

# 5G IA's POSITION PAPER on a EUROPEAN PARTNERSHIP on SMART NETWORKS & SERVICES under HORIZON EUROPE



## Smart Networks and Services for Next Generation Internet





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## **5G IA's Position Paper on a European partnership on Smart Networks and Services under Horizon Europe**

### ***Smart Networks and Services for Next Generation Internet***

**Smart networks and services are essential for the digital transformation of all sectors of our economy and society, for addressing societal challenges, and for protecting and empowering European citizens to participate in the digital society.**

### **Context**

The importance of high-performance networks and open access to multi-service Next Generation Internet (NGI) connectivity for the Digital Single Market and the need for Europe to continue deployment of such enhanced and secure networks required for its digital future have been confirmed by the European Commission in the European Gigabit Society Communication<sup>1</sup>. Future-proof digital infrastructure will enable innovation and have direct impact on businesses alongside schools, libraries, research centres, and public service buildings.

The competitiveness of Europe critically depends on the digital readiness of its enterprises and public institutions. The European economy in all industry sectors requires future-proof, fibre-based connectivity, evolved mobile technologies and innovative satellite solutions, implementing 5G networks and beyond. These communication infrastructures are key to develop industrial roadmaps and facilitate the growth of all sectors. Along with other key digital technologies, Smart Networks and Services will not only contribute to the digitization of traditional sectors but trigger innovative digital business models to create new value chains for consumers and businesses.

Many businesses – from European automotive manufacturers to global pioneers in bioelectronic therapies and rapidly growing SMEs (e.g. developing new augmented reality experiences) – will need a dramatic growth of their capacity requirements. To address this, the flexibility, reliability and performance of Smart Networks and Services are fundamental enablers to change the operational working practices and to launch new technologies, which will ultimately benefit society across Europe and beyond.

Smart Networks and Services will be much more than 'more data, at higher speed, for less cost'. Their resilience, reliability, and their ability to 'specialise' will make them the essential connection between a plethora of devices and objects, increasingly acting autonomously to work for the citizens as well as to entertain them. As networks are increasingly aimed at interconnecting key societal infrastructures like energy, factories, connected cars they are bound to become critical infrastructures and a strong EU industrial leadership is key to ensure end to end security and reliability of these infrastructures.

Smart Networks and Services offer a new opportunity to strengthen a critical domain of EU industrial excellence whilst offering opportunities to develop related industrial domains, notably in the field of a new

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<sup>1</sup> EU Commission: <https://ec.europa.eu/digital-single-market/en/news/communication-connectivity-competitive-digital-single-market-towards-european-gigabit-society>.



generation of devices (IoT) for critical industrial applications and in the field of distributed computing service platforms, hence contributing to the emergence of end to end value chains.

The EU should hence continue to encourage the development of Smart Networks and Services that ensure the best quality of service, the widest platform for innovation and the sustainable enhancement of infrastructures in locations where investment will yield the greatest socio-economic benefits secure infrastructures whilst maintaining social cohesion and equitable opportunity for the citizens of Europe.

The United Nations 2030 Sustainable Development Goals recognize the critical added value of Smart Networks and Services to support the digitalisation of society and economy in developing and developed countries, serving many different needs.

### **Smart networks and Services**

**The smart networks of the future will support the service platform for driving the digital transformation of our society**, acting as the ‘nervous system’ of the Next Generation Internet (NGI). Future communication systems and networks (Smart Networks) will be the foundation of the ‘Human Centric Internet’. They will provide the flexible, energy-efficient and high-performance critical infrastructure where Next Generation Infrastructure and other digital services will be developed and deployed. Smart Networks and Services will close the gap of digital competitiveness of European industries with respect to other areas augmenting human labour linked to disruptive new digital capabilities and avoid obsolescence of jobs in EU.

**Connectivity to all has evolved from a luxury to a critical human right.**

**A strong position in research, development and deployment of smart communication networks and service platforms will be a key future economic differentiator and ensure overall European industry remains competitive.**

**Smart Networks and Services provide the means to make a trusted and reliable knowledge based digital society a reality.**

### **Recommendations**

Flexibility, reliability and performance of “communication infrastructures” as provided by smart networks are critical not only to create the future digital society, but also to support the deployment of new technologies in various vertical sectors, creating better jobs and stimulating growth.

- **Europe needs to build on the excellent work started with the 5G PPP** and develop new opportunities across the value chains from cloud-based service provisioning to IoT and new opportunities for smart devices. It must retain its leadership in communication infrastructure research and innovation, in terms of both services and component manufacturing. Smart Networks is the essential digital infrastructure that will ensure that Europe remains globally competitive for decades ahead.
- **At a moment when other regions of the world have already started initiatives in the “beyond 5G” domain, an ambitious “de-risking” public private strategy in the field is needed considering the very high level of capital intensity in this research domain.**
- **Europe should hence strengthen the key area on Smart Networks and Services in Horizon Europe by a European Partnership with a significant budget allocation. Because of the rapid changes in technologies, Europe should avoid capping budgets to allow maximum flexibility.**



**In-kind contribution from the private sector should be considered as eligible, whilst a leveraging factor of at least 5 should be targeted.**

- This activity should be implemented in a specific **European Partnership instrument** that would closely cooperate with other organizations, EU Member States initiatives and partnerships. **The partnership could be established as Co-programmed European Partnership or as Institutionalised Partnership subject to an impact assessment by the Commission taking into account stakeholders' views.**
- The partnership should also strive to create implementation synergies with other related domains and notably the CEF2 activities aimed at deploying **Connected and Mobility 5G based solutions** along European cross border corridors.
- The private and public side should continue their **close cooperation** for the development of research roadmaps, the preparation of Work Programmes and Calls for Proposals, and to **improve the information flow** between the European Partnership and Member States.

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## **ANNEXES**

- I. Importance of 'Smart Networks and Services' for our Society and Economy
- II. About 5G PPP and 5G IA
- III. Communications Systems and Networks – A Strong Economic Contributor



## **ANNEXES**

### **I. Importance of ‘Smart Networks and Services’ for our Society and Economy**

- From supercomputers and parallel computers, to data analytics, passing through cybersecurity, the Internet of Things (IoT), cooperative robots, or autonomous vehicles, it is universally agreed that every system and application must be interconnected to its peers, as well as to other related entities and systems
- Ubiquitous, secure and affordable multi-service communications networks (enabling mobile and fixed use) are a fundamental enabler of a modern society
- Smart networks of the future will be the critical platform for driving the digital transformation and business processes of vertical industries (providing smart connectivity to economy and society)
- Smart networks are the foundation of the ‘Human Centric Internet’
  - Energy-efficient and high-performance infrastructure on which NGI and other digital services can be developed and deployed
  - Application of intelligent software (Artificial Intelligence) for decentralised and automated network management, data analytics and shared contexts and knowledge
  - Virtualisation and strict policies will foster a free and fair flow of data which can be shared whilst at the same time protecting the integrity and privacy of data which is confidential or private: users should be able to control their environment in the Internet and not be controlled by the Internet
- “Interconnection of everything” provided by smart networks will be a distinguishable flavour of a European competitive advanced society
- Smart network architecture will provide features significantly going beyond connectivity
  - Multiservice and Mobile Edge Computing will allow to store and process data locally at the edges of the network to provide fast reactions and efficient use of network resources
  - Programmable aggregation and virtualisation functions as well as built-in security functions will create a trusted environment for the Internet of smart things in which new applications and ideas can flourish
  - Future cost-effective communication systems and networks will increasingly be based on Artificial Intelligence (AI), Machine Learning (ML) and increased softwarisation in addition to requiring the continued development of classical communication technologies
  - It will intertwine distributed network, compute and storage resources to facilitate an agile composition of new services supporting a multitude of markets and industry sectors
  - It will benefit from new versatile intelligent terminals and devices (IoT) providing renewed industrial opportunities in this highly competitive domain

### **II. About 5G PPP and 5G IA**

The 5G Public Private Partnership (5G PPP) is the 5G collaborative research program that is organized as part of the European Commission's Horizon 2020 program – The European Union Program for Research and Innovation. It is aimed at fostering industry-driven research, monitored by business-related, technological performance and societal KPIs. The 5G PPP will deliver solutions, architectures, technologies and standards for ubiquitous next-generation communication infrastructure over the coming decade.

In the 5G PPP, the 5G Infrastructure Association (5G IA) represents the private side and the European Commission the public side. The 5G IA is committed to the advancement of 5G in Europe and to building global consensus on 5G. To this aim, the Association brings together a global industry community of telecoms & digital actors, such as operators, manufacturers, research institutes, universities, verticals and SMEs. The 5G IA carries out a wide range of activities in strategic areas including standardization, frequency spectrum, R&D projects, technology skills, collaboration with key vertical industry sectors,



notably for the development of trials, and international cooperation. Website: <https://5g-ppp.eu/> - Twitter: [@5GPPP](#) - Transparency Register 5G IA's ID number: 944198631623-17

### **The 5G PPP has been providing great benefits for Europe.**

The 5G PPP consists of three phases of collaborative research. Thousands of researchers and developers across Europe have been working on innovative solutions for the definition of 5G.

5G PPP projects are building pre-standards consensus and provide contributions to global standardization in order to strengthen Europe's influence on the 5G development.

#### **5G PPP places Europe ahead in the global 5G race**

The 5G PPP Programme provides the leading global forum for developing the ideas, concepts and solutions for what 5G will be and which technical solutions will be chosen.

The 5G PPP global impact achievements already include:

- A major impact on 5G standards with more than 300 technical contributions to IEEE802, 3GPP, ETSI, etc
- Beyond standards, proving the 5G system will work in more than 100 test/experiment sites
- Beyond Europe, a global impact with 7 memorandum of understandings signed between the European 5G IA and peer industry associations around the globe (Americas, China, Japan, South-Korea, Brazil, India and Canada)
- Beyond Telecommunications, to create impact on vertical industries several MoUs have been signed with industry consortia in priority vertical sectors (eg. automotive)
- Creation of a unique ecosystem bringing together multinational industries, SMEs, research centres and universities

#### **5G PPP drives European economy**

Europe is focusing on truly disruptive vertical use-cases for 5G - including URLLC (Ultra-reliable, low-latency communications) and critical communications - within 2020-22 timeframe, enabling new players entering the market with new services. For this purpose, 5G PPP has already:

- Created 5G technology leadership for European industry
- Successfully achieved most of the challenging business and technical key performance indicators (KPIs) as well as on track for the societal ones
- Stimulated a high level of SME participation in Phase 1 and Phase 2
- Had a positive Impact on the innovation capacity of SMEs
- Mobilised a huge additional private investment in 5G with the overall leveraging factor expected to exceed 10 times the allocated public funding (700 million €) by 2020

#### **5G PPP supports citizens and public authorities**

- Supporting Europe's leadership in the digitisation of industry and society
- Facilitating the creation of new societally beneficial services such as smart cities, e-health, intelligent transport, power, environmental protection, education or entertainment & media
- Enabling European e-inclusion through the rollout of high performant networks with pervasive access to all services

### **III. Communications Systems and Networks – A Strong Economic Contributor**

In Europe, the ICT domain contributes significantly to the economy with about 5% of GDP, which corresponds to a market size of € 600 billion, as confirmed by Eurostat [1].

In particular, the **communication systems and networks sector** [2] (manufacturing, including communication equipment and telecommunications) enables this market with:

- around 27.2 % (1.74 million employees) of ICT employment
- 37 % (€ 234 billion) of ICT market size.
- 47 % (€ 15 billion) of R&D expenditure in Europe.



According to GSMA [3], the mobile ecosystem provided direct employment to 1.09 million people in 2017 in Europe plus an additional 1.39 million indirect jobs. The employment ecosystem takes into account several players bringing **the total impact (both direct and indirect) of the European mobile industry to 2.48 million jobs.**

GSMA reports [3] that **the contribution of the mobile industry to GDP in Europe will grow from € 550 billion (3.3 % of GDP) in 2017 to € 720 billion (4.1 % of GDP) in 2022.**

This contribution comprises:

- direct impacts by the telecommunication industry
- indirect impacts by the use of communication systems and
- impacts on the overall productivity of economy

5G will be a major technology in growing industrial digitalization. Digitalization has risen industrywide **across the globe** and, according to a report from Ericsson [4], **the digital revenue for ICT players will be worth around USD 3.5 trillion by 2026 across the 10 key industries studied** (public safety, manufacturing, financial services, healthcare, energy utilities, automotive, media and entertainment, public transport, agriculture and retail).

**Europe has strong industries, which provide great opportunities for cooperation between verticals such as automotive, healthcare, transport, utilities and the ICT domain.**

## References

- [1] Eurostat: ICT sector - value added, employment and R&D. January 2018, [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT\\_sector\\_-\\_value\\_added,\\_employment\\_and\\_R%26D](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_sector_-_value_added,_employment_and_R%26D) and Eurostat: National accounts and GDP. 2017: [http://ec.europa.eu/eurostat/statistics-explained/index.php/National\\_accounts\\_and\\_GDP#Further\\_Eurostat\\_information](http://ec.europa.eu/eurostat/statistics-explained/index.php/National_accounts_and_GDP#Further_Eurostat_information).
- [2] EU Commission: Digital Agenda Scoreboard – The EU ICT Sector and its R&D Performance. 2018, [http://ec.europa.eu/newsroom/dae/document.cfm?doc\\_id=52246](http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=52246).
- [3] GSMA - The Mobile economy Europe report 2018, <https://www.gsmainelligence.com/research/?file=884c77f3bc0a405b2d5fd356689be340&download>
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