Energy Planning and Optimization Platform

Centrica Energy Trading

Figure 1: Interface of the energy planning and optimization platform developed by Centrica Energy Trading.

Summary of IoT case

The energy planning and optimization platform developed by Centrica Energy Trading consists of a web-based API with a data warehouse system for energy route-to-market services. The Centrica Energy Trading tool enables an optimal utilization of several asset types including heat pumps for district heating supply. This enables the optimization of energy consumption and production earnings as well as the minimization of expensive imbalances.

The platform provides an estimation of the Power consumption, heat production, and COP of the heat pump based on forecasted weather variables such as outdoor temperature, humidity, wind direction and speed. In addition, the interface includes estimation of the varying marginal prices in different electricity markets.

The services provided by the platform include coordinating heating and electricity markets, optimizing heat pumps for the provision of frequency regulation services and guaranteeing electricity prices for large-scale heat pumps and other consumption systems.

To date, several Danish district heating supply companies have adopted the Energy Planning and Optimization platform developed by Centrica. Electricity prices from the Nordic power exchange Nord Pool are analyzed in the platform, including Day ahead spot, Intraday and frequency regulation markets. The platform has enabled the correct registration at hourly level in the spot market and minimization of electricity and heat imbalances.

Figure 2: Example of the interface used by the platform from Centrica Energy Trading.

Results

Danish district heating companies have been able to maximize their profits by using the platform from Centrica Energy Trading. This was done through the optimization of the operation of heat pumps according to heating and electricity prices, as well as weather forecast indicators.

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FACTS ABOUT THE IOT CASE

IoT category: Grid services.

Heat supply capacity: No specific requirements regarding heating capacities.

Heat source: No specific requirements regarding types of heat sources.

Analysis method: Big data analysis and market models.

Modelling requirements: Data-driven.

Data required: Weather forecast and margin prices for electricity prices markets.

Technology Readiness Level: TRL 7 (system prototype demonstration in an operational environment). TRL 9 expected in Q4-2021.

Link to webpage:
www.centrica.com/our-businesses/energy-marketing-trading/