See energy in a new light » 2/2022

HELEN

What does Finland's energy future look like?

Finland is likely to even become a net exporter of electricity around 2030–2035.

» p. 11

Psst! Turn to page 11 to find out what the energy future looks like for Finland and Helen.

Energy in transformation

EDITORIAL » Energy has probably never been as interesting a topic as it is now. We are in the middle of an energy crisis, and many people are wondering whether we will have enough electricity and heat in Finland now and in the future.

Helen has lived through several energy-related crises. While every crisis has changed something, we have emerged stronger and wiser from each one. Thanks to our long history and strong competence, we have what it takes to overcome crises and emerge as a more efficient, environmentally friendly and customer-oriented company.

The energy crisis affects everyone in Finland. It is understandable that the rising and fluctuating prices are a topic of concern. At the same time, however, the situation presents us with an unique opportunity to change the way we operate.

The energy transformation motivates people and organisations to become smarter energy consumers. Digital services, such as Oma Helen, help and teach us to optimise energy consumption. At this moment, and during the coming winter, saving energy is the best way to prevent potential energy shortages. There will be enough electricity and heat in the future, even if they are produced in new ways.

“The transformation will reshape consumption.”

Juha-Pekka Weckström CEO

A SOURCE OF PRIDE

Shaking up the energy sector

Helen Ventures invests 50 million euros in startups in the renewable energy, e-mobility and circular economy sectors. The investment activities, which began in 2019, accelerate the energy transformation by providing support and financing for promising companies.

The Dutch software company Solar Monkey is one of Helen Ventures’ investments this year.

PHOTO: HELEN

HELEN

PUBLISHER Helen Ltd, Kampinkuja 2, Helsinki, 00090 HELEN, tel. 09 6171
EDITOR-IN-CHIEF Salla Virkkunen **EDITORIAL TEAM** Genero **REPRO** Aste Helsinki
PRINTED BY Punamusta **ISSN** 1455-9528
HELEN MAGAZINE is Helen Ltd’s and Helen Electricity Network Ltd’s shared customer benefit. The magazine is published twice a year. To cancel your subscription, send a message to asiakaslehdet@helen.fi Address change notifications: helen.fi Our services online: helen.fi and helensahkoverkko.fi

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Energy!

Read about current phenomena and news. Pick up tips for smooth daily life.

PHOTO: HELEN

#electricityconsumption **The Oma Helen mobile app is a smart energy user's best friend. It helps you monitor your electricity consumption, even at the hourly level, allowing you to identify the primary sources of energy consumption in your home. You can also use the app to access your full contract and billing details. Start using the service: helen.fi/en/omahelen-app**

TRENDSETTER

About electricity

Merja Mähkä decided to find out how the price of electricity is formed.

“In the past, the price of electricity was of no interest to me,” Merja Mähkä admits.

As an entrepreneur and freelance journalist specialising in money and investing, she is used to working with financial topics. In spite of that, the electricity bill for her household had never received much attention from her, as living in an apartment with district heating has kept the electricity bills small.

Last summer, Mähkä saw predictions of an energy crisis in the news.

“I became interested in the price of electricity for the first time. I wanted to find out more about it to understand how the system works.”

Keeping an eye on the price of electricity has become part of her daily routine. She even thinks about it when she goes out for a run. Calm seas mean more expensive electricity.

“I’ve become an occasional nagger when it comes to electricity. I want to make sure we make smart choices about energy at home. I reduced the floor heating in the bathroom. I avoid using the oven during the day. I try to do the things that a person living in an apartment can do.”

Merja admits that there’s still room for improvement.

“We charge our smart devices too much.”

DID YOU KNOW?
On Helen’s Instagram account, Merja Mähkä discusses how the price of electricity is formed and gives tips on how to save energy.

As the share of renewable energy grows, the price of electricity will fluctuate more and more.

TEXT AND PHOTO: JUSSI ESKOLA

#energymarket **We publish information on the energy market on our website to make it easier for you to understand trends in electricity prices and other current phenomena. More information: helen.fi/en/topical-news-on-electricity**

PHOTO: HELEN

The Museum of Technology is documenting the daily life, buildings, machinery and work tasks of the Hanasaari power plant before the closure of the plant next spring. Industrial cultural heritage is accumulated through choices. The documentation effort will give the opportunity to learn more about Hanasaari.

IN AN ELECTRICITY SHORTAGE, POWER OUTAGES ARE ROTATED ACCORDING TO A PLAN

✓AN ELECTRICITY SHORTAGE REFERS TO A SITUATION WHERE THE CONSUMPTION OF ELECTRICITY EXCEEDS THE AMOUNT PRODUCED.

✓IN AN ELECTRICITY SHORTAGE, THE USE OF ELECTRICITY IS TEMPORARILY LIMITED BY MEANS OF CAREFULLY PLANNED ROTATING POWER OUTAGES THAT LAST FOR ABOUT ONE HOUR.

✓PREPARATIONS FOR ELECTRICITY SHORTAGES HAVE BEEN MADE AT THE NATIONAL LEVEL, AND THE OPERATING MODELS INVOLVED ARE CAREFULLY PLANNED AND READIED.

✓ANY ELECTRICITY SHORTAGES WILL BE WIDELY COMMUNICATED AND COVERED IN THE NEWS.

✓YOU CAN REDUCE THE LIKELIHOOD OF AN ELECTRICITY SHORTAGE BY MONITORING YOUR ELECTRICITY USE AND REDUCING YOUR CONSUMPTION.

HOW IRRESPONSIBLE IS IT...

...to not defrost your freezer?

It might not be irresponsible, as self-defrosting freezers are becoming increasingly common. It works by circulating cold air in the freezer to bind moisture. The moisture is condensed on the surface of the evaporator. A heating coil in the evaporator melts and dries the frost. Freezers that do not have the self-defrosting feature should be defrosted regularly. Even a half-centimetre layer of frost increases electricity consumption by 30%. The best time to defrost a freezer is in the winter when the frozen food can be kept outside.

This answer was provided by Energy Expert Sari Loukasmäki from Helen.

#savingtips **Ventilation systems account for as much as a third of a home's heat losses. And when you heat the sauna, you should heat it for the whole family in one go. More than half of the electricity consumed goes into pre-heating the sauna heater.**

Hello, I'm the mood-setter!

A smart lighting system allows you to change the colour of your lights and control the lighting to suit any mood.

Complete our reader survey for a chance to win a smart lighting system starter kit (page 26).

1 What are the benefits of a system?

You can set the right lighting for your home depending on the time of day and the season. You can increase the brightness of your lighting gradually at night and wake up to lighting that resembles the sunrise. In the evening, you can gradually dim the lights to get ready for a good night's sleep.

2 What are the components of a system?

A starter kit can include two E27 light bulbs, a bridge and a dimmer switch. Pair the light bulb with the bridge to control your lighting and create lighting effects. A bridge can be used to control as many as 50 lights. The lights can be controlled via an iOS, Android or even a Bluetooth application.

3 How to use a dimmer switch?

A battery-powered dimmer switch is easy to install. Attach the mount on a wall with screws or double-sided tape. You can use it as a light switch or a remote controller. The dimmer switch has a range of more than 10 metres. It can be used to control up to 10 smart bulbs.

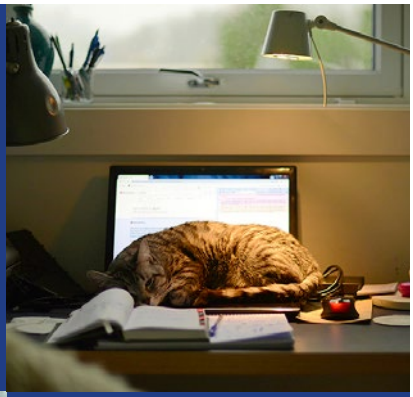
Controlling the smart lighting system via a mobile app means you can return to a home that is brightly lit with energy-saving bulbs.

PHOTOS: PHILIPS

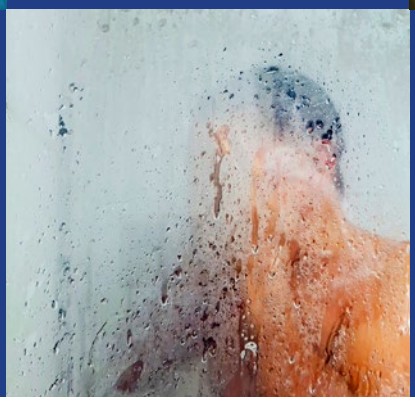
#service **You can manage your energy affairs through the Oma Helen service, which can be accessed via our mobile app or on your browser. If you can't find the answer to your question on Oma Helen, take a look at helen.fi/faq or contact our customer service.**

3 × how to save energy

2 Spend less time in the shower – two minutes is enough. Warm water contains a lot of energy. Don't run hot water unnecessarily and turn off the water while you soap yourself. Halving the time you spend in the shower also halves the amount of energy consumed. Are you ready for a two-minute challenge?



1 Adjust the radiators in your home and get used to a cooler room temperature one degree at a time. Reducing the room temperature by 1ºC reduces your heating-related energy consumption by about 5% per year. The recommended room temperature is 20–22ºC. A cool bedroom improves your sleep quality.



3 Switch off appliances that are not needed. Heating equipment uses a lot of electricity, so the amount of time it is used and the temperature settings have a big impact on energy consumption. Even low-powered devices should be switched off after use, as unnecessary energy streams lead to unnecessary costs.

PHOTOS: GETTY IMAGES

Street art

The streets of Helsinki became a bit more colourful last summer when nearly 100 power distribution cabinets were decorated with various works of art. The artists included individual residents as well as groups of day-care children and school pupils, art groups and professional artists. According to many of the contributors, including artist Tuuli Levit (shown in the photo), the best part of the painting process was having people stop and enjoy the piece and talk about art.

If you wish to apply for a painting permit for next year, send a message to **taidejakokaapit@helen.fi**

PHOTO: HELEN

#energyconsumption **Helen has put together a quick course to help you learn the basics of your energy consumption at home. Small changes can generate significant savings. Check out the course at helen.fi/fiksuksi-energiankayttajaksi (in Finnish).**

LET'S JOIN FORCES

An energy self-sufficient building

An apartment building in Postipuisto features carbon-neutral heating and cooling. The unique energy solution developed by Ilmarinen and Helen makes use of various sources of heating without wasting a drop.

Text: Marjukka Puolakka | Photos: Timi Kuosmanen

"This residential building on Rullakkokatu is a successful step towards a new approach to carbon-neutral construction. New projects are already on the drawing board," says Niina Nurminen from Ilmarinen.

"We wanted to develop an entirely new kind of energy solution."

BUILT IN THE POSTIPUISTO RESIDENTIAL DIS-trict in Helsinki, Rullakkokatu 1 is a zero-emission apartment building with 113 homes, two units of commercial premises, co-working space and shared sauna facilities.

"We wanted to develop a new kind of energy solution to enable energy-efficient and low-carbon living. Being a sustainable energy company, Helen decided to partner with us in this effort," says Niina Nurminen, Team Manager and Construction Manager at Ilmarinen.

The geothermal heating and cooling solution consists of 14 wells. Six of the wells were drilled under the building owned by Ilmarinen and eight under the adjacent car park. The heating system is complemented by condensation heat from the refrigeration equipment in the shop at street level and waste heat from the property's waste water. In summer, waste heat from the grocery shop is stored in the ground for use in winter. Electricity generated by rooftop solar panels reduces the need for purchased electricity.

"The shop at street level takes up only 10% of the building's size, but it covers nearly half of the property's heating requirement. If the various heat sources together produce more heat than the building needs, the excess heat can be fed into Helen's district heating network for use by the neighbouring properties."

Helen delivered the energy solution as a service package that includes everything from design to smart controlled use and maintenance throughout the property's lifecycle. The entire property has been fully self-sufficient with regard to heating and cooling.

"The energy efficiency of properties is a core priority in Ilmarinen's property development activities. Rullakkokatu 1 is a pioneering example of an energy self-sufficient property that was developed through genuine and close collaboration."

The European Heat Pump Association chose Helen and the heat pump supplier Oilon as the recipients of The Heat Pump award in recognition of the innovative heating solution.

Facts

Ilmarinen is Finland's largest private earnings-related pension insurance company. The company is owned by its customers.

By investing shared pension assets, the company secures the financing of current and future pensions.

Real estate investments account for approximately 12% of the invested pension funds.

According to Ilmarinen's climate roadmap, the company's goal is for its Finnish real estate investments to be carbon-neutral by 2035.

8+1 reasons

why a housing company should use the Yritys Helen service

1 With the Yritys Helen service, a housing company can manage its energy affairs through a single service. It provides an overview of the energy consumption and production, and you can use it to monitor energy and access Helen's services.

2 The browser-based service is free of charge and can be used to access contract information, invoices and yearly reports. Historical invoice data is available for up to five years.

3 You can monitor energy consumption and changes therein at the hourly, daily, weekly, monthly and yearly levels for a period of at least 10 years. The monitoring data can be broken down by energy type.

4 You can download energy consumption reports for specific time periods. This enables you to identify deviations and energy saving opportunities, as well as the effects of previously taken actions and the accumulated savings.

5 Yritys Helen helps the property manager and the board of the housing company keep an eye on the property's energy consumption trends. This allows you to forecast the total costs of energy and their impact on maintenance charges.

6 A single sign-on gives you an overview of the entire housing company's energy status (including electricity, district heating and district cooling). Property managers can access their properties' energy data with a single sign-on.

7 The electricity section of the service allows you to monitor the exchange price of electricity regardless of the housing company's contract type. Hourly prices for electricity can help move consumption to cheaper hours.

8 Helen develops this service for housing companies and business customers in collaboration with the customers, and new features are actively added to the service. The service is available in Finnish, Swedish and English.

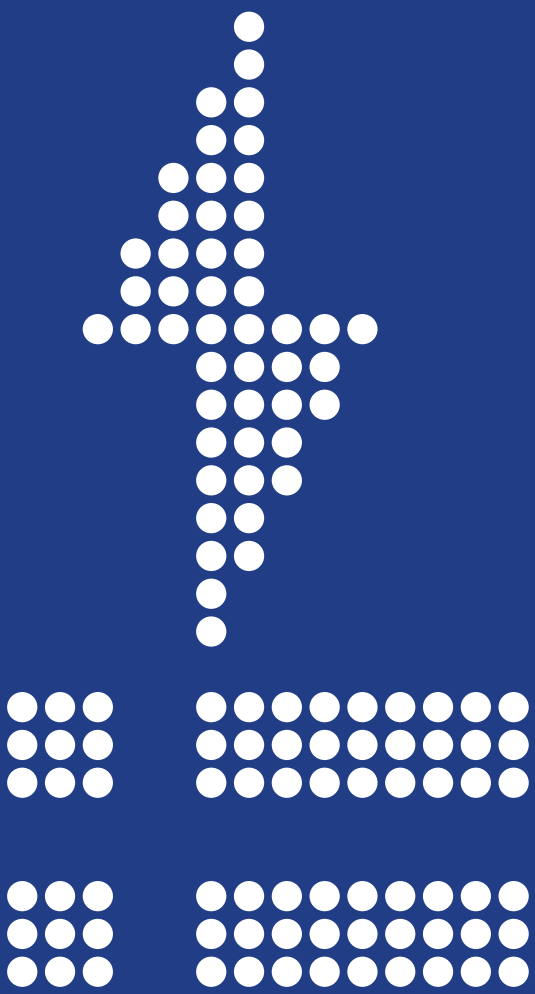
+1 In a housing company, the property manager, for example, can create an Yritys Helen account using the information provided in the invoice. Visit helen.fi to sign on to the service.

"Now, if ever, is the time for every housing company to monitor its energy consumption. This helps housing companies react to changes and deviations and take action to improve energy efficiency."

Päivi Pajunen
Product Owner, Yritys Helen

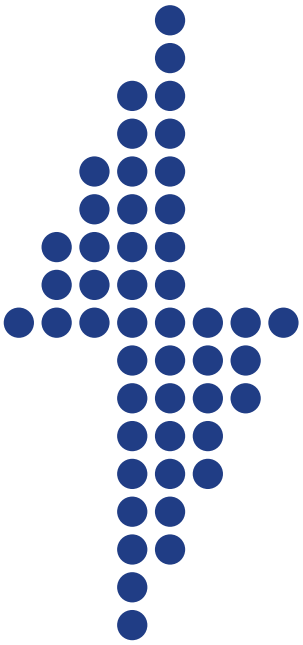
Energy

Everything you ever wanted to know about our energy future – and more.



Electricity and heating have been on everyone's mind lately. Will we have enough electricity and heat now and in the future? This is what Finland's energy future looks like.

Text: Kati Kelola | Photos: Getty Images



ENERGY FUTURE IS A TERM THAT TENDS TO BE associated with something that is far on the horizon. In fact, we all participate in shaping our energy future through the choices we make here and now. For example, many people have bought a heat pump, solar panels or an electric car. In the case of heat pumps, the demand has been very high.

"At the beginning of the 2000s, the number of heat pumps in Finland was in the tens of thousands. Now it is well over a million, with two-thirds of heat pumps in households and the rest in industrial use," says Esa Vakkilainen, Professor of Sustainable Energy Systems at LUT University.

CONCERNS ABOUT THE SUFFICIENCY OF ELECTRICITY and heating have become concrete due to the current energy crisis. At the same time, we recognise the need to transition from fossil energy sources towards renewable and zero-emission energy for climate-related reasons. Finland's energy future will be shaped by the need to meet both of these needs: sufficient energy and zero-emission energy.

In 2020, a third of Finland's total energy requirement was met by fossil energy sources – mainly oil, but also coal and natural gas. The remaining two-thirds of the production was zero-emission energy, such as nuclear power. Renewable energy – mainly hydropower and the burning of wood – accounted for 42% of total production.

"We are among the European leaders in the share of renewable energy," Vakkilainen says.

Finland's objective is to be carbon neutral by 2035. For this goal to be achieved, fossil fuels will need to be replaced by renewable energy, particularly by wind power. According to Vakkilainen, good progress is already being made in this respect.

"Finland's carbon dioxide emissions have decreased by roughly 30% since 2005. Very few fossil fuels are now used for electricity production in Finland. Their use is still slightly higher in district heating production, but even in that area there has been a transition to more diverse production, including heat pumps and the recovery of waste heat," Vakkilainen explains.

ONSHORE WIND POWER IS EMERGING AS THE MOST important source of renewable energy. It is becoming Finland's most significant form of electricity production, mainly due to its relatively low cost. According to Vakkilainen, the amount of wind power capacity currently under development in Finland is the third-highest in Europe.

"Our current wind power capacity is approximately 4,000 MW. We can expect the total wind power capacity to triple or quadruple over the next 5–10 years."

In addition to wind power, bioenergy and nuclear power will continue to play a significant role in Finland's energy production.

In the future, district heating may also be powered by SMR plants. SMR is short for Small Modular Reactor, which refers to a nuclear reactor with a typical power capacity of 300 MW.

SMRs could be placed in major cities that require district heating for tens of thousands of people. Vakkilainen anticipates that the first commercial SMRs could be commissioned around 2035–2040.

THE TRANSITION TO RENEWABLE ENERGY, INCLUDING weather-dependent sources such as solar and wind, also involves the development of the energy system. There is a need for new kinds of flexibility in both energy production and consumption to ensure the adequate supply of electricity on windless and cloudy days.

According to Vakkilainen, there are many technical solutions for ensuring the adequate availability of electricity. On the production side, the alternatives include various energy storage solutions, such as batteries, as well as SMRs.

On the consumption side, the solutions include monitoring consumption more closely and timing consumption outside peak hours, when the price of energy tends to be the lowest.

Vakkilainen believes that the choice of solutions for ensuring the adequate availability of electricity will be a political and economic issue that depends on what is deemed cost-effective and sensible.

In any case, there are many options.

"Combining many different solutions is better than pursuing a single solution. It is cheaper."

2321

The number of wind power projects under way in Finland in March 2022.

SOURCE: FINNISH WIND POWER ASSOCIATION

HELEN HAS SET A GOAL OF BEING CARBON NEUTRAL IN its energy production by 2030.

"This will mean phasing out fossil fuels and transitioning to a decentralised energy production structure with regard to both heating and electricity," says Vice President Janne Rauhamäki, Head of Energy Business Development at Helen.

The goal will be achieved through a combination of solutions: more efficient energy recycling, replacing fossil fuels with wind and solar power, the electrification of heating, the bioeconomy, new technologies, increasing the customer's role, developing energy flexibility and storage, and investing in research and innovation.

Helen already recycles energy by recovering waste heat from properties and treated wastewater at the Katri Vala and Esplanadi heat pump plants, for example. A heat pump that takes advantage of the thermal energy in seawater has been completed in Vuosaari. Waste heat from data centres is recovered at many locations.

"We're always on the lookout for waste heat streams," Rauhamäki says.

"In the future, waste heat from hydrogen production may play a big role, for example."

Initially, Helen is replacing fossil fuels in heat production with heat pumps, electric boilers and biofuels. The Hanasaari and Salmisaari power plants are already burning pellets, and a bioenergy heating plant is in the final stages of construction in Vuosaari. There are also plans for many new heat pump plants and electric boilers as part of the electrification of heating. In electricity production, in turn, Helen has invested in several large wind farm projects.

"Starting from the early 2030s, biomass will take on a diminishing role and be replaced with new technologies," Rauhamäki predicts.

THE NEW PRODUCTION TECHNOLOGIES WILL INCLUDE, for example, larger-scale heat pump applications, electrofuels produced with hydrogen, and small modular nuclear reactors.

The customer's role in energy production will grow in the future. Customers will become energy producers as solar power, electricity storage and hybrid heating solutions become more commonly used. Helen offers solutions to allow customers to produce solar power. Another area of development is the optimisation of energy consumption at properties. The smart heat distribution centre concept and the Kiinteistövahti service are examples of these types of services that are already available.

To ensure the availability of energy at all times, Helen has adopted – and is developing – flexible solutions for both production and consumption. Heat will be stored in the gigantic cavern heat storage facility under construction in Mustikkamaa.

"Heating demand changes substantially during the day depending on the outdoor temperature and consumption. The heat storage facility will enable us to balance the production of heat," Rauhamäki explains.

"The cavern in Mustikkamaa will contain hot water in an amount nearly equal to the total volume of water in Töölönlahti Bay."

FLEXIBILITY CAN ALSO BE INCREASED BY BALANCING demand. Helen offers smart systems and services that allow everyone to monitor their energy consumption and increasingly move consumption away from expensive peak hours to cheaper periods, and avoid excessive heating.

"The goal is to minimise costs and emissions from the consumer's perspective while maintaining comfort."

Thanks to the increased production of wind power, we will soon produce more electricity than we consume. Finland has sold electricity on days when wind power production is high.

Development efforts are an integral part of Finland's energy future. According to Rauhamäki, Helen is working on a number of studies on the feasibility of various energy sources.

"We engage in collaborative innovation with research institutes, equipment manufacturers, experts and consultants, and we develop solutions that suit our specific needs."

ESA VAKKILAINEN FROM LUT UNIVERSITY EXPECTS THAT there will be enough energy in Finland even in the future.

"By European standards, our costs of producing nuclear power, wind power and bioenergy are low. When we have phased out fossil fuels, we will be largely self-sufficient."

Finland is even set to become a net exporter of electricity around 2030–2035.

"Finland's growing wind power capacity is highly likely to bring us to a situation where we produce more electricity than we consume. Finland has already sold electricity on days when wind power production is high. These occasional exports will develop into continuous exports."

According to Vakkilainen, Finland's energy consumption will not grow substantially even if well-being continues to increase.

"In the future, we will be in a better situation than now. We will also be less at risk of having energy used against us as a coercive tool."

13 213 MWh

The hour with the highest electricity consumption in Finnish history was 17:00–18:00 on 7 January 2016.

SOURCE: FINGRID

HOW IT WORKS

Small modular reactor

In the future, electricity and heat can be produced by small modular reactors (SMR) either together or separately. A small modular reactor enables stable and reliable zero-emission energy production all year round. SMR is an umbrella term for several types of plants corresponding in size to a medium-sized industrial plant.

Infographic: Henna Ryynänen

The structure of a small modular reactor for heat production

1. THE REACTOR MODULE encloses the nuclear reactor.

2. THE NUCLEAR REACTOR is where the nuclei of atoms of heavy elements contained in nuclear fuel are split in a fission reaction that heats the water circulating through the reactor.

3. PASSIVE SAFETY SYSTEMS operate independently of external electricity networks and active human intervention. For example, the reactor modules can be placed in large containment vessels with enough water to cool the reactor for up to a month in exceptional circumstances.

4. OTHER PASSIVE SYSTEMS eliminate the need for pumps, for example, to circulate water in the primary circuit in many types of SMRs. In the absence of pumps, water is circulated with the help of gravity.

5. THE PRIMARY CIRCUIT is a closed system in which water is circulated between the nuclear reactor and the heat exchanger.

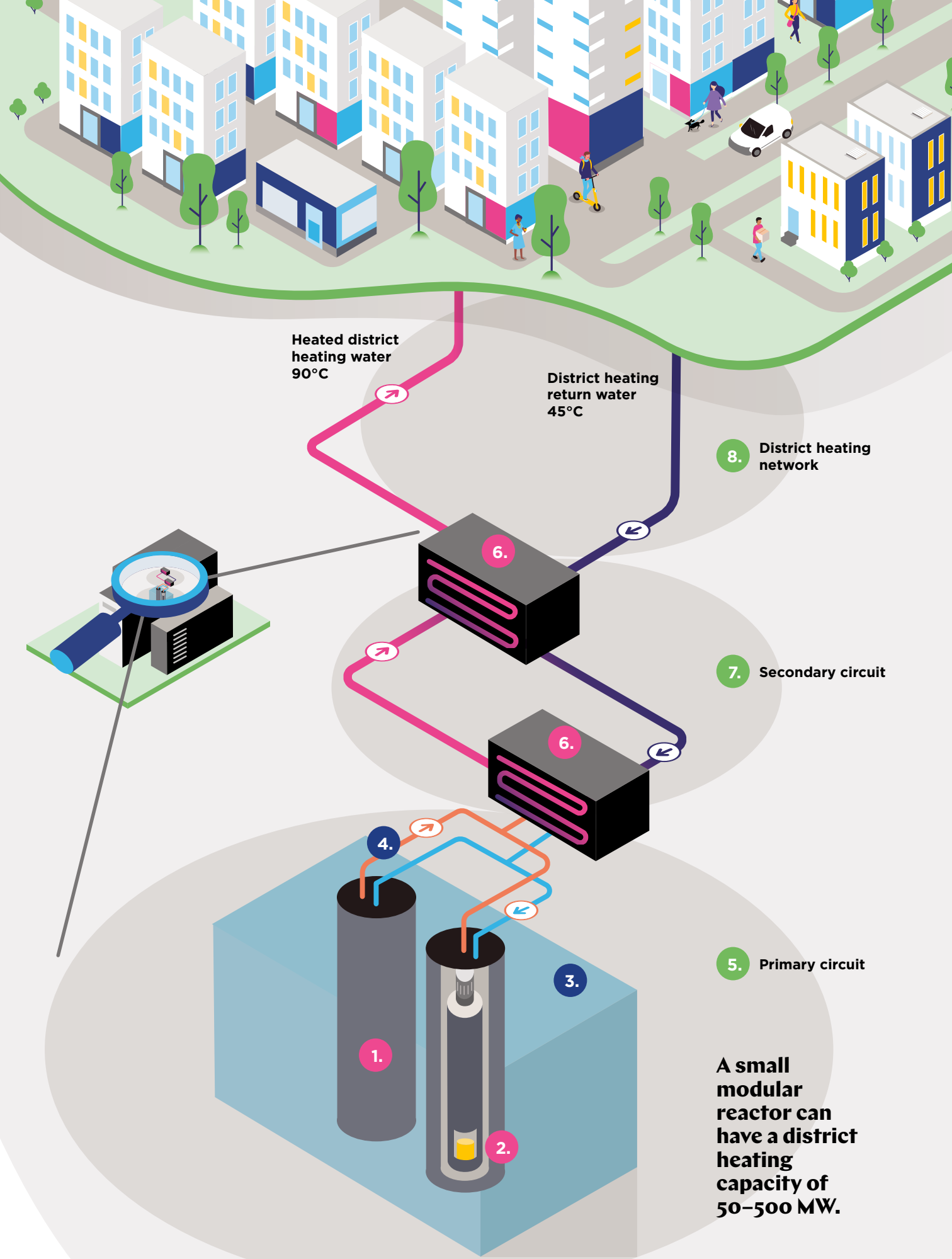
6. IN HEAT EXCHANGERS, thermal energy is transferred from one fluid to another through walls. The heat exchangers keep the water circuits separate, ensuring that radioactive material is not transferred from the primary circuit to the secondary circuit.

7. THE SECONDARY CIRCUIT is a closed loop of water between the primary circuit and the district heating network.

8. THE DISTRICT HEATING NETWORK'S cooled return water is reheated to a temperature above 90°C in the secondary circuit's heat exchanger. The heated district heating water is channelled out to heat properties.

Combined heat and power production by a small modular reactor

Small modular reactors designed for electricity production can be used for combined heat and power production. In that case, part of the steam intended for electricity production is directed to heat production. This increases the overall efficiency of the small modular reactor.



A small modular reactor can have a district heating capacity of 50–500 MW.

A vehicle for a maestro

Dima Slobodeniouk travels around the world conducting symphonic orchestras. In Helsinki, he drives shared electric cars.

I just came from the airport in a shared electric car. It's a great system. I don't think many people are even aware of these services yet.

I'm a classical conductor and I work with symphonic orchestras around the world. This autumn, I've been to Monaco, the United States, Sweden and Austria. I use car sharing services especially when I go to the airport.

About a year ago, a friend of mine told me about GreenMobility's electric car sharing service, so I looked into it. The first time I used the service, I booked a shared car that was within 500 metres of my home. It was nice to have a car almost in front of my building. I like driving. I even find it more relaxing than taking a taxi.

I occasionally use shared cars for short drives in Helsinki. I check the app to find an available vehicle and go pick it up. I've also ordered a car in advance to a specific address on a couple of occasions. I think the availability of the shared cars is fairly good, but there could be more of them. Expanding the service zone, for example, could get more people interested in shared cars.

My mobility decisions are always based on finding the most eco-friendly option. Could I walk? Or use public transport? Or maybe an electric scooter? My choice is influenced by both environmental and economical factors.

Shared cars are a good alternative to car ownership – or a complement to car ownership, as in the case of my family.

My experiences with shared cars have always been smooth. The cars have been tidy and well-maintained. Surprisingly, I've never even forgotten my belongings in a shared car.

GreenMobility's shared electric cars in Helsinki are powered by Helen's wind power. Check out the cars: greenmobility.com/fi/en

"There is a very good selection of shared cars. Growing demand will lead to even higher supply," says Dima Slobodeniouk.

TEXT AND PHOTO: JUSSI ESKOLA

9 TRICKY QUESTIONS

How much do you know about energy?

Test your knowledge of Finland's energy system now and in the future.

1

How many wind turbines were there in Finland at the end of 2021?
A. 96
B. 962
C. 1,962

2

What percentage of Finland's total electricity consumption was covered by wind power in 2021?
A. 10%
B. 20%
C. 30%

3

How many wind turbines were under construction in Finland in October 2022?
A. 236
B. 436
C. 636

4

How many nuclear power plants are producing electricity in Finland?
A. 3
B. 4
C. 5

5

What percentage of Finland's total electricity consumption is covered by nuclear power?
A. Up to 30%
B. Up to 40%
C. Up to 50%

6

What is the world's largest nuclear power plant?
A. Kashiwazaki-Kariwa, Japan
B. Zaporizhzhia, Ukraine
C. Hanul, South Korea

7

What number heat pump is currently under construction at Helen's Katri Vala heat pump plant?
A. 3rd
B. 5th
C. 7th

8

When was the first electricity-producing small modular reactor launched?
A. 2017
B. 2019
C. 2021

9

By which year does Finland plan to be carbon neutral?
A. 2030
B. 2035
C. 2040

PHOTO: GETTY IMAGES

ANSWER KEY: 1 B, 2 A, 3 C, 4 C, 5 B, 6 A, 7 C, 8 B, 9 B.

THE BIG PICTURE

Electric-ity from roads

Sweden has begun to build a sustainable road network.

The innovative eRoadArlanda is the world's first electrified road that makes it possible to charge vehicles while driving. Opened for traffic in 2018, it covers a distance of two kilometres between the Arlanda Cargo Terminal and the Rosersberg logistics centre.

An electric rail in the road is used to charge vehicles. A movable arm attached to the bottom of the vehicles connects to the electric rail during charging. In practice, the system works in the same manner as a tram line, but power is drawn from the road instead of overhead cables.

There are plans in Sweden for electrifying over 20,000 kilometres of roads using the same solution.

PHOTO: ALL OVER PRESS

Two kilometres long, eRoadArlanda in Sweden is the world's first electrified road.

TIMELINE

Heating food through the years

Humans began to enjoy tastier meals when they started to heat their food over an open fire.

29,000 BCE

An earth oven was a pit dug in the ground. A fire was lit in the pit and allowed to burn down to charcoal. The walls of the pit and rocks placed in with the charcoal radiated heat towards the centre of the pit, which was then used to heat food in the pit.

Two million BCE

According to the English anthropologist Richard Wrangham, humans first started to cook over an open fire. This made for tastier meals but also provided early humans with more nutrition and energy, which made it possible for the brain to grow bigger.

790,000 BCE

The earliest fireplaces were the focal point of a human dwelling. Shaped as a circle using rocks, they supplied heat for cooking and kept the dwelling warm.

1642

The first cast-iron oven was manufactured in Lynn, Massachusetts in the USA. Early cast-iron ovens consisted of rectangular plates that formed a box.

PHOTOS: GETTY IMAGES AND WIKIPEDIA

1802

According to the National Gas Museum located in Leicester in the UK, Zachaus Winzler from Moravia was the first person to use a gas stove for cooking. Moravia is a historical region in the Czech Republic.

1892

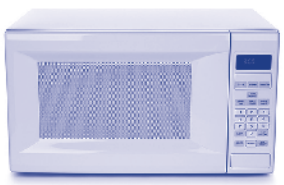
The Canadian inventor Thomas Ahearn cooked a hot meal using an electric stove. It was served with great fanfare at the Windsor Hotel in Ottawa.

1933

The induction stove was introduced at the Chicago World's Fair. It only heats the pan, not the stove itself. Food that falls on the stove doesn't get burned onto the stove top.

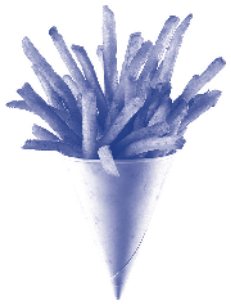
1947

U.S. engineer Percy Spencer was developing a radar application at the military contractor Raytheon when he realised that microwaves can also be used for heating food.



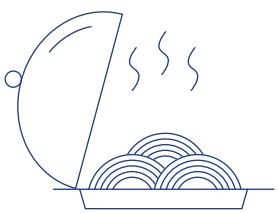
2005

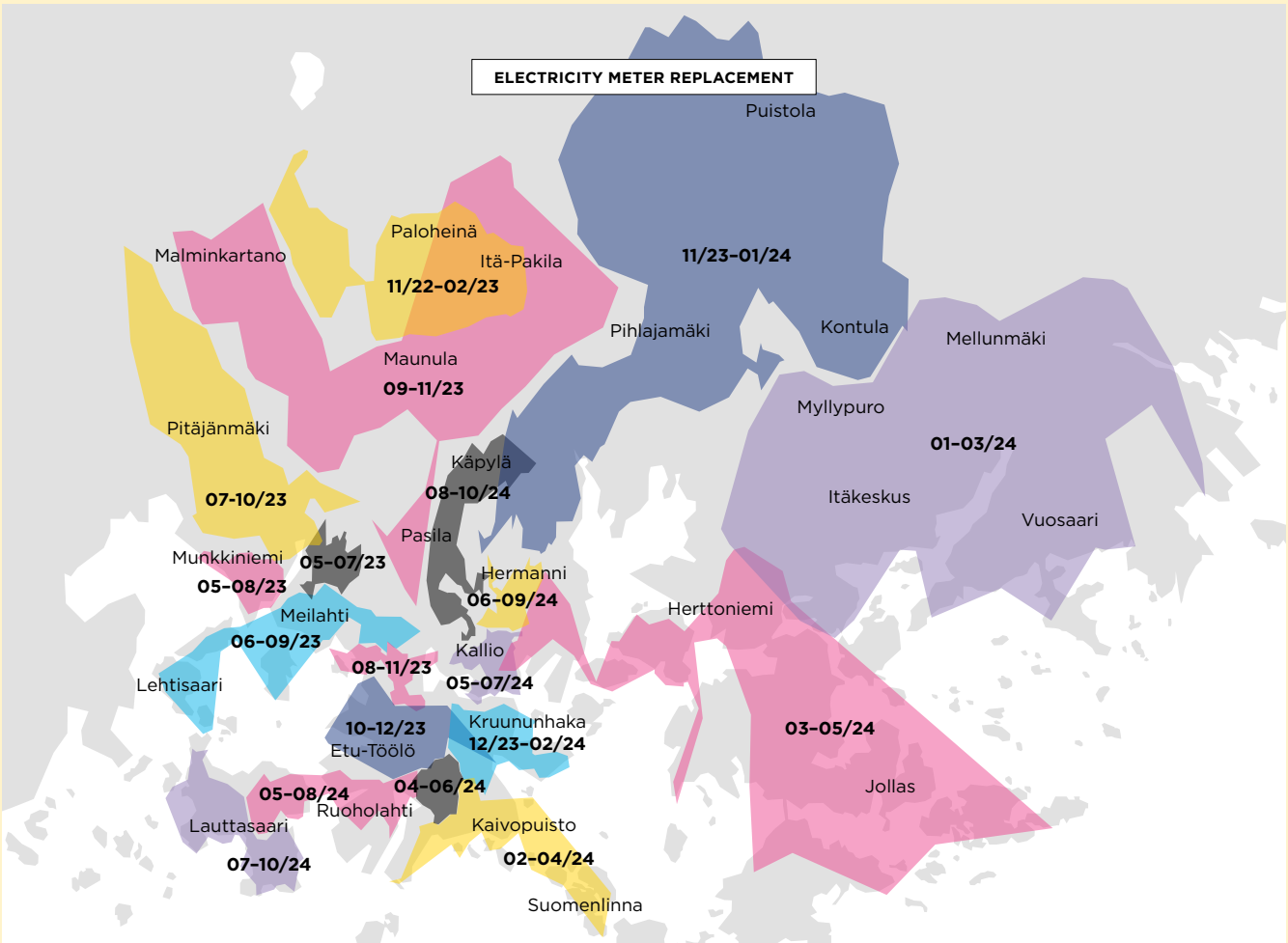
The Dutch inventor Fred van der Weij started developing the air fryer to come up with a way to prepare crispy chips without having to deep-fry them in oil.



2042

A 3D-printer oven prepares meals from ingredients according to pre-programmed specifications.





Replacing electricity meters

The pilot phase of meter replacements will start in November.

Text: Jouko Vuorela | Photo: Helen

HELEN ELECTRICITY NETWORK WILL start the replacement of some 120,000 electricity meters in Helsinki. The pilot stage will start in November 2022 in Pakila–Paloheinä–Maununneva, where about 8,000 electricity meters will be replaced with new remotely read meters.

The actual meter replacement project will start in May 2023 and last until October 2024. While most of the meters to be replaced are in central Helsinki, some are also located in other parts of the city.

"There are electricity meters to be replaced at locations of all sizes, except the largest electricity consumption locations. These meters are found in single-family houses, terraced houses, apartment buildings and commercial properties," says Metering Manager Mika Nousiainen from Helen Electricity Network.

"If the electricity meter is located in the housing company's common area, the customer does not need to be on hand when the meter is replaced. However, there are some old apartment buildings – especially in the city centre – where the meters are inside the apartments. In that case, the customer needs to be on hand to let the technician in."

"For the customer, the replacement of the electricity meter results in a brief power outage."

Mika Nousiainen
Metering Manager

The new meters have a metering period of 15 minutes instead of one hour. They can also be used to obtain real-time metering data.

"The lid on the new meter has a connector that can be used with devices that provide metering data at 10-second intervals for use by a building automation system or electric vehicle charging point, for example."

More information on meter replacements: **helensahkoverkko.fi/en/services/remote-reading**

Understand your energy with Oma Helen

The Oma Helen application now includes a number of new, useful features that can help you save money and make smart energy decisions in your daily life. Sensible energy consumption and eliminating excessive consumption are the most effective ways to ensure the adequate availability of electricity in all circumstances. Saving energy is particularly important during peak consumption hours. Below, you can find information on some of the changes we have made to Oma Helen this autumn. These features are available to all users of the Oma Helen app regardless of the type of contract. Oma Helen is continuously developed, with new features added. Keep your app updated to get the most out of it.

1. MONITOR HOURLY ELECTRICITY PRICES

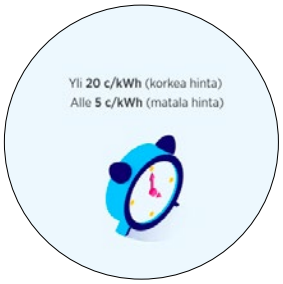
A chart in the electricity section of Oma Helen shows Finland's regional prices in the Nord Pool exchange, exclusive of taxes and electricity retailers' margins. The chart makes it easy for you to plan your electricity consumption to take advantage of cheaper hours. The hourly prices for each day are published around 3 p.m. the previous day.

2. FLATTEN CONSUMPTION PEAKS

Oma Helen shows you Finland's current electricity situation, informing you when you should limit your energy consumption. By moving your electricity consumption to the hours with lower total consumption, you contribute to improving Finland's energy self-sufficiency and ensuring the adequate availability of electricity. It also mitigates the upward pressure on prices.

3. DON'T MISS HOURS OF EXPENSIVE AND CHEAP ELECTRICITY

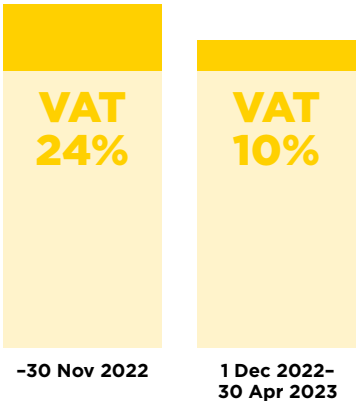
You can enable price notifications on Oma Helen to receive alerts whenever the hourly electricity price is exceptionally high or low the next day. The application notifies you of kWh prices above €0.20 or below €0.05. The notifications are sent around 3 p.m. every day.



Temporary reduction in value-added tax on electricity

In accordance with the Finnish Government's decision, value-added tax on electricity will be reduced from 1 December 2022 to 30 April 2023. The tax rate during the period in question will be 10%, instead of the usual 24%. The reduced VAT rate applies to the energy charge and basic charge for energy, but not transmission charge, basic charge for transmission or electricity tax. The reduced VAT rate will be automatically applied to your invoice, with no action required from your part.

You can find out your electricity price at the current VAT rate via the Oma Helen app or by pointing your browser to **helen.fi/en/log-in**



SUDOKU

Sudokus' solution: helen.fi/en/sudoku

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READER SURVEY

Send us your feedback and win a prize!

Which of the stories in this issue was the most interesting to you? You can also let us know what you would like to read about in Helen magazine.
Participate in the survey by 11 January 2023 online at **helen.fi/magazine-feedback** or send a postcard to Helen, Helen magazine, 00090 HELEN. Please write your contact details and customer number on the card.

One lucky survey respondent will win a smart lighting system starter kit.

Philips Hue starter kit
Philips Hue makes your lighting at home smarter. You can add new light bulbs and other components to the starter kit.

SOURCES OF ENERGY

Pilvi Hämäläinen

1

My dog and being outdoors

My 20-week old dog Humppa is an awesome and smart puppy! Maybe I ended up getting a dog because the character I played on the previous season of Putous was a dog. After some initial worrying, Humppa has brought a lot of joy and activity to my life. It's nice having someone waiting for you at home, always happy to see you.

Now that I have a dog, I've spent more time outdoors. After all, a dog should get to roam around forests! We've gone on nature trails. When you have to go outdoors even when you don't really feel like it, you find yourself becoming an outdoor person.

2

Great TV shows

When I have unwatched episodes of a good show on Netflix or HBO, I almost get butterflies in my stomach. It's like having a crush on someone and looking forward to seeing them again.

I used to watch the same TV shows repeatedly on video as a child. It's still one of my favourite ways of getting my mind off work. These days, I save episodes of the best shows for later watching because part of me doesn't want the show to end. Succession is one such show for me.

Facts

Pilvi Hämäläinen is a 36-year-old actor. In addition to starring in Putous, she has acted on stage and the Keisari Aarnio TV show, and she is also a judge on Suurmestari.

3

Audiobooks and podcasts

Audiobooks and podcasts can even make cleaning fun. They get my mind off other things and I start to look forward to continuing with the story. I particularly enjoy true crime stories.

4

Going to the gym

I've started going to the gym! It hasn't been long yet, but at least I can call myself a gym-goer. Physical exercise feels great. It makes me feel like I'm doing things that active people do.

5

Home-cooked food

I might come off as somewhat incapable of looking after myself, and that's true to an extent, but I have managed to cook macaroni casserole a few times lately. I eat too many ready meals from the supermarket, so managing to cook a good meal makes me happy. A home-cooked macaroni casserole is definitely better than store-bought.

TEXT: EMILIA SALORANTA PHOTOS: JOHANNA MYLLYMÄKI, SATU NYSTRÖM AND GETTY IMAGES

Helen's goal is to be carbon neutral by 2030. This will be achieved through more efficient energy recycling, replacing fossil fuels with wind and solar power, the electrification of heating, the bioeconomy, new technologies, increasing the customer's role, developing energy flexibility and storage, and investing in research and innovation.

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Real-time information on disruptions
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