



#ICTCLIMATE

The ICT sector, climate and the environment – preparation of a strategy for Finland

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LVAM MINISTRY OF TRANSPORT
AND COMMUNICATIONS

Background

- Finland aims to be carbon neutral by 2035 – GHG emission reductions are needed in all sectors of the society
- Digitalisation is a major enabler of CO₂ reductions in e.g. energy sector, industry, transportation
- The electricity and material consumption of the ICT sector is growing. Data centers, communications networks and devices are needed to provide the services that modern societies rely upon.

Climate and environmental strategy for the ICT sector

- A working group appointed by the Finnish Ministry of Transport and Communications has been preparing a climate and environmental strategy for the ICT sector in Finland

Two reports:

- A mid-term in June 2020
- Final report in November 2020
- Circulation for comments until 15 January 2021, finalization of the strategy

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Digita Oy **✦** DNA Oyj **✦** Elisa **✦** Energy Authority **✦** Finnet Association
Finnish Broadcasting Company Yle **✦** Finnish Energy
Finnish Federation for Communications and Teleinformatics FiCom
Helsinki Metropolitan Smart & Clean Foundation
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Ministry of Economic Affairs and Employment **✦** Ministry of Finance
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Telia **✦** The Association of Finnish Local and Regional Authorities
The Consumers' Union of Finland **✦** The Finnish Innovation Fund Sitra
The Finnish Software and E-business Association
The Finnish Transport and Communications Agency Traficom
TietoEVRY Corporation **✦** VTT Technical Research Centre of Finland Ltd



**POSITIVE IMPACTS
HANDPRINT**

Greenhouse gas
emission reductions
in other sectors

Digital solutions supporting
environmental protection
and nature conservation

Solutions facilitating
climate change
adaptation

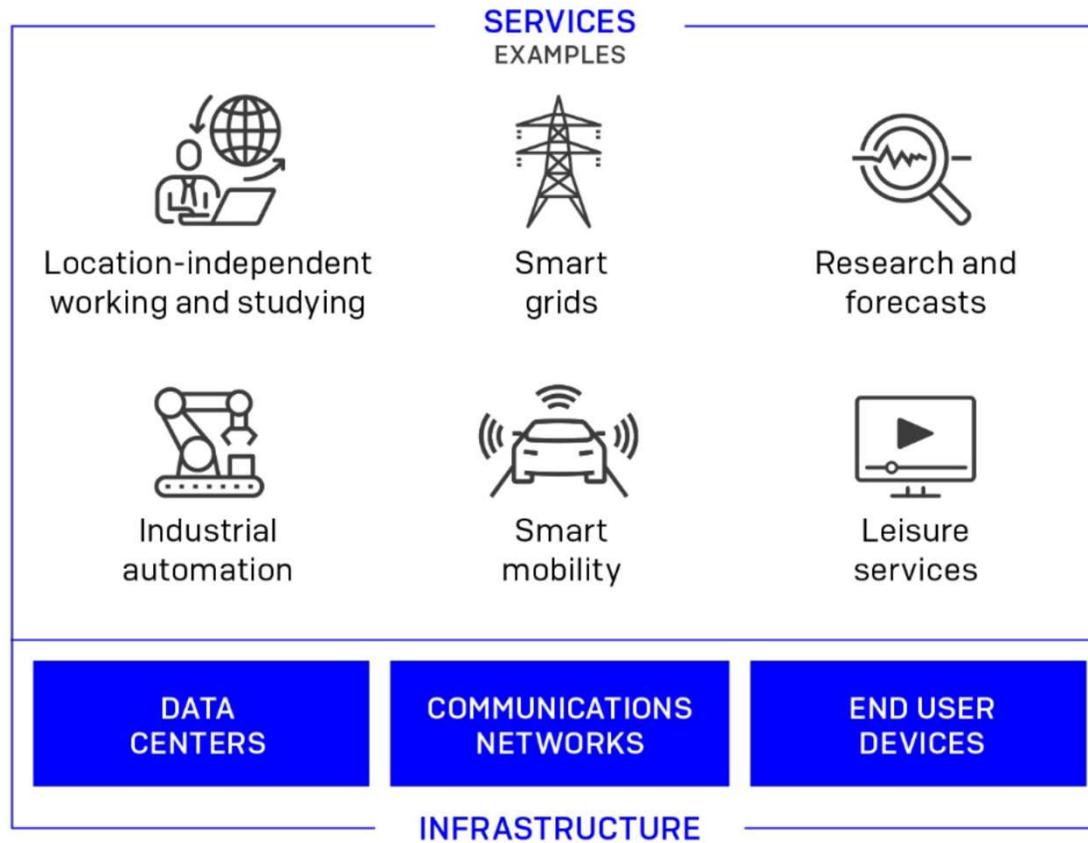


**NEGATIVE IMPACTS
FOOTPRINT**

Energy consumption
and its greenhouse
gas emissions

Raw materials usage in
infrastructure and devices

Emissions into air,
water and soil



Power consumption and associated emissions

- According to different estimates, the ICT sector accounts for 4-10 % of global power consumption and for 1.5-5 % of global greenhouse gas emissions
- The greenhouse gas emissions from electricity consumption depend on the structure of electricity production.
- In Finland, the majority of electricity supply from nuclear + renewables
- Data and emission impacts are crossing borders

Global Internet traffic is growing



Source: International Energy Agency

Power consumption and associated emissions: recommendations

- The use of energy efficient solutions and carbon-free electricity sources must be promoted
- The heat generated as a by-product of data centres and similar facilities should be better utilised
- Data centres have the potential to operate in the electricity market using the electricity they store in batteries
- Research, training of experts, and guidance in service procurement

Material use and associated environmental impacts

- Major material flows are associated with ICT end user devices
- The volume of global electrical and electronic waste is rising by up to 7% annually
- There is little ICT device manufacture in Finland. In the European frame of reference Finland is a relatively large producer of certain rare metals needed for devices.
- Metals are the most valuable components of end user devices, which besides them also contain plastic and glass. Recovery often presents a challenge owing to factors including the low valuable element concentrations and assembly techniques.

Material use: recommendations

- Extending the life span of equipment: design, awareness raising, using maintenance services, sustainability criteria in procurement
- Recycling of materials from old devices could be enhanced by means of financial incentives, such as compensation for the return of old equipment.
- Increasing understanding of and piloting technical means to recycle
- Increasing and tracing sustainability of production of raw materials

Improving knowledge base

- Energy consumption statistics and information on related emission effects in data centres and networks must be developed
- Several research needs were identified:
 - Information on the impacts and rebound effects of digital solutions during their life cycle
 - More information on material streams related to ICT equipment

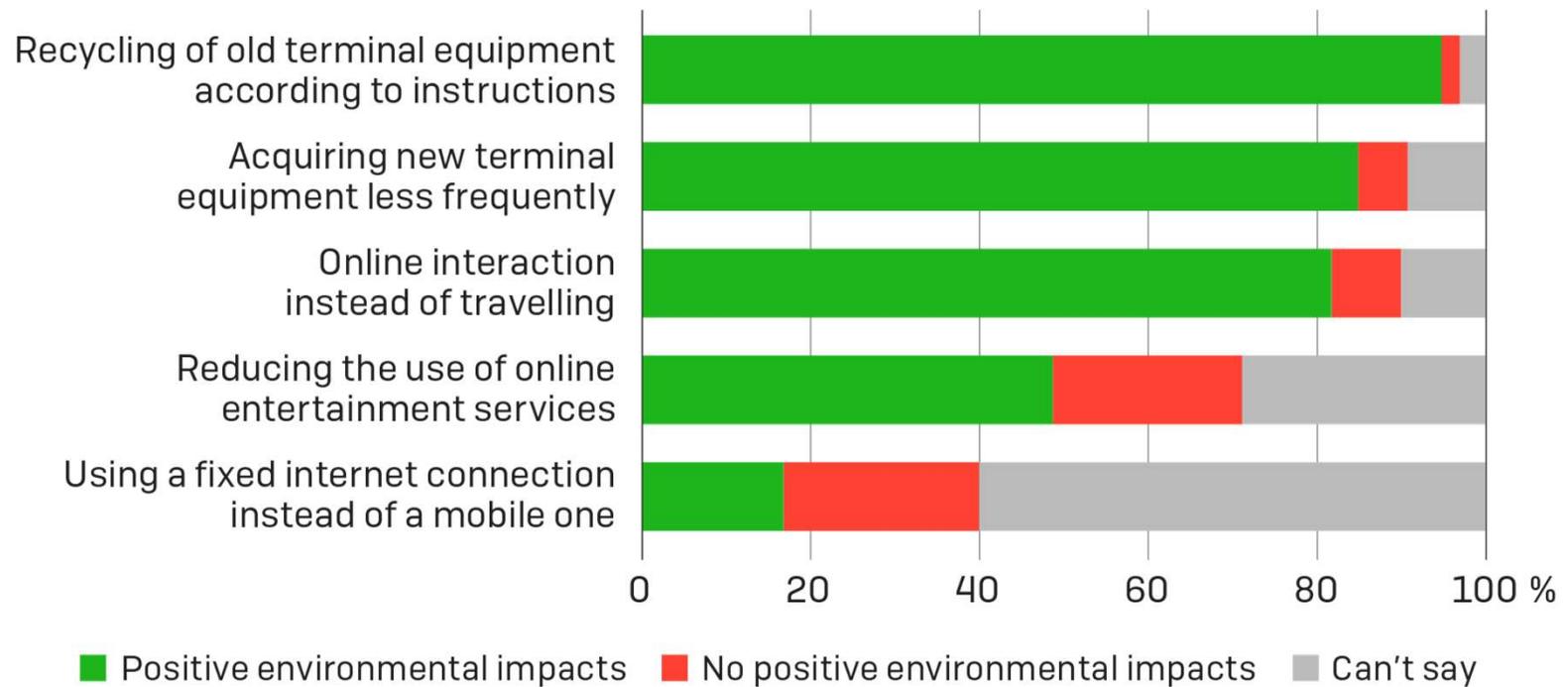
Enhancing positive impacts

- Developing solutions for climate and environmental challenges should be further encouraged: education, competitions/hackathons, taking full use of the combination of digitalisation and greening in recovery packages
- Potential of the ICT in housing, transport and mobility and industrial production, circular economy as a whole
- Often non-measurable. Renewable energy, for example, could not be put to large-scale use without the help of digitalisation.

Potential and challenges of new technologies

- Quantum computing, robotics, AI etc.
- AI, for example, is seen to hold immense potential for generating new solutions. What about its own energy use? Data scarce machine learning as a solution?
- More research is needed on environmentally sound application of new technologies + tools to put them into practice

Consumers' views on ICT environmental impacts



Consumers' role

- 90% of the data transfer in the mobile communications network in Finland goes through private subscriber connections (Traficom survey).
- Consumer behaviour plays an important role in managing the environmental impacts of the ICT sector's use stage.
- A large number of Finns are interested in receiving more information on the climate and environmental impacts of ICT equipment and services. (Traficom survey).
- The working group recommends that information on climate-friendly use of ICT services and equipment be shared by means of education, training and various digital skills projects and campaigns.



#ICTILMASTO

Thank you!

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