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## Euro-5g – Supporting the European 5G Initiative

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*Abstract*

This deliverable reports on the work involved with the creation and operation of the community working groups at the 5G-PPP level in cooperation with the 5G Infrastructure Association and the NetWorld2020 ETP. A flexible Work group approach has been taken to allow uptake of other ideas, as identified by 5G community and other 5G initiatives, and support new working groups as needed.

[End of abstract]

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**Acknowledgment**

This report is based in parts on the 5G-PPP Technical Board working documents and the terms of reference of the 5G-PPP working groups. All of this material is available in the 5G-PPP BSCW document repository.

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## Executive Summary

The purpose of this deliverable is to give an impression of the degree of activity in the 5G-PPP Work Groups that are supported by the Euro-5G project. Euro-5G supports all of these WGs by providing the email exploders and document repositories to enable their work. Audio conference facilities and WEBEX tools are also provided.

In addition Euro-5G takes actions to enable the publication and promotion for the results and these activities are visible under some of the other WPs of the project.

These involve such tasks as editorial work for whitepapers, preparation of flyers for announcing significant results, use of social media to promote the same results publishing these results on the web in a timely and efficient way.

Euro-5G is also active in helping organising such cross project events and workshops - particularly if they involve external (non 5G-PPP) participants. Here all services from organising the venue, through registrations and local liaison to assisting with the agenda preparation and the list of attendees. For some events Euro-5G support has also included providing the on-site support at the event.

These workgroups have the ambition to produce consolidate views and opinions from the 5G-PPP as a whole and Euro-5G will do everything possible to facilitate this.

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## Abbreviations

3GPP	Third Generation Partnership Project
BSCW	Basic Support for Cooperative Work
CELTIC-Plus	Cooperation for a European sustained Leadership in Telecommunications - Plus
CEPT	European Conference of Postal and Telecommunications Administrations
DGs	Directorate-Generals
DoW	Description of Work
EBU	European Broadcasting Union
EC	European Commission
ECC	Electronic Communications Committee
EMEA	Europe, Middle East and Africa
ESA	European Space Agency
ESOA	EMEA Satellite Operator's Agency
ETNO	European Telecommunications Network Operators' Association
ETP	European Technology Platform
ETSI	European Telecommunications Standards Institute
EU	European Union
EuCNC	European Conference on Networks and Communications
F2F	Face to Face
FCC	Federal Communications Commission
GSMA	GSM Association
ICT	Information and Communication Technologies
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
IMT2020	International Mobile Telecommunications 2020
ITS	Intelligent Transport Systems
ITU-R	International Telecommunication Union Radiocommunications Sector
ITU-T	International Telecommunication Union Telecom Sector
MWC	Mobile World Congress
NEM	New European Media Initiative
NFV	Network Function Virtualisation
NGMN	Next Generation Mobile Networks Alliance
NSF	National Science Foundation
PhC	Phone Conference
PIMRC	IEEE International Symposium on Personal, Indoor and Mobile Radio Communications
PPP	Public Private Partnership

R&D	Research and Development
RAN	Radio Access Network
SDN	Software Defined Networking
SME	Small and Medium-sized Enterprise
TBC	To Be Confirmed
VTC	Vehicular Technology Conference
WG	Working Group
WRC	World Radiocommunication Conference

# 1 Introduction

The purpose of this deliverable is to give an impression of the degree of activity in the 5G-PPP Work Groups that are supported by the Euro-5G project.

Within the 5G-PPP there are a number of cross-project work groups where the work of multiple projects can be converged into identifying the shared issues and developing supported program level position on technical and strategic items.

The currently active work groups have their origins in both 5G-Infrastructure Association activities and from decisions on needs by the 5G-PPP projects themselves.

<b>Working Group</b>	<b>Chairpersons</b>	<b>Origin</b>
Pre-Standardization WG	Hugo Tullberg, Ericsson	5G Infrastructure Association
Spectrum WG	Terje Tjelta, Telenor	5G Infrastructure Association
5G Architecture WG	Simone Redana, Nokia	5G-PPP Projects
SDN / NFV WG	Josep Martrat, ATOS / Carlos Jesus Bernardos, UCIH	5G-PPP Projects
Network Management / Quality of Service WG	Robert Mullins, TSSG	5G-PPP Projects
Vision/Societal Challenges WG	Jean-Sebastien Bedo, Orange	5G Infrastructure Association
Security WG	Jean-Philippe Wary, Orange / Pascal Bisson, Thales	5G-PPP Projects
SME WG	Jacques Magen, Interinnov	Networld2020

The 5G-PPP Steering Board and the 5G Infrastructure Association Board review the activities and the mandates of these groups at regular intervals and decide on their status. The 5G-PPP Technology Board reviews the progress within the groups and discusses any possible interactions as well as the commitment of the running projects to the WGs.

## 2 Working Group Activities

The 5G Infrastructure PPP uses specific Working Groups (WGs) to achieve consistency and harmony on the technical results being achieved within the projects. The Technical Board (TB), as the body responsible for technical consistency across the projects, monitors the ongoing activities of the cross project working groups and highlights where actions need to be taken. All projects participate in the TB and thereby are informed about the status of the WGs even if they do not participate in each one.

The WGs plans and achievements are discussed at TB level and TB members provide feedback and recommendations to the WGs to ensure the WGs plans are complementary and avoid duplications. Particular care is taken to ensure the work groups build on the project work and do not create extra work for the projects.

TB members are working on a 2016-17 technical / strategic plan and have cross-WGs synchronized perspectives at the project Technical Manager level.

TB may propose to SB the creation of WG when a technology discussion cannot be resolved solely by the TB participants. TB may also propose to SB the closure of a WG.

The main Association WGs contributed by projects members so far are (from TB perspectives):

- Vision & Societal Challenges WG.
- Pre-standardization WG.
- Spectrum WG.

The main Technical WGs contributed by projects members so far are (from TB perspectives):

- Architecture WG.
- SDN/NFV WG.
- Network Management & Quality of Service WG.
- Security WG.

There is a SME WG coming from the Networld2020 background.

- SME WG

In addition, one additional cross-Projects action is working but it is not (yet) organized as WG:

- METIS-II coordination work is not part of a dedicated WG, but progress is achieved through regular dedicated PhCs and specific PPP cross-projects Workshops along the lines of the DoW of METIS-II.



## 2.1 Pre-Standardization WG

### 2.1.1 WG organisation

- Chair: Hugo Tullberg (Ericsson).
- WG Reflector: [5g-pre-stand@5g-ppp.eu](mailto:5g-pre-stand@5g-ppp.eu).
- BSCW WG URL: <https://bscw.5g-ppp.eu/sec/bscw.cgi/38475>.

### 2.1.2 Objectives

Identify standardization and regulatory bodies to align with e.g. ETSI, 3GPP, IEEE and other relevant standards bodies, & ITU-R (incl. WPs) and WRC (including e.g. ECC PT1). Develop a roadmap of relevant standardization and regulatory topics for 5G: 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: Potentially propose where topics should be standardized; Influence timing on R&D work programs (e.g. EC WPs).

### 2.1.3 Activities

Regular PhCs since September 2015 (last PhC on 12.04.16) and first set of actions incl. contribution to PPP presentation in RAN Workshop organised on 17-18.09.15 in Phoenix, contribution to 5G Pre-std / Spectrum Global Workshop organised on 20.10.15 in Lisbon (collocated with ICT 2015) and contribution to PPP MWC 2016 White Paper (Section 5).

### 2.1.4 Detailed plans and results

- Work on Roadmap and Catalogue / inventory. All projects have identified a set of standardisation bodies in their dissemination/standardisation Work Package, which will be useful in the WG roadmap. In addition to the standardisation forums already identified by the projects, it is likely that additional forums must be added to address the verticals. An up-to-date roadmap has been developed for 5G PPP MWC 2016 whitepaper. It is used to start collecting the different inputs. Projects are expected to provide inputs on standardisation activities including planned technologies and targeted standardisation bodies to enrich this roadmap. Projects are also expected to update the Standardisation Tracking Document on actual standardisation contributions. There are 88 contributions to this tracking document on the 29<sup>th</sup> of July 2016.
- Coordination for PPP-referenced contributions to 3GPP RAN ad-hoc meeting organised on 28-29.01.16 in Barcelona (focused on RAN plenary study on Scenarios and Requirements for Next Generation Access Technologies).
- Preparation of the contribution to ETSI Workshop “From Research to Standardisation” organised on 10-11.05.16 in Sophia Antipolis.
- Proposal for a EuCNC 2016 Standardisation Workshop on 27.06.16 in Athens (1/2 Workshop – morning slots).

## 2.2 Spectrum WG

### 2.2.1 WG organisation

- Chair: Terje Tjelta (Telenor).
- WG Reflector: [5g-spectrum@5g-ppp.eu](mailto:5g-spectrum@5g-ppp.eu).
- BSCW WG URL: <https://bscw.5g-ppp.eu/sec/bscw.cgi/22098>.

### 2.2.2 Objectives

Promote research results in the spectrum area obtained by 5G PPP/H2020 projects as well as relevant FP7 projects, Setting up of a dialogue between 5G PPP projects concerning potential synergies and common interests across projects in spectrum related issues, Pursue the convergence of results on spectrum topics from the different projects to maximize the achievable outcome towards relevant technical bodies, Establish a knowledge base from European and other Global project results concerning advances in spectrum research, Liaise with spectrum groups or entities in regulatory bodies and industry associations, Work for improved understanding of collaborative spectrum research importance.

### 2.2.3 Activities

Regular PhCs between April 2015 and January 2016 and first set of actions incl. contribution to 5G Pre-std / Spectrum Global Workshop organised on 20.10.15 in Lisbon (collocated with ICT 2015) and contribution to PPP MWC 2015 and 2016 White Papers.

### 2.2.4 Detailed plans and results

- Collect information from 5G Infrastructure PPP projects as well as relevant FP7 projects and other global projects on spectrum relevant research results, e.g.:
  - Identify aspects related the 5G spectrum bandwidth requirements.
  - New methods for spectrum usage, system co-existence and interference management.
  - Experimental validation through trials and demonstrators (liaison with FIRE+).
  - Exploration of new frequencies and their usability for 5G.
- Review responses to relevant national or other consultations. Make available research results for relevant spectrum groups in regulatory bodies such as ECC/CEPT and ITU-R, national regulators, for instance in support of the preparatory work for WRC 2019.
- Liaise with industry associations (e.g. DigitalEurope, ETNO, ESOA, NGNM, GSMA, ESA, EBU) in order to provide new research results, for instance in support of the preparatory work for WRC 2019.
- Communicate its findings to the NetWorld2020 ETP. Support 5G Infrastructure Association activities on global cooperation for spectrum international harmonisation which is key for economies of scale.
- Liaise with the 5G PPP project steering and technical boards on spectrum topics.
- Contribute to the strategic research and innovation agenda on spectrum related research and innovation topics.
- Promote agreed spectrum research themes and research priorities to the EC, ESA and other entities in view of the future research programmes.
- Liaise with relevant R&D institutions such as EC DGs (Connect, Enterprise, Research), ESA and CELTIC-Plus.
- WG 5G Spectrum meeting organised on 25.04.16 in Brussels.

## 2.3 5G Architecture WG

### 2.3.1 WG organisation

- Chair: Simone Redana (Nokia). Vice-Chair: Alexandros Kaloxylos (Huawei).
- WG Reflector: [5g-architecture@5g-ppp.eu](mailto:5g-architecture@5g-ppp.eu).
- BSCW WG URL: <https://bscw.5g-ppp.eu/sec/bscw.cgi/25551>.

### 2.3.2 Objectives

The goal of this Working Group is to serve as a common platform to facilitate the discussion between 5GPPP projects developing architectural concepts and components and foster the discussions on the basis of the KPIs described in the 5GPPP contract. The group could also facilitate consensus building on the 5G architecture.

### 2.3.3 Activities

PhCs every 3-4 weeks with 2-3 presentations from projects. Interactions between most 5G Infrastructure PPP projects. Recent PhCs focused on the Architecture White Paper. Architecture WG meeting and Workshop organised on 04-06.04.16 in Brussels.

### 2.3.4 Detailed plans and results

- Addressing (among others): Architecture White Paper, Architecture cross-projects meeting, Architecture Workshop. Architecture work to possibly encompass the analysis of the main 5G architectural issues, performances, trade-offs and possible options with the aim to build consensus across projects.
- Results for 1H16:
  - 5G Infrastructure PPP projects meeting took place on 04-06.04.16 in Brussels: Internal workshop with participation only from WG on 04-05.04.16 and open workshop with participation also from non PPP stakeholders on 06.04.16.
  - 5G Infrastructure PPP projects meeting on 02-03.05.16 in London hosted by UCL.
  - Architecture White Paper delivered for the 5G Summit organised on 31.05-01.06.16 in Beijing.
  - White Paper launched (15 min slot) during 5G Summit on 31.05-01.06.16 in Beijing.
  - Public consultation to collect comments on the White Paper open for 2 weeks early June, target is to provide an update of the White Paper during EuCNC.
  - Architecture Workshop during EuCNC 2016 (“4th International Workshop on 5G Architecture”) organised on 27.06.16 in Athens (full day).
  - 5G Architecture Panel in EuCNC 2016 organised on 27-30.06.16 in Athens.
- Detailed plans for 2H16: incl. at least
  - 5G Architecture Panel in VTC Fall 2016.
  - Forecasted Architecture Panel in Globecom 2016 to be organised on 04-09.12.16 in Washington. Could include interaction with University New York, NSF and FCC.

## 2.4 SDN / NFV WG

### 2.4.1 WG organisation

- Chair: Josep Martrat (Atos). Co-Chair: Carlos Jesus Bernardos (UC3M).
- WG Reflector: 5G-soft-nets@5g-ppp.eu.
- BSCW WG URL: <https://bscw.5g-ppp.eu/sec/bscw.cgi/52699>.

### 2.4.2 Objectives

The purpose of this WG is to analyse and address unification and applicability of key research topics related to Software Networking including software defined concepts, infrastructures, systems and components for Wire and Wireless Networks, including Networked Clouds, IoT and Services, i.e. Software Defined Networks (SDN) and Network Function Virtualization (NFV) as developed and promoted by the 5G PPP projects.

### 2.4.3 Activities

First discussions - Regular PhCs. Each PhC included 2 projects presentations, incl. request to circulate an excerpt of 10-15 pages maximum of architecture deliverable / work in progress as input to the PhC.

### 2.4.4 Detailed plans and results

Agreement that the WG will look at the combination of SDN/NFV as a whole. Prioritisation of topics for discussion is on-going. Ideally this WG would be focusing on common set of northbound interfaces, what is exposed to the network application. Identify standardisation activities from the different projects in the area of software networks towards the goal of identifying both gaps and also potential common topics for collaboration among projects.

- Detailed plans/actions for 2016:
  - Continue working on the common understanding (guidelines for projects) and the terminology convergence among projects (specification and standardisation oriented, not particular terminology). A document from SELFNET project was circulated as a reference (January).
  - Further progress the perspectives on Open source and the impact of European industry (penetration of Open source in Mobile Industry - some players not sure about this). A survey launched from SONATA project as collaboration action.
  - Preparation of the accepted WG Workshop in EuCNC 2016 organised on 27.06.16 in Athens (FP7 and H2020 projects). Workshop to be focused on FP7 results (T-NOVA, UNIFY, NETIDE) and 5G Infrastructure PPP projects on architectural progress in SDN/NFV combination per topic (e.g. terminology, joint SDN/NFV aspects, standardisation gaps).
  - Working on a White Paper: ToC under discussion.

## 2.5 Network Management/QoS WG

### 2.5.1 WG organisation

- Chair: Robert Mullins (TSSG).
- WG Reflector: [netmgmt\\_wg@5g-ppp.eu](mailto:netmgmt_wg@5g-ppp.eu)
- BSCW WG URL: TBC.

### 2.5.2 Objectives

Network Management and Quality of Service are closely correlated themes:

Network Management aims to maintain the operations of the network in a manner that ensures that the required services are properly delivered to the users, that an expected quality of service is enforced for delivering such services to the end user and that security is maintained. To do so, network management is mainly focused on the control plane of the network to make sure all the services and operations running in the data plane are working properly.

Quality of Service covers areas such as networking, packet scheduling, traffic adaption and any other technique implemented in both data and control plane to make sure an expected quality of service is implemented for the delivery of services to the end user (bandwidth, low latency, mobility and availability)

### 2.5.3 Activities

WG addressing Network Management. Targeting White Papers and possible Demonstrator to validate projects results in a combined way.

### 2.5.4 Detailed plans and results

- Produce a White Paper (draft under development) that can be presented at the Global 5G Event organised in November in Rome and also be distributed to some standards bodies such as ITU-T and IMT2020 (other bodies to be also considered, e.g. IETF, ETSI).
- A workshop has been organized at EuCNC 2016 in Athens. 9 papers were prepared for the workshop.
  - NFV Reliability with Machine Learning – (CogNet)
  - Using Machine Learning to Detect Noisy Neighbours in 5G Networks – (CogNet)
  - A New Radio Access Stratum Security Architecture Supporting Dynamic 5G Radio Access Networks – (5G Norma)
  - The SELFNET approach to Self Protection through Autonomic Network Management – (SelfNet)
  - An Energy Efficient Architecture for 5G Network Management – (CogNet)
  - Towards Micro Segmentation in 5G Network Security – VTT (5G Ensure)
  - A Monitoring Framework for Heterogeneous NFV/SDN Cloud Environments – (SONATA)
  - Cooperative Caching in C-RAN using Bayesian Classification and Greedy Placement - (CogNet)
- The WG has dropped the security aspect of its initial ToR as the Security WG has been created, however certain areas such as Network Slicing stay within the ToR as still relevant to Network Management.
- Too early in 2016 (shared among the projects) to expect to be in a position to realize a combined projects demonstration but there may be other potential for such possibilities at a later stage.

## 2.6 Vision and Societal Challenges WG

### 2.6.1 WG organisation

- Chair: Jean-Sebastien Bedo (Orange).
- WG Reflector: [wg-vision@5g-ppp.eu](mailto:wg-vision@5g-ppp.eu).
- BSCW WG URL: <https://bscw.5g-ppp.eu/sec/bscw.cgi/30307>.

### 2.6.2 Objectives

To develop a consensus in Europe on 5G systems / infrastructures / services, Identify vertical application domains which would benefit from 5G (views of other sectors on 5G requirements) and associated challenges, Identify the societal, economic, environmental, business and technological benefits obtainable from the realization of 5G main concepts, Collect publicly available visions and major technical trends from industry, research community and available information from other regions, Identify commonalities, bottlenecks and differences in visions and technical trends, Prepare input documents for Pre-Standardization and Spectrum Working Groups and International Cooperation Activity, Develop H2020 call proposals for 5G PPP in partnership with the EC

### 2.6.3 Activities

Regular PhCs (on average every 2 weeks) and continuous set of actions since 2H14, incl. (among others) Association inputs to EC WP2016-17, MWC 2015 Association brochure, Vertical Workshops and Vertical White Papers, MWC 2016 Association 5G / Vertical White Paper, Association inputs to EC WP2018-2021.

### 2.6.4 Detailed plans and results

- Organisation of a workshop to explore the impacts of 5G for vertical industries in November 2015 where we had more than 100 registered participants
- Delivery of 5 whitepapers on 5G and vertical industries: automotive, factories of the future, energy, health and media & entertainment
- Preparation of the MWC 2016 whitepaper “5G empowering verticals”
- PPP Phase 2 Pre-structuring model
- Association Vision WG – NetWorld2020 Experts Group Workshop on PPP Phase 3 preparation, organised on 16.03.16 in Bologna.
- Association Vision WG – NetWorld2020 Experts Group Phase 3 questionnaire ( closed on 4 April 2016).
- Inputs to EC Phase 3 Scoping Paper delivered end of April 2016.
- PPP Phase 2 Brokerage Platform (<https://5g-ppp.eu/brokerage-platform-new/>).
- Next Verticals Workshops on (1) Media / Content organised on 19.05.16 in Brussels and (2) Automotive during EU ITS Congress organised on 06-09.06.16 in Glasgow (<http://glasgow2016.itsineurope.com/>).

Vision WG Targets	Q1	Q2	Q3	Q4
Inputs for 5G PPP Work Programme	Pre structuring model V2 (March)	Phase 3 scoping paper (inc. Experimentation strategy)		
Vertical sectors involvement	White Paper on Media & Entertainment (February)	Workshop on Media and Entertainment (with NEM)	Workshop on Automotive at ITS Congress	To be discussed
Vision dissemination	MWC White Paper (February)	Talks @EuCNC & 5G Global Event (China)	Talks @5G Global Event (Europe)	

Table 1: Vision WG Targets

## 2.7 Security WG

### 2.7.1 WG organisation

- Chairs: Jean-Philippe Wary (Orange) and Pascal Bisson (Thales).
- WG Reflector: [wg-security@5g-ppp.eu](mailto:wg-security@5g-ppp.eu).
- BSCW WG URL: <https://bscw.5g-ppp.eu/sec/bscw.cgi/71790>.

### 2.7.2 Objectives

The purpose of the group is to bring together the projects within the 5G-PPP that have common interest in the development and progression of topics related to security. The group will ensure, to as great extent as possible, that the projects are working in a complimentary manner towards consistent goals, exchanging ideas, minimizing the duplication of effort, contributing towards relevant standards and where possible cooperating on the development of compatible components, demonstrators, the exchange of data and results and the interworking of communication layers, where applicable.

### 2.7.3 Activities

First discussions and PhCs: Cross-project virtual meeting on 12.02.2016. Security WG Kick-off meeting held on 05.04.16. Next PhC to be organised. F2F meeting end of June fair chance to have it concomitant to EuCNC.

### 2.7.4 Detailed plans and results

- A first target output from the Working group should be a white paper providing an overview of the 5G Security coverage (landscape) in 5G-PPP Phase 1 with highlights on topics of shared interest and cooperation foreseen among the projects. Another primary target would be to contribute to other WGs (e.g. Vision WG, Architecture WG) White Papers for what concerns security aspects in scope while further shaping and driving the 5G Security vision (and its implementation) through dedicated join events (e.g. workshop, consultation...).
- As for further targets, they will reflect on achievements from various cooperation activities that would have occurred while in the meantime preparing the next steps (i.e. next research to come). Overall they may range from additional White Papers on specific topics covered through projects joint efforts, combined demonstrator presented at major events going through joint validation and/or roadmapping activities.
- Each of the various outputs of this WG would also take account of latest developments of 5G Infrastructure PPP Pre-structuring and possibly even contribute to it for what concerns Security topic specifically in scope.
- 5G-ENSURE is currently preparing an open consultation on 5G Security which has been shared with other projects of 5G-Security WG for feedback.
- Since kick-off work is now ongoing to structure and organise the work at 5G-Security WG starting first with sharing deliverables and other documents (e.g. consultation) as well as working together on some events (e.g. workshops).

## 2.8 SME WG

### 2.8.1 WG organisation

This Working group has its background in the NetWorld2020 ETP community and takes a keen interest in ensuring SME involvement in the 5G PPP projects and activities.

- Chair: Jacques Magen, Interinnov
- WG Reflector: [sme-wg@networld2020.eu](mailto:sme-wg@networld2020.eu)
- BSCW WG URL: This WG has an ftp space

### 2.8.2 Objectives

The main objectives of the SME Working Group are:

Help and support SMEs participation in the 5G PPP and more generally in EU R&D projects, including (but not limited to) reaching the target of at least 20% of the 5G PPP funding going to SMEs.

Improve visibility of SMEs in the 5G PPP and in general in EU R&D programmes, and ease/promote participation in NetWorld2020. Activate channels that may enable, facilitate and promote SME contribution into the NetWorld2020 SRIA and research topics, and SME involvement through other strategic documents related to NetWorld2020 and to the 5G PPP.

Ensure that the interests of SMEs, a key player in the EU economy, are adequately taken into account, more particularly in NetWorld2020 and in the 5G PPP.

Act as representative/interlocutor of SMEs in the telecom domain, more particularly in NetWorld2020 and in the 5G PPP.

Help SMEs access European funds, in the 5G PPP and beyond. The WG could e.g. “pre-digest” material and help SMEs find their way into 5G-PPP related funding and beyond.

Analyze the participation of SMEs in projects, potentially prepare questionnaire and transmit the conclusions and results to European Commission, for the 5G PPP in particular.

### 2.8.3 Activities

Within most event and information days the SME WG chairman has presented the opportunities and mechanisms for the players in the ICT SME community to get involved in 5G PPP proposals and projects.

### 2.8.4 Detailed plans

Further initiatives will be taken to stimulate SME involvement and to capture the interests and needs of those already involved. The information from those already involved will be used to improve the benefits for those considering participating.

### 2.8.5 Euro-5G specific action for SME

The Brokerage tool implemented for phase 2 of the 5G PPP is designed to allow SMEs in particular to post their competences and be found by proposal leaders looking to adopt such skills for their proposals - or to improve their SME level participation.

Additional information is available at:

- <https://5g-ppp.eu/brokerage-platform-new/> and
- <http://www.networld2020.eu/find-the-sme-you-need/>.



## 2.9 METIS-II Cross-Projects Work

### 2.9.1 WG organisation

- Leaders: Patrick Marsch (Nokia) and Olav Queseth (Ericsson).
- WG Reflector: there is no reflector
- BSCW WG URL: <https://bscw.5g-ppp.eu/sec/bscw.cgi/94050>

### 2.9.2 Objectives

As defined in the METIS II DoW.

### 2.9.3 Activities

METIS-II coordination work is not part of a dedicated WG, but progress is achieved through regular dedicated PhCs and specific PPP cross-projects Workshops along the lines of the DoW of METIS-II. Next PhC to be organised on TBC

### 2.9.4 Detailed plans

- Cross-project workshops
  - First cross-project Workshop organised on 28-29.09.15 in Kista, focusing on use cases, requirements and models, spectrum, RAN design and visualisation considerations.
  - Second cross-project Workshop jointly organised by METIS-II, FANTASTIC 5G and mmMAGIC on 21-22.01.16 in Valencia, focusing on 5G air interface design, air interface integration and RAN architecture.
  - Detailed plans for 2016: According to the METIS-II DoW, architecture Workshops in June 2016 and January 2017 (these will likely be organised in conjunction with the Architecture WG), and Workshops focused on air interface and RAN design in October 2016 (this will likely be organised among multiple projects in a similar way as the second cross-project workshop). It has now further been discussed to have another cross-project Workshop on waveform and air interface selection and harmonisation alongside EuCNC 2016 organised on 27-30.06.16 in Athens.
- Regular PhCs related to use case and model harmonisation:
  - From the first cross-project Workshop in September 2015, a regular phone discussion among projects on use cases and models and their consolidation and harmonisation across projects has been spun off.
  - Detailed plans for 2016 (as of 15.04.16): It has been agreed to establish a joint cross-project document on use cases and models, also linking to the Association work on the PPP Vertical White Paper for MWC 2016, e.g. Section 3 on Technical Requirements. This document could possibly be utilised for joint project impact towards ITU-R and 3GPP. Document on use cases and requirements early April 2016.
- Workshops at IEEE conferences organised by multiple 5G PPP projects:
  - There was a 5G RAN Design Workshop at ICC 2016 on 27.05.16 in Kuala Lumpur, jointly organised by METIS-II, FANTASTIC-5G, mmMAGIC and 5G NORMA.
  - Detailed plans for 2016 (as of 15.04.16): Workshop proposals for Globecom 2016 to be organised on 04-09.12.16 in Washington, including METIS-II, FANTASTIC-5G, mmMAGIC and 5G-CROSSHAUL.
  - Possible workshop in PIMRC 2016 organised on 04-07.09.16 in Valencia, involving further projects.

### 3 Conclusions

Euro-5G supports all of the WGs by providing the email exploders and document repositories to enable their work. Audio conference facilities and WEBEX tools are also provided.

In addition the Euro-5G takes actions to enable the publication and promotion for the results and these activities are visible under some of the other WPs of the project.

These involve such tasks as editorial work for whitepapers, preparation of flyers for announcing significant results, use of social media to promote the same results publishing these results on the web in a timely and efficient way.

Euro-5G is also active in helping organising such cross project events and workshops - particularly if they involve external (non 5G-PPP) participants. Here all services from organising the venue, through registrations and local liaison to assisting with the agenda preparation and the list of attendees. For some events Euro-5G support has also included providing the on-site support at the event.

The Metis II cross project activities are supported by Metis II.

The output of the Working Groups is available on the 5G-PPP website: <https://5g-ppp.eu/white-papers/>

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#### WHITE PAPERS

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 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**

White papers from the 5G Infrastructure Association:

- **5G-PPP White Paper on eHealth Vertical Sector – October 2015**
- **5G-PPP White Paper on Factories-of-the-Future Vertical Sector – October 2015**
- **5G-PPP White Paper on Energy Vertical Sector – October 2015**
- **5G-PPP White Paper on Automotive Vertical Sector – October 2015**
- **Specialized Services, Network Management and 5G – May 2015**
- **5G-PPP White Paper on Media & Entertainment Vertical Sector – January 2016**

White papers from the Networld ETP:

- **Networld2020 Whitepapers**

Here we can see the impact of this form of support. For example the original version of the [5G PPP View on 5G Architecture \(White Paper\)](#) was downloaded 5151 times since it was put online. Equally impressive is the fact that the updated version of the [5G PPP View on 5G Architecture \(White Paper - Updated July 2016\)](#) was downloaded 1155 times in the first 2 weeks since it was put online.

This indicates that the Euro-5G support is key in assisting preparation, publication and dissemination of the results of the 5G-PPP work.

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