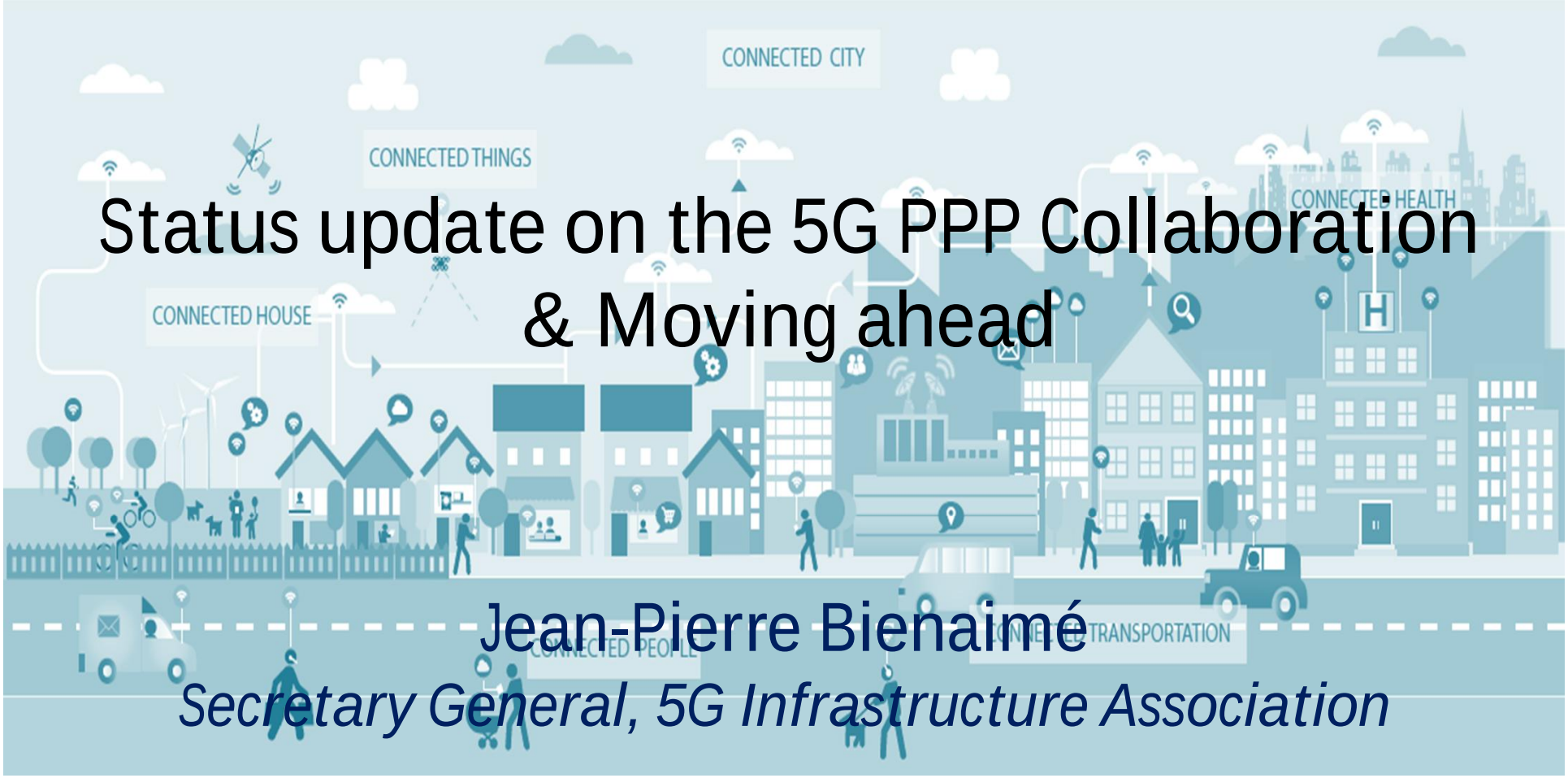
5G IA
INFRASTRUCTURE ASSOCIATION

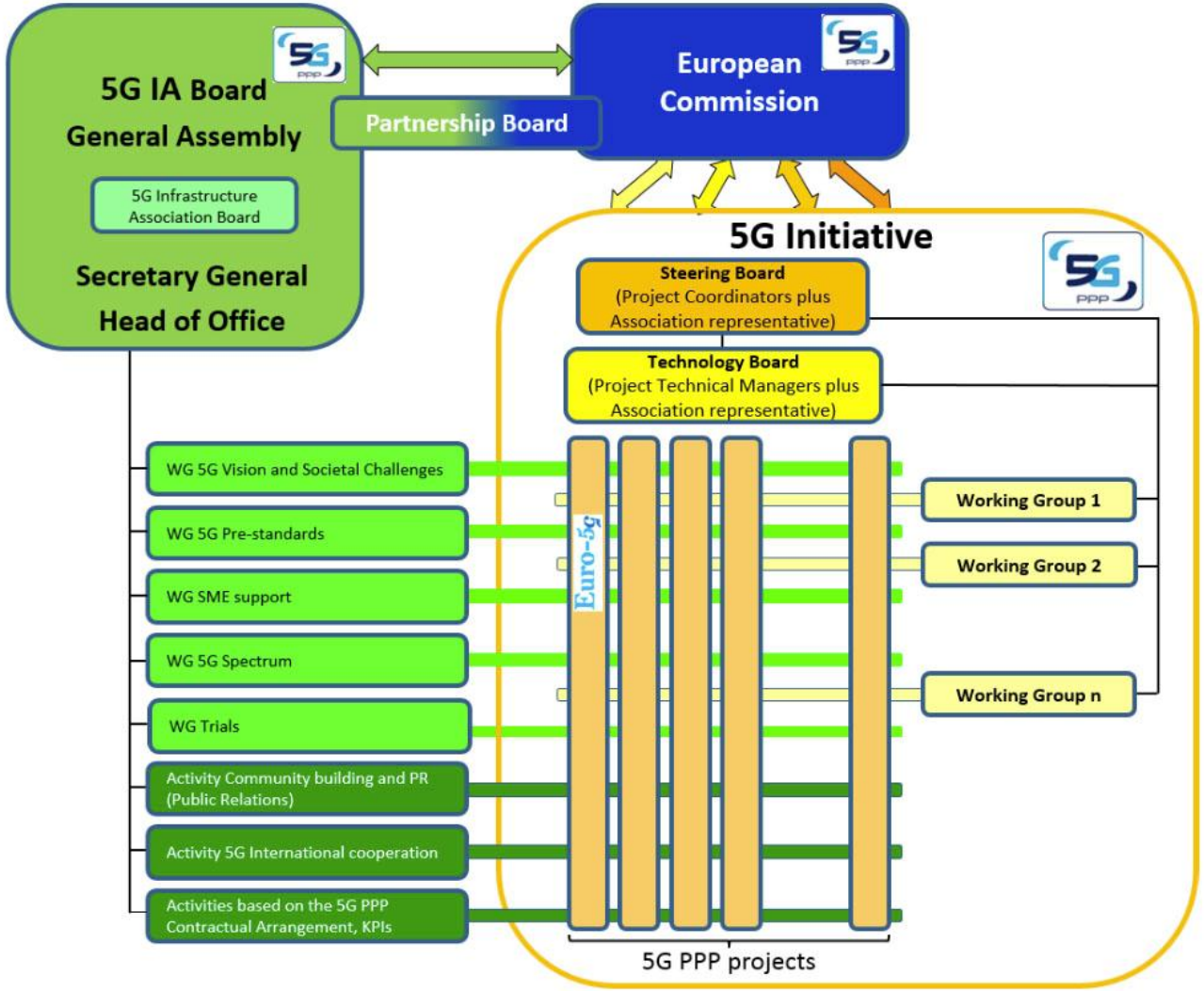


Status update on the 5G PPP Collaboration & Moving ahead

Jean-Pierre Bienaimé
Secretary General, 5G Infrastructure Association

http://5g-ppp.eu/

5G PPP Overall Governance



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Horizon 2020 5G PPP
19 Phase 1 projects on-going

5G IA

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5G Ensure
5G Security architecture, enablers, testbed

CogNet
Building an Intelligent System of Insights and Action for 5G Network Management

SELFNET
Framework for SELF-organized network management in virtualized and software defined NETworks

CHARISMA
Converged Heterogeneous Advanced 5G Cloud-RAN Architecture for Intelligent and Secure Media Access

SUPERFLUIDITY
Superfluidity: a super-fluid, cloud-native, converged edge system

5GEx
5GExchange
Automated & fast service provisioning

VirtuWind
Virtual and programmable industrial network prototype deployed in operational Wind park

SONATA
Service Programming and Orchestration for Virtualized Software Networks

COHERENT
Coordinated control and spectrum management for 5G heterogeneous radio access networks

5G-Norma
5G NOvel Radio Multiservice adaptive network Architecture

METIS-II
Mobile and wireless communications Enablers for Twenty-twenty (2020) Information Society-II

SPEED-5G
quality of Service Provision and capacity Expansion through Extended-DSA for 5G

SESAME
Small cEIIS coordinAtion for Multi-tenancy and Edge services

FANTASTIC-5G
Flexible Air iNTerfAce for Scalable service delivery wiThin wIreless Communication networks of the 5th Generation

5G-Xhaul
Dynamically Reconfigurable Optical-Wireless Backhaul/Fronthaul with Cognitive Control Plane for Small Cells and Cloud-RANs

Flex5Gware
Flexible and efficient hardware/software platforms for 5G network elements and devices

5G-Crosshaul
The 5G Integrated fronthaul/backhaul

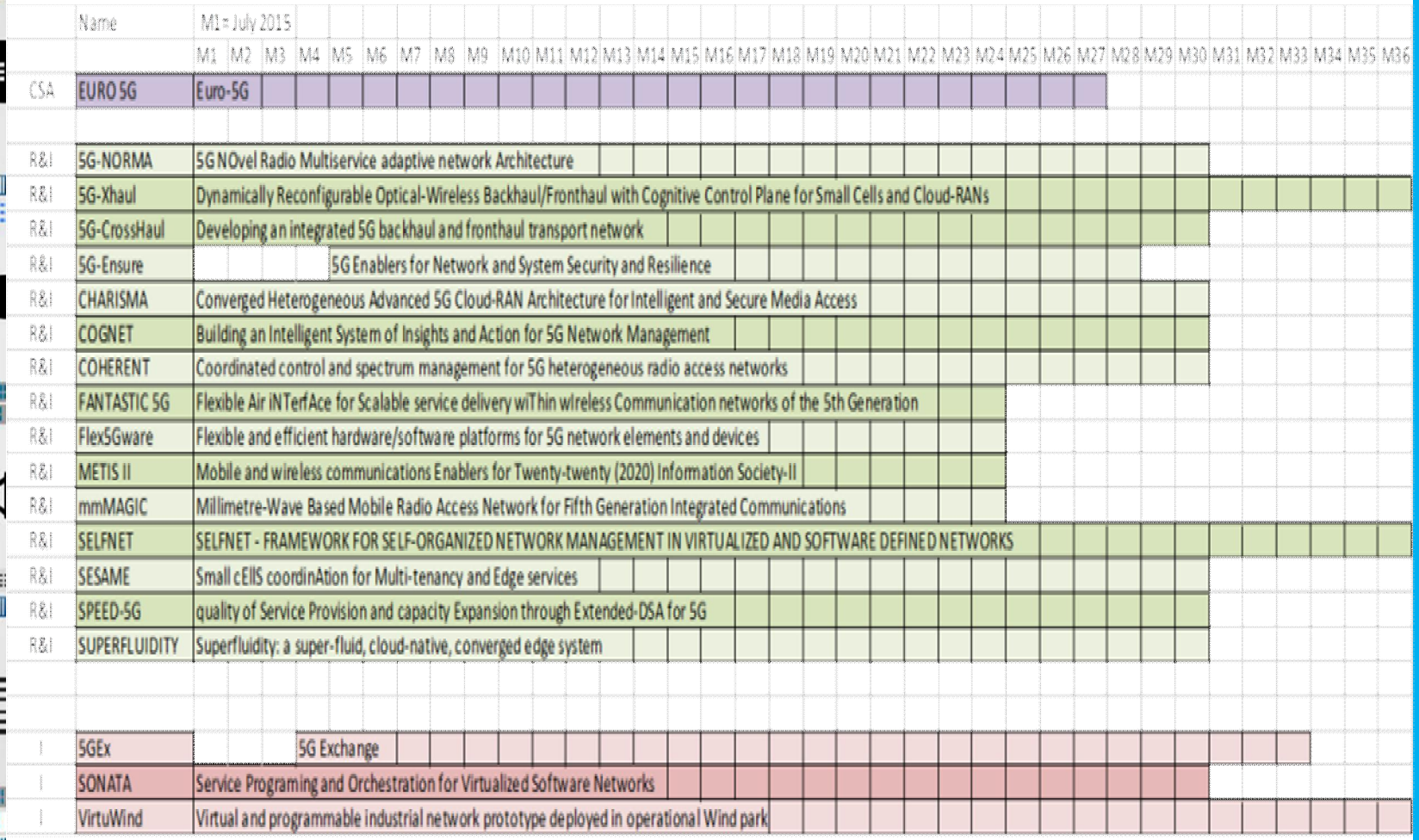
mmMAGIC
Millimetre-Wave Based Mobile Radio Access Network for Fifth Generation Integrated Communications

Euro-5G
5G PPP Coordination and Support Action

- Radio-related cluster
- Fronthaul/Backhaul
- Hardware implementation
- Network automation
- SDN, NFV, Cloud and Virtualisation
- Security

Source: 5G PPP, https://5g-ppp.eu/5g-ppp-phase-1-projects/.

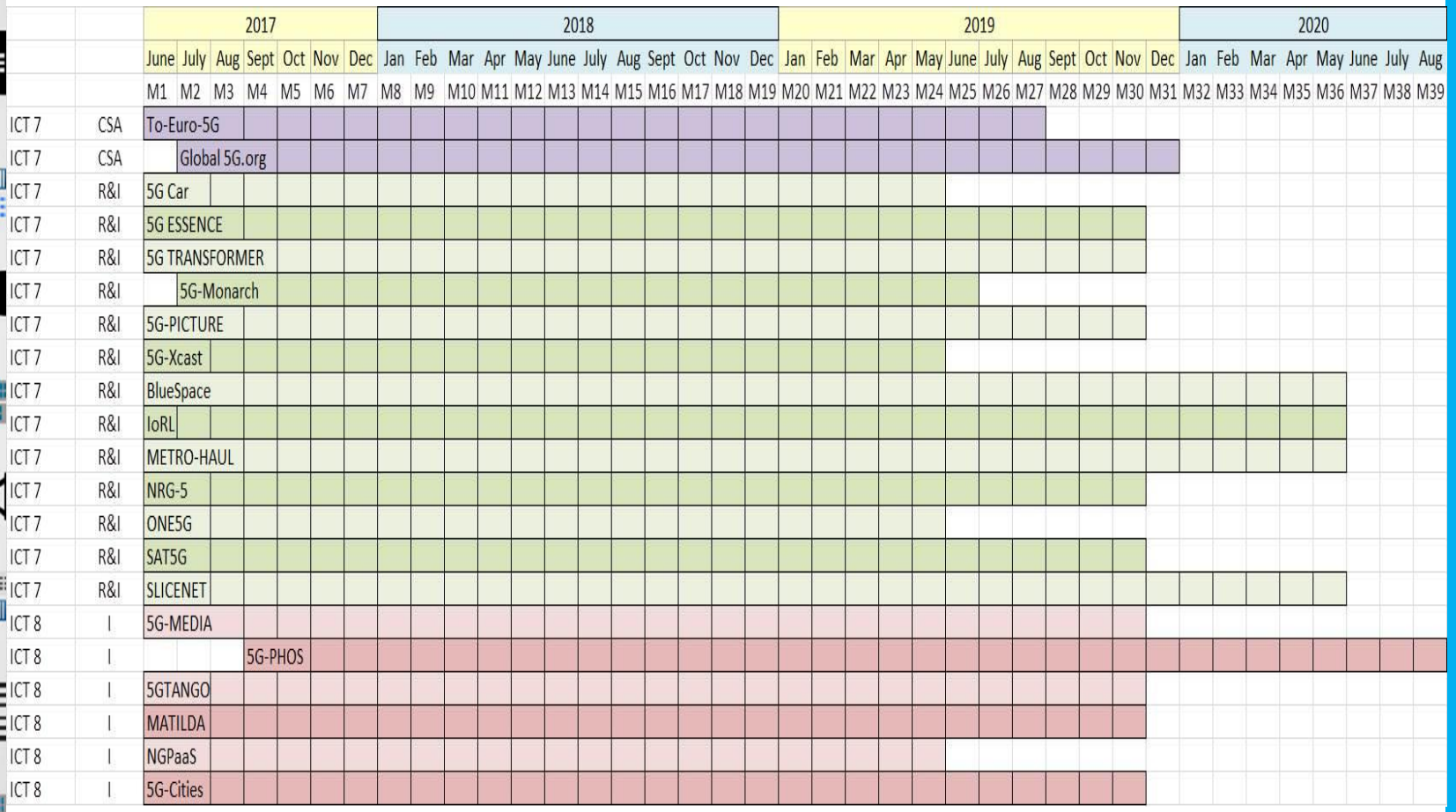
5G-PPP Projects Phase 1 timeplan



Phase 1 è Phase 2 Projects

Phase 1	Phase 2 follow up.
5G-Crosshaul	5G TRANSFORMER
5G-NORMA	5G-Monarch
5G-Xhaul	5G-PICTURE
SELFNET	SLICENET
Sesame	5G ESSENCE
SONATA	5GTANGO
EURO 5G	To-Euro-5G
FANTASTIC 5G	ONE5G

5G PPP Phase 2 timeplan



Phase 2 selection learnings

- Very good coverage of the work programme, as defined by the 5G-IA pre-structuring model (Targeted Actions)
- Leveraging on Phase 1 results and clear move towards software and cloud networks (RAN & CN)
- Effective inclusion of Verticals: automotive, healthcare, energy, media…
- New stakeholders and domains (satellite, optical)
- Strong potential to drive Europe towards 5G trials and demo paving the way towards implementation
- SME presence now above the 20% target

5G PPP Contractual Arrangement KPIs for Monitoring

- Business-related KPIs:
  - Leverage effect of EU research and innovation funding in terms of private investment in R&D for 5G systems in the order of 5 to 10 times;
  - Target SME participation with an allocation of 20% of the total public funding;
  - Reach a global market share for 5G equipment & services delivered by European headquartered ICT companies above the level of 43 % global market share in communication infrastructure.
- Performance KPIs:
  - Providing 1000 times higher wireless area capacity compared to 2010;
  - Reducing the average service creation time cycle from 90 hours to 90 minutes;
  - Very dense deployments to connect over 7 trillion wireless devices serving over 7 billion people;
  - Secure & reliable Internet with a “zero perceived” downtime for services provision.
- Societal KPIs:
  - Enabling advanced User controlled privacy;
  - Reduction of energy consumption per service up to 90 % (vs 2010);
  - European availability of a competitive offer for 5G systems and technologies;
  - New economically-viable services of high societal value like U-HDTV and M2M applications;
  - Development & availability of 5G skills curricula in partnership with the EIT.

Source: 5G PPP Contractual Arrangement.

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Establishment of Working Groups and Activities in relation to the 5G PPP Contractual Arrangement

- 5G PPP is contributing to several KPIs and EU policies related matters. For that purpose the following Working Groups and Activities have been launched by 5G-IA:
  - WG 5G Vision and Societal Challenges
  - WG 5G Pre-standards
  - WG SME support
  - WG 5G Spectrum
  - Activity Community building and PR (Public Relations)
  - Activity 5G International cooperation
  - Follow-up of the 5G PPP Contractual Arrangement, KPIs
- 5G PPP projects launched technology-oriented Working Groups
  - WG Architecture
  - Use cases and performance evaluation models
  - Software Networks (SDN and NFV)
  - Network Management, QoS
  - Security

Source: 5G Infrastructure Association.

5G-PPP WGs: Whitepapers delivered

https://5g-ppp.eu/5g-ppp-work-groups/

5G PPP

The 5G Infrastructure Public Private Partnership

About us | Getting Involved | Plans & Papers | Events | European 5G Action | Global 5G Actions | Media & News | Contact

WHITE PAPERS

Home /

The papers presented here to facilitate access to the views of the 5G-PPP community and to allow informed discussion of the 5G challenges as perceived by the members of the community.

Please note the opinions in these documents are the amalgamated opinions views of the contributors and may not be considered as representing the views of any individual organisation.

Issues Papers and Views from the 5G-PPP:

- 5G PPP_Security Landscape – **(White Paper) June 2017**
  This paper provide insights into how 5G security should be addressed in terms of "what" and "why".
- 5G PPP 5G Architecture – **(White Paper) Updated July 2016**
  This is the updated version of the 5G PPP View on 5G Architecture after incorporating the results of public consultations and discussions.
- 5G-PPP Stakeholders Survey. **June 2016**
  The Euro-5G project, in consultation with the other 18 5G-PPP projects, has produced this overview of the domains and sectors being considered by the projects as the target consumers of the solutions and technologies being addressed by the projects. >
- 5G-PPP use cases and performance evaluation modeling_v1.0 – **April 2016**
  This document provides an overview of the use cases and models that were developed for an early evaluation of different 5G radio access network concepts originating from various 5G-PPP phase 1 projects.
- 5G-PPP Pre-standards-WG Issues Paper – **October 2015**
- 5G-PPP Working Group on Network Management and QoS Paper "Cognitive Network

Recent News

sonata

SONATA views on Virtualised Infrastructure Management based on Containers

5G-Ensure

5G-ENSURE open consultation "What else needs to be done on 5G Security?"

5G PPP Phase I Security Landscape

News subscription

E-Mail Address

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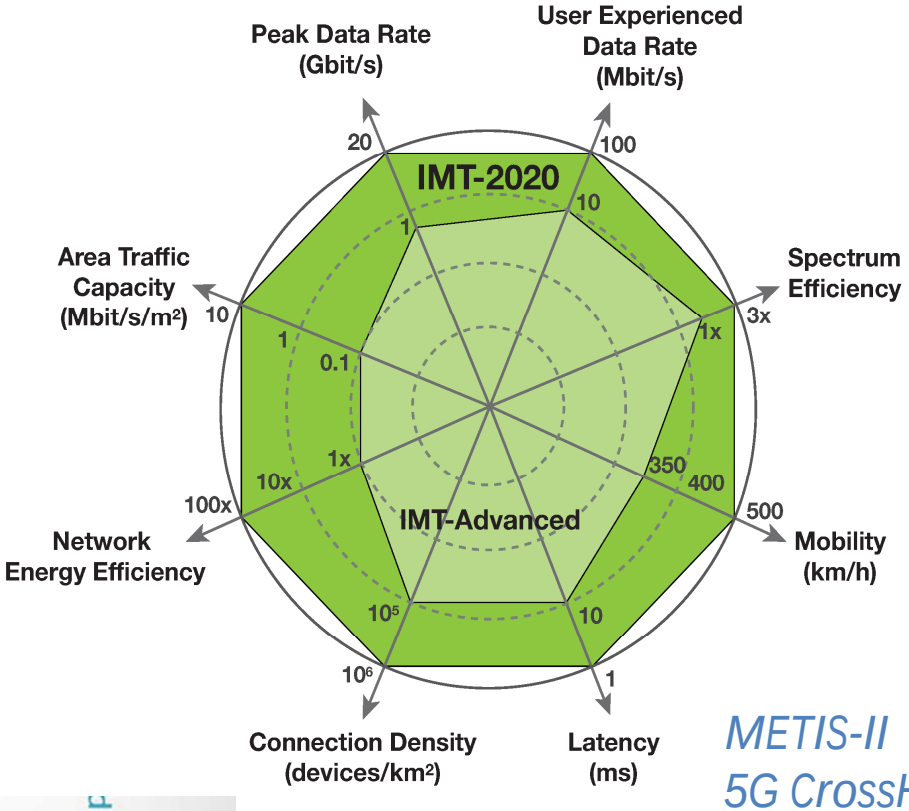
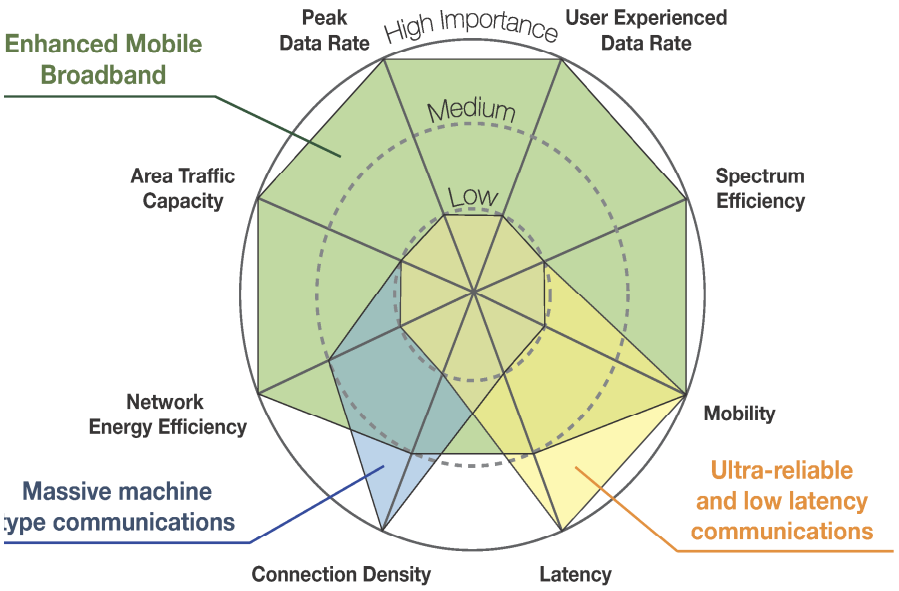
"5G innovations for new business opportunities"

New 5G PPP/5G IA white paper,





METIS-II
5G CrossHaul
SESAME
Coherent
Speed5G
Fantastic-5G
5G Norma
mmMAGIC
Flex5GWare
Charisma
5G Xhaul

EUCNC Conference, 12-15 June 2017, Oulu, Finland

Where do we stand with 5G requirements (1)? 3rd Cross 5G PPP Workshop February 2017

KPI	Requirement	METIS-II performance	Key contributor
C-Plane latency	< 10 ms	7.125 ms	RRC Connected Inactive, reduction of processing time in BS and UE
U-Plane latency	< 1ms	0.763 ms	Shortening of TTI, reduction of processing time in BS and UE
mMTC energy efficiency	> 10 years on a single 5 Wh battery	> 10 years on a single 5 Wh battery	Extension of DRX, C-Plane latency reduction, deep sleep energy conservation features
Peak data rates	> 20/10 Gbps for DL/UL	21.7/12.4 Gbps for DL/UL	MIMO spatial multiplexing (for lower frequencies), exploitation of mmW bands
Mobility interruption time	0 ms	0 ms	Multi-connectivity + make-before-brake

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Where do we stand with 5G requirements (2)? 3rd Cross 5G PPP Workshop February 2017

KPI	Requirements	METIS-II performance	Comments
User throughput (use case 1, UC2 and UC3)	UC1: 300 Mbps UC2: up to 5 Gbps UC3: 50/25 Mbps for DL/UL	UC1: 1 Gbps+ UC2: up to 7.85 Gbps UC3: 50/25 Mbps for DL/UL	Only DL values for UC1 and UC2 Different methodology applied for UC3 evaluation
mMTC device density (UC4)	> 1 mln/km^2	4 mln/km^2	Depends heavily on the traffic/report periodicity of mMTC devices. 1 upload of 1000 bits every 100 s was used in METIS-II
Reliability (UC5)	99.999% at 50/1000m for urban/highway	99.999% at 45/150m for urban/highway	For highway scenario, requirements seems very difficult to meet (revision needed?)
Network energy efficiency (UC1, UC3)	Should follow (at least) capacity improvement	For the capacity x1000, network energy efficiency improvements of 350-7500 were reported	Evaluation done only for Dense Urban environment. Savings depend on the load level in LTE-A/5G network

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5G PPP leading innovations towards 5G

- Thousands of researchers and developers across Europe are working on innovative solutions for the definition of 5G

- 5G PPP Phase 1 main achievements:
  - 5G System design & Evaluation aspects
  - 5G Air interface innovations
  - Networks management & Security innovations
  - Virtualization & Service deployment innovations

- 5G PPP Projects are building pre-standards consensus and provide contributions to standardization as well, in order to strengthen Europe's influence

5G PPP Phase 1 Golden Nuggets

5G Spectrum Requirements, Evaluation and Candidate Bands

5G Performance Evaluation Framework

5G System, Functional, Logical and Physical Architectures

5G Flexible RAN

5G Multi-Service Waveform

5G Massive Channel Access

5G Flexible Interference Mitigation and RRM

Technology Enablers for 5G RAN Platforms (HW & SW)

5G Integrated Transport Networks (FH/BH)

5G Network Management

Network Softwarization and Programmability integrating SDN and NFV Technologies

Flexible and Agile Service Deployment

E2E Orchestration in Single and Multi-Domains 5G Virtualized Networks

5G Networks Security and Integrity

Programmable Industrial Networks

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5G Pan-EU Trials Roadmap Version 1.0
Four Main Pillars

- Expanding the work initiated by Industry in the context of the 5G Manifesto and by the European Commission in the EC 5G Action Plan (5G AP)

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- Building Europe 5G readiness through 5G Private Trials
- 5G for Vertical Industries - Building the case through Pilots
- 5G for UEFA EURO 2020 - An opportunity for a Pan-European Showcase Event
- 5G Trials Cities

Pan-European Trials Roadmap 2017-2020+ Strategy and Streams

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5G Private Trials: Achieved and planned private trials and pilots (public information)

5G / 5G AP Trials Events | Smart Cities? | Smart Cities? MWC 2019? | EURO 2020 (UEFA)

5G Platforms: Experimentation & Trials on the basis of existing / new Platforms, open to ecosystem stakeholders R&I (e.g. Verticals). Covering both technological and E2E Platforms

5G Vertical Pilots: Experimentation & Trials dedicated to Vertical Use Cases. Possible prioritization of key Vertical Pilots at Pan-EU level (e.g. Automotive, Industry, eHealth…)

5G International Trials Cooperation | China, South Korea, Japan, USA, Brazil…

5G / 5G Action Plan (AP) Regulation & Policy

2017 | 2018 | 2019 | 2020

5G PPP supports international cooperation towards consensus building

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Pre-standards

Spectrum

Vision and Societal Challenges

5G IA
INFRASTRUCTURE ASSOCIATION

Activity 5G PPP Contractual Arrangement, KPIs

Trials

5G IMF
The Fifth Generation Mobile Communications Promotion Forum

5G Forum

5G americas

IMT-2020

Telebrasil
Associação Brasileira de Telecomunicações

and further international partners...

Activity Community building and Public Relations

SME support

Architecture

Use cases and performance evaluation models

OPNFV
Software Networks (SDN and NFV)

Security

Network Management, QoS

Source: 5G Infrastructure Association.

Towards a smooth and committed 5G roadmap…

- Avoid fragmentation:

- Respect all the standardization steps towards full 5G globally harmonized standard *(« Short-term solutions will not solve long-term issues… » Giuseppe Recchi, TIM):*
  - 3GPP roadmap (Rel. 15 & 16)
  - ITU-R IMT-2020 standard completion (2017 & 2019), and Spectrum bands identification & harmonization
- Avoid premature « 5G » launch announcements

- Be quick, business-oriented and cooperative:

- Implement pan-european & international 5G trials, including the verticals,
- Boost the standardization process, while respecting the steps
- Push collaborative international research as means for consensus building, even between competitors, to prepare future standards

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Vision…

- More than other regions in the world, Europe's vision for 5G is very ambitious, aiming at a deep transformation
- 5G will be a full connectivity platform, and not only an improved air interface, even aggregated with other technologies
- Let's implement Phase 2 projects, prepare phase 3, towards 5G deployment and 5G Evolution…

INFRASTRUCTURE ASSOCIATION

http://5g-ppp.eu

Thank you for your attention!