

Digitization provides opportunities for climate protection

Information and communications technology (ICT) can play an important role in the development of a low-carbon economy in Switzerland. By the year 2025, ICT has the potential to prevent up to 3-4 times more greenhouse gas (GHG) emissions in Switzerland than that which is caused by the overall production, operation and disposal of ICT devices and infrastructures.

This is the conclusion that was reached by «Opportunities and Risks of Digitalization for Climate Protection in Switzerland», a study conducted in July 2017 by Lorenz M. Hilty and Jan C.T. Bieser of the Department of Informatics at the University of Zurich in conjunction with Swisscom and WWF Switzerland. In precise terms, by the year 2025, ICT can help save up to 6.99 metric tonnes (Mt) of carbon dioxide equivalent (CO₂e) per year in Switzerland, while its own GHG footprint will only equal 2.08 Mt CO₂e. However, in order for the ICT sector to take advantage of this excellent opportunity to contribute to climate protection, certain assumptions must hold true. In particular, the authors of the study cite the importance of regularly tapping existing technical and economic potential by way of ambitious and goal-oriented measures. They also see great potential for reducing GHG emissions via ICT-based («smart») solutions in the transport, building and energy sectors. At the same time, greenhouse gases emitted by the ICT sector itself must drop by 17%, which is both technically and economically feasible as long as gains in efficiency are made.

The study found that the majority of GHG emissions from the ICT sector are caused by end-user devices. Currently, around 2/3 of consumption-related GHG emissions from the ICT sector in Switzerland are caused by desktops, laptops, tablets, smartphones and printers, while 1/3 of these emissions are generated by the operators of telecommunication networks and data centres. By replacing stationary

desktop computers («traditional PCs») with mobile devices (laptops, tablets, smartphones), whose weight and electrical power consumption are restricted to provide for greater comfort, we can cut down on emissions that are normally associated with their use and construction.

The shift to energy-sufficient devices

Another advantage of mobile devices is that they are «energy-sufficient», as they are required to consume only minimal amounts of power so they can be used for long periods of times with small and lightweight batteries. With these devices, it is possible to reduce per capita emissions caused by the use of ICT, all the while improving user-friendliness. By shifting to lightweight and energy-sufficient mobile devices, however, the amount of emissions generated during production will rise. It will therefore be all the more vital that the ICT sector make the supply chain «greener» and lower «embedded emissions» (emissions arising in countries

tiko

Swisscom has incorporated its energy-saving solutions and the tiko offer into a platform that consolidates electrical devices of thousands of households into one network, where they can be switched on or off as needed. Energy production is dependent on the weather and therefore in a constant state of flux. This, in turn, affects the energy

supply and the stability of the grid. If Swissgrid calls for a restriction in the amount of energy that is being consumed, tiko automatically delays the heating cycles of its subscribers, allowing for consumption levels to drop before another wave of energy consumption begins. As a result, consumers can save up to 60% on their heating bills. tiko is currently the largest energy storage network in Europe.



An informative overview of all the devices connected to the tiko

where raw materials are extracted for the production of devices). A key factor therefore is the reduction of the use of fossil fuels across the entire product life cycle. According to the authors of the study, nothing would so endanger the future GHG footprint of the ICT sector



platform is neatly displayed on the iPad.

than if this positive trend were to become compensated (or overcompensated) by an increase in the number of mobile devices per person and a decrease in the length of such devices' operating lives. In the worst case scenario, society would adopt a «throwaway mentality» with regard to digital electronics.

Such a mentality would cause the GHG footprint of the ICT sector to rise considerably, even if most consumers continue to respect the provisions of the Swiss Recycling System for Electrical and Electronic Waste. If steady (or increasing) amounts of already scarce resources are allocated to larger numbers of ever smaller devices, then the dispersion (and thus irreversible use) of rare metals will rise. Similarly, resource shortages and the expense (including energy expenditure and result-

ing emissions) required for the extraction and recycling of scarce raw materials will also increase. A second risk lies in the possibility that data traffic, especially data exchanged between machines, will grow at a quicker rate than the energy efficiency of the infrastructure. This would lead to an increase in emissions from the predominant part of the global Internet, which is still driven by non-renewable energy sources.

Consumers will not feel the difference

While carrying out the study, the authors put ten specific applications to the test. One of these applications involved the use of smart load management during the consumption of electricity. Such management can – as demonstrated by Swisscom's «tiko» – significantly reduce household energy consumption without

compromising the comfort of consumers. Another example is co-working, as ICT is now making it possible for more and more jobs to be done remotely. Co-working spaces can optimize or reduce required office space and shorten commute times. Further examples include car sharing and inter-company logistics solutions.

The University of Zurich study (PDF)
 The long form of the study can be downloaded as a PDF, or simply by scanning its QR code:
goo.gl/17k4HA



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