VAILLANT GROUP

ANNUAL *MAGAZINE*
2015

Vaillant | Saunier Duval | awb | Bulex | DemirDöküm | Glow-worm | Hermann Saunier Duval | protherm

We aim to be the leading provider of environmentally friendly, energy-saving heating, cooling and hot water solutions that are simple to operate.
Our goal is sustainable and profitable growth for our family-owned company.

VISION OF THE VAILLANT GROUP

Dr Carsten Voigtländer
Chief Executive Officer

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EDITORIAL

Ladies and Gentlemen,

Reviewing the past year 2015, we can look back on good business development and important launches of new products. There were numerous achievements to be celebrated and quite a few interesting stories taking place in our family company that are worthwhile telling.

A special event for us was winning the Sustainability Award as Germany's most sustainable large company in November 2015. The award once again recognised the consistent implementation of our sustainability strategy, which has been deeply rooted in our company for many years. The transfer of our sustainability philosophy into our new Green iQ premium product line, combining highly efficient heating technology with intelligent and intuitive control concepts, was among the deciding factors for the jury.

Sustainability, however, has turned into a buzzword of our times. That is why we wanted to know the extent to which people lead "green" lives and whether country-specific differences exist. In order to find this out, the Vaillant Group conducted an elaborate international study in 13 countries. You can read more about its findings from page 10 onwards.

Earlier in spring 2015, the colleagues from Saunier Duval in France received great public attention with a campaign in the Paris metropolitan area. Appliance replacement in record time: that was the promise – with the intention to acquire further market shares in the French capital. The project provides ample opportunity to take a closer look at the French market and its special characteristics.

Moreover, we shift our focus to the north, toward the Vaillant Group's activities in Norway – a market in which the company has been active for only a couple of years. Its most striking feature? Heat pumps account for about 90 per cent of the business. Norway is an ecological pioneer when it comes to incorporating renewable energies into building supply. The Vaillant Group benefits from this, as proven by several reference projects.

A topic that we are dealing with on a daily basis is digital transformation. Without doubt, we are currently experiencing a time of change, both in terms of industrial processes as well as with regard to product and service requirements. We asked for the opinions of experts on the subject.

I hope you enjoy reading our Annual Magazine 2015!

Yours,

01 SMILES ALL ROUND

Warmth Week in London

In the UK, the Vaillant Group picked 18 January 2015 to launch Warmth Week, on the day that is typically known as Blue Monday across the country. At the beginning of the most depressing week of the year, Vaillant put up the Smile Station in London's Victoria train station. The smile-activated vending machine dispensed free coffee and hot chocolate. Well over a thousand hot beverages were given away to cold commuters and passers-by. A team of helpers also handed out warmth kits to visitors and encouraged them to share their experiences through social media channels using the hashtag #KeepSmiling. Due to its huge success, Warmth Week was repeated in 2016. A whole week dedicated to sharing the joy of warm homes and good cheer, this time at train stations in Birmingham, Manchester and Glasgow.

J A N U A R Y – M A R C H 2 0 1 5

03 ISH TRADE SHOW

Going green the smart way

Green and intelligent – that is how Vaillant presented new products and services at the international industry trade show ISH 2015 in Frankfurt am Main. Besides the new condensing boiler and heat pump ranges, connective solutions for controlling the appliances via smartphone, technologies of the future such as the fuel cell and new services for installers were the centre of attention for visitors to the Vaillant stand this year.

02 PROJECT LUTETIA

Saunier Duval launches big campaign in Paris

In early 2015, Saunier Duval started a major sales initiative in Paris. The promise: customers would receive a new heating system in record time the very same day. Installers received the replacement units via bicycle express delivery within two hours at the latest. A major advertising campaign could be seen in around 250 metro stations all over the city. The bicycle express delivery service even caught the attention of the media. The aim was to increase boiler sales in the French capital. While Saunier Duval leads the French market in the segment of wall-hung boilers, this is not yet the case in Paris.

03 "MADE IN GERMANY"

New production line for the Chinese market

China is one of the Vaillant Group's most important growth markets. Our Chinese customers value the high-quality of German manufacturing and products greatly. Because of this, a new production line for a new generation of heating appliances went into operation during 2015. The units are manufactured exclusively for the Chinese market. Around 75,000 heating appliances "made in Germany" roll off the production line each year and are exported to Asia.

04 VAILLANT EXPO

Brand experience centre inaugurated

At the place where company founder Johann Vaillant produced the first gas-fired boiler at the close of the 19th century, the brand experience centre Vaillant expo was opened in April 2015. Since then, visitors to the 1,300m² centre in Remscheid have been able to discover how the Vaillant brand originated, how it has developed over time, and why it is now one of the most well-known brands in Europe. The Vaillant expo is not a museum, quite the contrary: employees personally present the brand, engaging visitors in a dialogue as they discover new, sustainable technologies designed for tomorrow's world. At numerous points, visitors have the opportunity to get actively involved. The brand experience centre was inaugurated with an official opening ceremony attended by more than 100 guests from 10 countries, including representatives from the media, politicians and business partners.

A P R I L – A U G U S T 2 0 1 5

05 VAILLANT DONATES WARMTH

New heating systems for SOS Children's Villages in Germany

Vaillant warms Worpswede. This was the motto under which the new heating system in the SOS Children's Villages in Worpswede went into operation. For the first time in the longstanding international partnership between Vaillant and SOS Children's Villages worldwide, the cooperation has been expanded to include projects in Germany. In addition to the village in Worpswede, Vaillant also equipped children's villages in the Black Forest and in Bockum with new heating technology during the year. Worldwide, Vaillant has already supplied modern heating systems to villages in France, Belgium, Croatia, Poland, Romania, Russia, Hungary, Ukraine and China. The partnership dates back to the year 2011. It originated in the Hungarian Children's Village in Battonya.

06 ELECTRONICS CENTRE UPGRADED

€10 million investment at Remscheid plant

The Vaillant Group has invested approximately €10 million in the upgrade of the Electronics Centre at the Remscheid plant. Thanks to this investment, electronics assembly will be even more productive in the future. Almost the entire stock of machinery will be modernised. The department staff of 150 employees manufactures around 1.6 million pieces of electronic equipment each year, out of a total of 620 million components. This corresponds to around 90 per cent of the company-wide demand. Almost all electronics are manufactured in-house – from the development of the software and hardware through to the assembly. The Vaillant Group's managing directors symbolically fired the starting pistol for the facility in June 2015.

08 VAILLANT TO HEAT UP KOREA

First European brand on the Korean heating technology market

With the opening of a branch office in the South Korean capital Seoul, the Vaillant Group is the first European heating technology company to sell high efficiency technologies in the Asian country. The foundation of the subsidiary is part of an international growth strategy. Sales and service activities will initially focus on the larger metropolitan region of Seoul. During a second stage, other urban centres such as Busan or Daegu will be developed. South Korea has over twelve million installed devices and an annual sales volume of more than one million units, making it the world's second-largest market for wall-hung gas-fired boilers. The first showroom in Korea opened in 2015 in the exclusive Gangnam district.

08 MARKET LAUNCH OF GREEN IQ PRODUCT SERIES

A new standard in sustainable heating technology

Vaillant presents the new Green iQ product series. The extremely environmentally friendly and efficient products meet the highest sustainability credentials throughout their entire product life cycle – from the initial stage of development to being recycled after use. Green iQ also represents efficient manufacturing and the very best quality materials. Only products that fulfil a defined catalogue of criteria carry the Green iQ label. All quality standards are continuously improved and strictly monitored. The product series sets new standards in sustainable, intelligent and future-proof heating technology. The first Green iQ products are the ecoTEC exclusive condensing boiler and the flexoTHERM exclusive heat pump. More products are currently in development.

09 BEST FACTORY AWARD

BFA 2015

Multiple honours for Belper

The Vaillant Group plant in Belper was honoured several times at the Best Factory Awards (BFA). The plant outranked hundreds of other production facilities of large industrial companies in two categories. Belper's win of the "Energy & Environment Award" means that it has now been the most sustainable plant in Britain for three years in a row. Belper also came out on top in the category "Most Improved Plant" for implementing continuous advancements in the plant and production processes throughout the past five years. In the category "Best Engineering Plant," the English production site received a special commendation.

09 VAILLANT IS "ERP READY"

Ecodesign directive successfully implemented

It is done: The Vaillant Group is "ErP ready." On time for the European ecodesign directive coming into effect on 26 September 2015, all of the Vaillant Group's products verifiably fulfil all efficiency standards and carry the new energy efficiency label. It was necessary to re-compile the required efficiency data for the 1,600+ products in the Vaillant Group's portfolio according to the Brussels specifications and label them correctly. Both the efficiency requirements and the product labels are a prerequisite for selling the products on the European market.

11 BEST CORPORATE WEBSITE 2015

Vaillant Group receives Econ Award

The Vaillant Group's new corporate website won the prestigious Econ Award issued by Econ publishing company and Handelsblatt Group. Fascinating stories paired with information and facts as well as the seamless interplay of content and navigation distinguish the portal www.vaillant-group.com as the best corporate website 2015. The Vaillant Group's new multimedia business card is a stylistic mix of interviews and reports in the form of videos and texts. All content is narrated using exciting and authentic stories. The award means that the website is included in the annually published Corporate Communications Yearbook.

A U G U S T – D E C E M B E R 2 0 1 5

11 GERMANY'S MOST SUSTAINABLE LARGE COMPANY

Vaillant wins the German Sustainability Award

Vaillant received the German Sustainability Award 2015 as Germany's most sustainable large company. The judging panel praised the consistent implementation of the exemplary S.E.E.D.S. sustainability strategy. The reason: as a provider of key technologies for the energy transition, Vaillant meets its environmental and social responsibility in an exemplary manner. Vaillant also received the sought-after award for the most sustainable product in 2011. The German Sustainability Award rewards companies that set an example in the way they combine economic success with social responsibility and environmental protection, thereby particularly promoting the concept of a sustainable society.


MY
GREEN
?

How sustainable is Europe

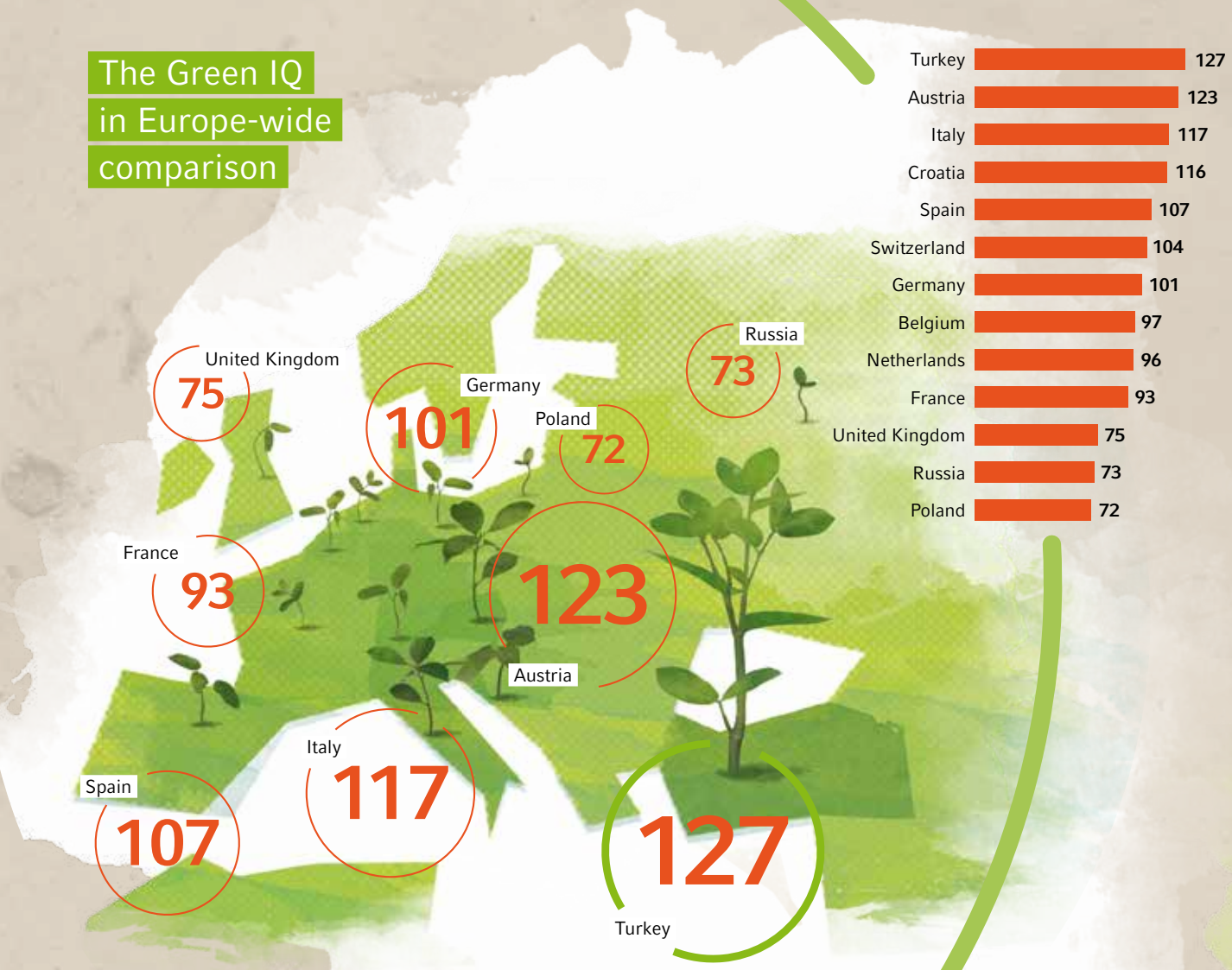
In the second half of 2015, the Vaillant Group carried out the first pan-European study on green intelligence. More than 13,500 respondents in 13 European countries answered questions on the sustainability of their personal lifestyle. In the end, some stereotypes were confirmed, and there were also many unexpected new findings.

More than 100 years ago, the psychologist William Stern developed the first model for measuring intelligence – with an intelligence quotient. Since 1990, emotional IQ has indicated how well a person can perceive and understand their own feelings and those of others. But can you also measure how environmentally intelligent people behave? How aware they are of the consequences of their actions? And to what extent they are prepared to act, accordingly, in a sustainable manner? Is there such a thing as a Green IQ?

"We found this question very interesting," explains Nicole Gharadjedaghi, who works in sustainability management for the Vaillant Group and headed the study project. "We wanted to find out to what extent people live their lives in a "green" way as well as whether there are any differences between nations or within a society and, if so, what they are." To find this out, the Vaillant Group brought a renowned market research institute on board: TNS Infratest. "Together with the market research institute, we spent a long time reflecting on how to calculate this kind of Green IQ," explains the head of the Vaillant Group market research team, Thorsten Wintrich, who helped develop the study's calculation methodology. "It was particularly important for us to not only survey people's attitudes, but also factor in their actual behaviour. To this end, we tested several models." In calculating the Green IQ, actual behaviour accounts for two thirds and attitude for only one third of the weighting.

"This was then adopted as the basis for an elaborate online survey in 13 European countries," explains Nicole Gharadjedaghi. More than 1,000 people per country took part in the study and answered a total of 100 questions. What do you consider as the most important political and social challenges at this time? Do you use green energy or energy from renewable sources? Have you ever replaced a functioning mobile phone with a new one? How often do you fly for private purposes? Do you prefer buying loose or packaged fruit? The pollsters used these and many other questions to determine the Green IQ of people from Spain to Turkey. With surprising results.

The Green IQ in Europe-wide comparison



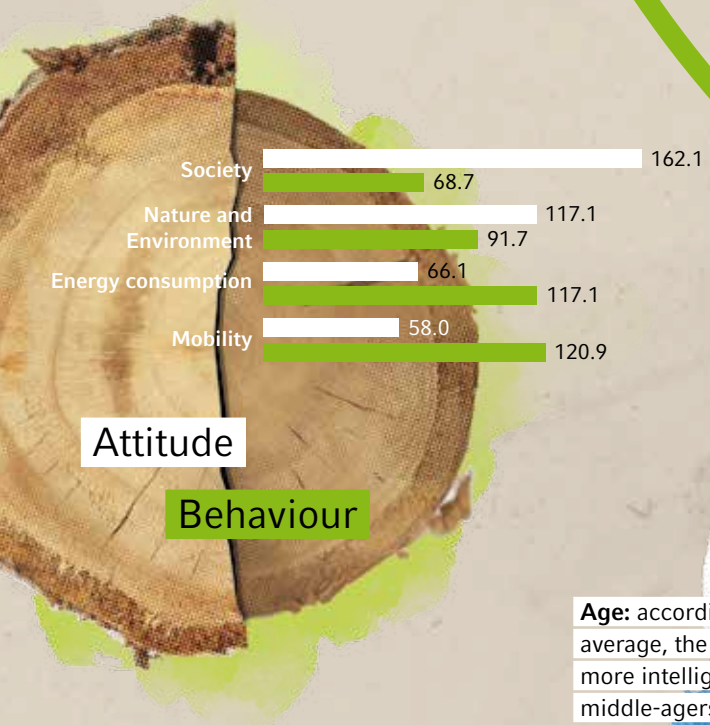
In calculating the Green IQ, the study focused on a range of topics which were designated as being particularly relevant for the survey. These subject areas included society and nature, energy consumption and mobility. Two more topics – purchasing behaviour and environmental behaviour – were added to the range of subjects. In the first four areas, respondents answered questions about their individual attitudes and about their actual behaviour. But regarding the last two topics, only the respondents' behaviour was taken into account.

In a country comparison, the study found Turkey to have the highest Green IQ. Here the green intelligence was way above average in all subject areas. Also, the Turkish respondents displayed a modest demeanor. Their actual behaviour was across the board more sustainable than their attitude. Most important for them: sustainable behaviour with a view toward society and nature.

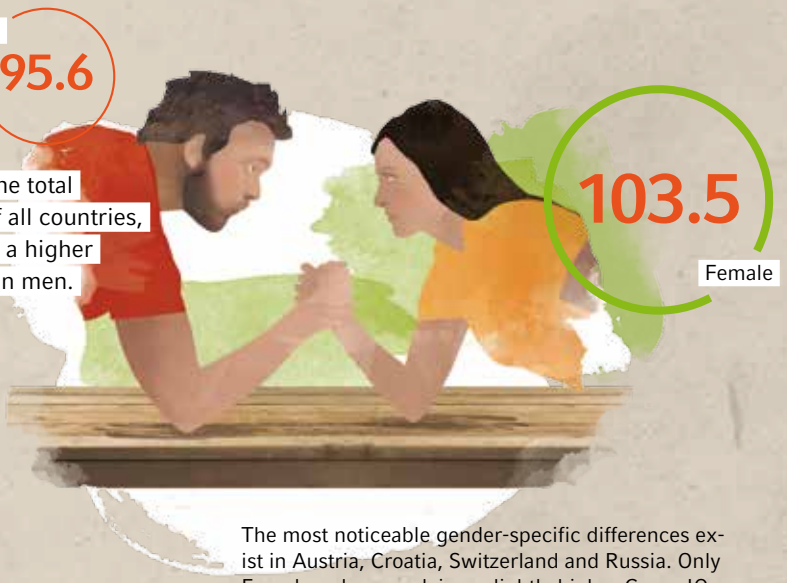
The Austrians and the Italians also displayed a high Green IQ. While green intelligence in Austria appeared to be equally distributed across all investigated areas, the Italian respondents – much like the Turkish interviewees – expressed a particularly high degree of sensitivity in matters relating to society and nature. When behaviour is reviewed across all 13 European countries, the study participants show the best Green IQ results in terms of energy consumption and mobility. You can read more about each subject area and about the distinctive characteristics of different nationalities on the following pages.

Behaviour and attitude: not all who think green are acting accordingly.

And vice versa: not everybody who acts green is fully conscious of this fact. In some of the countries, green attitudes and behaviour go hand in hand. But this isn't true for all countries, nor is it true in every aspect. In terms of their mobility and energy consumption, the respondents behave more sustainable. But this is not the case in the sectors society, nature and the environment.



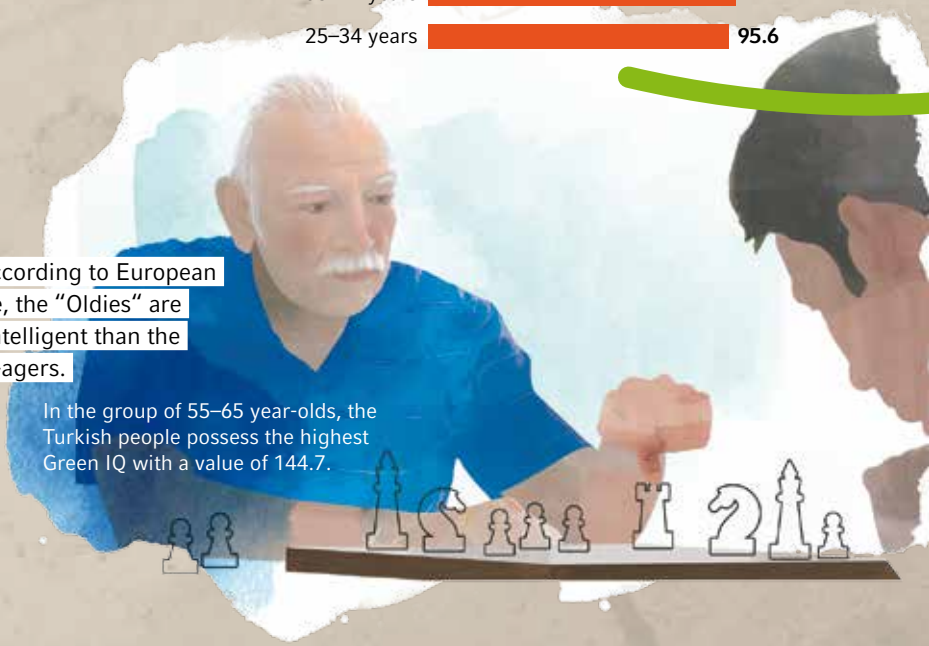
Gender: in the total evaluation of all countries, women have a higher Green IQ than men.



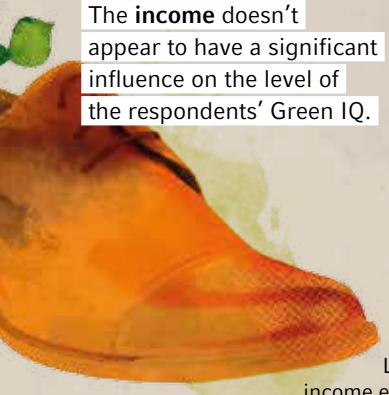
The most noticeable gender-specific differences exist in Austria, Croatia, Switzerland and Russia. Only French males can claim a slightly higher Green IQ than French women. The women with the highest Green IQ (132.8) live in Austria.

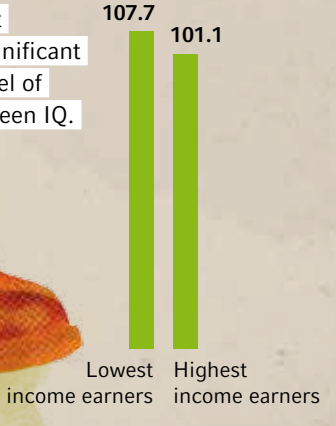
Age: according to European average, the "Oldies" are more intelligent than the middle-agers.

In the group of 55–65 year-olds, the Turkish people possess the highest Green IQ with a value of 144.7.



The **income** doesn't appear to have a significant influence on the level of the respondents' Green IQ.





But the study participants in the lowest income class and the ones with the highest income had the best Green IQ results respectively.

And how in shape is your personal Green IQ? Do you act as green as you really could? Take the test yourself and find out which category you belong to! Perhaps you are one of the exemplary 'Green Superheroes', or maybe a 'Green Trainee'? Or are you in fact a 'Sceptic', or even a 'Bad Guy'?

HOW GREEN ARE YOU?
Take the test yourself at
www.mygreenIQ.com

67 %

of respondents believe they could make a greater contribution to environmental protection and resource conservation.

SOCIETY AND ENVIRONMENTAL BEHAVIOUR

The value of nature

Behaviour is in accordance with awareness. Not always, it seems. In a number of countries, the survey showed significant differences between personal attitudes towards environmentally conscious behaviour and what was actually practised. This is hardly surprising. We have all had good resolutions that we were somehow unable to follow through in the end. Even so, Europeans are at least honest with themselves. Almost seven out of ten respondents admit they could make an even greater contribution to environmental protection and resource conservation in their daily lives. At the same time, 80 per cent agree that countering climate change is the responsibility of each individual.

If people's actual behaviour alone counted, the country ranking would look different. Poland would move up in the list.

"Although sustainability is a very high priority in Italy, we consider not only the ecological but also social aspects."

Italy and Croatia would take second and third place, and Austria fourth place. If you look at the results in more detail, then the gap between everyday behaviour, on the one hand, and attitude, on the other, is the largest in the Alpine republic. Looking at the Swiss, environmental awareness would also lead one to expect a considerably higher Green IQ score than what they put into practise in everyday life. This is interesting since no other country apparently takes climate and environmental protection as seriously as Switzerland. For Tobias Loher, head of sales support at the Vaillant Group in Switzerland, this at least is not surprising. "The Swiss are proud of their natural environment. They would like to preserve it. At the same time, we can also afford to give environmental and nature conservation such a high priority, as Switzerland is a wealthy country with low unemployment."

Italians, in contrast, show a near-perfect match between attitude and behaviour. As do the French and the Dutch. "As to

49 %

of Turks see their most important task as protecting the environment for the next generation.

86%

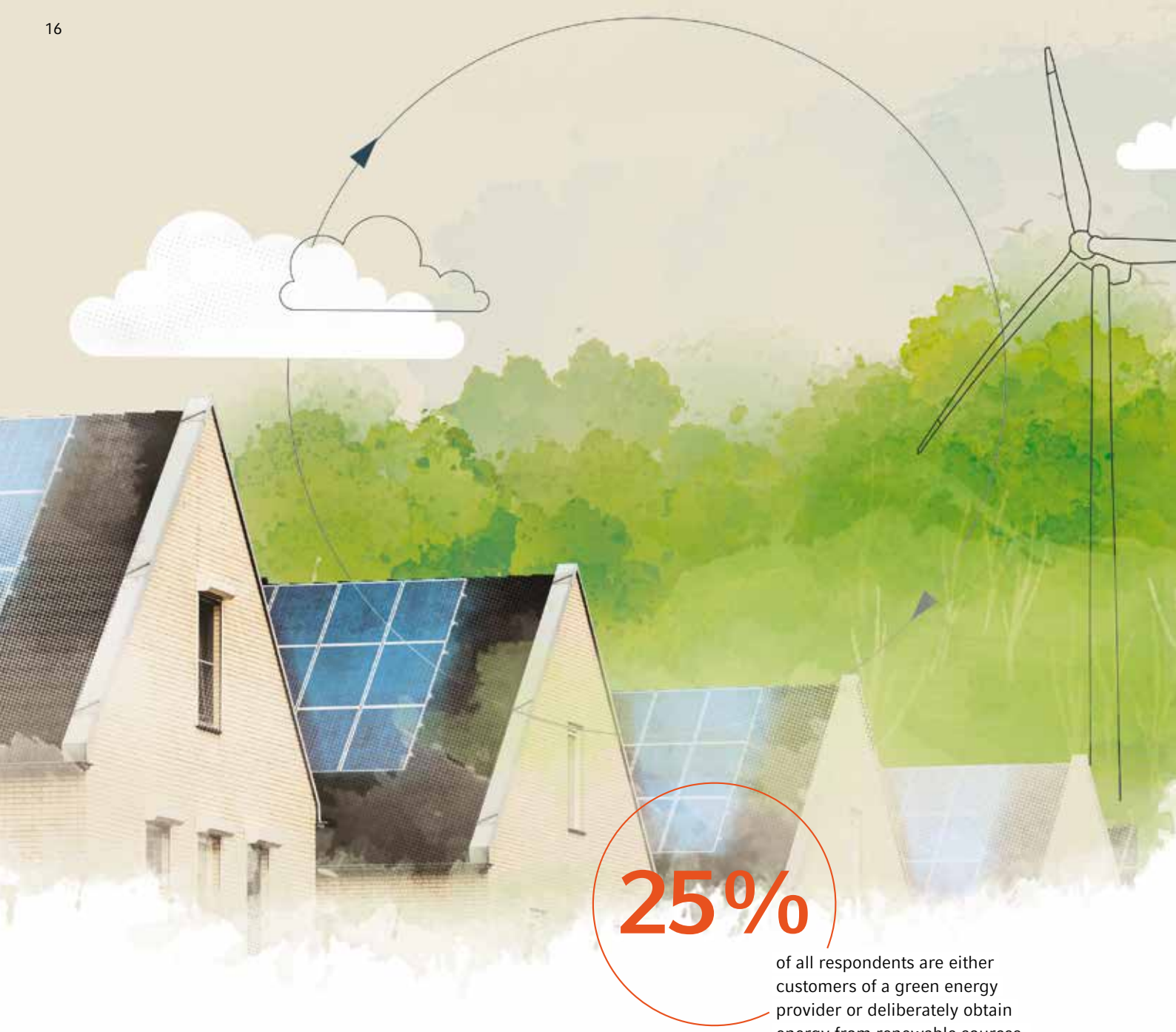
of Belgians separate their waste, while only 15 per cent of Russians do so.

my countrymen and women, you have to look very closely," says Marco Basla, who works as a communication manager for the Italian sales company. His impression is that awareness of environmental issues has risen over the years. Sustainability is a very high priority in Italy. "It is a much discussed topic in Italian society, although we consider not only the ecological but also the social aspects." Equal pay for men and women. Responsible corporate behaviour. 44 per cent of Italians say that sustainable behaviour is even crucial for a company's future economic success. "By this, I think, they also want to say that companies still have a lot of improvements to make."

No nation evangelises as much as Italy. 35 per cent of Italian study participants say they often try to convince friends and relatives to act in a more environmentally friendly manner. Only every fifth Italian respondent finds that constantly calling on people to be environmentally friendly is overkill. "Many people would surely pay more attention to their actions if they could afford it. The economic crisis in Italy has not yet been completely overcome," says Marco Basla. And not all Italians agree on who is actually principally responsible for environmental protection. Each individual say about one in four respondents. Every third person feels companies and industry should play the leading role, such as when it comes to using renewable energies.

"Environmental awareness is growing, especially in the big cities."

Başar Poroy, brand manager at Vaillant in Turkey, is truly surprised. It turns out to be his compatriots who show the highest Green IQ out of all the countries studied. "But we are proud of it, of course! Environmental awareness is growing, especially in the big cities." It thus makes sense that no other nation emphasises the importance of the natural world as much as the Turks, and that they see it as their generation's responsibility to preserve it. ›››



25%

of all respondents are either customers of a green energy provider or deliberately obtain energy from renewable sources.

ENERGY CONSUMPTION

An expensive commodity

Energy: where does it come from and how do we use it? One thing is clear for Austrians. They do not want energy from nuclear power plants: almost 70 per cent of respondents are opposed to nuclear power. "Hydropower dominates in Austria," explains Dominik Dorn, marketing expert for the Vaillant Group in Austria. "It accounts for two-thirds and thus the lion's share, followed by thermal power plants, which are usually powered by gas. We also have renewable energy sources such as geothermal, wind and photovoltaics." Austria only has to import about a fifth of its energy needs to meet the demand.

The Italians and Spanish can currently only dream of such a favourable balance sheet. Both countries depend on energy imported from abroad. "Natural gas from North Africa, nuclear power from France, oil from the Middle East," says Iñigo Aldecoa-Otalora, product director at the Vaillant Group in Spain. 30 per cent of both Spaniards and Italians monitor their energy consumption very closely; almost every third Spaniard even sees the energy requirements of a house or an apartment as a decisive factor when choosing their domicile. Aldecoa-Otalora finds this to be logical and explains: "Energy prices in Spain are quite high." Electricity prices in particular have increased sharply – more than 50 per cent in the past six years – while per capita income and purchasing power have remained unchanged.

"Hydropower dominates in Austria. It accounts for two-thirds and thus the lion's share."

83%

of Germans turn off the tap when brushing their teeth.

Over 60 per cent of Spaniards also say they prefer to have a shower rather than a bath, in order to save water. Aldecoa-Otalora is not entirely convinced by this, however. He believes his countrymen above all want to save time: "There is currently a trend to convert the bathtub into a shower. There are even special offers from companies to carry this out in one day."

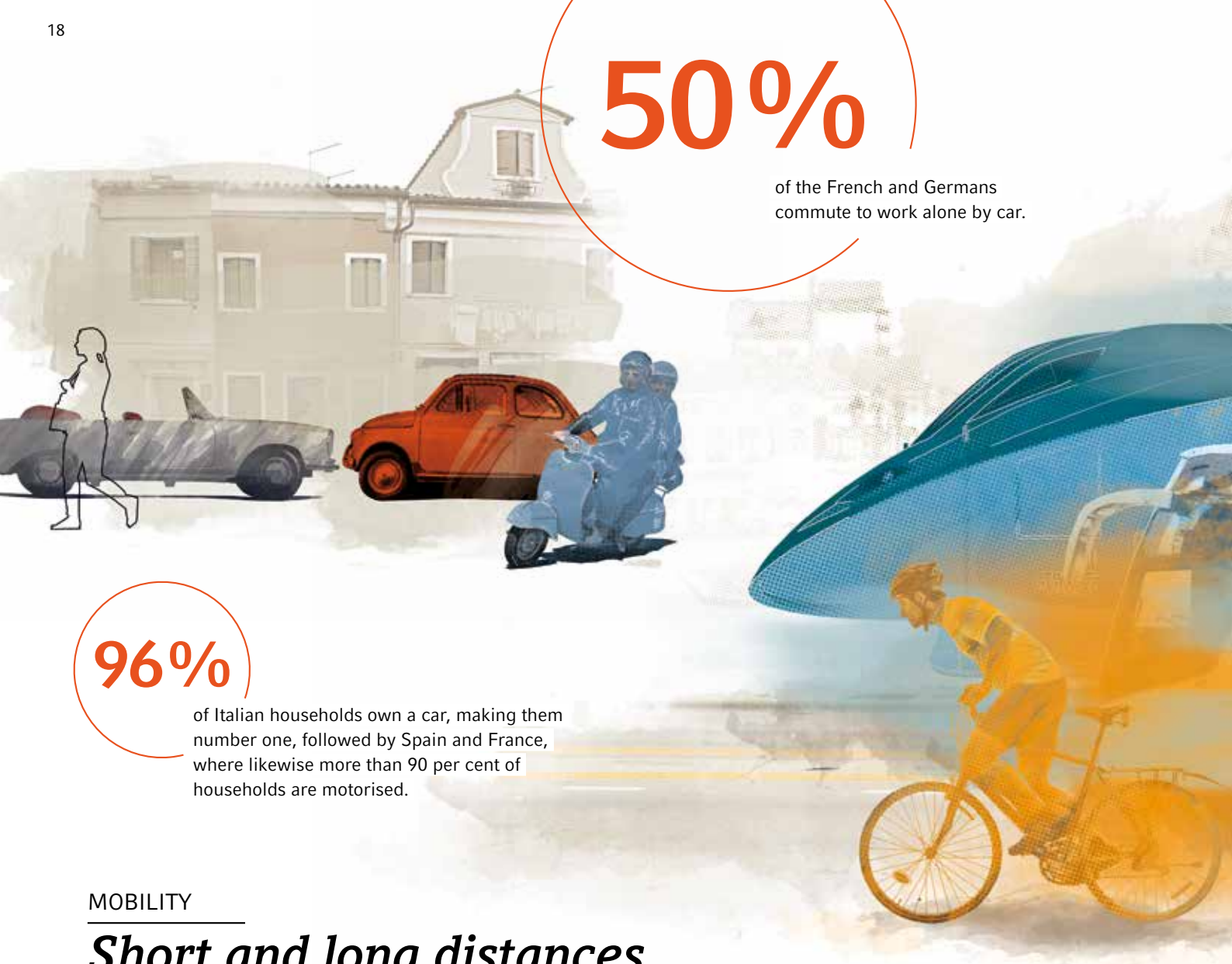
And what is the situation with renewable energies? This was another important issue for green intelligence. The answer is: not bad, but it could be better. When asked whether they are a customer of a green energy provider or deliberately use energy from renewable sources, every fourth person said "Yes." In Austria, every second person now does so. Energy consumers in Belgium, Germany and Switzerland also score well above average in this regard. If you look at the proportion of self-generated energy from renewable sources, then Switzerland leads the field. 20 per cent of the Swiss people who participated in the study produce green electricity for their household on their own.

Italians, in contrast, reveal the following special characteristic: they pay particular attention to efficient heating – although demand for it differs greatly between the Alps and Sicily. More than one in five feel well informed on the issue and 35 per cent are convinced that replacing old heating systems is the best way to save energy and minimise CO_2 emissions. Doing so also saves money. Added to this is the fact that the Italian Government supports the purchase of energy-efficient appliances through tax incentives. It would appear that only the Croatians are even better informed than Italians when it comes to heating. They already pay attention to it when hunting for a house: "Rental ads even indicate the brand of the heater," reports head of marketing Sunčana Starček. Another special characteristic, as this does not appear to be the case in any other country studied. ›››

"Electricity prices have increased sharply in Spain by more than 50 per cent in the past six years."

35%

of Italians consider replacing a heater as the most efficient way to save energy and reduce CO_2 emissions.



50%

of the French and Germans commute to work alone by car.

96%

of Italian households own a car, making them number one, followed by Spain and France, where likewise more than 90 per cent of households are motorised.

MOBILITY

Short and long distances

The Swiss, Italian and French stand out in terms of transportation. "We tend to be careful, conservative and cautious by nature," says the Swiss head of sales support, Tobias Loher, with a chuckle. One in four Swiss people uses public transport services as often as possible and most claim to have good access to local public transport. Only a small minority, about one out of ten, disagree and find access rather poor. These are peak values in the survey – and not particularly surprising for Loher. "The Swiss have a special relationship with public transport. They love to use it. It is well-developed and on time." That's what makes it so convenient. "There are not a lot of parking spaces in the cities, however, and they are expensive. That is also why car-sharing is so popular in Switzerland." The Swiss easily top the list when it comes to car-sharing. No wonder, they invented it after all: the first car-sharing cooperative was founded in Zurich back in 1948. And the Swiss also stand out when buying a car: they pay more attention to CO_2 emissions and low fuel consumption than other nations and also tend to turn off their car in traffic jams.

This looks completely different for their western neighbours. "In France, you have to take your car to work. Unless you live in Paris, Lyon or some other big city, where there is a good local public transport system. Everywhere else you lose a lot of time without a car," explains French product manager, Camille Mainguenaud. That is why half of the French use their car to commute to work – and they do so alone. Their German neighbours basically do the same. In return, the French are more reserved when it comes to flying. Only one in three flies for private purposes at least once a year. Only the Poles fly even less. "For longer distances, we use the well-developed highways or take the train. Within France, the TGV actually gets you to most destinations faster than by plane," explains Camille Mainguenaud. And private travel abroad is still unusual. Holidaying abroad? Nine out of ten French people can do without it. France has it all after all: mountains and sea, fascinating landscapes and loads of culture.

"The Swiss quite enjoy using public transport, which is well-developed and on time."

By contrast, 60 per cent of Swiss fly privately at least once a year; only the Turks fly more often. More people are clearly

aware that flying pollutes the environment. The fact that their behaviour does not match their awareness is explained by the desire for convenience. "Travelling is considered de rigueur in Switzerland. You want to go out and see the world," says Loher, though he also mentions that there is now a counter-movement that deliberately avoids air travel – for environmental reasons.

To the south of Switzerland, Italians have a very special relationship with their cars. Italy – land of cars. Less than 4 per cent of Italian households are without a car, making Italy number one in this department. Vaillant communication manager Marco Basla is not surprised. "We like to be comfortable. We use our cars for everything, even when it doesn't save us time. A bicycle would be faster for moving about within the city, as you don't have to look for a parking space. A car is more comfortable to sit in however; it is air-conditioned and you can make calls. It's a matter of comfort and convenience for us!" At the same time, fuel prices in Italy are very high, so Italians try to save fuel by driving slower than allowed or turning off the engine at red lights. ›››

"In France, you have to take your car to work. Unless you live in Paris, Lyon or some big city, where there is a good local public transport system."

50 %

82 %

of Germans shop without plastic bags.

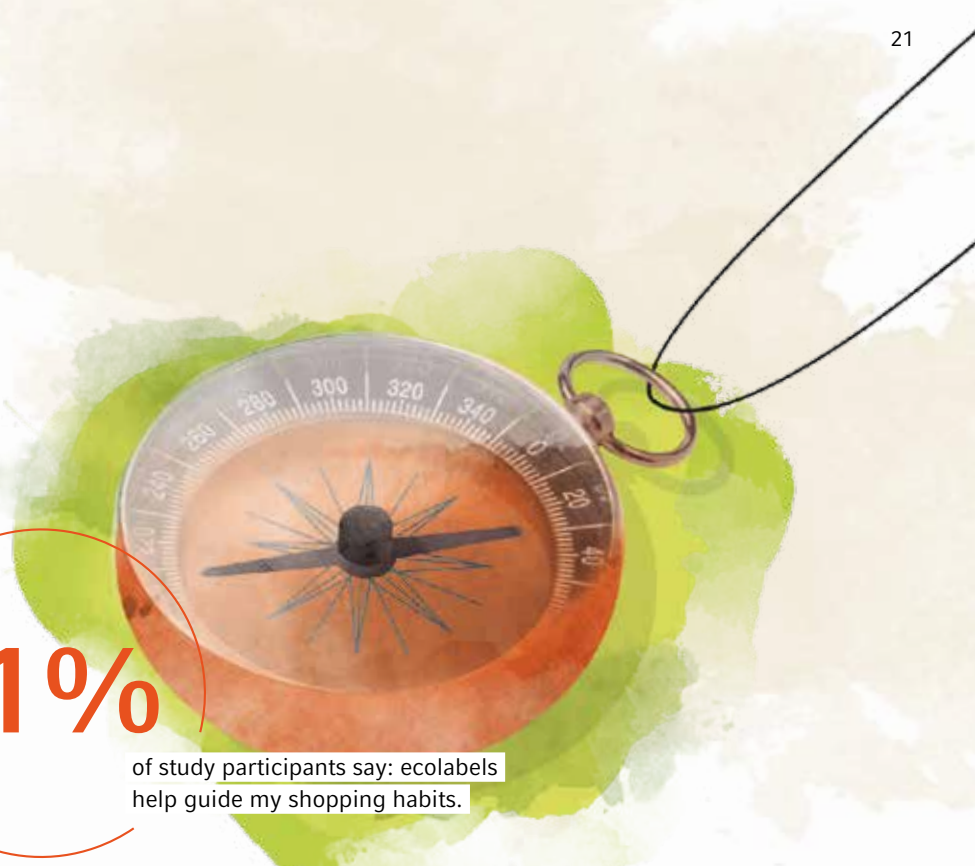
CONSUMER HABITS

We all have our own

Germans are losing their craving for meat. Some of them, at least. How come? No other nation surveyed reacts so sensitively to negative reports about factory farming and food scandals. Approximately one in five say they are eating less meat because of this. About 10 per cent choose a vegetarian diet, which is the same as the European average. Only about 20 per cent of the German interviewees declare that they wish to eat meat daily and that, moreover, an affordable price is the most important purchase criterion to them. Quite different from the Germans are the Croatian and Russian respondents. A majority of them still love their meat dearly.

Germans also seem somewhat at odds with themselves when it comes to shopping. 30 per cent of them buy exclusively organic eggs and almost the same percentage habitually use only recycled paper for toilet paper and paper towels. At the same time, they don't seem to care much whether the fruit and vegetables they consume are local and seasonal. They also don't mind buying them pre-packaged. Only a third of consumers prefers loose or unpackaged fruit. Their pre-packaged purchase should under no circumstances be placed into a disposable shopping bag, however. Only an 18 per cent minority buy a new plastic bag.

of respondents have changed their consumption behaviour in the face of environmental and food scandals.



11%

of study participants say: ecolabels help guide my shopping habits.

Almost everyone in Germany takes along a basket or cloth bag for shopping.

"Yes, we Germans really are a little contradictory," admits Natascha Swientek from the sales company Vaillant Germany. "I think shopping is a matter of attitude – and, in the end, also a question of money." Meat from organic farming happens to be considerably more expensive. Seasonal and regionally grown fruits and vegetables are not always available. "Many things, such as the shopping bags, have a long history. It's more than 30 years ago now that we first talked about avoiding the use of plastic shopping bags." The slogan "jute instead of plastic" made the rounds in 1978 as the environmental movement began to grow. It has now become normal to take along your cloth shopping bag. Whoever buys a new plastic bag (supermarkets stopped giving them away for free a long time ago) almost draws attention. "As for senseless packaging waste, we apparently still need some time to change these habits as well," says Swientek.

The French have become meticulous waste separators rather quickly in comparison. 80 per cent of respondents say they separate their waste according to recyclable materials. This puts the French in fourth place after Belgians, Austrians and Germans. This is remarkable, as the system is relatively new in France. It was only introduced on a widespread basis in the country from 2000 onwards. "The French have rapidly adopted waste separation and recycling habits," explains product manager Camille Mainguenaud.

"I think shopping is a matter of attitude – and, in the end, also a question of money."

Especially remarkable: the French also hold the leading position in terms of ensuring proper disposal of mobile phones. And they are the least inclined of all nations to replace a functioning mobile phone. "We French people use our devices until they no longer work. And that applies not only to mobile phones, but also to computers for example," emphasises Mainguenaud.

Have the individual's personal consumption habits changed in the face of global warming, environmental and food scandals in recent years? "Yes indeed!" said one out of every two respondents. As for Italians, as many as 80 per cent claim to have more sustainable consumption habits today. For Turks and Croatians, the comparable figure is around 70 per cent – the clear majority of study participants. The French, at 60 per cent, are also well-positioned in the field.

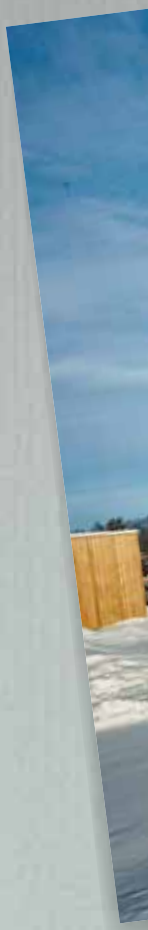
It is thus only fitting that the very same nations also attach the greatest importance to fair trade products, such as coffee, chocolate or textiles. While the European average is around 40 per cent of consumers who deliberately support fair trade, this customer group is twice as large when it comes to Turks and also well above the country average in the case of Croatians, at about 60 per cent.

For those interested in learning more details: all study results can be displayed interactively in the form of charts and tables.

http://data.mygreeniq.com/

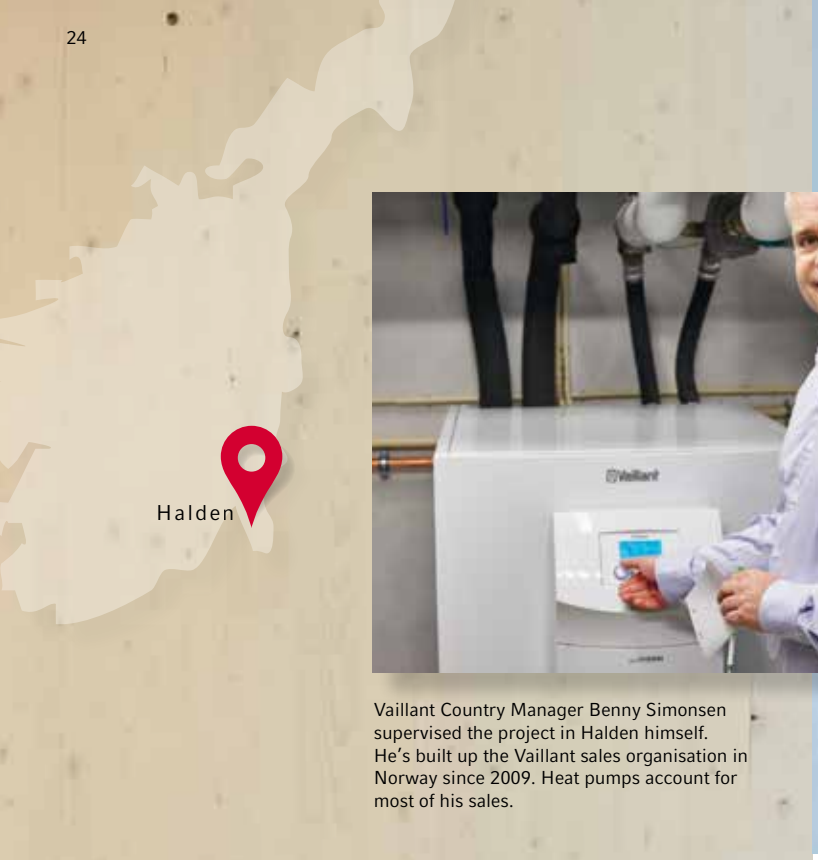
NORTHBOUND

The Norwegians are setting an example for how it's done. The country is a trailblazer – not only in terms of energy generation, but also in the conversion of households to renewable energies. The Norwegian government aims to supply almost all households with greener energy and is using subsidies to promote the transition. All oil boilers have to be changed to other energy sources by 2020. That's good news for the environment – and also for the Vaillant Group.



In order to supply the care centre in Brumunddal with heat ecologically and sustainably, a system consisting of heat pumps and solar thermal collectors is used.

The student dormitories in Halden are often shrouded in fog. Also here, Vaillant heat pumps ensure pleasant temperatures. This is done by means of a completely carbon-neutral process, as the electricity for the heat pumps comes from hydropower.



Vaillant Country Manager Benny Simonsen supervised the project in Halden himself. He's built up the Vaillant sales organisation in Norway since 2009. Heat pumps account for most of his sales.

Norway – the country of elks, salmon, vast natural landscapes, and a good social, education and healthcare system. That's probably what comes to mind first when you think of the thinly-populated state in Europe's far north, which has more fjords than inhabitants. The Norwegians enjoy an above-average high standard of living, even compared to other rich European countries. Wages and salaries are correspondingly high. Matching that, a beer may well cost the equivalent of €10. But people can afford it. For Norway is rich, especially in oil deposits, which the country possesses as well as gas fields in the North Sea. The only thing is, hardly anyone here uses gas and oil.

Unlike the vast majority of European countries, when it comes to its energy supply, Norway is largely independent. Only in the coldest winter months must electricity be bought in addition, currently from Poland. Otherwise, the country covers its needs itself and in fact completely CO_2-neutrally and environmentally sparing with water power. In all, there are more than 1,000 hydropower stations nationwide. Based on the population, that's the top figure worldwide.

"Norway offers very special prerequisites and opportunities. We're expanding our business and presence here step-by-step," says Vaillant Country Manager Benny Simonsen. It all began in 2008. In the meantime, the 42 year-old has put together a small, highly motivated team of at present ten employees, and aims to grow this further. The head office is based in Vestby, about 50 kilometres south of the capital, Oslo. About half of the team works in the field force.

Norway offers very special prerequisites and opportunities.

Simonsen knows the market and his customers like the back of his hand, for he comes from the industry. He used his good contacts in the beginning in order to target and recruit employees for Vaillant who could provide all-round customer care, from the sale of products to planning support. "My people are hand-

Halden is sleepy in the winter and gets a lot of visitors in the summer. A nationally well-known TV show is filmed here, and the town stages popular music festivals. Halden's nearness to the Swedish border is shown by its Fredriksten fortress of the 17th century. The eye-catcher in the town centre is the striking fjord.

Halden is the regional university and research centre and therefore requires student accommodation.

picked," he says. Nearly all of his colleagues are still all-rounders and have a technical background. With only a few people they have to cover a large territory, stretching 1,800 kilometres from North to South.

"A special feature of Norway is that heat pumps account for about 90 per cent of our business. Only about 30 gas boilers are sold against a total of 600 heat pumps," Simonsen adds. "This ratio is probably unique within the Vaillant Group. The focus here is quite clearly on renewable energies." Previously, Scandinavian competitors in particular carved up the market. But Vaillant's market share is now about 12 per cent in total, with an upward trend.

Geothermal heat pumps can be installed relatively simply in Norway. Due to the uniform rocky underground in the whole country, drilling is comparatively uncomplicated. The average temperature in the soil depths there is about 6 °C. Vertically inserted probes use this year-round stable temperature level as a heat source. Due to the climate targets and government directives, the demand for heat pumps in recent years has increased constantly. "However, here in Norway the systems – quite in contrast to many other countries – are preferably installed during the refurbishment of existing buildings and new larger single family houses," Simonsen explains. New buildings are now so well insulated that due to their low need for heat they often are heated solely with green electricity. In past decades, when oil was less expensive as an alternative fuel, houses were equipped mostly with oil stoves. But that's now changing due to the government directives. For small houses with an area of less than 100 square metres, the state tolerates 100 per cent of the supply coming from electricity. However, for larger objects a regenerative energy concept must be developed. So the Norwegians are having a (politically induced) rethink and increasingly are opting for complete heating systems based on renewable energies.

Green, greener, Halden

What that looks like in practice can be seen in Halden. The small town is located in Norway's far southeast, hardly a stone's throw from the border with Sweden. Somewhat hidden next to the entrance to the town, a building complex with a total of four student halls of residence has been put up. A small forest borders the rear part of the property and shields the residential units. On the transverse side of the building, there are wide windows that brightly light up the common rooms. Pale green and strong orange set colourful accents, otherwise the dormitories have been kept plain.

The dormitory complex belongs to Østfold University Colleges, whose main campus is located in Fredrikstad, about 40 minutes' drive away. Some of the faculties are based in Halden, including economic and social sciences, various foreign-language faculties and computer science. For the students, besides the lecture halls and university buildings there is also a small library, modern fitness training rooms and an indoor swimming pool. Outdoors, they have barbecue areas for summertime enjoyment. Studying in Halden is certainly very pleasant.

The demand for heat pumps has increased due to climate targets and statutory requirements.

The university has met the legal requirements for the building energy efficiency of its student dormitories with a passive house concept. An apartment-type complex which adheres to the passive house standard is – except for some pilot projects – rather rare, even in Germany where this standard originated 25 years ago. The object has a showpiece character even for Norway. The four single buildings, which currently house more than 350 students, consist to a large extent of wood. In addition, the building ensemble has been equipped with a completely sustainable energy system.

Thor-Ingar Synstad of the Vaillant sales team has a huge territory to care for. He drives up to 60,000 kilometres a year in order to meet his customers.

This contributes to the fact that the hall of residence is well-known in the community and beyond Halden. It has already won an award as the best regional new building of 2015.

Completely environmentally neutral

The energy concept for the student hall of residence was drawn up by a trade partner, the locally-based installation company F. Jørgensen, in cooperation with Vaillant. Benny Simonsen himself accompanied the project intensively, and with the technology in mind he explains: "For the supply we decided on the use of two heat pumps in cascade connection. One pump is enough for normal needs in the spring and autumn season; the second is automatically switched on as required during very low winter temperatures." Additional directly heated storage cylinders ensure the coverage of peak loads. "All the system's components are operated solely with green electricity," adds Anders Furuvarp, the responsible installer. "This makes the building supply 100 per cent sustainable." Exemplary, even by Norwegian standards.

The combination of heat pumps and renewable electricity makes the energy supply 100 per cent sustainable.

Heat distribution in the single and common rooms is done by underfloor heating. In addition, the rooms are heated by inlet air, Furuvarp explains. Also, every resident has in their room a small radiator run by electricity. For the region around Halden, although located in the South of the country, is often cool and rainy.

So it's all the more important that the students live in a healthy residential climate. The passive house standard, regulated ventilation system and uniform heat distribution helps to achieve this, as do the natural building materials used. The architectural design, based on a balanced ratio of common rooms and private quarters, also supports a comfortable learning and living environment. The university deliberately chose this integrated concept, and it is valued by the students. After all, the rents in the Halden hall of residence are no more expensive, despite all the extra comfort and the renewable energy supply.

"We're happy to have successfully realised the project," sums up Country Manager Simonsen. "We were able here to input our special system competence and our know-how of heat pump technologies in order to enable a completely environmentally neutral heat supply for more than 350 people."

Feel-good oasis for children

Change of scene. About three hours' drive to the North of Oslo, in the municipality of Ringsaker, lies the idyllic village Brumunddal. The nearest town is Hamar, but there's no urban hustle and bustle there. The region belongs to the sales territory of Thor-Ingar Synstad. "This is the location of the Mørkved Avlastningssenter, which can be translated as Relief Centre," he explains. Another reference project with Vaillant participation.

A special feature in view of the Norwegian climate: the solar collectors provide most of the heat needed in the spring, summer and autumn seasons. A total of 62.5 sqm of solar collectors are mounted on the roof areas.

→Sledging is a popular means of transport in winter. Everyone is on the move that way. With the long runners you can even sledge around curves.

The Relief Centre is well equipped with staff, providing one carer per child. The tasks for the day are assigned at the morning team meetings.

Thor-Ingar Synstad has been a member of the Norwegian Vaillant team since 2009 and talks excitedly about his work. His territory is four times the size of Denmark. So he spends considerable time in his car and drives up to 60,000 kilometres a year to care for his customers. "You have to be very flexible and familiar with all the technical particularities of the appliances," he says. "The work includes acquiring new customers, caring for existing ones, and giving technical advice right through to planning support. The demands are high." Because the country is so large, Synstad can't be everywhere at the same time. So the back-office colleagues in Vestby provide support.

The Relief Centre that Thor-Ingar Synstad is talking about is located in a housing development directly opposite a primary school. Disabled children are cared for in the centre, living there the whole week or for just a few days at a time. Many of them come from the surrounding area and go to school regularly with the other kids. It's only when the families need a break (a relief) from caring for them that Hege Terese Granstrøm and her team help out. Twelve female employees take care of the children day and night, with at least one carer per child. For the families, the care is free-of-charge. The Norwegian healthcare system enables this, meaning that everyone can make use of the Mørkved Avlastningssenter.

You have to be very flexible and familiar with all the technical particularities of the appliances.

Hege Terese Granstrøm is a trained nurse and head of the Relief Centre. She's worked there for 10 years and knows many of the local people. So when the time came to move the centre into a new building, it was important for her to focus on the people for whom it was constructed. The basic principle right from the start was to create a home for chil-

The rooms are open and spacious. Floor-to-ceiling windows let in a lot of daylight.

→ Many statutory regulations had to be taken into account in the planning. In general, attention was paid to a sustainable design and natural materials.

dren, but not an institution with the charm of a hospital. To achieve more comfort and privacy, the building was divided into individual living areas. There's also a small room for parents who want to stay overnight. The single flats are arranged in such a way that from outside they look like small, contiguous houses. Due to that and the cladding with a wood façade, the complex appears small and inviting and it fits well and attractively in the housing area.

Good things come to those who wait

Inside the building, modern living areas with a lot of colour invite the children to play and relax. The rooms are open and spacious, and floor-to-ceiling windows let a lot of daylight in. Dimmable artificial light helps against "winter blues" in the dark months. "It should be colourful and lively here and radiate a positive atmosphere," says Hege Terese Granstrøm. She's happy that the architects implemented her vision so well. During the lengthy planning not only the wishes of the staff but also many statutory regulations had to be taken account of. In general, attention was paid to a sustainable design and natural materials. In return for this, the project received public funds. In all, the building project took several years – a long time. But everyone today is happy with the result. The centre is a big enrichment for the entire region.

A sophisticated system

"The building is a low-energy house," Thor-Ingar Synstad explains. "We were able to install an elaborate geothermal and solar heating system that generates up to 90 per cent of the heat needed." An electric boiler covers the remaining need. Like the halls of residence, two Vaillant heat pumps in cascade connection are used here too. "However, the lion's share of the heating output of the system isn't provided by the heat pumps, but by the solar collectors on the roof,"

A sophisticated geothermal and solar heating system provides the centre with up to 90 per cent of the heat it needs.

adds Synstad. "Installing the collectors wasn't that easy," says Jonas Busk, the responsible technician. Namely, the collectors don't lie flat on the roof as usual, or are set up slanted – they hang vertically on the façade. "Finding the right angle for the incidence of the sun's radiation gave us a challenge in the beginning." As well as the underfloor heating, the solar collectors also supply the storage cylinders with water for daily use. Two cylinders, each with a capacity of 2,000 litres, are located in the centre's technical room.

It's unusual for Norway that the solar collectors do the main job in providing heat. In order to optimise the project further during the ongoing operation, the planning team consisting of the centre's management, the municipal building supervision body and the installers meet once a month. "I find it great that many members of the planning team here approach things with so much commitment. That helps us incredibly in everyday life," Hege Terese Granstrøm says. Petter Granum of the Ringsaker building supervision body is confident and looking forward to realising further systems in the community. "I still find it admirable that the team has pitched in so much over the years." The project also remains something special for Thor-Ingar Synstad, as he emphasises. It's an outstanding example of highly efficient heat supply based on renewable energies. "We've done a good job together and the result is impressive," he says. He's right.

Down to the Detail

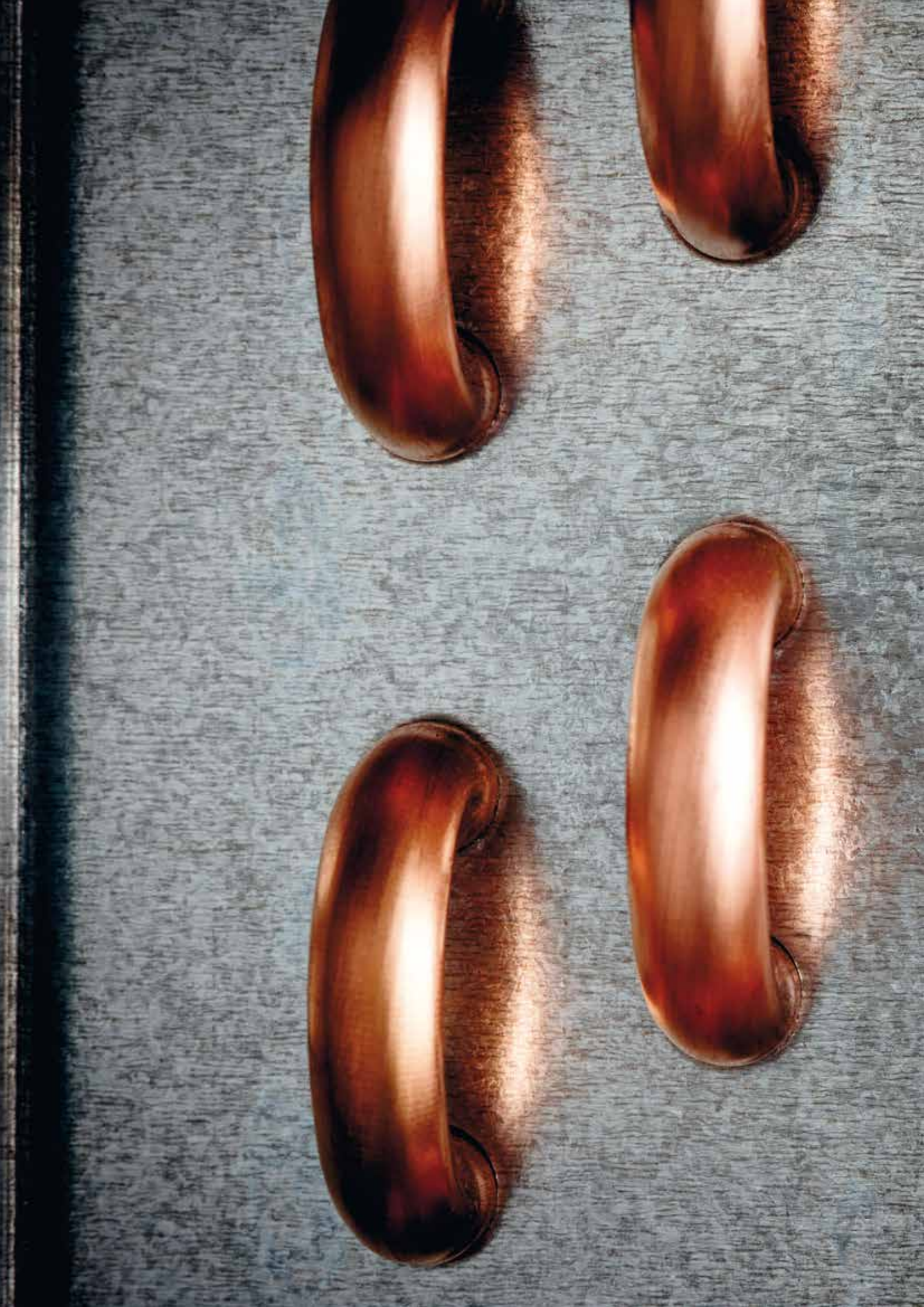
Over the years, photographer Joachim Stretz has brought many Vaillant Group products to life from behind his lens. But in 2015, he photographed them from a new perspective: close up. The project was the brainchild of Marketing Manager Juliane Krüger, who is responsible for the target group of architects and planners. They worked on the overall concept together. The photographer and engineer then focused on the smallest of details, taking devices apart in order to capture the unique aesthetics of their technology.

WARMING

Viewed from a bit further away, this component would be reminiscent of a slightly oversized tin of sardines. But that wouldn't really make it any clearer what this item is actually used for. The plain metal box embossed with the Vaillant hare performs a very important task: it's a heat exchanger and can be found in Vaillant gas-fired condensing boilers. In fact, it's a secondary heat exchanger, to be exact. It's responsible for supplying hot water. The appliance also contains an additional heat exchanger for the heating operation.

QUIET

At first sight this looks like a speaker cone, but first impressions can be deceptive. This object has nothing to do with sound – quite the opposite. It's a high-efficiency pump that serves as a circulation pump in a heating system. It is ultraquiet when in operation and, thanks to its efficiency, reduces electricity and gas consumption. Its modulation is very precise and it adjusts quickly to changing demands. The high-efficiency pump saves several hundreds of kilograms of CO_2 per year and requires just a quarter of the electricity used by older pumps – millions of which are still hiding out in dark cellars.

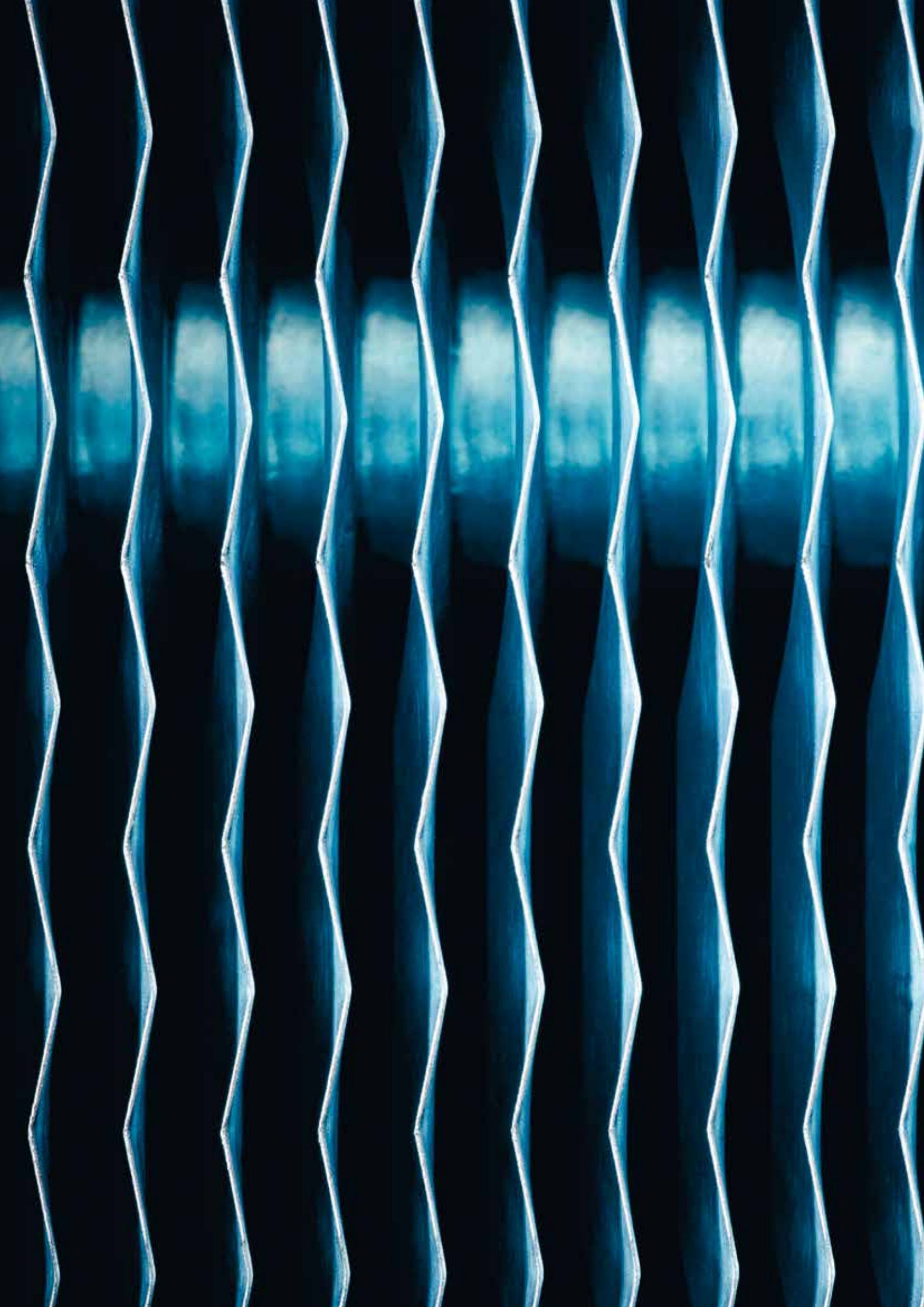


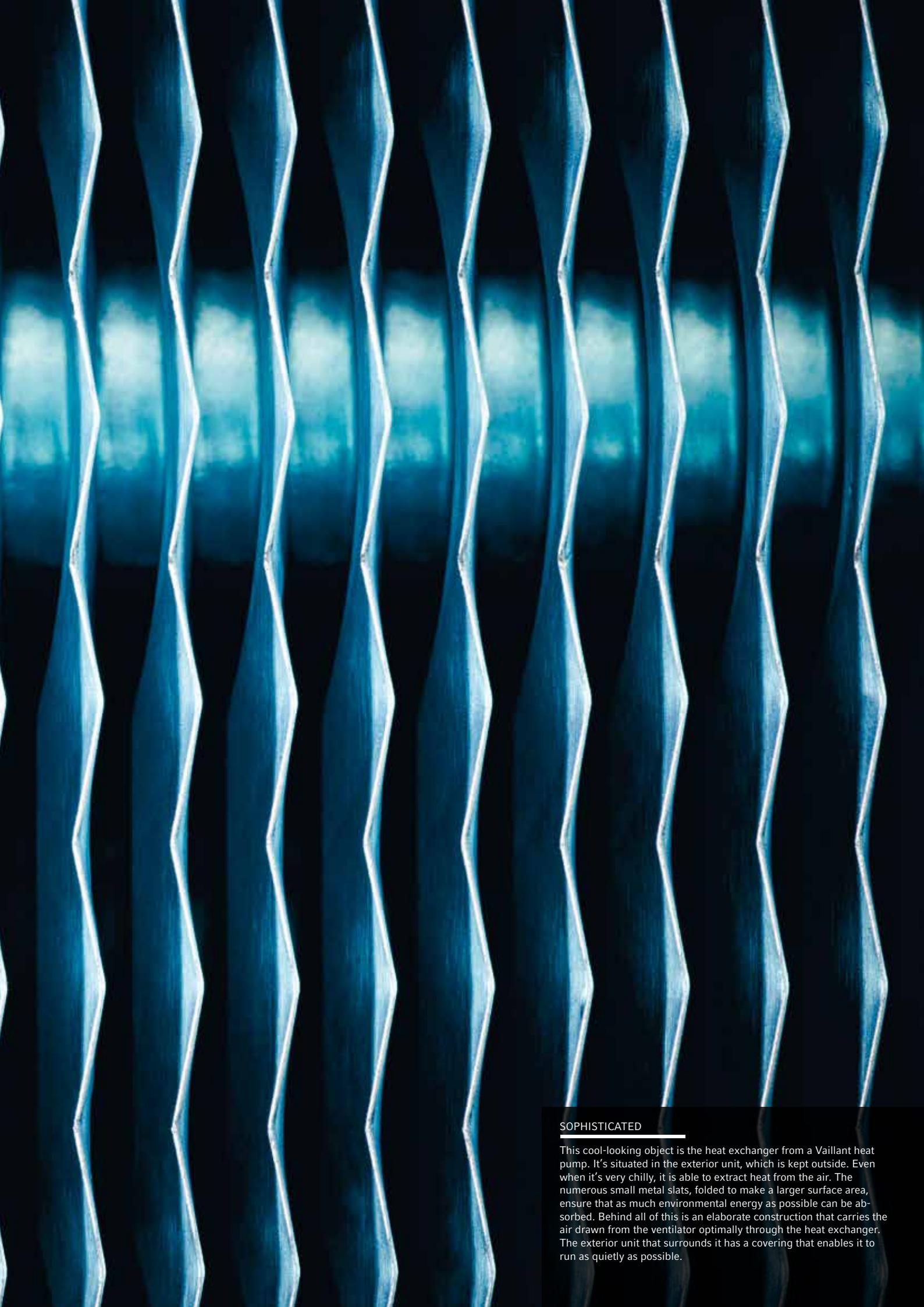
CLEVER

This image shows part of the inside of a Vaillant air-water heat pump. The metal loops carry forward heat that is extracted from the air via an external unit. The energy extracted from the environment is transferred to a coolant, which stores the heat and is able to vaporise even at very low temperatures. The steam is then compressed inside the heat pump so that it becomes warm – so warm that the house can be heated. And when the cycle is reversed in the summer, the device keeps the house nice and cool.

MULTITALENTED

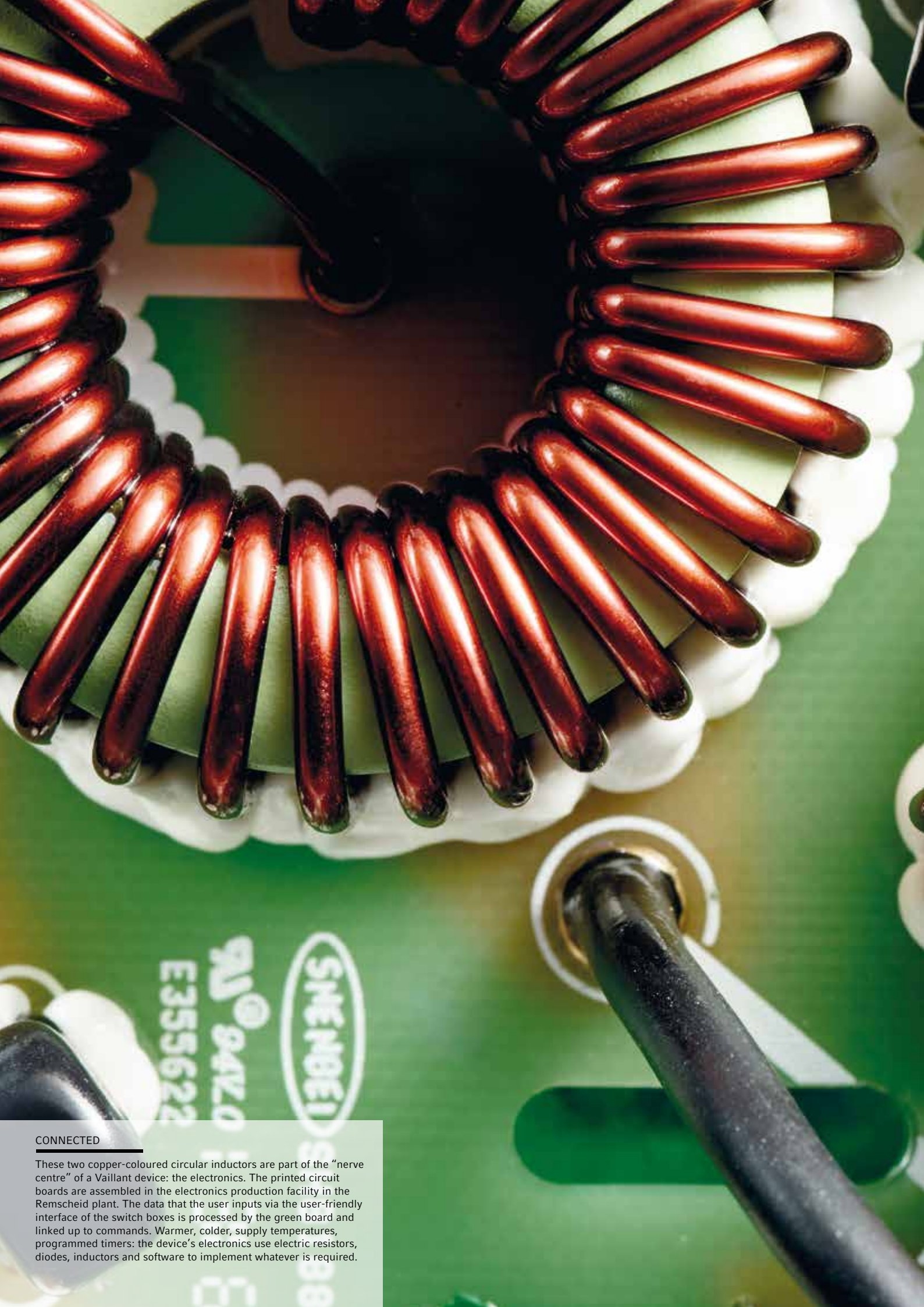
It's thanks to the priority switch valve in the image that hot water is always available. It is built into combined devices, which can provide both heating and hot water. The mechanism of this component is quite simple: depending on what's needed, the valve opens the inflow for either the heating circuit or for the secondary heat exchanger, which heats the water. A small servomotor makes the closure move up and down – softly and noiselessly. The priority switch valve ensures that the combined device, which works in "long-distance-runner mode," can also "sprint" when necessary.





SOPHISTICATED

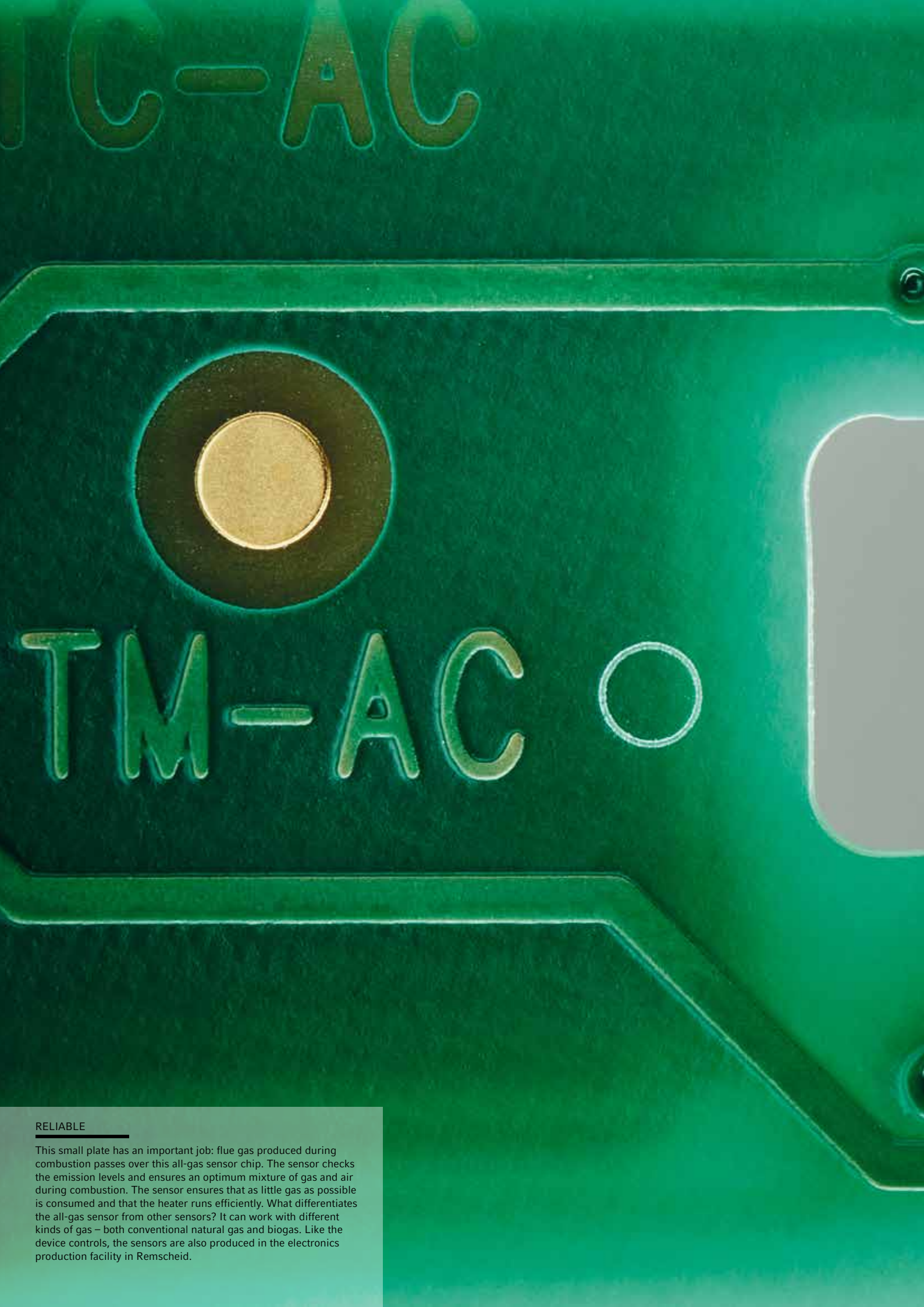
This cool-looking object is the heat exchanger from a Vaillant heat pump. It's situated in the exterior unit, which is kept outside. Even when it's very chilly, it is able to extract heat from the air. The numerous small metal slats, folded to make a larger surface area, ensure that as much environmental energy as possible can be absorbed. Behind all of this is an elaborate construction that carries the air drawn from the ventilator optimally through the heat exchanger. The exterior unit that surrounds it has a covering that enables it to run as quietly as possible.



CONNECTED

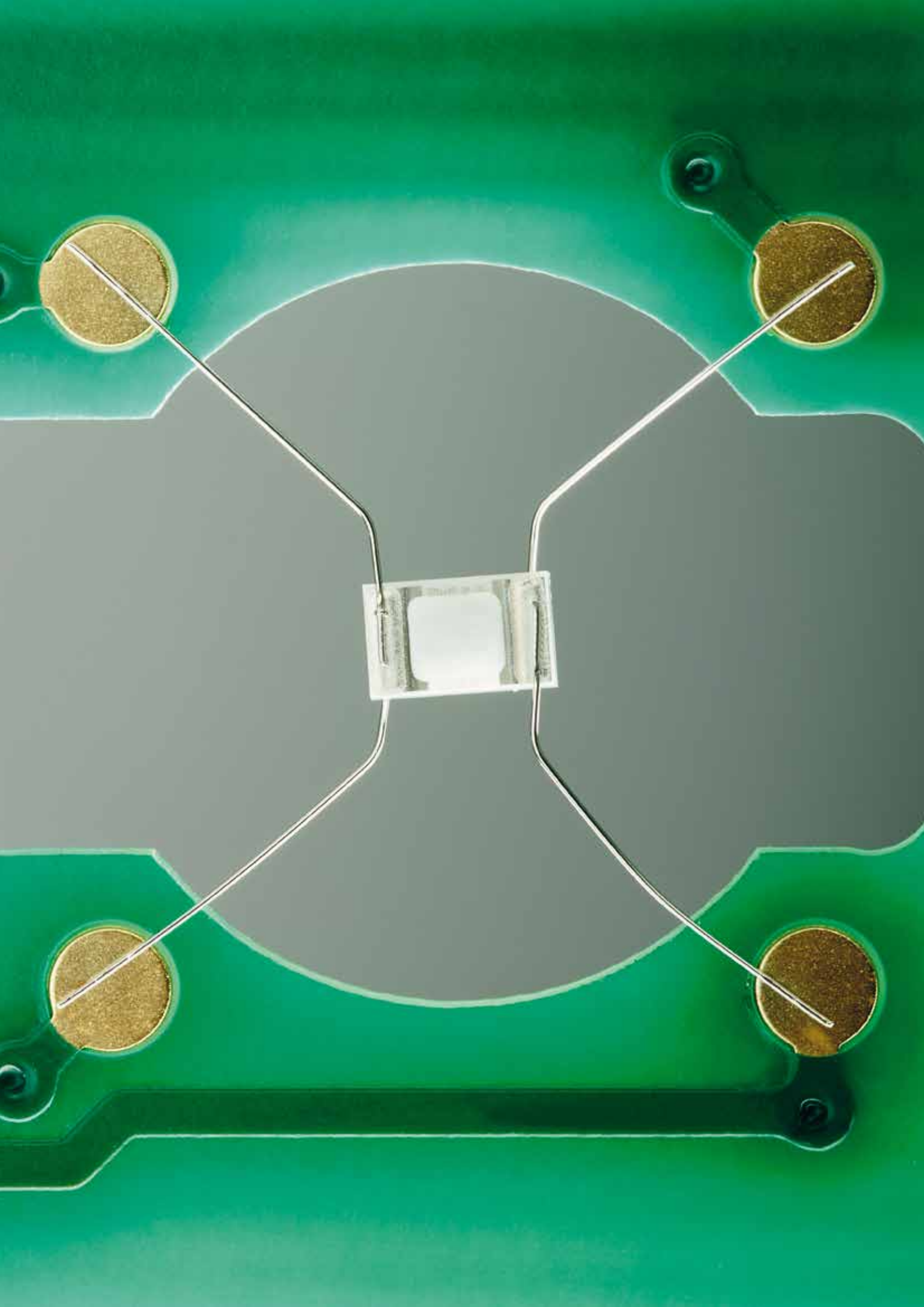
These two copper-coloured circular inductors are part of the "nerve centre" of a Vaillant device: the electronics. The printed circuit boards are assembled in the electronics production facility in the Remscheid plant. The data that the user inputs via the user-friendly interface of the switch boxes is processed by the green board and linked up to commands. Warmer, colder, supply temperatures, programmed timers: the device's electronics use electric resistors, diodes, inductors and software to implement whatever is required.


ROVI0H911K
JUMP2



RELIABLE

This small plate has an important job: flue gas produced during combustion passes over this all-gas sensor chip. The sensor checks the emission levels and ensures an optimum mixture of gas and air during combustion. The sensor ensures that as little gas as possible is consumed and that the heater runs efficiently. What differentiates the all-gas sensor from other sensors? It can work with different kinds of gas – both conventional natural gas and biogas. Like the device controls, the sensors are also produced in the electronics production facility in Remscheid.



DIGITAL TRANSFORMATION

The next industrial revolution?

Interview with Dr Dagmar Dirzus,
Managing Director of the VDI/VDE-Society
for Measurement and Automatic Control (GMA)

How are digitalisation and industry 4.0 changing the economy? Articles on the topic often talk about a new industrial revolution. Is it really such a dramatic change?

It actually is a very far-reaching change. It's got nothing to do with moving from analogue to digital. That began back in the 1970s when computers were introduced. Digitalisation refers to the comprehensive transformation of a whole company, including all organisational processes. This is the point we've reached now. It's about emancipating data, separating data from physical objects. And what's more, the data are passed on, networked, processed and analysed. That allows for something new, something creative to be developed.

Why should industrial companies make sure that they get on board with this development?

Because it's constantly accelerating and becoming increasingly complex …

… and you can't board a train that's already left the station, right?

Timing is a crucial factor here. Developments are already taking place very quickly. For example, we think that in five years' time, all sensors will have been completely replaced, even in large factories. That doesn't happen overnight, but step by step.

So that means that one has to lay the foundations today to be successful in the market tomorrow? Isn't that just a simple but harsh reality that has always been true?

Of course, but the difficulty here lies in the new challenge. It doesn't matter what you're selling; you must sell something that already has the potential to be networked today, even if not everybody can, or would like to, make use of this possibility at the moment. You must equip your production facilities and your products in such a way that they can even be connected with future systems.

To what extent are companies, particularly medium-sized businesses in the traditional industries, prepared to meet these requirements?

I have given a lot of talks on this topic. If I look back and compare the audience reactions from one or two years ago with those of today, then it's clear that there has been a lot of progress. An industrial revolution doesn't happen overnight. Neither does digitalisation. On the other hand, we are certainly not at the beginning of the digital transformation process. We no longer have 25 years to think about whether we want to join in. The international competition is already too strong for that – we only need to look at China and the US.

> *"Digitalisation refers to the comprehensive transformation of a whole company …"*

Does that mean we should be prepared for certain industries to be consolidated as a result of global digital competition, and for companies to disappear from the market?

In principle, yes. Not every company is going to disappear from the market all of a sudden, of course. But let's take mechanical engineering as an example: those companies who say, "Our business is bending sheet metal, we've always done it, and we'll still be doing it in 15 years!" need to realise that this is not entirely true. Yes, they might be right in some cases, but they will be working for less money. They will be easier to replace.

What is the biggest challenge posed by digital transformation?

First and foremost, it's a fact that it affects the entire organisation, in almost all areas. It's not enough to focus on a new business model. If the employees don't go along with it because they are unable to deal with the new potential and possibilities, since that's not how their work is organised, then a vital component will be missing. There is a lack of creativity. If we look at the engineering process, from planning a product to its market launch, it's true that digital tools have already been used for some time. But it's not usually a continuous process. And there are often problems when it comes to moving the data from the areas of planning and pure engineering to plant operations. This means that the entire company must be networked throughout. From engineering, to purchasing, to sales.

Do companies need a digital strategy for this, or even a Chief Digital Officer?

Yes, they do – but nobody from outside, please (laughs). This is particularly important for small and medium-sized businesses. It is usually more effective that this person is recruited from within the company and given targeted training for the job. The reason is quite simple: digitalisation is as individual as the product that you are selling.

And where do you find the people you need for this comprehensive transformation process?

Within the companies. We've all seen those negative headlines predicting that thousands of jobs are going to be lost. People were saying that back when the first automated manufacturing processes were developed. But nowadays there are more jobs in industry than ever before. It's about making processes more efficient. That applies to the engineering process in particular – it has the potential to reduce how much time is

needed, especially for repetitive standard tasks. The time that is saved can be used. You can hire fewer people. Or you can use the time to create something new and completely innovative. The people are there, the potential is there, the employees have a good level of training. But, of course, the traditional engineering disciplines must be prepared to use information technology to an ever-greater extent as an everyday tool.

So you think that people are basically capable of meeting these new requirements?

Yes. People are capable of adjusting and learning new things. We must learn how to deal with the digital transformation. If we transfer intelligence to machines and sensors, then we have the possibility of combining this intelligence with human intelligence to create new things. Structural problems only arise when machines know more about the product than the people who operate them do. But if we provide these people with clearly structured and very closely integrated data, so that they can receive and process it, then we will also create a basis within the workforce for changing and improving processes.

Another consequence of digitalisation is that suddenly there are market participants who previously had nothing to do with the industry. Is this giving rise to an increasingly complex kind of competitive pressure?

That's why companies must concentrate on their expertise. Based on this expertise – particularly via the engineering process – they can offer technical services and develop them into services that can be monetised. On the other hand, for everything that can easily be turned into a platform or a digital business model – for everything that is easy to copy – somebody will soon come along who can do it better or offer new functions. Generic apps are a typical example of this. Our focus should be on our own strengths and our own competences.

Isn't that also where the opportunities lie?

Yes, exactly! It's about the things that not everybody can do. Technical expertise. That's not trivial.

What other opportunities does digital transformation offer?

We actually need to look at it from another perspective. Anybody who doesn't join in with digital transformation and prepare for it today will not be here tomorrow. The "opportunity" is surviving. When we talk about opportunities, then there's no denying that in future industry-related services will increasingly be a profitable area. We shouldn't let them go.

What synergies are there in development and technology partnerships?

> *"Communication has not just become more intensive – it's also become faster."*

Communication between companies has increased considerably. Businesses are seeking closer contact with other businesses in order to consider what standards, technologies, platforms and services we need. In the past, this was less usual. Communication has not just become more intensive – it's also become faster.

> *“I think we are on the right path, especially in Europe.”*

Digitalisation is giving rise to new points of contact with customers and new business models. What is the difference between a sensible business model, a real trend and something that is just a fad?

That’s a difficult question. Every company would have to answer it for themselves. I think the most important thing is courage. Having the courage to try things out, to take action. The goal must be to generate new ideas and then implement them.

That will change the processes within the company.

And the culture. A lot of things come from the world of IT, such as the scrum process and other agile processes, plus collaborative working methods. We have now all understood that we have to be faster in the development cycles. We must initiate a cultural change everywhere – it has already begun in some areas. The decisive issue is often what we do with efficiency gains. They shouldn’t just flow into cost savings. If you do that, you’ll have problems in the medium term. It’s better to invest time saved through efficiency gains in creative thinking – and to use this investment to create new things and develop a pool of ideas.

Many companies set up new companies for this.

Of course. Although not every company has the necessary capital to do so. But nothing ventured, nothing gained. If you can’t do it alone, you have to look for a partner or become part of a consortium with several partners.

When we discuss digitalisation, we mainly talk about data, and that always leads on to the issue of data security. What framework conditions – in terms of laws and infrastructure – still need to be created, or at least improved?

I think we are on the right path, especially in Europe. There are applications that we can rely on and there will be more in the future. One example is the Fraunhofer Gesellschaft’s initiative Industrial Data Space, which is focusing on developing a trustworthy, secure system with servers based in Europe and a corresponding security architecture.

What will production facilities look like in five years’ time? Will they be completely digitalised and smart throughout? And what will the products look like?

In five years’ time, we will definitely have swapped existing sensors for intelligent sensors, even in the big process industries, where plants last up to 30 years. I imagine we’ll also have complete traceability of goods by then. The changes will be visible along the entire value chain. Companies must be prepared so that they can deliver their data.

Does that mean that smart products are not possible without smart production?

Yes. Exactly.

About the interviewee

Dr Dagmar Dirzus is Managing Director of the Society for Measurement and Automatic Control (GMA), a specialist organisation run jointly by the Association of German Engineers (VDI) and the Association for Electrical, Electronic and Information Technologies (VDE). GMA identifies technologies of the future, supports their development and shapes their applications. Part of the society’s task is to promote metrology, automation technology and optical technologies that are decisive for the digitalisation of industry.

Dagmar Dirzus holds a doctoral degree in mechanical engineering. Before joining GMA, she developed conference formats and seminars for the training academy VDI Knowledge Forum. Dr Dirzus initiated the conference series Industry 4.0 in 2014, she lectures regularly, stimulates knowledge transfer and standardisation, and thereby has become one of the leading voices on the issue of Digital Transformation.

FRENCH MARKET

Around the Eiffel Tower, things are moving

The French heating market is one of the largest in Europe. Despite the economic crisis, the construction sector remains at a high level compared to other European markets. And there is a new national regulation that sets out strict requirements for energy efficiency in buildings. But for the Vaillant Group, France isn't a homogeneous market. There's one region that's different to the rest of the country: Paris.


SaunierDuval
Toujours à vos côtés

It's a winter's morning in Paris. In Valérie's apartment there's no hot water and the heating isn't working. She examines the boiler above the fridge and decides to call the Saunier Duval customer service hotline. Sébastien, the technician, arrives – very quickly. He takes a look at the boiler: it's beyond repair. He tells Valérie he can replace it immediately, and places an order by phone. The new boiler is then loaded onto a bicycle. The Saunier Duval campaign in Paris promises: appliance replacement on the same day, with express bicycle delivery within two hours!

The commercial shows how it works: while Sébastien uninstalls the old boiler and prepares to install the new one, the express delivery is already underway. A bicycle courier sets off and weaves his way skilfully through the Paris traffic. Within two hours he is at Valérie's home, ready to hand over the new Saunier Duval boiler to the installer. And by the evening, Valérie's family have hot water and heating again.

"I'm a Parisian. If my heater breaks, I want a new one as quickly as possible," explains Alexandra Deschamps, Communications Manager at the Vaillant Group's French sales company. And that is exactly what this large-scale campaign aimed to convey, visibly, across the entire city. "We invested a great deal in getting noticed," she continues. And it worked. For a week, a series of posters was displayed in 250 metro stations. Then, on 19 January, the capital's largest free newspaper, Direct matin, featured an ad that covered the front and back pages. The newspaper's circulation is 540,000.

"In terms of visibility and attention, the campaign was a great success," says Deschamps. Her colleague Nicolas Flament, Marketing Manager for Saunier Duval, agrees. The bicycle was the key image, a real eye-catcher. "There was a lot of media interest in the express bicycle delivery service, especially from public media, even though our news is usually covered by the trade press," explains Deschamps. The Paris campaign was specifically aimed at end customers. "It was part of our Lutetia project. The aim of the project was to double our market share in Paris – which hasn't been very strong in the past – by 2018."

In terms of visibility, the campaign was a great success. There was a lot of media interest in the express bicycle delivery service.

But before the campaign was launched, Saunier Duval made considerable investments, particularly in its cooperation with installers and wholesalers, in order to strengthen its market presence and use maximum product availability to stand out. Flament explains, "If you're an installer and you go to a wholesaler for a boiler, the device needs to be in stock. Waiting for the wholesaler's order to come through and then going back to pick it up four days later just isn't acceptable. It's a specific problem of Paris where the square metres are so expensive that wholesalers have little place to stock and need to make a hard product selection." In 2014, the Saunier Duval team secured deals with twelve new wholesalers in the greater Paris area. By 2015, they had taken the next step, bringing more than 100 local installers on board as partners and providing special training for them.

In order to meet the needs of the installers – and also the end customers – a customer survey was carried out. It showed that speed was one of the most important criteria. Now it was clear: "Availability is what matters. We had to ensure that the wholesalers had the products in stock, at least the three most-used ones in Paris," explains Regional Sales Director Patrick Guérin. "In addition, we put together a comprehensive offer for the installers: quick delivery, a bonus programme, a technical support hotline and financing offers for the customers. And there were also training courses, points of sale at the wholesalers and, of course, the campaign, in order to help them reach customers."

"But the most important thing was the fact that we offered replacement kits," says Guérin. They are pre-installed units that make it very easy to replace a competitor's device with a Saunier Duval device. "There is no complicated installation – you can replace the device really fast." This was a prerequisite for the

WITH A STRATEGY INTO THE FUTURE

The French sales company pursues a clear strategy in order to sustainably grow in France.

- The new-build sector in France is recording dynamic growth. Single-family houses in particular are at the centre of the focus. The market was dominated by electric heating systems until a change to the regulatory framework in 2013. With modular systems made up of gas appliances, renewable energies and heat pumps, Saunier Duval wants to assume a leading position in the market.
- A second growth axis concerns the Vaillant brand and the further improvement of its market share in France. Even today, the brand is successfully established in many parts of the country. Further growth is intended.
- The third pillar – "Lutetia" – concentrates on the regional characteristics of the larger metropolitan area of Paris. The intention is to increase market shares by means of an increased presence and tailor-made offers for end customers and partners.
- The business with digital services for end customers moves ever more into focus.

campaign, which promised to replace end customers' devices within a day and guaranteed the installers express delivery within two hours.

The campaign was one of the highlights of the Lutetia project, but it was only possible thanks to the steps that had been taken prior to its launch and the accompanying sales initiatives. "It was a very mild winter," says Deschamps. "This meant that customers were not in as much of a rush as the customer survey had suggested." But Flament adds, "If we look at the 2015 figures, the campaign brought real momentum. Sales in Paris increased – we had the highest increases for boilers in the whole of France. We were able to show that we are a dynamic brand. This will have a lasting effect."

The Paris market is an unusual one. Although Saunier Duval is a market leader for wall-hung heaters throughout the rest of the country, it isn't in Paris. "We might be number two or three here," says France Country Director Régis Luttenauer. "Our aim with this project was to increase the standing of our brand in Paris." The Lutetia project is one of the pillars of a comprehensive market strategy that he developed together with his team. They have been implementing it step by step over several years. On top of the greater Paris area for Saunier Duval, the national sales company is focusing on two other areas: further developing Vaillant brand business and increasing activities in the new-build sector.

The new-build sector, which is the largest new-build market in western Europe, is still a particular priority. It is a growing market for heating appliances, including higher quality systems. The reason the new-build sector became the focus of such interest was linked to the introduction of the national Réglementation Thermique law, known as RT 2012. It sets out high energy-efficiency requirements for new buildings. Until then, electric heating systems had been the preferred solution, particularly for detached houses. This is a particularly French characteristic, since there is still such a large focus on nuclear energy there. The RT 2012, however, favours gas and renewable energies. Electric heaters and water heaters are hardly able to satisfy the requirements of the new regulation.

The promise of express delivery: appliance replacement in one day

09:30

The heating isn't working in Valérie's apartment this morning. She calls the Saunier Duval hotline.

10:30

Technician Sébastien arrives. He examines the heater in Valérie's apartment.

11:15

The bicycle courier picks up the Saunier Duval boiler from the wholesaler and loads it onto his delivery bike.

12:00

The streets of Paris are very congested, but the bicycle courier is able to move quickly through the busy traffic.

12:30

The heater is delivered. In the meantime, technician Sébastien has been preparing to install it.

13:45

Thanks to the replacement kit, the device is installed very quickly. Valérie is able to take a hot shower in her warm apartment that very evening.

The campaign started with a series of billboard ads.

The series of three posters was displayed in 250 underground stations. They communicated the brand's core message: no hot water? Heating not working? Let Saunier Duval take care of it – and you'll have hot water and heating again by the evening.

"This development saw a new market segment emerge for gas heaters and renewable energies. A new area had opened up and we wanted to get there first, with the right products and tools," says Luttenauer. Another special feature of the French market is the fact that the new-build sector is mainly B2B and dominated by construction companies. They work closely with energy consultants, whose recommendations are usually followed by the building contractors. That is why energy consultants must be won over. There is now a special team working on this and developing, among other things, tools aimed at this specific target group and software solutions for planning and simulations, some of which are directly available to the energy consultants.

While the company traditionally has solid, well-developed contacts in construction companies active in the area of apartment buildings – since they are also active in the renovation or older-building sector as property companies – the construction companies that work on individual detached houses and terraced houses are a new target group. There are around 2,000 companies in this segment, but a third of them are responsible for up to 80 per cent of new buildings. The largest of these companies are well connected. In order to be able to reach and influence all relevant decision-makers, the Vaillant Group in France focuses on central events and factory visits in Nantes. Communication is important, stresses the Country Director.

France is now one of the largest markets for heat pumps in Europe. Demand has risen considerably.

The new law has affected demand in France. Since the new legal frameworks have been introduced, the market demand in France has shifted. Although the RT 2012 remains unchanged, the technical solutions employed to live up to its requirements have evolved. Architects, building owners and manufacturers are learning to deal with the regulations and the technical demands they prescribe. At the beginning, solar and wood-fired systems were the preferred solutions – until builders realised that the installations were expensive and that a 10-year warranty was difficult to ensure. Demand for these systems decreased, and at the same time demand for the improved air-water heat pumps rose. With nearly 70 per cent of new-build volumes coming from this product segment, France is now one of the largest markets for heat pumps in Europe.

Saunier Duval has managed to establish itself as a market leader for solar systems in the new-build sector, first or second in the market for gas heaters and it has also achieved a significant increase in the area of heat pumps with a domestic hot-water heat pump. In 2016, a new air-water heat pump is set to enter the market. "The heat pump has been specially adapted to the requirements of the French market. We build a lot, but buildings tend to be small," says Marketing Manager Flament with a wink. An average detached house in France is 120 square metres, so space is at a premium. The new model's compact design meets the needs of this market. The company's stated aim is to provide the best air-water heat pumps on the market. The market launch is planned for late 2016. It will take some time, because first of all, all of the technical data has to be made available to the energy consultants with an appropriate amount of advance notice, so that they can be persuaded of the advantages of the new system.

Although Saunier Duval is a leading brand, Vaillant is not yet a major national player in France. The green brand certainly plays a significant role in certain regions (eastern and western France) but not in others (i.e. northern and southern France). Changing this and turning Vaillant into a national brand in the premium segment in France is also part of the strategy.

Noticeable: the bicycle was an eye-catcher

The delivery bike was the key image of the campaign. Homeowners were made aware of the offer by post. Bike-shaped fridge magnets ensured that people didn't forget the brand, the offer or the hotline number.

"The fact is, it's taking longer than we expected. As far as the number of new installers is concerned, we are not yet meeting our targets, even if our sales are on track. We're selling at higher prices with a better mix of products." The team believe that the goals they have set themselves will be achievable over the next four to five years, since they have now found the right process, according to Country Director Luttenauer. This is apparent from the figures: "In 2015, Vaillant was one of the year's big winners, with a double-figure increase in turnover."

The company's stated aim is to provide the best air-water heat pumps on the market. The market launch is planned for late 2016.

Vaillant also focuses on training courses and technology courses, plus invitations to Remscheid. In addition, there is a tour of France every year. An event with around 20 dates which are attended by 1,000 professionals, a mixture of both potential partners and loyal partners. Every year, different topics are discussed. In 2015, it was the European Ecodesign Directive and the new product label for heating devices. This year, the new Green iQ product range will be the dominant topic.

The experience gained from the Lutetia project has been very valuable, even if it is difficult to transfer the concept to other regions. "It is true that certain basic elements are important in all areas, such as offering training courses and gaining new partners. But we have to differentiate and adjust our approach to meet the needs of each individual region," concludes Flament. The project Marseillia is being organised for the Marseilles region next year – the title is taken from the city's Latin name, as was the case with the Lutetia project. "We want to use Marseillia to reach end customers as well, but we will also be focusing on a large trade fair in Marseilles as a starting point," says Flament. There are also plans for targeted regional development for eastern France and Lyon.

In addition, the team in France is also working on a locally oriented digitalisation strategy. In 2015, a step in this direction was already taken with the introduction of the MiGo app, which allows Saunier Duval devices to be controlled via tablet or smartphone. "Our main objective here is to target end customers and offer them digital services with real added value. That way, we also want to reinforce the loyalty of our installers," explains Luttenauer. Implementation should begin this year. Although the details of the connectivity project have not yet been revealed, the Country Director is able to hint at which region will be the focus and form the starting point: Lutetia!

THE VAILLANT GROUP IN FIGURES

The Vaillant Group was founded in 1874 and is today the second largest company in the European heating, ventilation and air-conditioning (HVAC) industry.

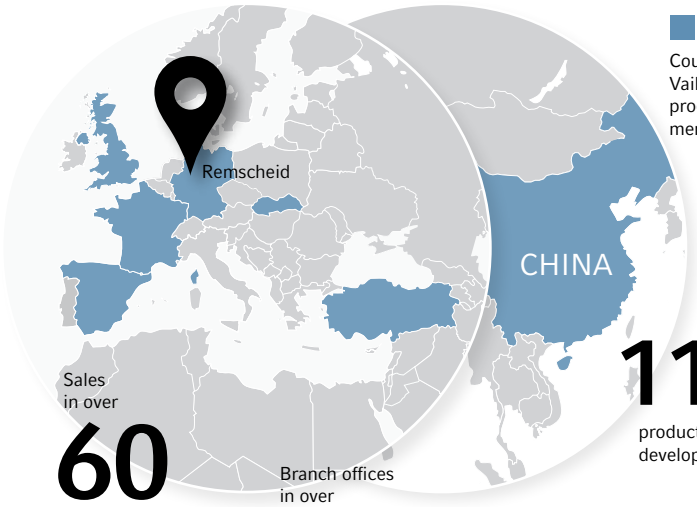
The Group's core business centres on the development, production and distribution of energy-saving, environmentally friendly heating systems and water heaters based on natural gas and renewable energy sources.

The Vaillant Group's brand family comprises eight international heating technology brands.

The Group develops and manufactures products at a total of eleven sites located in five European countries, Turkey and the People's Republic of China.

The Vaillant Group is global market leader in the segment of compact wall-hung heating appliances. An estimated 30 million households worldwide use technology of the Vaillant Group.

30 million
customers



Countries in which the Vaillant Group maintains production and development sites

Sales in over **60** countries

11 production and development sites

Branch offices in over **20** countries

EBIT of € **186** million in 2015

Net sales of € **2.41** billion in 2015

Net sales
€ million

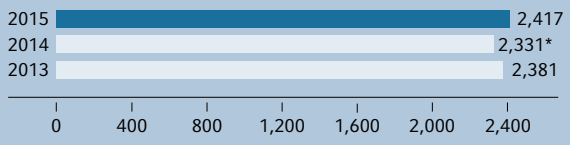
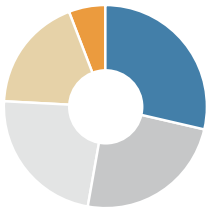
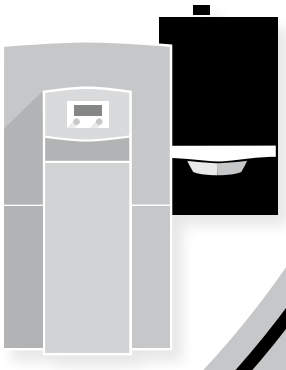


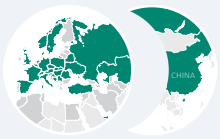
*Figure revised in accordance with new reporting structure

Sales by regions
€ million

Northern Europe	695
Central Europe	587
Southern Europe	556
Eastern Europe	440
Rest of World	140





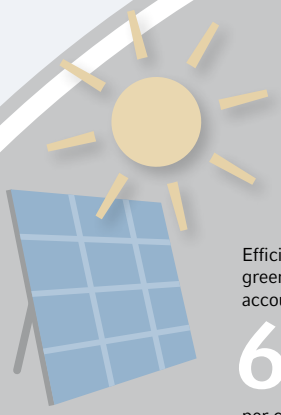


VAILLANT BRAND

The Vaillant brand is the internationally most well-known heating technology brand of the company, accounting for the majority share of sales of the Vaillant Group. It is perceived by our customers as the epitome of superior-quality products, German engineering excellence, innovative technologies, highly efficient heat generation and renewable energies. Products are sold under the Vaillant brand in all countries in which the Vaillant Group operates.

SAUNIER DUVAL BRAND GROUP

The Saunier Duval brand group comprises the brands Saunier Duval, AWB, Bulex, DemirDöküm, Glow-worm, Hermann Saunier Duval and Protherm. These brands primarily focus on high-volume demand in the area of proven gas heating technologies, solar thermal systems, air-water heat pumps and air-conditioning units. Apart from Germany and Switzerland, the Saunier Duval brand group is regionally represented with its brands throughout the whole of Europe and in Turkey.



Around
2,000
patents are held by the Vaillant Group

Efficient and green technologies account for
64
per cent of product sales

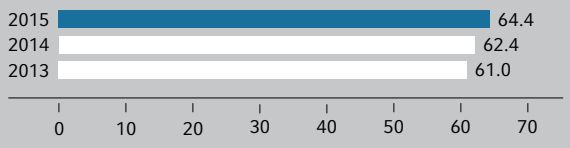
134
ongoing research & development projects

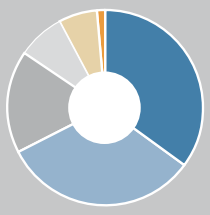
100
per cent family-owned

140
years of tradition as a technology leader in the heating, ventilation and air-conditioning industry

Efficient and green technologies – share of product sales

%

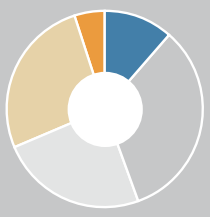




Employees by staff function

Headcount

Customer Service	4,334
Production	3,984
Sales & Marketing	2,105
Commercial Support	941
Research & Development	780
Apprentices/Interns	165



Employees by regions

Headcount

Northern Europe	1,407
Central Europe	4,067
Southern Europe	3,004
Eastern Europe	3,227
Rest of World	611

FAMILY BUSINESS

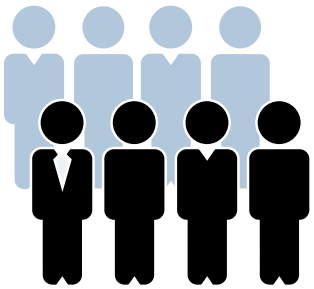
The Vaillant Group has been a family business throughout the more than 140 years of its existence and continues to be wholly family-owned to this day.

Since the company was founded by Johann Vaillant in the year 1874, the corporate strategy of the Vaillant Group has focused on sustainable and profitable growth. The economic success of the company is inextricably linked to a commitment to social and ecological standards.

The owners of the Vaillant Group exercise their entrepreneurial responsibility on the Partners' Board, the Supervisory Board and in the Partners' General Meeting. The corporate strategy is laid down by the Management Board in close cooperation with the Partners' Board. The prime focus is on the long-term increase of the company's value.

Additional information about the company and its bodies can be found on the Vaillant Group website:
www.vaillant-group.com

A staff of
780
work in product and technology development

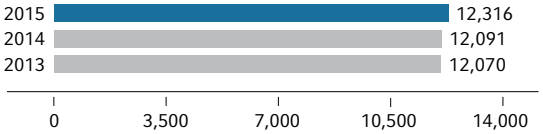


Around
50
nationalities are part of the Vaillant Group workforce

A total of
12,316
people worked for the Vaillant Group in 2015

Employees

Headcount



SERVICES WORLDWIDE

More people work in customer service than in any other area of the company. With around 4,300 service employees, the Vaillant Group is a leading service provider in the industry. Customers are supported throughout the entire life cycle of our products.

More than
4,300
Vaillant Group employees work in customer service

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Information about Vaillant brand products can be found on **www.vaillant.com** or by scanning the QR code.

Information about Saunier Duval brand products can be found on **www.saunierduval.com** or by scanning the QR code.

Information about products of the remaining Vaillant Group brands can be found on **www.awb.nl**, **www.bulex.be**, **www.demirdokum.com.tr**, **www.glow-worm.co.uk**, **www.hermann-saunierduval.it** and **www.protherm.eu**