

5G PPP Projects focusing on standardisation Verticals and Standards Tracker Tool



**The voice of the European industry for the
development, deployment and evolution of 5G**

**Colin Willcock & Jean-Pierre Bienaimé, 5G-IA
5G Vertical Users Workshop 12-13 February 2019, Brussels**

Background and Rationale



5G IA
INFRASTRUCTURE ASSOCIATION

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5G commitment with verticals

**The true differentiator for 5G is the vertical markets.
If we fail with the verticals, we fail with 5G.**


PHASE 1: 5G Core Research

main achievements:

- 5G System design & Evaluation aspects
- 5G Air interface innovations
- Network management & Security innovations
- Virtualization & Service deployment innovations
- 100s of contributions to standardization

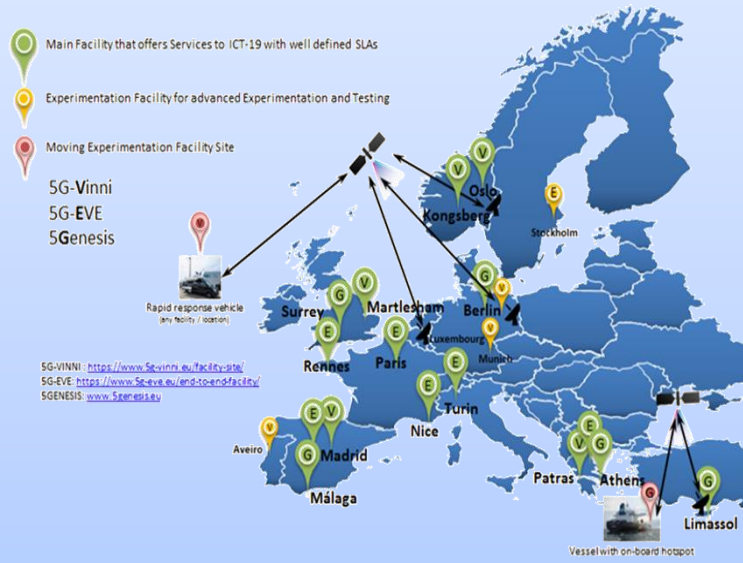
Mid 2015

PHASE 2: 5G application to Verticals



Mid 2017

PHASE 3: Large-Scale Trials and validation Platforms



Main Facility that offers Services to ICT-19 with well defined SLAs
 Experimentation Facility for advanced Experimentation and Testing
 Moving Experimentation Facility Site

5G-Vinni
 5G-EVE
 5Genesis

Rapid response vehicle (any facility / location)
 Vessel with on-board hotspot

5G-VINI: <https://www.5g-vinni.eu/facility.html>
 5G-EVE: <https://www.5g-eve.eu/end-to-end-facility/>
 5GENESIS: www.5genesis.eu

Mid 2018

2020+

5G-IA/5G PPP and Standardisation

For the 5G Infrastructure Association (5G IA) and the 5G PPP projects, standardisation has been a clear focus area with significant investment in fundamental research leading to standardisation submission.

Standardization activities are related to the direct and indirect 5G PPP projects inputs, and related 5G IA activities associated with spectrum and Market Representation Partner (MRP) of the 3GPP.

Europe interests in standards

- Capturing international standards -> markets
- Consumer protection
- R&D dissemination (?)
- Stimulating innovation
- What research should we fund so that we will have an impact on standards?...

The 5G-IA Pre-standardisation Work Group

Ultimately the goal of research and development initiatives such as the 5G PPP projects is to come up with technologies/concepts propositions that will shape standardization.

Chair: Olav Queseth, Ericsson

➔ Objectives

- Identify standardization and regulatory bodies to align with e.g. ETSI, 3GPP, IEEE and other relevant standards bodies, & ITU-R and WRC
- Develop a roadmap of relevant standardization and regulatory topics for 5G and evaluate existing roadmaps at international level;
- Propose own roadmap for 5G being aligned at international level.
- Influencing pre-standardization on 5G and related R&D and propose where topics should be standardized
- Influence timing on R&D work programs

Results and next steps



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Pre-Standardization Working Group: Analysis

- Standardization Tracker 2016-2017:
 - Started in 5G PPP Phase 1 (2016), 15 projects participating
 - 210 out of 317 input contributions to 3GPP (66%)
 - 120 RAN vs. 61 SA (SA-7; SA2-1; SA2-13; SA3-47)
- Standardization Tracker 2017-2019
 - Focus shifts to verticals with Phase 2
 - Increasing number of input contributions to TSG SA WGs, especially SA1. 77% contributions to 3GPP.
 - Useful insights into vertical clustering for the Verticals Cartography.
- Now on-boarding 3 new test platforms
- On-boarding of new phase 3 projects from June 2019

Input contributions confirm 3GPP as *THE* forum for standards and increasingly so for verticals within 5G PPP

5G PPP Phase 1 Projects main inputs

In terms of **Standardisation**, one of the largest impacts of EU projects is setting the scope of this standardisation effort; the triad of eMBB, mMTC and URLLC was originally promoted by the first phase of large 5G projects. As the standardisation process digs more into the details, the domains where **5G PPP Phase 1 projects had greater impact** are:

- Support of the Architecture for splitting of user plane and control plane.
- Support for slicing.
- Channel models used for evaluations.
- Scenarios and requirements.
- Subscriber Privacy protection, which has also received extensive press coverage including WIRED, FORBES and Sky News.

EU Vertical Showcase: A snapshot

- FS_5G_ATTRAC – Study on Asset Tracking Use Cases: SAT5G contributor
- FS_AVPROD – Feasibility Study on Audio-Visual Service Production: 5GX-cast
- FS_MPS2 – Feasibility Study on Multimedia Priority Service (MPS) Phase 2
- SAT5G: SA1 TR22.822 & RAN TR 38.811

From Toon Norp, Chairman SA1:

Common ground includes:

- High requirements on many open items for Rel-17, e.g. n° of devices; latency
- High frequency bands subject to blocking implying highly dynamic environment of things moving around. Seamless handover with high requirements.

- Phase 2 project:
“facilitating a European-led contribution to the international vision of 5G networks”



Online Verticals Cartography

In 2035, when 5G's full economic benefit should be realised across the globe, a broad range of industries – from transportation to entertainment and education, and everything in between – could produce up to 10.7 trillion euros worth of goods and services enabled by 5G mobile technology. Meanwhile, Europe's 5G Public Private Partnership (5G PPP) is developing new applications across a diverse set of verticals spanning proofs of concept, prototypes, demonstrations, trials, and pilots in order to validate the functionalities defined for 5G by the International Telecommunications Union (ITU) – Enhanced Mobile Broadband, Massive Machine Type Communications, and Ultra Reliable Low Latency Communications – so consumers and sector end users can really know what 5G is all about.

How to use the 5G PPP verticals cartography:

The experiments are taking place in Europe between 2018 and 2020. You can view the experiments by sector, country, and ITU functionality by clicking on the boxes on the right. New country locations and tests will be added in the future. Meanwhile, enjoy our 5G PPP showcase.

Download our latest fliers: [5G for Automotive: Experiments in Europe](#)



MATILDA: Industry 4.0 Smart Factory



5Gtango: Smart Manufacturing



Smart manufacturing is based upon the processing of operational data, machine data, and process data for building the future digital pervasive supply chains. Such data is used to control the intra-logistics supply chain as well as to optimise the production process and the machines involved (Factory and process automation).

- Agriculture and Farming
- Automotive
- Energy
- Health
- Industry
- Media & Entertainment
- Public Safety and Digital Divide Resorption
- Smart Cities
- Transport & Logistics

Countries

- Denmark
- Finland
- France
- Germany
- Greece
- Ireland
- Italy
- Netherlands
- Portugal
- Romania
- Slovenia
- Spain
- UK

Type of Experiment

- (1) Proof of Concept
- (2) Prototype
- (3) Demonstration
- (4) Trial
- (5) Pilot

Online tool tracking:

Use-case experiments in 5G PPP

➤ 63 experiments with more to come from phase 3

Data fields:

➤ 8 vertical clusters

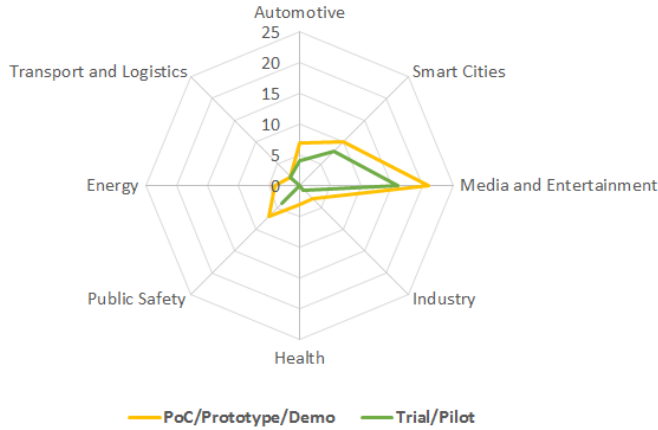
➤ Country

➤ Type of use-case experiment (maturity levels)

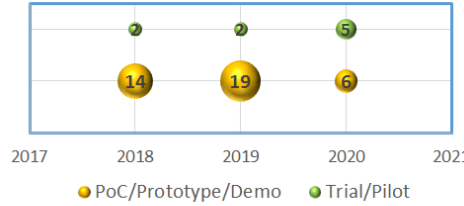
➤ ITU 5G Functionalities

Latest Analysis

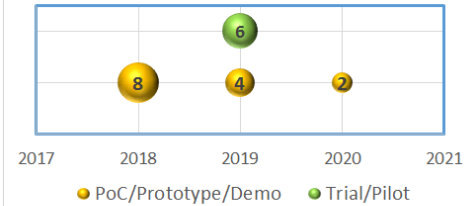
Number of Use Case Experiments for Different Vertical Clusters



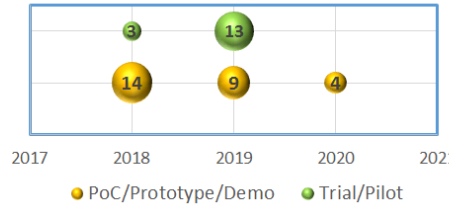
Number of Use Case Experiments: Enhanced Mobile Broadband (eMBB)



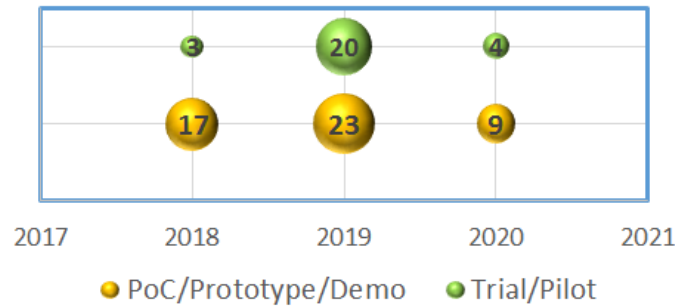
Number of Use Case Experiments: Massive Machine-Type Communications (mMTC)



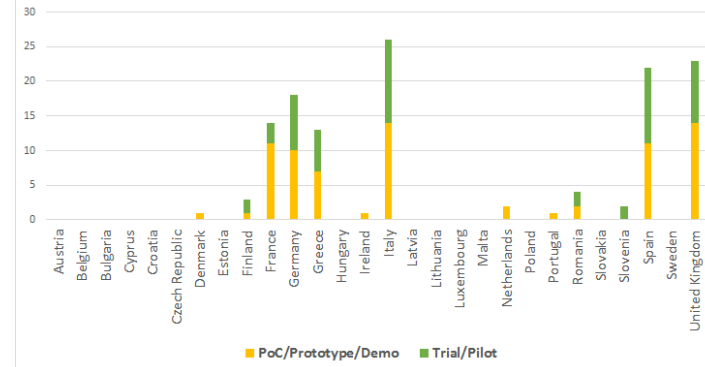
Number of Use Case Experiments: Ultra-Reliable and Low Latency Communications (URLLC)



Number of Use Case Experiments: All Vertical Clusters/Categories

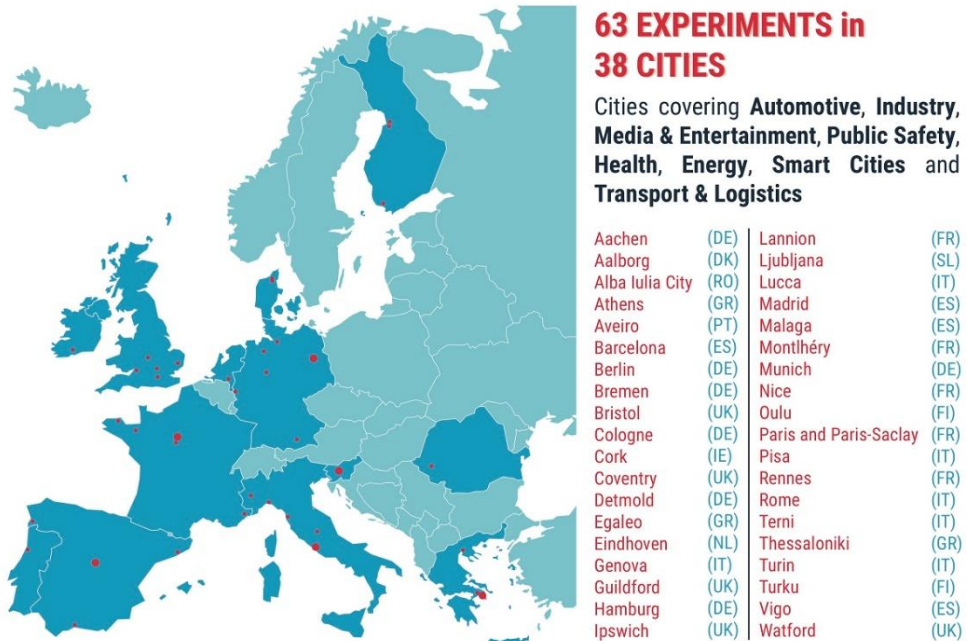


Number of Experiments per Country



Verticals Cartography: Cityscape Visualisations

5G PPP 5G Infrastructure Public Private Partnership



Future Developments

- Next release: cityscape interactive map

Performance KPI Tracker

- Monitoring 5G PPP KPI targets
- Analysis of breadth and intensity of KPI coverage
- Additional insights into technology and market readiness levels

The Cartography is a good fit with 3GPP support of verticals (current and expected)

New online Tracking Tool coming

Study on Asset Tracking Use Cases

Home » Standards Tracker » Study on Asset Tracking Use Cases

View Edit Track Devel

Study on Asset Tracking Use Cases

3GPP SA1: Study on Asset Tracking Use Cases

Acronym: FS_5G_ATRAC

Target release: Release 17

Completion rate: low (as of 04.02.2019). Opportunity for member and vertical industry contributions.

Objective of the study:

- Describe asset tracking use cases (for example pallets, containers, crates, parcels, luggage) with the emphasis on the use cases bringing new potential requirements and new KPIs to be supported by 5G communication services.
- Identify new potential requirements to be fulfilled.

Summary justification:

As every organisation owns assets (machines, medical devices, containers, pallets, trolleys ...) and since assets can be (extremely) valuable, asset tracking represents a huge market (billions of units) that so far is mostly untapped by 3GPP technology.

- Focus on:
- Opportunities for verticals (e.g. associations & projects)
- Opportunities for 5G PPP projects
- Online guides
- Online and published showcases

Complementary also to study on Emerging Business Models: having the right standards is a key factor for some verticals

Thank you for your attention!

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The logo for the 5G Infrastructure Association (5G IA) is displayed on a white, irregularly shaped background that resembles a speech bubble or a document page. The logo itself consists of the text "5G IA" in a bold, sans-serif font, with the "5G" in blue and the "IA" in black. Below this, the words "INFRASTRUCTURE ASSOCIATION" are written in a smaller, black, all-caps sans-serif font.

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