

A TRAFFIC LIGHT SYSTEM TO ENABLE GRID SAFETY IN A FLEXIBILITY POOLING MARKET

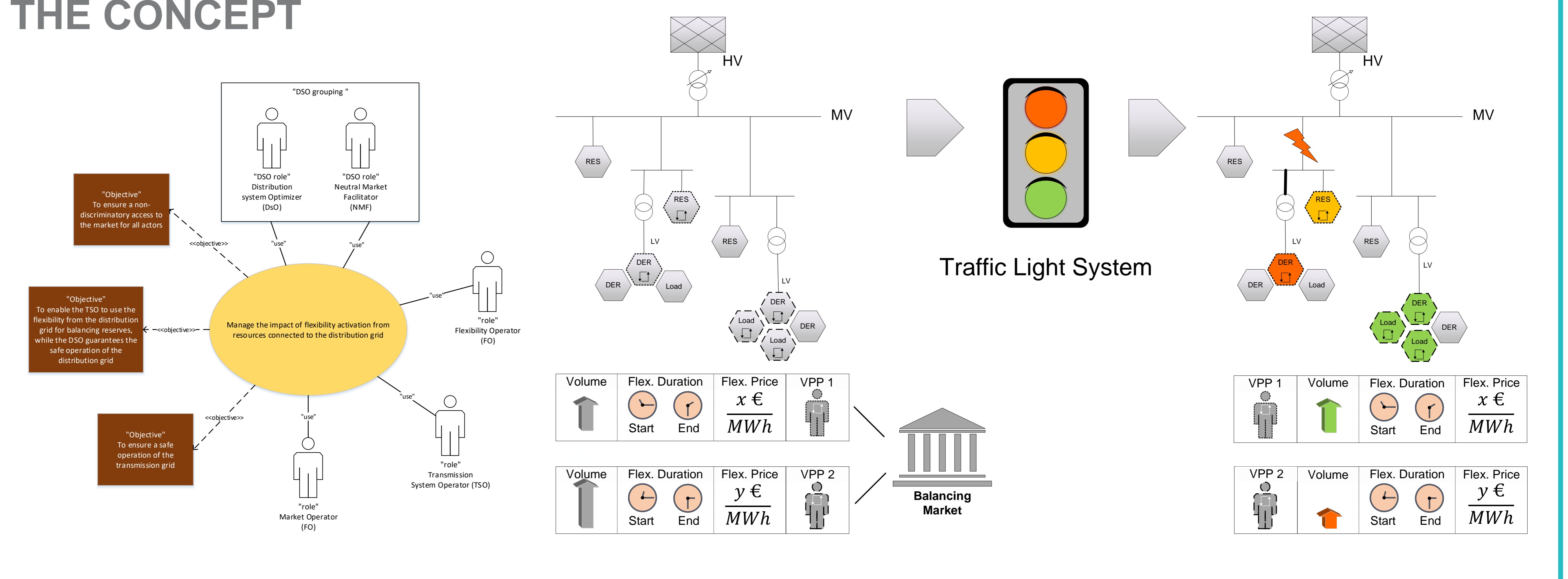


ABSTRACT

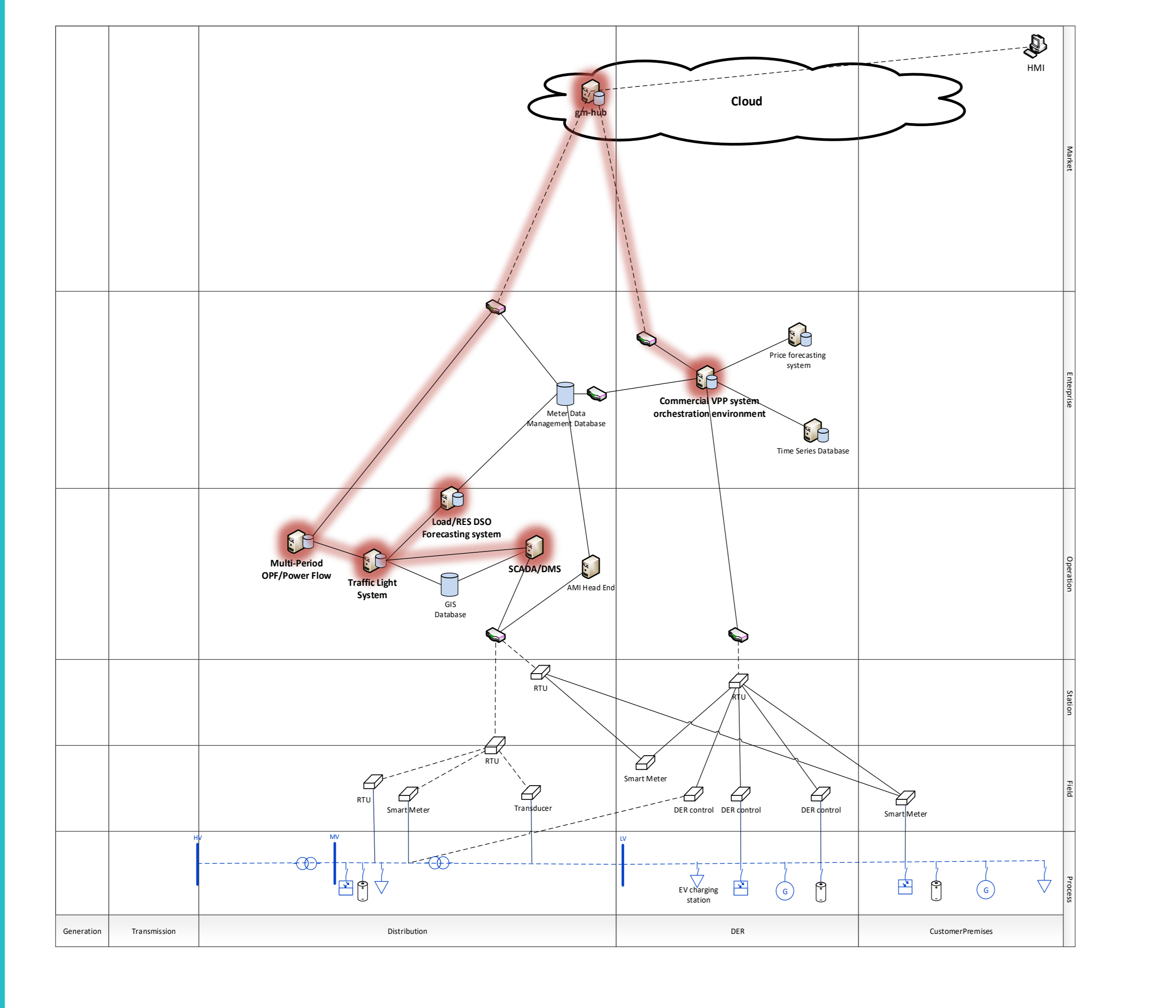
The increasing volume of **flexibility provided by distributed energy resources** is a key feature to the future power system. It creates the opportunity for specific actors known as aggregators or flexibility operators to offer new services to multiple stakeholders. For instance, a flexibility pool could be contracted by BPRs for portfolio balancing, by DSOs to improve their network planning and operation or by TSOs as secondary and tertiary reserve balancing.

However, the activation of flexibilities located on the distribution networks could **lead to voltage or loading violations if no rules are defined**. To guarantee a safe grid operation without restraining the access to new market players, it is crucial to **define the interactions and the responsibilities between the main parties**, i.e. distribution and transmission network operators as well as flexibility operators. The **Traffic Light System (TLS)** designed in the InteGrid project addresses these issues.

THE CONCEPT



THE ARCHITECTURE



OUTLOOK

The Traffic Light System complies with Portuguese and Slovenian market designs and regulations. **State of the art load and RES forecasts, state estimators and Multi-Period Optimal Power Flow algorithms** are integrated inside the Traffic Light System. The exchange of flexibilities information will be realized via the **Grid and Market Hub**, a cloud-based platform developed in InteGrid for neutral data exchange. The Traffic Light System is developed by AIT in collaboration with cyberGrid. It will be tested in two pilot projects based in Slovenia and Portugal, by Elektro Ljubljana and EDP respectively.

In addition, a Scalability and Replicability analysis of the TLS will be conducted to evaluate its deployment potential under different regulations and markets designs.

About InteGrid

The objective of the InteGrid project is to demonstrate how DSOs may enable different stakeholders to actively participate in the energy market and to develop and implement new business models, making use of data management and consumer involvement approaches.