Information Days on the Research PPPs

Brussels, 16 December 2013

Parallel Session
Energy-efficient Buildings cPPP

Chair: Andrea Gentili
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Industrial Technologies
New Forms of Production
Application of the Technology Readiness Levels

Where a topic description refers to a TRL, the following definitions apply, unless otherwise specified:
- TRL 1 – basic principles observed
- TRL 2 – technology concept formulated
- TRL 3 – experimental proof of concept
- TRL 4 – technology validated in lab
- TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 7 – system prototype demonstration in operational environment
- TRL 8 – system complete and qualified
- TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)
## Types of action
(see the general annex for further information)

| Research and Innovation Actions (RIA) | Activities aiming to **establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution.**  
|  | They may include **basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment.**  
|  | Projects may contain closely connected but **limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment.**  
|  | Funding rate: **100%** |
| Innovation Actions (IA) | Activities directly aiming at **producing plans and arrangements or designs for new, altered or improved products, processes or services.** They may include **prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.**  
|  | Funding rate: **70%** (except for non-profit legal entities, where a rate of 100% applies) |
| Coordination and support actions (CSA) | Actions consisting primarily of **accompanying measures** such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructure and may also include complementary activities of strategic planning, networking and coordination between programmes in different countries.  
|  | Funding rate: **100%** |
EeB PPP in Work Programme 2014

**EeB 1 - 2014:** Materials for building envelope  
*Monique LEVY*

**EeB 2 - 2014:** Adaptable envelopes integrated in building refurbishment projects  
*Dominique PLANCHON*

**EeB 3 - 2014:** Development of new self-inspection techniques and quality check measures for efficient construction processes  
*Alexandre D'ANGELO*

**EeB 4 - 2014:** Support for the enhancement of the impact of EeB PPP projects  
*Claudia BOLDRINI*

**EE 1 – 2014:** Manufacturing of prefabricated modules for renovation of building  
*Paula REY GARCIA*

**EE 3 – 2014:** Energy strategies and solutions for deep renovation of Historic Buildings  
*Ekaterini HAMBOURI*
EeB PPP in Work Programme 2015

EeB 5 - 2015: Innovative design tools for refurbishment at building and district level

EeB 6 - 2015: Integrated solutions of thermal energy storage for building applications

EeB 7 - 2015: New tools and methodologies to reduce the gap between predicted and actual energy performances at the level of buildings and blocks of buildings

EeB 8 - 2015: Integrated approach to retrofitting of residential buildings

EE 2 – 2015: Buildings design for new highly energy performing buildings
EeB 1 -2014  Materials for building envelope

Specific Challenge:

- Embodied energy and CO2 in materials represent an increasingly high percentage of the energy spent in the whole life cycle of a building.
- Major need for new sustainable materials for building envelope, defined as the interface between the interior of the building and the outdoor environment, including walls, roofs and foundations.

Scope (1):

- Development of new materials and/or solutions for building envelope components with reduced embodied energy, lower CO2 emissions and improved insulation properties during operation.
- The new components may also contribute to improve indoor air quality.
- The proposed solutions should go well beyond the state of the art and take into account the final performance properties of the new materials and of the respective building components.
**EeB 1 -2014  Materials for building envelope**

*Scope (2)*

- Enhanced durability
- Respect of sustainability principles
- Application to both new build and renovation
- Lightweight construction and ease of installation
- Realistic solutions at a reasonable price
- Increased comfort and noise reduction
- Recycling/reuse of materials may also be addressed
- Standardisation aspects can be considered
- Proof of concept: one (or more) component(s)
- Information guides for applications, installation and training
- The participation of public authorities may be an asset.
- Funded projects will be expected to cluster with each other.
EeB 1 -2014 Materials for building envelope

*Expected Impacts:*

- Reduction by at least 30% of the embodied energy and CO2 at component level;
- Improvement by at least 20% of insulation properties;
- Reduction by at least 15% of the total costs compared to existing solutions;
- Demonstration of at least a 5% reduction of the energy spent during the whole life cycle of a building;
- Improvement of the quality of information from product manufacturers to facilitate better decision making;
- Strengthening of the competitiveness of the European construction sector in the field of “green” construction technologies.

**TRL 6+**

**IA 70%**
Adaptable envelopes integrated in building refurbishment projects

Specific Challenge:

- **Ground-breaking strategies** for reducing energy use and greenhouse gas emissions
- Envelope should become an **active element** of the building
- **Adaptable**: - accommodate future renovation or technology upgrades - respond to a dynamic and intricate environment by measuring and processing multi-source information

Scope (1):

Breakthrough and adaptable envelope solutions including:
- Advanced materials/technologies for energy generation and storage
- Flexible innovative precast solutions
- Ventilation control for energy recovery
- Air tightness
Adaptable envelopes integrated in building refurbishment projects

**Scope (2):**
- Better acoustic properties
- Higher fire resistance
- Intelligent blinds or movable sun barriers
- Enhance natural light use
- Sensing and control systems for the best real time performance
- Flexibility

**Expected Impact:**
- Primary energy consumption ↓ by factor 2 to 4
- Better indoor environment
- Demonstrated replicability in real case-study
- Return on investment < 7 years
- Validation/market uptake of active building elements
EeB 3 -2014 Development of new self-inspection techniques and quality check measures for efficient construction processes

Specific Challenge:

- Today: availability of better energy-efficient building components => their benefits must not be lost through lack of knowledge or bad implementation during the construction processes
- Self-inspection and quality checks are implemented to guarantee the final thermal, acoustic and energy performance.
- => Quality control is of utmost importance

Scope:

The research focus is on new self-inspection techniques and quality check measures for efficient construction processes enabled by portable and robust systems that can be easily handled in the construction site.
EeB 3 -2014

Development of new self-inspection techniques and quality check measures for efficient construction processes

Scope:
The solutions proposed should preferably be cost-effective and easy to use. They should be validated in a relevant construction environment. Execution details brought to the construction site are of paramount importance to improve the overall quality. Consideration of working environments in the construction sector, such as geographical dispersion and heterogeneity of subcontractors. A significant participation of SMEs with R&D capacities is encouraged.

Expected Impact:
- Guarantee final performance / increasing the efficiency, reliability and productivity
- Innovative techniques => for critical components
- Guidelines, methodologies / standardisation
- Reduce by at least 50% of the mismatch of energy performance
**EeB 4 - 2014** Support for the enhancement of the impact of EeB PPP projects

**Specific Challenge:**

- Maximize dissemination, technology transfer and exploitation of results of EeB projects.
- Clustering of project activities in order to facilitate market uptake and exploit synergies.
- Monitoring of activities to ensure the adequate implementation of the programme.

**Scope (1):**

- Enable clustering of activities of different EeB projects
- Explore recent technological developments in the area of the cluster
- Information collection from top-ranked experts aiming at the elaboration of future EeB priorities
EeB 4 -2014 Support for the enhancement of the impact of EeB PPP projects

*Expected Impact:*

- Speeding up industrial exploitation and take up of results of EeB PPP projects.
- Stimulation of networks and alliances for further RTD and industrial innovation, including the development and practical application of a clustering model.
- Additional added value beyond the original scope of the EeB PPP projects by exploiting synergies and sharing best practice. Increased public presence and awareness of EeB PPP activities.
- More effective execution of activities of common interest, such as training & education, IPR management and standardisation.
- Anticipation of business trends and market prospects.
EE 1 -2014  
Manufacturing of prefabricated modules for renovation of buildings

**Specific Challenge:**
Better performing prefabricated modules (e.g. reduced installation time, better performing products across whole life-cycle) & multi-functional modules and components

**Scope:**
Demonstration activities; prototypes and pilots in real industrial settings and SME participation would have clear added-value:
- Innovative mass manufacturing processes to lower costs and ease building integration (e.g. aesthetics, automation tools);
- Integrated processes and advanced computer based tools
- Use of recycled materials for prefabricated facade elements;
- Cost-optimality aspects for given building types and geo-clusters
EE 1 -2014

**Manufacturing of prefabricated modules for renovation of buildings**

*Scope:*
Mainly demonstration activities; prototypes and pilots in real industrial settings & SME participation added value

*Expected impact:*
- Reduction in total buildings (primary) energy consumption by at least a factor of 2 and improved cost-level
- Significant reduction of renovation operations & low intrusiveness and impacts for users
- Reduction installation time by at least 30%
- Better quality standard, performance & indoor air quality
- Demonstration of replicability potential; ROI <10yrs
- High-tech SMEs renovation with prefab modules; creation of high skills jobs
Energy strategies and solutions for deep renovation of Historic Buildings

Specific Challenge:

- Cultural heritage assets are being lost at an alarming rate and need safeguarding for the future,
- Important driver of societal cohesion, identity, well-being, sustainable growth and job creation through tourism etc.
- Historic buildings typically provide essential infrastructure in European cities but mostly need more energy efficient solutions for upgrading and adaptation,
- Historic buildings identified as priority in the EeB PPP Roadmap,
- Need eco-innovative solutions for deep renovation of historic buildings that preserve authenticity and integrity.
Energy strategies and solutions for deep renovation of Historic Buildings

What we mean by:

- **Historic buildings** (not rigid definition):
  - buildings of cultural, architectural and historic significance
  - built prior to the middle of the last century

- **Holistic renovation:**
  - all refurbishment possibilities at building level together with
    - opportunities at district level
    - e.g. biomass, geothermal, district heating, etc.

- **Deep renovation:**
  - refurbishment that reduces both the delivered and the final energy consumption of a building by a significant percentage compared with the pre-renovation levels (Cf Directive 2012/27/EU on Energy Efficiency)
EE 3 -2014

Energy strategies and solutions for deep renovation of Historic Buildings

**Scope:**

- Innovative energy and environmental assessment methodologies,
- Tools for planning and implementing renovation of historic buildings,
- Monitoring and control technologies and systems,
- Non-invasive and non-destructive methods of surveying and diagnosis,
- Appropriate standards and information management for building maintenance,
- Replicability potential of the solutions developed,
- Interdisciplinary approach.
Energy strategies and solutions for deep renovation of Historic Buildings

Expected Impact:

• Optimised design and implementation of renovation projects at both building and district level,
• Provision of effective guidelines,
• Contribution to standardisation activities,
• Support to the implementation of the roadmap of the EeB PPP.

TRL 4-6
RIA 100%
For further Information ...


- **Information on the Research PPPs:** [http://ec.europa.eu/research/industrial_technologies](http://ec.europa.eu/research/industrial_technologies)
Questions

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Thank you for your attention!