



R&D to shape the networks and services of the future

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Panel: Horizon 2020 Europe's major new collaborative R&D Programme

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European

HORIZON 2020

[Innovation Union](#)

[Digital Agenda for Europe](#)

[European Research Area](#)

Europe 2020 priorities



Shared objectives and principles

Tackling Societal Challenges

ICT

Health, demographic change and wellbeing
– Food security and the bio-based economy

ICT

Secure, clean and efficient energy

ICT

Smart, green and integrated transport

ICT

Climate action, resource efficiency, including raw materials

ICT

Inclusive, innovative and reflective societies

ICT

Secure Societies

Creating Industrial Leadership and Competitive Frameworks

ICT

– Leadership in enabling and industrial technologies

Information and Communication Technologies (ICT)

– Nanotechnology, Materials, Manufacturing and Processing
– Biotechnology
– Space

– Access to risk finance

– Innovation in SMEs

Excellence in the Science Base

ICT

– Frontier research (ERC)

– Future and Emerging Technologies (FET)

– Skills and career development (Marie Curie)

ICT

– Research infrastructures

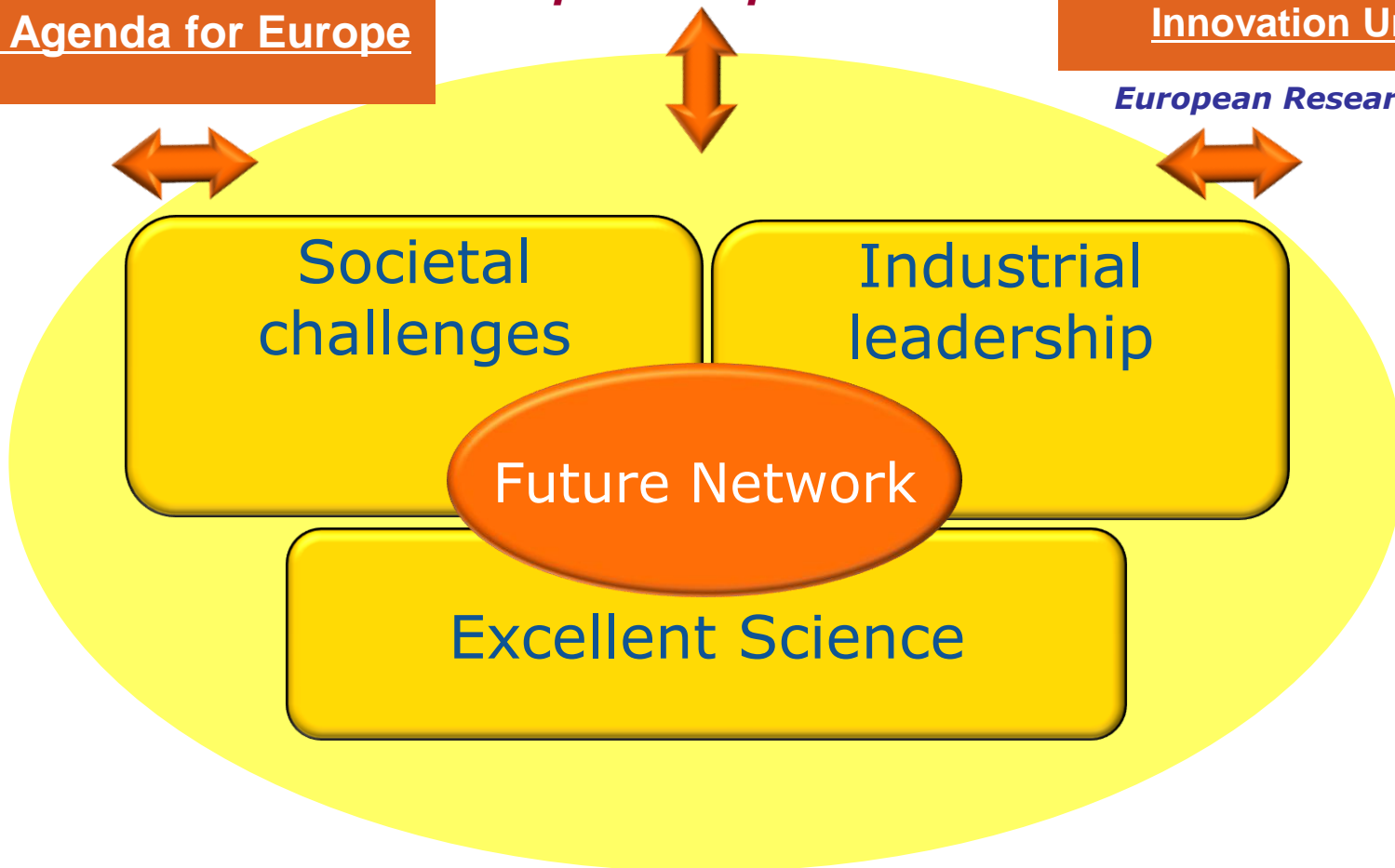
HORIZON 2020: new challenges

Digital Agenda for Europe

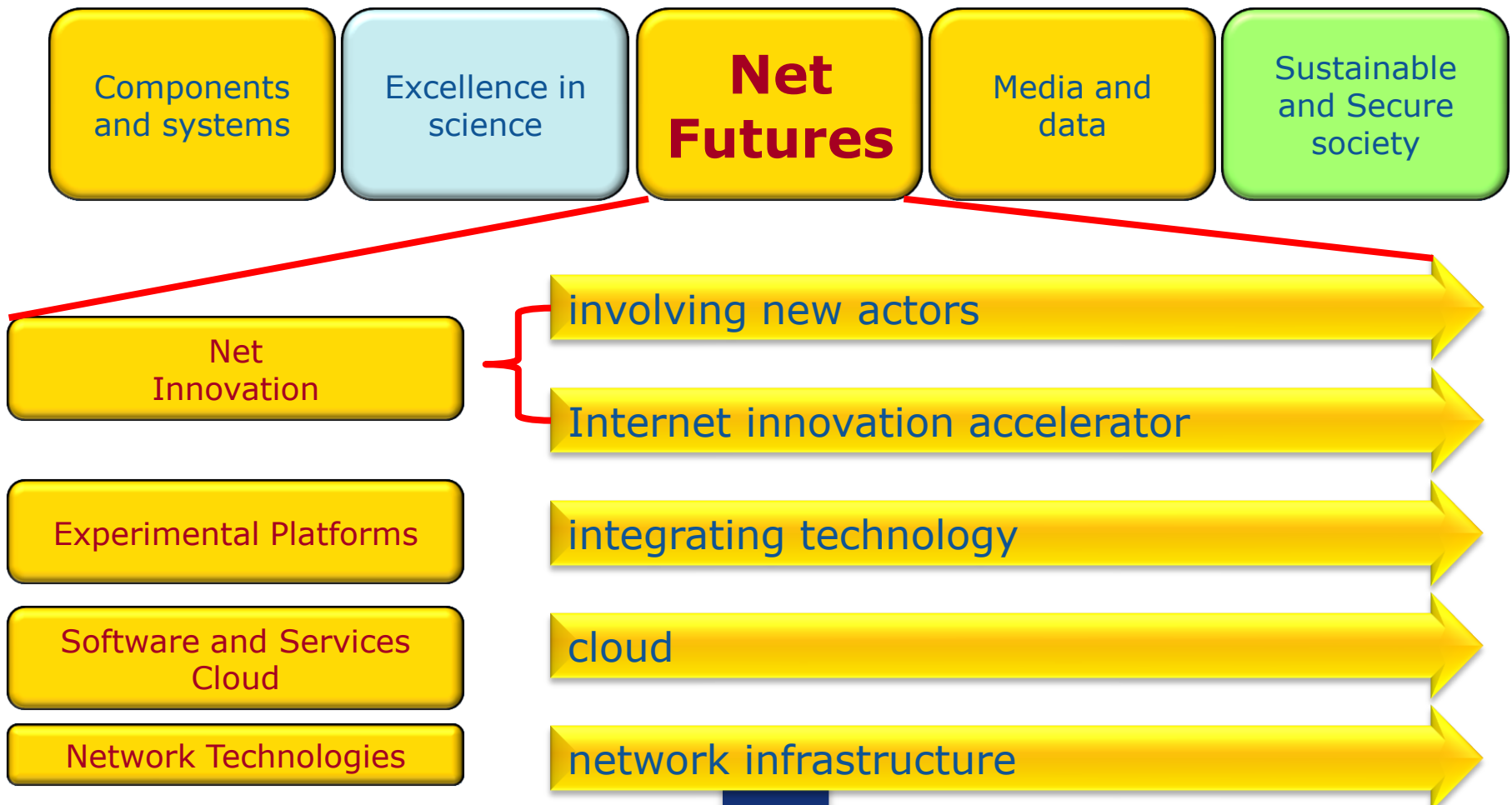
Europe 2020 priorities

Innovation Union

European Research Area



DG Connect and Net Futures -Mission and Domains



Challenge 3 – Future Internet WP 2013-14

IoT

Technologies for ecosystems
enabled by an Internet of things

Net Innovation

- Collective awareness platforms
- Web entrepreneurship

Cloud computing, software and services

- Advanced cloud infrastructures and services
- ECP: pre-commercial and joint procurement
- Innovative tools & methods for SW development

Experimental Platforms

- FIRE+
- Building upon FIRE

Network technologies

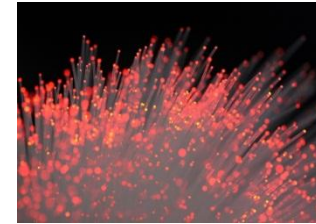
- Smart networks & novel architectures
- Optical and wireless network technologies

Network technologies

- 5G PPP on advanced network infrastructures

Trends driving EU R&I on Future Networks- I

- **Data explosion, content**
 - High capacity networks
 - Architectures, e.g. Content Centric Networks
- **Service platforms**
 - Software Defined Networks, open programmable and virtualised networks
 - End-to-End, cloud interoperability/integration
 - User involvement: personalised, social
- **Ubiquitous access/Mobility**
 - High capacity wireless, spectrum efficient and flexible technologies
 - Low radiation
 - From Convergence to fully integrated *global* networks



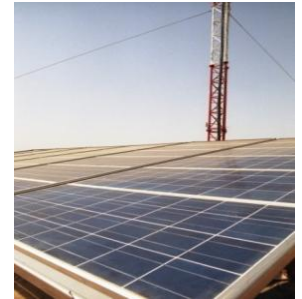
2G population coverage



3G population coverage

Trends driving EU R&I on Future Networks-II

- **Sustainability**
 - Green networks, drastic energy reduction/user
 - all optical beyond IP routing
- **Flexibility, low CAPEX, low OPEX**
 - Flexible self-management across multiple domains.
 - Big data usage, Quality of Experience
 - Leveraging network data in higher level applications
- **Objects connectivity**
 - IoT, spectrum efficient technologies
 - Integration environment
- **Security, Privacy...**



Integrated ubiquitous ICT infrastructure **a 5G initiative for Europe - context**

- Horizon 2020 Proposal
 - *Supporting PPPs (public-private partnerships), including Future Internet.*
- Speech of EC VP. Neelie Kroes
 - *Barcelona, World Mobile Congress, Feb. 2013, call for action to industry to submit partnership proposals for an advanced 5G future network infrastructure*
- Part of an integrated approach to Future Internet
 - *Cloud strategy (research, legal and procurement), PPP Internet as an innovation accelerator (generic enablers, platforms, new actors, entrepreneurship, innovation), FIRE (experimentation)*

So, what do we mean by 5G?

not a linear extrapolation of 1G, 2G, 3G, 4G...
instead, focus on...

- capacity and application crunch;
- convergence environment between networks and cloud computing
- true seamless convergence between fixed and mobile
- true ABC (Always Best Connected)
- optimised operation and deployment costs
- support to innovative applications

A 5G initiative for Europe

- Multiple actors called upon to contribute: telecom, IT, microelectronics, users, SME's...
- Validation through experiments and testbeds
- Clear KPI's as design goals:
 - *Providing 1000 times higher capacity and more varied rich services compared to 2010.*
 - *Saving 90% energy as today per service provided.*
 - *From 90 hours to 90 min service creation.*
 - *Secure, Reliable, dependable: perceived zero downtime for services*

A 5G initiative for Europe - rationale

- Strong foundation:
 - *Close cooperation with and within community*
 - *Strong and visible community (800+ entities in NET!works) – but not restricted to.*
 - *Industry oriented strategy*
- What the PPP brings:
 - *Long term commitment from both public /private side*
 - *Greater impact on innovation and leverage effect on complementary sources of financing*

more partnership, more commitment, more leverage!

Shaping a Connected Digital Future

- The overriding objective should be the "democratisation" of the network
- A seamless information access, knowledge sharing and communication space connected to the real world
- Conducive to individual and social empowerment... and to smart growth
- Addressing societal challenges should lead to innovation and growth opportunities for the ICT sector and beyond
- The upcoming integrated ubiquitous ICT infrastructure (5G) will be a game changer
- Global standards and open innovation are key for users and industry alike
 - ***HORIZON 2020 is a unique opportunity to meet these ambitions***