



Geas Guarantees Energy Savings Using the Internet of Things

It takes a staggering amount of data to pinpoint how quickly a given household can earn back the energy-efficiency investments they have made in their home, due to the sheer number of variables involved. But the use of sensors, the Internet of Things, and external data is enabling increasingly accurate predictions. So accurate, in fact, that Geas Energiewacht can now guarantee its customers the specific amount of money they will save. Their aptly named product, the Energy Savings Guarantee, is powered by ICT Group's Smart Energy solution.

Geas originally set out to use the Internet of Things to give customers more accurate information about the payback period for energy-efficiency measures. They eventually decided to take things one step further and introduce the Energy Savings Guarantee: a brand-new product that enables customers to know beforehand exactly how much money they will save if they allow Geas to carry out the required energy-efficiency improvements in their home.

"We currently have the technology to track heating boilers remotely and collect data on a household's energy consumption remotely. Isn't there some way we could take advantage of the massive increase in the amount of data available – including a growing amount of predictive data – to develop a product that helps customers to reduce their energy consumption?" That was the question independent IT consultant Huite Jan Hak asked during a presentation he gave last year to the Geas Energiewacht management board and representatives from the four service companies that have partnered with Geas. His audience was so inspired by his presentation that he ended up being hired as a product developer on the ambitious new project. He and product owner Gerwin Bloemberg were assigned to develop the concept behind the Energy Savings Guarantee, all the way to the product's market launch.

Savings Depend on Many Factors

The process of developing a system that can predict the payback period for energy-efficiency measures with absolute accuracy turned out to be more complex than the partners had anticipated. For starters, the amount of gas that homeowners use to heat their home depends not only on the type of residence and the level of insulation: the final meter value is also determined to a large extent by weather conditions. And of course, the family size and people's individual habits and preferences also have a significant impact on the consumption data. After all, some people like to take longer showers on average than others, and some will prefer a slightly higher room temperature.

The bottom line is that, when making a preliminary estimate of how much energy a family will save in the long run by re-insulating their home, you need to take into account a multitude of factors. Similarly, it's difficult to accurately predict the energy savings generated by solar panels or a solar boiler in advance. Sure, we can make a reasonable estimate of the expected number of sun hours based on meteorological statistics – but then sunshine in the Netherlands tends to be elusive and, as they say, there's nothing more unpredictable than the weather.

The Internet of Things and a Smart Algorithm

In taking on the ambitious challenge of researching and mapping all these variables, Geas had to find a specialized IT partner with the knowhow to develop a system that could not only collect and monitor the correct data, but could also help to analyze and visualize it. A critical part of this system is a smart algorithm that, supported by the Internet of Things and external data, is equipped to detect unexpected deviations in people's energy consumption patterns.

Integrated within a Single System

ICT Group is one of a select few companies at the frontline of using The Internet of Things to make homes more energy-efficient. Heine van Wieren, the company's Business Development Manager Energy: "After completing a small-scale pilot project involving forty homes in Groningen, we set up a larger project in the town of Heerhugowaard called **Energiekoplopers** ('Energy Leaders'). We connected the thermostats, solar panels, heat pumps, and boilers in 200 homes to the Internet. The system we developed could not only track the data remotely, but actively control these devices as well."

ICT Group uses IoT Suite+: an in-house-developed, IoT-based platform that runs completely on Microsoft Azure Cloud. The platform already came close to the system Gerwin and Huite Jan had in mind, and when they learned that ICT Group could also link data from other sources to the system (including meteorological data from the Royal Netherlands Meteorological Institute [KNMI]), they did not need to think twice to get on board.

Huite Jan: "There are a growing number of data providers that can link you up with thermostats, heating boilers, and other devices. But they all use their own portal and their own system, and it gets confusing when you need to log in to more than one system – there's just too much work involved. What we were looking to do was to integrate everything within a single system, and luckily the ICT Group's platform turned out to be perfect for that."

Heine: "We had a pretty steep learning curve in designing our solution. Soon after installing our platform at Geas we

added some new features, including the use of public data that makes it possible to predict energy consumption over an extended period of time. We also started using state-of-the-art business intelligence technologies to create reports. This tells us to what extent residents' actual energy consumption varies from the predicted pattern."

Data Analysis Predicts Future Consumption

The system is now up and running, and around 150 households signed up for the Energy Savings Guarantee in 2016. After an expert had examined their home and given them a quote, these homeowners chose to invest thousands of euros in energy-efficiency measures, including roof and floor insulation and solar panel systems.

What undoubtedly convinced these customers was Geas' promise to cover the difference between the estimated and actual savings if the measures taken did not have the desired effect. But to be able to provide that guarantee, Geas needs to be able to blindly trust the system they developed together with ICT Group. While the practice of monitoring customers' energy consumption in real-time may not be new, using data analysis to verify future consumption is a whole new ballgame, one that replaces rough estimates and guesswork with forecasts based on reliable data.

Choosing Tried-and-Tested Measures

"Our main target demographic for the Energy Savings Guarantee is the owners of slightly older homes," Gerwin tells us. A visit to the website of Milieu Centraal, a Dutch non-profit dedicated to raising awareness of energy consumption and the environment, reveals that many homes falling into this category do indeed appear to be badly in need of an upgrade. Many homes built prior to 1992 are poorly or insufficiently insulated, leading to unnecessarily high heating costs. Their owners would do well to consider investing in the latest insulation materials and techniques, as both their wallets and the environment will thank them.

An amount of roughly 10,000 euros is generally sufficient to 'green' the entire home. Geas favors tried-and-tested

energy-efficiency measures that have proven their positive effect over time. This means they can tell customers that they will be able to save as much as 40, 50, or in some cases even 60 percent on their energy bill – guaranteed.

And That's Just the Start of It...

The households currently using the Energy Savings Guarantee are having their energy consumption monitored in real-time. "But they're not likely to notice anything much as they go about their daily lives," Huite Jan assures us. "If Geas detects any irregularities in their energy consumption patterns, they will contact the customer by phone or email. And if, for example, it looks like some of the insulation materials may have become detached, we will request the customer's permission to send a technician round to the house. But our job isn't to advise customers to turn down the heat when we happen to see a spike in consumption – we want to intervene as little as possible in customers' comfort and sense of wellbeing."

Heine concludes by promising that "This is only the beginning. Geas and other service partners are continuing to develop and improve the Energy Savings Guarantee. And since we keep adding new services and products to the platform, the possibilities are endless. It also means we're flexible and are able to quickly adapt the platform to future trends and developments."

More information

E dt@ict.nl