



EUROPEAN COOPERATION NETWORK
ON ENERGY TRANSITION
IN ELECTRICITY TR@NSENER



Ciências
ULisboa

Brainstorming Lisbon Discussion of EU Call:

Upgrading smartness of existing buildings through innovations for legacy equipment

Innovation action, closes 03 09 2019



CONTEXT/CHALLENGE

- In the EU, the existing building stock represents the main challenge for a more efficient energy use across the whole energy system.
- Europe's clean energy transition will rely on smart energy flexible buildings with distributed energy generation from renewable energy sources
- Innovative technologies will enable smart buildings to interact with their occupants and the grid in real time
- Intelligent and connected devices, smart sensors and controllers, will create new opportunities for energy consumers.



CONTEXT/CHALLENGE

- The smart readiness of buildings may evolve faster for devices and systems easily replaced and installed.
- HVAC and DHW systems have higher costs of replacement, longer lifecycles and difficulties related to integration of replaced equipment in buildings.
- This installed equipment remains highly relevant for buildings interactions with the energy system, making its upgrade to higher levels of smartness an essential step.
- The revised Energy Performance of Buildings Directive introduces a Smart Readiness Indicator (SRI) to reflect the level of services offered by a smart building.



SCOPE OF CALL

Develop and demonstrate cost-effective technological solutions to manage energy within existing buildings based on user preferences and requests, interact with the grid providing:

- energy efficiency
- flexibility
- generation
- storage



SCOPE OF CALL

- Solutions to upgrade existing buildings, either residential or tertiary, using automation and IT to offer new services and control to the building users improving user comfort and satisfaction.
- Provide improvements in the areas put forward by the revised EPBD, in relation to the smart readiness indicator.
- Demonstrate how the smart systems, smart controls and smart appliances can be integrated seamlessly in existing buildings to interface and/or to control the major energy consuming domestic appliances that are already installed.



SCOPE OF CALL: SETUP PILOTS

- Pilots should involve several types of domestic appliances and technical building systems with longer lifecycles (boilers, radiators, DHW preparation, motors for ventilation, windows opening and shading; lighting etc.) and with shorter lifecycles (dryers, washing machines, fridges, etc.).
- Testing several types of control modes (ON/OFF, power modulation, etc.) possible for a given type of appliance.
- Recharging points for electric vehicles and other forms of energy storage should also be incorporated in the pilots.
- The proposed solutions should not adversely affect the original functionalities, product quality, lifetime, as well as warranties of the appliances.



SCOPE OF CALL: DEVELOP A BUSINESS MODEL

- Clear business model development and a clear path to finance and deployment.
- Key partners should have the capability and interest in making the developed solution a core part of their business/service model to their clients.
- Business models and exploitation strategies should target the broad uptake of the proposed smart systems and their integration with evolving electricity markets, e.g. dynamic pricing or other services and information offered by energy suppliers and/or aggregators.



FOCUS OF THE PROPOSAL

- Solutions should focus on cost-effectiveness and user-friendliness: easy installation and maintenance, maximising consumer comfort (e.g. self-learning)
- Provide information on own consumption (e.g. recommendations to the user in order to maximise savings) and gains from its contribution to grid operation.
- Solutions should build on innovative technologies, initiatives and approaches contributing to building smartness: semantics, data models, data layers, protocols, software building blocks, APIs, middleware, solutions for smart services, standards, relevant industrial consortia or technology initiatives, etc.
- Interoperability is essential to ensure the required smart readiness, in particular integration with legacy equipment, user-friendliness and broad market uptake.

The activities are expected to be implemented at TRL 6-8 (please see part G of the General Annexes).

Contribution from the EU of between 3 to 4 million



EXPECTED IMPACT

- A realistic estimate should be provided on the total energy savings/year and on the impact of the innovations demonstrated in the project on the total power available for cost effective demand response actions.
- The projects should involve technology providers (e.g. manufacturers of appliances, movable envelope components, smart control/ home systems providers), energy services providers (aggregators and/or suppliers and/or ESCO's), user representatives, electricity system operators and other actors as relevant.



EXPECTED IMPACT

Proposals are expected to demonstrate the impacts listed below using quantified indicators and targets wherever possible:

- Primary Energy savings triggered by the project (in GWh/year);
- Investments in sustainable energy triggered by the project (in million Euro);
- Upgrade of existing buildings to higher smartness levels, including a significantly enlarged base of existing building equipment and appliances monitored by energy management systems and activated through demand response actions;
- Reduction in energy consumption and costs, exceeding the additional consumption from IT and its cost.

Additional positive effects can be quantified and reported when relevant and wherever possible:

- Reduction of the greenhouse gas emissions (in tCO₂-eq/year) and/or air pollutants (in kg/year) triggered by the project.

