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Landis+Gyr in Finland excels as smart metering front-runner

Helsinki (Finland)

Smart metering coverage in Finland has exceeded the national target of 80 percent within the given legal timeframe: At the end of 2013 coverage was close to 100 percent. One third of the Finnish residential smart metering market is now managed with Landis+Gyr's Gridstream solution.

To date, Landis+Gyr has delivered over one million smart meters to a number of Finnish energy companies – the equivalent of delivering a smart meter to every third Finnish household. The following article looks at Landis+Gyr smart metering projects rolled out between 2010 and 2013 in Finland during the run-up to achieving the milestone.

Point of departure

The first residential smart metering rollouts began in the late 1990s. These were carried out after a positive business case showed that there were consumer segments where the benefits of smart metering clearly exceeded the required investment costs. The introduction of a new law on billing and smart metering, which was introduced in 2009, stipulated that 80 percent of Finnish households were to have smart meters installed by the beginning of 2014. Major smart metering contracts with the country's largest utilities were signed after a thorough public tendering process, which was started in 2009 – parallel to introduction of the new law. A majority of the smart meters were then installed between 2010 and 2013.

Project scope

The market requirements for smart metering solutions were all quite similar, independent of the utility: Each utility required tariff and hourly profile data, power quality data, disconnector and load controls, as well as alarms. In almost every case, the vendors were requested to provide a complete smart metering solution as a turnkey delivery, including:

- Smart meters
- Communications
- Smart metering software
- Software integration to the utility's IT systems (minimum requirement was integration to the Customer Information System, CIS).
- Installations
- Project management

Many utilities required a multi-energy solution capable of managing district heat or gas metering, as well as electricity, with a single solution, and most utilities wanted to outsource all smart metering operations.

Antti Latsa, Customer Service Manager at Finnish energy company Järvi-Suomen Energia comments that, during the procurement phase, it was "already clear that we wanted to take a comprehensive approach to making the best out of smart metering technology". So far, says Latsa, the energy company has benefited from the technology: After a recent heavy storm they were able to locate affected areas in the low voltage network "more precisely" and in many cases received information regarding the metering points that were without electricity supply before the customer contacted them. "This is just one example out of many that shows that there are a number of possibilities to make best use from metering data now and well into the future," he comments.

Technologies employed

Landis+Gyr provided the Finnish market with its comprehensive Gridstream end-to-end smart metering solution, which comprised the following elements as a turnkey delivery, including project management and installations:

- E450 and E350 smart meters
  - The meters measure hourly consumption and power quality information. All meters include remotely controllable relays that can be used to control individual loads in a household, for example for water boilers or heating. The meters are also equipped with a disconnector/connector that can control the power supply (power on/off).
- Two-way communication between smart meters and smart metering software
  - Hourly metering data is usually 'pushed' once a day.
  - On-demand reading requests and controls can be made.
  - The communication technology used is usually PLAN+ PLC communication, supplemented with 2G/3G communication. RF Mesh communication is also used when there are 220,000 metering points.

Leading the way in successful smart metering projects

Landis+Gyr has enabled Finland to exceed EU and national milestones and become the first country in the world to introduce hourly data measurement on an unprecedented scale.

Discover Landis+Gyr's end-to-end solutions for your smart metering project – **www.landisgyr.eu.**

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  - M-Bus communications is used in communications between the meters in multi-energy cases.
- Gridstream AIM smart metering software
  - The Gridstream software manages meter readings, and processes smart metering data. It acts as the bridge between the metering park and utility IT systems, handling all communication and control of smart devices. It also provides data storage, unification and validation.
- AIMIA
  - The integration platform of Gridstream AIM is used to enable two-way integration with utility IT-systems, e.g. CIS, NIS and MDMS. This means that utility personnel who are not in the metering department can gain access and utilize smart metering data smoothly and efficiently, without needing to separately access the smart metering system.

Today, Landis+Gyr manages over 750,000 metering points under its Meter Reading Service for utilities that outsourced the smart metering operations.

Landis+Gyr residential smart meter (E450)

Rollout

Smart metering projects have all been large-scale initiatives in Finland – at the height of activity, a smart meter was installed every minute in Landis+Gyr projects, peaking to 1,700 daily meter installations in a single project. Landis+Gyr carried out the installation of smart meters with contracted partners.

During the roll-out phase, a professional project management model was used, and optimized, based on models employed in previous large-scale rollouts conducted in Sweden and Denmark. Installation of meters is not just a technical process, but a logistical and communication challenge: ensuring correct meter types and communication technologies are used for the designated metering point, as well as contacting end-customers to agree on installation times, all require high degrees of coordination and planning work. Further factors that needed careful planning included, among others, organizing the recycling of the old, analog meters.

Outcome

Results show that, at the end of January 2014, the average reading reliability in projects with PLAN+ and RF-mesh was 99,8 percent. Utilities provide hourly consumption information to end-consumers via internet portals (information is available the following day). The end-consumers are then able to gain awareness of their energy consumption patterns and habits, as well as gain access to advice on energy efficiency.

Metering Service Manager Jari Rusanen from energy company Loiste Sähköverkot Oy talks about how their energy portal has received "excellent feedback" from their customers. In the portal, the end-user can see their individual energy consumption as well as savings they are making. Customers are also happy with billing which is today based on actual rather than estimated consumption. Based on this successful outcome, Rusanen says that the energy company is "now planning on expanding smart metering to water metering".

The utilities see significant benefits from the technology, including:

- Consumption based billing
- Better customer service due to exact real-time information
- Remote meter readings and control of power supply. For example, when an end-customer moves house there is no need for an on-site visit (customer service personnel can read the final consumption figure and then switch off the power until a new contract for the location is created). This leads to significant savings; for example, in Oulun Energia this saves 500 to 1000 site visits per month.
- Power quality information: faster reaction to failures, easier location of failures in the network
- Utilities receive detailed information on power cuts and their duration (Finnish legislation states that end-consumers must be compensated following long power cuts).

Finnish energy company Oulun Energia Siirto ja Jakelu is also pleased with results. "The ability for the company to manage meter readings remotely and switch off power immediately after the customer contract ends eliminates visits to between 500 and 1000 end-customers who move house within any one month and leads to great savings", says Matti Lehto, Operating Manager at Oulun Energia Siirto ja Jakelu. Customer services can provide better advice on energy efficiency due to exact consumption information - Oulun Energia has even been able to identify failures in end-consumers' electrical appliances in the home.

Jouni Lehtinen, Manager of Customer Relationship Management at Helen Electricity Network, has experienced similar results, stating that the technology "helps to identify 'power-hungry' equipment", such as night time standby loads or a sauna. Helen Electricity Network has been able to create usage patterns for such devices that enable them to not only save energy and money, but to also reduce their environmental footprint.

Mika Nousiainen, Metering Manager at Helen Electricity Network, brings the picture together by describing the factors that contributed to the milestone result: "Landis+Gyr was able to provide a solution that meets our needs, integrate it into our existing IT environment and carry out a turnkey project for 200,000 smart meters. That was not an easy task, but we managed to do it on time – thanks to the good cooperation with, and expertise of the supplier." Doubtless to say, these essential ingredients have contributed to the country's ability to become one of the most advanced in Europe in terms of its ability to meter electricity consumption at the residential level, while also helping to meet the EU's energy efficiency targets