

## Project / Topic of collaboration

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### ▪ Energy Flexibility Ready Smart Buildings

#### Entity that presents the offer

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TECES, Energy Cluster / Smart Building and Home including Wood Chain, Strategic Research Innovation Partnership (SRIP), Slovenia

#### Background

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European Commission introduced political frame for the introduction of energy flexibility market with the Winter package 2016 of Energy efficiency directive. Universal Smart Energy Framework (USEF) represents one of the possible market models for the introduction of energy flexibility. National energy agencies have already started activities related to the preparation of the legal framework the preparation of the legal framework for the energy flexibility market.

The **ongoing demonstration projects show its potential and attract the attention of possible flexibility service providers and users**, whilst **buildings, as one of the actors in the energy flexibility market, are currently not ready to be involved in such services**.

Buildings are normally treated from the viewpoint of energy savings but not from the viewpoint of increased energy flexibility potential. The measures for increasing buildings' energy flexibility potential should be systematically investigated, considering energy consumption, generation and storage units in buildings, their connectivity and bidirectional communication, measurement chains, and communication devices.

Special attention should be paid to the increased utilization of renewable energy sources, and energy storage systems inside buildings and in their surroundings where the utilization can be achieved by a proper usage of energy management systems (EMS), including their interactions with the systems inside the buildings and in their surroundings (other buildings, community, electricity network).

#### The aim of the project

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The aim of the proposed project **is to analyse, evaluate and demonstrate how buildings should be prepared for their active participation on the energy flexibility market**.

#### Current market and potential

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The existing energy flexibility services are limited on individual demonstration project in the form of demand side management and demand response. The Transmission system operators (TSO) already use the flexibility for provision of system services but they are limited on large production and consumption units (in Slovenia at least several MW).

Potential users of energy flexibility services are Balancing group Responsible Parties (BRPs), TSOs and Distribution system operators (DSO), whilst buildings with energy generation storage and production units can provide the energy flexibility services.

Thus, this **project should demonstrate how energy flexibility in buildings could be introduced as a market driven services interested for energy flexibility users**, such as Balancing group Responsible Parties (BRPs), TSOs and DSOs.

#### Objectives

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- **State of the art analysis** of buildings regarding their ability for providing energy flexibility services;
- **Proposals for improving readiness** of buildings for energy flexibility services
- **maximizing energy flexibility potential** of buildings;
- **Demonstration** of energy flexibility ready **buildings**;
- **Evaluation** of energy flexibility ready building(s) as a part of market driven energy flexibility services

#### Stakeholders

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- **USERS of energy flexibility services:** TSOs, DSOs and BRPs
- **Residential / Commercial buildings as PROVIDERS** of energy flexibility services (owners, end users, ...):
- **AGGREGATORS:** aggregate demand (users) / supply (providers)
- **PROVIDERS of enabling technologies:**
  - energy generation, consumption and storage devices and systems,
  - energy management systems, communication devices, measurement systems, control systems,
  - and components of all aforementioned devices and systems,
  - IoT, cloud-services, block-chains..., ...

- **EXTERNAL STAKEHOLDERS**
  - national and regional energy agencies,
  - chambers of commerce,
  - local communities.

### Actors of the value chain

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Identified users of energy flexibility services are the Balancing group Responsible Parties (BRPs), Transmission system operators (TSOs), and Distribution system operators DSOs, whilst buildings are providers of energy flexibility. The value chain consists all stake holders required to link the service users with the buildings (service providers):

- **aggregators and other service providers** that develop new market driven energy flexibility services and link the service users and service providers and energy flexibility market;
- **manufacturers of enabling technologies** (energy management systems, communication devices, measurement systems, control systems, devices in buildings in the form of energy generations, consumption or storage devices that are part of the building or building user installed devices, and components of all aforementioned devices and systems, including IoT, cloud-services, block-chains, ...) required to link the service providers (buildings) and users
- **buildings with their owners and users** that get payed for providing the energy flexibility services

### Added value sought by results of the collaboration

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- **Regulatory:** according to Winter Package 2016 national energy agencies started preparing national legal frames required for the introduction of energy flexibility as marked driven services. Results of the project (proposals, validations...) could help agencies implementing regulatory / legal frames as they could be one of the beneficiaries of the project results.
- **Technologically:** further developed and modified technologies, such as energy generation, consumption and storage units in buildings; energy management systems, communication, measurements and control devices and systems; IoT, cloud services, and block-chains, applied to prepare building for automated execution of energy flexibility services without to reduce buildings' functionalities, level of comfort and quality of living.
- **Social:** buildings owners and users will get an opportunity for additional incomes by providing automated and market driven energy flexibility services (demonstration and validation).

### Replicability

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All European regions have similar problems regarding energy flexibility. The solution developed in the scope of the project can be implemented in other European regions considering local legal frame for energy flexibility market and services.

### Offer of regional support (and in the case of their national or European entities)

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Slovenia: The national energy agency has to prepare legal frame for the introduction of energy flexibility services. Some of the prospective partners are involved in the preparation of national legal frames for the introduction of energy flexibility market. The proposed project is also supported by regional energy agencies and possible actors on the electricity flexibility market.

Moreover, topic of the proposed project has been **nationally recognised and supported as a priority field in the Slovenian Smart Specialisation Strategy** with TECES as a holder and coordinator of **Smart Buildings and Home including Wood Chain, Strategic Research Innovation Partnership**, which is one of the nine top priority topics of Slovenian S3.

### PREPARED AND PRESENTED BY

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