facility service information system. The emissions are calculated by using the average specific electricity and heat consumptions for Elisa's offices obtained from Elisa real estate system (kWh/sqm).

Emission calculations are restricted to the consumption of electricity and heat usage of the building and user electricity usage. Water consumption was excluded from the calculation as the impact of lifecycle emissions from water purification is very small.

4.2 Energy saving measures in the mobile network

The purpose of the calculation is to monitor the carbon dioxide emission savings resulting from the energy efficiency improvements in our mobile network. For reference is a situation, that no actions should not be taken: taking energy efficiency features in use, modernisation and replacement of old radio with modern more energy efficient equipment. Electricity savings in calculation period are multiplied by a coefficient of carbon dioxide emissions.

4.3 CO2 -free energy

The purpose of the calculation is to monitor carbon dioxide emission savings resulting from the purchase of carbon free energy. Emission saving is calculated by multiplying amount of renewable energy with market-based factor. In 2019 certificates of origin were purchased for renewable energy in Finland (245 GWh) and in Estonia (26GWh).

5 OTHER EMISSION SAVINGS RESULTING FROM ENERGY EFFICIENCY

5.1 Energy consumption of transferred gigabyte

The objective is to calculate energy consumption of the mobile network per package data volume (Giga byte) transmitted through the network. The energy consumption of the radio network is divided by the amount of data transferred. The number of mobile data in the mobile network will be obtained from maintenance statistics.

6 ELISA'S OWN ENERGY AND CARBON FOOTPRINT

Elisa's own energy consumption covers direct (scope 1) and indirect energy consumption. Direct energy consumption consist of reserve power fuel consumption and fuels from free car use benefit fleet. Indirect energy consumption consist of Elisa network and datacenters, offices and stores. Consumption figures are based on direct measuring (system reporting), computational and some part on billing based estimate.

Elisa's carbon footprint is based on most recent annual statistics and actual data obtained. 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 for the calculation and reporting of corporate financial calculations and reporting are used for calculations and reporting of GHG protocol. These area 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 has been evaluated by a third party.

7 MAIN FACTORS USED IN CALCULATIONS

SCOPE 1

Fuel	Source
Burning oil	Statistics of Finland 2019
Gasoline	Statistics of Finland 2019
Diesel	Statistics of Finland 2019

SCOPE 2:

Country	Source
Finnish average (electricity)	Energy authority 2018
Estonian average (electricity)	https://www.aib-net.org/facts/european-residual-mix
Great Britain, average (electricity)	https://www.aib-net.org/facts/european-residual-mix
Spain average (electricity)	https://www.aib-net.org/facts/european-residual-mix
Sweden average (electricity)	https://www.aib-net.org/facts/european-residual-mix

Norway average (electricity)	https://www.aib-net.org/facts/european-residual-mix
Fortum (district cooling)	Fortum 2018
Great Britain, average (district heating)	DEFRA 2018: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2016 - Conversion factors 2018 - Full set (for advanced users)
Finnish average (district heat)	Motiva 2018: https://www.motiva.fi/ratkaisut/energiankaytto_suomessa/co2-laskentaohje_energiankulutuksen_hiilidioksidipaastojen_laskentaan/co2-paastokertoimet
Helen (district cooling)	Helen 2018
International average (district heating)	Conversion factors 2019 - Full set (for advanced users), https://assets.publishing.service.gov.uk/government/uploads

SCOPE 3:

Transport type	**Source**
Train (pendolino)	Defra Conversion factors 2019
Long haul flight	Defra Conversion factors 2019
Ferry (HEL-STO)	Defra Conversion factors 2019
domestic flights	Defra Conversion factors 2019
Bus	Defra Conversion factors 2019
Commuting by Metro and tram	See 3.5 Emission factors used in calculation
Commuting by walk	See 3.5 Emission factors used in calculation
Ferry (HEL-TLL slow speed)	Defra Conversion factors 2019
Train (Local)	Defra Conversion factors 2019
Ferry (HEL-TLL high speed)	Defra Conversion factors 2019
Commuting by bicycle	See 3.5 Emission factors used in calculation
Short haul flight (up to 3700 km)	Defra Conversion factors 2019
Commuting by Bus	See 3.5 Emission factors used in calculation
Car (own)	See 3.5 Emission factors used in calculation
Commuting by train	See 3.5 Emission factors used in calculation
Commuting by car	See 3.5 Emission factors used in calculation
Express vessel (HEL-TLL)	Defra Conversion factors 2019
Car (leasing)	ALD and Leaseplan 2019
Train (International)	Defra Conversion factors 2019
Flight freight, international or long-haul	Defra Conversion factors 2019
Road freight	Defra Conversion factors 2019
Sea freight	Defra Conversion factors 2019
Equipments	**Source**
Smart phones	Apple 2019: https://www.apple.com/environment/reports/, calculated as an average form different models
Other electronics	Calculated average of all products in Anders' LCA study: Anders S. G. Andrae & Otto Andersen Int J Life Cycle Assess (2010) 15:827–836 DOI 10.1007/s11367-010-0206-30

Screens	WWF ilmastolaskuri
Cables	Carbon Footprint Estimation in Fiber Optics Industry: A Case Study of OFS Fitel, LLC
Services	**Source**
Services	Jyri Seppälä et.al. 2019. ENVIMAT research: https://www.motiva.fi/files/4771/Suomen_kansantalouden_materiaalivirtojen_ymparistovaikutusten_arviointi_ENVIMAT-mallilla.pdf

8 SOURCES AND ADDITIONAL INFORMATION

Space efficiency/Tilatehokkuus 2019: Rapal tutkimus 2018

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition. Internet address: http://www.ghgprotocol.org/files/ghgp/public/ghg-protocol-revised.pdf [27.2.2014]

The Greenhouse Gas Protocol: The Corporate Value Chain (Scope 3) Standard [9.3.2018]