



Cloud Power Texel

Smart Grid Pilot Projects — Results as of September 2015

Innovation programme commissioned by the ministry of Economic Affairs

- Local electricity grid on DC voltage
- Electric transport and decentralised electricity generation
- Energy-neutral Heijplaat
- Modular smart grid for business parks
- Smart grid and energy transition in Zeewolde
- ProSECco examines four user groups
- Smart grid in sustainable Lochem
- Smart heat grid on TU Delft campus
- Your Energy Moment
- Couperus Smart Grid
- **Cloud Power Texel**
- PowerMatching City II

Goal

- Design a renewable energy supply concept to demonstrate how a community can become as energy self-sufficient as possible.

Issues

- Are the end users willing and able to generate renewable energy independently?
- Are they prepared to change their energy consumption behaviour in order to use the energy that is generated at the times when it is available?
- How can we monitor, control and manage the flow of energy better? How can we align supply and demand?
- Can Cloud Power reduce energy consumption, increase the proportion of renewable energy in the energy supply and generate this energy locally?
- Which changes in legislation and regulations are required to stimulate local generation of renewable energy?

Duration

- April 2012 through January 2015.

Project partners

- TexelEnergie, Capgemini, Alliander.

By 2020, the municipality of Texel wants to be able to fulfil its complete energy needs by means of renewable energy. One of the parties that can contribute to this objective is the TexelEnergie cooperative, which initiated the Cloud Power project together with Alliander and Capgemini. Their goal is a self-sufficient community. The pilot project studied how such a community could function and how the energy flows can be monitored and charged for. The success of the system depends on smart energy management.

Results

A total of 160 permanent households and 140 holiday homes participated in the pilot project. The Home Energy Management System developed by Quby was especially adapted for the project with a function for setting individual goals. "If a household wanted to save 10%, the system calculated the maximum allowable energy consumption per day on the basis of the weather report," explains Arie Hobbel, project manager with Capgemini. "We did this to find out what the influence of individual goals and weather conditions were on behaviour. The users were given insight into the effects of the weather and their behaviour and we wanted to know if this would encourage them to take action. The daily goal on the basis of the weather report proved to be a particularly good stimulus for turning the heating down a bit, or taking other measures, such as fitting draught excluders." The pilot project also increased

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awareness with the use of smart plugs, which measure the consumption per electrical device. “This revealed which equipment was consuming more power than necessary, such as the pump for the underfloor heating that runs all day. The smart plugs allowed us to measure consumption and provide the homes with tips based on this. For example, we calculated the cost of washing with too hot water or an obsolete washing machine. People said they thought they were saving more energy, although we didn’t see this in our measurements.”

Lessons

On average, the households saved 5.1% on electricity and 10.3% on gas during the trial period. “During the evaluation meeting they said they wanted to save even more,” says Hobbel. “Our analysis revealed that people became more energy conscious when energy was scarce and hence expensive. They were prepared to postpone their energy consumption until the periods that a lot of energy was available and so cheaper, for example the periods that the community generated a lot of electricity themselves with the collective wind turbines and solar panels. The energy management system alerted them when this was the case and they then set the timer on their washing machine manually to profit from it. In the future, smart devices, that automatically detect the right conditions, could do this for them.” Changes in behaviour lead to lower morning and evening peaks. Energy storage systems make it possible to bridge the periods when there is little energy being produced. On an island such as Texel the total energy demand spikes during the school holidays. The seasonal fluctuations are clearly observable. “We deliberately involved holiday homes in the pilot project,” explains Hobbel. “Holiday makers are energy consumers too and we wanted to test our suspicion that it will be hard to influence the energy consumption behaviour of this group. This proved to be the case; there was indeed no way to influence holiday makers to change their energy behaviour.”

Plans for the future

Now that this successful pilot project has been completed, the consortium will be disbanded. “We have gained a huge amount of new knowledge,” says Hobbel. “We have learned that providing information about energy has a large influence on consumption.

Encouraging certain behaviours and discouraging others can lead to energy savings. Although the pilot project has been completed, TexelEnergie may start a follow-up project at a later stage. The smart meters that Alliander installed throughout Texel in anticipation of a widespread roll-out will stay where they are.” Hobbel thinks the concept of influencing energy behaviour can be successful, but that legislation currently inhibits a major roll-out. “The market system needs to be made flexible if we are to go any further. We need to be able to align energy consumption to availability. I am convinced that this can work; we proved as much with the pilot project. But first changes will need to be made in the Dutch legislation. To this end, we are joining forces with Capgemini to enter the global renewable energy market in order to promote our concept. We will apply the experience we gain in the Netherlands.”

More information

If you want to find out more about Texel Cloud Power then you can contact Arie Hobbel of Capgemini at arie.hobbel@capgemini.com or TexelEnergie at info@texelenergie.nl.

Smart Grid Pilot Projects: energy innovations

The goal of the Smart Grid Innovation Programme (Innovatieprogramma Intelligente Netten – IPIN) is to accelerate the introduction of smart grids in the Netherlands. The Netherlands Enterprise Agency (RVO.nl) carried out the project for the ministry of Economic Affairs. Over the past years, twelve different pilot projects have gained learning experiences with new technologies, partnerships and methods. The pilot phase has now been completed, but most of the projects will be continued. Via RVO.nl they share their experiences, particularly concerning the five key themes involved in smart grids: legislation and regulations, user research and user participation, vision, standardisation and new products and services. The goal is to achieve widespread roll-out via the path of experimentation. More information: www.rvo.nl/intelligentenetten

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