



EC R&D investments supporting Mobile Ecosystems

*INTEL European Research & Innovation
Conference 2013*

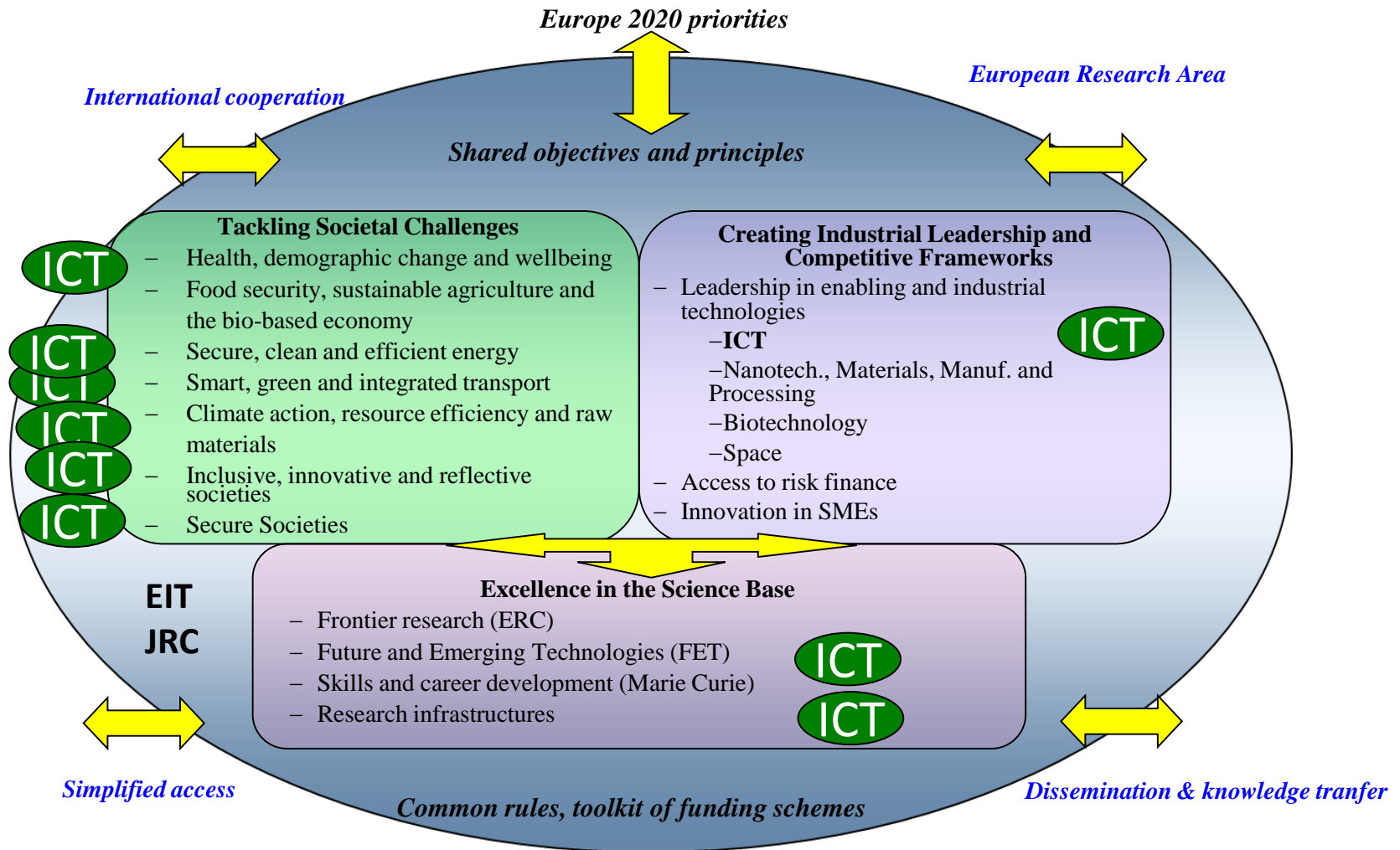
Mobility Track

Nice, 22 October 2013

Bernard.Barani

**European Commission - DG CONNECT
Deputy Head of Unit Network Technologies**

HORIZON 2020





European
Commission

Future Internet

IoT

Internet of things and platforms for
connected smart objects

Net Innovation

- Collaborative awareness platforms for sustainability and social innovation
- Web entrepreneurship

Cloud computing, software and services

- Advanced cloud infrastructures and services
- ECP: pre-commercial and joint procurement
- Tools and methods for software development

Experimental Platforms

- FIRE+ (Future Internet research & experimentation)
- More experimentation for the Future Internet

Network technologies

- Smart networks & novel Internet architectures
- Smart optical and wireless network technologies

Network technologies

- **PPP: Advanced 5G network infrastructure for the Future Internet**

INCO

EU-Japan R&D cooperation in Net
Futures

EU-Brazil R&D cooperation in
advanced cyber infrastructure

Motivations

- High Economic importance
- Addressing growing markets:
 - *Internet access*
 - *Mobile data services*
 - *Business data services*
- Solving perceived limitations of network infrastructures
- 5G Programmes now starting globally

5G PPP



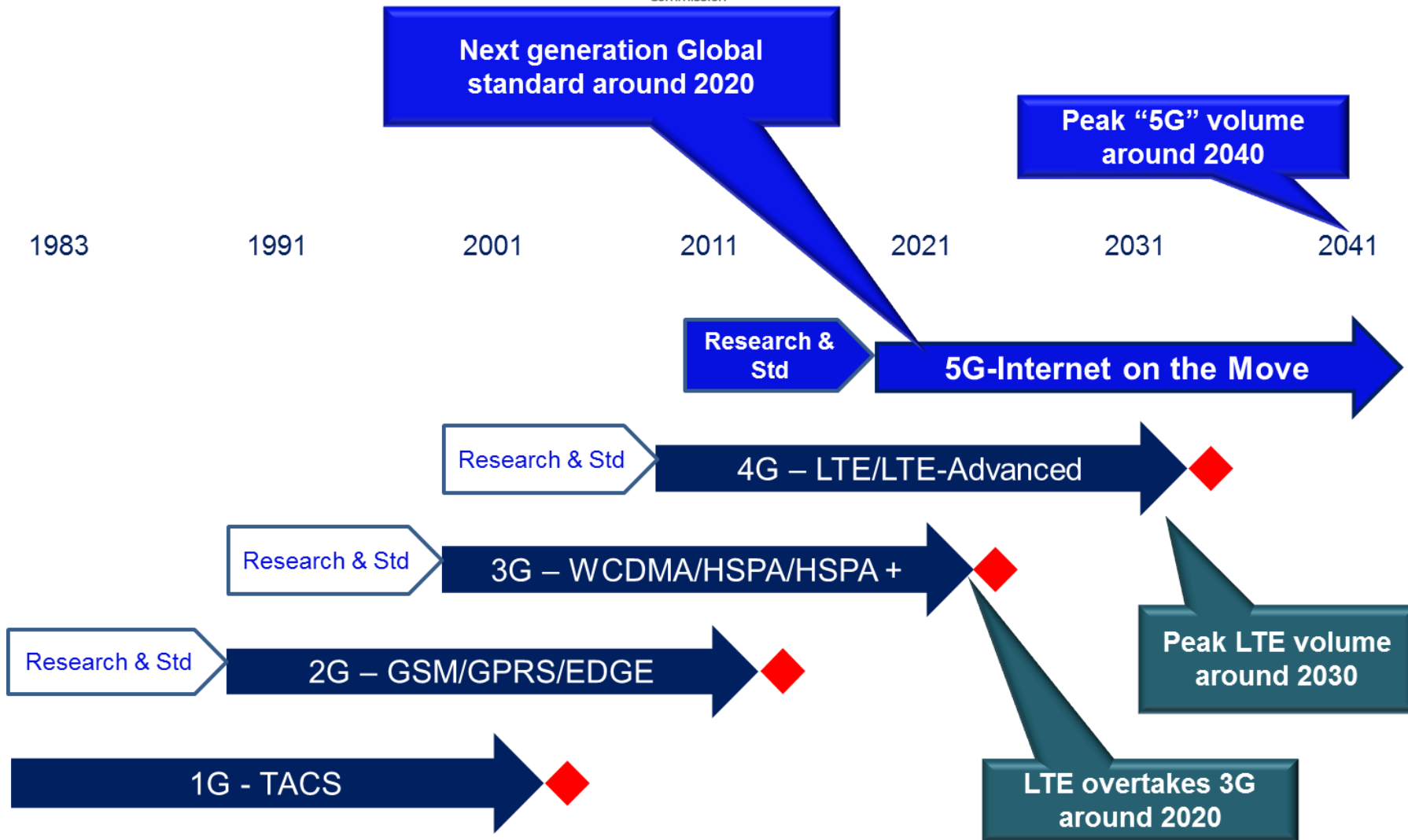
Foster European industrial leadership in supplying and deploying future network "5G" infrastructures

European industry to maintain a global infrastructure market share in 5G commensurate to what it is today.

Strategic Research Agenda and Innovation agenda (SRIA), roadmap based, test-beds and deployments.

- Addressing perceived network limitations
- Towards outputs, standards, interoperability
- Reinforcing the 7 million European jobs in the sector and the >3% GDP contribution

Why Now?

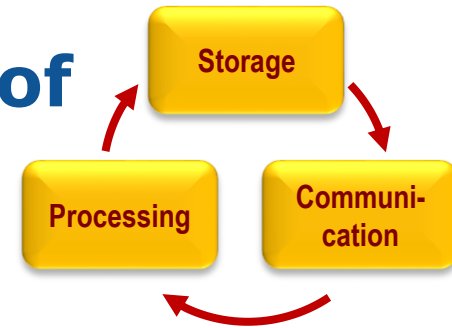


Average of 10 years research and standardisation, 20 years from introduction to peak volume

A 5G initiative for Europe

- **Strategic partnership**
 - *Industry drive, SRIA*
 - *From research to deployment including testbeds*
 - *Output oriented*
- **What the new 5G PPP brings in HORIZON 2020:**
 - *Long term commitment from both public /private side*
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 - *Impact on innovation and leverage effect on complementary sources of financing*
- **Critical mass**
 - *Exploitation of results, standardisation*
 - *One Stop Shop for international cooperation*

The Future: Very wide range of requirements



- From IoT to U-HDTV, ubiquity;
- Restless Pressure on bandwidth, spectrum crunch
- Complex traffic – usage patterns;
- Cloud computing reshaping the networks;
- Complex management
- Energy consumption

5G PPP, leveraging Trends

- Higher capacity access
 - Density, radio, cooperation, spectrum..
- Seamless Integration Fixed-Wireless access
- Network Function Virtualisation, Cloud RAN
- Software Defined Network
 - Unified network management,
 - Automated deployment and operation, self-organising networks
- Data analytics to optimise content and service delivery, security...

Design Goals

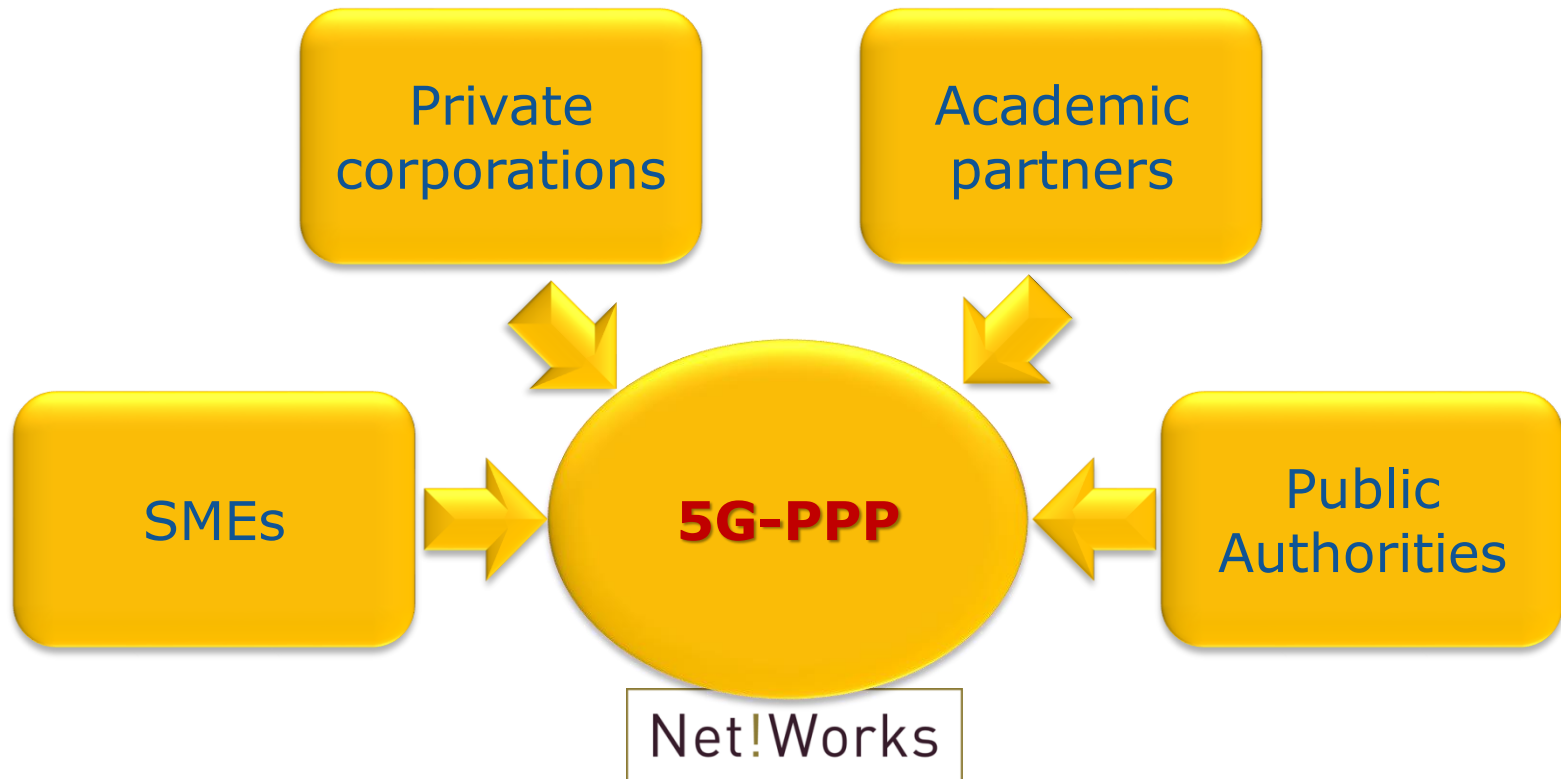


(some)

	Application Level	Access level	Latency	Switching Time
GS M	12 kb/s voice	20 kb/s	150 ms	seconds
3G	1 Mb/s HTTP	24 Mb/s	50 ms	500 ms
4G	10 Mb/s Web browsing	300 Mb/s	10 ms	200 ms
5G	1 Gb/s UHD	10 Gb/s fiber like	1 ms	10 ms

+ > 100 Billions of things, billions of Apps..

5G-PPP: Building the Community



Proposal introduced by ADVA Optical Networking, Alcatel-Lucent, ATOS, CEA Tech, Coriant, CTTC, Ericsson, ETNO, Eurescom, France Telecom / Orange, Fraunhofer HHI, Huawei, IMEC, iMinds, INRIA, INTEL, Intracom, NEC, Net!Works ETP, Nokia, Nokia Solutions and Networks, Portugal Telecom, Samsung Electronics, Telecom Italia, Telefonica, Deutsche Telekom – Telekom Innovation Laboratories, Telenor, Thalès, Turk Telekom, University of Surrey, VTT. (already 800 entities in NET!works, and not restricted to the current group of stakeholders)



European
Commission



Alcatel-Lucent



Atos



Coriant



EURESCOM



NEC



NOKIA
Connecting People



Telekom Innovation Laboratories



THALES



Core KPIs



- Providing 1000 times higher wireless area capacity and more varied service capabilities compared to 2010
- Saving 90% of energy per service provided (Main focus on radio access network)
- Reducing the service creation time cycle from 90 hours to 90 minutes
- Creating a secure, reliable and dependable Internet with zero perceived downtime for services
- Facilitating very dense deployments of wireless communication links for over 7 trillion wireless devices serving over 7 billion people.
- Ensuring User controlled privacy



1. Faster, more powerful and more energy efficient solutions for integrated high capacity access, core and data centre networks for a wider range of services

- Wireless networks
- Optical networks
- Automated network organisation - network management and automation
- Implementing convergence beyond the last mile access

2. Re-designing the network

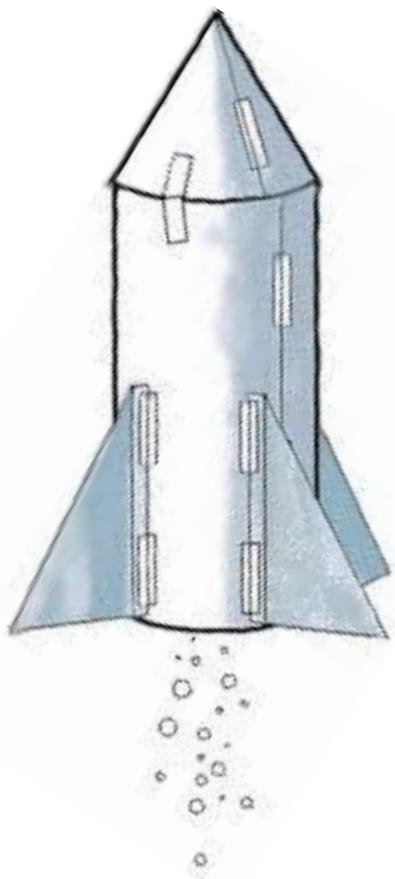
- Information centric networks
- Network Function Virtualisation
- Software Defined Networking
- Networks of clouds

3. Ensuring availability, robustness and security

4. Ensuring efficient hardware implementations



5G PPP - Three phases in EU



Phase III (2017-2018)

Large-scale trials



Phase II (2016-2017)

System optimisation



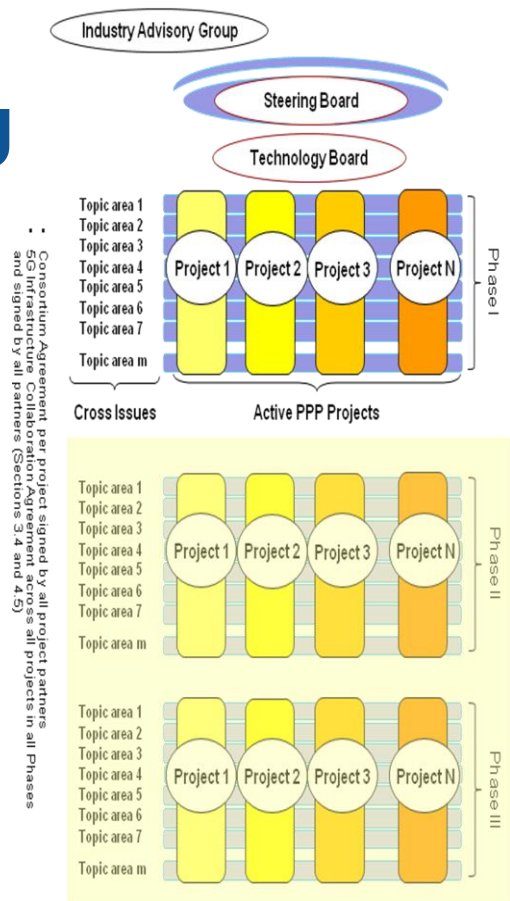
Phase I (2014-2015)

Basic research work



Ignition phase (2012-2013)

Project METIS; 5G NOW; i-JOIN..



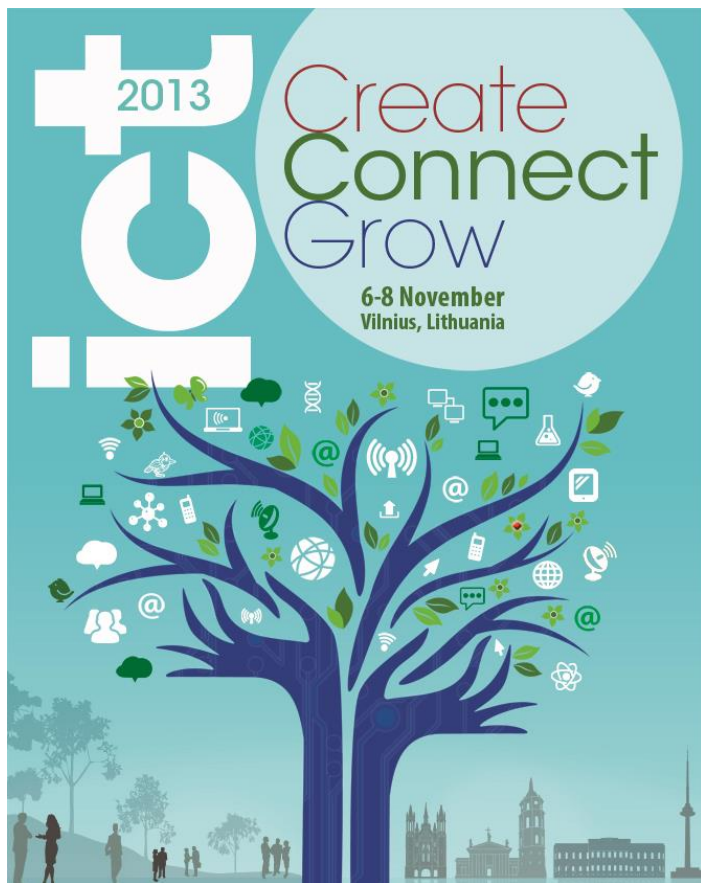
Programme Status

- Discussion with Member States;
- Two calls;
- Official launch December 2013
- PPP contractual agreements to be finalised



ICT 2013: Create, Connect, Grow

6-8 November 2013, Vilnius



Aim of the event:

ICT in Horizon 2020 - the EU's Framework Programme for R&I 2014-2020.

Structure of the event :

- conference,
- exhibition,
- networking.

Registration: Open from the end of April 2013

<http://ec.europa.eu/ictevent>



Thank you!

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DG Communications Networks, Content and Technology
<http://ec.europa.eu/digital-agenda/>

Network Technologies
<http://cordis.europa.eu/fp7/ict/future-networks/>

H2020, What's New?

~77 Billion €, Underpins Innovation Union

A single programme (FP7 + CIP + EIT)

Strong focus on societal challenges

More innovation

- Reaching out to non-traditional actors
- More risk taking
- Strengthened support for high-tech SMEs
- More open, light & fast schemes

ICT Roadmap-based research: Continuity and consolidation

FP7

H2020

ARTEMIS JTI

ENIAC JTI

Electronic Components & Systems JTI

Factory of the Future PPP

Future Internet PPP & SME Accelerator

Expansion of use cases

Networking R&D

5G PPP

Photonics R&D

Photonics PPP

Robotics R&D

Robotics PPP

Advanced Computing

Content Technologies and Information Management

Future Internet

The focus is on developing the network and computing infrastructures to accelerate innovation and address the most critical technical and use aspects of the Internet

This challenge will therefore address:

- **The limitations of an Internet not designed to support the very large set of requirements imposed by an ever more diversified usage**
- **The advent of more efficient computational and data management models**
- **The usage perspective supporting the early availability of testbeds for experiments and research validation**
- **Leverage the Internet to foster innovative usages of social and economic value and to promote entrepreneurship**

It also links to a cross-cutting action on IoT with Challenge 1

Contractual Agreement based PPP:

Public-private partnerships shall be identified in an open and transparent way based on all of the following criteria:

- a) the added value of action at Union level;**
- b) the scale of impact on industrial competitiveness, job creation, sustainable growth and socio-economic issues, including societal challenges;**
- c) the long-term commitment from all partners based on a shared vision and clearly defined objectives;**
- d) the scale of the resources involved and the ability to leverage additional investments in research and innovation;**
- e) a clear definition of roles for each of the partners and agreed key performance indicators over the period chosen.**



WHAT DOES NOT CHANGE

- **The financial rules are those of Horizon 2020**
- **Final responsibility for Work Programme stays with European Commission and is subject to Comitology**
- **Implementation remains with the Commission: selection of proposals, negotiation, review of progress and payments**

WHAT DOES CHANGE

- **Long-term commitment from Commission to support the field**
- **Long-term commitment by industry to invest, with a need to demonstrate its fulfilment (monitoring)**
- **Close interaction to reach agreement on content of calls. Greater focus on impact on growth and job creation**
- **Evidence based & monitoring of performance → KPIs & monitoring**
- **Large potential to leverage financing from other sources**
such as structural funds, EIB



Article 19 on PPPs

Horizon 2020 may be implemented through PPPs where all the partners concerned commit to support the development and implementation of R&I activities of strategic importance to the Union..

Involvement of the Union may take one of the two forms:

a) Institutional e.g. using Art 187 of the treaty....

b) entering a contractual agreement between partners specifying

Objectives of the partnership

Commitments of the partners

Key performance indicators

Outputs to be delivered

R&I activities that require support from H2020

Basic principle of the cPPP

- **Private sector partners advise the Commission on R&I priorities of the Horizon 2020 work programmes**
- **Implementation via 'normal' programme for R&I using H2020 Rules for Participation and with comitology**

Contractual agreement (MoU) to include:

- **Vision and Strategic Objectives,**
- **Multi-annual R&I roadmap,**
- **commitments,**
- **impacts,**
- **Governance and opening**
- **key performance indicators, monitoring of PPP performance**
- **means for termination**

~46% of funding to innovation-led activities

Large number of CP 70% activities:

- **Stimulating adoption, assessment and access services**
- **Technology transfer, rapid prototyping and testing of use cases**
- **Pilots (possibly large scale), experimentation and demonstration, large scale market validation (in real settings); pilot lines**
- **Consensus building, pre-normative activities, standardisation, reference implementations**
- **Online platforms and services for web entrepreneurs, SME incubators**

5% on the Open Disruptive Innovation scheme (SME instrument)

PCP/PPI activities (cloud, lab-on-chip for in-vitro diagnosis, e-textile for healthcare, robotics, public sector innovation, network of procurers)

Two Prizes (Optical transmission, Spectrum sharing)

Special activity on access to finance (topped up with funding from central scheme)

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Principles 5G PPP (Public Private Partnership)

- Focus on **infrastructure**
- Strategic Research & Innovation **Agenda defined by 5G PPP partners**
- **EU commits minimum €700 million** to leverage private investment in R&D&I funding for 5G between 2014 and 2020 (Horizon 2020 programme)
- **EU provides policy support** for 5G development (e.g. standardisation, spectrum planning, international consensus)