Finland's most energetic customer magazine » 2/2020

HELEN

100 bolts of lightning!

Coronavirus is raging. So are 2,000 thunderstorms.

» p. 11

Psst! I'm proud of the fact that Finland has a very high level of security of supply in energy.

Towards a new era

EDITORIAL » I took over as CEO of Helen at an exceptional time: in April, right in the middle of the coronavirus crisis. When the world around us is full of uncertainty, the basic building blocks of daily life take on even greater importance: your loved ones, your home, food, nature – and of course electricity and heating, which are essential in daily life.

The security of supply is part of Helen's operations: we have a role in ensuring that the daily life of Finns goes on smoothly in spite of the coronavirus. There's plenty of electricity, heating and cooling to go around, and their production and distribution has been ensured under all circumstances.

When we have overcome the coronavirus crisis, daily life will gradually return to normal. Once the pandemic has passed, we still have the climate challenge to contend with. One thing that the coronavirus crisis has revealed is a strong sense of community and collective effort. "We'll make it through this together" has been a common refrain during the spring. We can also work together to build a better, carbon-neutral future.

Let's join our forces and move towards a new era of energy!

"We'll make it through this together."

Juha-Pekka Weckström CEO, Helen Ltd

A SOURCE OF PRIDE

There's plenty of energy

Security of supply means being prepared to maintain the vital functions of society at a level that is as close to normal as possible. The energy industry contributes to the overall security of supply by ensuring that there is enough electricity and heating to go around.

The personnel at Helen's power plants make sure that there is enough electricity, heating and cooling to meet the demand. The control room in Salmisaari is shown in the photo.

PHOTO: HELEN

HELEN

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PRODUCTION Genero | A-lehdet **COVER PHOTO** Getty Images **REPRO** Aste Helsinki Oy **PRINTED BY** UPC Print, Vaasa
ISSN 1455-9528 **HELEN MAGAZINE** is Helen Ltd's and Helen Electricity Network Ltd's shared customer benefit. The magazine is published four times per year. The next issue will come out in August 2020. To cancel your subscription, send a message to asiakaslehdet@helen.fi. Address change notifications: helen.fi. Our services online: helen.fi and helensahkoverkko.fi

Energy!

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

PHOTO: VASTAVALO

#flowermeadow **The long and unusual spring turns to summer and roadside meadows start to bloom. This lovely sight is now an increasingly common feature of the urban environment as well. In Helsinki, the roof of the Munkkisaari district heating station turns into a summer meadow with plants that were chosen by children who live in the area! Read more on the next page.**

TRENDSETTER

I recycle on social media

Helsinki resident Salli Joutsenoja, 37, buys her children's clothes from online recycling groups.

Salli Joutsenoja has always been critical of unnecessary consumption for environmental reasons. When she became a mother, she started buying children's clothing from a local Facebook group for recycling childrenswear and other children's products in Helsinki's Haaga district.

"If we really need something and I can't find it after several weeks of browsing recycling groups, I need to compromise on my principles. But that doesn't happen often. I take my time with every buying decision I make."

Joutsenoja often buys large bags of second-hand clothes for Seela, 3, and Aili, 1, not knowing much about the contents except that they are the right size. The brands and colours are not important.

"Kids like to wear crazy combinations, so it doesn't matter what colours we get."

"Another advantage of second-hand clothes is that you don't have to worry about them so much. You can let your kids be kids."

Joutsenoja wants to set an example for her children and raise them to be environmentally conscious. She points out that buying more than you need is not necessary, even when you're buying second-hand clothing.

"Buying recycled clothes is good, but it's even more important to avoid unnecessary purchases."

DID YOU KNOW?
Many towns, villages and city districts have their own recycling groups online.

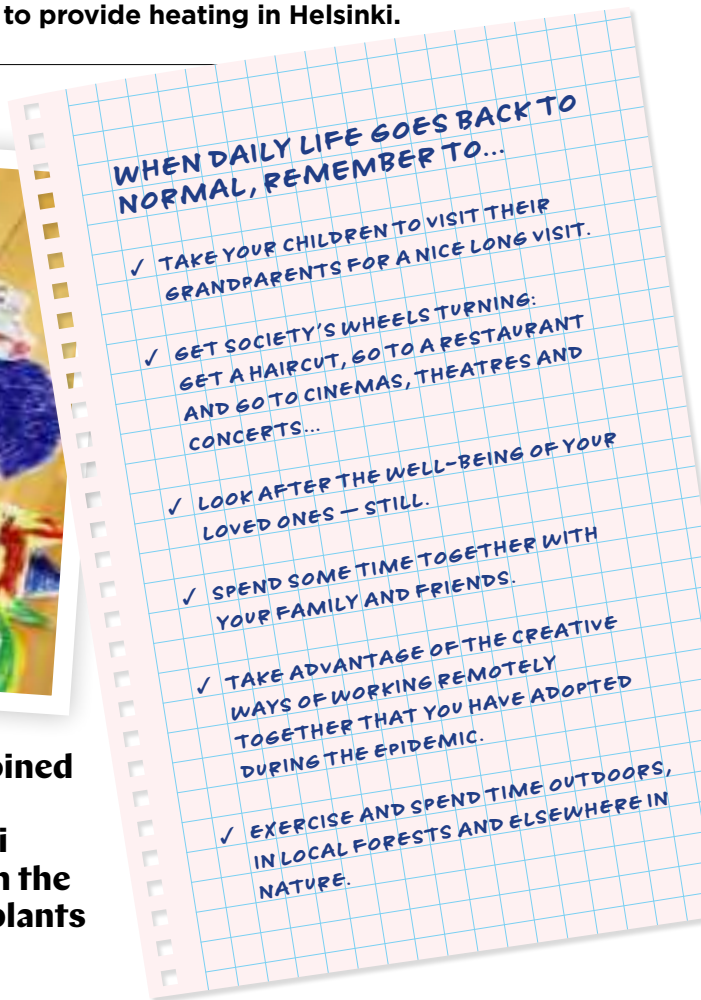
"Buying recycled clothes is good, but it's even more important to avoid unnecessary purchases altogether."

TEXT: ANI KELLOMÄKI, PHOTO: PAULA VIRTA

#sustainability **Paulig has been selected as Finland's most sustainable beverages brand. One example of Paulig's sustainability is the pilot project between Paulig and Helen to use excess heat recovered from the Vuosaari roastery to provide heating in Helsinki.**

PHOTO: HELEN

Helen, local residents and experts have joined forces in the project to create a diverse ecosystem on the roof of the Munkkisaari district heating station. Children between the ages of 3 and 5 from Day care Eira chose plants for the meadow at an arts workshop.



HOW IRRESPONSIBLE IS IT...

...to keep your old mobile phone sitting in a drawer instead of recycling it?

Ouch. Only 10 per cent of mobile phones are recycled. Mobile phones contain valuable metals such as gold, silver, copper, nickel and cobalt. Reusing these metals as raw material is called urban mining and it reduces the need to mine them from natural sources. You can recycle your mobile phone at nearly 500 collection points for electronics and at 2,000 retailers selling these devices.

PHOTO: KATARINA CYGNEL-NUORTIE

#joiningforces **The heating purchasing cooperation between Helen and Vantaan Energia is set to grow significantly. Helen will buy a quarter of the carbon neutral heat produced by the extension to the waste-to-energy plant in Eastern Vantaa.**

Hello, I sparkle up your windows!

A window vac cleans glass surfaces up to three times more quickly than traditional methods.

1

What is a window vac?

It's an appliance that electrifies your window cleaning. The combination of a microfibre cloth attached to a spray bottle and a battery-powered window vacuum cleaner is a quick way to wash windows of all sizes. The accessories available for this window vac include a charger, a spare battery, a separate suction head for small surfaces and an extension pole for reaching higher areas.

2

How does it work?

First spray some cleaning liquid on the window using the spray bottle. Wipe the entire surface with the microfibre cloth. Start the window vac and vacuum the dirty water from the glass, so the running water does not reach the window frame or the floor. You get sparkling clean windows without having to deal with buckets, rags, newspapers and streaks of dirty water on the glass.

3

What can I use it for?

In addition to windows, window vacuums are useful for cleaning other smooth and hard surfaces as well. Examples include bathroom walls, tiles in bathrooms and kitchens, glass tables and mirrors. It helps remove stubborn stains and you can even use it to clean spilt milk from your dining table.

"The battery life of window vacuums keeps getting longer. They used to run for 20–40 minutes, but some of the latest models offer more than an hour of running time."

More information on energy-related topics: **energiatori@helen.fi**

PARTICIPATE in our reader survey on page 26 for a chance to win a window vac.

#helenventures **Helen prepares to invest up to 50 million euros in growth companies disrupting the energy industry – Helen Ventures aims to accelerate the industry-wide transformation.**

Let's find out... about solar panels

Solar panels can provide you with electricity on the move and at home.

	What?	How much power?	Price?
SOLAR BACKPACK	A backpack equipped with a small solar panel.	6.5 W. The solar panel provides enough power to charge a phone, for example, even in low sunlight.	Approx. €100.
SOLAR PACK FOR A BOAT	A solar panel that can be installed on the sloped surface of a boat. Strong enough to be stepped on.	100 W. Enough to charge a small battery, for example. The panel needs to be connected to a control box.	Approx. €300.
A SOLAR POWER KIT FOR A SUMMER COTTAGE	Includes two 320 W solar panels and two 250 Ah batteries.	640 W. Includes a control box. Enough electricity to power a small refrigerator, lighting, a TV and phone chargers.	Approx. €2,500.
A SOLAR POWER SOLUTION FOR A DETACHED HOUSE	Includes ten 320 W solar panels installed and ready to use on the roof of the house and an inverter.	3,200 W. Covers approximately 10–30% of the household's annual electricity consumption.	Approx. €5,400, including installation. The installation fee qualifies for a tax credit for household expenses.

Smarter heating!

You can now improve your living comfort while saving energy. Helen's Kiinteistövahti service and smart heat distribution centre service provide housing companies with the tools they need to optimise the temperature of apartments without wasting money on excessive heating.

PHOTO: GETTY IMAGES

#carbonneutral **One of the world's largest heat pumps will be built in Helsinki, enabling a reduction in the use of coal. It's the first replacement for coal at the Salmisaari power plant: its output will represent more than 10% of Salmisaari's heating output.**

LET'S JOIN FORCES

Get the most out of solar panels

Until now, housing companies have only been able to use the solar electricity they produce in the building's shared facilities. Soon, when the legislation allows it, apartments as well can make use of the electricity produced by the housing company's solar panels.

Text: Marjukka Puolakka | Photo: Timo Pyykkö

PHOTO: PETRI MULARI

“Solar panels produce clean electricity and a clear conscience”

WHEN THIS HOUSING COMPANY IN HELSINKI needed to renovate the roof, the shareholders decided to do something good for the environment by building a solar power plant. A total of 33 solar panels were installed on the roof of the apartment building. The electricity generated by the solar panels is used to light the staircases, run the ventilation system and power the housing company’s other shared systems and facilities.

On sunny days, the panels produce enough electricity that it could be used in the apartments as well, but this is not possible under the current legislation. By participating in the FinSolar pilot project, Helen Electricity Network has actively advocated for legislative changes that would rectify the current issue concerning excess electricity.

“When we heard about FinSolar, we decided to join this pilot project for a compensation calculation service that makes it possible for the electricity produced by solar panels to be used also in the apartments,” says Sinikka Herajärvi, Chair of the Board of Directors of Asunto Oy Haapalahdenkatu 11.

Using the compensation calculation service does not require any changes to the electricity meters. Helen takes care of the calculations and allocates the benefits to the residents in proportion to their shareholdings.

“Each of the building’s residents can look at their electricity bill to see how much of their electricity is generated right on the roof of the building. My electricity bill has been reduced by €20–30 per year.”

“The legislative amendment will take effect at the beginning of 2021 at the latest, allowing Helen Electricity Network to start providing the compensation calculation service to its customers. When this service is available, it makes sense to install a solar power plant whose output exceeds the consumption of electricity represented by the building’s shared systems and common areas,” says Metering Manager Mika Nousiainen from Helen Electricity Network.

Facts

Asunto Oy Haapalahdenkatu 11. Chair of the Board of Directors: Sinikka Herajärvi.

A housing company in Helsinki’s Pikku Huopalahti district, consisting of 24 units: two three-storey apartment buildings and one two-storey terraced house.

The buildings were completed in 1992.

A total of 33 solar panels were installed on the roof of one of the apartment buildings in connection with a roof renovation project in 2017.

8+1 things you should know

if your housing company wants to get solar panels

1 When there is interest in the housing company to have solar panels installed, the Board of Directors should invite an expert from Helen to conduct an on-site survey. The topics of the survey include the placement of the solar panels and other technical issues.

2 When deciding on the size of the rooftop solar power plant, take note of the compensation calculation service to be introduced at the beginning of 2021. It'll make it possible to use the solar power produced by the housing company for the apartments.

3 The compensation calculation will be shown directly on the residents' electricity bills. The larger the solar power plant on the roof of the housing company, the larger the proportion of the electricity that can be covered by the rooftop solar panels.

4 After the survey, Helen will submit a recommendation and offer for the solar power plant. Depending on the articles of association, the decision to purchase the solar power system is usually made by a general meeting of the housing company.

5 Helen delivers the solar panels on a turnkey basis that covers everything from design to deployment. The system is delivered and installed quickly — it may take less than a month from placing the order.

6 The installation of the solar panels and inverter, and other electrical work, takes at least a few days depending on the size of the system. Helen offers a five-year warranty for the installation, compared to the two-year warranty offered by most other providers.

7 Congratulations! The panels generate clean electricity that is transmitted for use by the property and its residents directly from their own roof. Helen is always ready to help with any questions concerning electricity and energy.

8 Acquiring solar panels is a sensible and eco-friendly investment that will be reflected in your electricity bill. Solar panels make the property more attractive and increase the value of the apartments.

+1 Helen Electricity Network promotes better opportunities for housing companies to produce solar power. The introduction of the compensation calculation service is pending a legislative review with regard to value added tax, for example.

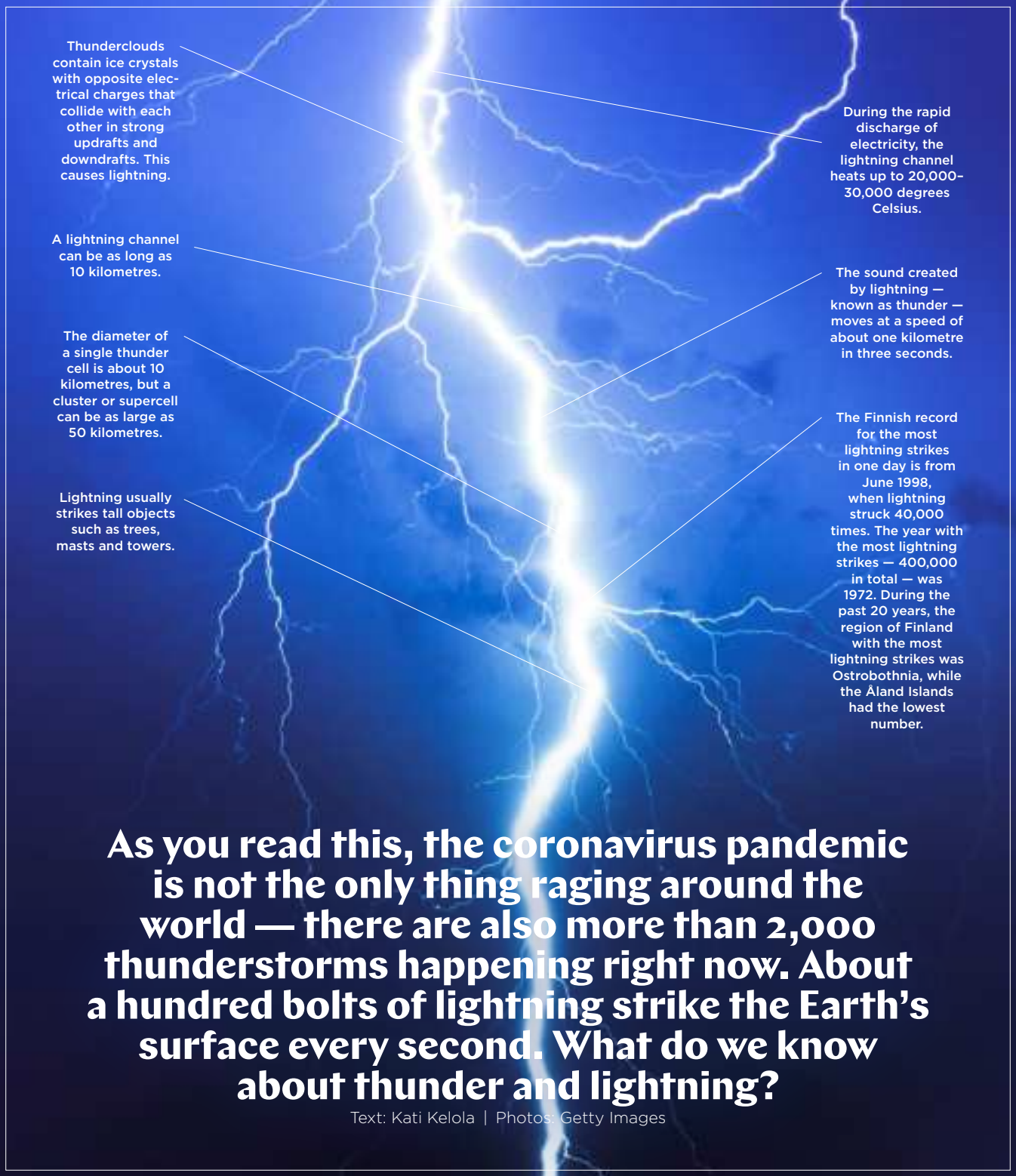
"Helen Electricity Network will offer the compensation calculation service in Helsinki as soon as the legislation allows it."

Mika Nousiainen
Metering Manager, Helen Electricity Network Ltd

PHOTO: TIMO PYYKKÖ

Lightning

Everything you ever wanted to know about lightning — and more.



Thunderclouds contain ice crystals with opposite electrical charges that collide with each other in strong updrafts and downdrafts. This causes lightning.

A lightning channel can be as long as 10 kilometres.

The diameter of a single thunder cell is about 10 kilometres, but a cluster or supercell can be as large as 50 kilometres.

Lightning usually strikes tall objects such as trees, masts and towers.

During the rapid discharge of electricity, the lightning channel heats up to 20,000–30,000 degrees Celsius.

The sound created by lightning — known as thunder — moves at a speed of about one kilometre in three seconds.

The Finnish record for the most lightning strikes in one day is from June 1998, when lightning struck 40,000 times. The year with the most lightning strikes — 400,000 in total — was 1972. During the past 20 years, the region of Finland with the most lightning strikes was Ostrobothnia, while the Åland Islands had the lowest number.

As you read this, the coronavirus pandemic is not the only thing raging around the world — there are also more than 2,000 thunderstorms happening right now. About a hundred bolts of lightning strike the Earth's surface every second. What do we know about thunder and lightning?

Text: Kati Kelola | Photos: Getty Images

The sound created by lightning moves at a speed of about one kilometre in three seconds.

The length of the delay between lightning and thunder tells you how far away the storm is. When lightning strikes, count the seconds to the rumble of thunder. Divide the number of seconds by three to get the distance in kilometres. For example, six seconds means the storm is two kilometres away.

WHAT ARE YOUR FAVOURITE MEMORIES OF THUNDER-storms?

Seeking shelter in a parked car outside your summer cottage? Flying through a thunderstorm in an airplane? Or an old family story about a grandmother who saw a ball of lightning fly out of her oven?

We all have memories of thunderstorms. Lightning and the deep rumble of thunder are fascinating, beautiful and a source of a certain kind of primitive excitement.

Forked lightning against the bluish black sky is a captivating sight. As you watch it, you count the seconds in your head to make sure you're safe.

But what are we really looking at when we watch a thunderstorm? What causes the rumble of thunder? What is lightning?

"LIGHTNING IS THE RESULT OF THE ATMOSPHERE TRY-ing to maintain its balance," says Research Scientist Terhi Laurila from the Finnish Meteorological Institute.

It takes three factors to create a thundercloud. The first of these is atmospheric instability in the form of a vertical temperature difference, with warm air below and colder air above. You also need moisture. The third is a triggering factor that gets the unstable and humid air moving. This could be a boundary between two air masses, a mountain range or the radiant heat of the sun.

"You need all three ingredients. For example, if the weather is very hot but dry, you won't get a thunderstorm."

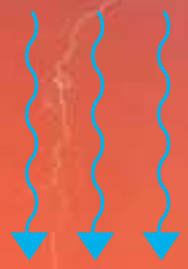
When the conditions are right, a strong updraft occurs, making particles collide inside the cloud. As they collide, the friction between them causes an electrical charge. The charge accumulated within the cloud is then discharged as lightning.

Thunderstorms can be divided into two categories. Air mass thunderstorms occur e.g. when the sun heats the ground or a mountain range forces an updraft. Frontal thunderstorms are caused by weather fronts. The most severe thunderstorms often involve a cold front.

There are more than 2,000 thunderstorms happening around the world at any given time. Some 100 bolts of lightning hit the Earth every second. The frequency of thunderstorms is the highest in hot and humid tropical regions, where they can be an almost daily occurrence.

The warmer the weather is, the more optimal the conditions are for a thunderstorm. Warm air holds more moisture. Moisture in the air powers thunderstorms.

It takes three factors to create a thundercloud. The first of these is atmospheric instability in the form of a vertical temperature difference, with warm air below and colder air above. You also need moisture. The third is a triggering factor that gets the unstable and humid air moving. This could be a boundary between two air masses, a mountain range or the radiant heat of the sun.



COLD DOWNDRAFT

WARM UPDRAFT

Ukko is the ancient god of weather, harvest and thunder in Finnish and Karelian mythology. Ukko is depicted here in R. W. Ekman's Kalevala-inspired painting Lemminkäinen at the Fiery Lake (ca. 1867).

There are reports of ball lightning from several centuries, but it remains a mystery to science. The phenomenon has never been successfully recreated in a laboratory. There are also no verified photos or videos of ball lightning, even with people having camera phones everywhere they go. The illustration shown here is not a real photo.

In Finland, the thunderstorm season is from May to September, but winter thunderstorms aren't unheard of.

"We do have observations of lightning in Finland almost every month of the year. In the winter, we can refer to them as thunder snowstorms."

During the peak thunderstorm season in Finland, there's lightning somewhere in the country almost every day.

THROUGHOUT HUMAN HISTORY, PEOPLE HAVE TRIED TO come up with explanations for this tremendous force that can kill or light fires. In Finnish mythology, Ukko was the god of thunder who drove his chariot in the clouds.

"Thunder was a big part of human mythology and folklore in the past. It was simultaneously spectacular and frightful," says Senior Archivist Juha Nirkko from the Finnish Literature Society (SKS).

SKS has collected information on thunder-related beliefs among Finns in different parts of the country. While the material was mostly collected in the 1930s, the sources were elderly people, so the beliefs reflect the views held by people in the 19th century.

"People used to think that thunder was an expression of anger by the gods."

The gods were said to be angered by people's sins, like cursing.

"If you curse or act disrespectfully, the gods will take vengeance," Nirkko explains.

It was believed that mocking thunder could cause a bolt of lightning.

"That's what happens to Juhani in Seven Brothers by Aleksis Kivi," Nirkko points out.

People believed they could reduce the severity of thunderstorms by beating hummocks with poles, for example. You could also try to split thunder by raising a saw or pitchfork to the sky while making hay, for example.

Putting out a fire that was started by lightning was believed to be difficult if not impossible.

After all, it was god's vengeance on man. People thought milk was more likely than water to put out a fire caused by lightning. That was the belief held in Border Karelia. A person interviewed in Kiikala (now Salo) even specified that only breastmilk would extinguish a fire caused by lightning.

When a tree was struck by lightning, it was believed to retain the awesome power of thunder. Using a toothpick made from such a tree would heal a toothache.

SCIENTIFICALLY, LIGHTNING CAN BE CLASSIFIED AS intra-cloud lightning and cloud-to-ground lightning. In the former type, the electrical charge accumulated in the cloud is discharged at the cloud level. In the latter type, the discharge happens between the cloud and the ground.

Intra-cloud lightning affects air traffic, for example, whereas cloud-to-ground lightning affects life on the surface.

When lightning strikes, the electrical charge in the cloud is discharged through a narrow lightning channel, which you can see against the sky with your bare eyes. During the discharge, the channel rapidly heats up to 20,000–30,000 degrees Celsius and expands explosively at about ten times the speed of sound, creating a shock wave.

"If you were right where the lightning strikes, you would experience a loud bang and even a blast wave," says Terhi Laurila from the Finnish Meteorological Institute.

Just a few metres from the channel, the shock wave turns into a sound wave.

"The lightning channel is several kilometres long. It can be as long as 10 kilometres. When lightning strikes, we hear sounds from different sections of the channel, which is why the rumbling can last quite a long time."

People have tried to find ways to harvest the tremendous amount of electricity in lightning, but Laurila says this is very difficult.

"When lightning starts in the cloud, there's no way of knowing where it will hit. It would be exceedingly difficult to place any equipment in the right spot."

The Estonian-German physicist Georg Wilhelm Richmann died of electrocution in his laboratory in St. Petersburg in August 1753 when he tried to capture lightning to study it.

The latest hypothesis is that ball lightning consists mainly of oxidised silicon and carbon, which the lightning has partially heated into plasma.

Another difficulty besides knowing where lightning will hit is the extreme amount of charge it contains.

"You'd need technology that prevents your equipment from exploding when hit by that kind of instantaneous power. As far as I know, no-one has developed a device that could handle that much charge in such a short time."

The average peak current of lightning is 15,000 amperes and the electrical energy contained in a typical cloud-to-ground lightning strike is 140 kWh. However, the vast majority of the energy of the lightning bolt is expended in heating the lightning channel. The energy that reaches the point where the lightning hits the ground would power a 1W LED bulb for about four months.

"Capturing the energy of lightning would be expensive. Other options, like solar power, are much easier for capturing a larger amount of electricity."

IF YOU HEAR THUNDER BEFORE THE ICE MELTS, IT'LL BE a cold summer ahead. It takes 90 days from the last rumble of thunder in the autumn for winter to come.

That's what people used to believe.

Even though we spend much of our time indoors these days, there are many beliefs related to thunderstorms and protecting ourselves from lightning.

People used to believe that you shouldn't hold a cat in your lap during a thunderstorm, because cats are electric and lightning might strike you. People also believed you shouldn't try to run away from a thunderstorm. One myth that survives to this day is related to rubber boots.

"It's not true that wearing rubber boots will prevent lightning from striking you," Laurila says.

"There is a hint of truth to it, though. If lightning strikes a certain distance from you, and the current moves towards you along the ground, wearing rubber boots could have an insulating effect."

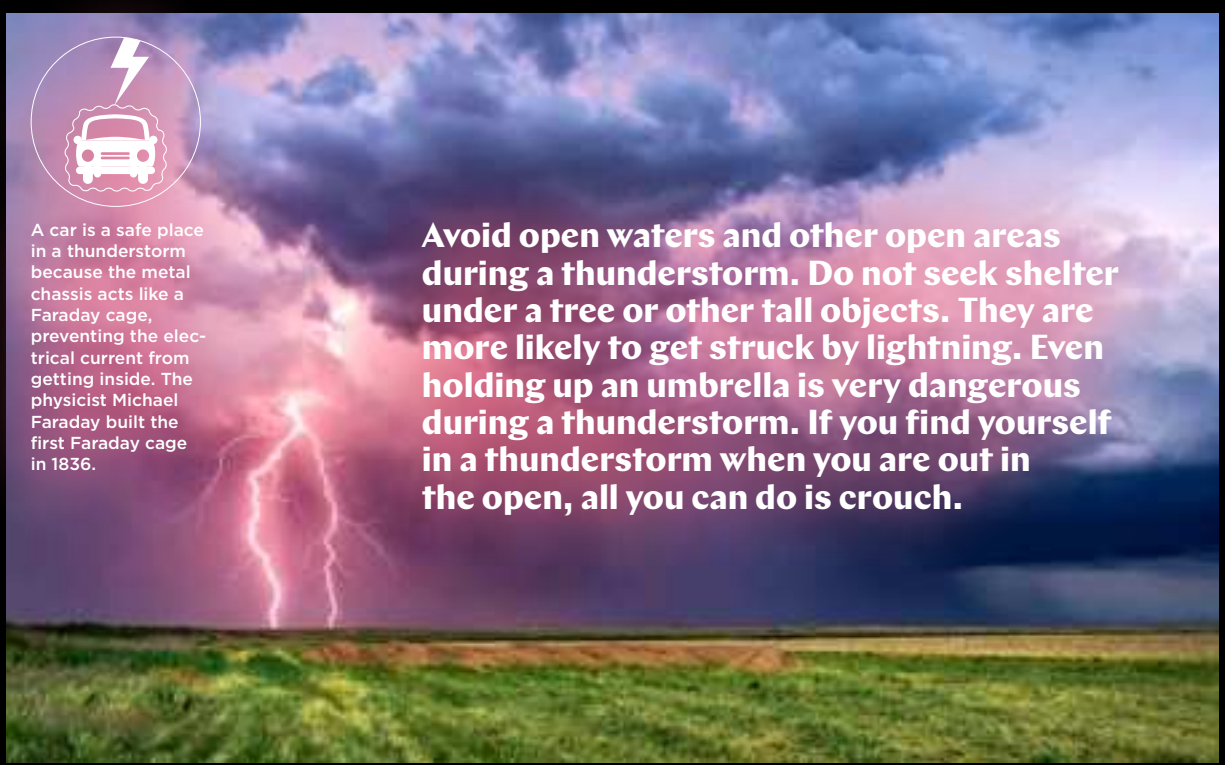
The old adage that lightning never strikes the same place twice isn't true either. There are many places in Finland that have been hit by lightning more than once. They are usually tall objects, such as masts or towers. The 146-metre Pasila TV tower, for example, has been hit by lightning many times.

Cars are known to be safe during a thunderstorm. The metal chassis prevents the electrical current from getting into the car even if lightning strikes. The safest option during a thunderstorm is being indoors.

"You should close the windows and doors to prevent the lightning current from entering through those openings.

You should also avoid using electrical devices, fireplaces and landline telephones. Fortunately, you can use your smartphone as long as you aren't charging it at the same time. It won't be hit by lightning.

SOURCES: FINNISH METEOROLOGICAL INSTITUTE



A car is a safe place in a thunderstorm because the metal chassis acts like a Faraday cage, preventing the electrical current from getting inside. The physicist Michael Faraday built the first Faraday cage in 1836.

Avoid open waters and other open areas during a thunderstorm. Do not seek shelter under a tree or other tall objects. They are more likely to get struck by lightning. Even holding up an umbrella is very dangerous during a thunderstorm. If you find yourself in a thunderstorm when you are out in the open, all you can do is crouch.

HOW IT WORKS

Protect yourself from lightning

A surge protector shields electrical devices from lightning strikes.

Infographic: Henna Ryynänen

Lightning strikes an overhead line

1. Lightning can travel several kilometres through overhead lines to reach a building, causing a voltage spike in a power line or telecommunications line that damages electrical devices.

2. Surge protectors shield devices from voltage spikes. There are surge protectors that are installed in the building's switchboard.

3. For sensitive devices, such as computers, televisions and modems, you can also install device-specific surge protectors between the device and a grounded outlet. You can install these device-specific surge protectors yourself. If your building does not have surge protectors, you should disconnect aerial cables, landline telephone cables and electrical devices when a thunderstorm approaches.

4. Switchboard surge protectors also protect rooftop solar panels and other components of solar power systems.

Lightning strikes a building

5. Direct lightning strikes on buildings are very uncommon. However, a lightning protection system can be created for tall buildings and buildings that are on top of a hill.

6. A lightning protection system includes insulated interception rods installed on the roof and connected to other metal structures, such as TV aerials and tin roofs. These are then connected by down conductors to a copper grounding electrode that circles the building. The current delivered by a direct lightning strike is very high, so the structures must be strong and large-diameter conductors must be used.

Lightning strikes a tree near a building

7. A tree that is taller than the building and is located approximately 10 metres from the building acts as a lightning rod and protects the building from lightning.

Cities and apartment buildings

8 In practice, surge protection is not necessary in cities because electricity is distributed through underground cables.

In figures

- There are about 140,000 cloud-to-ground lightning strikes on land each year in Finland.
- The temperature of lightning can be as high as 30,000 °C.
- 97% of the electricity network in Helsinki is underground. That makes it weatherproof.
- The reliability of the electricity network in Helsinki is 99.9997%.

Into the storm

Joni Rinta-Möykky, Chairman of the storm chasers' association Myrskybongarit, knows that capturing your first tornado is a great experience.

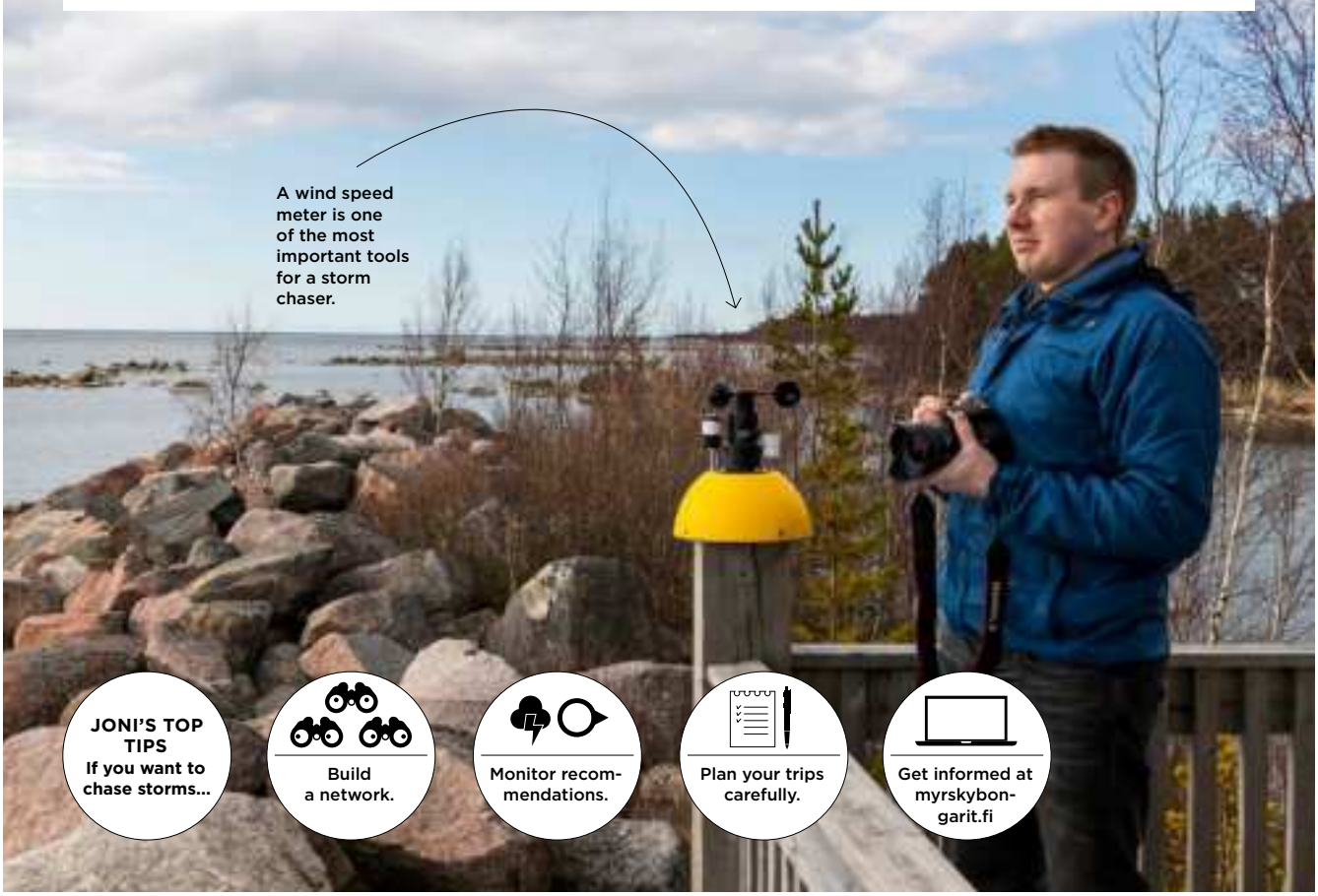
Storm chasing is a hobby that started in the U.S. It involves chasing extreme weather to capture photos and videos and collect scientific data. It's a hobby that brings you close to nature and gives you a chance to experience the excitement of natural phenomena. Capturing your first tornado or waterspout is an incredible experience.

I've always been fascinated by storms. First, I read books on the subject. Later, I became interested in weather forecasting methods and interpreting radar images. My approach is scientific, but you can also observe storms from the comfort of the patio of your summer cottage.

To be a storm chaser, you need to have common sense and humility. Lightning and the high winds of an autumn storm can be hazardous to your health. Gusts of wind exceeding 30 m/s, lightning strikes and flash floods are not something you should play around with. Sometimes you watch the news and see people take the wrong approach, like recklessly capturing images of lightning at a distance that isn't safe. Taking unnecessary risks can ruin the reputation of all storm chasers.

The key equipment for a storm chaser includes a computer for monitoring weather forecasts and a camera for capturing the events as they unfold. A windspeed meter measures wind gusts. A slide calliper can be used to measure large hailstones and a lightning radar triangulates the location of lightning.

Storm chasers can help by reporting scientific observations, such as storm damage and the size of hailstones, to the Finnish Meteorological Institute, and notifying the authorities of downed power lines and fallen trees.



TEXT: ANI KELLOMÄKI. PHOTO: HANNU AROMAA

9 TRICKY QUESTIONS

How much do you know about lightning?

Find out how familiar you are with this electric light phenomenon rumbling in the sky.

1

How high is the charge between a thundercloud and the ground?
A. 100 V
B. 100,000 V
C. 100,000,000 V

2

Which month has the most lightning strikes in Finland?
A. May
B. June
C. July

3

What region of Finland has the most lightning?
A. Åland Islands
B. Turku archipelago
C. Ostrobothnia

4

What is kalevantuli?
A. Lightning that is so far that you don't hear the thunder
B. A fire ignited by a lightning strike
C. The name used for lightning in the Finnish national epic, The Kalevala

5

Is a car a safe place in a thunderstorm?
A. No
B. Yes, the rubber tyres protect you from lightning
C. Yes, the metal chassis protects you from lightning

6

What causes the rumble of thunder?
A. Lightning heating up the air explosively
B. Lightning striking the Earth's magnetic field, which has a different polarity
C. Lightning heating up raindrops beyond their boiling point

7

When did Vicky Rosti compete in the Eurovision Song Contest with the song Sata salamaa (a hundred bolts of lightning), which was later covered by Antti Tuisku in the TV show Vain elämää?
A. 1977
B. 1987
C. 1997

8

What altitude can thunderclouds reach above Finland?
A. 8 km
B. 12 km
C. 16 km

9

Can a thunderstorm make your hair stand on end?
A. No
B. Yes, if it's right above you
C. Yes, if you're afraid of thunder

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

PHOTO: VASTAVALO AND GETTY IMAGES

The calm before the storm in the northern part of Lake Victoria in Uganda.

THE BIG PICTURE

A place of thunder

Lake Victoria is Africa's largest lake. It is situated in East Africa, covering parts of Uganda, Tanzania and Kenya.

The world's most thunderous place is the northern part of Lake Victoria in Uganda. In the Ugandan capital Kampala, you hear the rumbling of thunder 242 days per year on average. Most of the time, the storms come down over the lake and do not reach the city.

Thunderstorms are formed when cold winds move from land towards the lake at night. This drives the moist warm air upwards, where it collides with colder air. This leads to the formation of thunder-clouds and the storms they deliver.

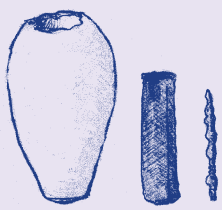
In recent times, weather forecasts have made better of use of satellite data to issue earlier storm warnings. This has increased the safety of the approximately 200,000 fishermen of Lake Victoria.

PHOTO: GETTY IMAGES

TIMELINE

Batteries through the years

Did you know that Gaston Plante invented the car battery more than 160 years ago?

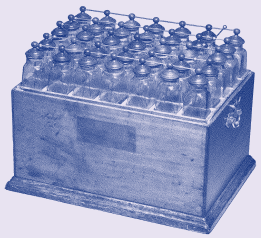


250 BCE

In 1938, the archaeologist Wilhelm König discovered strange clay pots at an excavation in Baghdad, Iraq. They contained iron rods encased in copper. Tests revealed that the pots had been filled with an acidic agent, which made König believe that they were ancient batteries. However, their real purpose is not known for certain.

1749

The term "battery" was first used by the American scientist and inventor Benjamin Franklin when he performed electricity experiments with a series of capacitors.

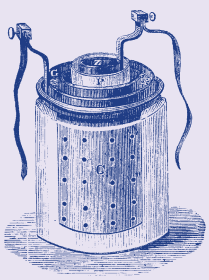


1800

Italian physicist Alessandro Volta invents the electrical battery. He stacks alternating layers of zinc and copper separated by cloth soaked in salt water. A lasting current runs through a wire connected to the top and bottom of the voltaic pile.

1836

The English chemist John Frederic Daniell develops the Daniell cell, which used copper and zinc sulphate as electrolytes. The cell was used as a power source for doorbells and telephones, for example.



1859

The French inventor Gaston Plante develops a rechargeable lead battery. It is still widely used in the ignition of cars with internal combustion engines.

1866

The French scientist Georges Leclanché invents the Leclanché cell, a carbon-zinc battery. The cell is used as the primary energy source of batteries until the 1950s.

1899

The Swedish engineer develops the first rechargeable nickel-cadmium battery, which is the foundation for today's electric storage batteries.

1970

The British chemist M. Stanley Whittingham proposes the use of lithium in batteries. For this, he won the 2019 Nobel Prize in Chemistry with two other scientists.

2016

A battery-based electricity storage system is deployed in Suvilahti, Helsinki, to balance out periods of high consumption and increase demand response.

2019

Helen's virtual battery stores solar power when your solar panels generate more electricity than your home consumes. The stored electricity is returned to you free of charge when your electricity consumption exceeds the output of your panels.

See you at the Olympic Stadium

The renovated Olympic Stadium is almost finished and will be open 360 days per year as soon as the circumstances allow it.

Text: Jussi Eskola | Photo: Skanska

"THE OLYMPIC STADIUM EXISTS FOR memorable experiences," says Marju Paju, Director of Marketing and Communication at Helsinki Olympic Stadium.

"We expect more than a million visitors annually at the stadium. More than half of them will be visitors who aren't there to attend major events. They will be people doing their daily exercise, tourists and users of the stadium's offices and conference facilities. This is a multi-purpose stadium."

In addition to the field and the stands, there are lots of places around the stadium for you to experience.

1. North Plaza

"The stadium has an impressive new North Plaza. With 5,380 square metres of space, it is our largest service area and it can also be used as a separate venue for events. One of the two main entrances is at the North Plaza," Paju explains.

2. Tower

"On the third floor of the Stadium Tower, we have a unique meeting space: the Old Commentator's Box. The top of the tower, at a height of 72 metres, offers one of the best views of Helsinki. I also recommend visiting the tower in the evening to take in the lights of the city."

3. Walk of Fame

"This underground passage is how the superstars of sports and entertainment enter the stadium. We want them to leave some kind of mark of their visit. People can visit the Walk of Fame on our guided tours."

4. Visitor centre and Bistro Stadion

"The visitor centre at the entrance to the Tower serves visitors and local residents every day. The lounge at the visitor centre is open to the public – no VIP card needed. The visitor centre is also home to the Olympic Stadium's new-look restaurant. You can come for a meal after a work-out or when visiting the stadium. The restaurant will also be used for weekend brunches and private events."

"We are undoubtedly the best stadium in the Nordic region when it comes to environmental responsibility."

Ilkka Rautakivi
Estate and Security Manager,
The Stadium Foundation

5. Conference facilities

"The renovated Olympic Stadium will have 20,000 gross square metres of new space. This includes an underground auditorium with 150 seats. The new conference facilities provide a unique setting for memorable events. The stadium also has office space for use by various organisations and companies."

6. Sports and wellness services

"The sports facilities at the Olympic Stadium are available for rent by sport clubs and the users of occupational well-being services. It's important for us to offer the stadium to the general public as a venue for sports and exercise. We will also open our doors to the public for exercise events that are entirely free of charge."

The environment comes first

"We are undoubtedly the best stadium in the Nordic region when it comes to environmental responsibility. Helen has been a very active partner for us in the development of the Olympic Stadium's energy solutions," says Ilkka Rautakivi, Estate and Security Manager at the Olympic Stadium.

The renovated stadium is equipped with LED floodlights. The field will be lit almost twice as bright as before, but the operating costs will be reduced by one-third. There will be charging stations for electric vehicles in the car park. Opportunities for using solar energy are currently being explored. The circular economy principle is taken into consideration in waste management. The seats inside the stadium are made from a composite material that contains wood and plastic.

The pitch was previously heated by electricity, but this has now been replaced by a more energy-efficient option: district heating from Helen. The indoor areas are also heated by district heating and cooled with district cooling in the summer.

"We use seawater and district heat return water for cooling. This saves a tremendous amount of fossil fuels," Rautakivi adds.

On the third floor of the Stadium Tower, there is a unique meeting space: the Old Commentator's Box.

SUDOKU

Sudokus solution: helen.fi/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 July 2020 online 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 window vac.

Kärcher WV2
A window vac and microfibre wiper connected to a spray bottle for cleaning liquid. For easy and streak-free window cleaning. Battery running time 25 minutes. Cleaning performance 75 m² per charge.

7 SOURCES OF ENERGY

Anna Perho

1

New PT

I can't wait to get back to working out under the supervision of my new trainer. Workouts are so much better when someone is watching over you.

2

Festivals

I love festivals. Normally I get excited about the summer's festivals even before winter is over: Ilosaarirock, Provinssi-rock, Karmarock...

3

Books

This may be the age of visual expression, but I find text to be the most energising form of media. One of my current favourites is Lost Connections by Johann Hari.

4

Light

The light of spring energises me. Spring and rebirth is a bit of a cliché, but it's true in my case.

5

Gin and tonic

Like black clothes and cash, it always works.

6

Pääskysaari

I'm working with my friend Jenni Pääskysaari on the new season of our podcast on Radioplay. Spending an hour with Jenni is like downing 400 ginger shots!

7

Work

I get a lot of energy from my job as a coach. It combines my passions and having an influence on things. I love it!

Facts

Anna Perho lives in Helsinki with her family and is the humble servant of her dog Jimi.

She is a coach and lecturer, columnist and podcast host.

She is writing a book on personal change.

She produced a set of videos with Helen on the theme "new solutions on the agenda of a modern housing company".

PHOTOS: JOHANNA MYLLYMÄKI, RIIKKA VAAHTERA, RADIOPLAY AND GETTY IMAGES

The Pasila TV tower is one of many places in Finland that has been hit by lightning more than once.

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- energiatori@helen.fi

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