

Challenge yourself at ICT Group

ELKE'S CHALLENGE:

Investigate the possibilities of flexible energy consumption

Elke Klaassen, technical consultant



Water Authority Amstel, Gooi en Vecht (AGV) and Waternet wanted to know whether the Horstermeer waste water treatment installation could reduce its energy costs by a different way of dealing with its energy supply and demand. Elke Klaassen, ICT Group's technical consultant, describes the challenges of her project: "My assignment was to determine the value of flexibility in the supply and demand of energy. My first step was to visit the water treatment plant to talk to the process operators and investigate all processes and assets. What are their energy consumption levels? My talks with the operators allowed me to determine whether there were any possibilities of flexible energy consumption at all, and to identify any possible quick wins."



The energyNXT Platform

Cost savings are of crucial importance to the energy market, and at the same time, aligning supply and demand is becoming an issue of rapidly increasing relevance. EnergyNXT, ICT's energy-specific IoT platform, provides transparent insight into an organization's energy regime. What's more, EnergyNXT offers a wealth of facilities for smart use of energy sources and aligning energy sources and consumption. Data from various sources are gathered and analysed. Storage and calculations are performed in the Microsoft Azure Cloud.

The immediate benefits of using EnergyNXT include enormous energy savings and reduced CO2 emission. This results in lower energy costs, but it also increases the stability of the network. The platform also offers facilities for managing energy demand. This will allow end-users to adjust their energy consumption in order to take into account price fluctuations. ICT Group is using energyNXT as a foundation for energy monitoring and for optimizing energy generation and consumption.

"Shifts in the supply and demand of energy over a period of time are not always possible, and also not always available in all locations", Elke explains. "For instance, you can't interrupt the water treatment process at a waste water treatment plant, or only treat the water during sunny weather. Horstermeer turned out to have CHP plants that convert the biogas, which is generated at the treatment site, into electricity. These combined heat and power installations offer tremendous opportunities. After all, CHP plants can produce heat and energy, and the energy consumption can be tuned to their own needs. AGV / Waternet was already aware of the fact that CHPs can offer flexibility, but I managed to make a detailed investigation of the opportunities. When is the CHP plant operational? At what levels of biogas does it produce energy? And what happens if you increase those levels?"

Options to achieve savings

"Usually there are three ways of achieving savings by controlling the demand. For instance, you can shift processes over a period of time in order to benefit from lower energy rates more often. "This option is called 'high-low rate'. Another option is to distribute the energy consumption over time, which may allow you to use a lower capacity connection to the grid, or it may enable

you to reduce the variable cost of an existing connection to the grid. The last option may even allow the treatment plant to operate in an energy-neutral way by using the available flexibility to optimize the alignment between supply and demand in the plant itself. This is achieved by maximizing the plant's own energy production, and minimizing the amount of electricity that is returned to the grid. From an economic perspective, this last option turned out to be the most attractive solution for AGV / Waternet. In addition to an increase in the plant's own consumption of the sustainable energy production, it also results in reduced peak loads on the electricity grid. And this results in considerable savings on an annual basis."



Investments

"AGV / Waternet has to decide whether it wants to invest in an Energy Management System (EMS). This system's realization will be based on our energy platform energyNXT. This platform offers opportunities for smart ways of organizing and aligning the energy consumption or production of all assets. I'm involved in several projects which make use of various other applications of energyNXT and which utilize this platform with the objective of avoiding congestion on the grid."

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Consultancy

Elke has been working for ICT Group for a year and a half, and she's passionate about her work. "The assignments are very diverse. Each new customer brings a new challenge. My current work has a lot to do with data science, but I'm aspiring to a position in which I can combine this with consultancy. Something I thoroughly enjoy is presenting research results to groups of subject matter experts. The interaction and feedback

that occur during these presentations show clearly whether people have properly understood the things you've investigated. ICT offers adequate opportunities for growth and what's more, the company supports my personal development by offering a range of training courses."

Energy expert

Elke Klaassen is a real expert in the domain of energy. She completed a Master's Degree in Sustainable Energy Technology at Eindhoven's Technical University (TU/e), followed by a PhD in Electrical Energy Systems group. After obtaining her doctorate she started working for an energy company where she was involved in marketing a new product via an incubation process. "However, after some time I felt that I wanted to develop myself within the domain of IT and energy." And it didn't take long before she had found a more challenging position at ICT.

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