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01 ENERGY from an underground network

The city centre of Helsinki has often been called ‘cheese with holes’. Its most important holes are the energy tunnels that contribute to the security of energy supply in the capital.

Pertti Suvanto | PHOTOS Pekka Nieminen

Markus Parviainen, Investment Manager at Helen Sähköverkko Oy, is beckoning us at the roundabout to follow his estate car. In just a moment, we arrive at the crossroad of Aleksanterinkatu and Mannerheimintie – albeit 30 metres underground.

The Kluuvi substation is located almost directly beneath the Three Smiths Statue. It was excavated in connection with the service tunnel serving the properties in the city centre of Helsinki and taken into use in 2011.

The substation is located at the centre of the greatest load density in Finland’s electricity use, and its output is consumed already within the area of about one square kilometre.

– Consumption of a hundred megawatts per one square kilometre is quite unique in the Finnish conditions, Parviainen points out.

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Crisscrossing and overlapping network

There is a simple reason for having the network underground: there is no free land left to build on in the most efficient and densely built areas in Helsinki.

– Here, we are in the middle of the city and still out of sight. With the Kluuvi substation, the network has been reinforced and the reliability of electricity supply has been improved further in the most important area of Finland's electricity consumption, Markus Parviainen explains.

Energy tunnels are one part of Helsinki's underground 'cheese'.

Helsingin Energia has a total of almost 60 kilometres of energy tunnels deep in the Helsinki headland. There are seven main tunnels. These are located in the bedrock, usually at a depth of 40–60 metres. Helsingin Energia's maintenance staff can move around in vans in the dry tunnel facilities to ensure trouble-free technical function of the systems.

– All in all, there are over 400 underground facilities and about 200 kilometres of technical maintenance tunnels under Helsinki, lists **Markku Hyvärinen**, Unit Manager of Network Development at Helen Sähköverkko.

The majority of the tunnels, such as the energy tunnels, are not open to the public, e.g. for security reasons.

There are also underground facilities classified as secret by the state, and they are not found on any master plan. However, there is an underground master plan in Helsinki, and it was completed in 2010 as the first one of its kind in the world. No other city has planned its underground facilities or knows its existing structures in their entirety as well as Helsinki.

Looped network

We are now deep in the Meilahti–Pasila–Käpylä main tunnel in Pasila to see the underground wonder, the Pasila cold accumulator. This underground lake with a volume of 11.5 million litres stores cold for the use of Helsinki residents.

– A similar gigantic accumulator, but twice the size, is being completed under the Esplanade Park, says Helsingin Energia's Project Manager **Timo Nevalainen**.

In Helsinki, 80 per cent of district cooling is produced with energy that would otherwise be unutilised. The Pasila accumulator is charged at night from beneath the Katri Vala Park, the world's largest heat pump plant that produces district heat and cooling in the same process. This plant is also located deep in the bedrock.

– The energy tunnels combine Helsingin Energia's main production plants into a major system. With these kinds of tunnels, we can easily transmit high volumes of district heat, cooling and electricity.

As the network of tunnels is looped, the security of energy supply is excellent. Optimisation of energy production in a network of major transmission lines is also important.

– We are able to meet power demands with the most advantageous production at any given time, Nevalainen explains.

02 You are important to us

"I'm really happy with my electricity. The price is right and the customer service impeccable, quick and flexible. I have recommended you to many people."

This customer feedback crystallises the expectations of many of our customers. A lot of them are satisfied if everything works and the energy price is reasonable. They appreciate competent and easy-to-reach customer service when they need it. If you are one of their number, you don't need to worry. We want our customers to be confident that our prices are set at a good and competitive level in the long term. We also develop our products continuously, so that we can offer enough alternatives for a variety of situations and lifestyles.

Companies are often accused of concentrating exclusively on attracting new customers and forgetting their existing customers. But we particularly wish our customerships to be long-lasting and want every one of our customers to feel that they are important to us.

A single person, family with young children or pensioner couple; different customers want different things. Competitive pricing and good customer service are the foundation that must be in order. As well as these, additional services and benefits are required, from which all customers can find just the things that give them pleasure and are useful.

Watch this space – we have great news and events in store for you next year, too!

Tiina-Kaisa Saukkola
Account Manager, Electricity Market

03 Towards A SMART HOME

Home automation can save energy and increase living comfort and safety. Smart features can be post-installed in homes, but in new builds it is included from the outset. The Kalasatama area is helping to show the way to the future.

Electrical equipment should be turned off whenever it is not used. If the house has a storage heating system, heating is best done when it is most economical. When everything is automated, the occupant also saves effort and avoids things like having to remember to turn off lights and puzzling over various on/off switches.

Product Manager **Hannu Pikkarainen** tells us that Helsingin Energia is about to announce a new Termo home automation service for controlling electric heating this autumn.

Pikkarainen believes that the next home automation applications are also likely to be related to heating control and energy saving in general.

"There is call for controlling various forms of electric heating and also such things as on/off switches in the home. The system could be set to switch off certain electrical equipment when there is nobody in the house."

Increased safety

Ossi Porri, Development Manager at Helsingin Energia, stresses that as well as increasing energy efficiency, home automation can also help to improve electrical safety.

"Of course, electrical safety is increased by the mere fact that the on/off system is programmed to automatically turn off the cooker when there is nobody at home."

Home automation systems can also be constructed to constantly monitor the operation of electrical equipment and set off an alarm immediately if the equipment behaves in any way that deviates from normal.

Possibilities open up also for other types of safety applications:

"For example, families with young children may be interested in an application that automatically informs the parents that small schoolchildren have now come home."

Home automation also adds to living comfort. It could feature a function that recognises an occupant in the room and sets the heating, ventilation and lighting automatically at optimum levels.

Equipment internet

Professor **Juha Röning** from the University of Oulu Department of Information Processing Science believes that the greatest possibilities for increasing energy efficiency, safety and living comfort open up when domestic appliances are connected to each other and the information network.

"In the home of the future, equipment is more integrated as part of the home, and we will get rid of switches and the hassle with leads," Röning says. It is likely that at some point in the future the various screens will also become history, and home functions can be controlled through speech and movement, for instance.

Röning adds that this kind of a home is part of the phenomenon becoming known as the Internet of Things.

"The trend is for more and more devices to be linked to the internet. An example is the modern cameras that are capable of sending the pictures instantly to the internet and social media."

Energy efficiency and control of energy use must be viewed not only from the single home perspective, but also one of a network formed by homes.

Smart aplenty in Kalasatama

Helsingin Energia is involved in designing a showcase of smart energy solutions in Kalasatama. The area will make use of a number of different automation and control systems.

They include local solar power, infrastructure supporting electric motoring, remotely read meters, energy storage facilities, and an electricity network supporting a diverse complex.

Helsingin Energia has been involved in a consultancy role to define the specifications required for the buildings in the system.

"The energy angle is highlighted in Kalasatama, but safety and maintenance issues are also important," says Ossi Porri.

The central idea is to control energy consumption and level out consumption spikes through methods like optimising usage on the basis of energy price.

PHOTO Jakke Nikkarinen

Electricity tax may rise from next year

The government has submitted a proposal to raise electricity tax as from the beginning of 2014.

If the proposal is approved, the electricity costs of an apartment consuming 2,000 kilowatt-hours of electricity a year would rise by about five euros per year.

The annual electricity costs of a detached house with electric heating, consuming 20,000 kilowatt-hours a year, would rise by 50 euros per year.

Have a festive Christmas

The opening of Aleksanterinkatu Christmas Street will take place on Sunday, 24 November 2013 at 1 pm. The Christmas lights will be switched on at 3 pm, after which the Christmas Parade will start from Senate Square and proceed to the Three Smiths Statue and the Esplanade, and then return to Senate Square. The younger members of the family are welcome to enjoy the merry-go-round of Helsingin Energia.

The Seurasaari Christmas Path will open on Sunday, 15 December 2013, at 1 pm – 5 pm. Along the path, you can watch festive plays, sing Christmas carols and play with elves. Father Christmas and Old Lady Christmas will arrive to listen to children's gift wishes. Helsingin Energia will be taking part in the event to create a happy Christmas spirit.

Testing new pellets

At Hanasaari, pellet combustion tests have continued with new pellet grades: torrefied and steam exploded pellets. The tests are carried out to find out, for example, the pellets' grindability, combustion, ash and emissions.

Previous combustion tests have already shown that, with a mixed combustion share of 5–7 per cent, high-quality Finnish residential pellets are well suited for coal-fired power plants.

Continuous co-firing of pellets will begin at the Hanasaari and Salmisaari power plants at the end of 2014. After that, the plants will use about 100,000 tonnes of wood pellets each year.

AT YOUR SERVICE Service numbers and price info

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