Activities of the BEREC Wireless Network Evolution Working Group

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Activities of the BEREC Wireless Network Evolution Working Group

Sietse van der Gaast,

co-chair of the BEREC Wireless Network Evolution Working Group

IEEE 802 meeting, Madrid - 25 July 2025

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Agenda

1. Introduction to BEREC and the WNE WG
2. Recent work of the WNE group
   - Private networks
   - Satellite communication
   - 2G and 3G phaseout
3. Potential future BEREC work
4. Wrap up

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01

Introduction to BEREC

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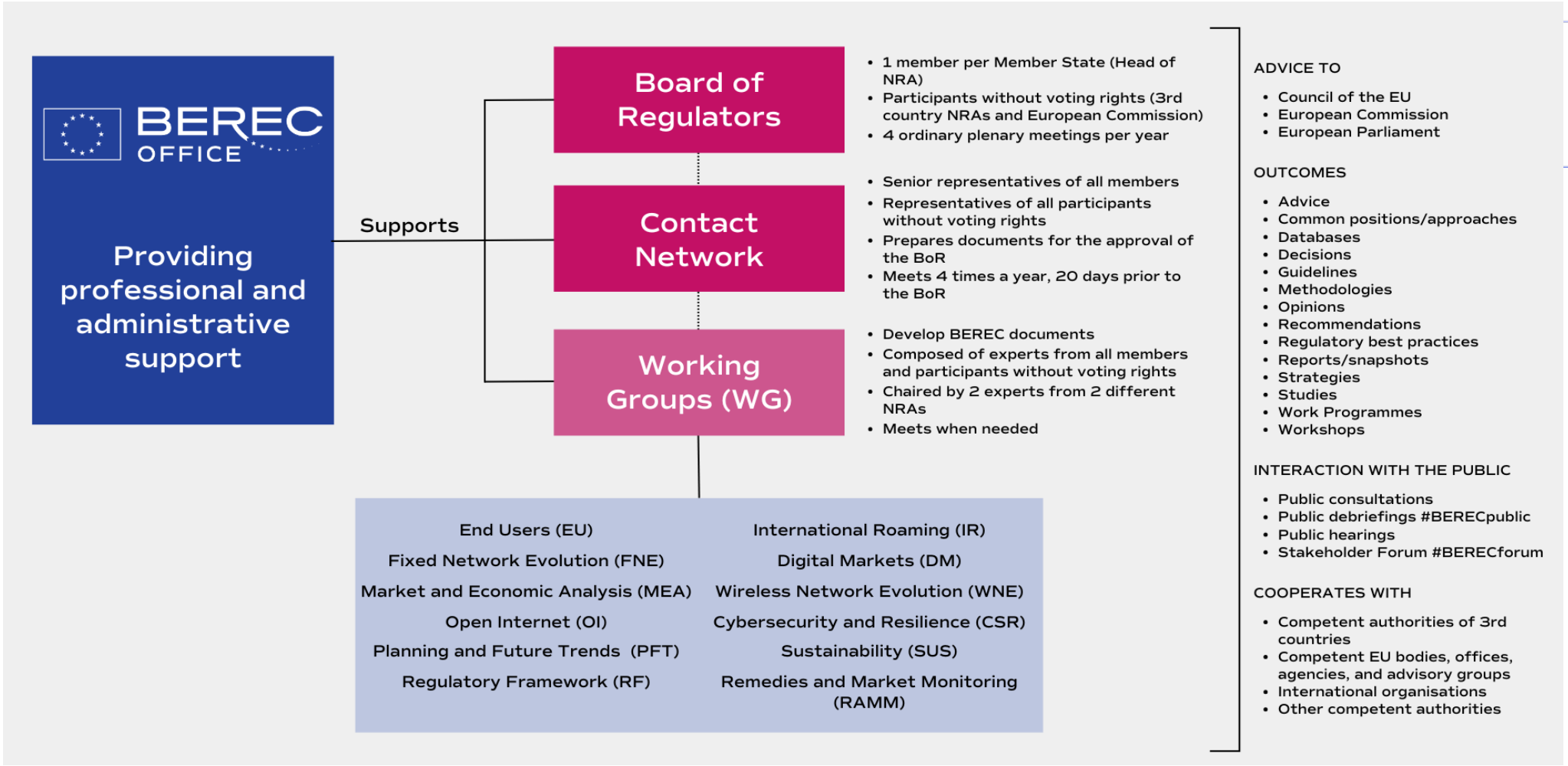
The Body of European Regulators of Electronic Communication



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The BEREC Wireless Network Evolution Working Group (WNE WG)

Relevant subjects:

- Evolution of physical network components
- Evolution of wireless radio technology
- Evolution of services & deployment

Focussing on impact on markets and consumers

Two co-chairs

- Joe Lynch of ComReg, Ireland
- Sietse van der Gaast of ACM, the Netherlands

Each year a number of drafters groups performing work items described in the BEREC work programme
See also: https://www.berec.europa.eu/en/working-groups/wireless-network-evolution

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Selection of recent WNE work

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Private Networks

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Status and work

- BEREC produced a report on the evolution of private networks in 2024-2025
  - Report based on answers to NRA questionnaire with 31 Responses, held in autumn 2024
  - Consultation in Q3 2024,
  - Incorporated responses and use cases in final report, published in March 2025

- What is a (5G) private mobile network?
  - Use cases
    - What organisations use it?
    - What is it used for?
  - Technical architecture
    - How is it deployed?
    - How does it differ from a public mobile network?

Observation 1: Not all Private Networks and their users visible to NRAs

In BEREC's view because of the different classifications and registrations used by NRAs it is very likely that a significant part of private network deployments is not known to NRAs.

- For instance, where MNOs deploy private networks without the need to register this as a private network, or where other companies deploy standalone private networks using (leased) MNO spectrum.
- Or where there is no obligation to separately register certain types of private networks.

As a result, potential difficulties faced by private network actors which regulation might address, may go unnoticed.

Observation 2: Private networks are a niche. But this may change.

- Questionnaire results draw a diverse picture of regulatory frameworks for private networks
  - the potential use cases of private networks are not part of the mainstream policy objectives (e.g. mobile broadband for end users), or
  - the use case and business case of private networks is very limited / niche / exceptional
- Private 5G networks are not widespread but interest is growing, because for some use cases:
  - There may be no alternative wifi solution, and no alternative MNO solution (including network slices) available or offered
  - MNOs cannot/don't want to provide the requested QoS of some business customers
  - The use of closed networks is mandated (e.g. security etc)

Observation 3: When private networks become popular, there are challenges

- 5G developments and cloudification may propel and ease private network deployment
- Use of MCC/MNC (network identifiers) may cause problems in case the use of private network densifies
- Private networks are aimed at very specific services bound to organisations/premises to distuinguish them from public networks,
  - How ‘specific’ these use cases and services are defined varies
  - Guarding the line between private and public networks and their respective frameworks may require new thinking depending on developments

Published BEREC documents
Private networks

- 2025 Final report: The evolution of private 5G networks and interrelation with public networks in Europe:
  - https://www.berec.europa.eu/en/all-documents/berec/reports/berec-report-on-the-evolution-of-private-5g-networks-and-interrelation-with-public-networks-in-europe
- 2024 Summary report summarizing the consultation responses :
  - https://www.berec.europa.eu/en/all-documents/berec/reports/berec-summary-report-on-the-outcome-of-the-public-consultation-on-the-draft-berec-report-on-the-evolution-of-private-and-public-5g-networks-in-europe
- 2024 Draft report and consultation announcement:
  - Public consultation on the Draft BEREC Report on the evolution of the private and public 5G networks in Europe | BEREC

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Satellite connectivity

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Status and work

- A succesful workshop on 22 May in Mainz 2025, Germany hosted by BNetzA
- The workshop was held in hybrid format and was very well attended, with 40 people on site and over 300 online from various stakeholder groups
- This year an internal workshop is held in multiple sessions, following developments leading to WRC 2027
-

Some relevant trends: SatCom, from alternative to mainstream?

- Non Terrestrial Networks (NTN) more and more complement Terrestrial Mobile Communication (TMC)
- Introducing fleets of Low Earth Orbit satellites. “Preparing for 6G”.
  - Potentially also additional solutions such as High Altitude Platform Systems (HAPS)
- Starting with emergency calls, but how much more in the future (potentially up to video streaming)?
  - Number of satellites grows fast (now hundreds, but thousands planned per ecosystem)
- Providing alternative for ‘fixed’ internet for remote locations, backhaul for mobile networks in remote locations
  - But if it is there, it can also be marketed for not so remote locations
- Satellite communication also moving to ‘direct to mobile devices’
  - Already there are ‘unmodified’ consumer smartphones on the market capable of satellite communication

Potential issues and uncertainties: Spectrum, jurisdiction, interoperability

Two approaches exist:

1. Communication with devices using International Mobile Telecommunication (IMT) spectrum may be a game changer,
   - but this spectrum is currently assigned to MNOs: subleasing? handover?
2. Communication with devices using Mobile Satellite Service (MSS) spectrum
   - but does not provide interworking with terrestrial mobile networks

In both cases there are several issues with standardisation and interoperability (for instance which emergency center is called and how?)

Published BEREC documents Satellite connectivity

- 2024 BEREC external workshop on usage of satellite technologies in mobile communications
  - Workshop + presentations: https://www.berec.europa.eu/en/events/berec-external-workshop-about-the-usage-of-satellite-technologies-in-mobile-communications
  - Summary report: https://www.berec.europa.eu/en/document-categories/berec/reports/summary-report-berec-workshop-on-secure-and-reliable-connectivity-from-leo-satellite-fleets-13-april-2023

- 2023 BEREC external workshop on secure and reliable connectivity from LEO satellite fleets
  - Workshop + presentations: https://www.berec.europa.eu/en/events/berec-workshop-on-secure-and-reliable-connectivity-from-leo-satellite-fleets
  - Summary report: https://www.berec.europa.eu/en/document-categories/berec/reports/summary-report-berec-workshop-on-secure-and-reliable-connectivity-from-leo-satellite-fleets-13-april-2023

- 2022 BEREC report on universal service:
  - Outcome public consultation: https://www.berec.europa.eu/en/document-categories/berec/reports/report-on-the-outcomes-of-public-consultation-on-the-report-on-satellite-connectivity-for-universal-service
  - Final report: https://www.berec.europa.eu/en/document-categories/berec/reports/report-on-satellite-connectivity-for-universal-service

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Phaseout of 2G and 3G

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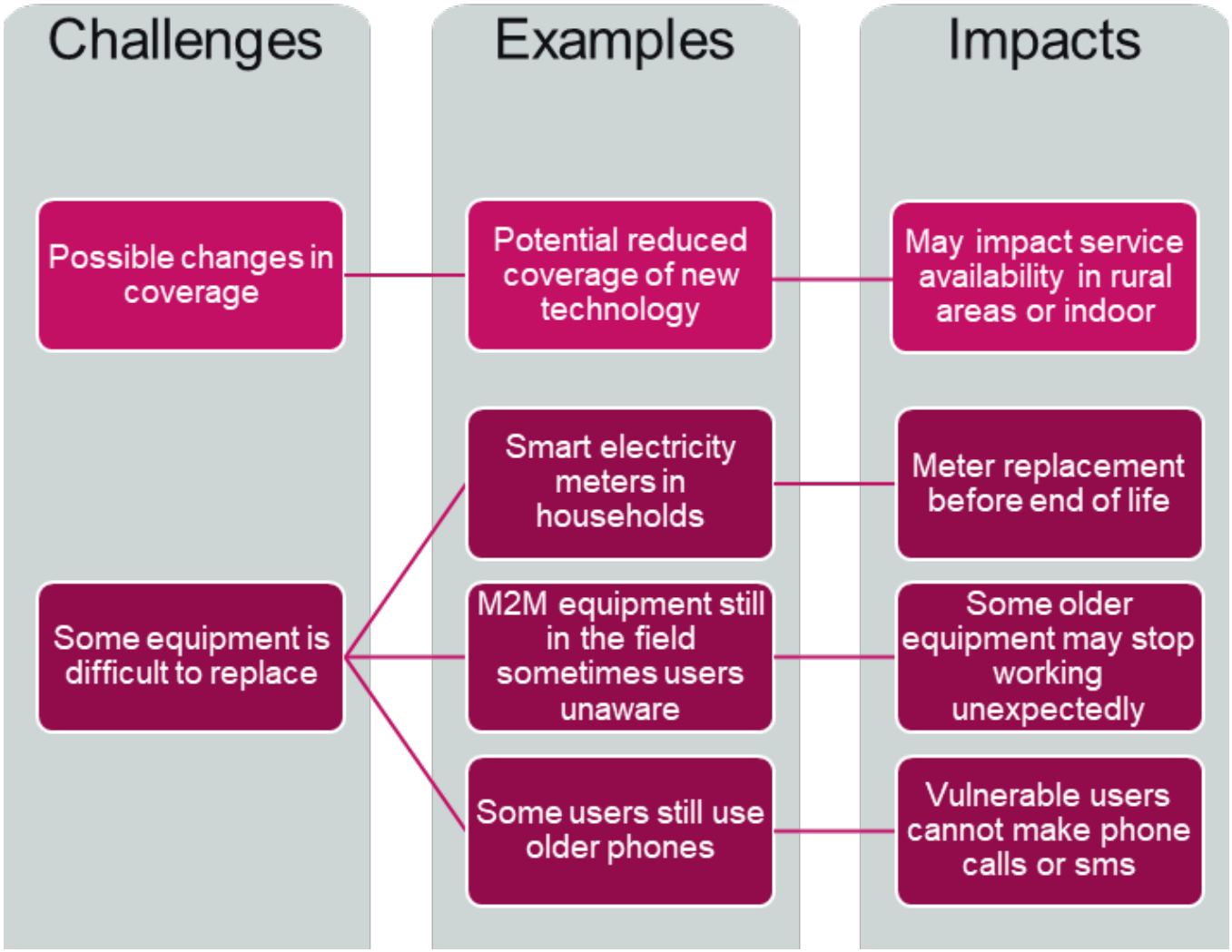
Status and work

- In 2023 BEREC carried out a study on the upcoming phaseouts of 2G and 3G in different European countries
- The study investigated possible challenges, and provided an overview of phaseout plannings
- As a follow up, BEREC organized an internal workshop on this subject in 2025

Challenges, examples, impacts (1)

More efficient spectrum use, stop inefficient technology

Better efficiency, reliability, security and sustainability: decommission older equipment



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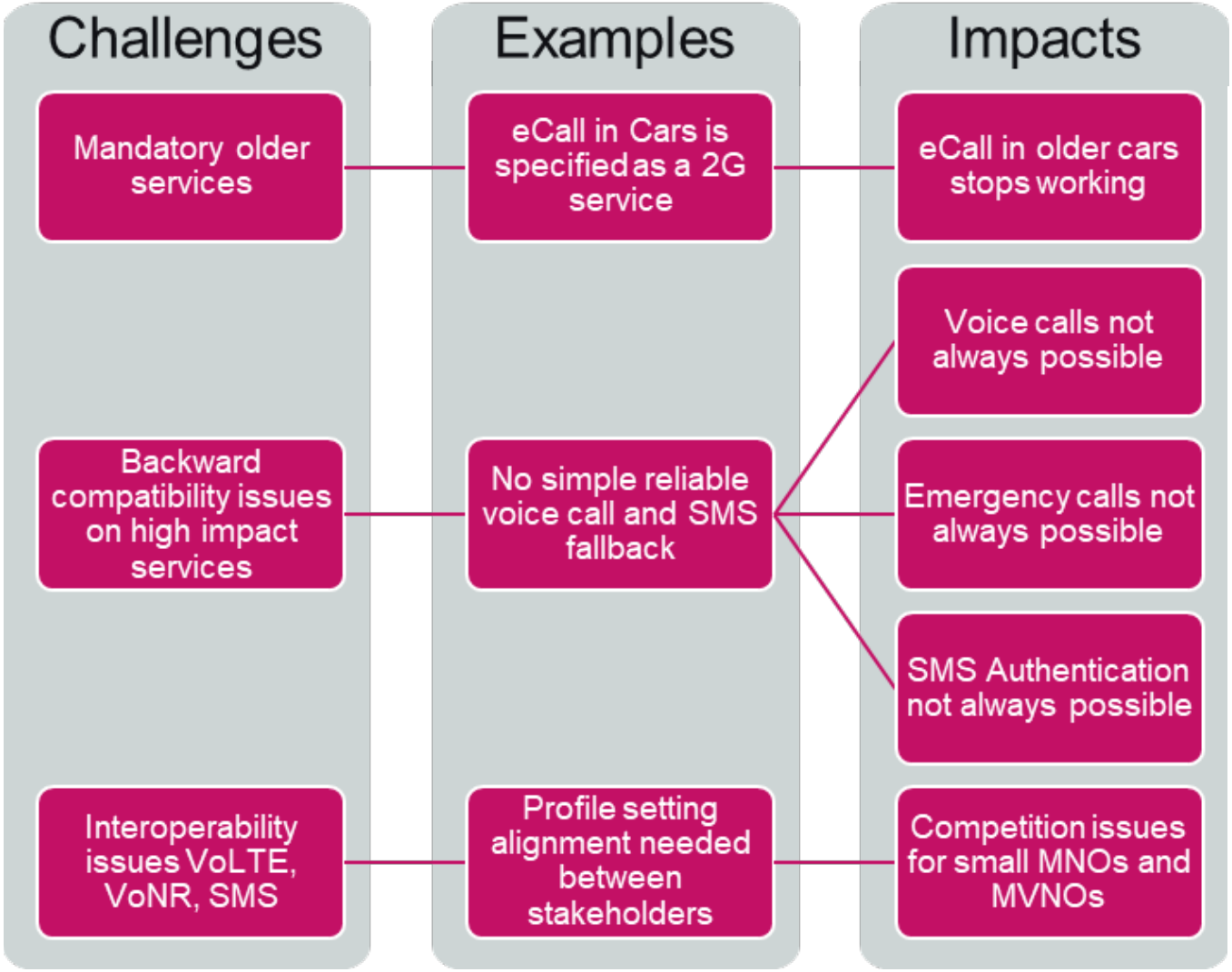
Challenges, examples, impacts (2)

Focus on new services:
better quality, choice, flexibility



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Current developments in Europe

- Approximately half of the European countries do not envisage 2G and 3G phaseout before 2030.
- The other half of the European countries see at least one Mobile Network Operator phasing out both 2G and 3G before or during 2030.
- A subset of the latter consists of around 10 countries with full phaseout of both 2G and 3G for all Mobile Network Operators in that country, with planned phaseout dates varying from end of 2025 to 2029.
- Planned phaseouts are sometimes delayed.

Published BEREC documents 2G/3G phaseout

- 2023 Final report: BEREC report on 2G/3G phaseout practices and challenges
  - https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-2g3g-phaseout-practics-and-challenges
- 2023 Summary report summarizing the consultation responses:
  - https://www.berec.europa.eu/en/document-categories/berec/reports/summary-report-on-the-outcome-of-the-public-consultation-on-the-draft-report-on-practices-and-challenges-of-the-phasing-out-of-2g-and-3g
- 2023 Draft report and consultation announcement:
  - Public consultation on the Draft BEREC Report on practices and challenges of the phasing out of 2G and 3G | BEREC

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Potential future WNE work

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Future BEREC work.
Your input is welcome!

BEREC Work Plan 2026 is still in development

- Focusing on BEREC input for the European Digital Network Act
- Potential (mainly BEREC internal) work on satellite communication, phasing out of 2G and 3G, private networks, hybrid networks, interfaces to mobile networks for developers and third-party services

How to follow our work and contribute?

- Attend the BEREC stakeholder forum (every year around end of March in Brussels)
- React to consultations of reports on berec.europa.eu
- Provide input for future BEREC work plans

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Wrap up

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Wrap up

- BEREC focusses primarily on public fixed and mobile communication access networks
- However, developments in indoor networking, private networks, personal networking and IoT variants provide important context.
- The evolution of hybrid networking may potentially lead to future regulatory questions

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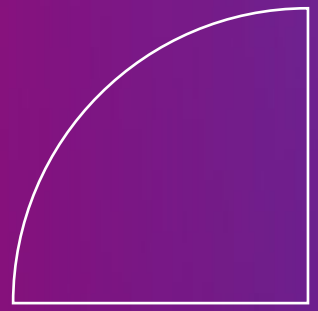

Questions?

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