



HOLISDER

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Integrating Real-Intelligence in Energy Management Systems enabling Holistic Demand Response Optimization in Buildings and Districts

Project presentation



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 768614.



HOLISDER project



The HOLISDER project introduces a **Holistic Demand Response Optimization Framework** that will enable significant energy costs reduction (~45%) at the building/consumer side, while introducing **small and medium sized buildings** (residential and non-residential ones) as a major contributor to energy networks' stability through optimized energy management in response to network constraints and conditions.



Project solution



- HOLISDER will enhance BEMS and Smart Home gateways with **innovative human-centric optimization algorithms** enabling optimized operation of buildings
- HOLISDER will deliver an “open” and modular end-to-end interoperability and data management framework based on JACE and EF-i that will:
 - enable open standards-based communication along the DR value chain;
 - enable interoperability with any Building and District Energy Management System, as well as, Smart Home systems and devices;
 - comply OneM2M standard;
 - assure cost-effectiveness and payback period of less than a year



HOLISDER key enablers

for the introduction of Demand Side Flexibility into energy markets



1. Consumer Empowerment

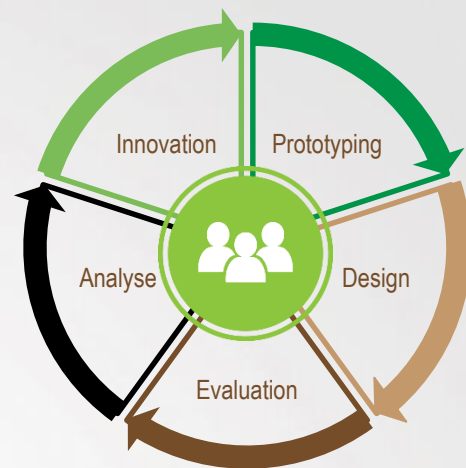
→ consumers as active energy market players reducing their energy bills (45-50%), tackling energy poverty, benefitting from wide range of services and providers

2. Establishment of end-to-end interoperability

→ between energy networks, building energy management systems and devices enabling two-way communication, plug-in-play installation and data exchange and integration

3. New business models for third parties

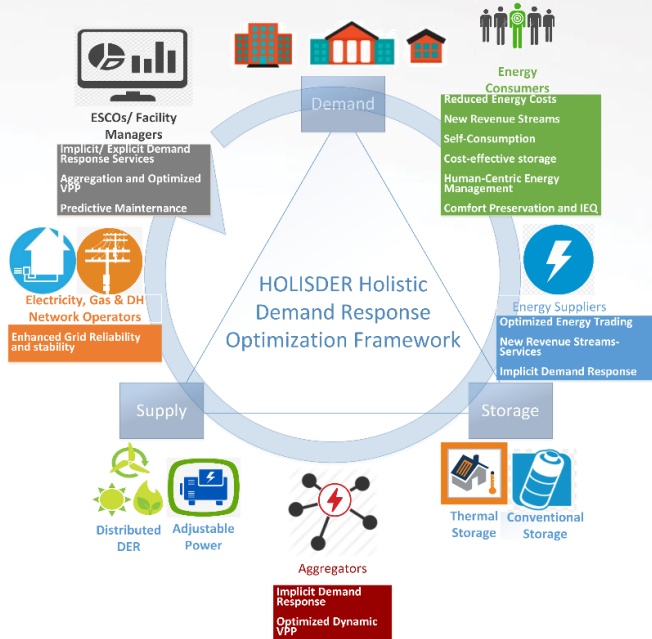
→ facilitating consumer involvement, representing them in energy market transactions, tackling knowledge barriers



HOLISDER User-Driven Innovation Approach



HOLISDER concept



- Significant **energy costs savings**
- Creation of **new revenue streams**
- Wide promotion of **self-consumption**
- Utilization of the currently unleashed **storage capacity** of buildings
- Proper tackling of **consumers' reluctance** to participate in **Demand Response**
- Further facilitation of consumers' participation in **energy markets**
- High **replicability** across different building types and systems
- Advanced adaptability to demand response **regulations** around EU Member States
- Enhanced operational **stability and security** of energy networks

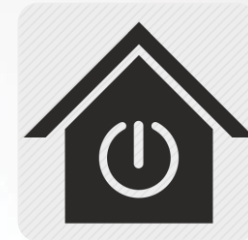


HOLISDER objectives



1 – Introduce residential and tertiary energy consumers as active players in energy markets and ensure significant benefits through their engagement in implicit human-centric demand response programmes

2 – Enable intelligence enhancement of currently available BEMS and Smart Home Systems with the integration of ICT-enabled human-centric DR optimization and predictive maintenance functions



HOLISDER objectives



3 – Deliver an open standards-based modular solution that ensures end-to-end interoperability between smart grids, EMS and smart home devices and holds a high replication potential around EU MS

4 – Safeguard grid reliability and the transition to a more fossil-free energy future through complementary explicit demand response strategies on the basis of aggregated flexibility utilization.



HOLISDER objectives



5 – Tackle major market entry barriers for consumers with the introduction of suitable business models for energy utilities, aggregators and facility managers

6 – Validate the resulting solutions in real-life environments and ensure enhanced consumer engagement in Demand Response



7 – Promote adoption of HOLISDER solution as a next-generation demand response optimization framework through intense dissemination and knowledge transfer of the project's outcomes to audiences within and beyond the EU



Pilot sites



HOLISDER framework will be validated in **4 large-scale pilot sites**:



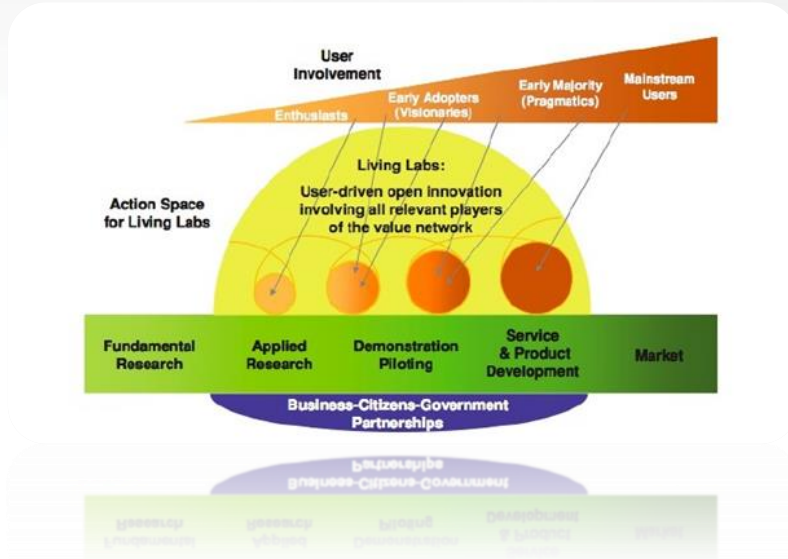
- 2 commercial, 25 residential buildings in **Athens**, Greece
- 3 commercial, 8 residential buildings in **London**, UK
- 2 commercial, 1 residential buildings in **Helsinki**, Finland
- 2 commercial, 44 residential buildings in **Belgrade**, Serbia

Demonstrations will take place in buildings of various typologies (residential and tertiary) in four diverse areas (climatic, demographic) under real operation conditions showcasing the wide replication potential of HOLISDER.

More than **1 600 occupants** in the pilot sites will be actively and directly engaged in the project activities, participating not only in the pilot roll-out, but also in the co-creation and co-design of HOLISDER solutions.



Living Lab activities



Goals:

- raising awareness, engagement and acceptance of pilot site occupants and stakeholders
- Involvement of end users in the requirements definition
- training users and contributing to the adoption of the HOLISDER concept and operation in the pilot sites
- involving all stakeholders in the evaluation of HOLISDER results.

The HOLISDER Living Lab activities will enable feedback obtainment from building occupants, ESCOs, facility managers, aggregators, DSO, standardization stakeholders, regulator or policy makers.

Tools: workshops, focus groups, door-to-door visits and quick online surveys

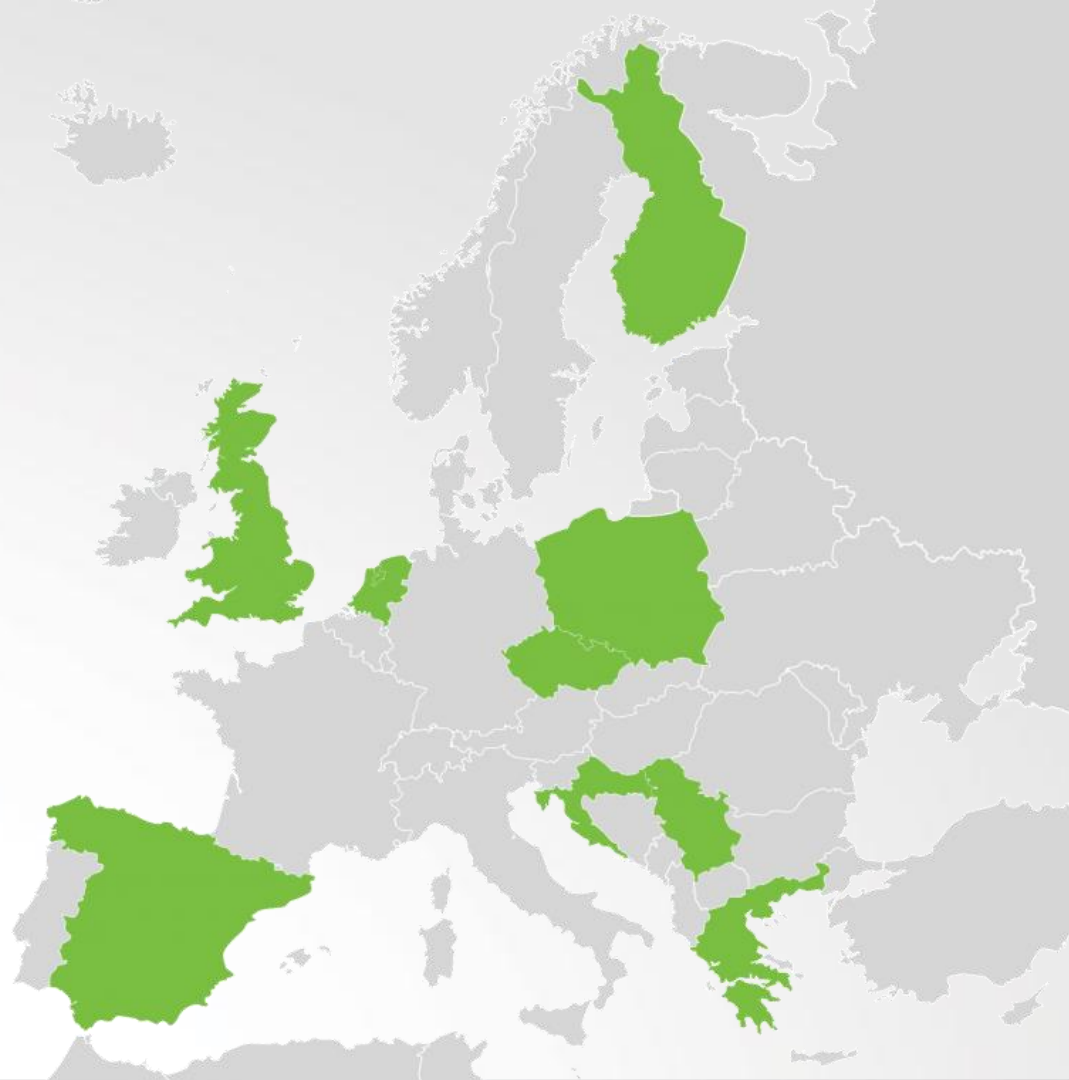


Project Partners

13 partners:

- 2 Research Organisations
- 5 Technology Providers
- 4 End Users
- 2 Market Uptake Accelerators

from 9 countries





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