EM&EM'S

A project by the Collignon - ATI Industrie - Flexide Energy consortium, subsidised by the Energy Transition Fund.

This project aims to develop, test and validate a functional digital ecosystem that optimizes V1G/V2G flexibilities, in a pilot environment which combines an industrial facility and an energy mix (photovoltaic, battery, etc), in Elia's grid services, energy markets and cost savings (e.g. self-consumption), using an Energy Digital Twin model and artificial intelligence.

It will accelerate the participation of industrial/commercial consumers in existing flexibility services (e.g. aFRR) and in-development opportunities, in close collaboration with Elia.

2.5.2 Object of the proposal

The goal of this project is to develop, test and validate a framework and artificial intelligence algorithms that will optimise the participation of fleets of combined V1G and V2G flexibilities on industrial sites on Elia's grid services and energy markets. In addition, the fleets will concurrently provide cost savings services to the industries (e.g. increase self-consumption), will be coordinated with the on-site energy mix (e.g. PV + battery) and respect operational constraints (e.g. vehicle SoC, industry constraints, grid metre, etc.)

A close collaboration is already established with Elia's Consumer Centric Market Design (CCMD) to define innovative use cases for the valorization of the combined V1G/V2G flexibilities to balance the Belgian Power System (WP1).

This first phase will end up with the validation of market participation models and innovative business models, considering current and in-development market design opportunities.

An Energy Digital Twin model and AI algorithms that will optimise these use cases will be developed. These algorithms will be based on resilient Security Constraints Economic Dispatch (SCED) models combining optimisation and Advanced Analytics techniques as well as mathematical models proven for other energy applications.

These algorithms will be integrated into the digital ecosystem of the EV and Energy Mix Test Lab in Erezée and additional hardware will be installed on-site. The algorithms will be tested and improved in the pilot environment (40 EV chargers) during the last months of the project.

The outcomes will validate the approach, guide the development of the future scalable and repeatable industrial product. It will also provide feedback to Elia CCMD with real operation data and experience for the implementation of future market design and products.

The final deliverables will include a summary report of the results as well as a high-level report with recommendations for politics, decision-makers, government, regulators, public entities, grid operators with key findings, main barriers identified and recommendations on market design for a large-scale implementation (GW).