Euro-5g – Supporting the European 5G Initiative

D2.7: Final report on 5G programme governance and operation, including event support and recommendations for Phase 2

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Abstract

This deliverable is the final report on 5G-PPP programme governance and operation, including event support and recommendations for Phase 2. It complements the intermediate report submitted as D2.3 at M12 (June 2016) with the activities done since July 2016.

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Executive Summary

This deliverable is the final report on 5G-PPP programme governance and operation, including event support and recommendations for Phase 2. This final report complements the intermediate report submitted as D2.3 at M12 (June 2016). It does not repeat what was reported in D2.3, but complements it with a focus on activities done since July 2016.

Because of the general nature of the "support" topic, this Deliverable summarises also activities that were undertaken in support of other activities done within the Euro-5G project. For example, events required physical logistics support, web support and agenda support, but also promotion and maybe community building activities. These numerous tasks done by Euro-5G on such an individual activity worked very efficiently together. Resulting from that, however, the same activity or event may appear in several Euro-5G Deliverables, e.g. in support, communications and even liaison due to the many different roles we performed. This might therefore sometimes appear as "double reporting" of activities which it is not, as the reports just address the individual facets of a joint activity.

The main parts of this report are:

Section 1: shows how the Programme level Collaboration Agreement was successfully implemented with a focus on 5G-PPP Phase 2 projects.

Section 2: shows how the Steering Board, as the forum for inter project strategic agreements and action plans, successfully worked in the second year of the 5G-PPP.

Section 3: shows how the Technical Board, as the forum for inter project co-ordination on technical issues has successfully worked in the second year of the 5G-PPP.

The inter project Working Groups, although part of the governance structure, are reported in a separate Deliverable – D5.7.

Section 4: reports on the Euro-5G support to the diverse set of events and activities, independently and in collaboration with the Commission, to promote and position the 5G-PPP on a European and global level.

Section 5: is an update on the figures and data originally presented in D3.1 and D2.3 on how the communications infrastructure supports all PPP activities.

Section 6 finally gives a few recommendations to be considered for Phase 2 of the 5G-PPP.

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1   5G-PPP Collaboration Agreement

1.1   The 5G Infrastructure PPP Collaboration Agreement

The implementation of the 5G-PPP is primarily through a set of projects selected and funded by the EU Commission in several phases under the Horizon 2020 research program. The projects are expected to closely collaborate and produce common positions and, eventually, harmonized solutions for the introduction of 5G in Europe by 2020.

To this end, the 5G Infrastructure PPP Collaboration Agreement was developed to facilitate the close interworking of the selected projects, and additional external projects, by ensuring the commitments to respect each other's intellectual property are recorded and binding.

The purpose of this Collaboration Agreement is to enable Parties to comply with the intention of Clause 41.4 of the model Grant Agreement, whether or not it is included in the Grant Agreement for their individual 5G Action under the 5G-PPP programme to implement the 5G Initiative. Since Phase 2 of the 5G PPP, Clause 41.4 has been included in the Grant Agreement of 5G Actions.

The first phase of the 5G-PPP programme was started on the 1st July 2015 when 17 projects were launched – two more projects selected in the first phase also started in November 2015 bringing the total number of active projects in Phase 1 of the 5G-PPP to 19.

These 19 projects had 167 unique beneficiaries who were invited to sign the Collaboration Agreement to facilitate the close interworking between the projects while protecting the rights of the individual participants. Eventually 166 participants had signed the agreement. The sole exception was an individual, participating as natural person legal entity, who could not accept the liability limitations.

For the 5G-PPP Phase 2 projects, Article 41.4 was included in the call text and is part of the grant agreement obliging the Phase 2 participants to be parties to such a Collaboration Agreement.

The principles of the agreement and the adoption rate for Phase 1 were reported in the Euro-5G D2.1: 5G-PPP Collaboration Agreement and its implementation.

It is expected that partners in projects in later phases of the 5G-PPP will also be party to the same agreement to facilitate continuity in the program.

1.2   Phase 2 projects in the 5G Infrastructure Collaboration Agreement

The Euro-5G project contacted the new Phase 2 projects in May 2017 and invited the participants in Phase 2 to accede to the same agreement as used in Phase 1 to meet their contractual requirement for such an agreement. Adopting the Phase 1 agreement would facilitate interaction between the projects of the different phases and grant access to Phase 1 results and had the added benefit that those participants who were already party to the agreement from Phase 1 did not need to sign again.

On the 1st June 2017 the Phase 2 launch meeting brought the new projects together for the first time and their potential interactions through common interests and the Working Groups were discussed.

Euro-5G explained the Collaboration Agreement rational to the new projects and reminded them of their contractual requirement through Article 41.4 to be party to such an agreement.

Phase 2 involved 21 new projects with 226 Participants. Of these, 85 were already parties to the Collaboration Agreement and this created a momentum to continue with the same agreement. There were 141 new parties to be signed up to the Collaboration Agreement for Phase 2. This is significant as it shows that the majority of participants in Phase 2 were not involved in Phase 1. This is reflected in the technical content of the projects where there is a significant increase in the organisations from the vertical sectors and applications domains participating in the projects.

By the end of May 2017, prior to the kick off meeting, projects had already started getting their participants to sign the agreement so that by the 1st of June more than 50% of the participants were parties to the Collaboration Agreement. The rate of participants acceding to the agreement is marginally better than in Phase 1 (see diagram) with over 90% of participants signing up within 4
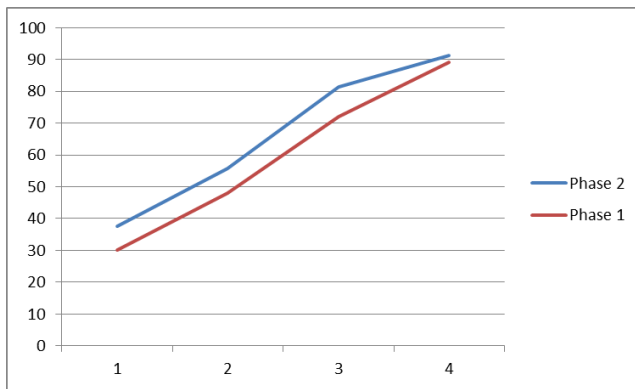
months of the agreement being presented to the projects.

2   Supporting the 5G-PPP Steering Board

The Euro-5G project provides the secretarial functions for the 5G-Initiative Steering Board (SB) of active projects which involves organising the meetings, determining the Agenda with the Chairman and producing the notes of the meetings and the record of the decisions taken. In addition the SB is supported by an email list to distribute all communications to all members, a BSCW document repository where such minutes and relevant documents are stored and audio- / web conference facilities to host conferences as required.

In the period since 1 July 2016, 7 Meetings of the SB have been held, 3 were physical meetings and 4 were by audioconference. The projects have planned another physical SB meeting for 20 September 2017 in Brussels.

2.1   Meeting 1: 09/09/16, Brussels

A main objective of this meeting was to coordinate preparation for the Year 1 project reviews to which Phase 1 projects have been invited later that month. This addressed mainly 3 items:

- Contribution of individual projects to 5G-PPP Working Group achievements:
  - o For the upcoming project reviews, a few lines description of the activities and contribution from each project to the 5G-PPP WGs would be appreciated by EC.

- Progress towards 5G-PPP KPIs:
  - o A summary on the projects' progress per KPI, according to the input provided by each project prior to this meeting was discussed. A discussion is also going on in the Technology Board (TB) to identify the projects' contributions and how they fit together.

- Main achievements of the projects:
  - o All projects briefly present their main project achievements. The main achievements are also described in a 5G Annual Journal that has been prepared with input from projects (and others) and is now available on the 5G-PPP web.

Further items on the agenda were the preparations for the Global 5G Event and Mobile World Congress (MWC) 2017, and the planning of future project- and WG workshops.

2.2   Meeting 2: 04/10/16, Telco

The main agenda items of this SB telco were the exchange of feedback from the project reviews that have taken place in the previous month, and the preparations for the Global 5G Event and MWC 2017.

Regarding the Global 5G Event, input material for the two speaking slots of the Association was discussed. Potential input was considered from the Network Management Whitepaper, the projects' Golden Nuggets and Security WG results. Also the exhibition where most projects were present was discussed.

The projects also discussed their potential contribution regarding the MWC 2017 whitepaper which will be built around the 9 capabilities identified.

Finally the projects also agreed to postpone the election of the SB Chairperson until November as no candidate had been identified so far.

2.3   Meeting 3: 29/11/16, London

At this meeting, which was hosted by Samsung, the main agenda items were review of the Global 5G Event, preparation of the MWC 2017 whitepaper, and a review of plans for future whitepapers.

The strong presence of projects in the exhibition of the Global 5G Event gave a strong message that 5G is high on the agenda in Europe. Some interest for collaboration with 5G-PPP projects has been

expressed by other regions (e.g. China), and projects were asked to discuss whether they would be interested. It was agreed that it might be better to wait until Phase 2 projects have started.

Regarding whitepapers review and planning, besides the MWC 2017 whitepaper there are plans or already progress by many WGs to prepare one, including Network management & QoS WG, Security WG, SDN/NFV WG and the METIS II coordinated joint activity on use cases and deployment scenarios.

As there has been only one candidate for the SB Chair position (Jean-Pierre Bienaimé, 5G-IA) and no candidate for the SB Vice-chair, no election was necessary and the projects agreed to confirm just with a show of hands the election of Jean-Pierre.

Figure 2: Jean-Pierre Bienaimé is the new SB Chairman

2.4   Meeting 4: 10/01/17, Telco

This telco focused on the review of the whitepapers currently under production and the planning of events.

The review of whitepapers showed that there is good progress, and e.g. the MWC 2017 White Paper was nearly ready.

The upcoming major events include the Cross-project workshop in Athens, the Workshop on 5G architecture and integration in London, the Global 5G Event in Tokyo, and EuCNC in Oulu. The first two events are organised by some of the 5G projects, while for the Tokyo event it was not clear whether there would be any opportunity to participate. EuCNC in turn was considered a major event and Euro-5G was already checking whether there could be special 5G-PPP sessions, in addition to the regular project paper or workshop contributions.

2.5   Meeting 5: 23/03/17, Telco

This telco was used to get an overview of the 5G-PPP Phase 2 Projects status, event review and planning and the progress of whitepapers.

From the Cross-project workshop it was reported that it showed good progress regarding measurement and progress on the KPIs - getting close to achieving 5G-PPP goals. Also MWC 2017 was very successful. However, for the Global 5G Event Tokyo there was no opportunity for project demos and presentations. It was agreed that for the next event we should suggest more technical sessions where the projects can present.

Projects were requested to provide input to the 5G European Annual Journal which' production is coordinated by Euro-5G.

A consolidated version of the SDN/NFV whitepaper was ready for public consultation and the other projects were asked to review and provide feedback. Euro-5G will technically support the process.

2.6   Meeting 6: 15/06/17, Oulu

The Oulu SB meeting had the new Phase 2 projects participating for the first time and thus it was a large meeting with about 35 participants. The agenda focused on getting the new projects introduced into the procedures, legal aspects (e.g. the Collaboration Agreement) and getting them involved in the various groups and activities.

As first of the Phase 1 projects would soon start phasing out, some aspects related to this were discussed, e.g. adding a summary of the final results on the 5G-PPP web.

Phase 2 projects were encouraged to consider joining working groups and while all WG leaders were asked to email to Phase 2 projects, Euro-5G agreed to monitor and support the process. All WG leaders present gave again a short status report of the activities. Euro-5G had already setup BSCW

accounts for the new projects to enable access to the document repository.

A discussion about the next Global 5G Event being organised in Europe took place, which according to the current schedule is expected for 2019, in particular regarding its timing so that Phase 2 projects can use it for demonstrating their results. The Phase 2 projects were asked to inform their projects and to plan for showing demos at this event.

2.7   Meeting 7: 03/07/17, Telco

This short web conference was used to review the progress and status of activities.
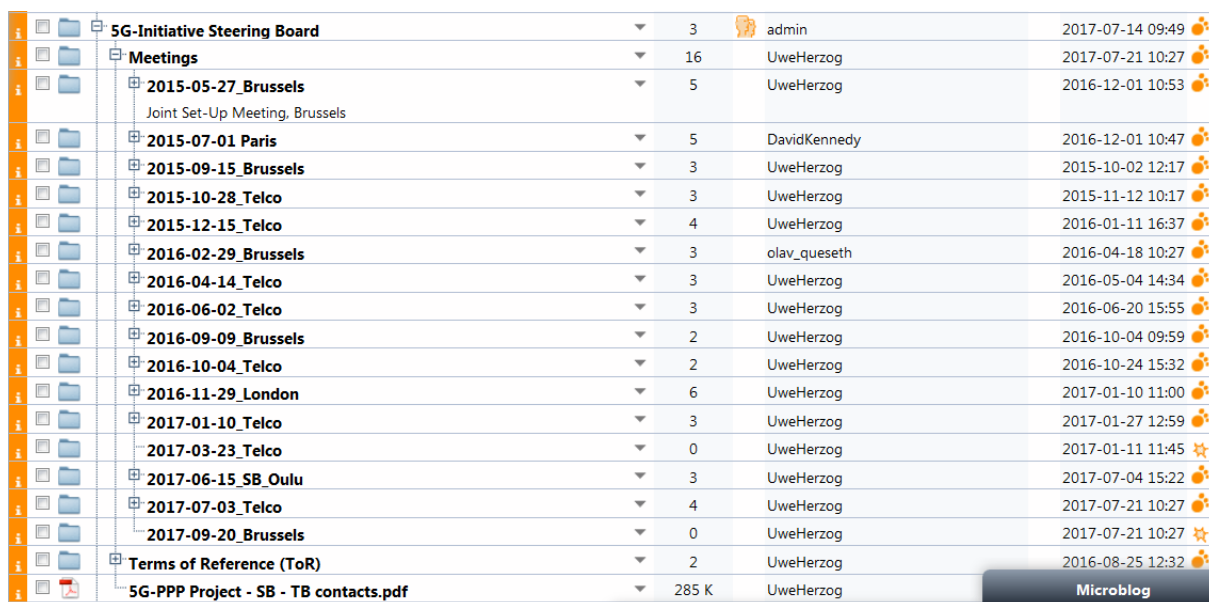
A new task came up regarding an ITU-R 5G-IA Evaluation Group where contribution from projects was solicited. This will be an independent evaluation of the radio interface starting from mid-2018, under the ITU umbrella. It is a significant effort and can only be accomplished with strong commitment from several projects. The new CSA - To-Euro-5G - is prepared to support this work. All Phase 2 projects were asked to consider whether they could contribute to this activity.

Regarding the 5G-Security Working Group, as 5G ENSURE who was leading this WG so far will not continue in Phase 2, it will need to be discussed who could lead this WG in future. Now major news was received from the other WGs.

Finally, some coordination on future events was done in particular regarding the Berlin 5G Week in November, where several projects are involved e.g. by organising a workshop or presentations.

2.8   SB documentation repository

All agendas and minutes of the 5G Initiative SB meetings are stored in the 5G-PPP BSCW document repository where they can be accessed by all beneficiaries of the 5G-PPP programme. Reference documents and slides used in the meetings, when available, are also there. In the interest of practicality, the minutes of each meeting are not attached to this deliverable but they are available on request.

	☐	📁	5G-Initiative Steering Board	▼	3	👤 admin	2017-07-14 09:49
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	☐	📁	2015-05-27_Brussels	▼	5	UweHerzog	2016-12-01 10:53
			Joint Set-Up Meeting, Brussels				
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	☐	📁	2015-09-15_Brussels	▼	3	UweHerzog	2015-10-02 12:17
	☐	📁	2015-10-28_Telco	▼	3	UweHerzog	2015-11-12 10:17
	☐	📁	2015-12-15_Telco	▼	4	UweHerzog	2016-01-11 16:37
	☐	📁	2016-02-29_Brussels	▼	3	olav_queseth	2016-04-18 10:27
	☐	📁	2016-04-14_Telco	▼	3	UweHerzog	2016-05-04 14:34
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Figure 3: Steering Board documentation repository

3   Supporting the 5G-PPP Technology Board

Figure 4: Didier
Bourse is the
Chairman of the TB

The Euro-5G project provides support to the actions of the Technology Board (TB) chairman and provides the secretarial functions for the TB which involves, organising the audioconferences and meetings, determining the agenda with the chairman and producing the draft notes of the audioconferences and meetings and the record of the decisions and actions taken. In addition, the TB is supported by an email list to distribute all communications to all members, and a BSCW document repository where minutes and relevant documents are stored.

In the period July 2016 – June 2017, 13 Meetings of the TB have been held, of which one was a physical meeting and 12 were by audioconference.

3.1   Meeting 1: 24/08/16 Telco

The audioconference focused on PPP Performance KPIs and addressed the KPIs projects interactions with Cross-projects / METIS-II WG, the KPIs methodology and metrics (incl. METIS-II inputs, GreenTouch Green Meter, projects inputs) and the KPIs Euro-5G document. There were further discussions, following the TB KPI audioconference organized on 20.06.16, on some of the KPIs questions at TB level (not exhaustive list): What does the KPI mean for the project perspective? What are the metrics seen from the project perspective? How does the project assess its contribution / improvement on the KPI? How can the TB assess the overall programme contribution to the KPIs (complementary or/and consistent or/and orthogonal solutions)? It was highlighted that KPIs work was limited for the time being mainly at project level, due to the limited available efforts. The possibility was reminded to create a dedicated WG on Capacity or/and Energy Efficiency and that the KPIs work could be clearly boosted thanks to the organization of one dedicated (2 days) workshop. The orientation was taken to further develop the work on Capacity and Energy Efficiency KPIs in the context of the Cross-projects / METIS-II WG and the Security KPI in the Security WG.

3.2   Meeting 2: 30/08/16 Telco

The audioconference addressed the TB actions review, the TB perspectives and expectations on WGs 2016 plans, the TB 2016 priorities, plans and forthcoming TB interactions and meetings, the TB Projects / Deliverables cartography, the PPP technical KPIs and projects contributions, the Projects 1st year main achievements, the TB 1st year "Golden Nuggets" (GNs), the 5G-PPP Annual Journal, the EC projects review and the Global 5G Event in Rome. Discussion about the TB GNs draft document released on 30.08.16. The TB projects GNs document was targeted to be analysed by TB members before the EC annual projects review. The TB WG plans document includes the PPP Working Groups plans and achievements (5G Industry Association WGs and Initiative WGs) and the TB feedbacks on these plans. The WGs plans are addressed at TB level and TB members provide feedbacks and recommendations towards the WGs to ensure the WGs plans are complementary and avoid duplications.

3.3   Meeting 3: 10/10/16 Telco

The audioconference addressed the TB actions Review, the EC Y1 projects annual review, the TB 1st year GNs, the TB perspectives and expectations on WGs 2016 plans, the TB 19.10.16 meeting objectives and agenda, the TB 2H16-2017 priorities and plans, the 5G-PPP Annual Journal, the Global 5G Event in Rome and the TB Chair & Vice-Chair election. Concerning the EC Y1 annual review, the good projects achievements and alignment were highlighted. It was stressed that more programmatic elements would be visible in the second year, including e.g. common demonstrations and joint achievements. The related discussion on possible actions was planned during the TB 19.10.16 meeting in Brussels. The TB WGs plans document was assessed as powerful and useful beyond the TB and the orientation was taken between TB and SB Chairs to possibly circulate the WGs up-dates to 5G-IA

Board members, to 5G Initiative SB and TB Chairs and to EURO-5G Coordinator. It was decided to have the WGs inputs collected by the 5G-IA Head of Office (HoO). There was further progress on the TB document summarizing the project deliverables and related cross-projects interest. This document is collecting the PPP Phase 1 projects interests related to the overall set of deliverables. The detailed agenda of the TB 19.10.16 meeting was further defined to ensure very efficient on-site discussions. The deadline for TB Chair candidates was set to 11.10.16.

3.4   Meeting 4: 19/10/16 Brussels

The meeting agenda included an introduction by TB Chair and EC Officer, the meeting objectives and agenda approval, the TB actions review, the TB 1st year experience and key lessons learnt at project and programme levels, the Global 5G Event, the external guests (Paul Foley (Tech4i[2]) and Tim Forde (Trinity College, Dublin) addressing the key take away point from the study "A Framework for Monitoring the Impact of 5G Public Private Partnership and the Associated Key Performance Indicators (KPIs) - SMART 2015/0013", the TB 2H16-2017 priorities and plans, the TB actions up-dates and the meeting conclusions and next audioconferences / meetings. The importance of TB actions at PPP programme level and the "meta-PMT" responsibility, to collectively ensure a very successful PPP programme, were stressed at the start of the meeting. TB work is clearly based on joint commitments and development of joint momentum on specific targeted / prioritized actions. Some projects made use of the TB projects GNs document, in order to enhance their state-of-the-art review and be prepared for possible questions on the programme relations during the EC Y1 annual review. Discussion and decision to structure the PPP programmatic achievement through the PPP programme GNs, building on the projects GNs. The target was to define (maximum) 10-20 PPP programme GNs, integrating (arborescence) the key projects achievements. Orientation to develop the projects Champions / WGs Excel file, summarizing the key projects experts contributing to the different WGs. Orientation to develop the TB projects joint demos Excel file, summarizing the projects demonstrations targets in forthcoming events / meetings. The objective is to define possible joint projects demonstrations (co-located or/and integrated). Open discussion on the forthcoming June-December 2017 period with 14 (4+10) ending Phase 1 projects and 20-25 Phase 2 starting projects. Potential difficulty to run / progress SB and TB actions (e.g. White Papers) with potentially 35 projects participating. Shall be clearly anticipated and TB actions shall be organized pragmatically.

3.5   Meeting 5: 21/11/16 Telco

The audioconference addressed the TB actions review, the SB and TB up-dates, the Global 5G Event key take away points, the TB 1st year GNs, the TB WGs 2H16-2017 plans, the TB 2H16-2017 priorities and plans and the TB KPIs progress. There was a joint (co-located) FANTASTIC 5G - 5G-NORMA booth organized in the in Global 5G Event, and most of the Phase 1 projects had their individual booth at this event. It was decided to further collect at TB level the potential targets for future joint demos (e.g. EuCNC 2017, Flex5Gware Final Event…). Further progress on the definition of the PPP GNs. Synchronization on SB and TB operation: The 5G-IA Board proposed again the same candidate to chair the TB. This chair will continue to chair the TB as there was no further candidate.

3.6   Meeting 6: 05/12/16 Telco

The audioconference focused on the PPP GNs and addressed the TB GNs context, the TB GNs projects inputs and the TB GNs clustering and convergence. 54 projects inputs had been received and the TB intention was to cluster and converge on 10 (minimum) – 20 (maximum) PPP programme GNs. TB Chair committed to provide a figure presenting the PPP programme GNs for the 5G Infrastructure Association MWC 2017 White Paper. As soon as the PPP programme GN Boxes would be converged / agreed, there would be immediate progress on the detailed definition of each GN, including the different projects inputs. The full action includes 3 steps with PPP website implementation and hyperlinks to projects websites / documents.

3.7   Meeting 7: 13/12/16 Telco

The audioconference focused on the PPP programme GNs and addressed the TB Phase 1 GNs updates, the TB Phase 1 GNs clustering and definition (20 maximum – 10 minimum) and the TB Phase 1 GNs actions and next steps. Further brainstorming was done to progress the definition of the programme GNs and the arborescence with projects GNs.

3.8   Meeting 8: 12/01/17 Telco

The audioconference addressed the TB actions review, the TB Phase 1 GNs, the PPP MWC 2017 White Paper, the PPP books, the Cognitive Network Management White Paper, the TB WGs plans 2017 and the 3rd Global 5G Event. Convergence and agreement concerning the 15 programme GNs. Synchronization on the PPP MWC 2017 White Paper and the latest issues to be possibly fixed. Progress on Performance KPIs expected to be boosted through the Cross-Projects / METIS-II Workshop on 06-07.02.17 in Athens. The stopping of EC Concertation and Clusters meetings was announced. Target to have other non-PPP projects (from EC DG CNECT E1 Unit) participating to PPP Workshops as appropriate.

3.9   Meeting 9: 02/02/17 Telco

The audioconference addressed the TB actions review, the TB Phase 1 GN Boxes, the TB WGs plans 2017 (incl. Trials WG), the projects joint demonstrations, the Cross-projects and Architecture Workshops, the Association MWC 2017 White Paper, the Cognitive Network Management and Security White Papers, the PPP books, the 3rd Global 5G Event and EuCNC 2017. The PPP Phase 1 GNs figure has been included in the PPP MWC 2017 White Paper. Further TB work on the definition of the projects GNs inside the 15 programme GNs. Synchronization on the WGs 2017 plans. It was noted that the line-up of WGs may change following the transition from Phase 1 to Phase 2 (potential closing / setting-up of WGs). Flex5GWare final event will include collocated demos with at least 5 other projects. Discussion on potential EuCNC 2017 booth on the basis of the GNs, potentially very interesting approach connected to the PPP programmatic perspective. Phase 1 projects expected to provide numerous good contributions to EuCNC 2017 to ensure very successful and visible PPP projects and programme achievements and contribute to the EuCNC 2017 success.

3.10   Meeting 10: 22/02/17 Telco

The audioconference addressed the TB actions review, the TB PPP phase 1 GNs, the TB EuCNC 2017 paper, the Cross-Projects and Architecture Workshops and the joint demos. Feedback was exchanged on the successful Cross-projects Workshop. There was further progress on the GNs definition. The Cross-projects / METIS-II WG will further develop the document on PPP use-cases and performance evaluation. There was a status update on the "5G Architecture and RAN Integration" Workshop and further discussion on the TB paper to be submitted to EuCNC 2017.

3.11   Meeting 11: 20/03/17 Telco

The audioconference addressed the TB actions review, the PPP Phase 1 and Phase 2 TB 2017 operation, the projects joint demos, the 3rd Global 5G Event and EuCNC 2017. The Annual Report 2017 will be structured around the projects and should include additional sections on GNs, KPIs etc. TB members need to be included in the definition and review process. There was a discussion on the possibility to develop a strong PPP White Paper on 5G Air Interface (AI) / Radio Access Technology (RAT). There was further synchronization on the 3rd Global 5G Event preparation and forthcoming contributions (incl. SB/TB inputs to be possibly prepared).

3.12   Meeting 12: 26/04/17 Telco

The audioconference addressed the TB actions review, the PPP Phase 2 up-dates, the projects joint demos, the 3rd Global 5G Event, the EuCNC 2017, the TB WG 2017 plans and the PPP Annual Report. 24 PPP Phase 2 projects were selected (13 RIA in ICT7 + 6 IA in ICT8 + 2 RIA EU-TW in ICT8 + 3 CSAs in ICT7). The PPP Phase 2 Portfolio analysis will be organized including actions from Euro-5G and To-Euro-5G CSAs. Synchronization on WGs 2017 plans. Synchronization on the 3rd Global 5G Event organization and forthcoming participation to sessions in connection to Vision, Spectrum, Trials and Pre-Standardization WGs. TB further triggering the Pre-Standardization WG for the up-date of the PPP standardization roadmap summary figure. There was also synchronization on the progress of the WGs White Papers.

3.13   Meeting 13: 15/05/17 Telco

The audioconference addressed the TB actions review, the PPP Phase 2 up-dates, the 3rd Global 5G Event, the EuCNC 2017 and the TB Phase 1 GNs. PPP Phase 2 Workshop to be organized on 01.06.17 in EC Brussels. A Special Session for PPP Phase 2 Projects will be organized during EuCNC 2017. Further progress was made on the definition of the TB figure depicting the PPP Phase 1 Deliverables words cloud. An additional figure will be developed depicting the PPP Phase 1 projects key words.

3.14   TB documentation repository

All agendas and minutes of the 5G-PPP TB meetings are stored in the TB directory of the 5G-PPP BSCW document repository where they can be accessed by all beneficiaries of the 5G-PPP. Reference documents and slides used in the meetings, when available, are also there. In the interest of practicality, the minutes of each meeting are not attached to this deliverable but are available on request to EC and Euro-5G project reviewers.
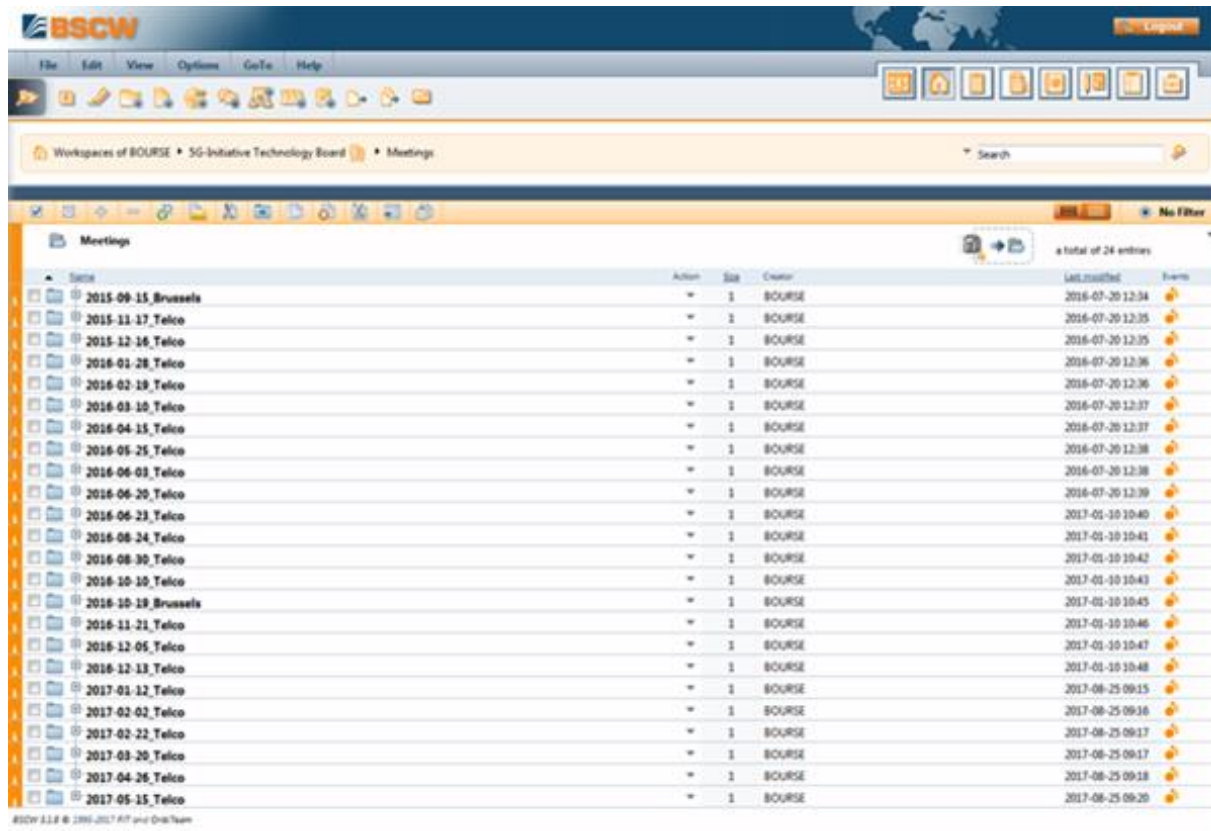
Figure 5: Technology Board documentation repository

4   5G-PPP Events

Euro-5G, as the 5G-PPP support action, was key in directly organising a number of events and in assisting the organisation of many others. The events listed in this section are a reflection of the ones that had the most direct involvement of the Euro-5G resources.

4.1   Global Level Events

4.1.1   5G-PPP @ Mobile World Congress 2017

The 5G Infrastructure Association Press, Media & Analyst Event "**5G Action Plan: from Research to Trials**" that was held on the 28 February at the Mobile World Congress 2017 in Barcelona was organised by Euro-5G on behalf of the Association and the European Commission.

Euro-5G successfully organised all the logistics, promotion and communication activities of the event.

This included:

- Logistics (e.g. venue, equipment) for the conference room
- Collaboration with Text100, a Spanish communication agency (mainly for promotion and media contacts)
- Branding of the room (e.g. 5G PPP roll-up, ad hoc slides set for each panel and each speaker)
- Invitations and contacts with speakers
- Provide free entrance tickets to MWC 2017 to 5G-IA's representatives and speakers
- Handling of registration of participants
- Liaise with the other regional partner organisations
- Contacts with journalists (e.g. deal with requests for interviews)
- Production of a video that was used as 'opening' of the event[2]
- Photos of the event
- Printing and distribution of the White Paper – "5G innovations for new business opportunities" and of a flyer with the Executive Summary of the White Paper
- Promotion activities (e.g. online presence in selected websites, articles, social media, mail blasts, stakeholders' engagement). Please refer also to Euro-5G *D1.3 "Final report on community building and support"*
- Preparation and distribution of press releases (before and after the event)
- On-site assistance (e.g. welcome speakers and attendees)

Furthermore, Euro-5G supported two 5G PPP Phase 1 projects, SESAME and 5G ENSURE, that had a booth at MWC2017 to present a demo.

A detailed description of the event, participants and impact is available in Euro-5G Deliverable *D1.4 "Final report on dedicated high-level stakeholders workshops and events"*.

Detailed information on the promotional material that Euro-5G produced and distributed at MWC 2017 is available in Euro-5G Deliverable *D3.4 "Final report on communication and public relation activities"*.

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[2] https://www.youtube.com/watch?v=pvmyWD3KLyw

4.1.2   2nd Global 5G Event, Rome, 9-10 November 2016

The organisation of the second global 5G event in Rome was a huge effort from Euro-5G.

The organisation started in early June 2016. All Euro-5G partners were actively involved in organizing the event, with a coordinated and synergic effort led by Martel. The consortium defined and developed the whole event, in close coordination with the 5G-IA and close collaboration with EC, as well as with the international partners that were invited to attend and give presentations.

The organization kicked off with the definition of the event's agenda and the speakers' invitations from Europe, China, Korea, Japan, Brazil and USA. At the same time, the entrance fee was defined and the online registration portal opened to the general public. The logistics organization included: the choice of the location, which needed to host both the conference (up to 500 participants) and the exhibition area (700 m²). For this reason, the Marriott Hotel in Rome (Italy) has been selected, due to its proximity to Fiumicino airport, its vast premises and experience in accommodating large events. We also took care of the rooming list and booking for the speakers and VIP guests, who, for their convenience, were accommodated at the same event's hotel. Moreover, all the participants enjoyed a promotional rate for early hotel bookings thanks to the negotiation we handled with several hotels in the area.

We also took care of the layout and set-up of the exhibition area, which showcased 25 exhibitors including: 5 major corporates (Huawei, Qualcomm, ZTE, Nokia, Datang), 18 5G-PPP projects, the 5G-IA and the 5G Mobile Forum. We supported each exhibitor's needs of customization and services.

Last but not least, we designed the whole event's brand identity, communicating widely the event online and offline (social media, press release, online promotion etc.) to maximise the attendance. All the materials, from the invitations, badges, merchandising and agendas, up to the space dressing carried a consistent look and feel. The event also benefited from the support of a professional AV company which took care of the direction of the audio-visual presentations and breaks during the event. A professional photo and video recording enabled us to widely report the event offline and online on real time through social media channels. Furthermore, a relevant effort has been dedicated to involve local partners (TIM) and local authorities (Italian Telecommunication Ministry) as sponsors and/or speakers at the event.

Below overview list shows the very wide range of activities that Euro-5G took care of related to the organisation of the Global 5G Event in Rome:

- Organisation of logistics (e.g. venue, equipment) for the conference room, the exhibition area, the social event and the VIP dinner in Rome downtown
- Logo and branded online and offline material (e.g. banners, printed programme) of the event
- Reservation of hotel rooms for speakers
- Travel cost assistance for designated guest participants (previously authorised by the EC)
- Arrangements with two hotels (e.g. block rooms for participants, shuttle service)
- Handling of registration of participants
- Invitations and contacts with speakers and moderators
- Preparation of Visa letters
- Liaise with the other regional partner organisations
- Contacts with Telecom Italia (sponsor of the Event)
- Contacts with Press and Media (before, during and after the event)
- Photos of the event, including 5G PPP Twitter animation before, during and after the event
- Preparation, printing and distribution of publications distributed at the event (e.g. The European 5G Annual Journal)
- Production of gadgets and promotional material

- Promotion activities (e.g. online presence in selected websites, articles, social media, mail blasts, stakeholders' engagement). Please refer also to "D1.3: Final report on community building and support"

- Preparation and distribution of press releases (before and after the event)

- Ensure compliance with Italian legislation on security

- On-site assistance

- VIP dinner with Speakers, Moderators and Representatives from the regional partner organisations

Euro-5G effectively complemented the work of the Multilateral Technical Programme Committee, which comprises representatives from each signatory association.

A detailed description of the event, participants and media echo is available in Euro-5G Deliverables *D1.4 "Final report on dedicated high-level stakeholders workshops and events"* and *D4.3 "Final Liaison Report"*.

Detailed information on the promotional material that Euro-5G produced for the 5G event in Rome is available in Euro-5G Deliverable *D3.4 "Final report on communication and public relation activities"*.

4.1.3   3rd Global 5G Event, Tokyo, 24-26 May 2017

The third Global 5G Event took place on 24 – 26 May 2017 in Tokyo, Japan, hosted by the Fifth Generation Mobile Communications Promotion Forum (5GMF). The purpose was to cooperate on building global consensus on 5G among the world's 5G promotion organizations. The theme of the event was "Creating the Crossover Collaboration for 5G Eco-Society". About 270 participants from all corners of the globe discussed that status and progress on 5G through a series of focused sessions.

Euro-5G supported the organisation from the European end.

Euro-5G's work on this event focused on:

- Contribution to the TPC

- Support to 5G-IA / 5G PPP's participation and overall visibility

- Distribution of two press releases, available on the 5G PPP website[3,4]

- Promotion activities (e.g. social media, mail blasts, stakeholders' engagement). Please refer to "D1.3: Final report on community building and support"

The actual organization of the event was mandated to a Technical Programme Committee (TPC), which was formed by the following representatives of the Multi-lateral MoU Signatories:

o Giovanni E. CORAZZA (5G-IA - Europe, supported by Euro-5G)

o Hyun Woo LEE (5G Forum - Korea)

o Zhendong LUO (IMT-2020 PG - China)

o Takehiro NAKAMURA (5GMF - Japan)

o Chris PEARSON (5G Americas - USA)

The TPC worked to define the programme structure as well as the individual speakers representing the

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[3] https://5g-ppp.eu/creating-the-crossover-collaboration-for-5g-eco-society-24-25-may-2017-tokyo-japan/

[4]   https://5g-ppp.eu/telebrasil-projeto-5g-brasil-joins-leading-5g-visionary-organizations-in-china-europe-japan-south-korea-and-the-americas-for-global-5g-event

various stakeholders and regions. The TPC held a side-meeting at the Tokyo event to start the organization of future editions of the Global 5G Event. The TPC work can be considered to be a successful example of International Cooperation supported by Euro-5G, with Europe playing traditionally a significant role in moderation and consensus building amongst partners.

In terms participation and visibility, several persons attended from Euro-5G and actively participated in the event: Colin Willcock, Chairman of the Board of 5G-IA (presenter in Session 4 and participant in the Wrap Up panel), Jean-Pierre Bienaimé, Secretary General of 5G-IA (presenter in Opening Session 2), Didier Bourse from Nokia presenting on behalf of the 5G-IA Trials WG (presenter in Session 3) and Giovanni Corazza from University of Bologna who is the 5G-IA representative in the organising committee.

Unfortunately there was no opportunity for booths neither for the presentation of whitepapers.

A detailed description of the event, participants and media echo is available in Euro-5G Deliverables *D1.4 "Final report on dedicated high-level stakeholders workshops and events"* and *D4.3 "Final Liaison Report"*.

4.2 Information Days for 5G-PPP Phase 2

The Purpose of these information day workshops was to inform and stimulate participation in proposals for future 5G-PPP calls. The reports from Information days 1 to 4 were included in Deliverable 2.3: *Intermediate report on 5G programme governance and operation, including event support*.

4.2.1 5th 5G-PPP Phase 2 Information day, Bratislava, September, 2016

The 5th 5G-PPP information day was a short session as part of the ICT proposers day event in Bratislava on the 26 September 2016 from 16:30 - 18:30. It was an information Session on 5G-PPP covering mainly two of the 5G-PPP topics:

- 5G-PPP Research and validation of critical technologies and systems

This topic aims at research and innovation in the field of the fifth-generation (5G) of mobile telecommunications technologies by leveraging on the results of Phase 1 of the 5G-PPP (Public Private Partnership) initiative. The goal is to validate research results in proof of concepts and demonstrators having use cases from sectors such as eHealth, automotive, video/TV broadcast, and energy. The topic covers wireless access and radio network architecture and technologies; high-capacity elastic optical networks; and software networks. The projects will be implemented as a programme and be expected to contribute with horizontal results to the programme integration process.

- 5G-PPP Convergent Technologies

Innovating in new optical access network solutions based on integrated optical device prototypes; and developing flexible virtual network functions useful for operators, service providers, and third parties. These projects will be implemented as a programme and be expected to contribute with horizontal results to the programme integration process. Another objective is to research and innovate in access convergence using experimentation facilities from Taiwanese partners.

Agenda:

The agenda was designed to give most of the time to people proposing ideas for projects:

- Introduction to the call by the Commission   Commission   20 minutes
- Overview presentation on 5G-PPP   5G-IA   20 minutes
- Networking presentations by interested parties   80 minutes

The video of the session is available here: https://webcast.ec.europa.eu/ict-proposers-day-2016-5g-

ppp-networking-research-beyond-5g

Euro-5G assisted in the organisation and promotion of this session which achieved an attendance of about 60 people.

4.2.2   Impact of 5G-PPP Phase 2 Information days, 2016

The primary impact of the information days was that over 100 proposals were received for the 5G call topics (ICT 7&8) from which 24 projects were funded. Within these projects the SME participation has been proportionally increased towards target ratio of the programme which reflects on the specific attention given to SME participation in the information days by Euro-5G representatives.

4.3   Other events

4.3.1   5G-PPP Phase 3 preparatory workshop, Bedford Hotel Brussels, 30 Sep. 2016

This workshop was held to elaborate a more detailed input on what is expected from the private side of the PPP for Phase 3. In particular it sought to prioritise topics in the Strategic Research and Innovation Agenda elaborated by the NetWorld2020 Expert Group and the 5G-PPP Vision WG for each call taking into account the TRL of the different technologies and concepts as well as the impact for the industry and the European society.

This workshop was also the start of the discussion on the roadmap and high level description of demos, trials and pilots which will be needed during the period 2018-2021 taking into account the needs of the vertical industries which will be served by 5G. This discussion on trial later continued in the Trials Working Group.

The event was prepared and supported by Euro-5G.

4.3.2   NGMN Industry Conference and Exhibition 2016, Frankfurt, 12-13 October 2016

Euro-5G placed a 5G-PPP booth at this event and provided personnel for the two days of the event. The stand was frequently visited and many discussions were held about forthcoming 5G-PPP calls for projects.

4.3.3   BERLIN 5G Week, 31 October - 4 November 2016, Fraunhofer FORUM Berlin

Euro-5G was instrumental in ensuring the 5G-PPP projects were invited to prepare papers, sessions and demos for this event.

4.3.4   5G Architecture WG Workshop hosted by Samsung, UK, 30-31 March 2017

This workshop was jointly organised by the Euro-5G project and Samsung on behalf of the co-organising 5G-PPP projects were: mmMAGIC, METIS-II, 5G-Crosshaul and 5G NORMA.

Registration was organised by Euro-5G and the agenda was prepared by the participating projects. The event ran over two days and the full set of presentations were made available to the 5G-PPP participants in the program level repository: https://bscw.5g-mmmagic.eu/pub/bscw.cgi/191166

4.3.5   Phase 2 kickoff workshop Brussels, BU25 0/S1, 1 June 2017

EC has invited the Phase 2 projects to a joint set-up / Kick-off meeting on 1 June in Brussels.

While EC was providing the room, Euro-5G has prepared the agenda and has been in contact with the projects in order to ensure their participation, to handle the registration, collect the presentation files and answer any question.

Euro-5G has also taken care of several *session moderator roles* throughout the day, and Euro-5G representatives have given a number of *presentations*:

- Colin Willcock opened the meeting and presented the role and structure of the 5G-IA.

- Jean-Pierre Bienaimé presented the overall structure of 5G-PPP and the expected outcome.

- Jean-Pierre Bienaimé presented an overview of the 5G-PPP governance model

- Presentation of the legal aspects of the Collaboration Agreement by Anne De Moor

- Uwe Herzog presented an overview of Phase 2 projects' interest in WGs and their planned contribution to programme level KPIs. He also gave an overview of the collaborative tools in 5G-PPP

- Didier Bourse gave an overview of Technology Board activities and plans

Projects were giving a 5 minute presentation with particular emphasis on technical results and expected interaction with the other projects.

Agenda

10:00 **Opening** and Welcome: presentation of the 5G-PPP principles. Why collaboration matters; Legal aspects of the Grant Agreement

10:30 **Presentation by the 5G Industry Association**: Goals, Governance, Industry commitment, Phase I project map and short introduction/motivation of the Collaboration Agreement

11:00 **Presentation by 5G-PPP Phase II projects**, focus interest in inter-project collaborations from the project view point, common technical issues, interworking opportunities

13:00 **Break**

14:00 **Detailed Collaboration Agreement Working structures and legal aspects**

14:30 **Overview presentations of 5G-PPP Working Groups** by WG Chairpersons

15:30 **Contribution to 5G-PPP KPIs, 5G-PPP Collaborative tools**

16:00 **Moderated discussion, Q/A.**

16:30 **Conclusion and next steps**

Euro-5G has taken minutes of the workshops which were distributed to all participants.

After the event, Euro-5G has made available all presented slides on a dedicated directory on the 5G-PPP BSCW server to facilitate further interaction between the projects.

4.3.6   Workshop "Spectrum for 5G", Brussels (BU25), 7 June 2017

This workshop presented and discussed recent research results covering the need for 5G spectrum and the suitability of the frequency bands under consideration (sub-GHz to millimetre) for 5G to provide ambitious services and adequate coverage, especially leveraging the 5G-PPP projects advancements. Special attention was given to the vertical industry requirements.

Figure 6: Spectrum for 5G Workshop logo

The workshop was attended by over 80 experts. It was structured in the following sessions:

- Welcome by EC and 5G-IA
- Session 1: Spectrum for 5G applications
- Session 2: Millimetre wave technology
- Session 3: Management of 5G spectrum
- Session 4: Timely access to spectrum
- Wrap-Up by 5G-IA

Euro-5G was the main organiser of the workshop which was closely linked with the activities of the 5G Spectrum Working Group for which Euro-5G provides the WG Chairman.

4.3.7   Networld2020 Steering Board meetings

Euro-5G supported the activities of Networld2020 and the logistics of organising Networld2020 Steering Board meetings on

- 8 September 2016 in Brussels
- 6 December 2016 in Brussels.

These meetings organised the activities towards the development of contributions to the Horizon 2020 work program and the Strategic Research and Innovation Agenda. In addition changes to the statutes and Governance Model were made in order to remove the direct link between NetWorld2020 and the 5G-IA.

The White Paper on "How Service Level Indicators and traffic management can increase the value of the Future Internet" was finalised and published on the NetWorld2020 web.

A new SRIA "Pervasive Virtual Mobile Communications" has been completed and published in September 2016.

The SB in its meetings had also detailed discussions regarding further contributions to the Horizon 2020 Work Program 2018 – 20 based on the scoping paper.

4.3.8   EuCNC 2017

Euro-5G organised two special sessions at EuCNC 2017 in Oulu on 14 and 15 June 2017. In these sessions the 5G-PPP Phase 2 projects (most of which had only started on 1st June 2017) had the opportunity to present themselves and their ambitions.

Figure 7: Audience at EuCNC special session 1

Agenda:

Welcome & Opening Statement: Bernard Barani, Acting Head of Unit DG Connect

Highlight Achievements from Phase 1:   Jean-Pierre Bienaime, 5G-IA

Project Presentations @ 6 mins each:

5G ESSENCE	Embedded Network Services for 5G Experiences *Ioannis Chochliouros, OTE Research*	
5GCAR	Fifth Generation Communication Automotive Research and innovation *Mikael Fallgren, Ericsson*	
5GCITY	5G CITY *Sergi Figuerola, i2cat*	
5G-CORAL	A 5G Convergent Virtualised Radio Access Network Living at the Edge *Antonio de la Olivia, uc3m*	
5G-MEDIA	Programmable edge-to-cloud virtualization fabric for the 5G Media industry *Pasquale Andriani, Engineering Ingegneria Informatica spa*	
5G-MoNArch	5G Mobile Network Architecture for diverse services, use cases, and applications in 5G and beyond *Diomidis Michalopoulos, Bell Labs Research, NOKIA*	
5G-PHOS	5G integrated Fiber-Wireless networks exploiting existing photonic technologies for high-density SDN-programmable network architectures *George Kalfas, Aristotle University of Thessaloniki*	
5G-PICTURE	5G Programmable Infrastructure Converging disaggregated neTwork and compUte Resources *Eckhard Grass, ihp-microelectronics*	
5GTANGO	5G Development and validation platform for global industry-specific network services and Apps *Josep Martrat, ATOS*	
5G-TRANSFORMER	5G Mobile Transport Platform for Verticals *Arturo Azcorra, UC3M*	
5G-Xcast	Broadcast and Multicast Communication Enablers for the Fifth-Generation of Wireless Systems *David Gomez-Barquero, Uni. Poli. de Valencia, iTEAM Research Institute*	
To-Euro-5G	To-Euro-5G: Supporting the European 5G Initiative *Uwe Herzog, Eurescom*	
BlueSpace	Building on the Use of Spatial Multiplexing 5G Networks Infrastructures and Showcasing Advanced technologies and Networking Capabilities *Idelfonso Tafur Monroy, fotonik.dtu.dk*	
Clear5G	Converged wireless access for reliable 5G MTC for factories of the future *Klaus Moessner, University of Surrey*	
global5g.org	Global vision, standardisation stakeholder engagement in 5G *Silvana Muscella, Trust-itservices.com*	
IoRL	Internet of Radio Light *John Cosmas, Brunel University*	
MATILDA	A holistic innovative framework for the design, development and operation of 5G-ready Applications and Network Services over sliced programmable Infrastructure. *Franco Davoli, CNIT*	
METRO-HAUL	METRO High bandwidth, 5G Application-aware optical network, with edge storage, compUte and low Latency *Andrew Lord, BT*	
NGPaaS	Next Generation Platform as a Service *Bessem Sayadi, Nokia Bell Labs*	
NRG-5	Enabling Smart Energy as a Service via 5G Mobile Network advances *Fiorentino Giampaolo, Engineering Ingegneria Informatica spa*	

ONE5G   E2E-aware Optimizations and advancements for the Network Edge of 5G
                 New Radio
                 Frank Schaich, Nokia Bell Labs

SaT5G   Satellite and Terrestrial Network for 5G
                 Georgia Poziopoulou, Avanti plc

SLICENET   End-to-End Cognitive Network Slicing and Slice Management Framework
                 in Virtualised Multi-Domain, Multi-Tenant 5G Networks
                 Qi Wang, Univ. of West Scotland

Euro-5G also organised a number of video interviews of the project managers which were later used for dissemination purposes in social media and on the web.

5   Programme support IT infrastructure

The information here is intended to update the information given in Deliverable 3.1 "Communication Hub" which described the programme support infrastructure at the start of the programme, and the interim report on programme governance in D2.3 at M12.

5.1   The 5G-PPP domain

5.1.1   Traffic Report (01/07/2016 – 22/08/2017)

The tables and charts below contain statistics for the recent period (July 2016 – August 2017). This is to complement the period from the start date of the 5G-PPP web site until July 2016 which was reported in D2.3: "Intermediate report on 5G programme governance and operation, including event support".
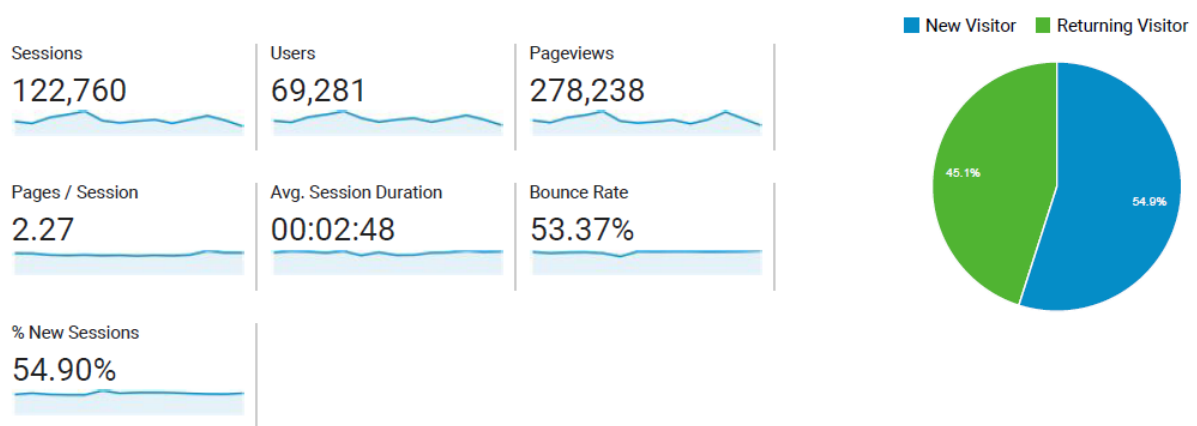

Figure 8: The 5G-PPP domain – traffic report

The site is being accessed from all corners of the globe as can be seen in the diagram below:
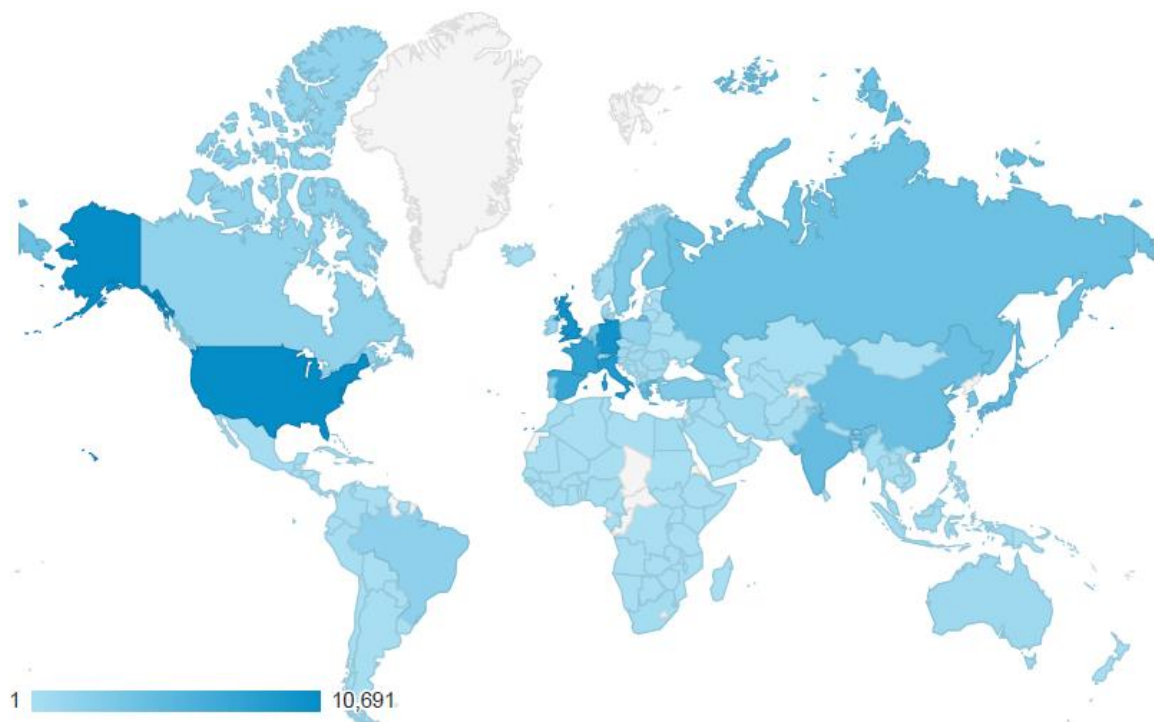

Figure 9: Countries accessing the 5G-PPP website

The domain www.5g-ppp.eu also supports external subdomains for projects or workgroups so that they can share the domain identity. So far seven subdomains of 5g-ppp.eu were configured: 5gex, 5gnorma, cognet, iorl, metis-ii, netmgmtwg and speed-5g. The statistics for the external domains are not part of the above figures.

When appropriate and agreed, an external organization can be granted permission to set up assigned hosts and maintain the Domain Name Service (DNS) for these hosts on their own DNS server(s). The name of each host must follow the naming scheme <ANYTHING>.<SUBDOMAIN NAME>.5g-ppp.eu, e.g. www.cognet.5g-ppp.eu

5.1.2   Top 25 Countries

Country	Acquisition	
	Sessions ↓	% New Sessions
	122,760 % of Total: 100.00% (122,760)	54.94% Avg for View: 54.90% (0.08%)
1. United States	10,691 (8.71%)	71.78%
2. Germany	9,856 (8.03%)	48.66%
3. United Kingdom	9,851 (8.02%)	50.25%
4. Italy	8,977 (7.31%)	47.61%
5. France	7,975 (6.50%)	51.52%
6. Spain	7,614 (6.20%)	43.68%
7. Japan	4,691 (3.82%)	56.15%
8. Belgium	4,401 (3.59%)	41.35%
9. India	4,370 (3.56%)	74.53%
10. Greece	4,239 (3.45%)	39.33%
11. China	4,116 (3.35%)	54.86%
12. Russia	3,957 (3.22%)	72.96%
13. South Korea	3,311 (2.70%)	58.99%
14. Finland	3,216 (2.62%)	42.75%
15. Sweden	2,656 (2.16%)	57.23%
16. Taiwan	2,548 (2.08%)	56.44%
17. Turkey	2,499 (2.04%)	47.62%
18. Portugal	1,880 (1.53%)	45.00%
19. Brazil	1,782 (1.45%)	56.62%
20. Netherlands	1,758 (1.43%)	55.35%
21. Canada	1,638 (1.33%)	56.72%
22. Poland	1,519 (1.24%)	48.45%
23. Ireland	1,031 (0.84%)	51.12%
24. Israel	967 (0.79%)	47.16%
25. Switzerland	843 (0.69%)	55.28%

Table 1: Top 25 countries accessing the 5G-PPP website

5.1.3 Top 25 Page Titles

Page	Pageviews	Unique Pageviews	Avg. Time on Page	Entrances	Bounce Rate	% Exit	Page Value
	278,238 % of Total: 100.00% (278,238)	218,941 % of Total: 100.00% (218,941)	00:02:11 Avg for View: 00:02:11 (0.00%)	122,235 % of Total: 100.00% (122,235)	53.37% Avg for View: 53.37% (0.00%)	43.93% Avg for View: 43.93% (0.00%)	$0.00 % of Total: 0.00% ($0.00)
1. /	55,034 (19.78%)	42,753 (19.53%)	00:01:53	37,910 (31.01%)	43.40%	44.03%	$0.00 (0.00%)
2. /white-papers/	22,799 (8.19%)	15,323 (7.00%)	00:02:53	7,490 (6.13%)	43.96%	47.57%	$0.00 (0.00%)
3. /event/second-global-5g-event-on-9-10-november-2016-in-rome-italy/	18,160 (6.53%)	10,759 (4.91%)	00:03:31	8,555 (7.00%)	65.69%	52.40%	$0.00 (0.00%)
4. /roadmaps/	8,073 (2.90%)	6,054 (2.77%)	00:02:30	2,328 (1.90%)	52.08%	42.88%	$0.00 (0.00%)
5. /5g-ppp-phase-1-projects/	7,621 (2.74%)	6,453 (2.95%)	00:01:29	2,065 (1.69%)	43.66%	27.75%	$0.00 (0.00%)
6. /event-calendar/	6,513 (2.34%)	5,152 (2.35%)	00:01:20	2,209 (1.81%)	55.03%	35.58%	$0.00 (0.00%)
7. /european-5g-actions/	5,221 (1.88%)	4,230 (1.93%)	00:01:12	1,173 (0.96%)	50.13%	27.35%	$0.00 (0.00%)
8. /5g-ppp-phase-2-projects/	4,602 (1.65%)	1,722 (0.79%)	00:00:47	619 (0.51%)	36.73%	12.82%	$0.00 (0.00%)
9. /projects/	4,342 (1.56%)	3,179 (1.45%)	00:02:06	1,591 (1.30%)	51.49%	36.99%	$0.00 (0.00%)
10. /our-members/	4,338 (1.56%)	3,719 (1.70%)	00:02:44	1,443 (1.18%)	65.15%	48.32%	$0.00 (0.00%)
11. /metis-ii/	4,221 (1.52%)	3,645 (1.66%)	00:03:09	2,686 (2.20%)	45.97%	55.86%	$0.00 (0.00%)
12. /5g-ppp-work-groups/	4,121 (1.48%)	3,410 (1.56%)	00:02:14	1,000 (0.82%)	59.15%	35.96%	$0.00 (0.00%)
13. /global-5g-actions/	4,038 (1.45%)	3,183 (1.45%)	00:01:36	283 (0.23%)	49.32%	29.10%	$0.00 (0.00%)
14. /5g-norma/	3,059 (1.10%)	2,642 (1.21%)	00:03:11	1,682 (1.38%)	44.24%	50.74%	$0.00 (0.00%)
15. /event/third-global-5g-event-on-24-25-may-2017-tokyo-japan/	2,651 (0.95%)	2,201 (1.01%)	00:04:18	1,869 (1.53%)	70.45%	71.97%	$0.00 (0.00%)
16. /coverage-plans/	2,537 (0.91%)	2,244 (1.02%)	00:01:34	514 (0.42%)	79.11%	34.21%	$0.00 (0.00%)
17. /5gex/	2,222 (0.80%)	1,913 (0.87%)	00:03:21	1,301 (1.06%)	44.23%	58.28%	$0.00 (0.00%)
18. /xhaul/	2,105 (0.76%)	1,859 (0.85%)	00:03:15	1,222 (1.00%)	66.48%	60.14%	$0.00 (0.00%)
19. /sesame/	2,070 (0.74%)	1,769 (0.81%)	00:03:23	1,182 (0.97%)	50.67%	57.20%	$0.00 (0.00%)
20. /selfnet/	2,032 (0.73%)	1,765 (0.81%)	00:03:10	1,167 (0.95%)	54.18%	57.28%	$0.00 (0.00%)
21. /mmmagic/	2,021 (0.73%)	1,788 (0.82%)	00:02:57	1,183 (0.97%)	53.15%	53.29%	$0.00 (0.00%)
22. /5g-trials-roadmap/	2,019 (0.73%)	1,476 (0.67%)	00:02:20	502 (0.41%)	50.10%	37.94%	$0.00 (0.00%)
23. /news/	1,974 (0.71%)	1,622 (0.74%)	00:01:03	231 (0.19%)	61.04%	29.74%	$0.00 (0.00%)
24. /5g-ppp-phase-2-pre-structuring-model/	1,970 (0.71%)	1,640 (0.75%)	00:02:58	961 (0.79%)	40.87%	49.70%	$0.00 (0.00%)
25. /5g-xhaul/	1,962 (0.71%)	1,717 (0.78%)	00:02:56	934 (0.76%)	47.66%	47.60%	$0.00 (0.00%)

Table 2: Top 25 page titles of the 5G-PPP website

5.1.4 Top 10 downloaded documents

1.	https://5g-ppp.eu/wp-content/uploads/2014/02/5g-ppp-5g-architecture-wp-july-2016.pdf	3,854 (14.30%)
2.	https://5g-ppp.eu/wp-content/uploads/2014/02/5g-ppp-use-cases-and-performance-evaluation-modeling_v1.0.pdf	1,204 (4.47%)
3.	https://5g-ppp.eu/wp-content/uploads/2014/02/5g-ppp-white-paper-on-automotive-vertical-sectors.pdf	849 (3.15%)
4.	https://5g-ppp.eu/wp-content/uploads/2016/02/brochure_5ppp_bat2_pl.pdf	774 (2.87%)
5.	https://5g-ppp.eu/wp-content/uploads/2015/11/160304_5g-infra-ppp_phase2-pre-structuring-model_v2.0.pdf	632 (2.35%)
6.	https://5g-ppp.eu/wp-content/uploads/2015/10/5gppp-brochure-final-web.pdf	618 (2.29%)
7.	https://5g-ppp.eu/wp-content/uploads/2016/02/5g-ppp-white-paper-on-ehealth-vertical-sector.pdf	572 (2.12%)
8.	http://5g-ppp.eu/wp-content/uploads/2015/02/5g-vision-brochure-v1.pdf	553 (2.05%)
9.	http://5g-ppp.eu/wp-content/uploads/2015/02/5g-vision-exec-summary-v1.pdf	504 (1.87%)
10.	https://5g-ppp.eu/wp-content/uploads/2014/02/5g-ppp-pre-standards-wg-issues-paper-for-20-oct-15-ws_final-edited.pdf	500 (1.86%)

Table 3: Top 10 downloaded documents on the 5G-PPP website

5.1.5 Overview statistics for the period since the launch of the 5G-PPP web

Below some information on web visitors and statistics is given for the whole period since the page has been launched in March 2014.

Report (17/03/2014 – 22/08/2017)

267,865 visits
2 min 47s average visit duration
54% visits have bounced (left the website after one page)
2.3 actions (page views, downloads, outlinks and internal site searches) per visit
605,078 page views,
40,153 outbound downloads[5]

Table 4: Statistics for the period since the launch of the 5G-PPP web

In the past 13 months (July 2016 – Aug 2017) the number of visits is nearly equal compared to the number of visits in the first 26 months (March 2014 – July 2016).

The web site currently consists of 360 published pages and posts and 10341 files. The total size of the web is 1.5 Gigabytes.

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[5] "Outbound Downloads" shows the list of external URLs that were clicked by our visitors from our website pages. All clicks on URLs that are not the same domain as the website (5g-ppp.eu) being tracked are counted as "Outbound Downloads".

5.1.6   Top 25 Outbound Downloads

"Outbound Downloads" shows the list of external URLs that were clicked by our visitors from our website pages. All clicks on URLs that are not the same domain as the website (5g-ppp.eu) being tracked are counted as "Outbound Downloads".

		20,290 % of Total: 33.22% (61,086)	
1.	bscw.5g-ppp.eu	1,712	(8.44%)
2.	networld2020.eu	1,500	(7.39%)
3.	metis-ii.5g-ppp.eu	1,191	(5.87%)
4.	5gnorma.5g-ppp.eu	913	(4.50%)
5.	www.5gex.eu	730	(3.60%)
6.	www.sesame-h2020-5g-ppp.eu	663	(3.27%)
7.	www.eventbrite.de	622	(3.07%)
8.	selfnet-5g.eu	576	(2.84%)
9.	5g-mmmagic.eu	566	(2.79%)
10.	www.5g-xhaul-project.eu	525	(2.59%)
11.	www.cognet.5g-ppp.eu	516	(2.54%)
12.	5gmf.jp	495	(2.44%)
13.	5g-crosshaul.eu	437	(2.15%)
14.	www.flex5gware.eu	426	(2.10%)
15.	www.charisma5g.eu	402	(1.98%)
16.	www.youtube.com	388	(1.91%)
17.	www.networks-etp.eu	356	(1.75%)
18.	www.ict-coherent.eu	352	(1.73%)
19.	www.sonata-nfv.eu	346	(1.71%)
20.	scic.ec.europa.eu	341	(1.68%)
21.	www.marriott.com	332	(1.64%)
22.	www.imt-2020.cn	318	(1.57%)
23.	superfluidity.eu	316	(1.56%)
24.	www.5gamericas.org	291	(1.43%)
25.	ec.europa.eu	262	(1.29%)

Table 5: Top 25 outbound downloads of the 5G-PPP website

5.2 Programme Repository

A document sharing web service BSCW has been setup to provide a document repository for the various bodies and working groups of the 5G-PPP. It also acts as a repository for deliverables and documents shared between projects.

Currently 6593 documents are stored in 1425 folders with a total size of 24 Gigabytes. In the past 12 months (Aug 2016 – Aug 2017) the size doubled compared to the first 29 months (March 2014 – Aug 2016).

5.3 Tools

5.3.1 Mail Lists

Over 150 mailing lists have been setup for 5G-PPP and NetWorld2020 ETP. The number is quite dynamic and new communication groups are evolving quite frequently.

By August 2017 the 5G-PPP mail server had distributed 1.4 million mails with a traffic size of 310 Gigabytes.

An e-mail server and personal accounts have been created for the 5G Infrastructure Association board members and these are actively used when communicating on behalf of the 5G-IA.

The Association member accounts of the 5G Infrastructure Association are personal in the form name@5g-ppp.eu. This enables the Board members to communicate visibly as a member of the 5G Infrastructure Association, instead of using their company- or university email account.

5.3.2 Audio and Web conferences

Euro-5G has offered a pure-audio conferencing tool with international dial-in numbers, and a web-conferencing tool (WebEx) which phones and computers can connect to.

A decline in the use of the audio conference bridge service has been observed in the past 12 months, and the web-conferencing tool has become the predominant tool. However, for smaller and / or shorter group conversations the audio conference bridge is still a popular and efficient tool as setup and connect is quick.

The conferencing tools have been used frequently by the various bodies and groups, e.g. the 5G-Initiative Steering Board, Technology Board, Working Groups etc.

Euro-5G is taking care of receiving requests for use of the tool and for making the required reservation of the resource and for informing the conference organiser of the connection details.

5.3.3 Registration services

Online registration facilities have been used for a number of workshops and information days. They consist of a web based form which gathers information into a database and automatically sends an acknowledgement to the registrant. The database information is then used to prepare participant lists and send updated information to the participants.

Similar forms have also been used for to enable the community to submit feedback in public consultations e.g. on Whitepapers or the Pre-structuring model. In these cases an online form captures the information and it is stored in a database. Then the key information is exported to a spreadsheet which the editors of the document under consultation use to produce the next version of the document.

In the recent period, registrations for 12 events, 4 Survey/consultations and several application forms were supported.

5.3.4   Brokerage Service

As part of the preparation for Phase 2 of the 5G-PPP the brokerage service was re-introduced. This service allows people to submit either proposal ideas or expertise offer profiles to the Brokerage Platform. Each submission will be published after approval by the brokerage platform moderator team from Euro-5G. Proposal ideas may be posted without publishing the idea owner's identity if they only wish to be contacted via the Brokerage Platform.

The platform offers search and contact request forms which allows idea proposers to find matching partners for a project consortium and companies to find interesting proposal ideas to cooperate in.

There were 37 expertise offers posted on the site and these were searchable via expertise, interest areas or type of organisation (e.g. SME). There was only one project idea posted as expected because proposal leaders generally are secretive about their proposals. However, they do use the search facility to find complementary resources for their proposals.

5.3.5   eVoting tool

Euro-5G provides an eVoting service tool. It enables decisions and elections to be held electronically using a secured system where the access and voting rights are controlled. It can be used e.g. for remote election of the Chairpersons of the various Boards and Working Groups when it is not possible to assemble the candidate list in the physical meeting, but also for the approval of documents. For example, the tool has been used for collecting the votes on approving the Revised Governance Model of the NetWorld2020 ETP that had to be collected from its nearly 1,000 members. The tool has in addition also been used for collecting approvals in smaller groups, e.g. for the approval of the scoping paper by the members of the 5G Association. The tool was also foreseen to be used for the election of the TB Chair and Vice-Chair persons. However, as there has been only a single candidate there was no need to do an election.

6   Recommendations for Phase 2

6.1   Organisational Recommendations

From the support action perspective, the overall process of organising and supporting 5G-PPP activities could be further improved – in terms of both effectiveness and efficiency – if the Support Action (Euro-5G) was more directly involved in the Partnership Board level discussions. Usually Euro-5G had to wait for feedback from the Association or the EC to understand what expectations were placed on the CSA. In some cases this was further complicated by the feedback not being consistent and getting different expectations from each side. In Phase 2 this needs to be improved so the project can respond more efficiently to requests for actions. A clear representation of the CSA at the partnership board may be the most efficient solution.

On a similar level, the links between the Association and the CSA project need to be a little more formal as the handover of tasks between both organisations can be improved. As there is a high degree of overlap, there is a lot of assumption that things are understood by those who have the view of both sides but the rest of the group may not have the same picture. We recommend short audio conferences between the Association chairman and the CSA project leader regularly, e.g. after Association board meetings, to improve this.

6.2   Event Logistics Recommendations

In some of the 5G-PPP events there was a recurring need to identify if an event was a 5G-PPP event, a 5G-IA event or even an EC event. This led to difficulties in decision making and budget management as it was not clear who was ultimately responsible. We recommend for future larger events to have a clear decision on responsibilities early in the preparation phase as well as a projection on where the costs may be allocated. This would be particularly important if major events are to be paid for from several budgets. We recommend that each event should have a designated event manager who should maintain the overview of the organisation.

This point also had an impact on the promotion of events where decisions on venues and agendas delayed the announcements and calls for participations.

6.3   Recommendations for the Steering Board

The SB is an important body that facilitates status updates and exchange of information between projects but also between projects and EC and the Association. It is also a useful forum e.g. for planning of joint activities and seeking project contributions to PPP-level activities.

For that to be efficient it is important that all SB members ensure their regular participation to SB meetings and telcos. Although the level of participation in Phase 1 was already good there is room for improvement. If a project is unable to find a representative to attend then at least this should be communicated to the SB Chairperson and facilitator from the CSA.

As some activities as e.g. brainstorming or certain discussions can only be effectively organised in a physical meeting, it should be ensured that physical meetings are organised in certain intervals. The experience showed that about 4 physical meetings per year is a good target. Having one teleconference in between two physical meetings is useful and sufficient for status updates, checking of progress of activities and informing about new requests or activities.

There have been regular requests from some SB members to have options for remote dial in into physical meetings, and this has been provided whenever feasible. The availability of dial-in facilities has however made it attractive also to others to dial-in instead of travelling to the meetings which sometimes led to significant remote participation, reducing the overall effectiveness of the meeting. It

can also be argued whether this is a fair behaviour against those who spent time and budget to travel. Therefore, for maximum effectiveness of the meeting, it is strongly recommended that dial-in facilities are not provided for SB physical meetings. There can of course be exceptions e.g. for enabling a Working Group leader to give an important report to the SB where this is the sole agenda item for which this person would attend. This has to be carefully organised as it needs to be avoided that other regular members are tempted to also make use of this option.

Appendix A   List of organisations invited to accede to the 5G-PPP Collaboration Agreement in Phase 2

Table 6: List of organisations invited to accede to the 5G-PPP Collaboration Agreement in Phase 2

Phase 2 Participant Organisations

1		AALBORG UNIVERSITET
2		AALTO-KORKEAKOULUSAATIO
3		ACCELLERAN
4		ADVA OPTICAL NETWORKING SE
5		Aeroflex Ltd
6		AIRBUS DEFENCE AND SPACE SAS
7		AIRRAYS GMBH
8		ALCATEL - LUCENT BELL LABS FRANCE
9		ALCATEL-LUCENT DEUTSCHLAND AG
10		ALCATEL-LUCENT ISRAEL LTD
11		ALCATEL-LUCENT ITALIA S.P.A.
12		ALMA MATER STUDIORUM - UNIVERSITA DI BOLOGNA
13		ALTICE LABS SA
14		ARCELIK A.S.
15		ARISTOTELIO PANEPISTIMIO THESSALONIKIS
16		ASM TERNI SPA
17		ASSOCIATION ISEP - EDOUARD BRANLY
18		ATHONET SRL
19		ATOS SPAIN SA
20		AVANTI COMMUNICATIONS LTD
21		AYUNTAMIENTO DE MADRID
22		BAPCO LBG
23		B-COM
24		BEIJING LEADPCOM TECHNOLOGY CO LTD
25		BIBA - BREMER INSTITUT FUER PRODUKTION UND LOGISTIK GMBH
26		BITTUBES GMBH
27		BLU WIRELESS TECHNOLOGY LIMITED
28		BRITISH BROADCASTING CORPORATION
29		BRITISH TELECOMMUNICATIONS PUBLIC LIMITED COMPANY
30		BROADPEAK
31		BRUNEL UNIVERSITY LONDON
32		BUILDING RESEARCH ESTABLISHMENT LTD
33		BUNDLESLAB KORLATOLT FELELOSSEGU TARSASAG
34		CAPRITECH LIMITED
35		CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
36		CENTRE TECNOLOGIC DE TELECOMUNICACIONS DE CATALUNYA
37		CENTRO DE INNOVACION DE INFRAESTRUCTURAS INTELIGENTES
38		CENTRO RICERCHE FIAT SCPA
39		CENTRUL ROMAN AL ENERGIEI - CRE
40		CHALMERS TEKNISKA HOEGSKOLA AB
41		CIT INFINITE DESIGNATED ACTIVITY COMPANY
42		COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES
43		COMSA INSTALACIONES Y SISTEMAS INDUSTRIALES SL
44		COMUNE DI LUCCA

45		COMUNICARE DIGITALE - ASSOCIAZIONEDI PROMOZIONE SOCIALE
46		CONSORZIO NAZIONALE INTERUNIVERSITARIO PER LE TELECOMUNICAZIONI
47		CORIANT PORTUGAL UNIPESSOAL LDA
48		CORNING OPTICAL COMMUNICATIONS GMBH & CO KG
49		CORPORACION DE RADIO Y TELEVISION ESPANOLA SA
50		COSMOTE KINITES TILEPIKOINONIES AE
51		CREATIVE SYSTEMS ENGINEERING (C.S.E) MONOPROSOPI EPE
52		DANMARKS TEKNISKE UNIVERSITET
53		DEUTSCHE TELEKOM AG
54		EASY GLOBAL MARKET SAS
55		EFACEC ENERGIA - MAQUINAS E EQUIPAMENTOS ELECTRICOS SA
56		EIGHT BELLS LTD
57		EMC INFORMATION SYSTEMS INTERNATIONAL
58		EMOTION SRL
59		ENGINEERING - INGEGNERIA INFORMATICA SPA
60		ERICSSON AB
61		ERICSSON GMBH
62		ERICSSON TELECOMUNICAZIONI
63		ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS
64		EULAMBIA ADVANCED TECHNOLOGIES MONOPROSOPI ETAIRIA PERIORISMENIS EFTHINIS
65		EURECOM
66		EURESCOM GMBH
67		EXPWAY
68		EXXPERTSYSTEMS GMBH
69		FAIRSPECTRUM OY
70		Ferrocarrils de la Generalitat de Catalunya
71		FERROVIAL AGROMAN SA
72		FONDAZIONE BRUNO KESSLER
73		FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.
74		FREIE UNIVERSITAET BERLIN
75		FUNDACIO PRIVADA I2CAT, INTERNET I INNOVACIO DIGITAL A CATALUNYA
76		FUNDACION PARA LA PROMOCION DE LA INNOVACION, INVESTIGACION Y DESARROLLO TECNOLOGICO EN LA INDUSTRIA DE AUTOMOCION DE GALICIA
77		GILAT SATELLITE NETWORKS LTD
78		GIOUMPITEK MELETI SCHEDIASMOS YLOPOIISI KAI POLISI ERGON PLIROFORIKIS ETAIREIA PERIORISMENIS EFTHYNIS
79		HAMBURG PORT AUTHORITY
80		HELLENIC TELECOMMUNICATIONS ORGANIZATION S.A. - OTE AE (ORGANISMOS TILEPIKOINONION TIS ELLADOS OTE AE)
81		HISPASAT SA
82		HOLON INSTITUTE OF TECHNOLOGY
83		HUAWEI TECHNOLOGIES (IRELAND) CO LIMITED
84		HUAWEI TECHNOLOGIES DUESSELDORF GMBH
85		IBM ISRAEL - SCIENCE AND TECHNOLOGY LTD
86		IDC ITALIA SRL
87		IHP GMBH - INNOVATIONS FOR HIGH PERFORMANCE MICROELECTRONICS/LEIBNIZ-INSTITUT FUER INNOVATIVE MIKROELEKTRONIK
88		III-V LAB
89		INCELLIGENT IDIOTIKI KEFALAIOUCHIKI ETAIREIA
90		INCITES CONSULTING SARL
91		INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE INCORPORATED
92		INEO ENERGY AND SYSTEMS
93		INFORMACIO I COMUNICACIO DE BARCELONA SA SOCIETAT PRIVADA MUNICIPAL
94		INNO TSD

95		INSTITUT DE L'AUDIOVISUEL ET DES TELECOMMUNICATIONS EN EUROPE - IDATE
96		INSTITUT FUER RUNDFUNKTECHNIK GMBH
97		INSTITUT JOZEF STEFAN
98		INSTITUT MUNICIPAL D'INFORMATICA DE BARCELONA
99		INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS
100		INTEL DEUTSCHLAND GMBH
101		INTEL RESEARCH AND DEVELOPMENT IRELAND LIMITED
102		INTERDIGITAL EUROPE LTD
103		INTERINNOV SAS
104		INTERNET INSTITUTE, COMMUNICATIONS SOLUTIONS AND CONSULTING LTD
105		INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM
106		INTRACOM SA TELECOM SOLUTIONS
107		INTRASOFT INTERNATIONAL SA
108		IQUADRAT INFORMATICA SL
109		ITALTEL SPA
110		KING'S COLLEGE LONDON
111		LEXDEN TECHNOLOGIES LTD
112		LIONIX INTERNATIONAL BV
113		LiveU Ltd.
114		MARBEN PRODUCTS
115		MARTEL GMBH
116		MELLANOX TECHNOLOGIES LTD - MLNX
117		MIRANTIS POLAND SPOLKA Z OGRANICZONA ODPOWIEDZIALNOSCIA
118		MOBICS TELECOMMUNICATION AND CONSULTING SERVICES SA
119		MOG TECHNOLOGIES SA
120		MOSTLYTEK LTD
121		MTN CYPRUS LIMITED
122		MUNICIPALITY OF EGALEO
123		NATIONAL CENTER FOR SCIENTIFIC RESEARCH "DEMOKRITOS"
124		NAUDIT HIGH PERFORMANCE COMPUTING AND NETWORKING SL
125		NEC EUROPE LTD
126		NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO
127		NETAS TELECOMMUNICATION ANONIM SIRKETI
128		NEXTWORKS
129		NOKIA SOLUTIONS AND NETWORKS DANMARK AS
130		NOKIA SOLUTIONS AND NETWORKS GMBH &CO KG
131		NOKIA SOLUTIONS AND NETWORKS MANAGEMENT INTERNATIONAL GMBH
132		NOKIA SOLUTIONS AND NETWORKS OY
133		NOKIA SOLUTIONS AND NETWORKS SP ZOO
134		NOMOR RESEARCH GMBH
135		NUROGAMES GMBH
136		OLD DOG CONSULTING LIMITED
137		OLEDCOMM SAS
138		ONAPP LIMITED
139		ONE2MANY BV
140		ONEACCESS SA
141		OPENLIGHTCOMM LTD
142		OPTIMUM ANONIMI ETAIRIA TECHNOLOGIES PLIROFORIKIS
143		OPTOSCRIBE LIMITED
144		ORANGE POLSKA SPOLKA AKCYJNA
145		ORANGE ROMANIA SA
146		ORANGE SA
147		ORION INNOVATIONS PRIVATE COMPANY

148		OULUN YLIOPISTO
149		PANATHINAIKOS ATHLITIKOS OMILOS (PAO)PODOSFAIRIKI ANONIMI ETAIRIA (PAE)
150		PANEPISTIMIO THESSALIAS
151		PEUGEOT CITROEN AUTOMOBILES S.A.
152		PIETRZYK SLAWOMIR
153		POLITECHNIKA WARSZAWSKA
154		POLITECNICO DI MILANO
155		POLITECNICO DI TORINO
156		POWER OPERATIONS LIMITED
157		PRISMTECH FRANCE
158		QUOBIS NETWORKS SL
159		QUORTUS LTD
160		RAI-RADIOTELEVISIONE ITALIANA SPA
161		REAL WIRELESS LIMITED
162		REDZINC SERVICES LIMITED
163		RESEARCH AND EDUCATION LABORATORY IN INFORMATION TECHNOLOGIES
164		RETEVISION I, S.A.
165		RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN
166		ROBERT BOSCH GMBH
167		RUNEL NGMT LTD
168		RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY
169		SAMSUNG ELECTRONICS (UK) LIMITED
170		SCUOLA SUPERIORE DI STUDI UNIVERSITARI E DI PERFEZIONAMENTO SANT'ANNA
171		SEETEC GMBH
172		SEQUANS COMMUNICATIONS SA
173		SES TECHCOM SA
174		SHANGHAI FEILO ACOUSTICS CO LTD
175		SIKLU COMMUNICATION LTD
176		SINGULARLOGIC ANONYMI ETAIREIA PLIROFORIAKON SYSTIMATON KAI EFARMOGON PLIROFORIKIS
177		SMART MOBILE LABS GMBH
178		SOCIETATEA NATIONALA DE GAZE NATURALE ROMGAZ SA
179		SOCIETE D'ECONOMIE MIXTE ISSY - MEDIA (SEM ISSY MEDIA)
180		SUITE5 DATA INTELLIGENCE SOLUTIONS LIMITED
181		SYNELIXIS LYSEIS PLIROFORIKIS AUTOMATISMOU & TILEPIKOINONION MONOPROSOPI EPE
182		TECHNISCHE UNIVERSITAET DRESDEN
183		TECHNISCHE UNIVERSITAET KAISERSLAUTERN
184		TECHNISCHE UNIVERSITEIT EINDHOVEN
185		TECHNOLOGIKO EKPEDEFTIKO IDRIMA STEREAS ELLADAS
186		TELECOM ITALIA SPA
187		TELEFONICA INVESTIGACION Y DESARROLLO SA
188		TELENOR ASA
189		THALES ALENIA SPACE FRANCE
190		THALES COMMUNICATIONS & SECURITY SAS
191		THALES SA
192		THE 5G INFRASTRUCTURE ASSOCIATION
193		TRANSPAKET AS
194		TriaGnoSys GmbH
195		TRUST-IT SERVICES LIMITED
196		TSINGHUA UNIVERSITY
197		TURUN AMMATTIKORKEAKOULU OY
198		UBITECH LIMITED
199		UBIWHERE LDA
200		UNION EUROPEENNE DE RADIO TELEVISION-EBU

201		UNIVERSIDAD CARLOS III DE MADRID
202		UNIVERSIDAD DE MALAGA
203		UNIVERSIDAD DEL PAIS VASCO/ EUSKAL HERRIKO UNIBERTSITATEA
204		UNIVERSIDAD POLITECNICA DE MADRID
205		UNIVERSITA' DEGLI STUDI DI MILANO-BICOCCA
206		UNIVERSITAET PADERBORN
207		UNIVERSITAT POLITECNICA DE CATALUNYA
208		UNIVERSITAT POLITECNICA DE VALENCIA
209		UNIVERSITE PIERRE ET MARIE CURIE - PARIS 6
210		UNIVERSITY COLLEGE LONDON
211		UNIVERSITY OF BRISTOL
212		UNIVERSITY OF PIRAEUS RESEARCH CENTER
213		UNIVERSITY OF SURREY
214		UNIVERSITY OF THE WEST OF SCOTLAND
215		VERTICAL M2M
216		VIOTECH COMMUNICATIONS SARL
217		VIRTUAL OPEN SYSTEMS SARL
218		VISCODA GMBH
219		VISIONA INGENIERIA DE PROYECTOS SL
220		VOLVO PERSONVAGNAR AB
221		VT IDIRECT SOLUTIONS LTD
222		WATERFORD INSTITUTE OF TECHNOLOGY
223		WEIDMULLER INTERFACE GMBH & CO KG
224		WIND TRE SPA
225		WINGS ICT SOLUTIONS INFORMATION & COMMUNICATION TECHNOLOGIES EPE
226		ZEETTA NETWORKS LIMITED

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