

See energy in a new light » 1/2022

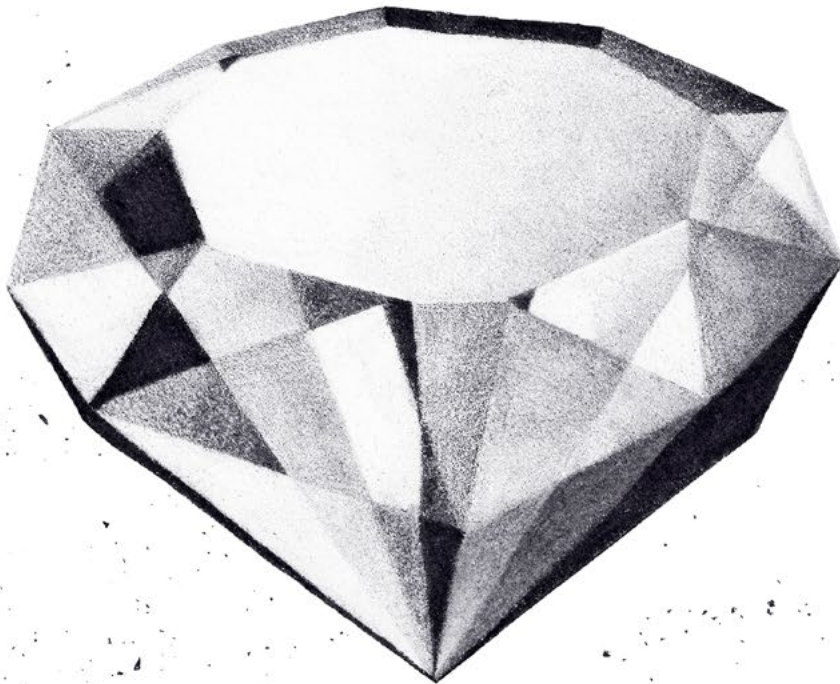
HELEN

Get rid of
wrinkles with a
steamer
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efficient
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neutral energy
system
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JVG gets
energy from
nature
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A solution as brilliant as a diamond

**Coal is being replaced in Helsinki's energy
production with new technologies,
such as heat pumps and waste heat.**

» p. 11

Psst! Turn to
pages 16–17 to
learn more about
carbon-neutral
electricity and
heat production.



A new energy system

EDITORIAL » Moderately priced and easily available energy is one of the pillars of modern society. When Russia started a war in Ukraine, that pillar was shaken. Suddenly, Europe's dependence on Russian fossil energy became very concrete.

At Helen, we have been working on building a fossil-free and carbon-neutral energy system for a decade now. Our energy production is diverse. We are not dependent on any single fuel or energy source.

The transition to centralised heating production in the 1950s was an important step towards more efficient energy production and cleaner air in the city. Until recently, coal and peat have been important energy sources in Finland. Coal has been used to heat homes in coastal cities, while peat has been used inland.

Helen's use of coal will be halved with the closure of the Hanasaari power plant in 2023. We will phase out coal completely in spring 2024 when the burning of coal at the Salmisaari power plant will end.

We are studying, piloting and implementing new, carbon-neutral solutions to produce energy. In the upcoming summer season, we can satisfy Helsinki's heating needs on a carbon-neutral basis by using heat pumps.

“The use of coal is coming to an end.”

Maiju Westergren Vice President, Sustainability and Public Affairs

A SOURCE OF PRIDE

Our century

Helen has provided Helsinki's residents with light and heat for over a century. The reliability of the Helen's supply of electricity and district heating is among the best in the world. Helen has been recognised internationally for its energy production and distribution. Helen's goal is to be a carbon-neutral energy company by 2030. For the sake of all of us.

Read Helen's story at helen.fi/energyinnewlight



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Painotuote



Energy!

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



PHOTO: HELEN

#homegarden Growing herbs is easy and fun! Buy fresh potted herbs from the supermarket. First, check the condition of the roots: fresh herbs have light-coloured roots. When you get home, water the root ball and spray the leaves. Use the largest leaves to make a salad and leave a few small leaves in the pot. In the summer, you can take the plant out of the pot and plant it in sandy soil to regrow.

#solarfarm More solar power! Helen's first solar farm will be completed in Nurmijärvi this summer. Did you know you can rent a solar panel of your own? More information: helen.fi/solar-power

PHOTO: HELEN



Helen is committed to responsible summer job principles to ensure a positive summer job experience for young people. This includes the recruitment process, orientation, supervision, meaningful work, fair pay and equal treatment. Helen will have nearly 60 summer employees this year.

Going up

The use of heat pumps and bioenergy as district heating sources increased by 8.3% in Helsinki from 2020 to 2021.



Going down

The use of coal and natural gas as district heating sources decreased by 12.4% from 2020 to 2021.

HOW IRRESPONSIBLE IS IT...

...to take a long hot shower?

Ouch. It is irresponsible. The longer the shower, the more energy (and money) goes down the drain. Taking a 5-minute hot shower uses nearly 800 kWh of energy per year. A 20-minute hot shower consumes over 3,000 kWh per year. Reducing your daily showering time from 20 minutes to 5 minutes can save over 2,000 kWh of energy per year, which corresponds to the total annual consumption of electrical devices in an apartment with 1-2 residents.

This answer was provided by Energy Advisor **Sari Loukasmäki**.



ILLUSTRATION: MIKKO HIRVONEN AND GETTY IMAGES

#carbonneutrality The share of carbon-neutral production rose to 32% of Helen's energy production last year. Helen currently has about 20 projects under way to promote carbon neutrality. More information on sustainability themes: helen.fi/sustainability-report



**We are on the path
towards renewable
energy production.**

TRENDSETTER

Innovator

Kristiina Siilin believes in clean energy systems in which hydrogen plays a big role.

In the energy system of a city of the future, one person's waste can be another person's resource.

This is a conviction held by Helen's Business Development Manager Kristiina Siilin. She is one of eight members of the under-35 business team selected by the Finnish Flow programme to represent Finland at the World Economic Forum in Davos in May.

Siilin first joined Helen when she was writing her Master's thesis on electricity storage solutions. Today, she develops services and solutions that support Finland's transition to renewable energy production.

"The growing use of renewable energy with variable output, such as wind power, requires flexibility in the energy system as a whole. Electricity storage systems are good for that purpose," Siilin says.

The circular economy is already being promoted in urban energy systems in many ways. The hydrogen economy is the next step to allowing various parties to take advantage of each other's waste streams.

"Producing hydrogen with renewable electricity generates waste heat, which can be captured in the district heating network and recycled to be used by the city's residents."

DID YOU KNOW?
The World Economic Forum meets annually in Davos to discuss current topics of global significance.

Hello, I de- wrinkle here!

A garment steamer is a quick way to get rid of wrinkles in clothes and curtains.



PARTICIPATE
in our reader
survey on page 26
for a chance to
win a garment
steamer.

1

What is a garment steamer?

A garment steamer produces hot steam to remove wrinkles from clothes. It can be used for various materials, such as linen, silk and cotton. In addition to garments, it can be used for curtains, cushion covers and bedspreads, for instance. Hot steam also helps make garments fresh and eliminate odours.

2

How does a steamer work?

Pour water in the garment steamer's tank. Hang the garment you are going to steam on a hanger. Plug in the steamer. When the steamer has heated up for about a minute, hold the garment and straighten it. Steam the garment in a top-down motion to remove wrinkles. You can also steam garments from the inside.

3

What else should you know?

Garment steamers cost €50–€150. You should make sure that your garment steamer has a limescale removal function. The steamer should have a heater of at least 1200 watts and its constant steam supply should be at least 20 grams per minute. The capacity of the removable water tank should be at least 70 ml.



You can easily get rid of wrinkles by pressing the garment steamer's heated steam plate directly against the fabric. The steam eliminates 99.9% of bacteria.

#energyconsumption A new feature in the Oma Helen service: at the beginning of the month, you get an easy-to-read report on your energy consumption for the previous month. Start using Oma Helen at helen.fi/omahelen-app

The different payment methods

	What?	How?	What else?
E-invoice	You get an electronic invoice delivered to your online bank. You can view the invoice, make payment and archive the invoice.	Choose e-invoice ordering in your on-line bank, select Helen Ltd as the invoicing party and enter the reference code from your invoice.	Review the information and submit the order. Your next invoice may still get delivered as a paper invoice.
MobilePay invoice	MobilePay is a convenient way to pay invoices on your phone. First, you need to sign up as a user in the MobilePay application.	Choose MobilePay as your invoicing method on the Helen website or through Helen's customer service.	Sign in to the helen.fi online service, go to the customer information section and choose MobilePay as your invoicing method.
Kivra invoice	The Kivra digital service (kivra.fi) allows you to send and receive environmentally friendly digital mail.	If your invoices are delivered as paper invoices, download the Kivra application on your phone or sign in a web browser.	Once you have signed up for the Kivra service, your Helen invoices will be delivered to your Kivra.
Paper invoice	A paper invoice is a traditional way to get invoices delivered to your home.	The postal service will deliver paper invoices in an envelope to your mail slot or mail box.	If you switch from a paper invoice to the payment method described above, you will reduce your carbon footprint.

Climate education that inspires ideas

Both children and adults have questions about energy. Helen has created a virtual Good Energy Lesson for schools. It provides concrete information on energy and inspires the participants to think about the impact that small individual choices can have. The topics covered in the Good Energy Lesson include how electricity is distributed in a city, the best way to dry laundry, and how much energy is consumed when you take a 20-minute shower.

Take a look at the Good Energy Lesson in Finnish: helen.fi/hyvan-energian-oppitunti



PHOTO: HELEN

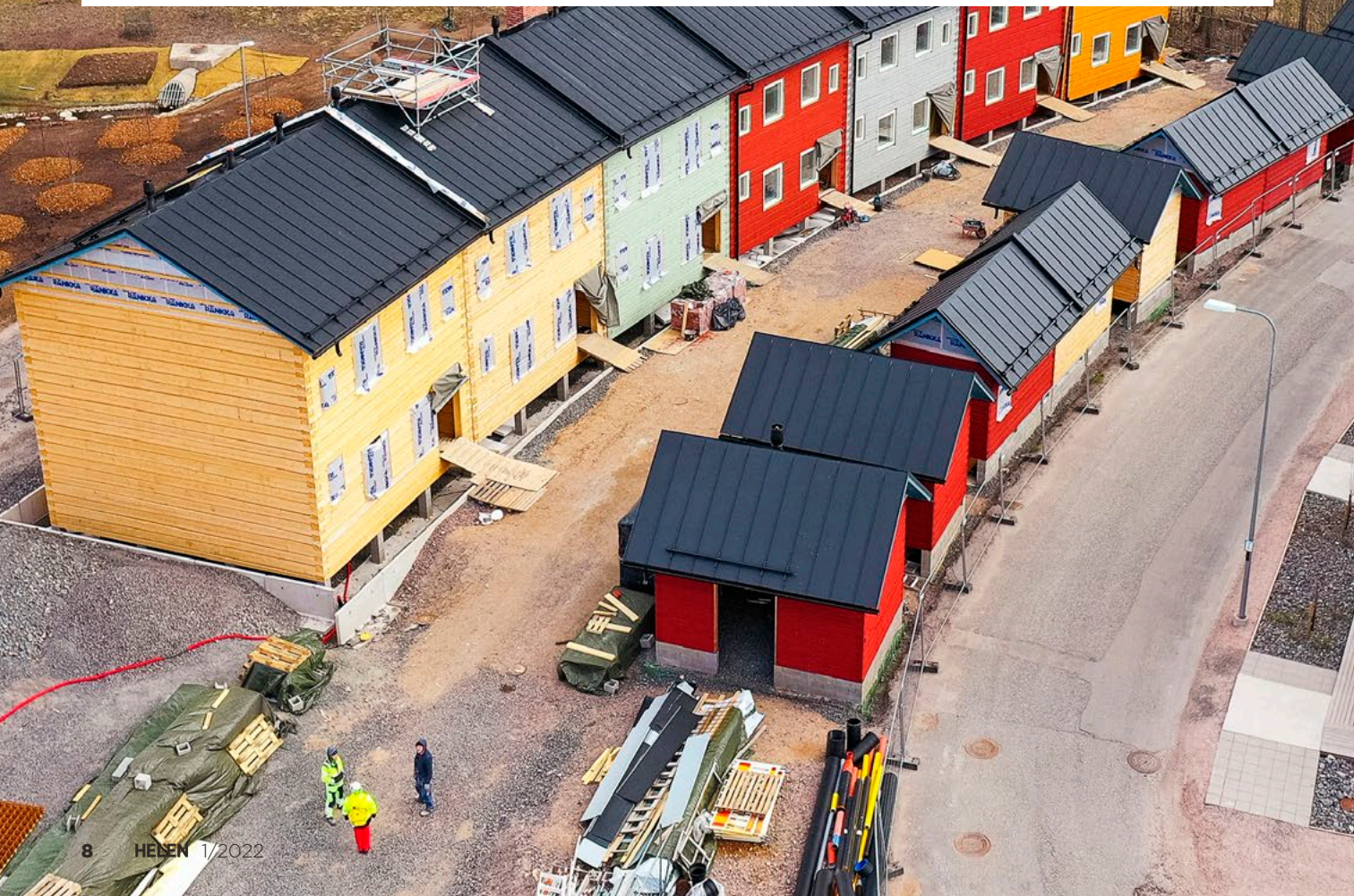
#poweroutages Power outages are very infrequent in Helsinki. Helen Electricity Network will send text messages to customers affected by power outages to inform them of the starting time and ending time of the disruption. More in Finnish: helensahkoverkko.fi/sms

LET'S JOIN FORCES

An energy-efficient log house

A terraced house project under construction in Helsinki's Honkasuo district will have its energy solutions built around renewable district heating. As Oy Haapaperhosen Aarre chose to partner with Helen to gain access to a full range of renewable energy solutions.

Text: Helen | Photos: Kim Öhman





“We realised we need to do our part by developing and implementing a more environmentally friendly construction concept”, says Minna Aarnio.

“This project is based on renewable and smart district heating”

A UNIQUE PROPERTY COMPRISED OF SEVEN terraced homes is under construction in Helsinki’s Honkasuo district.

“Each unit has its own solid timber beam frame, and they also include a separate outbuilding that is made from hewn timber. The residents will also have access to a shared sauna building in the common area,” says architect Minna Aarnio.

“There will be parking spaces for nine cars, equipped with chargers for electric vehicles.”

Rakennusasiatoimisto Aarre Oy, which was established by Aarnio and her husband, construction engineer Jukka Reini-kainen, is in charge of the founder contracting of the terraced homes.

“We started our company after the IPCC climate report was published in 2018. We realised we need to do our part by developing and implementing a more environmentally friendly construction concept.”

When trees grow, they bind carbon dioxide from the atmosphere. A structure built from solid timber beams sequesters a large amount of carbon for over a century.

The roof of each log home will be equipped with 16 solar panels that will, during peak seasons, generate more electricity than each home needs. The excess power can be sold to the energy company. Each home will also be equipped with air source heat pumps.

“This project is based on renewable and smart district heating.”

The housing company will acquire its smart district heating system as a service provided by Helen.

“In practice, it means that we get access to the full system, including a range of services, for a monthly fee. This is an easy and convenient solution for the residents. We like to keep things simple and straightforward.”

Helen’s approach, which is based on energy partnership, appealed to Aarnio.

“Helen is a development-oriented company that has ambitious climate targets. Those targets can’t be achieved by Helen alone. It takes cooperation. Accomplishing those goals is the outcome we seek through this partnership.”

Facts

As Oy Haaperhosen Aarre is a residential project comprised of seven log-built terraced homes and nine outbuildings in Helsinki’s Honkasuo district.

Construction will be completed in summer 2022.

The founder contractor has chosen Helen as its energy partner.

The heating solution is based on renewable and smart district heating.

Each unit will be equipped with air source heat pumps and 16 solar panels.

8+1 ways

for a housing company to reduce its carbon footprint

1 Housing companies can become more eco-friendly by installing rooftop solar panels to generate carbon-neutral electricity. In the peak season, the solar panels can cover nearly 10% of the housing company's electricity consumption.

2 Housing companies can sign a fixed-price two-year fixed-term electricity contract for renewable hydropower. The price remains the same throughout the term of the contract, even if the market price of electricity changes.

3 District heating can be upgraded to be emission-free by switching to recycled heat or renewable district heating. The new production methods will reduce Helen's district heating emissions by 50% by 2025.

4 Geothermal heating can reduce the carbon dioxide emissions of heating by as much as 80%. Combined with carbon-neutral electricity, it provides completely carbon-neutral heating generated on site.

5 An exhaust air heat pump (EAHP) takes advantage of waste heat and reduces heating energy consumption by 30-60%. An EAHP is an economical way to increase the efficiency of a housing company's district heating system.

6 Helen's Kiinteistövahti service helps avoid excessive and insufficient heating. Sensors in homes measure indoor temperatures, which are used by the service to provide guidance on adjustment needs.

7 Ensuring the functionality of the radiator network is part of Helen's Energy Upgrade service for housing companies. Adjusting and balancing the radiator network makes heating more efficient and increases comfort for the residents.

8 Emissions are reduced by lowering temperatures in excessively heated premises and making economical use of hot water. Reducing the indoor temperature by one degree reduces heating energy consumption by 5%.

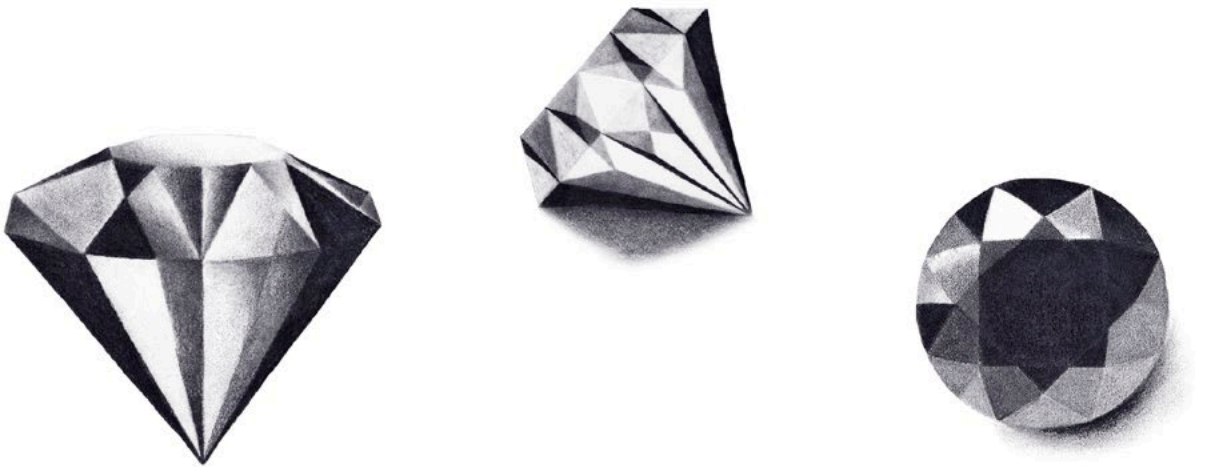
+1 Switching to an electric car reduces traffic emissions to a significant extent. Charging points installed at a housing company's car park enable the residents to switch to electric vehicles.

“Housing companies can take climate action by carrying out an Energy Upgrade project, the scope of which is determined by the number of residences, the consumption of heating energy and the goals of the residents.”

Minna Hellström
Commercial Development Lead, Helen

Carbon

Everything you ever wanted to know about carbon – and more.



Carbon makes all life possible. People have used carbon for a wide range of applications, from pencils and tennis rackets to heating and energy production. In these latter applications, carbon – or coal – is now being replaced by new technologies.

Text: Kati Kelola | Illustrations: Jenni Salminen



WHEN YOU GET TOLD OFF FOR MAKING A MISTAKE, YOU can say you were hauled over the coals. When two things are identical, they can be said to be carbon copies of each other.

Carbon and coal are not only used in various idioms, they are also present in our daily lives in a wide range of forms and objects. The carbon in pencils is graphite, which is the most common crystalline form of carbon. If you enjoy fishing, tennis or skiing, chances are that your equipment contains lightweight carbon fibre. When you buy someone diamond jewellery, you are giving them a small piece of carbon.

Carbon also has a wide range of industrial applications, including energy production, steel manufacturing and nanotechnology.

THE SIGNIFICANCE OF CARBON TO PEOPLE CANNOT BE overstated. Carbon is what makes all life possible. Most of the chemical compounds we know are carbon compounds. Plants, animals and people are made up of cells, and carbon is a key building block of those cells. Carbon compounds make up about 20% of the human body. This includes carbohydrates and fats, for example.

What makes the carbon atom unique is its ability to form long chains that can branch out, bond and form rings. The carbon atom can also bond with other elements, such as oxygen, nitrogen and hydrogen, which makes for an endless amount of possible compounds. Carbon compounds have also enabled the diversity of the species we have on earth.

Examples of the pure physical forms of carbon include graphite, diamond and graphene. While they are the same element, their form and attributes are different. Graphite, which is used in pencils, for example, is black in colour and one of the softest substances, whereas diamonds are transparent and among the hardest substances on earth.

Graphene, which was only discovered in 2004, is translucent and the strongest material ever tested. It is as much as 200 times stronger than steel and even harder than a diamond.

COAL BEGAN TO BE FORMED UNDERGROUND 360-290 million years ago, during the Carboniferous Period. Exposed to high temperatures and intense pressure, organic material from ancient plants first turned to peat, then brown coal – also known as lignite – and finally black coal. The oldest coal, known as anthracite, turned into diamonds under intense pressure. In nature, diamonds are found especially in kim-

berlite, which is a rare form of igneous rock found in Russia, Botswana, the Democratic Republic of the Congo, Canada and South Africa, for example.

The earliest known use of coal is in China, where coal was apparently mined for the purpose of smelting copper around 1000 BCE. The first known use of coal as fuel in Europe dates back to ancient Greece, around 300 BCE.

Starting from the 18th century, coal fuelled the industrial revolution. Industrial areas emerged in England, the Ruhr valley, Belgium and other parts of Europe. In those early days, coal was used not only for heating but also as fuel for ships, steam locomotives and other vehicles.

TODAY, THE APPLICATIONS OF COAL INCLUDE THE PRO-duction of electricity and heat as well as the manufacturing of steel.

“In 2020, coal accounted for approximately 27% of the world’s energy consumption,” says Research Team Leader Tiina Koljonen from the Energy Systems and Climate Research Team at VTT Technical Research Centre of Finland.

Even though the use of coal – like other fossil fuels – has been reduced around the world due to climate change, it is still the second-largest source of energy globally, behind only oil. Koljonen notes that coal represents a significant share of energy production in particular.

China is the largest user of coal by a wide margin. In 2020, China’s coal consumption amounted to 82 exajoules. One exajoule is

1,000,000,000,000,000,000 joules. India had the second-highest consumption of coal at just under 18 exajoules. Among Western countries, coal use is highest in the United States, where coal consumption totalled about 10 exajoules in 2020.

In Europe, Germany is at the top of the coal consumption list, followed by Poland and Turkey. Europe’s total coal consumption in 2020 was roughly the same as in the United States. Coal accounted for about 16% of the region’s total energy consumption. In Finland, coal represented approximately 10% of total energy consumption in 2020. Coal consumption in Finland was about 7% of the consumption of Germany, which is the largest user of coal in Europe.

COAL HAS ALSO PLAYED A SIGNIFICANT ROLE IN THE electrification and heating of Helsinki through the years. The city’s first coal power plant started its operations in Suvilahti in 1909, says Janne Rahamäki, Head of Energy Business Development at Helen.

**Carbon is present
in our daily lives in
countless forms.
The carbon in pencils
is graphite, which is
the most common
crystalline form of
carbon.**



1909

Helsinki's first coal power plant starts its operations in Suvilahti.



1953

The Salmisaari A power plant in Ruoholahti is commissioned and starts to produce electricity and district heat from coal.



1960

The Hanasaari A power plant is commissioned in the Sörnäinen energy supply area.



1974

The Hanasaari B power plant is commissioned to meet Helsinki's growing energy needs.



1976

The Suvilahti power plant is decommissioned.



1984

The Salmisaari B power plant is commissioned. Three years later, a desulphurisation plant is also commissioned in Salmisaari.



1991

The natural gas era begins with the start of operations at the Vuosaari A power plant. The Hanasaari desulphurisation plant is commissioned in the same year.



2007

Hanasaari A is demolished.



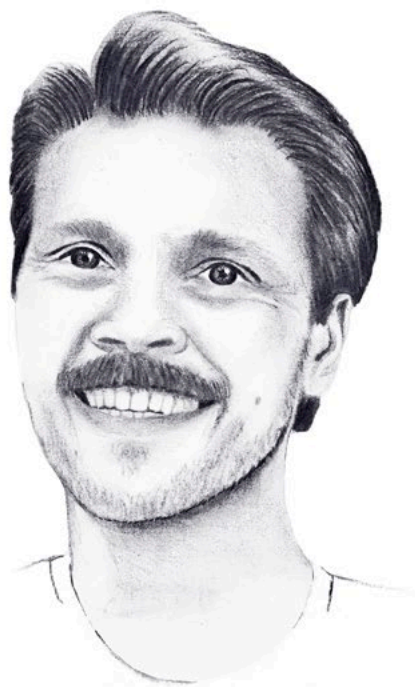
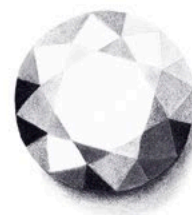
2023

Hanasaari B will be closed on 1 April 2023 at the latest.



2024

Salmisaari A and B will be closed on 1 April 2024 at the latest.



Back then, coal was used to produce electricity. The district heating network had yet to be built. Homes were heated by tiled stoves and baking ovens. When the era of coal cellars and central heating boilers began, hot water radiators began to appear in homes.

District heating began to be used more widely in Helsinki in the 1950s. Helen's first coal-fuelled plant producing electricity and district heating was Salmisaari A, which was completed in Salmisaari in 1953. It was followed by Hanasaari A in 1960, Hanasaari B in 1974 and Salmisaari B in 1984.

In recent times, coal has been used primarily to produce district heat for Helsinki's residents, with electricity produced alongside it.

Helen is in the process of phasing out the use of coal as part of Helen's goal of carbon neutrality. Helen has set a goal of being carbon neutral by 2030. Hanasaari will be closed by 1 April 2023 and Salmisaari by 1 April 2024.

"Finnish legislation requires that coal be phased out by spring 2029 at the latest," Rauhamäki points out.

Helen decided to accelerate its own transition to the carbon-free era by five years. The preparations for new, decentralised heat production have been under way for several years now.

"Heat needs to be produced in the city. Unlike electricity, you can't bring it over from the other side of the country.

Several different sources will be used for heating in Helsinki in the future.

"Various heat pump solutions are the primary direction we are moving in," Rauhamäki says.

Heat pumps can be used to process heat in the ground, bodies of water and air into district heat.

Helen is already capturing waste heat from data centres, properties, industrial processes and wastewater. The Katri Vala heat pump plant, which uses waste heat from wastewater and properties, had its sixth heat pump commissioned this year.

Heat is also produced from biomass.

"About a year from now, construction will be completed on Helen's wood chip heating plant in Vuosaari, which will exclusively produce district heat from wood chips."

Helen has also worked on the development of energy storage solutions. A thermal cavern storage for hot district heating water has been built in old underground oil caverns in Mustikkamaa.

"The primary purpose of the heat cavern is to balance differences between production and consumption."

Helen is also exploring the use of heat in seawater to heat properties.

"We are already producing district heat from other fuels besides coal. Coal now accounts for just under half of the total. About 30% is produced from natural gas and some 20% with heat pumps and biomass."

IN ADDITION TO FINLAND, MANY OTHER COUNTRIES have also announced they are phasing out coal. Nevertheless, Tiina Koljonen from VTT notes that Finland's level of commitment is quite unique.

"Finland is one of only a few countries to have a ban on coal inscribed in legislation."

According to Koljonen, the gradual phasing out of coal has been more successful globally than people expected 10 or 20 years ago. Koljonen suggests that, back then, people did not foresee how quickly renewable energy technologies would develop and their prices would fall.

"People's expectations concerning the declining costs of wind power, for example, used to be much more pessimistic. Today, it is recognised that

wind power is currently the most cost-effective way of generating electricity.

However, there are still countries around the world that have not committed to phasing out coal. Examples of these countries include China, India, the United States and Australia. According to Koljonen, new coal power plants are still being built in China and elsewhere in Asia.

"China's energy consumption is enormous. For the world's largest user of coal to completely phase out coal is not easily accomplished."

Phasing out coal is significant with regard to the mitigation of climate change, Koljonen notes.

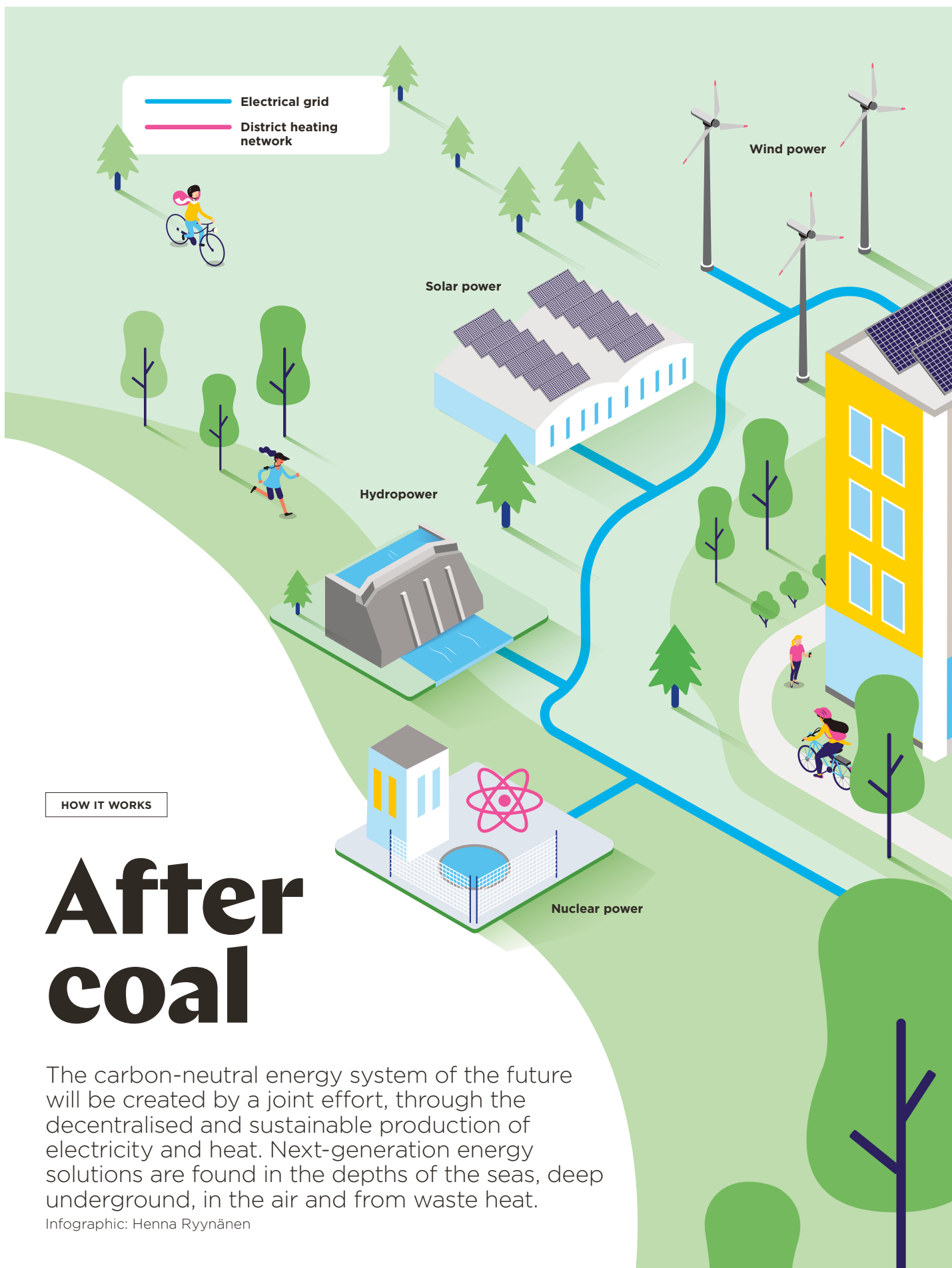
"When you look at global greenhouse gas emissions, energy production accounts for the vast majority of carbon dioxide emissions. In relative terms, the emissions from coal are higher than those of natural gas, for example. Coal generates more carbon dioxide emissions per unit of energy."

WILL COAL EVER BE PHASED OUT COMPLETELY AROUND the world?

"I imagine it will be. If we look ahead to 2050, I believe coal will still be used in Asian countries. However, by then, carbon dioxide capture and storage technologies will have been implemented."

"If the goal is to limit climate warming to 1.5–2 degrees, carbon dioxide capture and storage technologies absolutely have to be part of the use of coal."

For climate warming to be limited to 1.5–2 degrees, carbon dioxide capture and storage technologies need to be part of the use of coal.



HOW IT WORKS

After coal

The carbon-neutral energy system of the future will be created by a joint effort, through the decentralised and sustainable production of electricity and heat. Next-generation energy solutions are found in the depths of the seas, deep underground, in the air and from waste heat.

Infographic: Henna Rynänen



The trillionth tonne

Felipe de Ávila Franco's art installation serves as a wake-up call to increase environmental awareness.

My art installation *The trillionth tonne* (1,000,000,000,000) consists of eight tonnes of coal in eight polyurethane sacks. The sacks create a wall on which I have projected a carbon counter.

The counter shows the amount of carbon dioxide emissions into the atmosphere from human activity. In mid-April, the counter stood at over 668,379,500,000 tonnes of carbon dioxide equivalent. The counter is maintained by researchers from the Environmental Change Institute at Oxford University. Carbon dioxide equivalent is a unit used in climate science to illustrate the climate-warming impact of greenhouse gases. Burning coal accounts for 46% of the world's carbon dioxide emissions. Coal represents 72% of the greenhouse gas emissions caused by the energy sector.

Coal can be seen as an important driver of the modern era and the industrial revolution, but also as the culprit behind the present environmental crisis.

Helen helped me create *The trillionth tonne*. Helen provided me with the coal used in the installation and helped me check that the figures I had obtained in my initial research were accurate. I was motivated by partnering with an energy company that is transitioning from coal to clean energy.

The amount of greenhouse gases in the atmosphere keeps growing at a dramatic rate. Climate researchers predict that, at the present rate, the trillion-tonne milestone will be reached by 2040. If that milestone is reached, it may be impossible to stop climate change and its destructive impacts.

The Maanala exhibition will be featured at Amos Rex in Helsinki until 21 August. Go see what figure Felipe's counter has reached.

Brazilian-born artist Felipe de Ávila Franco has lived in Finland since 2013, when he began his studies at the Academy of Fine Arts.

Did you know this about carbon?

Find out how familiar you are with the element that makes all life possible.

1

What is the chemical symbol for carbon?

- A. H
- B. C
- C. Co

2

What is the melting point of carbon?

- A. 355°C
- B. 3,550°C
- C. 35,500°C

3

Which of the following countries has mined coal since 1000 BCE?

- A. China
- B. Mesopotamia
- C. United Kingdom

4

How much carbon dioxide is generated by burning 1 kg of coal?

- A. 1 kg
- B. 4 kg
- C. 10 kg

5

How many carbon compounds have already been discovered?

- A. Nearly 100,000
- B. Nearly 1,000,000
- C. Nearly 10,000,000

6

What percentage of the earth's carbon is underground?

- A. 0.8%
- B. 9.8%
- C. 99.8%

7

What percentage of the human body is carbon?

- A. 2%
- B. 9%
- C. 18%

8

How does carbon rank in terms of abundance in the universe?

- A. The most abundant
- B. Fourth-most abundant
- C. Tenth-most abundant

9

How is carbon created?

- A. The triple-alpha process
- B. Photosynthesis
- C. Cell respiration

The world's most beautiful coal mine

The decommissioned Zollverein coal mine is now a site that goes hand in hand with nature.

The Zollverein coal mine complex in Essen, Germany was inscribed into the list of UNESCO World Heritage Sites in 2001.

Shaft 12 at Zollverein was commissioned in 1932. It is considered to be the most beautiful coal mine in the world. The first coal mine at Zollverein was founded in 1847, and mining activities continued until December 1986.

Today, as much as 70% of the Zollverein park zone is covered by greenery and forests. It is home to over 540 species of ferns and flowers, as well as some 100 species of lichen. Also found in the area are at least 60 species of birds, 20 species of butterflies and 6 species of frogs. Zollverein is a popular place for a picnic.



PHOTO: GETTY IMAGES

Today, as much as 70% of the Zollverein park zone is covered by greenery and forests.



TIMELINE

Writing utensils through the years

Cai Lun, a Chinese court official, makes sheets of paper by pressing and drying pulped tree bark.

105

**3200
BCE**

The ancient Mesopotamians write Sumerian on clay tablets. Mesopotamia was located in the region of modern-day Iraq.



**3000
BCE**

Egyptians begin making papyrus sheets from papyrus stalks that grow in the Nile Delta. Ink is made by mixing water with burnt wood or oil.

600

Spaniards develop the quill pen, which goes on to be the dominant writing instrument for the next millennium. The highest-quality quills are made from swan feathers.



German metallurgist and inventor Johannes Gutenberg invents the printing press. He develops movable type that is made from metal and can be used multiple times.



1439

The English inventor Henry Mill patents the typewriter. According to the patent filing, the apparatus can be used to impress or transcribe letters one after another, in such a way that they could not be distinguished from print.

1714

MicroPro International's Director of Marketing Seymour Rubenstein and programmer Rob Barnaby create WordMaster, the first commercially successful word processing software.

1979

The lead pencil is adopted in England. In fact, lead pencils are not made with lead. They are made with graphite, which is the most common crystalline form of carbon. Graphite is mined in Cumberland, Northwest England.

1560

American inventor John J. Loud patents the ballpoint pen. Inside the pen is a small revolving steel ball. The pen can be used to write on rough materials, such as wood and leather.

1888



Nokia launches the 9000 Communicator, the first smartphone to feature a full QWERTY keyboard. It is an advanced phone that can be used to write, send and receive e-mail and fax messages.

1996



Do you have questions about energy?

Concerned about carbon? Do you want to be an eco-friendly energy user, but you don't know how? Don't worry! We want to help Finns see energy in a new light.

How can decentralised energy solutions replace coal now that you are phasing it out?

– Oskari, 46

Dear Oskari,
I understand your concern. We take a wide range of measures to ensure that there is enough energy to go around. We use existing green technologies and innovations to ensure that there is enough electricity in our city. Carbon-neutral energy production is built around wind farms and taking advantage of heat from the ground, water and the sun. We also recover waste heat from properties and data centres. Our customers will have an increasingly important role in energy production in the future. You could become an energy producer yourself!



How do I get my teenage child interested in saving energy? – Minna, 52

Dear Minna,
Perhaps a concrete illustration would make it easier for your teenager to understand energy consumption? If you are customers of Helen, you can use the Oma Helen application together with your teenager to see how heating the sauna or baking sweet rolls affects your home's electricity consumption data. You can then take a look at your electricity bill together and translate the amount to an expense or income your teenager can relate to, like the cost of a hobby or the hourly wage of a summer job. For example, how many hours of work at the summer job would it take to pay your monthly electricity bill?



I'm thinking about having solar panels installed on my roof, but the price is quite high. Does it make sense in the long run? – Ville-Veikko, 56

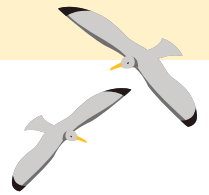
Dear Ville-Veikko,
Producing electricity with your own solar panels saves money and the environment, so it makes a lot of sense in the long run. Even in the current conditions, a solar power system pays itself back during its warranty period, as long as the size of the system corresponds to your actual electricity consumption.

Producing your own electricity makes you more self-sufficient and protects your finances against the rising prices of electricity as well as higher electricity taxes and electricity distribution tariffs. Solar panels are also a good investment because they increase the value of your home in the property market.

Does it make sense to use solar power in Finland? Compared to wind, for example, we don't get that much sun here. – Eliisa, 20

Dear Eliisa,
It's true that we don't get a lot of sun here, but that doesn't make solar power useless at these latitudes. Solar power can be harvested in Finland even in the winter. In fact, cold weather improves the efficiency of solar cells. In addition, light reflected off snow increases solar power output.

In the summer, our days are very long, which means that solar panels generate electricity from early morning until late at night. For these reasons, the total annual output in Finland is about the same as in Central Europe.



I just switched to wind power. What if there's no wind? Will I still get electricity at home? – Ruu, 18

Dear Ruu,
It's true that the energy output of a wind turbine depends on wind. To start, a wind turbine requires winds of 3–4 m/s. In practice, this wind speed is exceeded throughout Finland, which is why wind farms generate electricity over 90% of the time. Even if there are brief periods of no wind, you don't need to worry. The supply of electricity to your home is not dependent on wind speed in real time.

The electricity you get from your outlet at home always comes from the nearest power plant. We ensure that the electricity you use is derived from wind power by purchasing certificates of origin for wind power at an amount that matches your consumption.

How ecological is wind power really? – Sari, 56

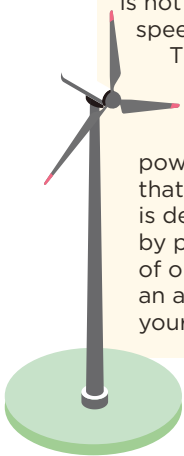
Dear Sari,
Generally, all forms of renewable electricity and nuclear power have a carbon footprint of zero. Of course, the production, construction, maintenance and demolition of the power plants themselves (solar panels, wind turbines, nuclear power plants) do generate carbon dioxide emissions. The Danish company Vestas, which is the largest supplier of wind turbines to Finland, has calculated that its modern wind turbines recoup the energy used for the aforementioned activities, and reach carbon neutrality, within approximately 5–8 months of being commissioned, which is faster than any other form of energy production.

Wind is an endless resource for electricity production, and it does not need to be delivered to the production site in a lorry.

Is it windy enough in Finland throughout the year for wind power? – Roland, 61

Dear Roland,
Don't worry! Finland is part of the westerly wind climate zone, which is fairly windy. Wind conditions are also significantly influenced by the Atlantic Ocean and the large land mass to the east. In addition to this "basic situation", it should be noted that, in cold weather, differences in atmospheric pressure are greater than in warm weather, which means that wind speeds are higher than average during the winter months.

Indeed, wind power production in Finland peaks in the winter, which is also when energy consumption is at its highest. Also worth noting is that the latest wind turbines have a very high hub height, and it is more windy up there than at ground level. Of course, windless moments can still occur occasionally.



Amendments to Helen's and Helen Electricity Network's data protection statements following the deployment of Datahub

We have updated our data protection statements. Going forward, the exchange of information in the electricity market will take place through the centralised information exchange system for the electricity retail market, known as Datahub.

The change in the information exchange method will not affect what data is processed. Data will still be transmitted reliably and securely between the various parties via Datahub.

Following the deployment of the centralised information exchange system, customers will be reliably identified and the primary responsibility for updat-

ing shared customer data (name, personal ID, postal address, phone number and/or e-mail address) on the centralised system will lie with the electricity retailer used by the customer.

For more information on our processing of personal data, please visit:

www.helen.fi/personaldata
www.helensahkoverkko.fi/asiakasrekisteri (in Finnish)

Please contact our customer service if you have any further questions regarding the change in the information exchange method:

Helen Ltd customer service

Postal address: 00090 HELEN
Telephone: 09 617 8080, Mon–Fri 8:00–18:00

Helen Electricity Network Ltd customer service

Postal address: 00090 HELEN
Telephone: 09 617 8090, Mon–Fri 8:00–18:00
E-mail: sahkoverkko.asiakaspalvelu@helen.fi

More information on the Datahub is available on the Fingrid website:

www.fingrid.fi/datahub

SUDOKU

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Sudokus' solution: helen.fi/sudoku

	2			8				
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		7			6			1
				2			8	



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							3	6
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9	5	8						



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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 August 2022 at helen.fi/magazine-feedback or send a postcard to Helen, Helen magazine, 00090 HELEN. Don't forget to write your contact details and customer number on the card.



One lucky survey respondent will win a garment steamer.

Philips GC362/80 Use this Philips Steam & Go garment steamer to freshen up your clothes and textiles – from silk to cashmere, from cardigans to curtains, without having to worry about burning.



1

Team sports & golf

VilleGalle: Sports of all kinds have been important to both of us throughout our lives. During my career, I've used sports to recover after doing gigs on the weekends. I play hockey, tennis, padel and badminton, and I've also done a bit of boxing. Lately, I've been doing sports every day, so I've also gone to hot yoga a few times for body maintenance.

Jare: We discovered golf a few years ago. It serves as a good balance to other sports and performing at gigs, which are activities that really get your heart rate going. Golf is also a way to enjoy a bit of peace and quiet, which is something I've begun to appreciate as I've got older.



SOURCES OF ENERGY

JVG



3

Therapeutic cooking

VilleGalle: Now that I've had more time, I've tried to cook healthier meals at home. I find recipes on TikTok: spicy pasta bolognese is my specialty.

Jare: I haven't done much cooking in the past, but now I've realised that it can be quite therapeutic.



2

Solitude & remote meetings

VilleGalle: During the pandemic, I've learned to get energy from being alone. I've realised that relaxing on the sofa at home is kind of nice. Now it feels strange to go somewhere with lots of people.

Jare: When we had the invitation-only premiere for our film, I realised that I no longer enjoy being in large crowds. Going forward, I'm sure I will get energy from being able to get minor meetings done remotely.



Facts

Helsinki natives Jare Brand (34) and Ville Galle (34) make up JVG, Finland's most successful rap duo. Their documentary biopic *Vuodet ollu tuulisii* is now in theatres throughout Finland.

4

Nature

VilleGalle: I've spent a lot of time at my parents' summer place. Now I'm dreaming of a cottage of my own to have a place where I can relax.

Jare: Going on nature hikes was not something I did very often in the past but, these days, I go for walks in Nuuksio sometimes.



Helen will be a carbon-neutral energy company in 2030. This goal will not be achieved alone, but with customers – by working together to build new energy solutions that harness waste heat and rooftops, for example. Helen supports its customers through the green transition and makes the opportunities presented by the new era of energy available to everyone.



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Helen Ltd

Kampinkuja 2, 00090 HELEN
• helen.fi

ELECTRICITY CUSTOMERS

Mon–Fri 8–18

Contracts and billing

- 09 617 8080
- helen.fi/contact-us

Free online services

- helen.fi

Phone line for movers 24/7

- 09 617 8020

HEATING CUSTOMERS

Mon–Fri 8–16

New district heating connections

- 09 617 8013

Contract amendments and assistance

- 09 617 8014

Billing, meter reading and energy consumption

- 09 617 8001

Technical assistance concerning district heating

- 09 617 8012

COOLING CUSTOMERS

Mon–Fri 8–16

Sales and contracts

- 09 617 8015

FAULT REPORTS

Disruptions in electricity distribution

- 08001 80808

Disruptions in district heating distribution

- 08001 60602

Real-time information on disruptions

- helen.fi

CALL CHARGES

- Calls are subject to local network or mobile call charges

Helen Electricity Network Ltd

- helensahkoverkko.fi

ELECTRICITY NETWORK CUSTOMERS

Contracts and billing

- 09 617 8090

Electricity network connections

- 09 617 8086

- helensahkoverkko.fi

Free online services

- helen.fi