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Public Consultation on the BEREC Draft Report on Sustainability: Assessing BEREC's contribution to limiting the impact of the digital sector on the environment

Fields marked with * are mandatory.

Body of European Regulators for Electronic Communications
BEREC

During its 50th plenary meeting (10 March 2022), the BEREC Board of Regulators has approved the Draft BEREC Report on Sustainability: Assessing BEREC's contribution to limiting the impact of the digital sector on the environment for public consultation.

This Draft Report on Sustainability provides an overview of the results of BEREC's groundwork on ICT sustainability to assess and better understand the impact of the digital sector, including electronic communications networks and services, on the environment. It sets out an outline of BEREC's approach to environmental sustainability of the sector.

This Draft report constitutes the first step: BEREC will continue to build up its knowledge on the important topic of sustainability to be able to contribute with its expertise in shaping the green and digital twin transition. Collaboration with relevant stakeholders will be of importance in this process, notably to share analysis and experiences related to ICT sustainability.

For structured responses to this consultation, BEREC kindly asks you to submit your comments/remarks per each chapter of the draft report in the following questions below. You will have also the opportunity to upload a supporting document at the end of the survey (file size limit: 1 MB).

Responses should not be submitted later than **14 April 2022 (17:00 CET)**.

* Name

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Organisation

Nokia

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Feedback on each chapter of the Draft Report

1) Please enter your comments on Chapter 1 (Introduction) here:

Nokia welcomes Berec's attention to sustainability of the telecommunication networks. We appreciate the opportunity to submit our views through this public consultation.

Nokia is committed to maximize our positive impact on society, people and the planet – our handprint, and we continuously work to minimize our potential negative impact – our footprint. We believe there is no green without digital - digitalization and climate action must go hand in hand. Nokia contributes to the European Green Deal goals and more specifically greening of the European networks through our innovations driving down the energy consumption of our products. We launched the new AirScale radio platform that can bring savings in power consumption, material use and logistics. In March we announced the commercial release of our liquid cooled AirScale portfolio. Also, our new chipsets brought improvements in energy efficiency compared to earlier generations. Network transformations enabled by those and other innovations described below cut emissions per bit of data transmitted.
Our recently released People and Planet report nokia-people-and-planet-2021-sustainability-report.pdf provides detailed information about our environmental performance, including on emissions and supply chain footprint.

2) Please enter your comments on Chapter 2 (Case studies) here:

Studies show that access infrastructure is the most energy-consuming segment in a network. The base station in the radio access network (RAN), for example, accounts for between 60-80% of energy consumption. Opportunity lies in network modernization. Successive generations of technology—global systems for mobile (GSM) to LTE to 5G—are ever more energy efficient.

5G is natively greener than previous generations of mobile technology and can potentially provide 100 times more data traffic with less energy per bit thanks to new standardized efficiency features.
5G is the only radio technology that can help to digitalize societies while also allowing the decoupling of the growth in data traffic from equivalent potential growth in energy consumption. An energy-efficient 5G deployment strategy is the only way to build the best performing, lowest cost 5G radio networks. Modernization of the legacy 2G/3G/4G base stations with modern Single RAN software and hardware while rolling out new 5G radios can compensate for adding new radio sites, as the modern equipment consumes less energy with advanced sleep mode software features. The sleep mode optimization can be automated by intelligent energy savings management enabled by machine-learning algorithms. 5G also provides the foundation for the efficient use of other new technologies (AI, VR/AR, blockchain).

Also in fixed networks, newer technologies such as fiber-to-the-home (FTTH) brought more energy-efficiency. Since 2007, fixed broadband power consumption has been reduced by 38% while speeds have increased by a factor of 64x. This trend shows that the explosion in demand for connectivity does not necessarily need to lead to a massive increase in emissions. Chipsets are the primary driver of energy consumption in an access node, and with more power-efficient chipsets, CSPs can achieve smaller nodes that take up less space, use less power and need less cooling. Like mobile technologies, successive generations of passive optical networks (PON) improve their energy efficiency. XGS-PON (10 Gigabit Symmetrical PON), for example, consumes twice the energy of GPON but delivers five times the capacity, so CSPs upgrading PON networks will also improve carbon footprint on a bits delivered per watt consumed basis.

The mobile backhaul network also needs to use the most energy-efficient and sustainable technology. Traditional copper used in urban backhaul is being replaced by fiber, with the associated improvements in energy efficiency previously described. Network convergence has been around as a concept for a long while, and the improved performance characteristics of the latest generations of PON make this a viable

option for mobile backhaul. An urban FTTH network has the capacity to support mobile backhaul alongside residential broadband and is advantageously close to where 5G small cells are needed. A single converged network for mobile backhaul, business and residential broadband is more energy-efficient than separate networks since it reduces the number of cables laid and electronic equipment deployed.

Liquid cooling is an interesting innovation bringing down energy consumption of networks. Around 80% of energy used by mobile radio networks becomes waste heat, which in typical indoor radio sites needs an air conditioning system to remove the excess heat from the equipment room or shelter. Site cooling is not efficient, as a typical aircon system such as COP2 requires 500W of energy just to cool 1kW of waste heat from a radio base station. Liquids can transfer 4000 times more heat and the liquid cooling system COP is typically 20 watts, which means a 90% reduction in cooling system energy consumption. Nokia introduced the world's first liquid cooled AirScale Base Station. The solution can capture 80% of the waste heat to liquid which makes it possible to transfer the heat over distances and to circulate the heat for other purposes like building heating, this can reduce base station CO2 emissions further by 80 %.
There is also a great potential in AI. For instance, EdenNET SON energy saving modules with machine learning algorithms enable cell-specific parameterization and thanks to continuous analysis of the traffic patterns by cells, it also enables automatic re-configurations based on dynamic changes in traffic patterns. These algorithms help to reduce energy consumption further once the energy saving SW features are activated.
Cooling represents approximately half the energy consumed by data centers. Norwegian Construction company MIRIS uses liquid cooling for its data centers and reuses it in a local heating system, creating a clean and energy efficient process. Likewise, Iliad has adopted adiabatic cooling, a more energy efficient cooling process which uses a change in air pressure caused by volume expansion in all its data centers and expects that this will reduce power consumption.

3) Please enter your comments on Chapter 3 (Outcomes on BEREC's previous work on sustainability) here:

4) Please enter your comments on Chapter 4 (Inputs from stakeholders) here:

5) Please enter your comments on Chapter 5 (Key findings of the external study) here:

6) Please enter your comments on Chapter 6 (Conclusions and outline for BEREC's future work on sustainability) here:

Every network improvement program is an opportunity to increase sustainability with network modernization options described above producing real results for CSPs and for this planet. Policy incentivizing investments into greener solutions can accelerate the transformation. However, we strongly urge to first and foremost consider the enablement effect of connectivity and digitalization towards other sectors, as that holds the biggest potential. Connectivity helps industry sectors such as manufacturing, agriculture, transportation and energy to improve their energy and material efficiency and decrease waste and emissions, while increasing productivity and safety. According to a study by GSMA, the manufacturing industry can reach annual productivity and energy savings gains of 10–20% by 2030 by moving to smart factories, leveraging IoT devices and automation. Another GSMA research shows connectivity and digitalization can help other industries and society to reduce their emissions by up to 10 times more than the mobile industry's own emissions. Nokia in collaboration with GSMA Intelligence produced additional reports exploring relation between connectivity and climate, such as Industry pathways to net zero Mobile and digital technology in support of industry decarbonisation, and The essential role of AI in improving energy efficiency

Further, regulations and policies must be coherent and consistent across Europe and -whenever feasible- globally to maximise their impact. Existing international standards and recognised global measurement methods should always be prioritised above creation of new measures or indicators, for instance when it comes to life-cycle assessment.
Moreover, science should drive the decisions, not subjective (end-user) perceptions. We urge regulators to base their decisions on objective and verifiable factors.
Technology neutrality is a valuable principle of the European regulation. It is advisable to consider benefits and incentives for environmentally sustainable networks, but there should be sufficient flexibility in definition of those as innovation advances and new choices may become available in years to come. At the same time those incentives should not constrain operators in making the most optimal choices for their networks, considering their specific needs and circumstances.

Nokia stands ready to further assist Berec in examining the best regulatory options for sustainable networks of the future.

7) Please enter any other comments you may have:

Please upload here any supporting document that you deem relevant:

In accordance with the BEREC policy on public consultations, BEREC will publish all contributions and a summary of the contributions, respecting confidentiality requests. Any such requests should clearly indicate which information is considered confidential.

Confidential contribution:

- [ ] Yes
- [x] No

If yes, please specify the information which should be treated as confidential:

Background Documents

Draft BEREC Report on Sustainability

Contact

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