

Comments by the Government of the Federal Republic of Germany

on the European Commission's exploratory consultation "The future of the electronic communications sector and its infrastructure"

To the European Commission

18 May 2023

The Federal Government thanks the European Commission for carrying out this consultation and the opportunity to submit comments in this regard. We welcome the fact that the European Commission is holding a consultation on the future of the telecommunications sector. In particular, the Federal Government welcomes the fact that, in section 4, the European Commission is carrying out the announced consultation on the debate on network cost contribution before considering specific regulatory measures. We also consider it very positive that the European Commission is furthermore conducting a consultation on the topics in the other sections 1, 2 and 3.

However, the Federal Government would have liked to see more open-ended questions and also further preliminary questions in the questionnaire and, in particular, in sections 3 and 4 to create a common understanding of the initial situation and possible problems. The current consultation concerns fundamental questions on the future shaping of the telecommunications sector. Therefore, it is essential that, first of all, an open exchange on the respective basic assumptions is possible and that the questions are not indirectly based on certain assumptions. In this regard, we thank the European Commission for its willingness to consider additional aspects submitted when evaluating the consultation and all comments, and for its open-mindedness towards all perspectives.

In the following, the Federal Government will comment on the individual sections and will also refer to the questions of the consultation document.

Re section 1: Technological and market developments: impacts on future networks and business models for electronic communications

The Federal Government welcomes the fact that the consultation addresses future networks and business models. However, at the same time, a stronger focus on the actual state of the telecommunications sector would be desirable. Therefore, we would like to ask the European Commission to also gather information on the actual state of the telecommunications sector, since the current situation is a decisive factor regarding the question of whether there is a need for market intervention.

On 13 July 2022, the Federal Government adopted its Gigabit Strategy to provide state-of-the-art connectivity in Germany. In the Gigabit Strategy, the Federal Government formulated clear objectives and specific measures for achieving its goals in the field of digital infrastructures. By 2030, Germany aims to provide fibre to the premises and state-of-the-art mobile communications standards wherever people live, work or travel.

Relevant technological developments, challenges and obstacles (questions 1-3)

Digital and technological sovereignty depends not least on whether German and European suppliers will be able to provide essential and critical systems or system components for future communications networks. Germany and Europe must play a key role in shaping future communications systems and the next generations of mobile communications (in particular 6G, but also 5G, which is currently being deployed), develop technological foundations at an early stage and protect them under patent law, thereby laying the foundations for becoming a major player in the global market for these key technologies with innovative and internationally competitive products. However, to safeguard sovereignty in the long term, further innovation efforts are needed in Germany and Europe. We have to create the foundations for a comprehensive 6G system. This system must cover different technological levels – from the network level to the material, component, microchip and module levels. Convergence of radio and fibre-optic networks, from the radio access network to the wide area network and satellite communications, is to be strengthened. A broader market introduction of 6G is expected around 2030. From the perspective of the Federal Government, the following important research fields emerge with regard to future communications systems and ubiquitous connectivity in virtually all areas of life (hyperconnectivity):

- Concepts for area-wide coverage by ultra-wideband, intelligent and actively adaptable 6G antenna systems for gigahertz and terahertz frequency ranges ('terahertz communications');
- Deep integration of artificial intelligence (AI) technologies for network control and optimization as well as in transmission procedures and signal processing;
- Flexible, modular, scalable and programmable infrastructures for long-lived and upgradeable systems ('network virtualisation', 'network disaggregation and cloud RAN', 'low orbit satellite communications');
- Concepts for high localization accuracy in the centimetre range and the sensory detection of the environment using communications technologies – for example in production ('super precise geolocation');
- High-speed optical networks and photonic-electronic integration for communications systems as the backbone of mobile and fixed broadband coverage.

6G is considered as an important building block for future value chains and the future hyperconnected society. Currently, there is a global technological race for dominance in shaping 6G. We have to establish global partnerships with value partners in order to shape 6G in line with democratic values. Germany and Europe are well positioned in the field of research and development of future communications systems. However, this position must be maintained and expanded by funding research and technological development. At the same time, societal needs and interests such as trustworthiness, reliability, security and sustainability of communications technologies must be considered and addressed in research and development from the very beginning.

Previous generations of mobile communications often had the problem that innovations could not be brought into use quickly and in a targeted manner, or that they were not transferred into widespread business models or products quickly enough. One option to address this issue is to offer real-world laboratories and test beds for digital pioneers at an early stage. In Germany, in particular the four 6G research hubs located throughout the country are to create opportunities to research and validate technological applications or subcomponents of a 6G system with a promising future at a precompetitive stage.

Energy consumption and environmental footprint (question 6)

The Federal Government is of the opinion that the environmental impacts of the information and communications technology (ICT) sector should be regarded in a holistic way. On the one hand, networks, along with data centres and end-user devices, are just one component of the digital production chain. On the other hand, the environmental impact has to be considered over the entire product life cycle and includes not only CO₂ emissions but also other effects on the environment, such as the generation of e-waste and the consumption of rare earths. Here, careful analysis is needed to determine by which means and where in the production system environmental impacts can best be addressed to successfully implement the objectives of the European Green Deal.

All in all, the current state of knowledge on the energy demand of ICT infrastructures is still partly incomplete and partly also contradictory. Therefore, there is a significant need for research. Accurately and regularly determining the energy demand of ICT infrastructures, if possible using real data from companies, would be desirable.

The future energy demand of ICT infrastructures largely depends on the future development of energy efficiency. Efficiency improvements have made it possible in the past to limit the increase in energy consumption in relation to the rapid growth of the ICT sector. If the progress observed in energy efficiency as well as increases in transmission capacities and, indirectly, in data volumes continue, the demand for energy can be expected to rise further. Stabilizing the current energy demand seems to be possible only if all efficiency potential is consistently exploited.

The increasing deployment of efficient fibre-optic networks and high-performance mobile networks is an important step towards reconciling the growing need for reliable and high-performance communications networks as well as rising energy demands with the challenge of minimizing CO₂ emissions. These technologies can contribute to CO₂ savings in other sectors through the use of digital applications that require high-capacity network connectivity, thus driving forward the digital and green transformation. Whether this will succeed depends on how these efficiency enhancements are used. Rebound effects and unsustainable business models (see question 7) can worsen the balance.

Moreover, the considerable and increasing consumption of resources and primary raw materials, many of which are considered critical ('critical raw materials') and hardly recyclable (with current design and technology), must be taken into account.

From an energy efficiency perspective, it would appear advisable to quickly migrate technologies with high energy consumption (e.g. VDSL) to fibre-optic or other VHC networks (DOCSIS). For mobile networks, increased sharing appears to be energy efficient (e.g. via RAN sharing/Multi Operator Core Network (MOCN)). To transmit data in a manner that is as energy-efficient as possible, it makes sense for radio applications (mobile communications, WiFi and other radio applications) to consistently switch off frequency ranges (for example, when there is no load). For reasons of energy efficiency, the timely phasing out of all 2G and 3G networks to the capacities still needed for security-relevant or narrowband uses (eCall, M2M) and the migration to 5G and, in the long term, 6G are advisable.

Virtual mobile networks could make it possible to transmit data with lower energy consumption. Moreover, from our point of view, networks could be operated more efficiently and with better capacity utilization if management and control functions are combined at higher network levels. The development of Open RAN in terms of its impact on the energy efficiency of the networks has not yet been fully clarified.

Overall impact of digitalization on the environment (question 7)

The overall impact of digitalization (production and operation of software and hardware) on the environment depends on various pressures (resource extraction, loss of biodiversity, water consumption, climate, etc.). The overall impact is thus difficult to assess.

A large part of greenhouse gas emissions and the loss of biodiversity does not occur during the use of digital devices but during their production and the extraction of the necessary raw materials. The increasing digitalization also brings challenges such as rebound effects and rising energy demands.

The fact that network efficiency has so far increased significantly underpins the anticipated development. It cannot be assumed that the demand for reliable high-availability and high-capacity communications networks will stop growing. Therefore, we need further increases in efficiency through technological advancement and the responsible use of data and resources to enable digital technologies to unleash their potential for greater sustainability. In the future, there will not only be efficiency improvements on the network side, but it can also be expected that the requirements on the application side will evolve towards more trustworthy, efficient and greener data processing.

At the moment, an increase in demand for mobile data volume of approximately 40-50% per year is expected for the period from 2019 to 2030, which in turn will generate increased computational requirements with an impact on energy demand¹.

It is not clear how this trend will develop in the future. A positive scenario would be possible under three conditions:

1. The opportunities offered by digitalization have to be used to support environmental policy goals.

¹ Final report: Umweltbezogene Technikfolgenabschätzung Mobilfunk in Deutschland (Environmental technology assessment of mobile communication in Germany) (UTAMO project), p. 159 (German only).

2. Digital infrastructure consumes raw materials and energy along global value chains. This means that software, data centres and end-user devices must become more efficient and substance cycles must be closed.
3. Digital business models should be made more sustainable. The focus of many digital business models is to incentivize consumption by means of personalized online advertising; this is often unsustainable consumption that is harmful to the environment and the climate. On the other hand, digitalization can also help sensitize consumers to more sustainable purchasing behaviour.

Diverse measures can help to significantly reduce the impact on the environment. This includes factors such as network and site planning, device and facility modernization or active load and energy management as well as network-related measures for competitive infrastructure sharing. Circular design, production and operation of ICT are of particular significance and are becoming increasingly important in public procurement – also at EU level.

Funding mechanisms for network deployment (question 19)

For the digital transformation to succeed, it is of crucial importance that investments in digital infrastructures in the EU and Germany are attractive. However, the Federal Government currently does not have any indications that the existing funding mechanisms for investments in digital infrastructures in Germany or the EU do not work.

According to industry sources, around 50 billion euros in private-sector funding will be available for fibre optic network deployment in Germany over the coming years. In addition, there will be further private-sector investments in the deployment of mobile communications in Germany and, complementarily, funding for the deployment of fixed and mobile communications networks. From the Federal Government's perspective, the mentioned funding mechanisms are sufficient and suitable for enabling the necessary investments in digital infrastructures in Germany. The basic assumption that there is a need for funding not covered so far in the EU – as made in the consultation questionnaire – needs to be verified. In this context, it should be taken into account that the need for investment in the networks cannot be conclusively predicted at present, for example because of stricter resilience and sustainability requirements. According to current findings, it is expected that there are no unmet financing needs for Germany. For the EU level, we would like to refer to the EU funding programme Connecting Europe Facility (CEF) Digital, which provides funding for digital infrastructure, among others in the field of 5G and also for backbone connections. From the German point of view, this does not primarily raise the question on a mechanism for funding digital infrastructures. The European funding programmes should be continuously adapted to future developments.

Investments by vertical industries (question 20)

The Federal Government expects that the vertical industries will contribute to investments in the digital transformation of our country. Some vertical companies are already investing in infrastructure, for example in Content Delivery Networks (CDNs) and in electronic communications networks (in the core network or submarine cables).

Moreover, new business models will bring new market players to the market. In the mobile communications sector, for example, the existing approach, which is limited to mobile network operators only, will fall short of the mark. In this ecosystem, there will be a variety of providers that will shape vertical 5G markets in particular. To support these vertical markets, a high level of knowledge transfer is required.

In general, new applications and business models that require high-performance infrastructures are an important factor for network deployment, as increasing demand will incentivize network deployment.

Re section 2: Fairness for consumers

The Federal Government attaches great importance to consumer rights and in particular the universal service and the newly created right to access basic telecommunications services in order to ensure appropriate social and economic participation. For this reason, the Federal Government, when implementing the European Electronic Communications Code (EECC)², has strengthened consumers' rights when bandwidth is too low or in case of disruptions and made it easier to terminate contracts.

The question of whether and when affordable universal service is provided (Art. 85 EECC) has to be considered separately from the general telecommunications regulation objective, which is to achieve affordable prices for end users (Art.3(2)(d) EECC).

Evolution of access to broadband at an affordable price (question 21)

The price development of access to broadband at an affordable price is not foreseeable at this point in time. To date, no obligations have been imposed in Germany.

In general, it can be observed for Internet access products that there is often an increased willingness to pay higher prices for new products with higher bandwidths, while prices for such services gradually again decrease over time and with the introduction of improved products. The long-term development of the pricing of Internet access products has thus been rather stable in the past, while performance has increased steadily.

For the universal service, the Federal Network Agency (Bundesnetzagentur) has published principles for determining affordable prices. These are taken into account when obligations to provide telecommunications services are imposed. The Federal Network Agency is monitoring the development and level of prices for these services.

The universal service with regard to consumers with low income or social needs (question 22)

In Germany, participation of people in need with low income is mainly guaranteed by social benefits via the minimum income protection systems. All expenses for communications services that are part of the standard needs are covered. This means that not only consumption expenses for a flat rate for fixed network access (telephone and Internet) but also consumption expenses for mobile network access (call units and data volumes) are taken into account. They are therefore to be regarded as part of the socio-cultural minimum subsistence level. The provisions of the Telecommunications Act, on the other hand, secure access to basic services to ensure appropriate social and economic participation of all citizens. The requirement that basic services have to be offered at affordable prices also contributes indirectly to the protection of consumers with low income.

² Directive (EU) 2018/1972 establishing the European Electronic Communications Code.

The universal service with regard to persons with disabilities (question 23)

The European Union's regulatory framework takes account of the needs of people with disabilities. This is achieved not only by way of universal service provisions but also by many other means, such as customer protection requirements or requirements for access to emergency services. Therefore, equal access for people with disabilities, including access to assistive equipment, is ensured in Germany by special provisions in the Telecommunications Act (cf. section 51 TKG in particular). These cover access to telecommunications services in general and are not limited to the universal service. Ensuring equal access for people with disabilities is indirectly covered by the universal service provisions, even though they are not the main focus of the requirements.

The universal service provisions and future connectivity needs (questions 24 and 25)

The Federal Government attaches great importance to the universal service and the newly created right to access basic telecommunications services with a view to ensuring appropriate social and economic participation. However, the universal service is not the right instrument for achieving nationwide gigabit coverage and fully meeting consumers' future connectivity needs, also with regard to the already mentioned EU connectivity goals and the targets of the German Gigabit Strategy. We can only achieve nationwide gigabit deployment if private-sector deployment is supported by investment-friendly and competition-friendly regulation and supplemented by publicly funded deployment in uneconomic areas. The universal service ensures access to basic services and thus merely is an affordable safety net for all those who have been cut off from the provision of services so far. Universal service is not aimed at ensuring an optimal provision of services for citizens. Consumers' needs change with social, technological and economic progress, which also lead to changes in the requirements for consumer participation. For these reasons, we believe that the flexible design of the universal service's scope and the adjustment of the scope to changing minimum needs is appropriate (see Article 116 and Annex V EEECC at EU level and section 157 TKG for Germany).

The requirements for access to basic telecommunications services in Germany follow the principle of technology neutrality. The right to be provided with telecommunications services does not specify the technology to be used to provide the basic service. There is no entitlement to be connected with a certain technology, for example fibre optics. The only relevant factor is that the specified minimum requirements are met. These are dynamic: the requirements to be met by basic services have to be reviewed annually to check whether the bandwidth essential to ensure social and economic participation in society is actually provided. In this context, the coverage situation in Germany as a whole has to be taken into account. This means that the progressing gigabit deployment will – also in the long run – result in a corresponding increase in the requirements for the universal service. The universal service regime is thus flexible enough to also ensure that future minimum demands are met.

The universal service ensures access to basic services and should be maintained to provide an affordable safety net. This is in line with the Federal Government's obligation to ensure the provision of infrastructure in accordance with the needs of the public (Art. 87f of the Basic Law (GG)).

Financing of the universal service over the next ten years (questions 26 and 27)

Germany has developed a sharing mechanism for compensation for telecommunications services provided as part of the universal service (section 163 TKG). This compensation is cur-

rently borne by the providers operating on the relevant market for the provision of telecommunications services in accordance with section 157(2) TKG. The Federal Network Agency may oblige providers providing number-independent interpersonal telecommunications services within the scope of the Telecommunications Act to participate in the sharing mechanism if their coverage and user base are significant (section 163(6) in conjunction with section 21(2)(1) TKG).

The Federal Government is of the opinion that in Germany compensation for the provision of telecommunications services within the scope of the universal service should be borne by the providers of electronic communications networks also in the future. An expansion to further digital online players does not seem appropriate. For the same reasons, expanding the requirements of Article 90 EEC is not appropriate either. Instead, the choice should remain between public funding and a sharing mechanism of providers of electronic communications networks and services.

Therefore, Germany does not see any need for expanding the universal service funding options.

Other means for ensuring affordable access to broadband for consumers (question 28)

In Germany, coverage of the needs of consumers with low income or special social needs is ensured by social legislation (e.g. cost coverage for telecommunications connections).

Apart from the universal service, the Federal Government is providing Gigabit funding specifically in areas where no private-sector deployment is going to take place in the foreseeable future, in particular in rural, less densely populated or structurally weak regions. This also helps to ensure that consumers have affordable access to broadband and also contributes to equal living conditions in densely and less densely populated areas.

As described in the Gigabit Strategy, the Federal Government is also examining whether vouchers – with the aim of a more efficient use of public funds – can be considered as an instrument to strengthen demand and fund inhouse gigabit development (FTTH) for underserved areas. The Broadband State Aid Guidelines of the European Commission already allow for these funding options.

Usefulness of an EU-wide fund and contributors (questions 29 and 30)

We do not consider an EU-wide fund for the universal service or for other support offered to consumers to ensure that they have access to broadband at an affordable price to be useful or necessary. An EU-wide fund would entail administrative and legal challenges, in particular due to the fact that Germany has just established a system of access to basic telecommunications services with a sharing mechanism (see questions 26 and 27), and experience must first be gained before the current legal framework can be evaluated. Moreover, essential questions with regard to the implementation of such an EU-wide fund are unresolved.

As already explained (see questions 24 and 25), the universal service is not the right instrument for achieving nationwide gigabit coverage. It is not aimed at ensuring an optimal provision of services for the citizens.

Furthermore, it has to be taken into account that broadband availability and prices vary across Member States, as does the landscape of telecommunications companies. An EU-wide fund would be less suited for meeting the needs of the varying initial situations in the Member States than a solution that is individually tailored to the specific situations in the Member States and based on the provisions of the EEC that already provide for harmonisation. Attention must also be given to the fact that the Member States have room for manoeuvre in determining the

scope of the universal service. It would not be appropriate to distribute the varying costs across all Member States via an EU-wide fund.

For these reasons, Germany does not see any need for an EU-wide fund.

If such a fund is established, it should be limited to the funding options under Art. 90 EEC. The system of compensation among the providers of electronic communications networks and services pursued so far in Germany should be maintained. The fact that the provision of universal service is (and should remain) limited to electronic communications networks and services is another reason why the groups of those who must provide compensation should not be expanded. The universal service does not include content services.

Re section 3: Barriers for the single market

The Federal Government is committed to the completion of the digital single market. At the same time, it aims to strengthen the digital and technological sovereignty of the EU and its Member States. In this context, being digitally sovereign does not refer to self-sufficiency or isolation but to strengthening existing resources and one's own capacity to act. Supporting key digital technologies is an important focus of the Federal Government. In particular, the promotion of research into and the development of new applications, network architectures or modes of functioning can contribute to digital sovereignty in the EU's single market.

We know that a digital transformation that safeguards our values, our digital sovereignty and our technology location in Germany can only be achieved within a progressive European framework. We are strengthening digital sovereignty in various areas at national and EU level and in international contexts.

Single market for electronic communications (question 33)

The Federal Government considers the existing legal framework and in particular the EEC to be the appropriate instruments for promoting the single market with regard to electronic communications networks and services. We therefore see no need for a revision at present. The legal adaptations to implement the provisions of the EEC in Germany have only been in force since 1 December 2021. For a comprehensive evaluation and a decision on the need for adaptation, experience is currently still lacking.

In Germany, there are also medium-sized providers in the sector of fixed network providers. Larger pan-European providers operate on the German market through national subsidiaries. These are entrepreneurial decisions of the providers concerned, which operate in the European single market on the basis of the applicable legal framework for electronic communications.

Furthermore, it is important that the European legal framework leaves sufficient flexibility for the Member States to be able to take adequate account of national specificities and needs.

EU-wide deployment of digital infrastructure (question 34)

We currently do not see any efficiency gains that could result from an EU-wide deployment of networks. As regards mobile networks, the costs of network deployment are mainly driven by local, nationwide site coverage, i.e. by the construction and operation of base stations and the associated backhaul connection. Here, the costs are naturally caused locally and depend primarily on the nationwide coverage. It is not clear how cross-border deployment could lead to relevant economies of scale here. The authorisation of spectrum, as another significant cost

driver, takes place in market-based auctions. The costs of spectrum thus already reflect its market value taking into account the market situation and the obligations imposed. Here, no potential savings are apparent either. The core network infrastructure is being deployed in line with demand and the associated costs play a relatively very subordinate role. Likewise, it seems far-fetched to assume that efficiency gains could be achieved in the sector of fixed networks: fixed network deployment naturally takes place in a regionally and locally very limited area and depends on local conditions. In Germany, experience has shown that especially alternative network operators that have newly entered the market are able to realize extremely efficient deployment strategies, thereby also triggering competitive pressure.

Finally, it would also have to be considered that a narrowing of the market on the supply side could lead to less competition and thus to a deterioration of the range of services offered, which would be to the detriment of end customers. In the context of merger control proceedings, effects on competition will therefore also have to be carefully examined in the future.

Consolidation of providers in the EU (question 35)

The objectives of telecommunications regulation include, among others, the creation and maintenance of competition in the markets for electronic communications for the benefit of the economy and society. This should be upheld. The decision as to which Member States or parts of Member States a company operates in is ultimately a decision made by the respective company. Here, companies operating EU-wide have as much of a role to play as regional network operators. Consolidating the provider landscape reduces competition. Moreover, no special barriers to cross-border consolidation are apparent, provided it is compatible with merger control law.

A more integrated radio spectrum market is viewed critically (question 36)

In the view of the Federal Government, spectrum is a scarce public resource, whose distribution lies within the sovereignty of the state. A radio spectrum market in the strict sense of the word does not exist. However, the 'distribution' of the scarce resource is an important element in the context of the provision of communications services. From the perspective of the Federal Government, a more integrated spectrum market is not an advantage, as it does not offer the possibility of taking adequate account of national needs and specificities. Even in the 5G pioneer bands (700 MHz, 3.6 GHz and 26 GHz), which have been harmonized EU-wide, demand still varies across Member States. Differing national starting points, which are the reason for the varying needs, should not be overlooked. A more integrated spectrum market could even have negative effects if it meant that progressive Member States would be slowed down. Also, the possibility to tailor coverage obligations to national circumstances would no longer exist.

Licensing/authorisation schemes (question 37)

In view of the different markets in the EU with their national specificities and the resulting varying spectrum needs, we doubt that introducing a common award and authorisation scheme for spectrum use at EU level would provide an added value.

So far, Germany has always been very quick in making spectrum available for mobile networks, e.g. the 5G pioneer bands. A uniform licensing/authorisation process entails the risk of slowing things down and would not be in line with Germany's and the EU's connectivity goals.

In addition, an EU-wide mechanism raises as yet unanswered follow-up questions, such as how one-off fees are distributed among the Member States, what conditions apply to EU-wide licensing/authorisation or which national law applies and where jurisdiction lies.

For satellite communications in particular, there are existing and functioning processes in the International Telecommunication Union (ITU). Furthermore, there are global coordination requirements that have to be considered beyond the EU.

The Federal Government recommends, also with regard to the subsidiarity principle, to stick to the proven procedures also in the future. Moreover, no further bureaucratic hurdles should be created.

Vertical use cases do not per se have a cross-border reach. They are in most cases limited to the regional or local level. Their licensing/authorisation can be dealt with much faster and better at Member State level with knowledge of the local situation. If several Member States are affected, Article 37 of the EEC provides for the instrument of common licensing/authorisation.

Finally, there is a risk that small and medium-sized enterprises would face disadvantages in EU-wide award or licensing/authorisation procedures, as they often only need spectrum in one Member State. Competition would also suffer as a result.

Participation of non-EU countries/entities (question 38)

The Federal Government does not view the participation of non-EU countries or entities in technical preparatory work for EU decisions on spectrum harmonisation or international negotiations on spectrum issues in accordance with the processes established so far as problematic. Rather, it is precisely the existing processes that open up the largest possible markets for German and European industries for the benefit of German and European consumers.

The European Conference of Postal and Telecommunications Administrations (CEPT) develops the technical basis for spectrum harmonisation and prepares the European positions for the World Radiocommunication Conference. The joint development of the technical conditions of use with the CEPT states allows for a larger information base, faster study results and, above all, a larger market for EU Member States. It ensures that the same conditions apply not only in the EU states, but also in the EEA/EFTA states, the candidate countries and neighbouring states of the EU states, some of which are important markets for German industry. In addition, uniform technical conditions minimize the risk of cross-border radio interference, especially at the EU's external borders.

Furthermore, if necessary, the Radio Spectrum Committee – in which only EU Member States are represented – can still regulate EU specificities vis-à-vis the CEPT proposal.

The advantages continue when it comes to the preparation of European positions for international negotiations in the CEPT. Thus, on the one hand, a common understanding of future uses at EU level can be found in advance and, on the other hand, the capacity to assert European interests in international negotiations can be improved.

We would also like to point out that the EU can already steer spectrum policy issues in international organizations if Union law is concerned (Art. 218(9) TFEU). Changing the existing processes is therefore not necessary.

Dealing with radio frequency interference (question 39)

Cases of spectrum interference amongst EU Member States and cases of interference between EU Member States and third countries can already be discussed centrally in the Radio Spectrum Policy Group (RSPG) and the corresponding Good Offices Working Group.

We therefore see no need at present for a further centralization of such cases at EU level. In addition, cases of radio frequency interference usually only occur between two or three countries, which means that it is not necessary to involve all EU Member States.

Moreover, cross-border radio frequency interference is handled within the framework of the ITU. For this purpose, there are regulations under international law and the Radio Regulations Board, which is a kind of arbitration court. Even preliminary consultations on this at EU level are not necessary, as this is about bilateral technical expertises. For individual cases in which systems with relevance for the EU are affected, there already are procedural rules.

Re section 4: The question of network cost contribution

The Federal Government welcomes the fact that the EU Commission is conducting a consultation on the issue of network cost contribution before considering regulatory measures. However, the Federal Government would have preferred more open questions and wordings. If the public consultation is to form a reliable basis for subsequent policy decisions, this is only possible – in the interest of achieving better regulation – on the basis of a completely open-ended catalogue of questions. This also applies to the terminology used in the consultation document: for example, terms such as ‘data generators’ or ‘large traffic generators’ (e.g. questions 27, 43, 49 to 51 and 54) should not be used synonymously for a group of stakeholders such as content and application providers (CAPs). Data and traffic on the network are requested and ‘caused’ by customers of Internet access providers.³ Thus, ‘information society service’ is defined in Directive (EU) 2015/1535, to which the Digital Services Act also refers, as “any service normally provided for remuneration, at a distance, by electronic means and at the individual request of a recipient of services”. The Federal Government would also have welcomed it if other aspects with relevance for the political decision had also been addressed in the questionnaire, such as the effects on net neutrality, the quality of the content offered or the revenue development of companies in the market.

In the view of the Federal Government, the consultation should initially focus on the question of whether regulation is necessary in the first place. How such regulation is to be implemented can only be meaningfully examined once the question of whether it is necessary has been affirmed.

Investments in network infrastructure (question 40)

The Federal Government is committed to ensuring that, by 2030, nationwide fibre-optic connections to the home and the latest mobile communications standard will be available wherever people live, work or travel in Germany. The goals of the Gigabit Strategy and the Digital Strategy are in line with the goals of the Digital Decade 2030. With its ambitious digital and connectivity policy, the Federal Government is also contributing to achieving the goals of the Digital Decade 2030 at European level.

³ BEREC, October 2022 BoR (22) 137, Page 6.

As formulated in the Federal Government's Gigabit Strategy, private companies are making the main contribution to gigabit deployment in Germany.⁴ State funding, with the fixed network and mobile communications funding programmes of the Federal Government as well as supplementary programmes of the federal states, provides support where there will be no private-sector deployment in the foreseeable future.

According to industry sources, around 50 billion euros will be available in Germany for fibre optic roll-out alone in the coming years. From the Federal Government's point of view, this is a considerable sum, which is available for future network deployment. In addition, there will be further investments by other market participants in connectivity and digital infrastructure. We expressly welcome these investments to achieve the connectivity goals in Germany and the EU.

Accordingly, sufficient funds will foreseeably be available in the market in Germany and, moreover, further funds can be made available in a targeted manner through funding programmes.

Thus, it would still have to be examined whether further funds for network deployment should be made available in the EU by means of legal or regulatory measures. Here, it must be considered that, in practice, red tape or the availability of civil engineering capacities or skilled workers are often the limiting factors for network deployment. It should also be taken into account that the different companies in the market pursue different business models. These companies therefore invest in different ways in the various network infrastructure elements. In this context, the core business of the network operators is infrastructure deployment and operation. It is therefore not expedient to compare different investments by companies in the Internet ecosystem and to use this comparison as a basis for deciding whether regulatory intervention is necessary.

From the Federal Government's perspective, it is important that the prerequisites for regulatory intervention, which are prescribed by European law, are met. Only proven market failure justifies regulatory intervention. So far, we see no evidence of such a market failure with regard to network investments. In this regard, further developments have to be monitored.

Increase in traffic and attribution of traffic (question 43)

In many cases, data traffic cannot be clearly attributed to specific companies or end users. For example, some large content providers deliver both their own content and third-party content via their CDNs. However, many content providers have their content delivered via commercial CDNs; this is also what some large content providers do with part of their content. As a consequence, in the case of network cost contribution, there would be a considerable lack of clarity concerning the attribution of data traffic. In the case of possible obligations linked to the volume of traffic, there would then be a danger that companies could be treated unequally and put at a disadvantage.

In addition, there is a risk of indirect disadvantages if companies use providers for data transport that the EU-Commission has classified as large (obligated) 'traffic generators'. The latter often offer CDN and cloud services, which are also used in particular by small and medium-sized enterprises (SMEs), but also by content providers of different sizes (such as streaming providers, public TV broadcasters). If large (obligated) 'data traffic generators' pass on increased costs to their CDN and cloud service customers (which is to be expected), network cost contribution would – contrary to the intention – no longer be limited to large 'data traffic generators'. If one wanted to distinguish whether the data traffic ultimately originates from a large CAP

⁴ Gigabit Strategy of the Federal Government, p. 7.

or from a different provider, the network operators would have to use what is referred to as deep packet inspection (DPI), which, however, would not be permitted. If the data traffic is encrypted, it would not be technically possible to identify from whom the traffic originates. Passing on costs would have a negative impact on the competitiveness of small and medium-sized enterprises. Furthermore, competition between the providers of CDN and cloud services would be distorted, since only services of large 'data traffic generators', but not those of other providers, would be subject to an obligation.

Importance of compression algorithms (question 44)

We understand that compression algorithms can contribute to reducing data traffic. Independent of compression algorithms, however, transport protocols used on the Internet are designed in such a way that the utilization of capacity is maximized (and capacity thus used as efficiently as possible). Adaptive quality adjustments in the transmission of content already today contribute to the fact that the transmitted data volumes depend on the available transmission capacity and thus only the 'necessary' data volumes are transmitted. Nevertheless, the further development of compression algorithms to reduce data volumes is welcomed and the use of compression is viewed positively. Therefore, in our view, such technologies should continue to be used where this seems reasonable.

Thresholds for the definition as 'large traffic generators' (question 49)

We see a considerable lack of clarity and risks concerning the definition of threshold values on the basis of data traffic in the network, since data traffic, to a large extent, cannot be traced and attributed without doubt due to the structure of the Internet. The question of attribution arises in particular when attributing data traffic from cloud providers or CDNs (see answer to question 43 regarding this matter).

In addition, the introduction of such a threshold value can create an incentive for companies to stay 'below' this threshold value if possible to avoid becoming subject to an obligation to make a network cost contribution. Therefore, a threshold value could also inhibit innovation.

Relationship between network investments and increase in data traffic (question 51)

The Federal Government doubts that there is a strong correlation between the increase in data traffic and higher costs for data transmission or in the interconnection market. For example, the Body of European Regulators for Electronic Communications (BEREC) found that the costs of access networks in the fixed network are traffic volume sensitive only to a very limited extent.⁵ There is some traffic volume sensitivity in mobile networks. A study by Analysys Mason also confirms that data traffic growth is, if at all, associated with a small increase in network costs: "*In 2018–21, network-related ISP costs increased by 3% in total over three years, whilst network traffic increased by over 160% in that same period, showing that ISP networks can handle significant traffic growth at modest incremental cost.*"⁶

⁵ BEREC, BoR (12) 137 Section 3.

⁶ Analysys Mason, The impact of tech companies' network investment on the economics of broadband ISPs, Report for Incompas, S. 10; <https://www.analysysmason.com/consulting-redirect/reports/internet-content-application-providers-infrastructure-investment-2022/>.

Furthermore, transit prices have fallen steadily over the years⁷. This indicates a competitive market in combination with peering and the use of CDNs rather than signs of a market failure. With regard to future developments, we are of the opinion that even if data traffic continues to increase, network costs will not increase significantly, but rather the trend of falling costs will continue.

Network cost contribution and environmental footprint (question 53)

Any network deployment cost contribution requires a valid justification. In our view, any mechanism to that effect must not lead to negative effects on the environment and the environmental footprint of services. We believe that it is the responsibility of all players in the Internet ecosystem to reduce their environmental footprint as much as possible. As already stated, such issues only become relevant in the context of network cost contribution when there is a market failure.

Incidentally, we would like to again note (see answers to questions 6 and 7) that the environmental impact of generating data traffic only concerns a small part of the ICT sector and only a single element of the product life cycle.

Analysis of the statements in the European Declaration on Digital Rights and Principles and characteristics of network cost contribution (questions 54 and 60)

We thank the European Commission for referring to the European Declaration on Digital Rights and Principles. This declaration, which was signed on 15 December 2022, is based on common European values. We welcome the fact that it was possible to adopt this declaration. It is designed as guidance for a people-centred, safe, inclusive and open digital environment in the European Union.

From the Federal Government's point of view, the wording regarding the conditions for investments in the digital transformation is a general commitment to fair framework conditions in the age of digitalization. However, for the Federal Government, the wording does not imply an agreement to the demands that content and application providers (CAPs) should contribute to network costs and network deployment costs.

Overall, we are critical of a proposal for a binding mechanism for direct payments from CAPs to network operators for the reasons outlined below. It could put smaller network operators with less negotiating power at a disadvantage and lead to distortions of competition. Furthermore, a mechanism that results in a payment of CAPs as a contribution to financing network deployment poses risks to the interests of consumers. A levy is likely to lead to an additional burden on consumers, as it can be assumed that the costs would be passed on to them. As a result, consumers would bear the costs of infrastructure deployment in two different ways – in their relationship with telecommunications companies and in their relationship with CAPs. Similarly, we see direct payments as a significant threat to net neutrality and thus to the open and free Internet. Negotiation obligations combined with dispute resolution mechanisms also require a justification and presuppose the identification of a market failure. Moreover, such an approach would increase the risk of a termination monopoly being exploited. At the end of a dispute resolution procedure, a decision would have to be made by the regulator who would have to decide on the amount of

⁷ WIK Consult, Report: Wettbewerbsverhältnisse auf den Transit- und Peeringmärkten (Competitive conditions in transit and peer markets), p. 40; https://www.wik.org/fileadmin/user_upload/Unternehmen/Veroeffentlichungen/Studien/2022/Studie_Wettbewerbsverhaeltnisse_auf_den_Transit-_und_Peeringmaerkten.pdf (German only).

the network cost contribution in case of doubt. This in turn would amount to a fee regulation that would require justification.

However, a digital contribution or fund at EU or national level, as inquired about in question 60 of the consultation document, also gives rise to concerns. On the one hand, this applies with regard to the implications of EU state aid law. On the other hand, a fund mechanism would be very complex and involve a high administrative burden. A levy could indirectly lead to an additional burden on consumers, as it can be assumed that the costs would be passed on to them. In addition, there is considerable uncertainty as to whether such a levy would even be invested in the deployment of digital infrastructure. In practice, ensuring this would lead to a considerable administrative burden. We therefore currently have serious reservations as to whether a levy of the kind proposed is a suitable means of improving infrastructure deployment in Europe.

Even if smaller companies were exempt from having to pay (direct payments or funds), this would lead to significant challenges. For example, smaller content providers and media companies are dependent on the content of larger providers, which means that they would be indirectly affected by a levy on larger companies.

Contributors and beneficiaries of network cost contribution (questions 55 and 56)

We are of the opinion that – if network cost contribution is established at all – a restriction of the group of contributors to certain content and application providers may lead to significant market distortions. Moreover, such a restriction conflicts with the principle of net neutrality and the principles of equal treatment and non-discrimination (cf. recital 1 of Regulation (EU) 2015/2120). Overall, any obligation to contribute imposed on content providers poses the risk of a negative impact on media diversity and quality by depriving these companies of resources they then cannot invest in content. In addition, given the importance of bundled products, the effects on the competitive situation of content providers must also be taken into account (e.g. telecommunications network operators who also offer streaming services that compete with services offered by content providers). All these considerations would also apply to a negotiation obligation with a dispute settlement mechanism. Moreover, such an approach would increase the risk of a termination monopoly being exploited.

It also holds true with regard to the beneficiaries that a restriction to certain groups of beneficiaries can lead to distortions of competition. Generally, we also wonder how a precise differentiation among contributors and among beneficiaries can be achieved. We see considerable implementation problems here. Rather, if a mechanism appears to be justified and necessary, all contributors to network deployment should qualify as beneficiaries (also with reference to questions 57 and 61 of the consultation document). They can then also be content and application providers or other companies (e.g. tower companies who deploy passive infrastructure) that provide digital infrastructure themselves.

Effects and risks of network cost contribution and questions regarding its design (questions 56 to 58)

From the Federal Government's point of view, advantages for network deployment can, if at all, be expected if any funds generated through network cost contribution are earmarked for the deployment of VHC networks. For the measures to be effective, it would also be important that they provide added value for network deployment and the achievement of the European and national deployment targets. We have considerable doubts whether a simple earmarking without additional safeguard mechanisms is sufficient to achieve this. These doubts apply to direct pay-

ments, a negotiation solution and an EU fund. This is because the earmarked funds could replace other investment funds companies had originally planned to use for network deployment. Thus, the additional funds would not lead to additional network investments. The companies might then use these saved investment funds for other purposes (e.g. dividends or investments in third countries) instead of investing them in the networks in the single market. In the worst case, this could result in the measures not having any effect at all on network deployment in the EU or the Member States because no additional funds are made available.

In addition, it would have to be ensured that the funds generated through network cost contribution do not qualify as state aid, as otherwise – possibly time-consuming – approvals under state aid law would have to be obtained first. Finally, potential benefits must be set against the risks network cost contribution entails. We regret that only risks related to direct payments were inquired about in the consultation and that risks with regard to the proposals on digital contributions and a fund at EU or national level were not addressed.

Both in the case of direct payments (irrespective of whether there is a direct obligation to pay or a negotiation obligation with a dispute settlement mechanism is established) as well as in the case of a fund mechanism, the following possible effects must be comprehensively examined in advance (with equal priority): effects on the market, competition, the Internet ecosystem, net neutrality (especially in the case of a discriminatory treatment of providers) and consumers. This also includes risks to media diversity and quality. In addition, effects on innovation and investments in digital infrastructures must be considered as well as (especially against the background of the potential passing on of costs) possible effects on SMEs from the sector of network operators and of content and application providers as well as media organizations. Discriminating against or favouring individual groups can also have a negative impact on competition and innovation.

A mechanism that provides for a payment by CAPs as a contribution to financing network deployment and thus directly affects the interests of consumers is problematic. A levy is likely to lead to an additional burden on consumers if it can be assumed that the costs would be passed on to them.

For example, there is a risk of negative effects on other companies if cloud service providers, which are used, for example, by small and medium-sized enterprises but also, for instance, by public broadcasters, are included in the group of those subject to the levy.

Similarly, we see a direct payment and a negotiation obligation as a significant danger to net neutrality and thus to the open and free Internet. The EU has established net neutrality as a fundamental principle in Regulation (EU) 2015/2120. According to the Regulation, it must be ensured that data traffic is not treated in a discriminatory manner, blocked, throttled or prioritized and that all data is treated equally. This applies both to the transmission of data on the Internet and to access while using data networks. Thereby, it is ensured that users can access all the content they want to access and that they can freely use the telecommunications contract they have concluded. Introducing a direct payment or negotiation obligation only for certain CAPs entails the risk of treating data in a discriminatory manner. In particular, it must be ruled out that data transmissions of providers that do not make the payment are slowed down or even partially or completely blocked. In the case of blocking, consumers would only be able to access the services of content providers that have paid a fee. This contradicts the principle of net neutrality.

At the same time, direct payments and negotiation obligations could result in a decrease in the diversity of the services offered and the quality of content on the Internet. Providers might withdraw from the market completely or not even enter the market to offer their services. This could trigger or intensify market concentrations. The broad spectrum of services offered and an open

Internet are crucial to ensure the digital participation of consumers in as wide a range of services as possible and to enable them to take full advantage of digitalization. Even if smaller companies were exempt from a direct payment, significant problems could arise. For one thing, this applies to the attribution of traffic. For another thing, smaller content providers and media companies are more dependent on the content of larger providers, which means that they would be indirectly affected by a levy on larger companies (cf. question 43).

Making available 'more money' could also have an inflationary effect on civil engineering costs. In addition, windfall profits could occur. Even if a network operator invests additional funds in network deployment, it is possible that these investments would have been made anyway.

The Federal Government is currently not aware of how network cost contribution could be realized in a way that simultaneously complies with competition rules, net neutrality, can be implemented with only minimal administrative effort and does not impair the interests of consumers. In the view of the Federal Government, in particular an approach that seeks to indiscriminately cover all entities that feed in data in line with a general 'sending party pays' principle will lead to considerable adverse effects, not least for the Internet ecosystem as a whole, for innovation and for young companies.

Questions regarding the form the fund model should take (questions 61 and 62)

Not only a direct payment solution, but also a fund model would be very complicated. The delimitation as to which user groups would have to pay into a fund based on what criteria is challenging when taking into account the principle of equal treatment. According to the basic idea of the debate, all market participants who profit from network deployment would have to pay, regardless of whether they benefit in their role as content providers, network operators or other users. Thresholds, such as a certain percentage market share or the share of content in the generated data traffic, on the other hand, run the risk of leading to unjustified unequal treatment and distortions of competition.

This shows that a fund model, like direct payments, poses major challenges for the market and in terms of supervision. A fund model would have to be compatible with EU state aid law and would have to not lead to a high administrative and cost burden for the companies concerned and the managing organization.

Furthermore, a fund solution also entails risks for consumers. Consumers are likely to be additionally burdened even in the case of a fund solution, since content providers pass on higher costs to their customers. Furthermore, there are dangers for net neutrality and thus free access to a wide range of Internet services for consumers.

Final comments re section 4

Also, with a view to BEREC's preliminary comments of 7 October 2022, sufficient proof of the need for a legal or regulatory intervention is required. Therefore, the question which form network cost contribution should take does not arise for us at present.

From the Federal Government's point of view, before making a final assessment, it remains to be seen whether substantial new findings emerge that provide grounds for a comprehensive examination of the need for regulatory intervention, also with a view to an ecological effect.

Concluding remarks

Finally, we would like to reiterate that the Federal Government regards the future network deployment in Germany as one of its priorities. At the same time, our country thereby also contributes to the further network deployment in the European Union and to achieving the goals of the Digital Decade 2030. With a view to the measures necessary to accelerate the deployment of gigabit and mobile networks, the national Gigabit Strategy has been launched. For the EU level, we refer to the 2030 policy programme for the Digital Decade and the CEF Digital funds available for 5G and backbone deployment.

We would also like to point out that, for Germany and the European Union, both very high-performance telecommunications networks and services as well as diverse and high-quality content offerings are of great importance. These two areas are not separate from each other. Without high-performance networks, high-quality content cannot be accessed on a large scale. Without attractive content and applications, there is no demand for high-performance networks and no stimulus for network deployment. This should be kept in mind in the context of the current political debate.