Energy-efficient Buildings (EeB)

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DG Research and Innovation

Lisboa, 19th of September 2014

HORIZON 2020

European Commission

Rationale of the EeB PPP

- **The construction sector is the largest EU single activity (€1,2 trillion, 9.6% of GDP) and biggest industrial employer (14,6 million direct jobs).**
- **The sector is highly fragmented and 95% of the 3,1 million enterprises (EU-27) are SMEs. Turnover has decreased significantly during the crisis.**
- **Buildings account for 40 % of total energy use and 1/3 of Greenhouse Gases in Europe.**
- **Very low replacement rate of the existing stock (1-2% per year)**

European Commission

Rationale of the EeB PPP

- **Energy-efficient solutions are found at present too expensive by homeowners. Novel approaches can be optimised with research at EU scale.**
- **Renovation technologies offering energy savings would also foster new jobs**
- **Energy efficiency in the built environment cannot be solved on a Member State scale: novel technologies and systemic solutions are needed, which are optimised leveraging on research at EU scale, but customised at local scale**

http://www.e2b-ei.eu/default.php

European Commission

E2B Energy Efficient Buildings

International Non for Profit Industrial Association: E2B Association

NAVIGATION

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Climate change is a reality, which is altering the world around us. Urgent action needs to be taken now.

The construction industry is a large contributor to CO2 emissions, with buildings responsible for 40% of the total European energy consumption and a third of CO2 emissions. To help address climate change the European Commission has set specific targets to be achieved by 2020, known as the 20/20 targets. These targets are to reduce energy consumption by 20%, reduce CO2 emissions by 20% and provide 20% of the total energy share with renewable energy.

In order to help the construction industry reach the 20/20 targets and achieve energy neutral buildings and districts by 2050 **the European Construction Technology Platform has set up the Energy Efficient Building European Initiative (E2B EI), steered by the Energy Efficient Buildings Association (E2BA)** founded in November 2008.

This is a Europe wide industry driven research and demonstration programme for energy efficient buildings and districts, with the ambitious vision that all European buildings will be designed, built or renovated to high energy efficiency standards by 2050.

Last News

http://www.e2b-ei.eu/default.php

" A " members: Industrial members

ACCIONA	Large: Turnover > 400 M€	www.acciona.es
AGC GLASS EUROPE	Large: Turnover > 400 M€	
ARUP	Large: Turnover M€	
BOUYGUES CONSTRUCTION	Large: Turnover M€	
CEFIC	Association	
CIE SPA	Large: Turnover M€	
COMSA EMTE	Large: Turnover M€	
D'APPOLONIA	Large: Turnover M€	
DRAGADOS	Large: Turnover M€	
EDF	Large: Turnover M€	
FCC	Large: Turnover M€	www.fcc.es
FERROVIAL-AGROMAN	Large: Turnover > 400 M€	www.ferrovial

" B " members: Research Organisations

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY	Small & medium RTD	www.ait.ac.at
ASCAMM		
BBRI		
BPIE		
BUILD.AAU, AALBORG UNIVERSITY		
CARTIF		
CBI		
CEA LIST		

" C " members: SMEs

ACE	SME	www.ace-cae.eu
ACTIVE SPACE TECHNOLOGIES	SME	www.activespacetech.com
AIC ASTURIAS	SME Association	www.aicasturias.es
AMSOLUTIONS	SME	www.amsolutions.gr
ASM	SME	www.asm-poland.com.pl
B&W	SME	www.baxwillems.eu
CEMOSA	SME	www.cemosa.es

" D " members: Public Promoters and Agencies

CECODHAS	Public Promoter	www.cecodhas.org
CENTROHABITAT	Public Promoter	www.centrohabitat.net
CNEES	Public Promoter	www.cnees.fr
GREENOVATE! EUROPE	Public Promoter	www.greenovate-europe.eu
POLE ALSACE ENERGIVIE	Public Promoter	pole.energivie.eu
SUSTAINABLE ENERGY IRELAND	Public Promoter	www.sei.ie
VISESA	Public Promoter	www.visesa.com

Research and Innovation

The EeB Roadmap

- Part1: Vision
  - An innovative high-tech energy-efficient European Construction industry (regarding buildings and districts)
- Part 2: Research and Innovation Strategy
  - Main drivers: Design, Structure, Envelope, Energy equipment, Construction Process, Performance Monitoring, Building's end of life, Cross-cutting challenges and integration along the value chain
- Part 3: Expected Impacts
  - Reduce by 2020 energy use by 50% compared to 2010 levels
  - Adequate rate of renovation: ideally up to a yearly 4% of the foreseen 2020 building stock
  - Leveraging additional investments (factor 4 or higher)

Call 2014

European Commission

- *EeB-01-2014 Materials for building envelop –Innovation Action*

- *EeB-02-2014 Adaptable envelopes integrated in building refurbishment projects – Research and Innovation Action*

- *EeB-03-2014 Development of new self-inspection techniques and quality check methodologies for efficient construction processes – Research and Innovation Actions*

- *EeB-04-2014 Support for the enhancement of the impact of EeB projects - Coordination and Support Actions*

Call 2015

European Commission

- *EeB-05-2015 Innovative design tools for refurbishement at buildings and district level –Innovation Actions*

- *EeB-06-2015 Integrated solutions of thermal energy storage for building applications– Research and Innovation Action*

- *EeB-07-2015 New tools and methodologies to reduce the gap between predicted and actual energy performances at the level of buildings and blocks of buildings –Innovation Actions*

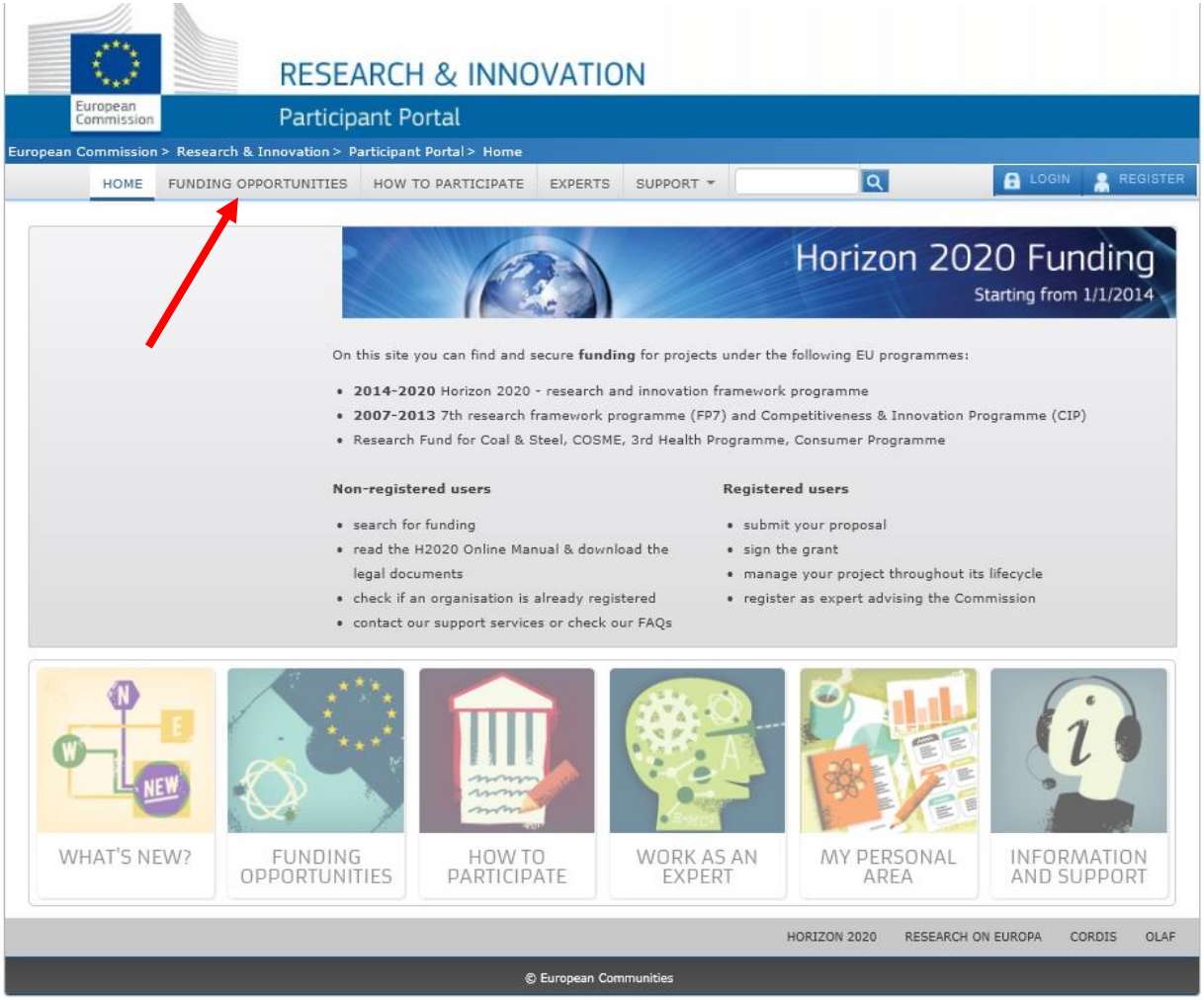
- *EeB-08-2015 Integrated approach to retrofitting of residential buildings - Innovation Actions*

- *EE 2 – 2015 Buildings design for new highly energy performing buildings – Innovation Actions*

Call 2015

European Commission

http://ec.europa.eu/research/participants/portal/desktop/en/home.html



Call 2015

Horizon 2020
- Search Topics
- Calls
- Call Updates

Other EU Programmes 2014-2020
- Research Fund for Coal & Steel
- COSME
- 3rd Health Programme
- Consumer Programme

FP7 & CIP Programmes 2007-2013
- Calls
- Call Updates

Other Funding Opportunities

6 Results

Keyword Search: EeB SEARCH

If you don't find your topic, you can also use the **free text search**.

Status: Open / Closed / Forthcoming

Sort by: Title / Call Id / Publication Date / Deadline Date

Topic: Buildings design for new highly energy performing buildings:EE-02-2015
Specific Challenge: By the end of 2020 (2018 for buildings occupied and owned by public

Call title: Energy Efficiency - PPP EeB and SPIRE topics
Call identifier: H2020-EE-2015-1-PPP
Status: Forthcoming
Deadline: 04-02-2015

Topic: Innovative design tools for refurbishing of buildings at district level:EeB-05-2015
Specific challenge: The development of sustainable solutions for refurbishment of buildings and

Call title: Call for Energy-efficient Buildings
Call identifier: H2020-EeB-2015
Status: Forthcoming
Deadline: 04-02-2015

Topic: Integrated approach to retrofitting of residential buildings:EeB-08-2015
Specific challenge: Europe is facing the challenge of deep rehabilitation of residential buildings

Call title: Call for Energy-efficient Buildings
Call identifier: H2020-EeB-2015
Status: Forthcoming
Deadline: 04-02-2015

Topic: Integrated solutions of thermal energy storage for building applications:EeB-06-2015
Specific challenge: Storage plays a pivotal role in synchronising energy demand and supply, both

Call title: Call for Energy-efficient Buildings
Call identifier: H2020-EeB-2015
Status: Forthcoming
Deadline: 04-02-2015

Topic: New technologies for utilization of heat recovery in large industrial systems, considering the whole energy cycle from heat production to transformation, delivery and end use:EE-18-2015
Specific challenge: Heat recovery represents an important and unexplored opportunity for reducing

Call title: Energy Efficiency - PPP EeB and SPIRE topics
Call identifier: H2020-EE-2015-1-PPP
Status: Forthcoming
Deadline: 04-02-2015

European Commission

Call for Energy-efficient Buildings

H2020-EeB-2015 | Sub call of: H2020-EeB-2014-2015

Planned Opening date	22-10-2014		
Publication date	11-12-2013	**Deadline Date**	04-02-2015 17:00:00 (Brussels local time)
Total Call Budget	€62,480,000	**Main Pillar**	Industrial Leadership
Status	Forthcoming	**OJ reference**	OJ C 361 of 11 December 2013

Topic: Integrated solutions of thermal energy storage for building applications — EeB-06-2015

Topic Description | Topic Conditions & Documents | Submission Service

Specific challenge: Storage plays a pivotal role in synchronising energy demand and supply, both on a short and long term (seasonal) basis. Transformation of our existing building stock towards very low energy buildings and nearly zero energy and Plus-energy buildings requires effective integration and full use of the potential yield of renewable energy. Thermal storage is a key priority to make such a step, particularly considering the energy renovation of the existing stock, where compact building level solutions are required.

Scope: Proposals should address advanced solutions required to reduce thermal losses, reduce pressure drops, and improve heat exchange in and between storage material and heat carrier. Having in mind a system approach, innovations are required at different levels. High energy density storage materials are needed in terms of long term multi-cyclic stability at tuneable temperature levels. These advanced energy storage materials should allow regeneration temperatures in a range below 100ºC to enable a higher efficiency and effectiveness of thermal energy storage of at least 6 times the energy storage density of water. Furthermore, an additional innovation may concern storage reactor components, in particular the heat exchanger. With respect to the entire storage system, advanced energy management is needed, including smart algorithms for (dis)charging at different temperatures, and simple and robust control equipment. These storage solutions should be enabled by material innovations that are safe and environmentally friendly.

Small scale demonstration of the technical (with compactness as a crucial boundary condition) and economic feasibility of such storage systems at the level of components and systems in relation to space heating and cooling and/or domestic hot water systems of a single building are expected, validating a systemic approach in system integration and scalability in near real life operating conditions.

For this topic, proposals should include an outline of the initial exploitation and business plans, which will be developed further in the proposal project.

Call 2015

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EeB-06-2015

Integrated solutions of thermal energy storage for building applications

Specific challenge: *need to synchronise energy demand and supply (short and long term); full use of renewable energy; compact building level solutions are required;…*

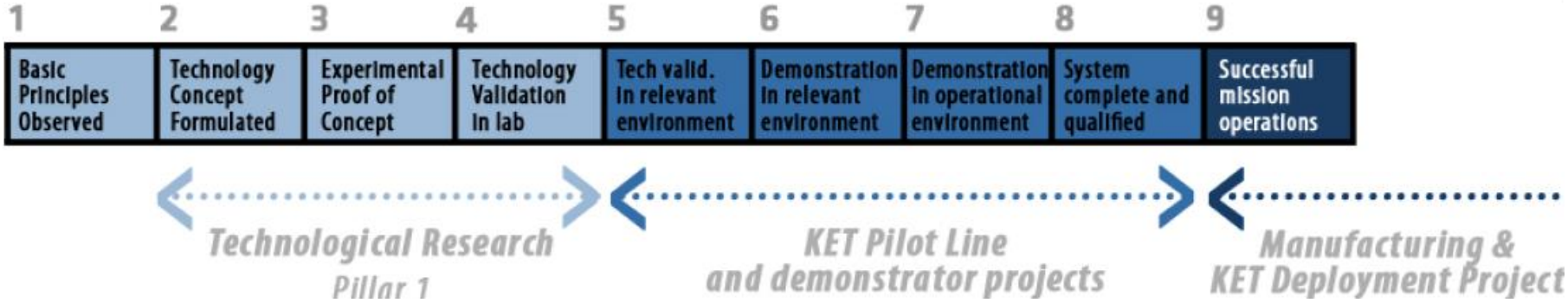
Scope: *proposals should address solutions to reduce thermal losses, reduce pressure drop and improve heat exchange; high energy density storage materials are needed; tuneable temperature levels; advanced energy management is needed including smart algorithms; simple and robust control equipment; storage solution should be safe and environmentally friendly; need for initial exploitation and business plans; 3-6 M€;…*

Expected Impact: *comparison with existing solutions; performance in multi-cyclic seasonal use for at least 20 years; reduction of the energy consumption by at least 15%; return on investment below 10 years;….*

Type of Action: *Research and Innovation action*

European Commission

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 (industrial relevant environment for KETs)
TRL 6 – technology demonstrated in relevant environment (industrial for KETs)
TRL 7 – system prototype demonstration in operational environment
TRL 8 – system complete and qualified
TRL 9 – actual system proven in operational environment (competitive manufacturing for KETs)

European Commission

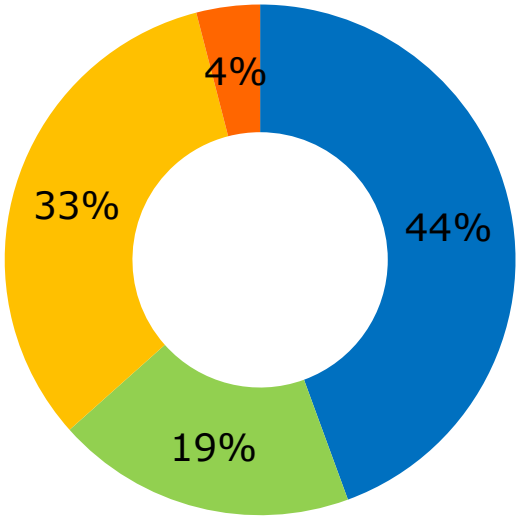
Particularities of the PPP calls

- **Involvement of industry** in the preparation of the WP
- Added value from (and for) **industrial stakeholders**
- **High involvement of experts from industry in the evaluation process (> 50%)**
- **One stage evaluation to reduce time-to-grant**
- Many **DEMO** topics
- **Exploitation of results** is a very high priority
- **Subject to the same rules and regulation as other H2020 calls**

H2020–EeB–2014

European Commission

	PROPOSALS		
	Eligibile	Main List	
	nb	nb	EC Contribution
EeB-01-2014	34	4	€ 21,816,949.00
EeB-02-2014	35	2	€ 9,331,641.00
EeB-03-2014	16	3	€ 15,998,856.00
EeB-04-2014	5	4	€ 1,976,338.00
	90	**13**	**€ 49,123,784.00**



Main List

Ec contribution

- EeB-01-2014
- EeB-02-2014
- EeB-03-2014
- EeB-04-2014

H2020–EeB–2014

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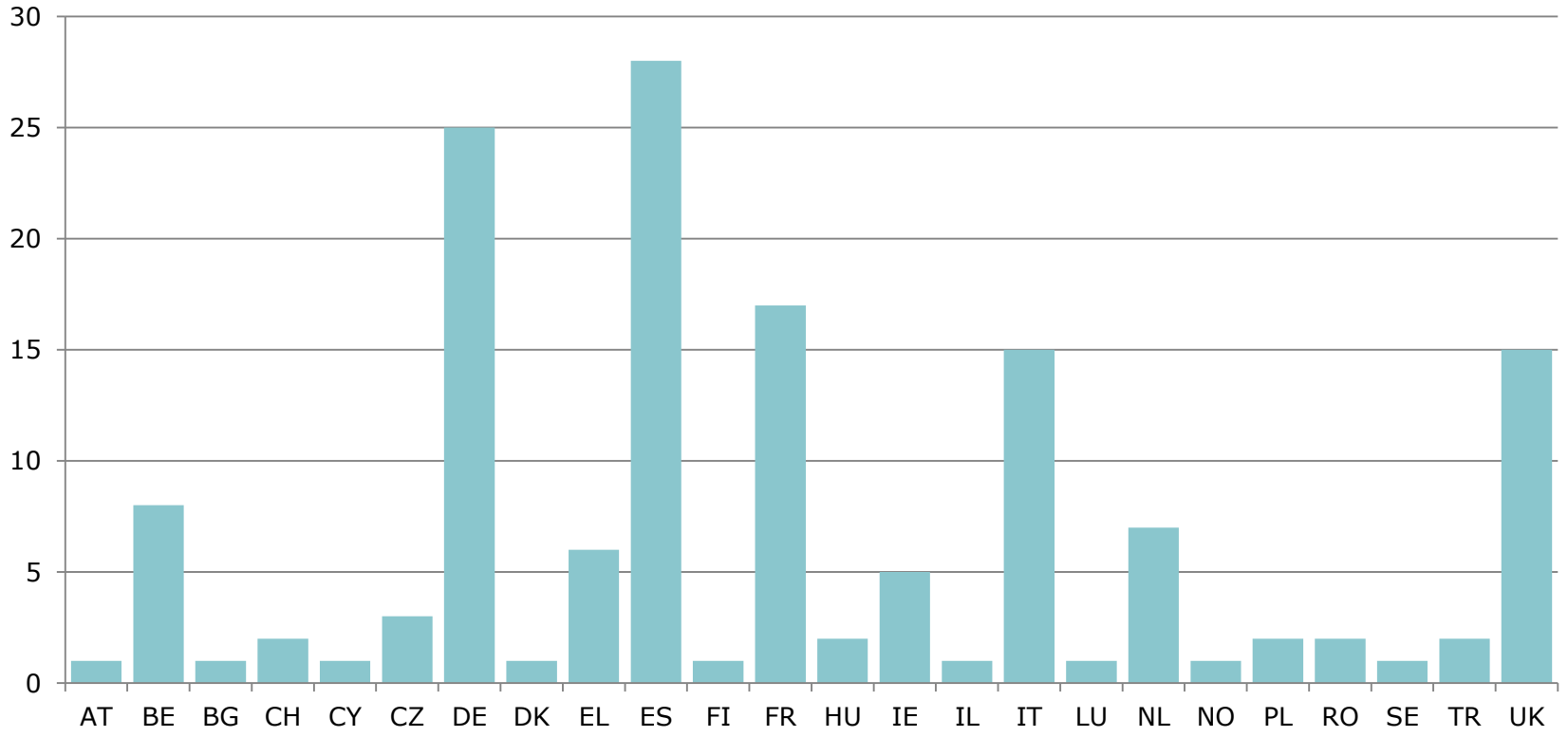
Number of participants by country
Main List



http://ec.europa.eu/research/industrial_technologies/information-day-for-ppp-2014_en.html

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RESEARCH & INNOVATION

Key Enabling Technologies

H2020 Information Day on Research PPPs 21 October 2014

Information Days on the Research PPPs on Factories of the Future, Energy-efficient Buildings, Green Vehicles and Sustainable Process Industry Brussels, 21 October 2014

An Information Day on the Research PPPs will take place on 21 October 2014 in Brussels.

The aim of the event is to give the research community an overview of ongoing activities, and to support the preparation of proposals for the 2015 calls.

The info day will also offer plenty of opportunities for networking.

Register for the info day

Privacy Statement (PDF version, 137KB)

Share

Energy-efficient Buildings (EeB)
Factories of the Future (FoF)
Sustainable Process Industry (SPIRE)
Other PPPs
Meetings and workshops
H2020 Information Day for PPPs 21 October 2014
- Programme
- Practical information
- Brokerage activities
- Registration

H2020 Information Day for PPPs' 16-17 December 2013
e-Library

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Fax:	+32 (2) 296 05 50

Thank you for your attention

More information:

HORIZON 2020:
http://ec.europa.eu/research/participants/portal/desktop/en/home.html

Contractual Public-Private Partnerships in research and innovation:
http://ec.europa.eu/research/industrial_technologies/ppp-in-research_en.html

HORIZON 2020

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

Specific Challenge:

- Major innovations in the **design tools, construction methods and management practices** to allow **integration at district level;**
- A renovated building should be **part** of a **global energy system;**
- **Interoperability** tools and solutions suited to collaborative multi-disciplinary refurbishing work

Scope (1):

Focus on design at building and district level including:

- Adjacent systems: **district heating/cooling** and **decentralised thermal energy generation** and other interactions with the neighbourhood, giving **priority to local renewable resources**.
- Holistic methods and tools;

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

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

Scope (2):

- Geo-clustered data sets
- Operational info / knowledge based design -> input for management systems

IA 70%

TRL 5-7

Expected Impact:

- More effective refurbishment at building and district level.
- Optimised design of integrated energy-efficient buildings enabling actors to take validated and quantified choices for the refurbishment at building and district level.

Significant participation of SMEs with R&D capacities is encouraged

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

Specific Challenge:

- **Storage** plays a pivotal role in **synchronising energy demand** and **supply**, both on a short and long term (seasonal) basis.
- Transformation of our existing building stock towards **very low energy buildings** and **nearly zero energy** and **Plus-energy** buildings requires effective integration and **full use of the potential yield** of renewable energy.

Scope (1):

- **Advanced solutions** to reduce: thermal losses, pressure drops, improve heat exchange in and between storage material and heat carrier .
- **High energy density storage materials:** - long term multi-cyclic stability at tuneable temperature levels - **regeneration t°** in the range below 100°C - **energy storage capacity** at least 6 times the water one;

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

Scope (2):

- Storage reactor components (innovative heat exchanger);
- Advanced energy management, safe and environmentally friendly.

RIA 100%

TRL 4-6

Expected Impact:

- Provide advanced thermal energy storage solutions.
- Demonstrate solutions that have a stable long term performance in multi-cyclic seasonal use of at least 20 years.
- *Deliver compact system < 2,5 m³ per dwelling.*
- *Reduction of the net energy consumption of a building by at least 15% and have a return-on-investment period below 10 years.*

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

Specific Challenge:

- **Monitor** the **real energy use** in energy-efficient buildings and for a a set of interacting buildings.
- **Capture** the real **complexities of the energy performance** of the actual **buildings** and **districts**.
- Effective methodologies to describe **user behaviour**.

Scope (1):

- Develop **methodologies and tools** to monitor and assess actual building energy performance considering user behaviour, complex energy systems performance and weather forecast, etc.
- **Predict accurately** building energy loads and consumption along the whole lifecycle ;

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

IA 70%

Scope (2):

- A **holistic "open" approach** to building control and monitoring systems is required;
- Support decision making during the whole life of the building;
- **Real time** optimisation of energy demand and supply using intelligent energy management systems at the level of a block of buildings.

TRL 5-7

Expected Impact (1):

- **Significant reduction** in the **difference** between **real** and **predicted** energy behaviour in a building or a block of buildings after demonstration of the viability of the new tools and methods for measuring and analysing **real building energy performance**.

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

Expected Impact (2):

- The **gap** is **narrowed down** to a value consistent with energy performance contracts.
- Provide solutions with a **high replication potential**.

Significant participation of SMEs with R&D capacities is encouraged.

EeB 8 – 2015 Integrated approach to retrofitting of residential buildings

Specific Challenge:

- Focus on **deep rehabilitation of residential buildings** (including buildings of historic value)**;**
- Innovative, efficient and cost-effective retrofitting solutions to meet the planned **net-zero energy standards**.
- **Breakthrough solutions :** affordable along the whole life cycle, reducing maintenance with higher performance reliability and reduced energy use.

Scope (1):

- **Systemic approaches** integrating the **most promising** cost-effective technologies and materials to **reduce building heat needs**;
- The **district scale**, as well as the **interactions** between the buildings and the thermal and electrical energy networks should be taken into account;

EeB 8 – 2015 Integrated approach to retrofitting of residential buildings

Scope (2):

IA 70%

- Innovative solutions with a high degree of **flexibility** to the **grid**;
- Integration of compact thermal energy storage unit;
- Full **potential of ICT:** control systems, modelling, simulation, virtual reality, etc.;
- Large scale demonstration - high replicability - financial model;
- Standardization work;
- Participation of building owners;
- Low intrusive techniques;
- Speeding up the construction process at high quality standards

TRL 5-7

EeB 8 – 2015 Integrated approach to retrofitting of residential buildings

Expected Impact :

- **Real case demonstration** of innovative retrofitting solutions close to **net zero energy** standards.
- Reduction of **at least 60% in energy consumption** compared to the values before renovation while ensuring affordability.
- Demonstrate a **high replicability potential**.
- **Return on investment should be below 7 years** in the case of deep retrofitting.
- Advent of a **new generation of skilled workers and SME contractors** in the construction sector aware of the need of a systemic approach towards energy efficiency should be promoted through the proposed activities.

Significant participation of SMEs with R&D capacities is encouraged.

European Commission

EE 2 -2015 Buildings design for new highly energy performing buildings

Specific Challenge:

- All buildings must achieve "nearly zero energy" by end of 2020 (end of 2018 for public buildings)
- Encourage "plus energy buildings" to reduce overall energy use and increase share of renewables
- Costs of such buildings are a barrier to investment
- Industry needs to deliver affordable solutions to meet these targets

European Commission

EE 2 -2015 Buildings design for new highly energy performing buildings

What we mean by:

- **Nearly Zero Energy Buildings (nZEB)**
The very low amount of energy required should be covered to a "very significant extent" by energy from renewable sources, produced either on-site or nearby

- **Plus Energy Buildings**
Buildings that produce more energy than they consume

European Commission

EE 2 -2015 Buildings design for new highly energy performing buildings

Scope:

- Demonstrate reduced costs with nZEB performance, whilst accelerating market uptake
- Passive or active solutions
- Automated or cost-effective maintenance of installations
- Assess and minimize gap between predicted and actual energy performance
- Address the challenge to move to a large scale e.g. net-zero energy neighbourhoods
- Focus on on-site and nearby RES designs and energy efficiency methods that go beyond nZEB standards

European Commission

EE 2 -2015 Buildings design for new highly energy performing buildings

Expected Impact:

- Increased share of nZEBs, aiming for 100% by end of 2020.
- Cost reductions at least 15% compared with current situation
- Additional benefits in terms of energy reduction
- Demonstration for net-zero energy districts that use onsite or nearby RES

TRL 5-7

IA 70%