SNS in the FP10

What objectives and technologies?

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The Voice of European Industry and Research for Next Generation Networks and Services

What Connectivity and Service platforms represents:

The foundation of the digital economy and society

A crucial infrastructure for security and sovereignty

Dual use, safe and resilient infrastructures

The backbone of digitisation of all EU businesses

A key domain for EU economy

6,7% of EU GDP, Eurostat 2021

Booming public investments from our main competitors

Booming investments for Member States

€ 2 Billion for 6G, e.g.

A high risk, R&D intensive domain

Risk sharing with public policies/partnership

A key technology for EU policies

- EUCCS, IRIS²,
- Sustainability;

An EU valorisation platform for key technologies

AI, Quantum, HPC, security, chipsets, computing;

The Draghi report : The telecommunication equipment and software sector are also key for the EU's cyber-resilience, security of strategic infrastructures, and protection of citizens' and business data

What is at Stake

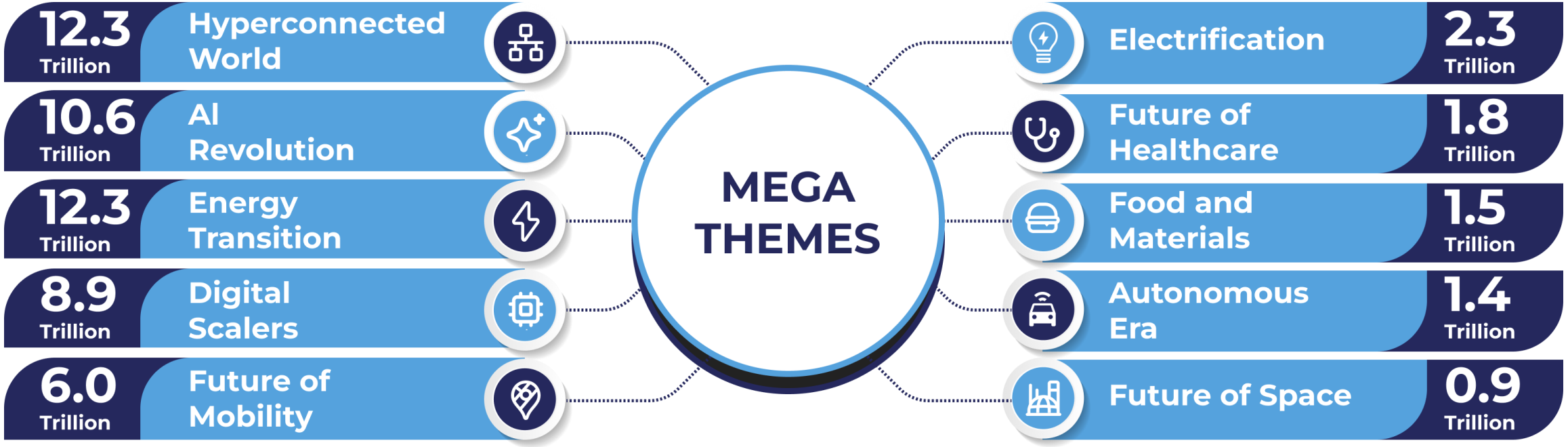
Sovereignty & Competitiveness

- **Around 80%** of **Internet traffic** is funneled towards **GAFAM platforms**, ➔ the "closed Internet" era.
- The **monetisation of digital services** largely takes place **outside of Europe**.
- **Significant disruptions** are expected to arise from the integration of **Cloud** and **AI** technologies within **networks**.
- **Persistent security challenges** continue to be a major issue.
- **Networks are increasingly connected** to **military applications** (e.g., **Starlink**).
- The evolution of networks/services is an ongoing journey – **EU R&D efforts do re-enforce EU's position in the global context**.

What is at Stake

Opportunities

- **Seizing the € Trillion** opportunity from broad digitisation as expected over the 2030-2040 time frame (Source, Forbes)
- **Opportunity for EU leadership** in beyond connectivity domains (devices, computing)
- Importance of **verticals engagement**



Technological Opportunities

Artificial Intelligence

AI for Networks (example)

Opex top 100 Telcos: ½ of their revenues (€ Tn)

Downtime: sec/wk vs 10mn/week for clouds

Manual operations

Level 4 goes into full automation

Real Time sensing, autonomous decisions, intent based

Cross domains,

Data models

Networks for AI (example)

Huge opportunity for LOCAL service provision

Avoiding deep in network data handling

Based on techs like DGX Spark, 1000 Trillion ops per second ➔ true local AI

Perfect storm with Network low latency

Frugal AI

Complement of AI native arch

- **Disruption opportunity for service monetisation and independance**
- **Opportunity with accumulated data over time**
- **True Network designed AI** (see GSMA initiative)

Technological Opportunities

Cloud Computing

- Proper coupling service provision/infra capabilities (based on traffic booming)
- definition of a cross provider model that guarantees full interop/QoS
- AI for the provision of user services
- service monetisation model for EU players
- framework to develop and market services in compliance with EU regulation;
- service based innovation through opening and emergence of communities of developers
- local services (example may include PPDR)
- service development environment for networks:

> **Leveraging IPCEI and current HEU activities, may be shorter term to market**

> **Implementation across various architectures, including 6G.**

Technological Opportunities

Quantum Networking

Still large number of limitations:

- **Fragile nature of quantum information, quantum interference, decoherence, and signal loss. repeaters at multiple segments to maintain the accuracy of quantum networking**
- **Complex manipulation: inability to copy the quantum state limit many applications on a routine basis.**
- **Scalability issues: Long-distance quantum communication is currently hypothetical**
- **High costs: Implementing and maintaining quantum networking requires a high-cost investment.**
- **Quantum networking hardware and software need high investments in technology, engineering, and costs.**
- **Complex integration: Quantum networking has its own standardization and interoperability requirements for hybrid networks.**

> **Long term issue compatible with FP10 time frame, both R&D and experimentations**

Technological Opportunities

Micro electronics

Expanding the domain to telecoms:

- New RF bands, beyond mmWaves
- Joint coms and sensing, dual application chipsets
- SoC's, multiple net function implementations;
- Virtualisation, HW capabilities and accelerators
- AI/ML, integration data management at edge and coms;
- Devices

> **Target expansion of EU capabilities in both coms/services and µelectronics**

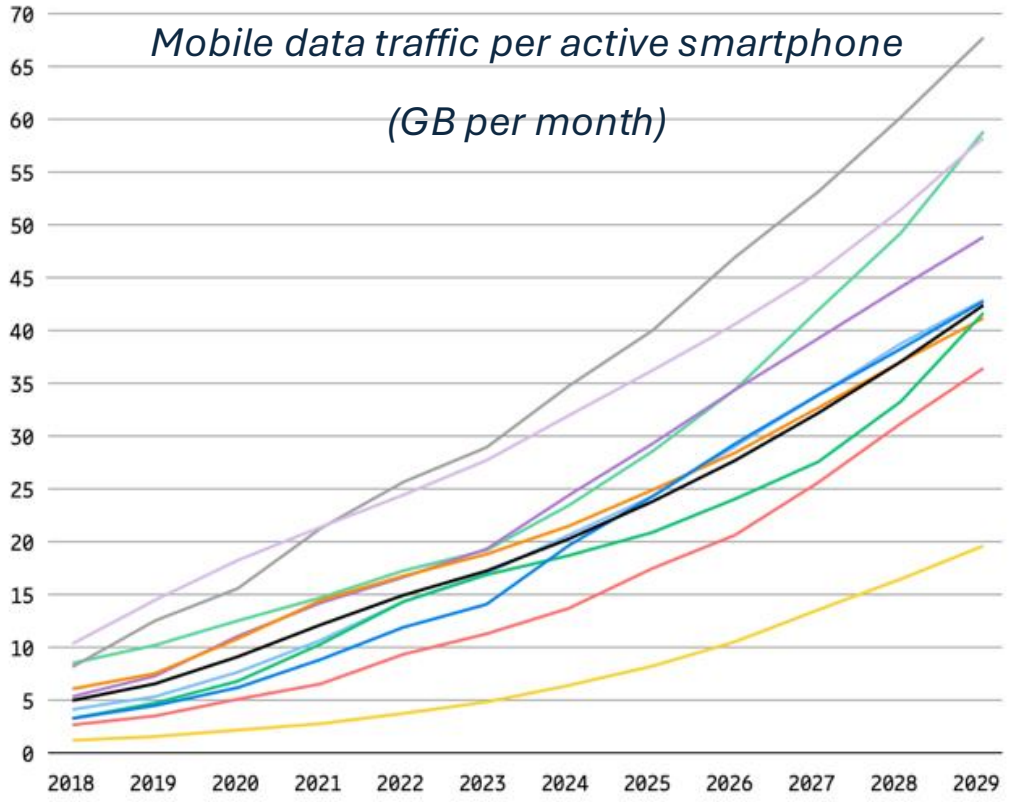
Technological Opportunities

Leveraging and expanding EU Strongholds

- **Radio:** new spectrum, sharing, AI Radio, Ultra massive MIMO, Spectrum as a Service..
- **Virtualisation/cloudification**, Service deployment models across heterogeneous domains;
- **Service level and openness** to innovation (e.g. app economy)
- **Software implementations** and vertical driven API's
- **Optical techs,** very high capacity, software control;
- **Satellites,** coping with T advances (seamlessly..)
- **Security, resilience**, raising attack surface; (SW)
- **Sustainability**, even more critical with scalability
- **Devices:** towards EU capabilities? (Starting from low level requirements like RedCap)

Scalability, Sustainability

Intertwined and more critical as volumes increase



Regions	2023	2029	2029
India, Nepal, Bhutan	29	68	15%
North America	19	59	21%
GCC	28	58	13%
Western Europe	19	49	17%
Middle East and North Africa[1]	14	43	20%
Central and Eastern Europe	17	43	17%
South East Asia and Oceania	17	42	16%
Global average	17	42	16%
North East Asia	19	41	14%
Latin America	11	36	22%
Sub-Saharan Africa	5	20	26%

- **Global market for Mobile Data Traffic: 109 million Terabytes per Month in 2023, about 603 million Terabytes per Month by 2030, CAGR of 27.6%**
- **AI generated traffic expected to reach 1800 EB/months by 2035**
- **Machine traffic exceeding human generated traffic**

➔ **Critical to target strict optimisation of infrastructure resources to avoid cost explosion and unsustainable operations.**

Our Targets

Adresssing Draghi's report tech challenges:

Network Computing platform as European technology aggregator with underpinning technologies (Draghi Annex, 3.1)

- Radio tech, arch, spectrum
- Softwarization & Virtualization
- Service provision
- Optical networks
- Satellites, NTN
- Security, resilience
- Sustainability

Cloud (Draghi Annex, 3.2)

- New architectures for EU services
- Cloud AI convergence
- Cloud for Networks

Artificial Intelligence (Draghi Annex, 3.2)

- Network specific LLM (GSMA)
- Distributed archs
- Frugal AI, low computation
- Cross Domain AI
- Network for AI

Quantum (Draghi Annex, 3.2)

- Quantum networking
- Post Quantum sec

Micro Electronics, chipsets on selected domains (Draghi Annex, 3.3)

- Networks/RF
- Cloud, virtualisation
- AI
- Devices

Societal Resilience

Large scale digitization of businesses/social processes

Our Approach

A Strong Networks and Services initiative to:

- **Leverage EU strongholds to develop capabilities in related domains**
- **Leverage related domains in EUROPE: infrastructure implementations can not be delocalised**
- **Exploit AI opportunities to develop innovative EU service offers, notably locally;**

➔Use Network and Services platforms as an aggregator of digital key technologies, systems and services to minimise EU dependencies at full scale system level

➔Exploit specific EU public policy environments to catalyse take up, e.g EUCCS

➔Adopt a "Top Down " approach

Need: Integrated Implementation

- **Synergies from R&I to pre-deployment** from the start & at the Progamme level: not all technologies are at the same maturity level.
- Include the entire **life cycle through** a well-defined set of technologies, use cases, and timelines, akin to initiatives in other regions.
- **Include new activities:** defence, transfer of technologies to start ups.
- **Facilitate the execution of cross-cutting activities** (Chips JU, Photonics HPC, Quantum, etc.)
- **Respond to the suggestions from PKH, Draghi, and Heitor reports**

Key Take Away-recommendations

Two core objectives: master the digital connectivity infrastructure and develop the EU service capabilities to monetise it;

Exploit the prospects of AI, notably for local service provision;

Use network and service infrastructure as an aggregator of technologies to focus developments and optimise EU exploitation impact;

The JU Model works: several years of investments to get it up to speed with a critical mass of EU industry commitments should be leveraged!

between supply and demand side

Integrated programme, from R&D to predeployment and valorisation.