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# Horizon 2020 Work Programme for Research & Innovation 2018-2020

**Brokerage Event on H2020 Energy WP  
Brussels 16 November 2017**

**NMBP Programme – Energy- efficient  
Buildings – Calls 2018/2019**

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Innovation



# Energy Efficient Buildings Policy backgrounds & Call Objectives

- Paris agreement (COP21), Energy Union policies
- EC revised targets (2030): GhG (40%), Energy efficiency (30%), RES (27%)
- Energy Roadmap (2050) ; Drastic Reduction of energy consumption(50 %) and CO2 emissions ( 90%) for new and renovated buildings
- Construction sector/ Buildings are responsible for about 40% of total Energy consumption in the EU and GhG emissions.
- **R&I to integrate & demonstrate innovative technologies in** : Materials and components for energy savings, and generation, thermal distribution and **storage**, systems, use of **renewable energy sources**, **ICT efficient management** buildings systems, **tools for simulation** and **prediction**.
- **Re- boost the business of Buildings"**
  - Ensure best use of **innovative, reliable** and **affordable technologies**
  - Drive creation of **High Tech. Building Industry** – Improve its **Competitiveness**

# EeB/EE PPP in Work Programme 2018

- **LC-EeB 02: Building Information Modelling adapted to efficient renovation (RIA)**
- **LC-EeB 06: ICT enabled, sustainable & affordable residential building construction, design to end of life (IA 50%)**
- **LC-SC3-EE-1-2018-2019: Decarbonisation of the EU building stock (IA)**
- **LC-SC3-EE-5-2019: Next-generation of Energy Performance Assessment and Certification (IA)**

## Topic LC-EeB 02: Building information modelling adapted to efficient renovation (RIA)

### Specific Objective:

- Today, there are many BIMs that are too specific to the building considered. Not really replicable easily to other Buildings.
- Need to offer easy, practical, operational tools kits for all stakeholders
- Challenge : provide compatible tools that would allow collecting of data from existing buildings and exploit data from different sources

# Topic LC-EeB 02: Building information modelling adapted to efficient renovation (RIA)

*TRL  
From 4  
-to 6*

**Scope: Proposals should include the following elements :**

- To harmonise and provide common data exchange formats
- Modelling of the building energy should include existing parameters, as well as the environmental and GIS data
- Enabling to couple BIM system with additional models (acoustics; calculator for economic evaluation of various renovations scenarios)
- Allow the development of applications to benefit from inputs of inhabitants
- Cooperation with standardisation bodies

*RIA-  
100%*

## Topic LC-EeB 02: Building information modelling adapted to efficient renovation (RIA)

### Expected impact:

- Reduction of the renovation working time of at least 15-20 %
- Acceleration of the market uptake across Europe (target of 50% of their renovation business of constructing/ renovations companies)
- Creation of best practice examples for construction retrofitting sector for operators and associated stakeholders

***EUR fom 5 to 7  
millions***

## LC-EeB-06: ICT enabled, sustainable and affordable residential building construction, design to end of life

### Specific Objective:

- Including ICT in the overall building process and operation
- ICT solutions need to include : the design, manufacturing, construction, material choice, operation and end of life phases affecting the overall building lifecycle.
- Help reducing the performance gap.

## LC-EeB-06: ICT enabled, sustainable and affordable residential building construction, design to end of life

**Scope: Proposals should include the following basic elements**

- **Develop an advanced digitalised and industrialised construction and building process utilising smart combinations of materials/components;**
- **Assess the overall life cycle of construction, in order to deliver more efficient buildings in terms of sustainability and construction, maintenance and operation costs;**
- **Provide for fully integrated systems to be compact, exchangeable, and easy to commission and to operate and demonstrate business solutions for operating such building life-time ICT solutions.**

*TRL  
from-  
5 to 7*

*IA-  
50%*



## LC-EeB-06: ICT enabled, sustainable and affordable residential building construction, design to end of life

### Expected impact:

- Reduction of CO2 with 15 -20 %;
- Construction cost reductions of at least 15 %;
- Buildings shortened construction time (reduced by at least 10 -15 %);
- Reduction of the gap between predicted and actual energy consumption;
- Improved indoor environment;
- Significantly improved integration of the value chain;
- Contribution to new standards and regulations;
- Demonstration of large scale replicability potential.

*EUR from 6  
-to 8  
millions*

# EeB/EE PPP in Work Programme 2019

- **LC- EeB 01 Integration of energy smart materials in non-residential buildings (IA)**
- **LC- EeB 03 New developments in plus energy houses (IA)**
- **LC- EeB 05 Integrated storage systems for residential buildings (IA)**
- **LC-SC3-EE-4-2019-2020: Upgrading smartness of existing buildings through innovations for legacy equipment (IA)**

# LC-EEB-01-2019: *Integration of energy smart materials in non-residential buildings*

## Specific Objective:

- Europe is leader in the development of components for buildings, based on the use of high-efficient insulation materials, which should lead to achieving recyclable, **nearly zero-energy** building envelopes **when applied to new buildings.**
- **Challenges of solutions:**
  - ✓ Not allow for an equal performance in existing buildings.
  - ✓ Still not allow the integration of smart energy storage.
  - ✓ Complexity, weight control and overall retrofitting costs.
  - ✓ Work is required to advance the TRL.

*TRL  
from 5 to 7*

# LC-EEB-01-2019: *Integration of energy smart materials in non-residential buildings*

## Scope: Proposals should cover all of the following,

- development of lightweight active/passive energy management components with:
  - ✓ *reduced maintenance costs,*
  - ✓ *for wide range of environmental conditions and reuse at the end of service life ,*
  - ✓ *favour renewable resources,*
  - ✓ *respect of sustainability principles (International Reference Life Cycle Data System Handbook)*
- solutions:
  - ✓ *for new and for retrofitting existing buildings.*
  - ✓ *allowing installation without modifying/overloading existing structures.*
  - ✓ *demonstrating a high replication and industrial potential.*
- modelling & development of novel testing methodologies for assessing the long-term performance (estimation of durability, service life).
- Proposals should include actions designed to:
  - ✓ *facilitate cooperation with other projects;*
  - ✓ *to enhance user involvement;*
  - ✓ *to ensure the accessibility and reusability of data produced*
  - ✓ *Likely to contribute to standardisation and certification*

# LC-EEB-01-2019: *Integration of energy smart materials in non-residential buildings*

## Expected impact:

- $\geq 25\%$  insulation properties (component level passive mode);
- $\geq 10\%$  in energy-storage capability (active mode);
- Water and air tightness  $\geq 10\%$  (controllable solution);
- Cost  $\leq 15\%$  (market uptake across Europe and contribute to social affordability).

IA  
70%  
100%

## ***Proposals for Innovation Actions submitted under this call should:***

- ***Clearly stated relevant indicators and metrics, with baseline values.***
- ***Include a business case and exploitation strategy.***

***EUR 4-6 million***

# LC-EeB-03-2019: New developments in plus energy houses

## Specific Challenge:

EU has set a long-term goal of reducing greenhouse gas emissions  
COM (2011) 885 final

EE targets set at EU level were/are currently being reviewed:

Energy Labelling Regulation 2017/1369

EcoDesign Working Plan 2016-2019

Amending Directive 2012/27/EU on Energy Efficiency

Amending Directive 2010/31/EU on EPBD

SET-Plan rolls out concrete steps how R&I could reach 2025 targets

# LC-EeB-03-2019: New developments in plus energy houses

## Scope:

We need to keep stimulating the community. One needs to develop further the concept of **Plus Energy Houses**, producing more energy than they use.

The idea is to generate, over a year, more energy than is consumed. So, in addition to being high energy efficient it also needs to be able to generate on-site renewable energy, all in a cost-effective way and leading to high users' satisfaction.

The energy surplus could be stored or feed into the public grid

Energy consumption - heating, cooling, lighting, water heating

Demonstrations in **multi-storey apartment building** in each of the **4 climatic zones** (Mediterranean, Oceanic, Continental and Nordic)

# LC-EeB-03-2019: New developments in plus energy houses

## Scope:

- Energy Efficient Designs
- Novel materials
- Energy System Integration
- Collect and analyse data, digital management and control systems
- Standardisation issues
- Financing

*TRL*  
*5-7*

*IA*  
*70%*



# LC-EeB-03-2019: New developments in plus energy houses

## Expected impact:

- **Contribute to reducing of the CO<sub>2</sub> emissions**
- **Similar costs as compared to the 2020 NZEB**
- **Improved indoor environment leading to higher rate of users' satisfaction**
- **Increase the share of Plus-Energy-Houses in view of 10% by 2030**

*EUR from 6-to  
8 million(s)*

**"Relevant indicators and metrics, with baseline values, should be clearly stated in the proposal"**

The impacts should be defined as part of a chain, beginning first with the **outputs** of each project, followed by **outcomes**, and later on the **impacts**

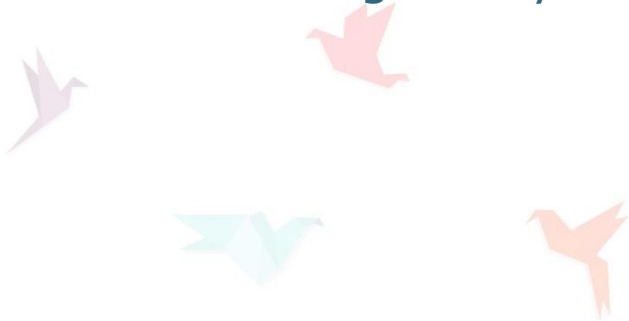
Do not forget the **business and exploitation plan** and a **credible path** to deliver the innovations to the market.

## LC- EeB 05 Integrated storage systems for residential buildings (IA)

### Specific Objective :

Efficient Storage and management of peak loads to synchronise demand/ supply of heat for low energy and/or renovated buildings.

- Develop short/ medium term solutions beyond water systems (thermochemical) – various modules (but space limitation).
- Better Integrate systems with inclusion of Renewable Energy



# LC- EeB 05 Integrated storage systems for residential buildings (IA)

## Scope :

- Advanced Solutions
  - Reduce: thermal losses, pressure drops, improve heat exchange in and between storage material and heat carrier.
  - High energy density storage materials ( $< 100^{\circ}\text{C}$ , X 10 Water)
  - Innovative Reactor Components (heat exchanger)
  - Advanced Energy management systems (safety).
  - Easy to maintain and not expensive
- Small scale Demonstration ( technical/ economical).
  - Overall system for space heating/ cooling / hot water
  - Single building – scalability – compactness

TRL  
From 5-  
to 7

IA  
70%  
100%

# LC- EeB 05 Integrated storage systems for residential buildings (IA)

*EUR from  
6-to 8  
million  
s*

## Impact :

- Demonstrate Reliable systems (multi-cyclic seasonal use of at least 20 years).
- Develop compact system  $< 1,0 \text{ m}^3$  per dwelling.
- Reduce energy consumption ( $> 25\%$ ) and reach ROI below 10 years.
- Use of High Energy Density Materials ( $> 10$  times water).
- Relevant indicators, metrics with baseline values in the proposal

# Deadlines 2018– 2019 / Indicative Budgets

Topic	Budget 2018	Budget 2019	Deadlines
LC-EeB 02-2018			31 Oct.17- 22 Feb. 2018
LC-EeB 06-2018	Total 35,0		31 Oct.17- 22 Feb. 2018
LC-SC3-EE-1	9,0	12,0	25 Jan.18 - 4 Sept.18 24 Jan.19 - 3 Sept.19
LC-SC3-EE-5		10,0	24 Jan.19 - 3 Sept.19
LC-EeB 01-2019			16 Oct.18 - 21 Feb. 2019
LC-EeB 03-2019			16 Oct.18 - 21 Feb. 2019
LC-EeB 05-2019		Total 53,5	16 Oct.18 - 21 Feb. 2019
LC-SC3-EE-4		10,0	24 Jan.19 – 3 Sept.19

# Thank you!

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<https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-nmbp-st-ind-2018-2020.html#c,topics=callIdentifier/t/H2020-NMBP-ST-IND-2018-2020/1/1/1/default-group&callStatus/t/Forthcoming/1/1/0/default-group&callStatus/t/Open/1/1/0/default-group&callStatus/t/Closed/1/1/0/default-group&+identifier/desc>