EeB PPP Project Review

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Energy Efficient Buildings PPP

Shape
EU-wide Public-Private-Partnership
Large scale research (80%) and demonstration (20%) program
Driven by the industry grouped in E2B Association

Size
Aspiration: €2 billion over 10 years
Commitment: €500m from 2010-2013 from president Barroso

Remit
Reduce energy consumption and CO2 emissions
Improve EU energy independence

www.e2b-ei.eu
## Benefits of the PPP – Method

<table>
<thead>
<tr>
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<th>July 2009, €65m</th>
<th>July 2010, €85m</th>
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<tbody>
<tr>
<td><strong>Success rate:</strong></td>
<td>28%</td>
<td>20%</td>
</tr>
<tr>
<td>17 funded of 60</td>
<td></td>
<td>24 funded of 120</td>
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<td><strong>Share by Org. Type:</strong></td>
<td></td>
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<tr>
<td>- Higher Education:</td>
<td>18%</td>
<td>15%</td>
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<tr>
<td>- Private for Profit:</td>
<td>48%</td>
<td>53%</td>
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<tr>
<td>- Research Org.:</td>
<td>26%</td>
<td>24%</td>
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<tr>
<td><strong>Share of Funding of SMEs:</strong></td>
<td>24%</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Countries of funded partners:</strong></td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td><strong>Rapid implementation:</strong></td>
<td>&lt;1 year start</td>
<td></td>
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<tr>
<td><strong>Known rules</strong></td>
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Benefits of the PPP – Framework

- Common framework for multidisciplinary working
- High commitment from stakeholders
- Indicative budget ensures continuity
- Focused activity allows long term planning
Benefits of the PPP – Direct impact

- Increase industrial investment in R&D
- **Companies in small countries** access new technologies
- Knowledge base for SMEs
- Demonstrators – acceleration factor

Pictures from COOL-Coverings

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Benefits of the PPP - Indirect impact

Job creation
Economic impact

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EeB PPP Project Review

FP7-funded projects under the first call

JULY 2011
Demonstration of Energy Efficiency in Buildings
- Building Energy Efficiency for Massive Market Uptake
- Industrialised Energy Efficient Retrofitting of Residential Buildings in Cold Climates
- School of the Future: Towards Zero Emission with High Performance Indoor Environment

Improving the Energy Efficiency of Historic Buildings in Urban Areas
- Efficient Energy for Cultural Heritage

ICT for Energy-efficient Buildings and Spaces of Public Use
- ICT4E2B Forum
- Energy Efficiency and Risk Management in Public Buildings
- Energy Efficiency for European Sport Facilities
- Self Powered Wireless Sensor Network for HVAC System Energy Improvement
- Smart Energy Efficient Middleware for Public Spaces
- ICT Platform for Holistic Energy Efficiency Simulation and Lifecycle Management

New Nanotechnology-based High Performance Insulation Systems
- Development of Nanotechnology-based Insulation Systems
- New Advanced Insulation Phase Change Materials
- Development of a Novel Cost-effective Nanotech Coatings
- New NANO-technology Based High Performance Insulation Foam System
- Aerogel Based Composite Nanomaterials for Cost-effective Building

New Technologies for Energy Efficiency at District Level
- New \( \mu \)-CHP Network Technologies for Energy Efficient and Sustainable Districts
- Energy-Hub for Residential and Commercial Districts and Transport

PPP Related FP7 Projects
- Clean and Resource Efficient Buildings for Real Life
- Development of a Clean and Energy Self-sustained Building
- Multi-source Energy Storage System Integrated in Buildings
- Resource and Cost-effective Integration of Renewables in Existing High-rise Buildings
- Strategic Networking of RDI Programmes in Construction and Operation of Buildings
Building Energy Efficiency for Massive Market Uptake

Beem-Up will demonstrate the economic, social and technical feasibility of retrofitting to drastically reduce energy consumption in existing buildings, and lay the ground for market uptake. The project aims to improve energy efficiency in existing buildings, obtaining better indoor comfort conditions.

Coordinator: Acciona, Spain
Start date: January 2011
Duration: 48 months
Total budget: 7.6m euros

- Develop cost-effective, high performance renovation of existing residential buildings, reducing energy consumption
- Ensure a comfortable and healthy living environment and favour the integration of renewable energy
- Input on key expertise to implement innovative building and energy management

Call: Demonstration of Energy Efficiency in Buildings
Industrialised Energy Efficient Retrofitting of Residential Buildings in Cold Climates

E2ReBuild aims to transform the retrofitting construction sector from resource based construction towards an innovative, high-tech, energy-efficient industrialised sector. In this project, new retrofit solutions in planning, design, technology, construction, operation and use of buildings are implemented and evaluated.

Coordinator: NCC AB, Sweden
Start date: January 2011
Duration: 42 months
Total budget: 8m euros

• Industrialised energy efficient retrofitting of residential buildings in cold climates
• Demonstrations represent typical building typologies from the period 1946-1980 time, creating attractive environments
• Solutions are demonstrated in 7 projects in Finland, Sweden, the Netherlands, France, Germany and the UK

Call: Demonstration of Energy Efficiency in Buildings
School of the Future: Towards Zero Emission with High Performance Indoor Environment

This project aims to design good examples of future high performance buildings. The indoor environment performance of the demonstration buildings in different European climates will be greatly improved due to holistic retrofits of the building envelope, service systems, integration of renewables and management systems.

Coordinator: Fraunhofer-IBP, Germany
Start date: February 2011
Duration: 60 months
Total budget: 4.9m euros

- 100% carbon-free school building setting the standard for the future with improved Indoor environment quality
- Demonstration that big energy savings can be achieved with limited additional costs (<100 €/m²)
- Development of European benchmarking, including innovative, cost-efficient energy retrofit strategies for the future

Call: Demonstration of Energy Efficiency in Buildings
Efficient Energy for Cultural Heritage

This Project bridges the gap between conservation of historic buildings and climate protection. Historic buildings will only survive if maintained as a living space. Energy efficient retrofit is important for structural protection in heritage buildings but retrofitting can also improve the comfort of the building.

Coordinator: EURAC Research, Italy
Start date: October 2010
Duration: 42 months
Total budget: 6.6m euros

- Bridging the gap between conservation and climate protection
- Develop criteria for the assessment of energy-efficiency measures regarding their conservation-compatibility
- Examine passive and active energy-retrofit solutions, looking at 8 case studies

Call: Improving the Energy Efficiency of Historic Buildings in Urban Areas
This Project aims to bring together relevant stakeholders involved in ICT systems and solutions for Energy Efficiency in Buildings. Our community looks to identify and review the needs of ICT and Construction. It will also look at implementation of innovative solutions, sharing of best practices and roadmap results.

Coordinator: D’Appolonia, Italy
Start date: September 2010
Duration: 26 months
Total budget: 1.4m euros

- Create a dynamic community representing both ICT, construction and energy players
- Allow public stakeholders to validate future needs and identify development routes for research and innovation
- A validated technology roadmap will be delivered on ICT for energy-efficient buildings

Call: ICT for Energy-efficient Buildings and Spaces of Public Use
Deregulation of energy sectors provides challenges and opportunities alike for operators of public buildings. Energy prices and CO₂ emission restrictions create incentives to adopt more energy-efficient technologies. Market and technological uncertainty necessitate decision support for risk management.

Coordinator: Afzal Siddiqui, UK
Start date: October 2010
Duration: 42 months
Total budget: 3.4m euros

- Aid the need for energy-efficient, cost effective public buildings via an optimisation-based Decision Support System
- Enhance the methodology for modeling energy flows in buildings with advances in efficient management of uncertainty
- Enable long-term planning, specifically analysis of retrofits and/or expansion of on-site energy sub-systems

Call: ICT for Energy-efficient Buildings and Spaces of Public Use
Energy Efficiency for European Sport Facilities

This Project challenges the world of sport facilities to improve their energy efficiency. Through the development of optimisation strategies, smart metering, integrated control system, and intelligent control strategies dedicated to sport facilities, to deliver energy savings with a return on investment of 5 years.

Coordinator: D’Appolonia, Italy
Start date: September 2010
Duration: 36 months
Total budget: 4.7m euros

- Dedicated solutions for sports facilities to target 30% reduction in energy consumption and CO2 emissions
- Develop, integrate, test (KUBIK), and validate in 3 Pilot Locations 4 scalable modules
- Deliver smart metering, integrated control, intelligent optimal decision making, and a multi facility management portal

Call: ICT for Energy-efficient Buildings and Spaces of Public Use
Self Powered Wireless Sensor Network for HVAC System Energy Improvement

The project examines the concept that knowledge of current building conditions can lead to decision making and control strategies. Gathering this data is expensive due to the cost of installation and maintenance of sensors. TIBUCON proposes a cheaper solution based on Self Powered Multi Magnitude Wireless Sensor Networks.

Coordinator: Mostostal Warszawa, Poland
Start date: September 2010
Duration: 36 months
Total budget: 2.4m euros

- Use of SP.MM.WSN to set a maintenance free building monitoring system for HVAC installations
- The solution is suitable for new and existing buildings
- System will be tested in the office building in Poland and in 4 different residential buildings in Spain
Smart Energy Efficient Middleware for Public Spaces

This project aims to address the reduction of energy usage and CO₂ footprint in existing public buildings and spaces without significant construction works, by an intelligent ICT-based service monitoring and by managing the energy consumption. Focus will be historical buildings in order to avoid damage by extensive retrofitting.

Coordinator: Politecnico di Torini, Italy
Start date: September 2010
Duration: 36 months
Total budget: 2.9m euros

• Reduce energy usage and CO₂ usage in existing public buildings without significant construction works
• Real-time monitoring of dynamic sensor data and control of operation of both passive and active environmental systems
• Decision makers and building administrators are in control to optimise energy efficiency in existing buildings through ICT

Call: ICT for Energy-efficient Buildings and Spaces of Public Use
HESMOS will achieve an industry-driven holistic approach for sustainable optimisation of energy performance and CO₂ emissions through integrated design and simulation. Fragmented existing intelligent building data will be linked to complete a complex lifecycle simulation in phases with potential for large savings.

**Coordinator:** Technische Universität Dresden – Institute of Construction Informatics, Germany

**Start date:** September 2010

**Duration:** 36 months

**Total budget:** 4.6m euros

- Provide advanced simulation capabilities to decision makers in the whole life-cycle of buildings
- Integrate a Virtual Laboratory to connect CAD and energy efficiency tools in order to enhance building industry efficiency
- Close the gap between Building Information Modeling (BIM) and Building Automation Systems (BAS)

**Call:** ICT for Energy-efficient Buildings and Spaces of Public Use
Development of Nanotechnology-based Insulation Systems

NanolInsulate will develop durable, robust, cost-effective opaque and transparent vacuum insulation panels (VIPs). VIPs will incorporate new nanotechnology-based core materials, such as nanofoams and aerogel composites and high-barrier films, resulting in panels that are up to four times more energy efficient.

Coordinator: KINGSPAN, Ireland
Start date: July 2010
Duration: 48 months
Total budget: 6m euros

- VIPs incorporate new nanotechnology-based core materials and high-barrier films
- Providing product lifetimes in excess of 50 years suitable for a variety of new-build and retrofit applications.
- Reduce manufacturing costs to below 50% of current costs

Call: New Nanotechnology-based High Performance Insulation Systems
New Advanced Insulation
Phase Change Materials

Thermal insulation is one of the key solutions in reducing energy consumption. The NANOPCM project gives an innovative and highly technical, cost effective solution to increasing the thermal inertia of the envelope without increasing either the mass or the space.

Coordinator: Acciona, Spain
Start date: June 2010
Duration: 36 months
Total budget: 3.5m euros

- Development, production and demonstration of low cost and improved Phase Change Materials (PCMs) for new high performance insulation components in existing buildings
- Demonstrate the viability of production of the new materials at pilot plant scale
- Evaluate the performance of the developed materials in existing buildings

Call: New Nanotechnology-based High Performance Insulation Systems
Development of a Novel Cost-effective Nanotech Coatings

COOL-Coverings addresses an integrated envelope strategy, developing a novel and cost-effective range of nanotechnology improved coatings. The Project aims to reduce heat transfer to indoor spaces by developing high Near Infrared Reflecting nanomaterials for envelope application.

Coordinator: Keraben, Spain
Start date: June 2010
Duration: 36 months
Total budget: 3m euros

- High NIR-reflective paint membranes and tiles for outdoor application based in inorganic nanostructured materials
- Manufactured and installed using conventional technologies
- Applicable to new and existing buildings

Call: New Nanotechnology-based High Performance Insulation Systems
New NANO-technology Based High Performance Insulation Foam System

Nanofoam project aims at developing novel nanotechnology-based high performance insulation systems to improve energy efficiency of new and existing buildings.

Coordinator: DOW Europe, Switzerland
Start date: In negotiation
Duration: 36 months
Total budget: 3.3m euros

- Develop an innovative high-performing nanostructured thermoplastic foam, employing a low GWP blowing agent
- Lower thermal conductivity than commercial insulation products at a competitive price
- Meets European building code requirements, mechanical, fire resistance, moisture/fungi resistance

Call: New Nanotechnology-based High Performance Insulation Systems
AEROCOINs proposes to create a new superinsulating material by overcoming two major obstacles which have prevented a wide spread use of silica-based aerogel super-insulation components in the building envelope. These obstacles are the mechanical weakness of silica aerogels and its high cost.

Coordinator: Tecnalia, Spain
Start date: June 2011
Duration: 48 months
Total budget: 4.3m euros

- Superinsulating silica aerogel-based materials
- Demonstrate performance of insulating components with potential cost savings of up to €30,000m/year in energy
- Reduction of 30% of overall energy consumption and 25% of CO₂ emissions

Call: New Nanotechnology-based High Performance Insulation Systems
New μ-CHP Network Technologies for Energy Efficient and Sustainable Districts

The Projects optimises and implements an innovative energy production and distribution concept for sustainable and energy efficient districts. The concept is based on dynamic heat exchange between buildings exploiting a micro-combined heat and power solid oxide fuel cell system for energy production.

Coordinator: Mostostal Warszarwa, Poland
Start date: September 2010
Duration: 48 months
Total budget: 11.8m euros

• Create new micro-CHP network technologies for energy efficient and sustainable districts
• Advanced district heating piping, biogas production from food wastes, smart control and hybrid wireless network systems
• Optimise thermal power management at building and district level via dynamic heat exchange between buildings

Call: New Technologies for Energy Efficiency at District Level
Energy-Hub for Residential and Commercial Districts and Transport

A new type of energy infrastructure for a district including an advanced system for matching supply and demand of energy (heat, cold and power) and incorporating advanced heat storage technologies such as Thermo Chemical Materials. Full-scale demonstration of the technology is to be used in the district of Tweewaters, Belgium.

Coordinator: TNO, Netherlands
Start date: December 2010
Duration: 48 months
Total budget: 11.7m euros

- Smart grid type of energy infrastructure, based on matching supply and demand of heat, cold and electricity
- Development of compact heat storage technologies, in particular based on Thermo Chemical Materials
- Application of innovative business models

Call: New Technologies for Energy Efficiency at District Level
Clean and Resource Efficient Buildings for Real Life

The Project aims to create a good indoor environment in buildings whilst reducing operational energy use. Development and novel use of nano-materials and new control algorithms improve the energy performance of windows, building envelopes, air handling, heating, ventilation and lighting systems, and provide improved indoor environment.

Coordinator: Eberhard, Karls University of Tübingen, Germany
Start date: November 2008
Duration: 48 months
Total budget: 12m euros

• Integration of nano and micro technology-enabled components in a holistic approach
• Development of new building control strategies integrating active and passive elements
• Tests in laboratory, simulated test rooms, real-life test beds, and building demonstrators for new and existing buildings
Development of a Clean and Energy Self-sustained Building

The project aims to develop an intelligent, self-sustained and zero CO₂ emission hybrid energy system to cover electric, heating and cooling loads in buildings. Primary energy is harvested using renewable energy sources, while excess energy is converted into hydrogen to be used as an energy storage medium.

Coordinator: D’Appolonia, Italy
Start date: October 2008
Duration: 48 months
Total budget: 9.9m euros

- Industry-driven initiative aimed at demonstrating the application of a hybrid energy system which integrates RES and uses hydrogen storage
- Hydrogen is reconverted into electricity upon demand
- Examine the technical feasibility including safety
The objective of the project is the development, evaluation and demonstration of an affordable Multi-source Energy Storage System Integrated in Buildings, based on new materials, technologies and control systems. This will result in a significant reduction of energy consumption and active management of the building demand.

Coordinator: Acciona, Spain  
Start date: March 2009  
Duration: 48 months  
Total budget: 6m euros

- Development and demonstration of an affordable multi-source energy storage system (MESS) integrated into the building
- Energy storage results in significant reduction of the buildings energy consumption and management of energy demand
- Utilities must produce an amount of energy greater than the demand in order to guarantee a safe energy supply

Call: PPP Related FP7 Projects
Resource and Cost Effective Integration of Renewables in Existing High-rise Buildings

The Cost Effective project aims to develop the concepts and components to convert the façades of existing high-rise buildings into multifunctional, energy gaining components. These will have a substantial effect on the energy conservation potential in the EU25 and the consequent CO₂ mitigation.

Coordinator: Fraunhofer ISE, Germany
Start date: October 2008
Duration: 48 months
Total budget: 10.7m euros

- In existing high rise buildings both the façade and roof need to be used in renewable energy conversion to meet demand
- Convert façades of existing buildings into multifunctional, energy-gaining components
- Transparent solar thermal façade to provide solar heat, protection against overheating, and glare protection

Call: PPP Related FP7 Projects
Strategic Networking of RDI Programmes in Construction and Operation of Buildings

Eracobuild is a major tool to help national programme owners from 22 Member States cooperate in increasing the sustainability of the built environment and the value of buildings for citizens. It contributes to the development of Research Development and Innovation (RDI) of the European Research Area.

Coordinator: CSTB on behalf of MEDDTL, France

Start date: November 2008

Duration: 36 months

Total budget: 2.3m euros

- ERABUILD and Eracobuild have issued 3 joint calls for tenders and 6 joint calls for proposals
- The project has supported more than 20 research projects jointly funded by several Members States
- Eracobuild represents national and regional funding programmes for research related to construction and operation of buildings

Call: PPP Related FP7 Projects
Thank you