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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.



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)**.

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Feedback on each chapter of the Draft Report

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

Executive summary

P2: Based on ITU-T L1410/ETSI 203 199 standard and Hilty framework this is commonly known as first order effects while adverse effects are more commonly referring to negative second order effects

P4: BEREC are encouraged to refer to the international standards developed by ITU-T, in particular L.1450 on ICT sector footprint and ITU L.1410 on LCA

P4: This figure fails to mention the ITU-T L.1470 baseline, agreed between ITU-T, GSMA, GESI and SBTi (at 1.4% of overall emissions)

P4: These figures from RAMBOLL-study are derived from studies that may use the percentage differently since different methods are applied, and different reference-levels for overall GHG emissions may be referred to.

Page 7, P2: It is recommended to refer to standardized life cycle phases such as materials acquisition, production, use and end-of-life treatment (see ETSI 203 199). Deployment is an initial phase of the use stage and quite limited in comparison to other activities. (There seem to be a misunderstanding regarding this term in the Ramboll report)

P2:

The consideration of rebound effects in relation to first order effects unclear. In a footprint based on actual data any direct rebound in relation to increased efficiency of products is already included in data sets. The intrinsic limits in energy efficiency gains may refer to the decline of Moore's law but as explained in L. 1450 a network is a complex system where efficiency measures exist at different level, so even in case of a decline in Moore's law there are many other opportunities to increase energy efficiency. This includes but is not limited to use of sleep modes and the decommissioning of older generations of systems.

P2: GHG development does not follow electricity consumption automatically due to opportunities for decarbonizations

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P5: BEREC are encouraged to consider the substantial experience of the standardization community in this field

P5: BEREC is also encouraged to consider and support industry initiative such as the establishment of the ICT decarbonization trajectory developed by ITU. GSMA, GeSi and SBTi for SBTi (L.1470 and SBTi ICT sector guidance), ITU-T Net Zero standard (L.1471), UNFCCC Climate Action Pathway for ICT and mobile etc

P6: There should also be an opportunity for BEREC to consider and support positive second order effects and suppress any adverse effects

Footnote: Belkhir study is assuming a direct connection between data traffic and energy consumption - while these data points collected independently shows a more complex relationship. In particular development over the last decade has shown that while data traffic grown exponentially, energy consumption increased in a limited and linear fashion contradicting this hypothesis

1 INTRODUCTION

See comments on this part in the summary. Note also that no in depth analysis of sources, assumptions and data was performed when these numbers were combined. Moreover, this refers to a mixture of peer-reviewed and non peer-reviewed sources with different coverage of collection of actual data.

Page 8, P1:

Note that this prediction is based on a hypothesis (that data traffic is a good indicator for energy consumption) which has not been validated - and proven wrong historically. Moreover, forecasts as far as 2040 for a dynamic sector like ICT seems not meaningful as the definition of the sector is likely to change in an unpredictable way.

P2: Suggested to refer to "A high-level estimate of the material footprints of the ICT and the E&M sector" (2018, Malmodin, Bergmark and Matinfar) which looks at the sector based on a hybrid-approach.
<https://easychair.org/publications/download/XvgV>

P3: Hence, it would be important for BEREC to support and push efforts such as ITU-T L.1470, ITU-T L. 1471, UNFCCC climate action pathway for ICT and mobile

Page 9, P2:

Should be clarified whether this refers to a life cycle or use perspective or to the use of electricity during operation.

Figure 2:

The distinction between digital transformation and sustainable development is not clear and the allocation of initiatives between those can be debated

Page 11, P3: For the future BEREC is encouraged to also consult SDOs (primarily ITU-T SG5 and ETSI) for a more comprehensive view on existing and relevant methodologies since standardization in this domain have been ongoing for more than a decade

P4: Detailed comments are provided on the Ramboll study which is considered to perform a quite superficial assessment of existing literature and standards, largely failing to take note of existing and ongoing ICT specific assessment standards developed for different purposes

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

Page 14, P4: It is noted that this committee has put forward ITU-T L.1450 as the main framework for establishing the ICT sector carbon footprint.

Page 17, last para before 3: It is noted that existing initiatives to large extent have not taken note of existing standards in the domain

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

Page 19, p1: This needs clarification in terms of which standards and data sets are considered

P1: As technology footprints may not follow national boundaries which may imply introduction of (sometimes artificial) boundaries and allocations. Hence, it should be important to align methods and data collection between countries. In particular, countries should take note of associated activities and methodology development in the frame of ITU-T SG5 (In particular standards such as L.1450 and L.1410)

P5: This recent study may be helpful to understand current situation: Electricity Consumption and Operational Carbon Emissions of European Telecom Network Operators (2022, Lundén, Malmodin, Bergmark and Lövehagen) <https://www.mdpi.com/2071-1050/14/5/2637>

Page 19, P1: There is also an opportunity to value and promote such as ITU-T L.1470, L.1471 and UNFCCC Climate action pathways for ICT and mobile

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

Page 21, p1: Here it is suggested to also consider ongoing work in ITU-T on establishment of a database (Refer to workitem L.Database in ITU-T SG5 Q9 L.Database)

Page 22, box on ITU et al: This description does not take note of ITU-T SG5 standards on decarbonization, LCA and carbon emissions assessments for different targets and circular economy and e-waste related standards

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

P1: A more detailed review of the external study is available in the study itself (attached)

P4: The standards assessment performed by Ramboll was not comprehensive and seemed to focus more on company reporting (GHG protocol and similar standards) than on standards for assessments and decarbonization. As such the report does not provide sufficient coverage of what existing and ongoing standards can provide to inform BEREC's process

P4: Independent collection of traffic and energy consumption data shows that data traffic does not a good indicator for energy consumption despite many studies starts from that assumption without validating it.

P4: Use of renewable electricity is acknowledged by ITU-T L:1470 as a key measure for decarbonization of the sector, despite that this is not put forward much in the report.

Page 26, p2: The Ramboll study seem to have misunderstood the definition of deployment and due to this focuses more on digging than on IC production and other manufacturing and materials related activities of higher significance.

P3: However, since networks are complex previous efforts have shown the complexity of comparability and the inevitable trade-off between comparability and representativeness of real conditions, and the necessity to apply several metrics and different scenarios to get a relevant basis for comparisons

P3: As stated in the summary this view seems at least partly based on the view that Moore's law is declining. As described in L.1450 the electricity consumption of networks is more complex and there are many other levels of optimizations that will enable continued efficiency gains.

P4: Circularity, longevity and recycling aspects would be at least as important.

P5: The interviews seemed to have focused in particular on company level GHG reporting based on the standards referred to.

Page 27, figure: It would have been preferred to refer to life cycle stages established by L.1410 where deployment is a limited part of the use stage while other cradle-to-gate activities are more prominent

5.3.1, P1: The misunderstanding of the concept deployment leads to a singlehanded focus on civil work neglecting other at least as important embodied emissions such as those associated with production of IC. The report also largely neglects the importance of renewable electricity and decommissioning of older technologies

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

P28, footnote: These two studies refer to different topics: The first seem to consider a footprint/first order effect or partial effect perspective. The second refers to the aggregated effect of first and second order effects while the second order effects is a topic which seems to be out of scope (at least no systematic research in this domain seems to have been undertaken)

Page 29, P2: Actually the ICT sector trajectory of L.1470 outperforms the European ambition and could be leveraged by BEREC, as well as the net zero standard L.1471. There are also other ITU standards helpful to address circularity

P2: These neglects the L.1470 baseline and Malmudin & Lundén estimates at around 1,4% based on extensive collection of actually reported levels

P3: Though the data situation is far from perfect companies are to large extent reporting emissions but many studies neglect to collect these data and prefer theoretical models

P3: Methodologies exist but may not be sufficiently known or applied. Hence the problem is not lack of data and methods but studies failing to consider them

P3: Experts criticize the 2040-perspective as meaning less to estimate as we could not have the slightest idea what the sector and ICT technologies will look like in a 2030 timeframe. The 14% figure is based on the assumption that electricity scale with data - a theoretical approach which has not been reflected in actual data

P3: At the same time ITU and partners present a feasible and normative scenario on halving emissions by 2030 which should be considered as it was agreed only after consultations across four organisations and as such better represent a more plausible (but not self-established) way forward

P3: What is the basis for this statement ("While the exact figures contained in studies may vary, there is a general agreement in the academic community that ICTs' GHG contribution will significantly increase if no action is taken" - I would rather claim there is a fundamental disagreement in the academic community between data collectors and theoretical models, while ITU and partners provide a unified way forward (however demanding significant action to be implemented)

P3 (last sentence): In this regard the standards community provides the tools but practitioners and researchers may not be willing to adopt them

P4: This should refer to standardized life cycle stages as outlined in L.1410

Page 30, p3: BEREC should make sure to involve standards expert of ITU to make sure that such studies are performed in line with best assessment practice

P4: To this end it would be beneficial if BEREC could collaborate with ITU-T SG5 Q9 on the work stream on establishing a data base for the ICT sector

Page 31, P2: Moreover the switch to renewable electricity would be important and could thus be promoted

Page 32: Adding to this BEREC could help establish a deeper understanding on consumers' digital

behaviour and footprint by performing wide and detailed usage studies

GLOSSARY

Carbon neutrality:

It is suggested to refer to the concept net zero which is more well-defined and more closely refer to the performance of the sector. Refer to ITU_T L.1471 for definitions

Enabling effect:

positive second order effects.

Although second order effects are important this report does not include them but marginally.

ANNEX II

Page 43, P5: The IEA work is considered more solid than those more theoretical approaches

P6: This will depend on how systems are built. See Ericsson Breaking the Energy Curve for guidance

Page 44, P1: Until now the report has mainly been about first order effect. Second order effects are also important but would be better to address separately and more thoroughly

Page 48, P2: GSMA has also been an important partner of ITU-T in the establishment of the ICT sector decarbonization trajectory in L.1470

Page 49, P2: Impact of ETNO operators is outlined in Electricity Consumption and Operational Carbon Emissions of European Telecom Network Operators (2022, Lundén, Malmodin, Bergmark and Lövehagen) <https://www.mdpi.com/2071-1050/14/5/2637>

7) Please enter any other comments you may have:

Ericsson have been researching ICT sustainability impacts for many years and have a large repository of peer reviewed research providing both quantifications and methodology development. <https://www.ericsson.com/en/about-us/sustainability-and-corporate-responsibility/sustainability-report/sustainability-metrics/sustainability-research>

We have also been active contributors to many of the main standards developed in this area over the last decade, in particular in ITU-T SG5 and ETSI EE.

As a company we are working actively to address our own emissions through science-based trajectories <https://www.ericsson.com/en/blog/2022/3/net-zero-what-is-it> and by participating in partnerships such as Exponential Roadmap Initiative and European Green Digital Coalition to see how we could best engage our technology in the twin transition of green and digital.

Based on these experiences we welcome and are happy to support BEREC's increasing focus on environmental sustainability. However, we see that the current report is lacking a comprehensive understanding of the standards and research domains in this area, as well as regarding ongoing activities and trajectories which we track back to the background report from RAMBOLL which is lacking in knowledge of the standards landscape, existing decarbonization trajectories and of the ICT sector footprint composition, in particular with regards to mobile networks, which leads to unbalance in identification of hotspots/priorities and opportunities. To better reflect such opportunities we would also like to put forward the UNFCCC Climate Action Pathways (Industry track - ICT & E&M, <https://unfccc.int/climate-action/marrakech-partnership/reporting-tracking/pathways/industry-climate-action-pathway>).

Hence, for future steps we encourage a closer mapping of existing standards in collaboration with the SDOs, and a more thorough assessment of existing research and opportunities.

Detailed comments on the WIK/RAMBOLL study could be shared at request as the file was too big to be uploaded.

Finally we would also like to provide detailed comments on the foreword:

P2: To map out the standardization landscape BEREC should consider that these networks are usually referred to under different names including networks, telecommunication networks, ICT networks etc - hence standards names are more commonly using these terms.

P2: Our ongoing research shows that GHG emissions of the sector have been stable since around 2010. Moreover, ITU-T L.1471 shows that the sector can halve emissions by 2030 if following this decarbonization trajectory.

P2: For networks in Europe please refer to for a detailed analysis of telecommunication networks in Europe: Electricity Consumption and Operational Carbon Emissions of European Telecom Network Operators (2022, Lundén, Malmodin, Bergmark and Lövehagen) <https://www.mdpi.com/2071-1050/14/5/2637>

P7: Such work items have been defined in ITU-T SG5 and BEREC are encouraged to participate in this standardization to derive indicators that are harmonized internationally. For some areas, such as energy efficiency BEREC should also refer to existing standards by ETSI.

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
 No

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

Background Documents

[Draft BEREC Report on Sustainability](#)

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