

“Control of connection capacity through flexible application of RES, storage and demand-side management” - FLEXICAP (VLAIO-TETRA)

Synthesis

The energy landscape in Flanders has been marked in recent decades by the emergence of decentralised energy sources. The variable and more and more expected flexible consumption of electricity from solar and wind will have to result in increased electricity consumption from renewable sources in the future. The search for a good on-site balance between taxes, decentralised sources and energy buffers is essential for optimal energy management in both the private and industrial sectors. The technological possibilities to increase self-sufficiency and self-consumption of energy are sufficiently available, but by flexibly adjusting consumption and production to each other, self-sufficiency can be greatly increased. However, a new challenge is imminent due to the abolition of the traditional day/night pricing. This will manifest itself in the form of an active control of consumption due to an additional tariff carrier based on connection capacity (the so-called capacity tariff). By linking the use of renewable energy to the most optimal storage and relating this in turn to a flexible control based on this capacity tariff and the future variable energy tariffs for medium and small consumers, this means a new challenge for the grid of the future.

The answer to this question is undoubtedly to use and/or increase the integration of renewable energy sources and/or by using storage systems and intelligent flexibility. Several challenging and future techniques will be analysed in order to maximise the proposed optimisation. This will also make it possible to avoid the local expansion of network capacity and to use the flexibility of consumption (demand response) to balance supply and demand of energy (in the future as a function of time-dependent energy tariffs). By contributing to the future need for flexibility, this will also have an impact on the distribution network and increase the potential for integrating electrical charging points into the network.

Objectives

- Managing the balance between yield and consumption by ensuring the interoperability of different systems by aiming for maximum flexibility in function of the variable cost of energy with minimum capacity utilisation.
- Optimizing yield and consumption will reduce energy bills by increasing the simultaneity of own yields and consumption through the use of energy buffers and flexible consumption patterns in function of the prevailing energy tariff.
- Minimizing the connection capacity by responding to the reduction of peak loads and making them predictable.
- By integrating the digital meter a better link between energy yields and existing and new storage technologies. In turn, the digital meter signals can be linked to a flexible supply and demand pattern.
- Energy storage as a solution for increasing self-consumption, self-sufficiency, and increased flexibility.