

Flexmarket experiments to solve congestion issues in the power grid

AgroEnergy

AgroEnergy is a 100% subsidiary of the Eneco Group and is a market leader active in delivering (sustainable) energy solutions for greenhouses. We focus on facilitating smart trading solutions in the energy market for customers through an online trading platform.

We also develop state-of-the-art data-driven services to help our customers in optimizing energy costs. We use structured and unstructured data streams from our own IT landscape, external sources and climate computers of our customers greenhouse. Solvers convert this data into useful (physical) solutions.

The energy market is changing rapidly, and horticulture is leading in terms of innovation in crop and energy management. We are the energy partner of the greenhouse owner and work according to the core values: reliable, transparent and innovative.

Problem statement

The increasing share of wind and solar power in power production leads to instability in the power supply. Also we see changes in the pattern of energy consumption. Charging of electrical cars and installation of heat pumps cause new hot spots on the grid. Imbalance between the production and consumption of power increases. Also Tennet and the distribution system operators are worried about congestion on their grids and are searching for effective means to avoid this.

Congestion can be reduced by increasing the network capacity. This requires high investments, long term planning and a clear business case. The other option is to implement price mechanisms that stimulate producers and consumers to change their behavior to avoid congestion. The price mechanisms are implemented via a market model, the flex market. A flex market allows suppliers of flexible resources like CHP's in greenhouses, batteries and heat pumps to sell their flexibility to distribution system operators.

During last winter a TU student examined the pros and cons of the price mechanisms in a flex market as a solution for congestion issues. He discovered there is a recent dominant view at engaged energy parties. Based on this view he lined out a possible working market model. This model is described by EDSN group 'Netverzwaring tenzij' and will probably be supported by new legislation later on this year or next year.

Now most power distribution companies prepare to execute flexmarket experiments in defined areas. Their goal is to experience the real operation of this market model. AgroEnergy, her customers and partners intend to join these experiments in the 'aggregator-role'. Our goal is to become a major supplier of flexible power in these markets for congestion issues.

Research question

- Under which circumstances is this a profitable and feasible market model for AgroEnergy, her customers and partners?
- Is this market model effective in solving congestion issues in operational cases? Does this require specific conditions?

Research approach

1. Formulate specific and measurable research hypotheses
2. Design and execute experimental projects (=hands on in operation). We are currently preparing pilot projects for Tennet, Stedin and Liander.
3. Frequent analyses of the results and make adjustments in the pilot methodology based on findings.
4. Testing expectations based on the results of empirical research.
5. Formulate conclusions and recommendations.

More information

<https://www.agro-energy.nl/kennis/whitepaper/2017/03/17/whitepaper-elektriciteitsmarkt/>

<https://www.agro-energy.nl/kennis/whitepaper/2018/06/20/whitepaper-flexmarkten-als-alternatief-voor-netverzwaring/>

<https://etpa.nl/>

<https://www.stedin.net/over-stedin/duurzaamheid-en-vernieuwing/smart-grids>

<https://www.usef.energy/>