Future of Connectivity

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

1. **Which technological developments do you expect will have the largest impact on the electronic communications sector in the next 10 years?**

   - 6G, Edge Cloud, Artificial Intelligence, Open networks/network disaggregation and cloud RAN, Super precise geo-location

   Explanation:

   - Edge cloud is a very efficient technology which also enables the reduction of storage duplication and thus, makes for less emissions. Edge cloud also provides better security, which in times where cyber-attacks are getting more frequent is of significant importance.
   - AI development equals new business opportunities. AI also offers benefits for current business models since it enables better virtual assistance and the extraction of valuable data in order to optimize services.
   - The development of precise geo-location is especially important for IoT devices and to raise competitiveness in the market.

2. **From a global/strategic perspective, which challenges and opportunities will these technological advances entail for the electronic communications sector?**

   - Both the current 5G rollout and future 6G rollout as well as the connection of IoT devices via Wi-Fi networks will require additional frequency band spectrums in the future. Thus, fair and proportional spectrum allocation is crucial.
   - Another challenge arises from the scarcity of IPv4 addresses. New providers, which are only now entering the market do not have sufficient IP addresses for their customers. Therefore, the EU should support a faster transition to IPv6.
   - Lastly, another challenge for European companies at the moment is that there are numerous ambiguities in relation to international data traffic. Since the use of many innovative services also involves the transmission of personal data to recipients outside the EU, it is important to finally ensure legal certainty, especially with regard to an agreement between the USA and the EU.

3. **What are the most urgent problems to address in terms of unleashing the full technological potential of electronic communications and what (structural) impact will the future developments identified in Q.1 have on electronic communications**

networks? (e.g. on the type/quality of the connectivity, on the networks' architecture /functioning, on the provision model for connectivity, other)

- One of the most urgent problems to address is the lack of trained professionals who know how to operate new technologies, e.g. given fibre optic technicians, which are essential to insure that the VHCN roll out progresses in accordance with the goals set by the digital decade. The EU shall thus promote and stimulate digital education. Financial support is especially needed for traineeship programmes in the IT sector. ISPA also calls upon the member states in particular to put forward financial support programs for broadband expansion.
- Although the EU often plays a pioneering role in researching new technologies, it then loses this leading role in the application and implementation of the technologies because it restricts itself through excessive regulation. It would therefore make sense to first evaluate the existing regulatory requirements for the telecommunications sector in order to strengthen the competitiveness of European providers compared to companies from third countries.

4. **What impact will the future developments identified in Q.1 have on providers of ECNs or on other infrastructure investors? (e.g. role, business models, investment efforts, transformation/development opportunities) [Multiple answers possible]**

5. **What impact will the future developments identified in Q.1 have on digital/online players or on other industrial players? (e.g. role, business model, investment efforts, development opportunities, other) [Multiple answers possible]**

6. **What are your views with regard to the evolution of the energy consumption and the respective environmental footprint (notably CO2 emissions) of the main technological blocks of the future networks (copper, fibre, 5G, 6G, edge clouds, etc.), notably in terms of their operation? [Substantiate your answer as much as possible.]**

- Digitalisation of many industries and daily activities has played an important role on the decrease of CO2 emissions. Yet, an isolated environmental analysis of the emissions of the sector does not offer a realistic view. Only a wider analysis throughout sectors would show the real impact of electronic services on the environment. For instance, cloud hosting allows providers to run large server farms, which can often be maintained in a more environmentally friendly manner, compared to private servers that are run by individuals. An example for these eco-friendly practices would be the usage of seawater to cool down large server farms. Another notable development since the pandemic is the increased use of video conferencing tools, which has made frequent business travel almost obsolete. In addition, by using smart technologies in the development of electronic vehicles, technology has contributed massively to the reduction of carbon footprint worldwide.
- Furthermore, since the beginning of the 21st century data networks have become more efficient, the energy intensity of fixed networks has continually decreased, and the

efficiency of mobile energy has increased by 20% in recent years. Ultimately one can conclude that the increase in data traffic does not equal an increase of the environmental footprint.

7. **Digitalisation is an important enabler of green and sustainable ambition. The increased use of digital technologies is expected to reduce the environmental footprint of many sectors. At the same time, the expected increase in data traffic may increase the environmental footprint of electronic communications. In your view, what will be the overall impact on the environment? [Only one option can be selected]**

   - Moderately positive

   Explanation: Answered above.

8. **How do you expect ECNs to evolve/transform in the next 10 years and how will this evolution affect your business?**

9. **What are in your view the key future market developments that are likely to significantly impact the electronic communications networks, their architecture and/or their function? [We plan to report on the top 5 developments]**

10. **Are there major obstacles to establish standards in relation to network access protocols and application programme interfaces (APIs) in order to support new service models and/or new network architectures?**

    - No

    Explanation:

    - ISPA believes no further harmonisation or regulations relating to APIs are needed. In case any problems arise, a rapid solution will be provided by the market, thus, making any further regulatory interventions unnecessary and merely burdensome.

11. **What additional needs compared to today's baseline do you expect will be needed for strengthening cybersecurity / network resilience and the related expected costs (e. g. in terms of CAPEX, other) for the next five years, including as regards replacement of high-risk vendors? [Fill in the table and substantiate your answer as much as possible.]**

    - The replacement of high-risk vendors must be treated in a careful manner since it is attached with significant costs, especially where mobile operators have to remove components from just recently rolled out networks. ISPA advises therefore against any politically incentivised decisions, which would negatively impact the existing network infrastructure.

12. **What are the strengths, weaknesses, opportunities, and threats ("SWOT") for the providers of electronic communications networks that shape their current and future operations?**

13. **How could providers of electronic communications networks best adjust to the ongoing and future technological and market changes and be able to better compete globally and attract investors? [We plan to report on the top 5 developments]**

14. **What would be the barriers to achieve the needed transformations [Use the number scale to select the level for each option]**

15. **What would be the expected yearly investment required to achieve the needed transformation of your company over the next five years? (In EUR million, and in % as percentage to the company yearly revenue)**

16. **In your view, in which areas will investments be most required to achieve the needed transformation? Please quantify, where possible, the investment in each area [Use the number scale to select the level for each option]**

17. **What will be the sources of revenues of the electronic communications sector and the ways to monetise the investments in business transformation over the next 10 years?**

18. **Which cooperation models would you expect to see emerging or growing the most in the next 10 years?**

    - ISPA expects to see growing cooperation between content and application providers and vertical industries (e.g. automotive and household appliances), especially since the development of suitable hardware and software is crucial to keep up with the requirements of smart living and the goals of the digital decade.

19. **What funding mechanisms do you foresee as being currently able to finance the needed extra investments?**

20. **Do you expect vertical industries to contribute significantly to investments in new digital infrastructures (e.g. for automated driving, manufacturing & logistics, health applications)? If so, please describe how this may develop in terms of business /cooperation models. Mention also any obstacles that may exist to the development of such forms of raising financing, and how they could be resolved.**

    - Yes

    Explanation:

- We assume that investments of vertical industries will increase and that as a result demand for VHCN connections will rise.

Chapter 2: Fairness for consumers

21. In your opinion and considering the overall economic context, is the access to broadband at an affordable price for consumers likely to evolve in the next 10 years?

- Markets evolve and adapt accordingly to the socio-economic factors. Considering the current market dynamics caused by a pandemic, which lasted three years and the war in Europe, it is impossible to make assessments how the market will react in the upcoming 10 years. Nevertheless, ISPA believes that key to maintaining affordable and good services is guaranteeing competition both on an infrastructure and service level.

22. In your view, has the universal service regime been an efficient and effective tool in protecting consumers with low income or special social needs? [Only one option can be selected]

- Not at all

Explanation:

- In Austria this is achieved though affordable offers by the providers. Furthermore, several companies offer even lower package tariffs for low-income families or unemployed citizens. Thus, it is our experience that the universal service regime has been of no relevance in Austria regarding internet access services. We know of no cases where someone requested a universal service due to lack of access to internet services.

23. In your view, has the universal service regime been an efficient and effective tool to ensure equal access for persons with disabilities, including access to assistive equipment? [Only one option can be selected]

- Not at all

Explanation:

- As mentioned above the universal service regime has not been relevant for ensuring equal access in Austria. Instead, such policies are pushed forward by the providers themselves, who already offer specialized tariffs for people with disabilities (e.g. tariffs that include free additional data to support video calls for hearing impaired users).

24. In your view, does the universal service regime answer the future connectivity needs that should be ensured for all consumers? [Only one option can be selected]

- No

Explanation:

- As mentioned above in order to maintain a lower price while offering better services the key is to maintain competition within the EU/national markets.
- In case there is a lack of take up of high bandwidth subscription due to financial reasons member states should consider introducing connectivity vouchers.

25. **In your view, what do the expected market and technological developments described in Section 1 mean for the universal service regime? [Only one option can be selected]**

    - The universal service regime will not be needed.

    Explanation: Answered above.

26. **The current source for financing the universal service in electronic communications is public general budget and/or financing from providers of electronic communications networks and services. What should be in your view the appropriate way for financing the universal service in electronic communications in the next 10 years? [Multiple options can be selected]**

    - Public general budget

27. **If you answered in the previous question that the range of providers should be widened, how should contributions to financing from private entities (i.e. providers of electronic communications, digital online players and/or data generators) to the universal service regime be structured? [Only one option can be selected]**

28. **Outside universal service, could other means of support to consumers to ensure their affordable access to broadband be envisaged? [Only one option can be selected]**

    - No

29. **Would a dedicated EU-wide fund be useful? [Only one option can be selected]**

    - No, it would not be useful.

    Explanation:

    - Introducing an EU wide fund would only penalize such member states, where due to effective competition low and affordable prices already exists, to the benefit of those member states, where due to lack of competition prices are kept artificially high.

30. **If you answered that a fund would be useful, who should contribute to the dedicated EU-wide fund?**

31. **From an affordability perspective, what is your view regarding the retail price cap on intra-EU communications (i.e. EUR 0.19 per minute for calls and EUR 0.06 per SMS message, both excluding VAT) introduced by an amendment to the Open Internet Regulation, and which is set to expire on 14 May 2024?**

- No need for retail price regulation in the future

Explanation:

- This cap is over the market retail price and thus not relevant. Most intra-EU communication is either covered by flat rate packages designed to attract customers or by internet-based services/communication platforms.

Chapter 3: Barriers to the Single Market

32. **What future developments in terms of technological developments, new applications, network architecture or functioning (or other) could further promote the development of the digital single market?**

- A predisposition for an EU single market is that more providers are active in more than one member state. Yet, this is currently impeded by the lack of harmonized legal frameworks.

33. **In your view, are there obstacles to the full integration of the single market for electronic communications? If so, please explain what, from your point of view those obstacles are (do they relate to the rules governing the general authorisation, the application of the country of origin/country of destination principle with respect to supervisory rules, the bodies in charge of monitoring and enforcement, etc.)? If you consider no obstacles to the full integration of the single market exist, what would be in your view the reasons why providers of ECNs generally do not offer their services EU-wide?**

- So far, one of the biggest problems has been that in many relevant areas the implementation of EU legislation (e.g. the EECC) is not consistent across all member states. In addition, there are different eligibility criteria and building permit procedures, which differ between EU members and even within a member state (e.g. given in states with a federalist system). Thus, if the EU wants to promote the European internal market, it is particularly important to start with full harmonization in these areas.
- The Gigabit Infrastructure Act provides an opportunity to achieve harmonization and to overcome these obstacles.

34. **Are there identifiable/expected cost savings or other efficiencies that could arise from the EU-wide deployment of infrastructure and/or provision of services by providers of ECNs? If so, please describe the type/category of cost savings (e.g. in terms of network management, service provision, regulatory cost savings, administrative burdens, etc.)**

35. **In your view, do obstacles exist to cross-border consolidation of electronic communications providers in the EU? If you consider that obstacles exist, please describe the type/category of obstacles and indicate what steps/actions could be taken to remove these. What opportunities for cost savings could result from cross-border consolidation if those obstacles were removed?**

36. **In your view, could there be benefits from a (more) integrated radio spectrum market in the EU? If yes, please explain what those benefits would be and, as far as possible, quantify those benefits. What steps/actions could be taken to promote a more integrated radio spectrum market in the EU?**

37. **In your view and without prejudging any policy direction, what would be the added value, risk and cost of implementing a common EU-level licensing/authorisation scheme for spectrum use in well justified cases (e.g. cross-border reach of infrastructure/service, significant added value of an EU joint authorisation scheme compared to individual Member State authorisations)? Please indicate the areas in which such a scheme would be most useful (e.g. in cases of satellite communications and/or vertical use cases).**

    - No, there would be no benefits from a common EU level licensing scheme. On the contrary this would lead to disadvantages for smaller providers. Small providers who only offer their services in one Member State would have to bid for a frequency at EU level, which they then only use in one region or one Member State.
    - Furthermore, any harmonization can only begin after the current frequency allocation periods have run out.

38. **Do you consider the participation of non-EU countries or entities in technical preparatory work for EU decisions on spectrum harmonisation or international negotiation matters on spectrum (such as e.g. within the European Conference of Postal and Telecommunications Administrations (CEPT)) as a potential issue of concern for EU sovereignty, resilience or security? If yes, to what extent is it a concern? Please indicate what institutional structures or mechanisms would be best suited to allow the EU to monitor spectrum policy matters in international organisations, and to undertake the technical preparations concerning the Union's decision-making process including before and during international negotiations concerning spectrum policy matters?**

39. **In your view, what would be the added value, risk and cost of addressing cases of radio frequency interference in EU Member States from third countries (notably those that may potentially have serious effects on more than one Member State) only at EU level (i.e. whereby the EU acts in unity) instead of at the level of each affected Member State (acting individually)?**

Chapter 4: Fair Contribution by all digital players