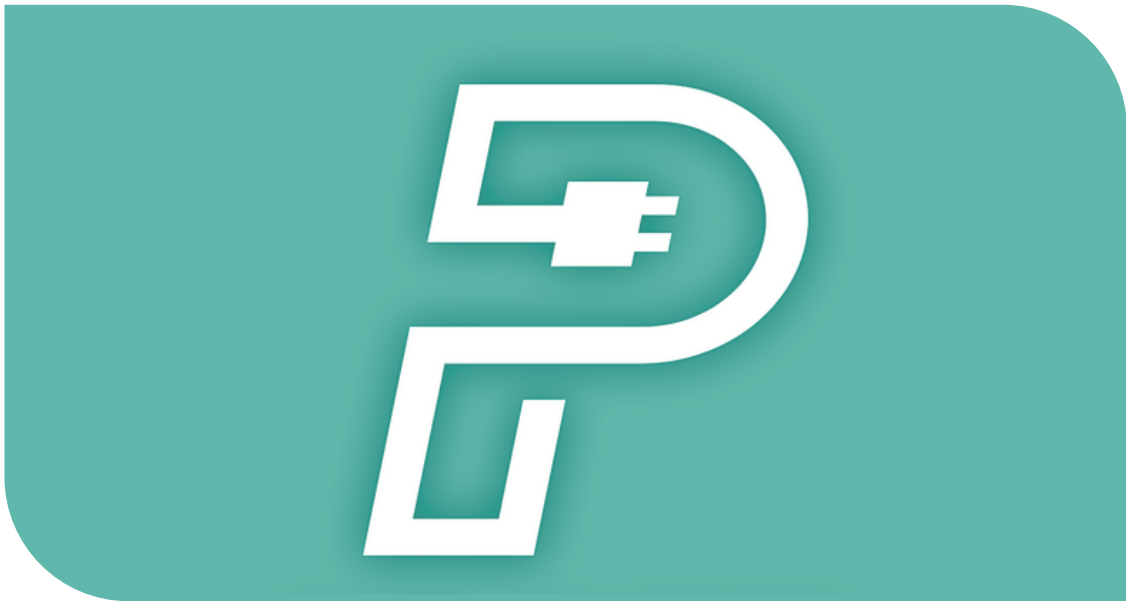
Plug&plAy eneRgy ManagEmeNt for hybrID Energy Storage



The challenges in the ongoing energy transition as well as meeting national, European, and United Nations' goals require the integration of more decentralised renewable energy generation units into existing distribution systems. PARMENIDES could support this by offering interoperable solutions to optimise flexibility utilisation, through various storage technologies at different aggregation levels and time scales.

Objective 1: New Ontology

PARMENIDES will create a new ontology, PARMENIDES Energy Community Ontology (PECO), with a focus on electricity and heating domains.

Objective 2: Energy Management System (EMS)

PARMENIDES will develop a new generation of EMS utilizing the PARMENIDES Energy Community Ontology as knowledge base, supporting use cases related to energy communities and Hybrid Energy Storage Systems.

Objective 3: Secure and Reliable Data Exchange

PARMENIDES will define information and communication architecture, enabling an interoperable, and secure exchange of data and instructions.

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The Austrian pilot encompasses two different municipalities in Styria, characterized by diverse infrastructures, with a primary focus on the electricity sector

Fully automated use cases for grid-friendly behaviour of energy communities through the utilization of Hybrid Energy Storage Systems (HESS)

Grid Capacity Management (GCM) gathers measurements from the low voltage grid and computes the operational limits of the available HESS flexibility, ensuring adherence to technical grid constraints

EMS calculates the optimal set-points of HESS, considering optimization objectives and utilises the PARMENIDES Energy Community Ontology (PECO) as a knowledge base

The Swedish pilot will assess the flexibility potential of residents in a multi-apartment building at KTH in Stockholm

The flexibility provided by the electrical and thermal storages with different time scales will be demonstrated through EMS

Flexibility strategies, especially trade-off exploration and exploitation, will be utilized to refine an operation algorithm for the EMS, which considers technology constraints, user preferences, and behavior

Involving different stakeholders and leveraging measurement data enables the assessment of feedback regarding flexibility strategies and digital tools

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