BEREC Work on 5G

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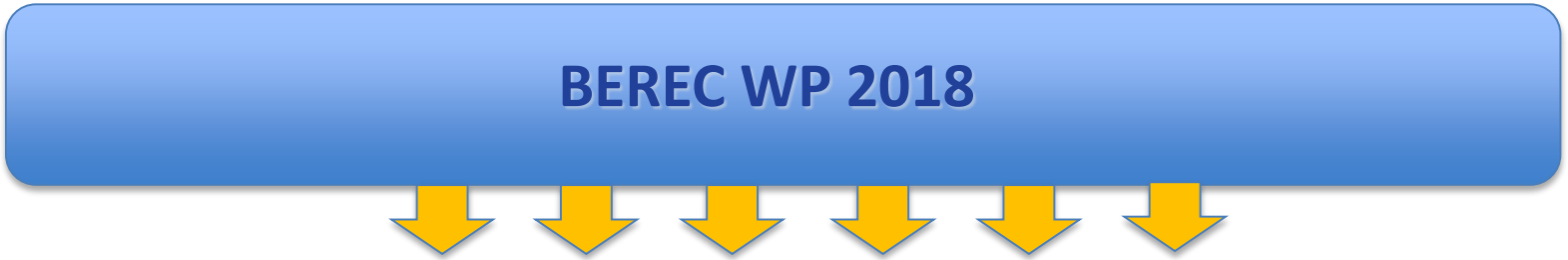
BEREC Mid-term Strategy 2018-2020

3 pillars in the BEREC Mid-Term Strategy 2018-2020

Promoting competition and investment
Empowering and protecting end-users
Promoting the single market



- Responding to connectivity challenges and to new conditions for access to high-capacity networks
- Monitoring potential bottlenecks in the distribution of digital services
- **Enabling 5G and promoting innovation in network technologies**
- Fostering a consistent approach of the net neutrality principles
- Exploring new ways to boost consumer empowerment
- BEREC Obligatory Work and Stakeholders Engagement

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Strategic Priority 3: Enabling 5G and promoting innovation in network technologies

- *BEREC will make 5G a strategic priority in the coming three years with the aim to enable European-scale solutions that promote competition, are consistent with the EU regulatory framework and which may help reap the benefits of early and coherent implementation in terms of innovation, productivity and growth in the internal market.*

- *To this end, BEREC will – within the scope of its competence – actively and closely follow the development of 5G and will, where relevant, work in cooperation with other EU bodies (in particular RSPG) to identify potential hurdles to a smooth and quick implementation in the Member States.*

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Roadmap

- **Spring 2018: Study on Implications of 5G Deployment on Future Business Models**
- **Spring 2018: BEREC sent a draft common position on mobile coverage to RSPG - public consultation on it in June 2018**
- **Report on infrastructure sharing – published with the view to a common position on infrastructure sharing in December 2018**
- **Common position on information to end - users on mobile coverage to be expected in December 2018**
- **A report on spectrum authorization and award procedures under preparation**

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Workprogramme 2019 – consultation phase

- BEREC Report on the impact of 5G on regulation and the role of regulation in enabling the 5G ecosystem
  - assessment on the impact of 5G on regulation and the role of regulation in enabling the 5G ecosystem to include how regulation could influence the pace at which innovative services are brought to market – especially vertical solutions.
  - other issues on which 5G may have an impact (market definition, impact of network slicing on net neutrality, numbering, wholesale access to mobile networks to enable competition in vertical applications, roaming, switching barriers, and the extent to which similar issues might arise in the deployment of IoT solutions using pre-5G networks).
- BEREC Report on the monitoring of 5G roll - out and quality of service
  - follow up the 2018 work, focusing on the monitoring of the 5G networks coverage and quality of service and the roll-out and sharing of small cells.

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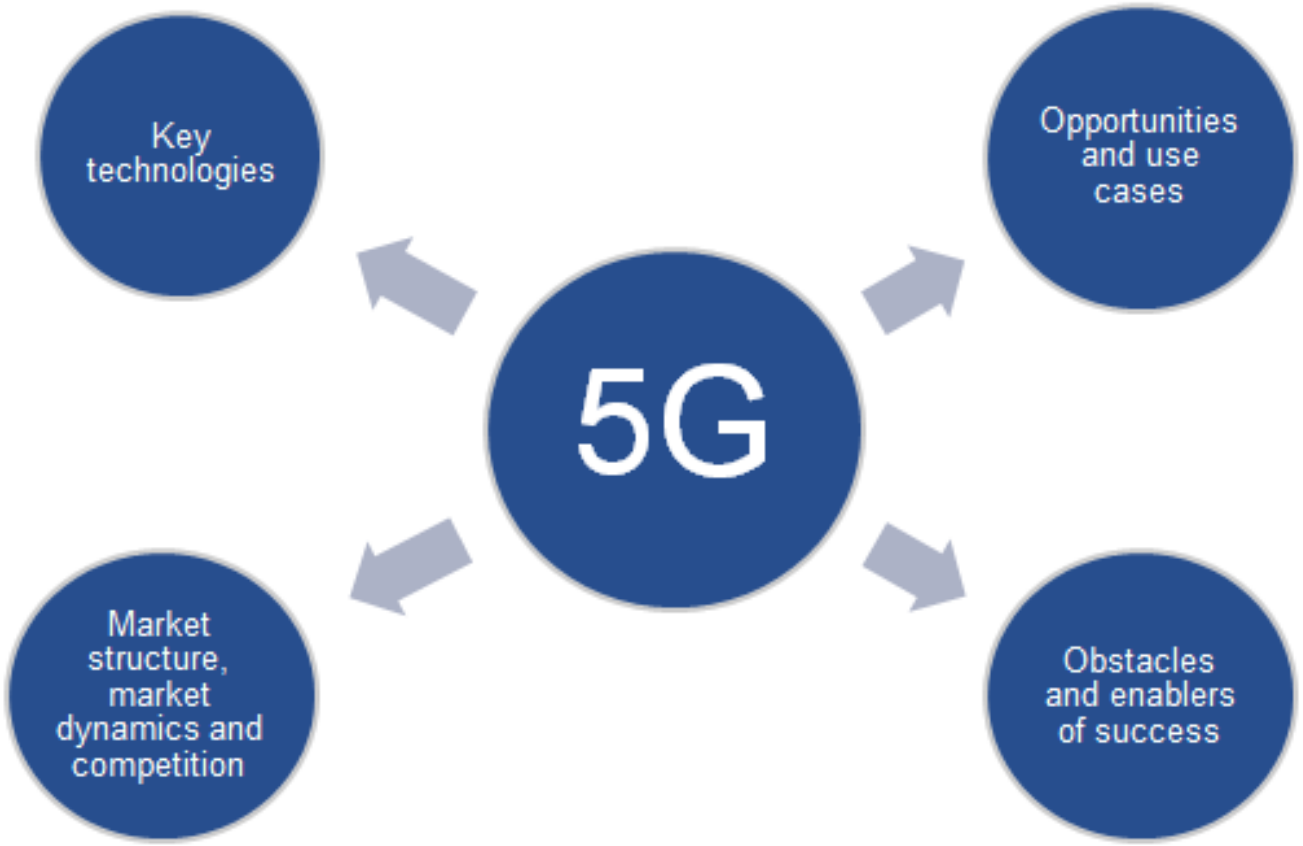
Study on Implications of 5G Deployment on Future Business Models



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Common Position on Monitoring Mobile Coverage

1. Technical specifications for monitoring mobile coverage in Europe

2. The use of signal predictions for mobile coverage estimation

3. Ensuring the accuracy of coverage information provided to the public

4. Availability and presentation of mobile coverage information

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Draft Common Position on Mobile Infrastructure Sharing

- Common definitions relating to mobile infrastructure sharing
- A list of benefits stemming from mobile infrastructure sharing
- A description of the European regulatory framework applicable to mobile infrastructure sharing
- A common non-exhaustive list of parameters to consider when addressing mobile infrastructure sharing agreements

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Conclusion

BEREC FACILITATES A FAST AND SMOOTH DEPLOYMENT OF 5G IN EUROPE

PREPARE
the 5G landscape

5G is based on small cells, meaning more base stations are needed for it to work properly. To help minimise the cost and boost the speed of 5G deployment, BEREC will gather best practices in infrastructure sharing across Europe. It will publish a **Report on Infrastructure Sharing** and adopt a **Common Position**.

SOW
the seeds of 5G in Europe

For 5G deployment, spectrum needs to be assigned. Member States may have different spectrum available and use different ways to assign it. To help each country to pick the most suitable procedure for its market, BEREC will publish a **Report on Spectrum Authorisation and Award Procedures**.

HELP
the crop of 5G grow

Citizens and companies should benefit from reliable 5G services. Coverage obligations can help to ensure the wide availability of 5G, especially in challenge areas like rural regions, indoors or along transportation networks. A **Best Practices Report on Coverage Obligations** by BEREC will help Europe to foster a fertile 5G deployment.

MONITOR
the development of 5G

There are clear benefits to achieving a common understanding of how to monitor mobile coverage. A BEREC **Common Position on Monitoring Mobile Coverage** will facilitate a mutual understanding and foster a consistent approach on how this information can be made available and understandable throughout Europe.

HARVEST
the bountiful 5G crop

With its work, BEREC will help to prepare a fertile landscape for 5G deployment. The next step is for citizens and operators to harvest the 5G crop, maximising the potential that 5G has to offer. Completely new business models, high speed internet everywhere and smart homes are just the beginning.

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BEREC focus in 2018: 5G

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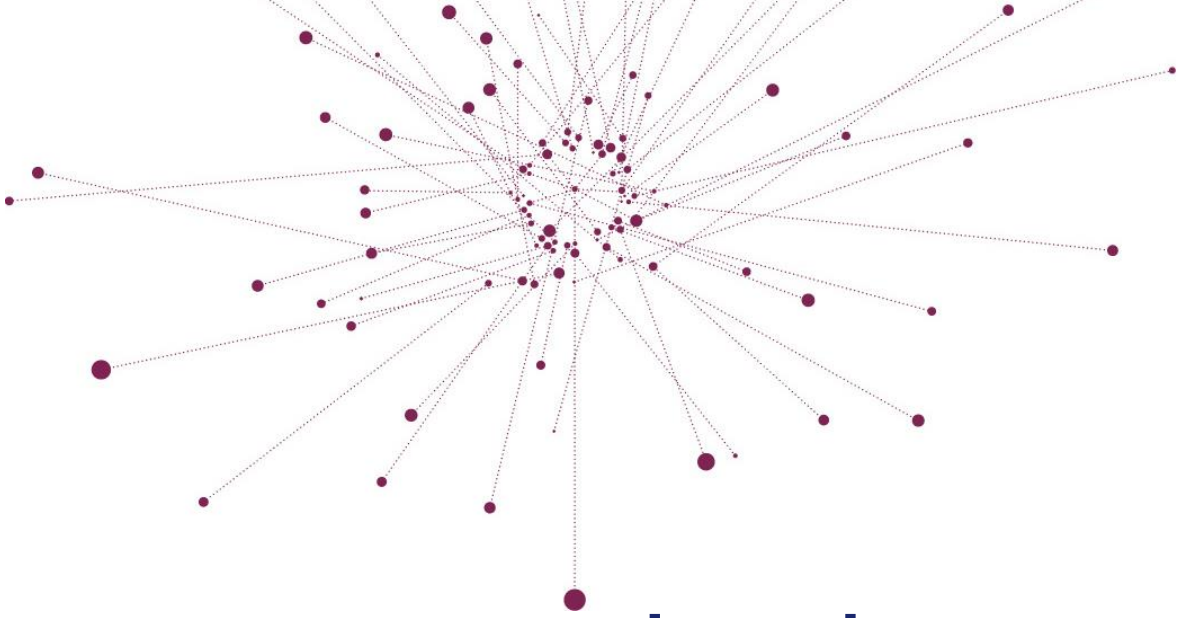

Thank you !

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Study – some key findings

- In the short and medium term development **rather evolutionary** and not revolutionary (mixed connectivity environment)
- **Enhanced Mobile Broadband** is likely to be the main driver of 5G deployment
- The realization of 5G use cases will **be a step-by-step process** and many potential uses are currently at very early stages of development
- In the longer run **new services enabled by 5G**(wide variety of **different niche applications** but no killer application and **verticals** with specialist requirements, pricing models are a challenge)
- **Private deployments of 5G** within spaces such as factories or warehouses. Should be procompetitive and help to drive coverage.
- Access to **small cell** sites**, availability of backhaul** and **infrastructure sharing** are important **obstacles** and **enablers**

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Regulatory Issues

- Challenges arising from small cells
- Access to spectrum
- Coverage issues
- Competitive issues
- Backhaul for 5G cell sites
- Edge Computing
- Net Neutrality
- Sectoral regulation and quality of service

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Tackling the 5G challenges

BEREC proactively tackles upcoming challenges and supports the consistent deployment of 5G in Europe

A variety of projects addresses 5G hot topics:

- Coverage obligations
- Award and authorization procedures
- Infrastructure sharing
- Net neutrality input to an evaluation

Close cooperation with relevant institutions

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Common Position on Monitoring Mobile Coverage

- **CP 1: Technical specifications for monitoring mobile coverage in Europe**
  - Criteria for information about mobile coverage:
    - Strength of the signal received
    - Minimum probability of successful service reception
  - applying an appropriate threshold to the available mobile signal power

- **CP2: The use of signal predictions for mobile coverage estimation**
  - *"NRAs should base their coverage estimation on coverage calculations/predictions whenever it is not economically or technically possible to carry out field measurements of the whole country. "*
  - An NRA may elect to:
    - generate coverage prediction and publish information themselves
    - obtain the results of predictions from the operators and publish information themselves
    - use a third party to generate the coverage predictions an publish information

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Common Position on Monitoring Mobile Coverage

- **CP3: Ensuring the accuracy of coverage information provided to the public**
  - *"NRA should verify the reliability of mobile coverage information using, where appropriate, field measurements, noting that for technical and resourcing reasons it may not be possible to make widespread measurements."*

- **CP4: Availability and presentation of mobile coverage information**
  - *"NRAs should strive to provide easy-to-access accurate mobile coverage information to the widest possible range of consumers."*
  - useful for end-users to be able to compare coverage and services provided by their operators
  - Goal: maximize access, especially via website, apps, open data

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Draft Common Position on Mobile Infrastructure Sharing

- Common definitions relating to mobile infrastructure sharing
  - passive sharing: co-location, backhaul physical elements, site sharing, mast sharing, backhaul sharing
  - active sharing: RAN sharing, core network sharing, data transmission, national/local roaming, frequency (or spectrum) sharing

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Draft Common Position on Mobile Infrastructure Sharing

- Benefits stemming from mobile infrastructure sharing
  - cost reduction
  - resource reallocation (improving coverage or quality of service)
  - improved efficiency (spectrum capacity, space, administrative obligations)
  - effect on competition (enhancing competition in sparsely populated areas)
  - environmental/public benefits (landscape image protection, town/country planning)

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Draft Common Position on Mobile Infrastructure Sharing

- A description of the European regulatory framework applicable to mobile infrastructure sharing
  - telecom specific current and future regulatory framework (new code)
  - role of general competition law

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Draft Common Position on Mobile Infrastructure Sharing

- A common non-exhaustive list of parameters to consider when addressing mobile infrastructure sharing agreements
  - competition between the sharing parties
  - Impact on the non-sharing parties and the market in general
  - investment incentives
  - the positive impacts on service brought to consumers/end users
  - the impact on public interests
  - reversibility and contractual implementation
  - other parameters specific to the agreement type
    - Passive sharing might be encouraged across all the territory
    - Active sharing should be evaluated depending on area type (densely-populated, moderately-populated and sparsely populated areas)
    - Core network sharing is likely incompatible with infrastructure competition
    - Spectrum sharing might lead to capacity extension where only one cooperation partner deploys a network to the detriment of infrastructure competition
    - Legacy technology sharing might help the continuation of the services and allow for more efficient spectrum use
    - Sharing agreement with new entrants usually provides for additional competition