

EMPOWER2.0

EMPOWER 2.0 is the abbreviation of Empowering the citizens - Towards European Energy Market 2.0 (Enabling **More** People's **OW**nership in Energy tRansition). EMPOWER2.0 is an [Interreg North Sea Region](#) funded project with 15 partners, led by Gemeente Zaanstad (NL).

Objective

The project aims to demonstrate and accelerate the empowerment of citizens to become active energy citizens - and to create local energy communities via existing civil society structures - through development of new solutions (e.g. organisational) and adoption of new, emerging and existing solutions for energy ownership. This will lead to an increase of energy awareness and renewable energy production, and hence reduce the environmental footprint in the North Sea Region.

Pilot projects through the NSR will be run that use opportunities to organize direct access to the energy market by engaging and connecting existing civil society structures, such as schools, sports clubs, neighbourhoods, business parks or local energy cooperatives. 14000 households in the directly involved municipalities and regions of the partners will be empowered, leading to an increased uptake of renewable energy by 1% of the households in the NSR and a reduction of 28000 carbon dioxide emissions in the North Sea Region.

Ghent University's role

The research group EELAB/Lemcko takes the role as technical knowledge partner for the Transfo Zwevegem pilot project. The project consists of developing a microgrid with different kinds of RES (Renewable Energy Sources), HESS (Hybride Energy Storage Systems) and an unique LVDC-backbone interconnection.

Activities of the research group within the pilot are:

- Optimization of RES and HESS for increased self-consumption and self-sufficiency
- Analysis on aggregation of consumption profiles on feeder level
- Power flow calculations within the LVDC-backbone and design of the LVDC-backbone
- Comparative analysis of LVDC-backbone with aggregated RES and HESS and AC-grid with distributed RES and HESS
- Analysis and prediction of consumption and yield profiles
- Development of an interactive demonstrator for the visualization of the energy flows within the pilot site.

More details about the pilot project and EELAB/LEMCKO's involvement can be found on the next page.

Contact

Do you have any questions? Feel free to [contact](#) us.

Partners

This project is financial supported by:



The project partners are:



Pilot project Transfo Zwevegem

History and background

Transfo Zwevegem is an old thermal power plant situated in Zwevegem and is located nearby the Channel Kortrijk-Bossuit. The power plant has been built just before World War I and was put into service for about 90 years.



Figure 1 Skyview of the pilot site

In 2001 the production has been stopped and the municipality of Zwevegem and the intermunicipality Leiedal bought the site with the aim to transform it to a new social-economic zone and to develop the site as a zero-impact zone. This will be realized by developing a microgrid with different RES (Renewable Energy Sources) such as solar panels and wind turbines and HESS (Hybrid Energy Storage Systems) such as batteries, hydrogen storage, pumped hydrostorage, supercaps,...

Project concept

These RES and HESS will be interconnected over the whole site by a LVDC-backbone which will be connected with one centralized inverter to the AC distribution grid. An energy management system will be put in place in order to optimize the powerflows and so maximize the self-sufficiency and self-consumption of the community.



Figure 2 Microgrid Transfo Zwevegem

One of the goals of the project is to give it a demonstrative character for the citizens and to valorize the captivated knowledge on educational level. This is also one of the general aims of EMPOWER2.0. For that reason, EELAB/LEMCKO will

develop a demonstrative interactive screen which will be able to visualize the real time energy flows over the whole site. Besides the energy flows, the screen will also show an overview of the production, consumption, self-sufficiency, Moreover the visitor will have the option to interact with the screen in order to give him more insights in the behavior of energy systems.

EELAB/LEMCKO will also stand for the design of the LVDC-backbone and the optimization of the different assets. Furthermore, as it's research scope is strongly linked to this project it's obvious that the research results will have a high value for the development of this microgrid.

Process

The procedure for setting up a regulatory sandbox is currently ongoing. Next to that a funding application for financing the infrastructure has been submitted and granted.

Pilot project partners

