# Impact of the Energy-efficient Buildings PPP

## Report from the Workshop held 26 November 2010

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**Associate Director,**
**Global Research, Arup**

**December 2010**

# Executive summary

**Background**

On 26 November 2010, EC representatives, project coordinators and participants of projects funded by the calls in the 2010 work programmes of the Energy-efficient Buildings Public Private Partnership (EeB PPP), and other stakeholders including the E2B Association (E2BA), met in a workshop to investigate enhancing collaboration within the PPP and to carry out a first assessment of its implementation.

Projects demonstrated their scientific and technological excellence and discussed the challenges for the sector. Primarily, this is how these technologies can be taken to market and which mechanisms are needed to ensure mass-deployment. Projects varied in scope, and included the possibility of developing new business models by exploring new techno-economic concepts, opening or creating new markets, and encouraging the development of local supply chains. There was agreement that engagement under a European project helps the traditionally risk averse construction industry to increase its R&D spend.

The PPP is driving innovation through a more holistic approach that considers both technical and non-technical aspects. It provides a platform for best practice sharing, knowledge dissemination and the creation of a cooperation environment across the whole supply chain supported by a baseline long-term common vision.

**Benefits of the PPP**

The results from the first round of PPP calls show that there are a number of benefits of using the PPP process when compared to business as usual FP7. The PPP allowed for a strong presence of SMEs, short approval and negotiation time, industry led projects, predefined budget, etc.

A more remarkable benefit is that the PPP provides a common framework with committed stakeholders and it enables real multidisciplinary working bringing together different parts of the EC. By connecting projects and complementing with activities like training, education, collection of best practice, standardisation, influencing legislation and incentive scheme development, the PPP could create the right market conditions for mass deployment of new technologies.

Some of the most direct impact of the PPP are demonstrators that will accelerate taking technologies to market. The PPP also encourages an increased industrial investment in R&D and can help companies in small countries to access new technologies thereby providing SMEs with opportunities for technology development funding.

With the PPP we have moved from ad-hoc research projects to a long term research programme giving potential for greater scale and impact. This programme bridges activities between project teams' ambitious objectives and the Europe's challenging environmental and socioeconomic targets.

We are aware that research alone will not solve the problem. We need accompanying measures for implementation and replication to ensure real market uptake of low carbon technologies.

Therefore, we need additional elements to be able to create the right ecosystem: Tools to measure and to monitor RTD impact; Policies and regulatory frameworks for retrofitting; Decision making tools; Procurement procedures; Standards and interoperability; Affordable investments and financial mechanisms; Mechanisms for engagement of SMEs, etc.

**PPP beyond 2013**

To make sure real impact is achieved, the continuation of the PPP will be fundamental in addition to other supporting actions such as incentive schemes, large scale demonstration, development of new types of contracts, etc.

The multiannual roadmap has been a great success by helping to focus stakeholders on a long term common agenda. It has been recognised as a reference point for the industry and in some countries is informing national and regional agendas. The roadmap guarantees continuity of work and keeps industry keen to participate in the PPP knowing that the roadmap advises the EC in areas for future funding.

# 1. Introduction

On 26 November 2010, EC representatives, project coordinators and participants of projects funded by the calls in the 2010 work programmes of the Energy-efficient Buildings Public Private Partnership (EeB PPP), and other stakeholders including the E2B Association (E2BA), met in a workshop to investigate enhancing collaboration within the PPP and to carry out a first assessment of its implementation.

The ad hoc Industrial Advisory Group (AIAG) has been very successful in developing a multi-annual roadmap and longer-term strategy to support the identification of projects meeting the strategic research agenda. Now interest is refocusing on what the PPP delivers to the socioeconomic and sustainability agenda of Europe.

First hand evaluation of the PPP process for the 2010 call shows some evidence of the benefits of this mechanism when compared to business as usual FP7; namely, high success rate, strong presence of SMEs, short approval and negotiation time, industry-led projects, dialogue through the AIAG, long term roadmap developed with industry, predefined budget, funding for enabling technologies, etc.

However, we need to look beyond the immediate advantages of the PPP mechanism and need to understand how it will tackle the 2020 and 2050 targets for energy efficiency and carbon emissions and how it will turn these challenges into business opportunities.

This report outlines how the PPP can facilitate collaboration, and do a first assessment of its implementation. The value added of the PPP and the coverage of the roadmap are also discussed.

# 2. Background

The E2BA was set up to gather the industry (large companies and SMEs), research institutions, promoters and relevant stakeholders as well as to liaise with member states and coordinate with other related national, European and international initiatives.

The step change for the E2BA was the announcement of the EeB PPP on the economic recovery plan in 2008. The PPP brought together various DGs: RESEARCH (NMP, ENV), ENERGY and INFSO. A quick response was needed and it was decided to use existing FP7 mechanisms to facilitate rapid implementation whilst providing a long term approach. Another key element of the PPP is the AIAG, which was set up to liaise with the EC's inter-service group and to create a multiannual roadmap.

The vision of the roadmap sets out three key milestones. Firstly, reduce the energy consumption of existing buildings, secondly, retrofit/build and operate energy neutral buildings, and thirdly, design and operate energy positive buildings.

The PPP under the recovery plan (2010-2013) covers mainly the objectives in the first milestone of the vision. At a time when the impact of the Economic Recovery Plan is being assessed there is a need to demonstrate the impact of the PPP and its success to date.

# 3. Methodology

DG RTD with the support of the E2BA organised the Workshop on impact of the EeB PPP, which took place in Brussels on 26 November 2010. (see Appendix 1 for the workshop agenda). It was well attended with at least one representative from each project and members from E2BA other related associations and European platforms (see Appendix 2 for a list of attendees).

The objectives of the workshop were:

- To enhance the cooperation links within the PPP
- To facilitate a first assessment of its implementation
- To explore the technological coverage of the PPP roadmap
- To address innovation, dissemination and exploitation issues
- To discuss added value of the PPP as a whole and a roadmap beyond 2013

The workshop started with some context setting presentations from DG RTD by Christophe Lesniak, Lorenzo Valles and Anne Mallaband. This was followed by project presentations from all the EeB PPP projects plus some additional FP7 projects that were approved before the PPP came to life. Presentations addressed the technological coverage of the PPP roadmap, as well as innovation and exploitation issues (see Appendix 3 for a list of the projects presented at the workshop).

Following the project presentations, there were two panel discussions. A number of prepared questions were addressed by panellists and the floor was open for discussion (questions are listed in Appendix 4). The first panel focused on the added value and overall impact of the PPP. Panellists for Session 1 included:

- Ignacio Calvo, Acciona
- Henk Miedema, TNO
- Vladimir Gumilar, Construction Cluster of Slovenia
- Bruno Smets, Philips Lighting

The second panel discussion covered the need for roadmap beyond 2013. Members of this panel included:

- Ger Spork, CEFIC
- Tilmann Kuhn, Fraunhofer ISE
- Paul Cartuyvels, Bouygues Construction

The workshop closed with final views from other DGs colleagues and the summary from the rapporteur.

# 4. Projects overview

The projects were clustered around the call they responded to:

- Energy efficiency in buildings (demonstration) - ENERGY
- Compatible solutions for improving the energy efficiency of historic buildings in urban areas - ENVIRONMENT
- ICT for energy-efficient buildings and spaces of public use - ICT
- New nanotechnology-based high performance insulation systems for energy efficiency – NMP
- New technologies for energy efficiency at district level - NMP
- Other PPP related FP7 projects

The following sections give an overview of key highlights and specific issues from project clusters.

## 4.1. Impact

The projects presented an overview of their expected impact. Namely, they confirmed their strong contribution towards the 2020 carbon and energy targets whilst improving living conditions.

Projects responding to the call on “Compatible solutions for improving the energy efficiency of historic buildings in urban areas” (ENVIRONMENT) mentioned how they will demonstrate feasibility to significantly reduce energy consumption in the large proportion of existing buildings stock. Other projects claimed up the potential for 50% cost saving on heating/cooling, and up to 77% reduction in energy demand.

Projects responding to the “New nanotechnology-based high performance insulation systems for energy efficiency” (NMP) call, confirmed they would reduce the cost of new technologies, look into approaches for industrialisation and support the development of standards for new materials. It is worth highlighting that one of the projects could be developing a European industry for aerogels, as current suppliers are all in the US.

Projects demonstrated their scientific and technological excellence. The challenge for the sector is how these technologies get to market and what mechanisms are needed to ensure greater take-up. Some projects mentioned the development of new business models by exploring new techno-economic concepts. Others mentioned opening or creating new markets and encouraging the development of a local supply chain

## 4.2. Exploitation

Projects responding to the call on “New nanotechnology-based high performance insulation systems for energy efficiency” (NMP) outlined project partners as the most appropriate route to exploitation given the presence of the whole supply chain. However other mechanisms could be considered once IPR and ownership of results is properly addressed, such as public procurement.

District solutions will require more sophisticated business and service models. Projects responding to the call on “New technologies for energy efficiency at district level” (NMP) are aiming to explore new approaches on this front.

In addition, there was good presence of end users in particular on “Energy efficiency in buildings” (DG ENERGY) demonstration projects, where local authorities and city councils are project partners. These groups have a very strong appetite to get involved in PPP projects but at times they find it difficult as they are new to European projects. Their participation could be improved in more research oriented projects, in order to guarantee technology adoption, dissemination, education, etc.

## 4.3. Dissemination

All projects without exception listed the classic ways of disseminating RTD projects: websites, newspaper articles, wikis, workshops, conferences, and campaigns for stakeholders. Projects responding to the call on ICT for energy-efficient buildings and spaces of public use (INFSO) have suggested some more innovative ways to get the message across such as training of users and education, using the E2BA as a route to promote research outcomes and appointing a spokesperson. One of the projects responding to “New technologies for energy efficiency at district level” call (NMP) will be doing virtual demos in 3-4 cities.

However, there is unrealised potential to disseminate projects and outcomes. Later in the discussion, the issue of larger and more frequent joint dissemination of projects and reaching a wider audience emerged, being E2BA an ideal vehicle for that.

Some technology platforms have also shown their support, for instance SusChem sent a message of endorsement commenting on their involvement to date through the materials related calls. The construction industry is one of the most significant customers / sector for the chemical industry. Involvement of stakeholders across the whole supply chain of construction is an interesting proposition. The PPP could take the role of providing the platform for interaction.

Through the “Energy efficiency in buildings” (DG ENERGY) projects thirteen demonstrator sites will be developed in the next three to five years. Nine demonstrators correspond to residential buildings and four to schools. The presence of clients is rather remarkable with nine building owners and 4 cities/municipalities participating as consortia members. Broadcasting of the demonstrators would be key to showing the value of the PPP and to engage more industry.

## 4.4. Standardisation

Standards are one of the recognised barriers for uptake of new technologies in the construction industry. The approaches presented in the project proposals were to incorporate new materials in existing standards and provide policy insight and raise awareness for the creation of new standards

A more coherent approach to standardisation and interoperability is required. Cross-project collaboration could lead to the definition of new standards.

This issue is of particular importance on the “New nanotechnology-based high performance insulation systems for energy efficiency” (NMP) projects, as new materials need to be specified and tested against standards.

## 4.5. Added value

Projects presentations gave an overview of where the PPP adds value to the project and where projects can add value to the PPP.

There were two key points highlighted on how the PPP adds value to projects:

1. Facilitates taking technologies to market supported by a baseline long-term common investment strategy.
2. Networking for consortia set up, knowledge sharing, research results dissemination, standards development, addressing safety issues and informing end users.

Projects can also add value to the PPP through identifying key skills needed, tackling non-technical barriers transferring knowledge and showcasing the deliverables of projects to raise awareness.

Other PPP related FP7 projects recognised the value added of the PPP as it drives innovation through a more holistic approach than business as usual FP7 given that it considers both technical and non-technical aspects. They also reflected on the potential of the PPP for best practice sharing, knowledge dissemination and the creation of the right environment for collaboration.

# 5. Benefits and added value of the PPP

When looking into the impact of the PPP, several levels of impact need to be considered. The first level covers immediate impacts from the implementation of the process and method of funding. The second level relates to the value added elements from the common framework that the PPP provides. The third level is the direct impact from RTD outcomes of projects, e.g. use of new technologies, reduction of carbon emissions, cost savings, etc. These benefits will be realised in the medium term and they are articulated as aspirations in the project proposals. However, we will have to wait 3-4 years to quantify benefits for the industry and the EC economy from the collective activity (e.g. job creation, increase in GDP, etc.).

## 5.1. Method and process

There are a number of immediate benefits that became apparent short after the first round of calls:

- Rapid implementation
- 28% success rate
- 50% of partners from industry
- Over 24% of industrial partners were SMEs
- Less than one year from proposal to project start. (First Grant signed on 25 May 2010)
- Use of existing funding rules
- Technology scope of calls is closer to industry needs and more accessible for SMEs thanks to the roadmap

## 5.2. Common framework

The PPP instrument provides extra leverage for the EC and for businesses, establishes a common framework with highly committed stakeholders and it enables real multidisciplinary working bringing together different parts of the EC (NMP, ENV, ENERGY and INFSO).

It was widely recognised that the PPP has advantages when compared to usual FP7 route. The PPP agreement between industry and the EC represents a common path to achieving energy efficiency in Europe. Below are the key benefits that were identified at the workshop.

The PPP enables multidisciplinary working and brings together many different experts facilitating real open innovation. There is also scope to include end users, which is essential to introduce and embed innovations in the market.

There is an indicative budget for the next 4 years that will be allocated through a jointly developed roadmap. This ensures continuity and addresses the risk aversion culture of the industry. Calls are more construction focused and there is a more transparent strategy that allows long term planning in the sector.

## 5.3. Direct project impacts

The long term vision of the PPP is encouraging increased industrial investment in R&D. The PPP can also help companies in small countries access new technologies and provides SMEs opportunities for technology development funding.

Demonstrators will be one of the key tangible outputs from the PPP, they are instrumental in taking technologies to market and they are a great acceleration factor much welcomed by industry. There are expectations that the emphasis on demonstration actions will increase further down the line.

Knowledge transfer activities will be fundamental to translating project results into actions. Projects could also share their proposed approach to technology exploitation, whilst always being mindful of IPR issues. Feedback received after the workshop highlighted how projects should collaborate for knowledge creation but when there is competing IP, projects should compete in the market.

## 5.4. Indirect impacts

We will have to wait until the results of projects are available in 4 years time to start quantifying the long term real economic impact from the PPP. However today we can start focusing on some quick wins and impacts achieved by working together in the short term.

To link the PPP to the global innovation picture, we need to consider the contribution from Member States. The program approach and the time perspective make communication with stakeholders easier and more efficient. It gives the possibility for a stronger connection to national programs. Feedback from one of the Swedish partners highlighted that the EeB program is mirrored by a national program in Sweden which provides high leverage and stronger Swedish participation in Europe.

With the PPP we have moved from research projects to a research programme giving potential for more large scale impact. An EeB ecosystem is formed. As discussed, the PPP bridges activities between project teams' ambitious objectives and the Europe's ambitious environmental and socioeconomic agenda.
Joint dissemination of projects will be a key factor. The E2BA has a fundamental role in this respect in using existing dissemination platforms and envisaging new methods to reach a wider audience, not just politicians and the industry but also end users and the general population.

To achieve the objectives of the SET Plan, the 2020 Strategy and the Economic Recovery Plan, the PPP needs to link into other large scale interventions from the EC such as innovation partnerships like Smart Cities.

# 6. PPP beyond 2013

## 6.1. Continuation of the PPP

Throughout the day, attendees of the workshop strongly agreed on the need to continue the PPP as such or an enhanced form of it beyond 2013. Discussion focused around three main elements that justified this need:

Large scale and long term impact

- The PPP tool is essential if we are to achieve 2020 goals and recovery plan objectives on time
- R&D is the upstream answer to achieve energy efficiency
- Mechanisms that enable better supply chain collaboration are also required
- Further work is required to address city scale challenges. The current PPP will clearly not have scope to look at his topic by 2013
- Non technical elements such as behavioural changes, business models, standardisation challenges etc. will also need to be addressed to drive results to real implementation on a larger market place
- The industrial impact will clearly also depend on the non technology elements. Again this will also enable an effective transition to post 2013 initiatives.

Industry engagement

- The PPP provides a single voice for industry through having a group approach aligned with EC policy
- The PPP creates a forum and a platform for collaboration like no other existing mechanism
- The EC funding commitment and guarantee of continuity addresses the risk aversion from industry for investing in research
- Simplification of EU funding would be a key driver to improve industry engagement
- A balance is needed between large projects and small projects. Large projects with extensive involvement of stakeholders, like cities and regions will encourage further industry participation but often small projects provide more tangible results

Market uptake and technology implementation

- The PPP allows integration of the whole supply chain in projects facilitating future technology exploitation
- The PPP paves the way to take projects outcomes to market
- The PPP can facilitate dissemination of technologies and approaches closer to end users
- By having a long term platform, projects could be closely followed up after implementation to evaluate how they are fulfilling their technical and business objectives
- There are barriers that the PPP as a whole will need to address to promote market uptake of technologies. First is standardisation, as we are developing EU-wide technologies but servicing national markets. Second, strong political backing is needed so the right economic incentives are put in place at national level.

- To drive results from the EeB into real societal implementation a series of non-technology topics need to be addressed to make an innovation successful. Special attention needs to be given to Venture capital, public regulation / incentives to drive innovations “take –up”, behaviour change and societal acceptance
- The PPP could be the technology developer feeding the European Smart Cities innovation partnership

## 6.2. Roadmap beyond 2013

Most projects to date have been in retrofitting with the exception of one on demonstration of very low energy buildings. There are lots of demonstrators in Europe, but this is not sufficient as they are not taken to large scale deployment. We need to be more ambitious to make real impact.

At the workshop panellists highlighted some of the urgent research and innovation needs that have not been covered to date and may need to be addressed in future calls and beyond 2013.

- Business models for retrofitting (e.g.: new services including ESCO's)
- The continued strong effort needed to address the challenge of existing buildings
- More focus on energy neutral and energy positive buildings in the existing building stock
- End user behaviour analysis to promote technology adoption
- Pursue the district and urban dimension
- Energy efficiency and mobility
- Greening buildings and energy efficiency
- Work on materials and systems
- Design of smart city-ready buildings
- Ageing and accessibility
- Automation and control
- Industrialisation and mass customisation
- Diagnosis and predictive maintenance
- Whole life cycle of materials and components

Significant technology cost reduction

When we look further than 2013, the ultimate objective is to have a sustainable construction sector that considers not only environmental impact but also socioeconomic and cultural issues Europe has a tremendous and attractive cultural heritage assets which need a specific set of energy efficient solutions. Therefore issues around client and user needs and demands; Insurance and liability issues; Guarantees; Fiscal incentives need to be considered alongside more technical challenges.

To continue the build up of the roadmap, wide industry engagement and reflection of national priorities need to be considered. Industry will continue to engage if calls map well into the roadmap.

In other to select the right topics, key factors to consider are the generation of world class new knowledge and the potential for mass-deployment. Impact assessment and cost benefit analysis should also be key parts of the selection process. Further criteria could include fast technology transfer, ease of application and the potential for large scale deployment.

# 7. Conclusions

First hand evaluation of the PPP process for the calls in the 2010 and 2011 work programmes shows some evidence of the benefits of this mechanism when compared to business as usual FP7: high success rate, strong presence of SMEs, shorter time to approval and negotiation time, industry led projects, dialogue through the AIAG, long term roadmap developed with industry, predefined budget, etc.

The PPP also has a number of benefits derived from providing a common framework with committed stakeholders and it enables real multidisciplinary working bringing together different parts of the EC (NMP, ENV, ENERGY and INFSO).

By setting up clusters of projects the PPP could provide an environment for market transformation activities including training & skills, collection of best practice, standards set up, influencing legislation and incentive scheme development. This type of activity would create the right market conditions and a strong and innovative sector.

To make sure real impact is achieved, the continuation of the PPP will be fundamental. Also, other instruments in addition to RTD actions are required e.g. intervention of the European investment bank, new types of contracts, large scale demonstration, support actions to reinforce the activity, etc.

There are many benefits of the PPP that we can realise today, however, we will have to wait sometime to see other industry impacts such as safeguarding and job creation, public health, increased turnover, etc.

The multi annual roadmap of the EeB PPP has proven to be a reference point for industry and for national and even regional programmes. It has been a remarkable success, helping to focus on a common agenda. The roadmap is open and available for everybody, it ensures continuity of work and it encourages business to participate in the PPP knowing that it advices the EC on topics for future funding. There is a more transparent strategy that allows long term planning in the sector and increases R&D spend.

The PPP is at the moment a technology agent, however to ensure real industry implementation of research outcomes, the PPP needs to consider the challenges posed by regulation, standards, and the need to match supply and demand. The PPP therefore should aim to create a more holistic approach, filling the gap between technological and non-technological issues. Therefore, the roadmap should evolve and be adapted to consider a more holistic approach.

The following are a set of short and medium to long term recommendations for the EC and the E2BA. Some of these recommendations depend on the willingness of projects to cooperate.

| **Recommendations for 2011** | **Recommendations for 2012-2013 and beyond** |
|---|---|
| • Facilitate links between clusters of projects<br>• Ensure common dissemination of projects<br>• Link to network of national stakeholders<br>• Communicate a clear message of the benefits of engaging and dedicated activities for end users<br>• Gather information from all projects to | • Make sure that the PPP links to other relevant initiatives such as the future Smart Cities European Innovation Partnership<br>• Maintain the current multidisciplinary approach with multiple EC services effectively working together<br>• Launch activities aimed at addressing issues |

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|---|---|
| collect best practice<br>• Coordinate NLPs (National Liaison Points) with ERACOBUILD and equivalent in other Member States, to bring up national agendas and strengthen the network of national stakeholders<br>• Bring all PPP projects together regularly for exchange and networking. More time for networking on the info day or clustering exercises would be very well received.<br>• Encourage the presence of partners with expertise in market adoption and commercialisation of technology such as banks, investment funds, venture capital firms, etc.<br>• Consider funding of Coordination Support Actions (CSA) projects on: Analysing the synergies and potential for collaboration across EeB projects; Dissemination and exploitation following up the completion of a cluster of projects; Addressing barriers for implementation and developing action plans for mass-deployment | around standards and regulation<br>• Developing the roadmap further, breaking down topics, mapping barriers and implementation methods on a timeline<br>• Close collaboration between projects will ensure there is continuity and avoid the risk of losing IP and relationships when consortia break up.<br>• Consider bringing in end users to projects towards the middle or end of the project to take into consideration the different timescales for different stakeholders.<br>• Connect the PPP with DG Regio to access Structural Funds, as 4% of these funds can be spent on retrofitting.<br>• Address issues on habits & culture through geocluster focused activity. |

# Appendix 1 – Workshop Agenda

## Workshop
## Impact of the Energy-efficient Buildings PPP

**Thursday 25 November 2010**
Location: La Brasserie Van Maerlant
Rue Van Maerlant, 2; 1040 Brussels

**19:00-19:15** **Welcome address**
*Herbert von Bose, Director DG RTD Industrial Technologies*
*Manuela Soares, Director DG RTD Environment*

**19:15-21:30** **Networking dinner**

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**Friday 26 November 2010**
Location: European Commission
Berlaymont Building (Robert SCHUMAN Room)
Rue de la Loi, 200; 1040 Brussels

**8:30-9:00** **Registration**

***Chair: Christophe Lesniak, DG RTD***

**9:00-9:15** **Welcome and objectives of the workshop**
*José-Lorenzo Vallés, Head of Unit, DG RTD*

**9:15-9:30** **Impact expected of the EeB PPP**
*Stefano Carosio, co-chairman EeB Ad-Hoc Industrial Advisory Group*

**9:30-9:45** **Political context and assessment of the PPPs**
*Anne Mallaband, DG RTD*

**9:45-13:00** **Short presentations of the projects**
*Representatives of the projects participating*
(with coffee break at 11:00-11:15)

**13:00-14:00** **Lunch Break**

**14:00-15:00** **Panel discussion on the added value and overall impact of the EeB PPP**
*Ignacio Calvo, Acciona*
*Henk Miedema, TNO*
*Vladimir Gumilar, Construction Cluster of Slovenia*
*Bruno Smets, Philips Lighting*

**15:00-16:00** **Panel discussion on new inputs for a roadmap beyond 2013**
*Ger Spork, CEFIC*
*Tilmann Kuhn, Fraunhofer ISE*
*Paul Cartuyvels, Bouygues Construction*

**16:00-16:30** **Rapporteur's Summary & Conclusions**
*Marta Fernandez, ARUP*

# Appendix 2 – List of attendees

| Organisation | Name | Project Acronym |
|---|---|---|
| KERABEN GRUPO SA | Miguel Ángel BENGOCHEA ESCRIBANO | COOL-Coverings |
| D'APPOLONIA SPA | Antonio DE FERRARI | COOL-Coverings |
| DOW DEUTSCHLAND | Van-Chau VO | NANOFOAM |
| Dow Europe | Marco BARSACCHI | NANOFOAM |
| Kingspan Research and Developments Ltd | Adrian PARGETER | NANOINSULATE |
| Pera Innovation Ltd. | Mark PULLINGER | NANOINSULATE |
| ACCIONA INFRAESTRUCTURAS S.A. | Jose CUBILLO | NANOPCM |
| ACCIONA INFRAESTRUCTURAS S.A. | Marcel DIERSELHUIS | NANOPCM |
| TECNALIA | Maria MORAGUES | AEROCOINs |
| TWI LIMITED | Paola DE BONO | HIPIN |
| CYTEC | Ron SWART | HIPIN |
| MOSTOSTAL WARSZAWA SA | Juliusz ZACH | FC-DISTRICT |
| ECN | Frans KOENE | E-Hub |
| ECN | Henk KAAN | E-Hub |
| ACCIONA INFRAESTRUCTURAS S.A. | Javier GRÁVALOS MORENO | MESSIB |
| EBERHARD-KARLS-UNIVERSITAT TUEBINGEN | Udo WEIMAR | Clear-up |
| National Technical University of Athens | Maria TAXIARCHOU | H2SUSBUILD |
| Idrogen2 | Giacomo COPPO | H2SUSBUILD |
| FRAUNHOFER-GESELLSCHAFT | Tilmann KUHN | Cost-Effective |
| CSTB | Luc BOURDEAU | ERACOBUILD |
| D'APPOLONIA SPA | Christian MASTRODONATO | ICT 4 E2B Forum |
| MOSTOSTAL WARSZAWA SA | Piotr DYMARSKI | TIBUCON |
| STOCKHOLMS UNIVERSITET | Afzal SIDDIQUI | EnRiMa |
| Minerva Consulting & Communication Sprl | Monica JURADO MEJIAS | EnRiMa |
| D'APPOLONIA SPA | Thomas MESSERVEY | SPORTE2 |
| ISA | Carlos ROSARIO | SPORTE3 |
| TU DRESDEN | Raimar J. SCHERER | HESMOS |
| POLITECNICO DI TORINO | Enrico MACII | SEEMPubS |
| POLITECNICO DI TORINO | Anna OSELLO | SEEMPubS |
| NCC Construction Sverige AB | Christina CLAESON-JONSSON | E2ReBuild |
| ACCIONA INFRAESTRUCTURAS S.A. | Jesus Mª ISOIRD AURREKOETXEA | BEEMUP |
| FRAUNHOFER-GESELLSCHAFT | Heike ERHORN-KLUTTIG | School of the Future |
| EURAC | Alexandra TROI | 3ENCULT |
| ICLEI | Federica CITTADINO | 3ENCULT |
| ACCIONA | Ignacio CALVO | |
| AIDICO | Sergio MUÑOZ GÓMEZ | |
| ATOS | Ignacio SOLER | |
| BIC | Ake SKARENDAHL | |
| Bouygues Construction | Paul CARTUYVELS | |

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|---|---|---|
| BSRIA | Andrew EASTWELL | |
| Cecodhas | Carini PUYOL | |
| CIM-MES | Krysztof GRABOWIECKI | |
| ClimateWell | Mats FÄLLMAN | |
| CSTB | Alain ZARLI | |
| D'Appolonia | Stefano CAROSIO | |
| DELPHIS | Baptiste CAMUS | |
| Dragados | Miguel SEGARRA | |
| ECCREDI | Adrian JOYCE | |
| FCC Construcción | Francisco ESTEBAN LEFLER | |
| Lafarge | Pascal CASANOVA | |
| Mostostal | Juliusz ZACH | |
| NTUA | Ionnis PASPALIARIS | |
| Philips | Bruno SMETS | |
| Politecnico di Milano | Emilio PIZZI | |
| Royal BAM Group | Ger MAAS | |
| SOLINTEL | J. Antonio BARONA | |
| VTT | Markku VIRTANEN | |
| ZAG | Sabina JORDAN | |
| HTC | Nathalie PILAT detto BRAÏDA | |
| BBRI | Peter WOUTERS | |
| TNO | Henk MIEDEMA | |
| Construction Cluster of Slovenia | Vladimir GUMILAR | |
| Schneider Electric | Oscar NILSSON | |
| SAP | Maher CHEBBO | |
| CEFIC | Ger SPORK | |
| | | |
| European Commission | Herbert VON BOSE | |
| European Commission | Manuela SOARES | |
| European Commission | Lorenzo VALLES | |
| European Commission | Christophe LESNIAK | |
| European Commission | Andrea TILCHE | |
| European Commission | Patrice MILLET | |
| European Commission | Rogelio SEGOVIA | |
| European Commission | Patricia ARSENE | |
| European Commission | Merce GRIERA I FISA | |
| European Commission | Astrid BRANDT-GRAU | |
| European Commission | Milan GROHOL | |
| European Commission | Dominique PLANCHON | |
| European Commission | Alexandre d'ANGELO | |
| European Commission | Anne MALLABAND | |
| European Commission | Matthijs SOEDE | |
| European Commission | Raymond STERLING | |
| | | |
| ARUP | Marta FERNANDEZ | rapporteur |

# Appendix 3 – Projects presented at the workshop

| | Acronym | Full title project |
|---|---|---|
| Energy efficiency in buildings (demonstration) - ENERGY | | |
| 1 | BEEMUP | Building Energy Efficiency for Massive market Uptake |
| 2 | E2ReBuild | Industrialised energy efficient retrofitting of resident buildings in cold climates |
| 3 | School of the Future | School of the Future – Towards Zero Emission with High Performance Indoor Environment |
| Compatible solutions for improving the energy efficiency of historic buildings in urban areas | | |
| 4 | 3ENCULT | Efficient ENergy for EU Cultural Heritage |
| *ICT for energy-efficient buildings and spaces of public use* | | |
| 5 | ICT 4 E2B Forum | European stakeholders' forum crossing value and innovation chains to explore needs, challenges and opportunities in further research and integration of ICT systems for Energy Efficiency in Buildings |
| 6 | EnRiMa | Energy Efficiency and Risk Management in Public Buildings |
| 7 | SPORTE2 | Intelligent Management System to integrate and control energy generation, consumption and exchange for European Sport and Recreation Buildings |
| 8 | TIBUCON | Self Powered Wireless Sensor Network for HVAC System Energy Improvement - Towards Integral Building Connectivity |
| 9 | SEEMPubS | Smart Energy Efficient Middleware for Public Spaces |
| 10 | HESMOS | ICT Platform for Holistic Energy Efficiency Simulation and Lifecycle Management Of Public Use Facilities |
| New nanotechnology-based high performance insulation systems for energy efficiency – NMP | | |
| 11 | NANOINSULATE | Development of Nanotechnology-based High Performance Opaque & Transparent Insulation Systems and Biocide Formulations for Energy Efficient Buildings |
| 12 | NANOPCM | New Advanced iNsulatiOn Phase Change Materials |
| 13 | HIPIN | High Performance Insulation based on Nanostructure encapsulation of air |
| 14 | COOL-Coverings | Development of a novel and cost-effective range of nanotech improved coatings to substantially improve NIR (Near Infrared Reflective) properties of the building envelope |
| 15 | NANOFOAM | New NANO-technology based high performance insulation FOAM system for energy efficiency in buildings |
| 16 | AEROCOINs | Aerogel-Based Composite/Hybrid Nanomaterials for Cost-Effective Building Super-Insulation Systems |
| New technologies for energy efficiency at district level | | |
| 17 | FC-DISTRICT | New µ-CHP network technologies for energy efficient and sustainable districts |
| 18 | E-Hub | Energy-Hub for residential and commercial districts and transport |
| *PPP related FP7 projects* | | |
| 19 | Clear-up | Clean buildings along with resource efficiency enhancement using appropriate materials and technology |
| 20 | H2SUSBUILD | Development of a clean and energy self-sustained building in the vision of integrating H2 economy with renewable energy sources |
| 21 | MESSIB | Multi-source energy storage system integrated in buildings |
| 22 | Cost-Effective | Resource- and cost-effective integration of renewables in existing high-rise buildings |
| 23 | ERACOBUILD | Strategic networking of RDI programmes in construction and operation of buildings |

# Appendix 4 – Questions for the panel discussions

Members of each panel addressed questions 1 and 2 before the discussion was opened to the floor.

**Panel discussion 1**
**Added value and overall impact of the PPP**

1) As compared to FP7 business as usual, do you see clear advantages in the PPP approach for the private side? … And for the public side?
2) What specific differences from usual FP7 ways have you found useful?

3) Do you consider that the PPP approach contributes to higher leveraging of private funds for research in this area?
4) What could suggest that the present implementation (roadmap, projects, etc.) will help achieve the stated goals of the PPP?
5) How you consider that the PPP approach may help to reach a greater overall impact than just FP7 projects?
6) What is the impact of the PPP on achieving innovation?
7) What should be the interaction between different projects in this PPP?
8) How can we achieve broader dissemination & stakeholder participation?

**Panel discussion 2**
**Roadmap beyond 2013**

1) What would justify a continuation of this PPP beyond 2013?
2) What urgent research & innovation needs are not covered by the present roadmap or cannot be completely met by 2013?

3) What strategic research areas should be considered beyond 2013 to fulfil the long-term goals?
4) How could the PPP achieve a proper cross-over between the objectives of the Recovery Plan and those of the EU2020 Strategy?
5) Which criteria should be used to help identify the most suitable research areas in a roadmap for beyond 2013?
6) How could the PPP ensure the highest industrial impact beyond 2013?
7) What barriers need to be overcome to promote market uptake of technologies in this area?
8) How could the PPP contribute to a possible Innovation Partnership?