



Intelligent Distribution Nodes

An intelligent controller to demonstrate a common set of grid services for DSOs and TSOs, aiding a balancing-responsible party using a battery energy storage system (BESS)

Operating the BESS to provide balancing services, congestion management, and non-frequency ancillary services to TSOs and DSOs

Distinctive Features

- An advanced control system through the use of ICT services
- A new mechanism for end-user aggregators to provide grid services

Why

The Pilot's motivations

- Reduce electricity costs by increasing revenue or reducing an associated penalisation cost
- Improve supply reliability
- Provide flexibility and ancillary services to the DSO and TSO
- Provide advanced energy services
- Increase the amount of existing local PV generation

What

The Pilot's expectations

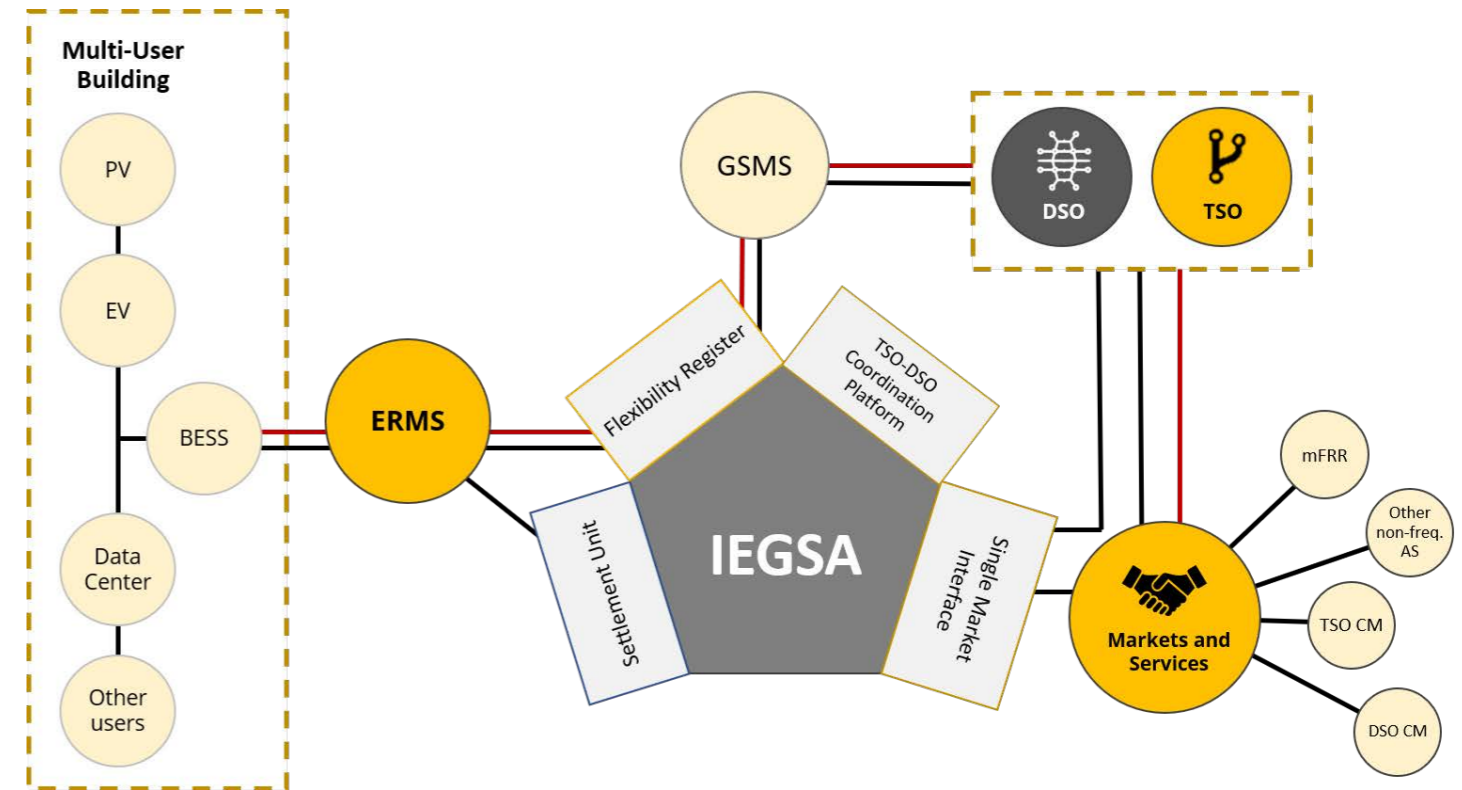
- **Business:**
 - A combination of local congestion management markets with wholesale and balancing markets
 - Ancillary services provision by aggregated end users, prosumers, and distributed generation
- **Technical:**
 - The management of small-scale assets at the distribution level
 - Predictive grid models of the subsidiary network under the IDN to be used by TSOs and DSOs
 - Foundations for new network codes, particularly on demand-response aggregated under IDNs
 - A new mechanism for end-user aggregators to provide grid services

Business Model

- Using intelligent distribution nodes with energy storage and power-flow-managing capacity, the solution ensures energy balancing and congestion management.
- The demo-site building includes a BESS, PV, and EV chargers.
- It will also include a data centre working 24/7, thus requiring high power quality and reliable supply.
- In addition to flexibility services, other advanced ancillary services will also be demonstrated.
- An innovative control system will be enabled – notably, by the information hub.

KPIs Definition

- An increase of renewable penetration achieved in the distribution grid
- The total number of offers of grid flexibility to the grid operators that are approved
- The duration of the DSF service and associated curtailment
- The quantified improvement of the BESS turnover thanks to participation in new markets
- The correctness of energy deployment forecasting from the information hub
- Improved revenue rates with more data collected and processed by the information hub



User Features

- The demonstration of a multi-user building
- A decentralised local market
- A new mechanism for end-user aggregators to provide grid services

Grid Features

- Valuing aggregated demand response for providing system flexibility and increasing the share of small-scale DERs
- Descriptive and predictive models of aggregated prosumers at the distribution level
- Appraising the efficacy of aggregated distribution nodes to provide ancillary services to system operators