



Contribution to a Strategy for Smart Sector Integration

CSC – IT Center for Science Ltd.

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CSC - IT Center for Science Ltd. sees smart energy sector integration as an important means in pursuing the objectives of the Green Deal. Decarbonising sectors such as heating, transport and industry requires more efficient and cleaner ways to produce energy, and innovations that reduce the amount of energy needed. In addition, due to the growing amount of intermittent renewable energy, the energy systems need more flexibility and stability through energy storage and conversion between the different energy sectors.

The key in achieving better integration in energy sector is technological advancement and new innovations. There is a huge potential in solving technological challenges such as power-to-X, hydrogen and processes of energy-intensive industry. In addition, there is demand for services that increase energy efficiency by optimising the energy usage. Solving the challenges related to the energy sector require top level research and innovation activities. The Commission needs to ensure that the proposed funding for Horizon Europe and Digital Europe Programme is not cut in the negotiations for the next multiannual financial framework. Sufficient funding for RDI activities, as well as good digital and research infrastructures are necessary for developing new, climate friendly technology.

Even though digitalisation and ICT sector are primarily an answer to the climate problem, they use a lot of energy themselves. The ICT sector is currently using 5-9 % of the world's electricity¹ and the share is expected to grow to 21 % by 2030². A substantial part of the current and future consumption comes from the data centers. Therefore it is clear that actions are needed in order to decrease data centers' environmental footprint.

The environmental aspects of running data centers should be taken into account to a greater extent, especially with publicly funded data centers. Data centers should be built in locations where there is a possibility to use renewable energy and free cooling or utilise the waste heat. Reusing the waste heat generated by a data center for example in a district heating network is a great example of smart sector integration. There is a lot of potential in using the waste heat of data centers in heating, as it solves two problems; the environmental footprint of the data centers reduces, and emissions of carbon intensive heating sector reduce. There are already examples of how to implement such solutions; a good case for benchmarking is CSC's data center in Kajaani, which will host a EuroHPC pre-exascale supercomputer LUMI³ from the beginning of the next year. The waste heat generated by the center will heat up 5000 homes in the area. In addition to the utilisation of the waste heat, the circular economy thinking needs to be incorporated in the data center business in other ways as well. It means for example exploring the possibilities to build centers on existing infrastructures and taking care of the life-cycle of the materials that are used.

The EU should support environmental friendliness of data centers by placing entirely or partly EU-funded energy-intensive operations such as high-performance computing and data management in data centers that have the smallest environmental footprint. Due to the modern high-speed data connections, operations can be located even

¹ <https://www.enerdata.net/publications/executive-briefing/expected-world-energy-consumption-increase-from-digitalization.html>

² Andrea & Edler (2015). On Global Electricity Usage of Communication Technology: Trends to 2030, Challenges 2015, No. 6, s. 117-157; doi:10.3390/challe6010117.

³ <https://www.lumi-supercomputer.eu/>



in otherwise peripheral areas. The current EU green public procurement criteria for data centers, server rooms and cloud services should be promoted and private actors should be encouraged to take the environmental aspects into account more comprehensively. The main barrier for utilising the waste heat of data centers is that it is not always economically sensible. The best tool to overcome that problem is different incentives: energy taxation, emissions trading system and funding for technological solutions that help to make the data centers more environmentally friendly (for example heat pumps, which are needed to raise the temperature of the waste heat so that it can be fed into the district heating network).

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