



5G Public Private Partnership Context and Priorities

***5G Infrastructure PPP Information Day
28 April, Issy les Moulineaux***

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Communication networks are essential

→ **5G PPP**: a Strategic initiative to reinforce EU competitiveness in this domain

→ Consolidating jobs

→ Industry driven

→ Holistic: telecoms + IT + micro elec + users..

→ Enabling novel applications

→ EU contribution to global 5G debate,
accelerating consensus (end 2015)



5G PPP in a Nutshell



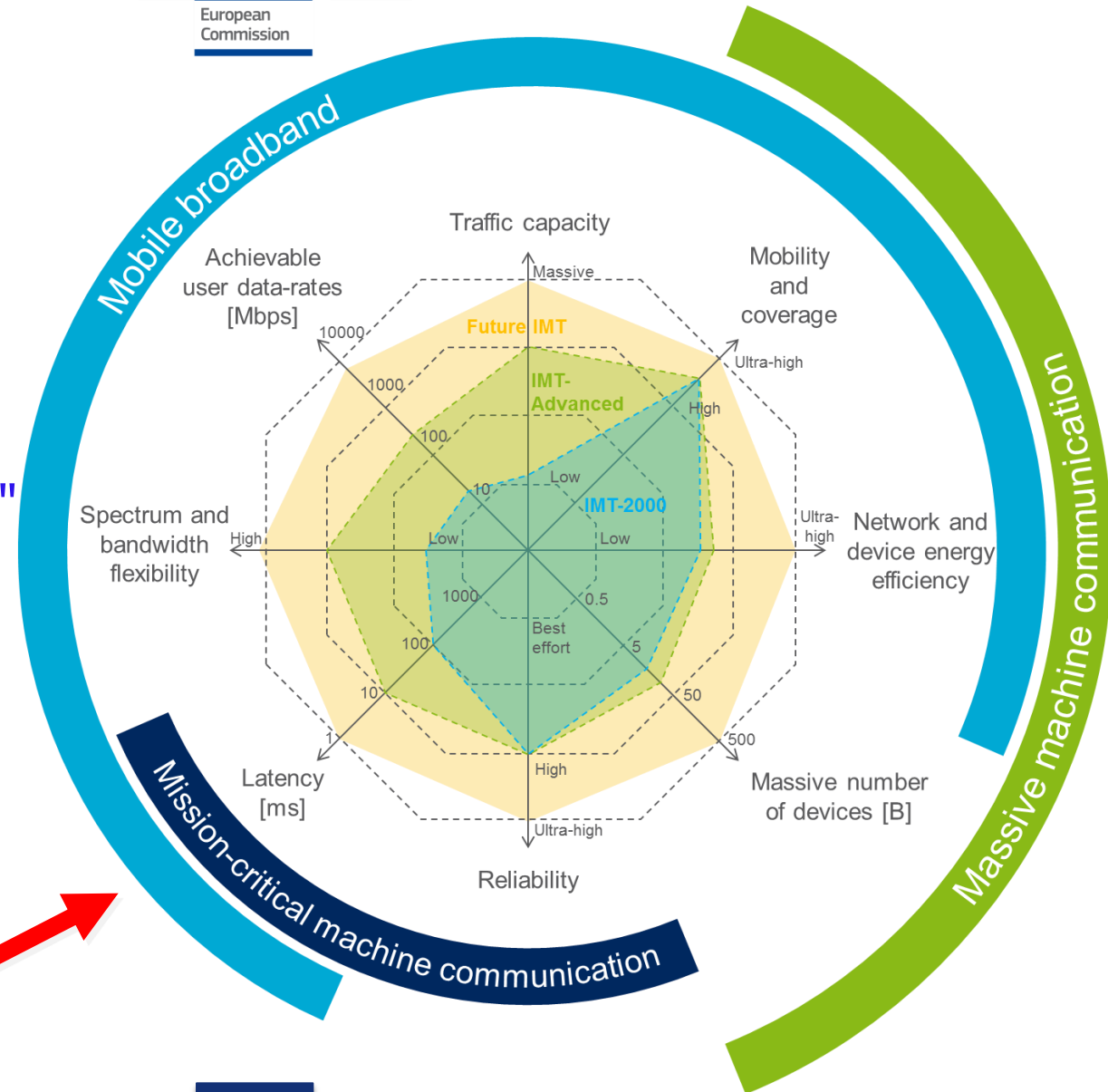
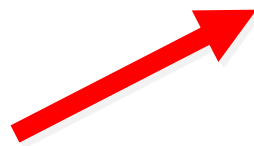
- Focus on **Communications infrastructure**, with a beyond 2020 time line
- Contractual Agreement signed with an **Association** representing the private side: <http://5g-ppp.eu/>
- **Strategic Research & Innovation Agenda** defined through **European Technology Platform: NetWorld2020.org**
- **EU commits budget up to €700 millions** for R&D&I funding for 5G between 2014 and 2020 (through Horizon 2020 programme)
- **Private Side** commits to **leveraging investments (X5)** and aiming at **agreed KPIs**
- **Beyond R&D: EU provides policy support** for 5G development (e.g. standardisation, spectrum planning, international consensus)

5 G Priorities & Drivers



- From IoT to U-HDTV, ubiquity;
- "Verticals" requirements
- Tactile Internet
- True ubiquitous "ABC" access
- Traffic growth (spectrum) and complexity
- Cost /energy

ITU PDNR
"IMT VISION"



Programme Aspects



- **Objectives:**

Achieve more than a group of standalone projects

Avoiding gaps

-> **Optimising project portfolio** but space for flexibility

-> You are part of a **Programme**

- **Ex Ante:**

➤ **Pre Structuring model:** a working methodology **worked out by the Association** as a tool to define optimised set of activities and their interfaces.

👉 ***Evaluation remains under full EC control***

- **Ex post:**

➤ **Contractual clause linking 5G PPP projects,** enabling easier knowledge and output sharing. As per FI-PPP model.



Projects to contribute to Association led Working groups:

- **WG 5G Vision** → towards 5G definition by end of 2015
- **WG pre standards/IPR**
- **WG spectrum (WRC 2018)**
- **WG Public Relations**
- **WG International coop**
- **WG societal**

Next steps: WP 2016-17; experiments..

Additional Information



- Constituency building event June, 26, Bologna, in the context of the EUCnC Conference

See <http://5g-ppp.eu/>

See <http://eucnc.eu/>

- Possibility of another event end of May explored!
- ***Submission date 25 November 2014 (€125 million)***
- ***Projects start March-April 2015***

Useful Sites



Main portal (grants, calls, Work progs...)

- http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-work-programmes-2014-15-annexes

Follow us on Twitter

[@NetTechEU](https://twitter.com/NetTechEU)

5G in Digital Agenda Web site

<http://ec.europa.eu/digital-agenda/en/towards-5g>

Network Technologies

<http://ec.europa.eu/digital-agenda/en/network-technologies>



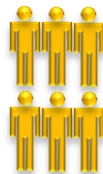
European
Commission

Thank You

Communication networks are essential

- Connecting EU citizens
- Enabling the Internet
- Powering digital applications
- Growth and competitiveness
- Global market of €400 billion
- EU-headquartered companies have 40% global market share

> 1,3 million jobs
In Europe



**→ 5G PPP: European Strategic – Holistic – Initiative,
+ a response to 5G initiatives launched globally**



Strand Radio network architecture & technologies

1000 mobile traffic increase, versatile requirements

- Network architecture, new use cases, new frequency bands, latency;
- Increased frequency re-use (10), versatile low-cost radio access infrastructure (IoT to > 1Gbps) + low energy
- Flexible backhaul solutions, efficient signalling
- Architecture for 5G "transceivers" and micro-servers, key HW building blocks to support various spectrum usage scenarios
- Preparing for large scale demonstrators and test-beds (possibly leveraging existing experimental facilities)

Strand Convergence beyond last mile

Integration, unified control

- Ubiquitous access continuum
- Cooperative, cognitive fixed and heterogeneous resources, with fixed optical access reaching at least 10 Gb/s
- Reuse and sharing of functionalities
- Solving management heterogeneity of technologies
- Taking into account regulations

Strand Network management

Minimize Opex, capex, complexity; Optimise QoS, QoE

- Network level management (SON)
- Service level management (metrics, for user perceived quality of service)
- Converging SDN and Autonomic;
- Security across domains, risk analysis and definition of threat models

Expected Impacts

At macro level, strong EU industrial base % of markets

At societal level, a wider spectrum of applications and services at lower cost, with increased resilience and continuity, with higher efficiency of resources usage

At operational level,

- 1000 times higher mobile data volume per geographical area.
- 10 times to 100 times higher number of connected devices.
- 10 times to 100 times higher typical user data rate.
- 10 times lower energy consumption for low power Machine type communication.
- 5 times reduced End-to-End latency (5ms for 4G-LTE).
- Ubiquitous 5G access including in low density areas .
- European industry driving the development of 5G standards, of 5G SEP -
- Availability of a scalable management framework reduction of network management opex by at least 20%. Availability of security/authentication metrics across multi domain virtualised networks.

Strand Virtualisation and SW Networks

Flexibility, beyond firmware implementations

- Virtualisation of net.functions, VM concurrent access to resources, migration
- Orchestration of resources, OS like, cross domain configurability, open source approach;
- Integration application/service layers with network layers, landscape aware decision for reconfigurability
- Openness, OTT integration, E2E SLA, exposure of resources to third party providers/developers



Expected Impacts

At macro level, i) NFV/SDN industrial capability in Europe by 2020; ii) large scale operational deployment of NFV/SDN by 2020.

At operational level,

- network function implementation through generic IT servers (target) rather than on non-programmable specific firmware (today).
- Fast deployment of large scale service platforms on top of network infrastructures, from 90 days (today) to 90 minutes (target).
- Trustworthy interoperability across multiple operational domains, networks and data centres.

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Support Actions

Coherence and impact

- Programme integration, analysis of outcomes
- Societal issues
- International activities
- Support to standards
- Support to spectrum policy
- Web site,
- Roadmaps, including experimental facilities

NB: International co-operation with countries having bold R&I initiatives in the field (Korea, Japan, US, China) may be considered on a win-win basis.

Pre Structuring Model



European

P8:
5G Holistic Network Architecture

P13:
5G Network Security

P11:
Cognitive Network Management

P9:
Enabling Technologies Unified Control

P16:
Multi-Domain

P14:
Software Networks Platform

P1:
5G Wireless System Design

P6:
Novel Architecture

P2:
5G Air Interface

P5:
5G
HW/SW
Platforms

P7: Backhaul/Fronthaul

P3:
5G for Massive
MTC

P4:
5G mm-Wave
Air Interface

P12:
SLM &
Metrics
for
QoS/QoE

P10:
5G Services
E2E
Brokering
and Delivery

P15:
Service
Program.
and
Orchestr.

See also

<http://5g-ppp.eu/>

Open consultation, closed 17 April 2014