**Huawei Technologies' input on the Draft BEREC Work Programme 2023**

Huawei Technologies welcomes the opportunity to provide its input on the Draft BEREC Work Programme 2023.

*Short description of Huawei Technologies' input on the Draft BEREC Work Programme 2023*

## 1.3. Report on practices and challenges of the phasing out of 2G and 3G

Huawei takes note of BEREC's willingness to better understand and assess any impact of possible future phasing out of some legacy systems (2G and 3G) on the electronic communications market including system reliability and security, sustainable network management, end-user terminal developments, etc.

Huawei welcomes this initiative and would be interested in participating in the public consultation and sharing its insight about 2G and/or 3G switch-offs best practices.

## 1.5. Update of criterion 4 of the BEREC Guidelines on very high capacity networks (carry-over)

Huawei takes note of BEREC's intention to work on the revision of VHCN Criterion 4 as stipulated in paragraph 25 of the BEREC Guidelines on very high capacity networks which states that *"since it was not yet possible to take 5G fully into account for the release of these Guidelines, as it has not yet reached mature deployment and significant penetration, BEREC intends to update criterion 4 (performance thresholds for wireless networks) as soon as possible and not later than 2023."*

In this connection, Huawei welcomes BEREC's intention to launch a public consultation with a view to adopting draft guidelines at Plenary 3 2023 for publication. Huawei intends to contribute to this public consultation.

## 1.12. Report on cloud services and edge computing

We welcome BEREC's intention to adopt a Report on cloud services and edge computing. Huawei intends to contribute to the public consultation which will be launched in due course.

We would like to emphasize the role of **AI together with 5G, Cloud and Edge**. We invite BEREC to take a holistic view incorporating the synergetic effect of those technologies.

5G serves as an important enabler for smart manufacturing transformation. Combined with cloud computing, big data and artificial intelligence, it can help enterprises achieve smarter production, smarter management and more flexible production, while at the same time connect people, machines and equipment into a unified and interconnected industrial network. With the introduction of new technologies such as 5G edge computing and network slicing, mobile operators can provide industrial customers with a new generation of converged infrastructure that

is more flexible and more secure and solutions that are lightweight, easy to deploy, and easy to manage to help them more easily migrate to flexible, automated and intelligent productions.

Huawei considers that the EU should build on its strengths: sensors, applications and systems, maintain autonomy in these sectors and master the value chain, especially the digital part enabled by 5G connectivity. Edge computing is a key technology for IoT and 5G to support applications with more stringent requirements, zero-latency, higher capacity and massive connected devices. Convergence of technologies is key, as between AI and IoT, and in line with the European vision for IoT evolution in the next five years. The move to more intelligent devices needs to be supported: learning capabilities should be integrated in the devices by leveraging AI and Machine Learning. The orchestration of the complexity is crucial: future research challenges should cover open distributed Edge computing architectures. The EU needs to adopt a human-centric and inclusive approach to IoT. The Edge should be explored from Europe's strength of diversity and as an opportunity to develop IoT in an inclusive manner, including socially, urban/rural and enterprise/SME. To this end, and in order to fully realize the EU's growth potential in smart and green transport, smart energy grids and digital healthcare systems, our understanding is that 5G, together with AI, Cloud and Edge, will be a key architecture element with a view to enabling the aforementioned 5G verticals.

### 2.3. BEREC Report on Indicators to measure environmental impact of electronic communication networks and services (carry-over)

BEREC will consider the indicators that might help evaluate the environmental sustainability of electronic communications networks and initiatives from electronic communication operators.

Huawei welcomes this initiative because we firmly believe that we cannot promote digitalisation without promoting the reduction of the carbon footprint of the digital industry including its enabling effect on a wide range of other industries. Therefore, we would like to participate in and contribute to technical workshops of BEREC as well as questionnaires. Huawei can contribute in a variety of areas like energy consumption, smart agriculture, or smart mobility (enabled by both C-V2X and Intelligent Automotive Solutions), smart grids, smart healthcare, remote education and industrial automation.

### 2.4. Potential ad-hoc work on ICTs sustainability in the framework of the European Green Deal implementation

We welcome this potential ad-hoc work stream of BEREC and would be delighted to contribute to its deliverables in due course.

As a global vendor of wireless equipment and devices, Huawei Technologies is not only a prominent stakeholder in the wireless sector, but through its engagements with a variety of verticals, Huawei is also increasingly involved in a diverse range of other sectors.

We consider that 5G is a significant enabler of energy-efficient wireless communications, noting that the energy efficiency per bit of 5G is considerably greater than that of 4G. This is achieved through the use of wider channel bandwidths, massive-MIMO technologies (itself facilitated via time division duplex operation), and dynamic processes to turn base stations off when idle, or to allocate network resources only when required by an application – possibly in a virtual dedicated slice. Going forward, these features will be enhanced through AI technologies. As such, 5G will

be instrumental in managing the carbon footprint of mobile networks in view of the expected phenomenal growth of data consumption over the next decade.

But far more significant is the ability of 5G to help other industries to achieve their climate impact targets, known as the *"enabling effect"*. According to the International Telecommunication Union (ITU) SMART 2020 report[1], the scale of the enabling effect, across all ICT, will be equivalent to 15% of all global emissions by the end of 2020. The 5G enabling effect arises from changes to processes and behaviours, supported by high-capacity and low-latency 5G networks. Together with virtualization, edge computing, AI-enabled analytics and cloud, 5G can help industries to implement new processes as an integral part of energy efficiency programmes, by supporting the most efficient and flexible allocation of resources.

### 2.4.1. BEREC Report on the entry of large content and application providers into the markets for electronic communications networks and services

Huawei welcomes BEREC's intention to organise several internal workshops with experts and relevant stakeholders to gather their inputs and insights on the topic.

We would be delighted to contribute to this work stream and look forward to hearing from you.

### 2.7. Assessment of the IP interconnection ecosystem and impact of the potential sending party network pays principle on Internet ecosystem and on end-users (carry-over)

Huawei welcomes BEREC's work aimed at assessing the grounds for a proposal on a fair share contribution by OTTs to network infrastructure costs considering the market developments that have occurred in the recent years and the investments made by the different stakeholders. We take note of BEREC's intention to also analyse the potential impact such proposals would have on end-users (e.g. end-user payments for both IAS and CAP subscriptions, quality of service), on competition and on the Internet ecosystem.

Huawei would certainly consider participating in BEREC's efforts to collect further information relevant to this analysis, and monitor emerging trends as the market continues to develop.

### 2.11. BEREC workshop on the perspectives and regulatory/competition challenges of Internet of Things

We take note of BEREC's intention to organise a workshop with the twofold purpose of reviewing the state of play of IoT services and discussing emerging regulatory/competition challenges for IoT services in view of 5G and 6G.

We are firmly convinced that the way forward for the EU will consist in leading, promoting, bridging and collaborating in IoT and Edge Computing and other converging technologies research and innovation, standardisation and ecosystem building, providing IoT and Edge Computing deployment for European businesses creating benefits for European society. Cooperation with other global regions to ensure removal of barriers to development of the IoT and Edge Computing market while preserving European values, including privacy and consumer protection should be the founding pillars of a European IoT ecosystem.

[1] ITU, "Summary of SMART 2020 Report". See: https://www.itu.int/md/T05-FG.ICT-C-0004/en.

We would be delighted to participate in this workshop and look forward to hearing from you.

### 3.2. BEREC Report on Member States' best practices to support the defining of adequate broadband Internet access service (carry-over)

The provision of broadband connectivity to all citizens is one of the top priorities of the EU, and is captured in the Communication on the Digital Compass for the EU.

We believe that fixed wireless access (FWA) is an important solution with this regard, especially in suburban and rural areas. Specifically, FWA delivered via 4G/5G can leverage – where applicable – existing mobile network infrastructure, and exploit the latest advances in wireless communications. Furthermore, because there is no need to dig trenches, deploy cables underground or get approvals from property owners to install wires in buildings to reach end-users, 4G/5G FWA can be deployed much faster than fibre and with a much lower environmental impact. For this reason, we consider 4G/5G FWA as a viable complementary solution to a fixed fibre connection in geographic areas where it is either technically or economically not feasible to deploy optic fibre, and would encourage stakeholders to adopt a more pragmatic approach based on a smart combination of both FTTH and FWA in accordance with the principle of technology neutrality. We consider that a smart combination of FTTH and FWA offers a genuine step change in terms of broadband deployment in rural areas in line with the objectives pursued by the EU. We are glad to see that this view is increasingly shared by public authorities, governments, national regulatory authorities (NRAs) as well as think tanks[2].

Huawei welcomes the upcoming public consultation in this regard.

### 3.4. BEREC Guidelines detailing Quality of Service (QoS) parameters

We welcome BEREC's intention to adopt Guidelines detailing QoS parameters of IAS and publicly available ICS and the publication of information, especially as regards 5G networks and their evolution.

Huawei would be delighted to contribute to the upcoming public consultation in due course.

[2] For further information, see: https://www.analysysmason.com/research/content/white-papers/broadband-challenges-opportunities/ and https://www.wik.org/veroeffentlichungen/studien/weitere-seiten/role-of-state-aid.

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