

VAILLANT GROUP

ANNUAL  
**MAGAZINE**  
2014



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.

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Dr Carsten Voigtländer  
Chief Executive Officer

**Ladies and Gentlemen,**

2014 was an eventful year for the Vaillant Group with many highlights and memorable moments.

In addition to the brand anniversaries of Bulex, AWB and DemirDöküm, it was also the anniversary of the Vaillant Group's foundation 140 years ago. This joyous occasion was celebrated in all countries with customer events and family days at our sites. Moreover, a roadshow with the motto "140 years of responsibility. For the world of today and tomorrow" went on tour through the entire Vaillant Group.

Complementary to our continuing business expansion in Eastern Europe, an important focus in 2014 was placed on the markets in the Far East. In China in particular, the largest regional market, we were again able to grow, while also further strengthening our local presence. In the course of the year, we inaugurated our highest-located customer forum in the Tibetan city of Lhasa in the Himalayas. An additional branch office opened for business in the city of Guiyang in the south of China. In order to continue on the path of growth in Asia, a national sales company for the South Korean market was founded in the metropolis of Seoul. South Korea is one of the largest markets for wall-hung heating appliances.

This provides ample opportunity to take the time for a closer look at both countries and the local activities of the Vaillant Group. I recommend reading our detailed report from page 12.

An important challenge, which kept us occupied in 2014, was the company-wide implementation of the European ecodesign regulations and preparations for the energy label for heating appliances and water heaters. The law constitutes another step towards energy efficiency in the EU. For the Vaillant Group, this entails new market potentials for growth with future technologies and renewable energies.

Efforts in research and development in 2014 have brought us closer towards the market launch of a heating appliance on the basis of fuel cell technology. Approximately 200 of the appliances are currently proving their reliability and readiness for everyday use in field tests across Europe.

You are kindly invited to learn more about each of these topics as well as the Vaillant Group's highlights in 2014 on the following pages of our Annual Magazine. I hope you enjoy reading it!

Yours,



# Anniversary with a future

2014 was a year of anniversaries: 80 years of Bulex, 80 years of AWB, 60 years of DemirDöküm – three brands of the Vaillant Group gave us the perfect occasions to take a look back at the past and into the future. And this was just the beginning – in addition to these three brand anniversaries, the Vaillant Group, founded in 1874, celebrated its 140th anniversary. This special event was held in line with the motto “140 years of Vaillant. 140 years of responsibility. For the world of today and tomorrow.”







To mark the 140th anniversary, a Vaillant roadshow went on tour around the globe. The Vaillant hare with an exhibition in tow travelled 22,000 kilometres across the entire Vaillant Group and its markets. On his way, he visited over 20 cities, sending best wishes from the picturesque setting of the orangery at Schönbrunn Palace in Vienna, from Milan, from Moscow's Red Square and the vast, bustling cities of Beijing and Shanghai.

Employees, partners and friends of the company were invited to celebrate with Vaillant at each exhibition location, to take a look back at the past and then to share their own visions for the future.

The 140-year history of Vaillant has always been shaped by innovation and creativity. The exhibition illustrated this with a look back at yesteryear. From the famous closed-system gas-fired bathroom heater, for which company founder Johann Vaillant applied for a patent in 1894 and which revolutionised bathing. On to the introduction of the "hare in the egg" as one of the first brand logos in Germany. And through to the invention of the central heating boiler in 1924, which enabled heat to be supplied to every room in a house. The exhibition paid tribute to the milestones in the company's history and also marked the historical context in which they occurred.

The next chapter of the roadshow was dedicated to the present. The focus was on the wide range of efficient, energy-saving and environmentally friendly technologies that supply energy to today's homes.

Finally, the roadshow looked towards the future. The Vaillant Group aims to actively shape the world of tomorrow, particularly in the domains of heating and energy supply, comfort in your home, environmental protection and resource conservation. Therefore the exhibition addressed six important future issues – urbanisation, transportation, the environment, the world of work, demographic change and health care. In the Vaillant Future Studio, visitors were able to create their own vision of the world in 140 years' time, turn their vision into a picture and share it with their friends and acquaintances via the Internet.



**01** 2014

**Belper receives sustainability award**  
The Vaillant Group plant receives the National EEF Sustainable Manufacturing Award in January.

**04** 2014

**"The good feeling of doing the right thing"**  
The new Vaillant campaign is launched in mid April with printed ads and a television commercial.

**02** 2014

**Nantes brand experience centre**  
The first Saunier Duval experience centre opens its doors to visitors at the plant in the French city of Nantes in February 2014.

**03** 2014

**SHK Essen industry trade fair**  
The Vaillant Group presents its latest products at the important SHK Essen specialist trade fair in March 2014.

**06** 2014

**recoVAIR market launch**  
A new range of ventilation units is launched internationally under the Vaillant brand in early summer 2014.

**05** 2014

**Vaillant World Cup**  
The first Vaillant World Cup is held as part of the 140th anniversary celebrations. Teams from 17 countries come to Germany for the football tournament.

➔ See page 34 for further impressions.

**06** 2014

**VPS in Roding**  
The Vaillant Group production system (VPS) is introduced at the Roding plant in June. VPS has now been adopted in all plants.

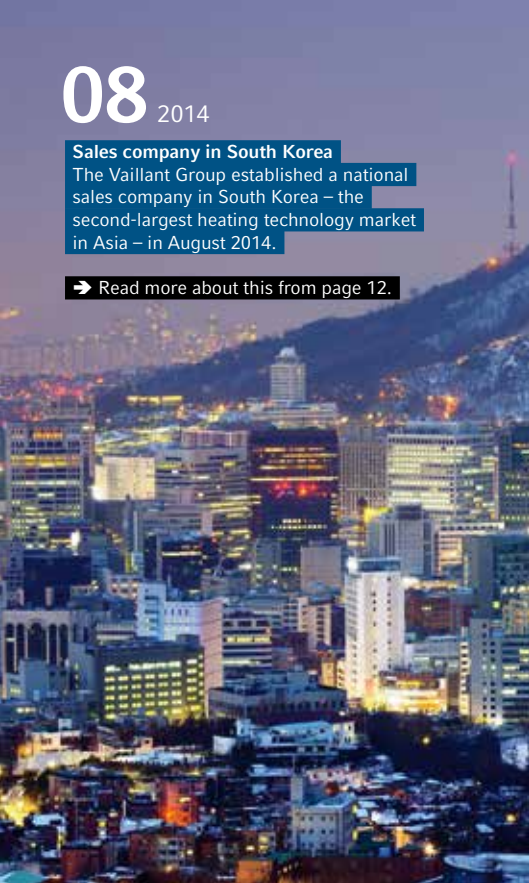


08 2014

#### Sales company in South Korea

The Vaillant Group established a national sales company in South Korea – the second-largest heating technology market in Asia – in August 2014.

➔ Read more about this from page 12.



08 2014

#### Sales office opens in Lhasa

The highest-located sales office of the Vaillant Group officially opens in the Tibetan city of Lhasa in August.

➔ Read more about this from page 12.



09 2014

#### Combined heat and power station for day-care centre

The Ahörnchen day-care centre wins a Vaillant combined heat and power station in a national online contest in Germany.



09 2014

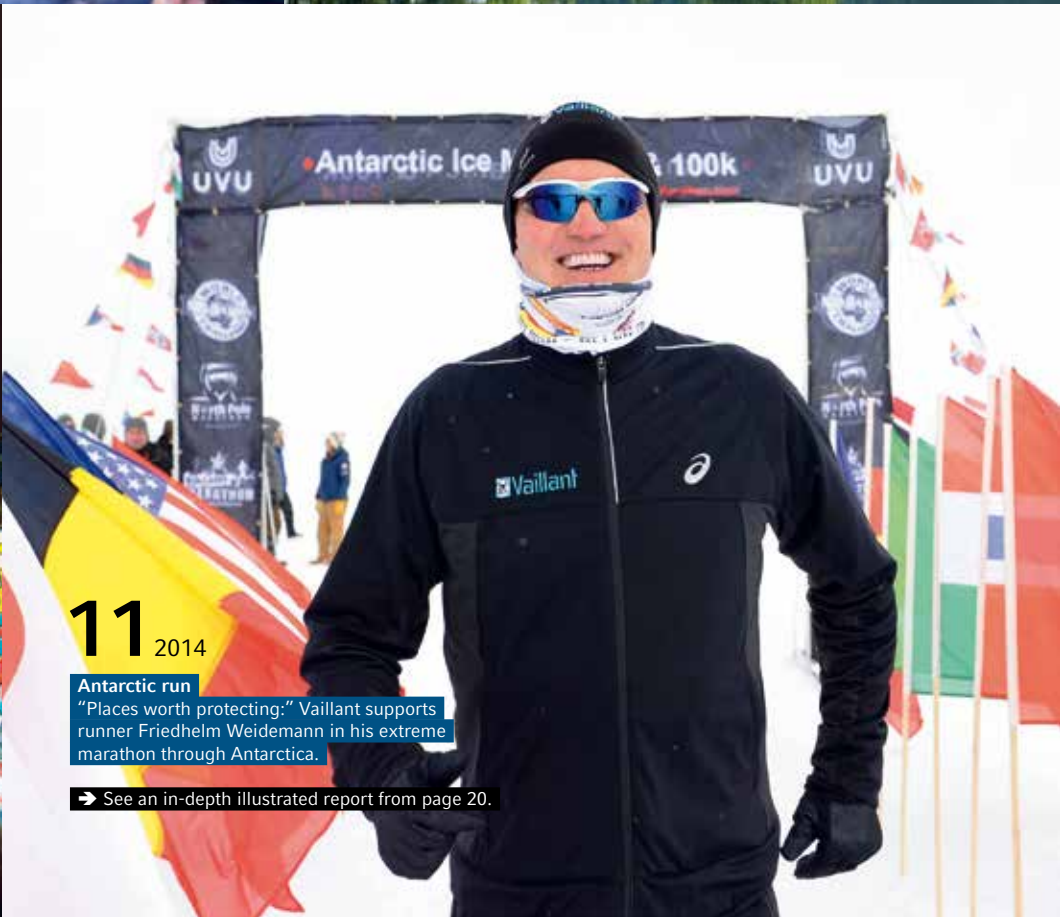
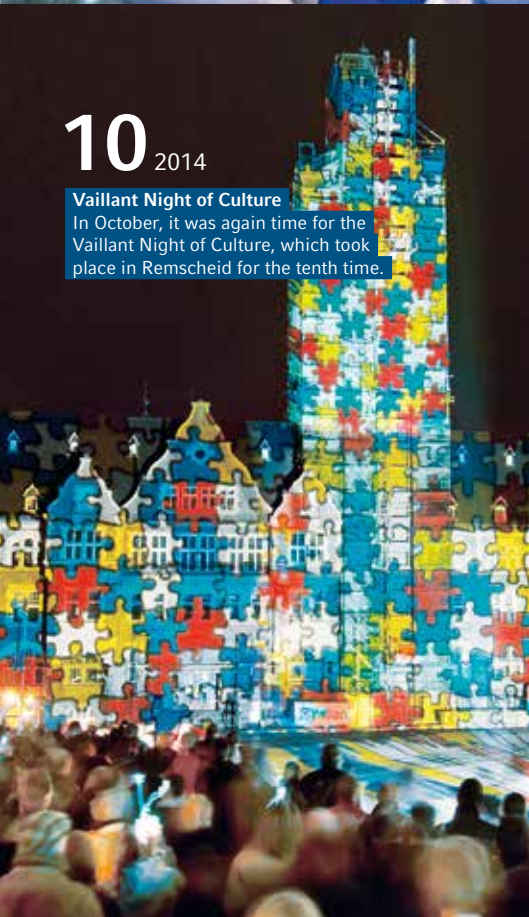
#### B.A.U.M environmental award

The Vaillant Group's sustainability team receives the environmental award from the German Association of Environmental Management (B.A.U.M. e. V.) in 2014.

10 2014

#### Vaillant Night of Culture

In October, it was again time for the Vaillant Night of Culture, which took place in Remscheid for the tenth time.



11 2014

#### Antarctic run

"Places worth protecting:" Vaillant supports runner Friedhelm Weidemann in his extreme marathon through Antarctica.

➔ See an in-depth illustrated report from page 20.



# THE VAILLANT GROUP IN SUMMARY

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

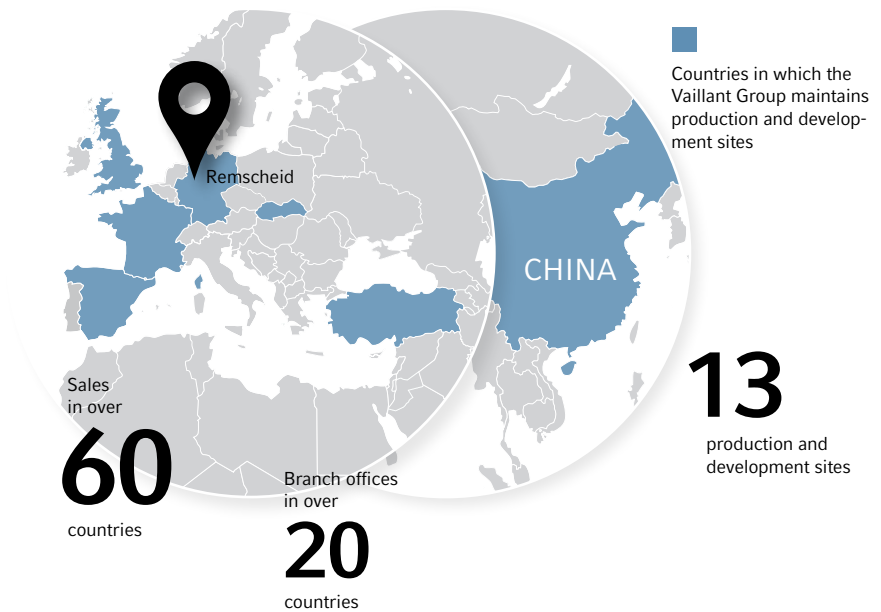
The Group's core business centres on the development, production and distribution of energy-saving, environmentally friendly heating systems and water heaters based on natural gas and renewable energy sources.

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

The Group develops and manufactures products at a total of 13 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



## 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. As a premium brand, 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.



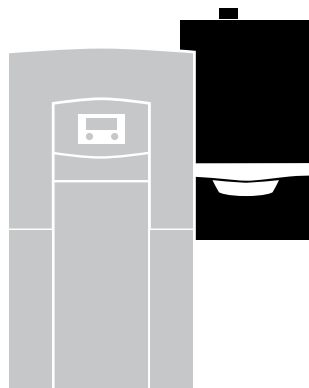
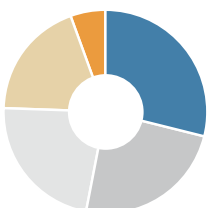
## SAUNIER DUVAL BRAND GROUP

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.



### Sales by regions € million

Northern Europe	676
Central Europe	565
Southern Europe	524
Eastern Europe	440
Rest of World	128

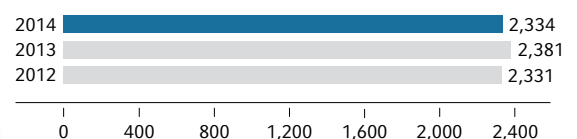


Net sales  
of €

**2.33**

billion in 2014

Net sales  
€ million



EBIT of €

**166**

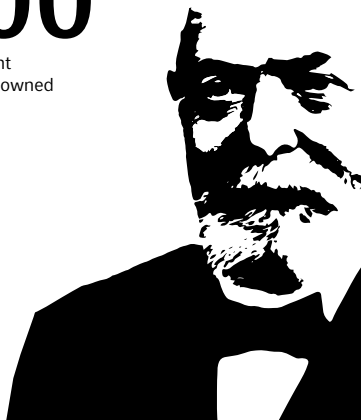
million in 2014

# 100

per cent  
family-owned

# 140

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



## FAMILY BUSINESS

The Vaillant Group has been a family business throughout the 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 been focusing 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](http://www.vaillant-group.com)



## SERVICES WORLDWIDE

In no other area of the company do more people work than in customer service. With around 4,300 service employees, the Vaillant Group is a leading service provider in the industry. Customers are accompanied throughout the entire product life cycle.



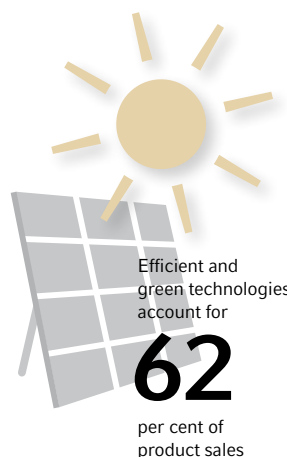
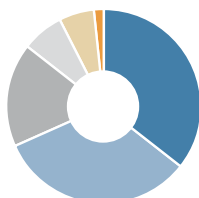
# 4,300

Vaillant Group employees work  
in customer service

### Employees by staff function

Headcount

Customer Service	4,297
Production	3,882
Sales & Marketing	2,065
Commercial Support	938
Research & Development	743
Apprentices/Interns	165



Around  
**2,000**

patents are held by  
the Vaillant Group

# 105

ongoing research &  
development projects

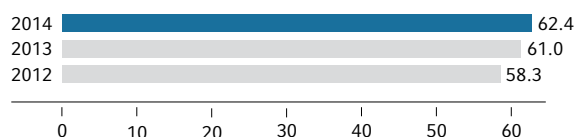
Efficient and  
green technologies  
account for

# 62

per cent of  
product sales

### Efficient and green technologies – share of product sales

%



A staff of

# 743

work in product and  
technology development



Around  
**50**

nationalities are part  
of the Vaillant Group  
workforce

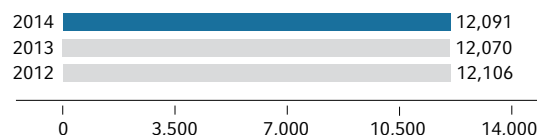
A total of

# 12,091

people worked for the  
Vaillant Group in 2014

### Employees

Headcount



### Employees by regions

Headcount

Northern Europe	1,378
Central Europe	4,037
Southern Europe	3,045
Eastern Europe	3,145
Rest of World	486



# TECHNOLOGY FOR GREATER COMFORT IN YOUR HOME

Condensing technology accounts for around

# 30

per cent of the Vaillant Group's turnover



Up to  
**20**

per cent of energy can be saved with modern condensing technology compared to an older boiler

## GAS-CONDENSING TECHNOLOGY

Modern condensing technology based on natural gas is traditionally one of the most important segments in the product range of the Vaillant Group. No other heating technology is subject to so much demand from customers. Accordingly, the Vaillant Group offers condensing appliances for heating and hot water supply across all eight brands and across all markets in which the company is active.

The technology is extremely popular due to its high efficiency and the relatively low investment and installation costs. Condensing appliances make use of all the heat produced during the combustion of the fuel, including the residual heat contained in the flue gases which disappears up the chimney in traditional boilers. Heating with condensing technology means producing heat with virtually no energy loss.

A further advantage of condensing boilers is that they can be used so flexibly. As a result, the technology is suitable for installation in new buildings and appliance replacement in existing building stock. The available output classes cover all areas of application, ranging from small flats to the central supply of large blocks of flats.

More than

# 900,000

compact condensing appliances were produced by the Vaillant Group in 2014

## HEAT PUMPS AND SOLAR HEAT

Free, environmentally friendly, limitless – the future of heat generation rests with renewable energies. For heating, for providing hot water, for producing electricity at home. The use of green technologies has been an integral part of the Vaillant Group's product range for many years.

Among homeowners, heat pumps are currently the most popular high-efficiency technology based on renewable energies. Heat pumps extract the required energy from the air, from the ground or from groundwater. This is even possible with low outdoor temperatures during the cold season. The heat pump uses a compression process to raise this temperature to the point where it is sufficient to heat the building. Across several brands, the Vaillant Group offers more than 40 different heat pump systems in total – for use with any environmental heat source.

Solar energy likewise does not cost a single penny. Solar thermal collectors use the power of the sun for hot water supply or for heating support. This creates no burden for the environment at all. As a result, solar heat generation has now become a standard solution.

The Vaillant Group manufactured around

# 170,000

square metres of solar collectors in 2014



Heat pumps provide up to

# 75

per cent of the energy supply from the environment for free





Up to  
**70**

per cent of domestic electricity can be generated using a CHP station

#### COMBINED HEAT AND POWER

The principle of combined heat and power (CHP) enables homeowners to generate heat and electricity at the same time. CHP systems use natural gas for a dual purpose. Compared to separate power and heat generation, cogeneration saves energy costs and protects the environment. The self-generated power can be used right at home, making homeowners more independent with regard to their energy supply.

The product range of the Vaillant Group includes all output classes, from small family power stations for single- and two-family houses to mini-combined heat and power plants for larger blocks of flats and industrial applications.

The Vaillant Group trains around

**75,000**

installer partners each year



Sales of services and spare parts accounted for around

**20**

per cent of the Vaillant Group's turnover in 2014

#### SERVICES AND DIGITAL SOLUTIONS

The services of the Vaillant Group begin with installation and end with replacement of the system. The service spectrum includes the commissioning of new systems, maintenance of existing ones and the provision of technical support to installers and trade partners. Training and technology seminars for installers are further key service areas.

The Vaillant Group also provides remote-controlled online services for energy supply control and operation monitoring as well as mobile applications enabling homeowners to individually optimise their energy management.



Around

**20**

per cent of fuel costs can be reduced by incorporating renewable energies

#### HYBRID SYSTEMS

Modern heating systems are designed to provide the building's energy supply as economically and sustainably as possible. Typically, several technical components and energy sources are combined for this purpose. Condensing appliances or heat pumps operated in conjunction with heat-recovering ventilation systems or with solar support are highly efficient system solutions. Complementary heat storage units and intelligent control technology enable effective energy management.

The Vaillant Group is a full-range supplier offering all available solutions in the areas of heating, ventilation and air-conditioning technology, enabling customers to obtain complete system solutions from a single source.

Around

**60**

per cent of the hot water supply in a system can be provided by solar energy

# *Looking to the Far East*

China is a fast-paced market and different from Europe.

The Vaillant Group has been generating double-digit growth rates there for years. By now, the country has developed into one of the Group's most important markets. And there is potential for more in China, as there is in the Asian region as a whole.

The youngest Vaillant sales company commenced operations in South Korea in August 2014.

**F**ar away, incredibly big and exceedingly foreign: China. The numbers speak volumes: China currently has almost 1.4 billion inhabitants and is therefore the world's most populous country. It covers 9.6 million square kilometres, which makes it almost twice as large as all 28 EU member states combined. With a gross domestic product of over 9,200 billion US dollars, China is the world's second biggest economy. Adjusted for purchasing power, it is in the process of overtaking the USA. Over the past 40 years, China has achieved a level of industrial development that it took the European countries more than 200 years to accomplish – from an agrarian to a high-tech country.

Of course, this does not apply to every stretch of land in this gigantic country. In western China, there is still a need for investment in infrastructure and jobs. This has resulted in many people moving



to the cities on the east coast and in the south in recent decades. Again, the figures could hardly be clearer: In the past three decades, 260 million Chinese people have moved from the rural regions to the cities. By 2030, this figure will be around one billion. It is a migration that will create megacities and constantly generate change. At a breathtaking pace.

So China isn't the same everywhere. "We had to ask ourselves three crucial questions: Is it cold and/or do the people need heating? Is there natural gas that our appliances can be operated with? And: Is the market dominated by strong regional suppliers?" Country Director Wang Weidong is segmenting the Chinese market. The best potentials for the Vaillant Group were found along the Yangtze River and to the north of it. "The people there earn more. Chongqing, Wuhan, Nanjing and Shanghai are very important cities for us. Apart from that,



13

中华人民共和国 // PEOPLE'S REPUBLIC OF CHINA  
// LAND AREA: 9.6 MILLION KM<sup>2</sup>  
// POPULATION: 1.36 BILLION  
// 30 CITIES WITH >4 MILLION INHABITANTS  
// GDP: US \$9.2 TRILLION

대한민국 // SOUTH KOREA  
// LAND AREA: 100,266 KM<sup>2</sup>  
// POPULATION: 50 MILLION  
// SEOUL: 10.1 MILLION INHABITANTS  
// GDP: US \$1.3 TRILLION

On the one side, the historical temples in the Forbidden City, and on the other, the glittering skyline of a metropolis. Tradition and modernity appear side by side in China.





The Vaillant Group currently has 25 sales offices in China, covering 87 per cent of the mainland regions, with the remaining regions of this huge country coming into focus as well. In August 2014, for example, a customer forum opened on the “roof of the world” in Lhasa, Tibet; in September, another followed in Guiyang in the south of the country.

The branch offices are offering customers a better service. They are all equipped with a showroom and have their own engineers. Being close to customers is important. One precondition for the choice of location is the city’s connectedness with the country’s gas grid, which is still being expanded.

the weather there is very harsh in the winter. It is cold, windy and wet,” says Wang Weidong.

Meanwhile, the Vaillant Group’s map of China has changed. There are now 25 branches, covering 87 per cent of the mainland regions, with the remaining regions of this huge country coming into focus as well. In August 2014, the Vaillant Group opened a customer forum on the “roof of the world” in the Tibetan capital of Lhasa; in September, this was followed by another branch office in Guiyang in the south. In November 2015, these will be followed by Kunming in the southwest, a relatively big city even by Chinese standards with 7.26 million inhabitants. “The expansion of the gas grid is enabling us to open up the market further. Naturally, we already have dealers in Kunming, but now that the city is connected to the gas grid, we are also going to open a branch office there,” says Wu Jing, Head of Marketing. “For us, it is extremely important to reach our customers. We are pursuing a zero-distance strategy.”

Customers should not be kept waiting. They should feel well looked after by a manufacturer who is clearly taking responsibility. “That is a very important point for our customers. We offer not only Vaillant appliances, but also Vaillant services,” emphasises Wu Jing. Vaillant is approachable, always. Twenty-four

hours a day, seven days a week. “If there is a sizeable problem, someone will come along and rectify it,” says Wang Weidong. “We are aiming for long-term growth. That means we have to do the right things. Always.”

In addition to the service engineers in the branches, there are more than 200 after-sales partners. “It is imperative that we have a professional team. It must be guaranteed that the product is set up and maintained properly so that it can operate smoothly and efficiently,” says Wu Jing. A lot of money was invested in service. A total of 60 per cent of the 300 Vaillant employees in China are service engineers. Furthermore, 700 engineers

from partner firms underwent intensive training programmes last year alone.

No other international heating brand has ever paid so much systematic attention to customer proximity. Vaillant was the first brand to make general use of showrooms. There are currently 900 showrooms in China. The purpose of these is for customers to experience, see and understand heating systems. Wu Jing sees customer information as the core element in the recipe for success: “We started by explaining how a modern heating system works. After all, back then – I mean in 2006 – a wall-hung boiler was completely unknown.”

## CHINA – LAND OF THE MEGACITIES

China has more than 120 cities with at least a million inhabitants – more than any other country. China’s urbanisation rate increased almost three-fold, from less than 20 to 54 per cent, between 1978 and 2013. This process in China was completed twice as quickly as that of the USA in the 19th



century. The officially registered figures for China’s megacities are Shanghai with 20.2 million, Beijing with 16.4 million, Chongqing with 11.4 million and Shenzhen with 10.4 million inhabitants. Chongqing, however, is estimated at more than 30 million.



The opening ceremony in Lhasa, the capital of the autonomous province of Tibet: Lhasa lies 3,400 metres above sea level and currently has some 250,000 inhabitants.

## NEW HEATING SYSTEM FOR SOS CHILDREN'S VILLAGE

The Vaillant Group and SOS Children's Villages share a close partnership. The first project in China has now been completed. In November – in time for the start of winter – the SOS Children's Village in Chengdu was fitted with heating systems for the 17 houses there. In addition, as part of the roadshow for the 140th anniversary celebra-



tions, books were collected for the children. These were handed over by Country Director Wang Weidong personally in Lhasa on the day before the new branch office was opened.

Since 2006, the end user business has come ever more strongly into focus. This was part of a strategy that was elaborated under the leadership of Wang Weidong in 2006. Whereas end users accounted for only around 25 per cent of sales in 2006, the figure is now almost at 50 per cent. Wang Weidong specifies the opening of the call centre in 2007 – a direct line to the customers and guarantor of their satisfaction – as an important milestone.

The growing strength of the end user business segment has also made Vaillant a top brand in China. All of the industry's leading international brands are active in China. More than 200 regional suppliers can be added to these, although many of them operate in a different market segment.

Vaillant is the leading international heating brand on the Chinese market – in terms of both volume and brand image. Vaillant is regarded as the strongest brand in the "European progressive", "consumer-oriented heating technology" and "air pollution control" categories. A total of 14 per cent of end users would regard Vaillant as their first choice; among users of heating appliances this proportion was even higher. Compared with a survey from 2010, prompted brand awareness has increased from 15 to 24 per cent. The sales figures, too, speak for themselves: In 2014, Vaillant sold well over one hundred thousand appliances

and alone catered to around ten per cent of the market for wall-hung boilers. In 2006, the corresponding figure was just 15,000 units. A significant number of the appliances intended for Chinese market supply is produced in the Group's Wuxi plant. "In the long run, it was obvious: If we wanted to sell six-figure quantities each year, we would need local production facilities. We couldn't be so successful without Wuxi," says Wang Weidong. The existence of our own plant, which was opened in 2007, sends out an additional signal: Commitment to the market, to China and to the region. Now demand is so high that a production line devoted especially to China has been put into operation at the German Vaillant Group's plant in Remscheid.

Complementing the business strategy, there is another factor that helps to explain this success: The social transformation in China. The middle class is growing, and so too is the number of potential customers. And the market will continue to grow because wages and salaries are increasing; between 2008 and 2013, according to the OECD, the average annual increase on a nationwide basis was 8.6 per cent, while other statistics point to an increase of 10 to 15 per cent in 2014 alone. The wage and salary increases are very much desired. In its current five-year plan for the period up to 2015, the Chinese government is putting an emphasis on strengthening domestic de-

mand, on improving the quality of life and consequently on supporting middle class growth.

The middle class has not always been a target group for Vaillant. At first, the wealthy and the highest earners were the envisaged target group. "This has changed. Now, full-time salaried employees with median incomes can afford a Vaillant heating unit," explains Wu Jing. "In recent years, we have also opened up the middle class – which, of course, is still growing. The upper segment, by contrast, has a limited volume." The typical Vaillant customer is a couple with child, who own residential property and possess a net monthly household income of more than 10,000 Chinese yuan (CNY). The average income of salaried employees in Beijing is around 5,000 yuan. Those who work for large international companies often earn a great deal more. "This also means that anyone who can afford their own house or flat can also afford a Vaillant heating system," summarises Wu Jing. "Compared to property prices, our products have become very affordable."

Protherm products, too, have been offered in China for a number of years now. The differentiation is clear: Vaillant is the premium line that stands for "the comfortable life" and has a very broad product spectrum ranging from wall-hung boilers and water heaters to solar



The Chinese Vaillant Team celebrates the great cooperation in 2014.



## CHINA – REPUBLIC OF EDUCATION

A great deal of importance is attached to education in China. In the 2009 PISA survey, pupils from Shanghai were the best in all three test subjects – a feat that was repeated in the next survey in 2012 as well. The demands made on the children are tough. They are obliged to attend school for nine years. After six years of primary school, they must attend the first secondary stage for at least three years. The three-year senior stage is voluntary and is completed with examinations lasting several days. The results determine whether the pupils may attend university and, if so, which one.



The growing strength of the end user business segment has made Vaillant a top brand in China. A total of 14 per cent of end users regard Vaillant as their first choice.



installations, air-conditioning units and heat pumps. The Vaillant Group brand Protherm addresses the upper medium segment as “the heating expert from Europe” and offers only wall-hung boilers. Both brands, however, stand for the highest quality standards and for design “made in Germany” under the Vaillant Group umbrella.

Forecasts are assuming that the market is going to grow from 1.3 million units in 2014 at an annual rate of ten to twelve per cent and reach just over two million units in 2018. In the process, the condensing boilers segment will grow much more robustly than the non-condensing appliances segment.

“China is growing very quickly and lots of things are changing at an amazing speed. We’ve got to stay ahead of the game,” emphasises the Country Director. These changes are also opening up new possibilities. The Chinese government had already set the course for high-quality sustainable growth with the current five-year plan that it published in 2011, which also includes strengthening the middle class and tackling China’s environmental problems. In addition, the government has identified “new strategic industries” that it would like to encourage selectively. These include reducing energy consumption, new non-fossil energy sources and environmental protection.

Hence the new, stricter emissions rules for heating units that were adopted in July 2014. These stipulate that only appliances that comply with the emissions standards can be approved and installed. For international manufacturers, this does not constitute an obstacle. But it shows how seriously the government is taking its efforts to improve air quality. “China needs better air, better water and better living conditions. This is opening up a lot of potential for us,” says Wang Weidong.

This example also shows how dynamic the market is. “The market for individual heating appliances developed in China just some decades ago. Now is the time that standards are being developed and we have to ensure that we are involved,” says Wang Weidong, explaining the necessity of involvement in associations and networks. “The technical requirements change pretty quickly in China.



That is very challenging.” Engineers from the Wuxi plant and from the research and development department are working closely with each other to remain up to speed.

To be prepared for future requirements, a working group is analysing opportunities and fields of action for the future and deriving specific measures from them. The market is growing and changing. The competition, too, is now putting its faith in systematic proximity to customers by setting up showrooms, sending mobile exhibitions up and down the country, erecting billboards along the highways: “We have a sporting year ahead of us. We are very well positioned and are working hard to maintain the tempo. We want to prepare the market for new products; we want to reach our customers even better, even more directly,” says Wu Jing.

The Chinese customers in the premium segment are regarded as very well informed, highly educated and well attuned to the Internet. It goes without saying that Vaillant also sells its products online in China via the sales super-platform Alibaba. A professional online sales team helps the customers by providing information and with their orders. The future intention is for a quarter of end user business to be conducted through e-business channels. Wu Jing says that it is important to have a presence there, and to be visible where the customers are.

“The new communication channels, the new media and the Internet are a challenge for us, also as far as smart home applications are concerned,” adds Wang Weidong. Vaillant China has been very successful over the past ten years. The NSC is aiming to maintain its double-digit growth rates. “But success is not inevitable. The Chinese market is too complex for that.” And too fast-moving.

**A**lmost 1,000 kilometres away as the crow flies – or a two-hour flight from Beijing – a completely different market is opening up in Seoul: South Korea. The newest Vaillant sales company has been working there since August 2014. The common factor is the continent and a promising heating technology market. Although China has supplanted South Korea as the second biggest market for wall-hung boilers for



## HIGH TECH AND HIGH CULTURE

South Korea stands for high tech, for mobile communications technologies, for state-of-the-art consumer electronics and for modern IT and automotive industries: With its large corporations, the republic is a driver of global innovation. The country of 50 million inhabitants is one of the world's top 15 economies. The standard of living in South Korea is high and statistics show that Koreans live for one year longer than the OECD average. The latest stage in a long history of more than 5,000 years. The many UNESCO World Heritage sites, too, bear witness to this – for example, Changdeokgung Palace.

the first time, there are still around 1.2 million appliances sold every year in the 50-million-inhabitant country. To date, most of the business in Korea has been done by a number of domestic and one Japanese manufacturer, whose devices, however, have a somewhat limited lifespan of around seven to ten years.

The starting point for the South Korean sales company is obvious: Seoul. More than ten million people live in the capital city and 23 million live in the metropolitan region – in other words, around 45 per cent of all South Koreans. “That is our target region; the one we want to concentrate on first,” explains Country Director Peter Son. At present, around 15.7 million South Korean households are connected to the gas grid, with 12.2 million households – that is, almost all – using gas-fired heating appliances. The government is in the process of expanding the gas grid further. “The potential here is enormous. I am fully convinced of this market,” says Peter Son.

The premium segment accounts for around five to ten per cent of the gas boiler market. “This segment is growing,” declares Son. “Here we can be the first European premium brand to present its quality – in terms both of products and services. That is a good way to set a new standard in the market. Any competitor that follows us will have to live up to our standards. If they don't, they will not be perceived as premium suppliers.”

In South Korea, unlike in China, the Vaillant Group is putting its focus consistently and exclusively on high-efficiency technology. Sales of the ecoTEC plus combi appliance, which is already certified for the market, are scheduled to

commence in June 2015. The portfolio will then be expanded step by step, initially with the condensing boiler line and later with other products such as geothermal heat pumps, solar thermal systems, combined heat and power stations, and fuel cell heating units. South Korea is heavily dependent on fossil fuels and energy imports, explains Peter Son. That is why the government is counting on renewable energy sources and energy efficiency, offering tempting subsidies and tax advantages and supporting companies that do research and development in this area. “This means that, in the long term, South Korea is a highly promising market.”



In August 2014, the newest Vaillant sales company commenced operations in Seoul, the South Korean capital.

The market now needs to be developed. In the first phase, the Seoul metropolitan region will be the focal point. “We are going to use the first period to develop our local brand awareness and to improve and stabilise our service quality.” There are already plans for a second phase. The focal point will then be the “second-tier” cities, such as Busan and Daegu in the south of the country.

Peter Son and his team of employees are still working flat out to establish a partner network. “It is very important that we find the right partners that can live up to our expectations and those of our customers.” The intention is to set up showrooms at the partners’ shops. Exhibitions in architecture studios or in sales offices of construction materials suppliers are also imaginable – and, of course, the company’s own customer forum in the suitable surroundings of the Gangnam district, one of the wealthiest quarters in South Korea, well known for its exclusive shops. The perfect environment for the premium segment. The opening is scheduled for September 2015.

The customer target group is clearly defined: The upper middle class and above, and homeowners with a net monthly household income of more than seven million South Korean won (KRW), the equivalent of around 4,800 euros. The customers are between 40 and 60 years old, drive German cars – and love products “made in Germany”. Their greatest concern is safety, especially with regard to gas heating appliances. The desire for comfort – for an ample supply of hot water – is second to this. The ordinary boilers that are currently often operated in Korea are not always able to guarantee this in the hard winters.

Korean customers are generally regarded as highly sophisticated and the market is an ideal testing bench for new products. Peter Son can therefore see another additional advantage: “If we get positive customer feedback in this market, we will also have good prospects in other Asian markets.” This is because Korean customers’ high standards are well known far beyond the country’s borders. “Being successful in South Korea is a strong argument for convincing customers across Asia of the quality of Vaillant products.”

And business in Asia is continuing to grow. In May 2015, Vaillant will open a sales office in Hong Kong – an optimum vantage point for the Southeast Asian region and its foreign, still untapped markets.

↑The Gangnam district in Seoul, the South Korean capital, is one of the country’s most exclusive residential and shopping quarters. This is where the first Vaillant showroom is scheduled to be opened soon.

→In the anniversary year of 2014, the Vaillant Roadshow, complete with hare, stopped in Shanghai and at two other stations in China.



#### ENERGY LABEL IN KOREA



KEMCO, the Korean energy management company, is responsible for issuing the energy efficiency labels that were introduced in 1992. At present, 35 appliances for household use, such as refrigerators, light bulbs, televisions and gas boilers, are classified with grades from 1 to 5 under this system. Products graded worse than 5 may not be sold.





# "China is no entrepreneurial soft cushion ..."

A conversation with Bruno Rudnik, Environmental  
Spokesperson for the German-Chinese Business  
Association (DCW)



Bruno Rudnik has worked for many years in China and possesses intimate knowledge of the country and Chinese economy. He is the owner and managing director of a business consultancy, specialising in clean-tech projects in China and India in the area of renewable energies and energy efficiency.

## → Mr Rudnik, what should everyone know about the Chinese market?

← China should not be perceived as "one" market; China is a multitude of markets. There are enormous regional differences from province to province: Concerning demographics, geography, climatic conditions, progress of industrialisation, and local purchasing power. It's too simplified a notion to think: One pair of shoes – one product X – for every Chinese person. That's not how it works in reality.

## → China is gigantic. What does it take to be permanently successful there?

← China is no entrepreneurial soft cushion, but an extremely dynamic and competitively oriented environment. This constitutes a constant challenge that must be accepted and managed. It's imperative to have a clear definition of what and where one's market is in China. Even a relatively small market in China is quite sizeable when absolute numbers are considered. Further requirements are good local partnerships and the necessary distribution channels.

## → What is the basis of Chinese growth?

← The focal point of investments in the past has been on infrastructure development projects. This was the foremost driver of growth. Massive investments in ports, roads and motorways, railroad lines, and urban development. By now, China possesses a quite well developed infrastructural base. Therefore, the focus will shift to some extent in future. Away from pure quantitative growth and towards a more qualitatively shaped growth. Less growth through investments, more growth through private consumption.

## → Does this mean that China is changing?

← Yes, the growth model and the future model are currently being re-defined. I believe that, at the moment, we are witnessing a real sea change in China, and this shouldn't be underestimated. Average salaries in Shanghai, for instance, grow in double digits year over year. On the one hand, this is a positive development, on the other, it creates an entirely different cost base for companies compared to this time ten years ago.

## → What characterises the Chinese consumer in particular?

← TV sets, dishwashers, mobile phones – these desires have more or less been satisfied. I would say that there is a special affinity for new technologies and the digital society. This is a very, very big issue in China. Moreover, there is a willingness to try out new things. Status symbols are important. China is in general very competitive, not just economically but also in the social domain. Add to that a distinctive brand awareness, for example when it comes to luxury goods.

## → Does this also apply to the area of housing?

← Of course, an apartment is a status symbol for the well-off middle class and therefore in demand. The real estate market almost overheated in the past couple of years. One came close to asking when the bubble was going to burst. But that didn't happen. Admittedly, we are now in the midst of a cooling-off period, but the demand for, say, upgrading one's own quality of life remains.

## → Are consumers becoming more conscientious?

← There exists the middle class that was mentioned earlier. Here are people who want to afford a better lifestyle and make

self-assured purchase decisions. We even begin to see sustainable consumerism ever more often. There are consumers who want to buy organic groceries, energy-efficient and environmentally friendly products. It is rarely the case that a purely ecological purchase decision is made; rather, it's usually a mixture of ecological and economic criteria. The percentage of people that can afford such products may be small. In total numbers, however, that group is certainly growing.

## → In passing you mentioned brand awareness. What brand value does the label "Made in Germany" have?

← "Made in Germany" is an epitome of quality in China, evoking positive associations. Engineering, know-how and superior product quality are the predominant characteristics that are connected with Germany. The European brands push into the market from the top, whilst regional suppliers create pressure from the bottom. This situation is currently very typical. But there is also ever more pride for local products and local brands.

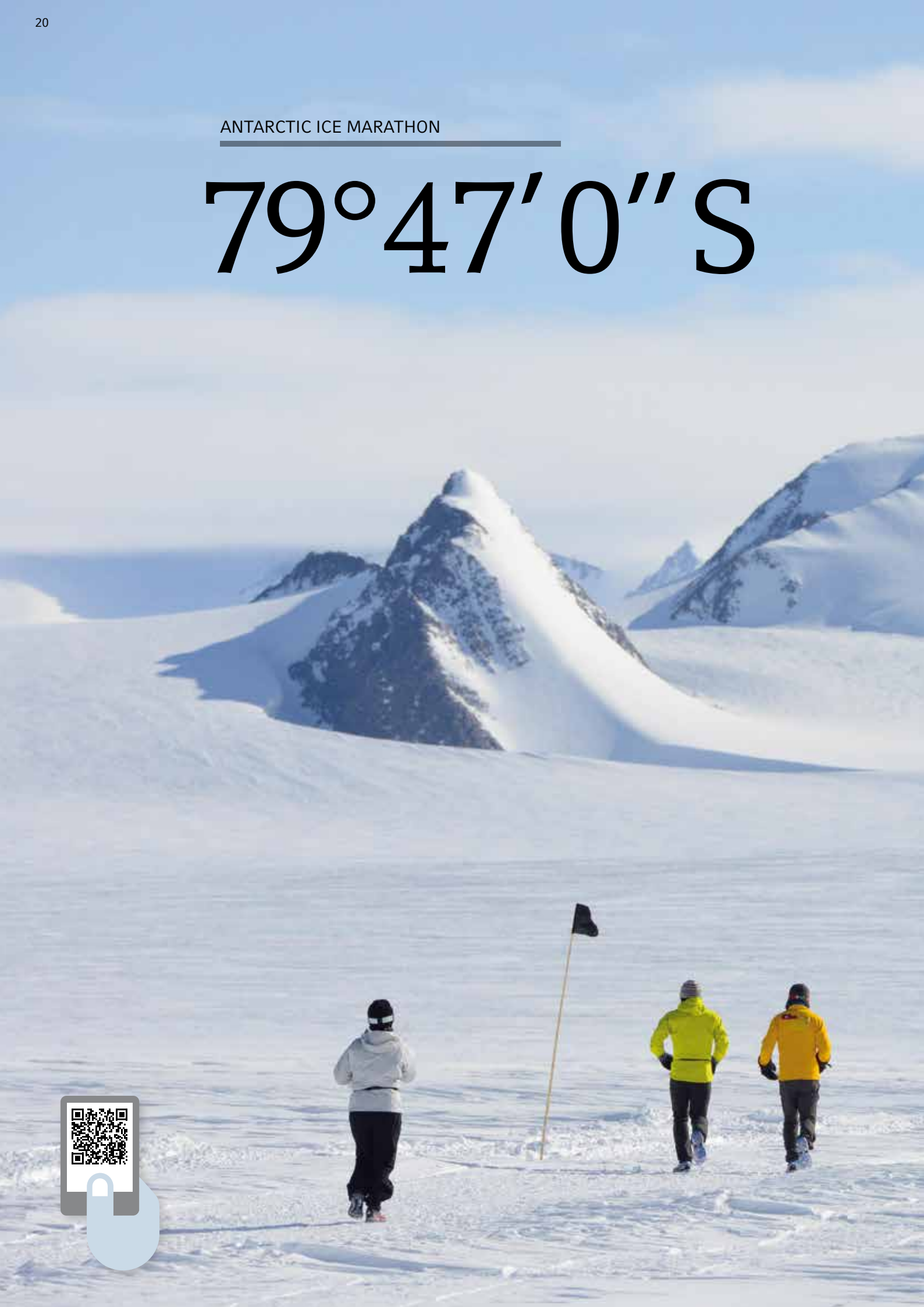
## → Can you give us an example?

← The telecommunications industry provides a very nice example. There, a major Chinese manufacturer of smartphones has replaced within a short period of time, months basically, Apple and Samsung as the market leading suppliers. In other words, we have witnessed a complete overhaul of market realities in a year and a half. This example teaches us that Chinese brands increase in status.

ANTARCTIC ICE MARATHON

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# 79°47'0"S








←↓ Protecting eyes and skin against the intense sunlight is a must. Otherwise, the athletes would run the risk of serious injuries.



## PLACES WORTH PROTECTING

Would you fancy running a marathon in  $-20^{\circ}\text{C}$  weather? No? Well, Friedhelm Weidemann did. Kick-starting the Vaillant-initiated campaign “Places worth protecting”, the northern German ran 42 kilometres through the eternal ice of the Antarctic. In the coldest, windiest, but also sunniest place on Earth, Weidemann completed the Antarctic Ice Marathon on 21 November 2014. Around 50 extreme athletes ran along the base of Union Glacier across one of the most unique natural landscapes on the planet. Weidemann, completely overwhelmed by the extraordinary vastness of the region, immediately recalls what motivated him to run: He wants to draw attention to one of the most beautiful and endangered places in the world. If global warming continues unabated, the polar ice caps will keep melting, spelling the end of Antarctica as we know it.



A man, Friedhelm Weidemann, is running on a treadmill inside a climatic chamber. He is wearing a black Asics jacket with a Vaillant logo, black pants, a black beanie, and running shoes. The treadmill and its handrails are heavily covered in frost and ice. The background shows the interior of the chamber with glass panels and structural elements.

In the climatic chamber of the Vaillant Group in Remscheid, Friedhelm Weidemann undergoes the Antarctica suitability test in his full gear. Where heating units are normally subjected to the most adverse conditions, Weidemann puts his fitness and his running gear to the test. Even in temperatures as low as  $-20^{\circ}\text{C}$ , he is able to work up a sweat. His training partner is the exterior unit of a Vaillant geoTHERM heat pump.





↖↑ The athletes that take part in the Ice Marathon receive their final instructions before the race. There is a significant danger of getting lost in the vast ice desert even after meticulous preparation.  
 ↑ Everything required for the marathon has to be delivered by air and taken away again in the same way. After the event, even dirty snow is hauled away in order to preserve the natural landscape of the Antarctic to be as pristine as possible.



↓→Course marshals ensure that the runners have everything they need. Even though the weather might not encourage it, it is vital that the runners stay hydrated. The body does sweat even in sub-zero temperatures and there is a risk of dehydration during the long run.







Nothing but nature – no houses, no cars, no people, no noise. The awe-inspiring beauty of the Antarctic landscape casts its spell over the runners. On a midsummer's day with glorious sunshine and temperatures of around  $-20^{\circ}\text{C}$ , Friedhelm Weidemann runs some 42 kilometres on behalf of Vaillant and the climate across the coldest, windiest, but also sunniest place on earth.





After almost six-and-a-half hours, ice runner Weidemann is the 18th of some 50 runners to reach the finish line. "That was definitely the slowest, but also the most beautiful marathon that I've ever run," he sums up, exhausted yet proud. He confesses to having felt like an ant on a lonely planet during the race. The loneliness and vastness of the Antarctic are difficult to imagine.

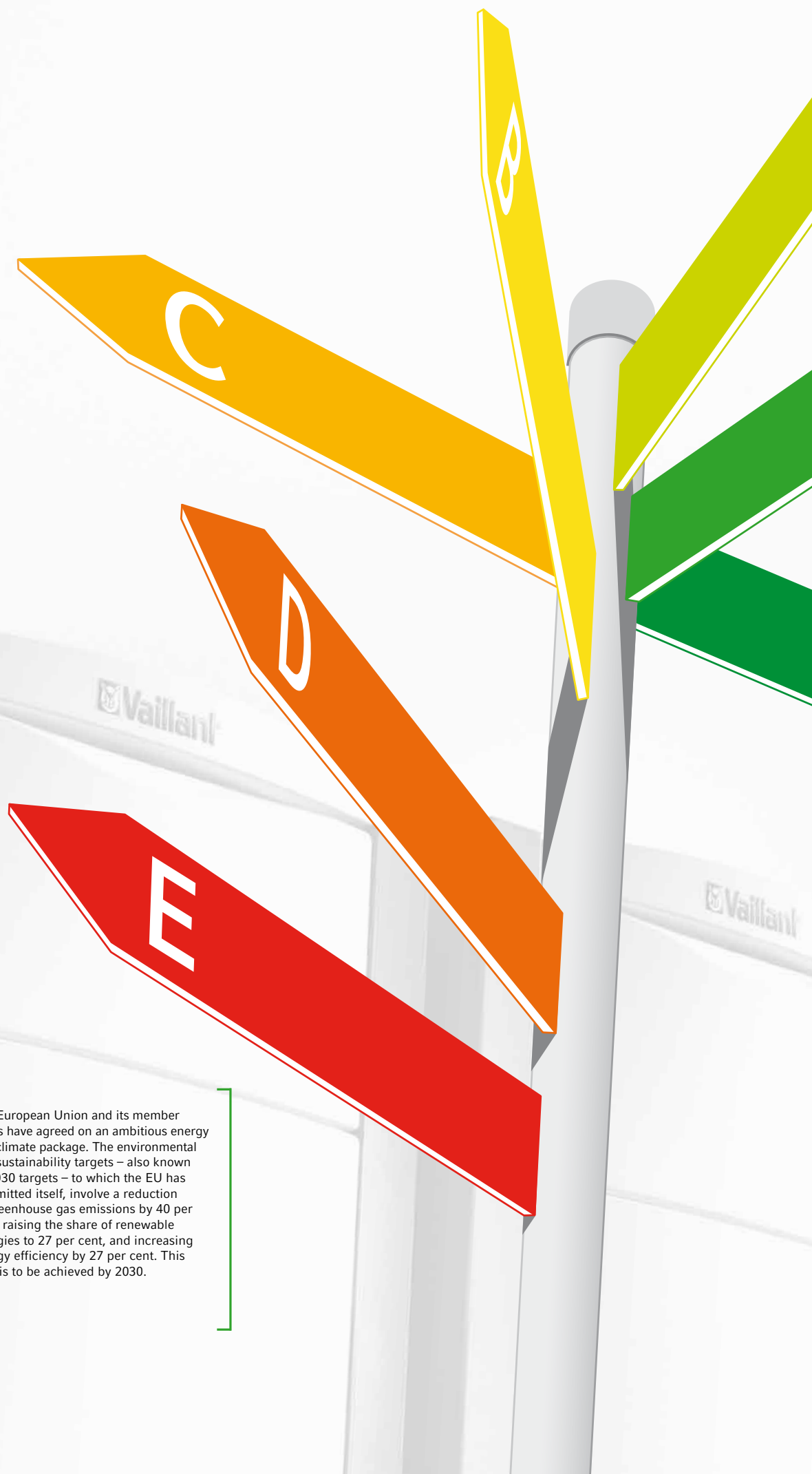







↑ Motivation running high, around 50 marathon runners break through ice and snow over more than 42 kilometres. ← At the end, a jubilant Friedhelm Weidemann throws his arms into the air. Running through the unique landscape is an experience he will never forget.





The European Union and its member states have agreed on an ambitious energy and climate package. The environmental and sustainability targets – also known as 2030 targets – to which the EU has committed itself, involve a reduction of greenhouse gas emissions by 40 per cent, raising the share of renewable energies to 27 per cent, and increasing energy efficiency by 27 per cent. This goal is to be achieved by 2030.





ECODESIGN AND ENERGY LABELLING

# Europe wants more efficiency

Europe is taking another step on its way towards more climate protection and preservation of resources. Very soon, new standards for the energy efficiency of heating appliances will become mandatory throughout the whole of Europe. Products which fall short of the requirements can no longer be sold. Outdated technology disappears from the market. The law applies in all member states in the same way. Brussels will also introduce a new mandatory labelling requirement for heat generators. In future, every consumer will be able to tell the efficiency class from an easily visible label. Aided by the label, every person should be able to directly compare products and make a purchase decision for more efficient appliances on that basis. Manufacturers of especially energy-saving products will benefit from this. At the same time, manufacturers will bear an ever greater responsibility to continuously improve their products. The competition for winning over the customer is getting tougher. The Vaillant Group has thoroughly prepared for this.



**E**ight long years passed since the first discussions of the so-called ecodesign requirements of the Energy-related Products Directive (ErP) and their actual adoption. The process was accompanied by Brussels bureaucracy, technical debate and at times controversial discussions. Representatives from the European Commission were involved, as were consultants, technical experts and numerous associations and industrial companies. In the end, in the year 2013, the outcome was a commitment to the EU's environmental policy targets, on the one hand, while taking into account the complexities of modern building supply on the other. The variety of heating technology begins with a wood-burning fireplace and ranges to highly efficient heat pumps. In between, there are a good dozen more technologies that can also be combined with each other almost without limitations. Developing criteria that allow product technologies to be reasonably grouped together under one directive and on one efficiency scale was a prolonged and challenging endeavor.

"The development of the ecodesign requirements was closely accompanied by the associations. So there was a good exchange of information," remembers Karl-Heinz Backhaus, Head of Politics, Association and Standardisation Management at the Vaillant Group, who accompanied the entire process. "Back in the phase prior to the publication, which was postponed time and again, we discussed how our products would range in efficiency." When the regulations were eventually published in the Official Journal of the European Union around seven years later, this took place almost unexpectedly for everyone involved on an average Thursday, without much advance notice from the responsible authorities. "In 2013, the issue of ecodesign and energy efficiency labels came to the fore. A transitional period of two years began. Since then, a large number of functional areas have been heavily involved in the implementation."

The aim of the ecodesign regulation, as the German Federal Ministry for the Environment points out, is to establish products in the market that provide optimal functionality while using only minimal resources and energy, and producing either no pollutants or only those absolutely necessary for their functionality. Efficiency and environmental re-

quirements are added to traditional product requirements such as cost-effectiveness, safety and reliability. "The European ErP directive provides a legal framework which specifies, in detail, its implementation on a national level," Backhaus explains. This means: "Proof must be provided for the affected products that they fulfil the efficiency and environmental criteria." Only products that are compliant with the regulations receive CE certification and can therefore continue to be sold on the single European market.

One of the first countries to successfully demonstrate how environmentally friendly products can by law become standard on the market is Japan. The highly technologically advanced country was the first to implement the "top runner" concept. "Top runner" means that the best and most efficient product – for example, a dishwasher with particularly low water consumption or a highly energy-saving television set – is ultimately denoted as a reference for all rival products. Within a certain period of time, generally following a transitional period of several years, the reference product sets the minimum benchmark for products which can be brought to market as of then. This effectively means that suppliers of advanced technologies will gain a competitive edge, leading in turn to a greater market share of ecologically advanced products. More than 50 countries have now established their own efficiency and environmental standards. In the EU, this is a mix of the minimum efficiency standards from the ErP directive,

The new European energy labelling regulations demand that manufactures of heating appliances and hot water appliances provide an energy label for their product.

The product label must be clearly visible at the point of sale, in all sales-related situations and in all product advertising.

There is more than one type of label. Depending on the product technology, the label design may vary and may contain different information. In total, there will be more than a dozen labels on the market in the future.

All labels have in common that efficiency classes will range from A++ to G for heating appliances and combination heaters, and from A to G for domestic hot water appliances.

#### ECODESIGN VS. ENERGY LABEL

The **Energy-related Products Directive (ErP)** – also called the **ecodesign regulation** – is part of the EU's environmental policy framework. The legislation defines mandatory efficiency requirements for energy-related products that determine market admission. To educate customers and promote energy-efficient products, the EU also passed an additional **Energy Labelling Directive (ELD)**. This directive demands the display of mandatory energy labels which show the energy efficiency class of a product.



## 1 GENERAL INFORMATION

The top line contains the name of the manufacturer and the precise product description.

## 2 RADIATOR SYMBOL

The radiator symbol indicates that this is a space heating device. If the device is also used for providing hot water, a separate efficiency scale is also displayed.

## 3 NOISE EMISSIONS

The label contains information about the appliances' operating volume inside and outside of the building. This information is important in the case of external units for heat pumps, for example.

## 4 LOAD PROFILE SYMBOL

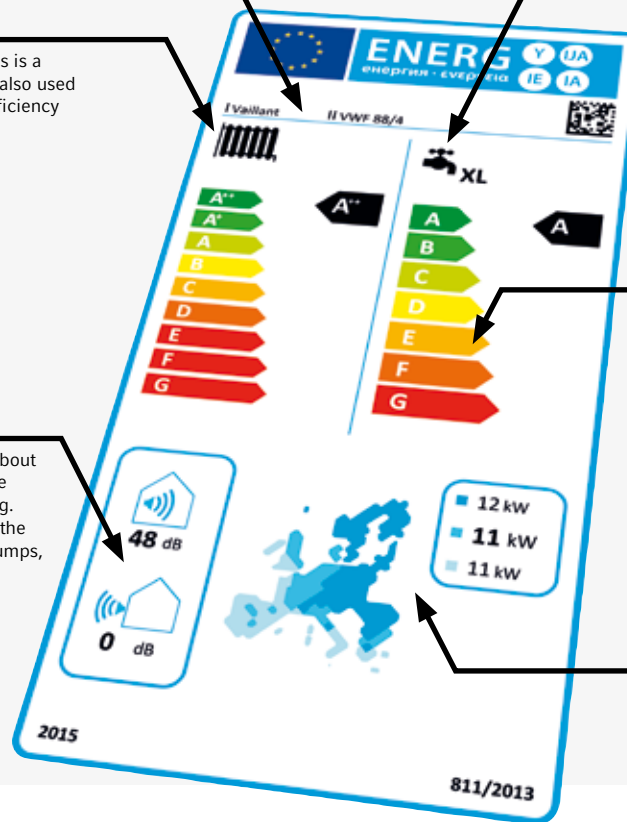
The spigot symbol indicates that this is a device for producing hot water. In total, there are nine different load profiles for hot water systems. The spectrum ranges from 3XS to XXL.

## 5 EFFICIENCY CLASSES

Heat-generating appliances are graded on the same scale. There are no separate scales for different technologies. The efficiency classes for heating devices range from A++ to G. The scale for hot water appliances ranges only from A to G. Combi appliances receive two ratings.

## 6 OUTPUT AND REGION

Efficiency may vary depending on the output class and the climate zone in which the device is operated. The label displays both.



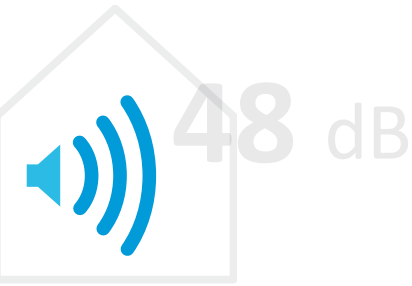
mandatory energy labelling requirements and various product-specific, voluntary environmental declarations.

In September 2015, the ecodesign requirements will enter into their mandatory phase. This marks the end of a two-year transitional period. For the Vaillant Group and other manufacturers, this means that all new appliances introduced after 26 September 2015 must be certified in accordance with the requirements established by the directive. Existing product ranges must also be examined for compliance with the requirements by this date. In addition to the measurements that were required for market admission before, various new data will need to be collected. In the future, each product will come with technical documentation in the form of a data sheet. Furthermore, the manufacturer must provide an energy efficiency label with the product. The label must be clearly visible on the appliance, at all points of sale, and in all sale situations. The principle and appearance of the label is already well known to consumers from domestic and electrical appliances. The efficiency classes range from green A++ to red G. The label can also include additional product-specific information such as the output class, annual consumption or noise emissions during operation. In 2019, the scale will be adjusted once more. In addition to an A+++, which will mark the new upper limit, the lowest grading will be limited to the efficiency class D.

"It posed a significant challenge for us that a lot of the data necessary for documenting ecodesign compliance had never been compiled in the prescribed form before," explains Dr Christian Rosier, who, in close

cooperation with the Group's Quality department, has been the project manager responsible for ecodesign implementation. "This was made even more complicated by the fact that, at the time of the introduction of the requirements, the measurement and test specifications had not yet been fully defined." In fact, certain high-efficiency technologies and hybrid systems still lack binding definitions of test methods to enable the precise, and thus comparable, determination of an appliance's efficiency class.

Rosier adds: "A high level of complexity was due to the fact that we are not talking about three or four products, but rather several thousand item numbers that need to be adapted. In the medium term, this means that around 80 or 90 per cent of the product range is affected." For certain products, well over a hundred different single measurements are involved in determining the efficiency class. Taking the entire product range of the Vaillant Group into account, the vast quantity of individual data presented a significant challenge. To this end, the certification project team specially developed an efficient data management process.



**I**mplementation of the ErP directive and the energy labelling directive is demanding from both a technical and a staffing standpoint. "In addition to the operational activities in the development department, logistics, production and quality management, the program management responsible for the product range, together with the marketing department, must form the link between the head office and the markets and sales companies," explains Christian Rosier. Sales and marketing need to make numerous changes, ranging from the redesign of product exhibitions to revisions of all sales documentation and price lists. "This affects almost all facets of day-to-day operations and commercial business." Across

#### WHAT PRODUCTS ARE AFFECTED?

Each product category has its own special catalogue of requirements which is specific only to this group of products. Known product groups for which requirements have already been



established include refrigerators, dishwashers and television sets. Heating, ventilation and air-conditioning technology products that are now affected by ecodesign regulations include heating and combi appliances, water heaters, air-conditioning units and heat pumps. Ecodesign requirements for ventilation systems and small solid fuel systems are currently being prepared.

Europe, several thousand sales representatives need to be ErP-trained, including downstream training and services for wholesalers and installers, as well as information and consultation for end users.

The latter remain an unknown factor. The small amount of consumer research available indicates that customers in different countries may differ in their appreciation for the efficiency class of heating units or hot water systems. While it is assumed to play a relatively large role in purchase decisions in Italy, there might not be any noticeable impact on demand in the United Kingdom. Experience from other product groups, some of which have already had efficiency labels for some time, shows that the product itself also matters greatly. In the case of white goods, the efficiency class is very important for purchase decisions, but it is practically irrelevant for buying a car.

One thing that is certain, however, is that the new energy label will promote greater environmental awareness in the medium term. This is a positive sign with regard to private energy consumption for heating and hot water supply. After all, the biggest factor in energy consumption and associated CO<sub>2</sub> emissions is still domestic heating.

**J**udging by the outcome, ecodesign implementation paid off for the Vaillant Group. It turned out that the company offers leading products with the best energy efficiency classes across all technology seg-







ments. In the case of heat pumps, the current systems already meet the more stringent requirements in place for 2019 and thus fulfil the prerequisites for an A+++ rating. In the range of heat storage cylinders, the further reduction of heat loss results in the required level of efficiency for an exceptional A+ rating. This category, however, will not be on the label when the label is introduced. The combined heat and power stations receive an A++ rating. Modern condensing boilers, in combination with solar heat or an intelligent control unit, end up in efficiency class A+.

It is also true, however, that despite its positive effects, the product label alone cannot entirely replace expert advice. The label is limited in terms of the information that it can provide. There are a number of reasons for this. Unlike in the case of refrigerators, washing machines or television sets, the label is not restricted to one product group. Instead it includes everything from conventional non-condensing boilers to the latest heat pumps and compares all these very different technologies on one single scale. It may be possible to quickly work out how much money down to the precise euro and cents one refrigerator can save as a result of lower annual consumption compared to a different model. But this is not equally simply done with a heating appliance. The label also includes various types of energy which have significantly different costs. Therefore no cost savings can be determined from the energy efficiency class. In addition, heating appliances do not operate equally efficiently in every building. House and technology need to be matched. Individual usage behaviour plays an important role. And one should bear in mind that the whole of Europe has a variety of different climate zones, from Scandinavia in the north to the Mediterranean in the south, and the temperate regions in between. It is particularly in the case of heat pumps and solar thermal systems that climatic conditions lead to different efficiency classes.

#### WHAT ENERGY LABELS DO ALREADY EXIST?

Energy efficiency labelling was first introduced in the 1970s with labels for electric ovens. Since then, dozens of laws and regulations have established labelling requirements across Europe. More and more product groups and features have been incorporated over time. In the recent past alone, this includes standby consumption of electrical appliances (2008), satellite receivers,



light bulbs, power adapters, electric engines, televisions, refrigerators and freezers (all 2009), wine coolers, washing machines and dishwashers (2010), fans (2011), and lately heating appliances, hot water systems and kitchen hoods (2015).

It always requires a holistic approach to make the right choice for the most energy-efficient technology. In the vast majority of cases, this can only be ensured through an appropriately skilled expert. It is consequently worth obtaining this advice.

“Despite the costs and huge effort that the implementation means for us as a company and for the industry as a whole, we welcome the ecodesign requirements and the energy label,” says Dr Jens Wichtermann, Director of Corporate Communications, Sustainability Management and Politics, summarising the position of the Vaillant Group. “The intention of the European Commission to promote energy-efficient products in the market and thus do away with less efficient technologies makes good sense. This is also consistent with the strategic direction of our company and with the goal of continuing to make our products ever more efficient and more environmentally friendly for our customers.” Today, efficient and green technologies account for 62 per cent of product sales at the Vaillant Group. A declared sustainability goal by 2020 is to increase this sales percentage to as much as 80 per cent.

**E**nergy efficiency as a core business and environmentally oriented product development will present ever greater economic opportunities in the future. The ecodesign regulations and the energy efficiency label contribute to this. “Our goal is to offer the most efficient products on the market,” explains Jens Wichtermann in conclusion. The replacement of outdated technologies creates new growth opportunities for heat pumps, for system solutions involving renewable energies and for new technological developments such as fuel cell heating units. A new impetus for increasing the refurbishment rate of the energy supply of buildings can provide fresh momentum for the advancement of a real heating revolution in Europe. Since 2008, the amount of renewable energies used in the provision of heat to homes across Europe has been growing at a slower rate than was the case, for example, ten years ago. This is set to change again.





# VAILLANT WORLD CUP 2014

It was an event that showed the size, the colourful nature and the diversity of the Vaillant Group. Colleagues from many different countries, cultures and all parts of the company came together to stage the first Vaillant World Cup – based around fairness, respect and passion. As part of the numerous activities held to mark the 140-year anniversary, some 200 players from 17 countries, their supporters in tow, met in Germany for a unique football tournament dedicated to a good cause.







The teams vying for the World Cup came from every corner of the Vaillant Group to converge on the famous football city of Dortmund on Friday, 23 May 2014. Getting to know all the colleagues from around the world was everybody's first item on the agenda. The teams had prepared well for the occasion. The fan equipment included wigs, hats and flags in national colours, as well as handmade costumes and even full-body hare outfits. The live draw for the first round, the group stage, was met with great excitement and constituted the highlight of the evening.





The day of the tournament began early with a quick warm-up. Then, the first ball was kicked and matches started on five pitches at once. At least four supporters rooted for each team, creating a vociferous atmosphere off the pitch. Joining in with them were a large number of Vaillant employees and their families in the stands, eager not to miss out on the tournament as spectators. All matches were played in mixed teams, five-a-side, with unlimited substitutions. The tournament featured some real classic football encounters, such as the Netherlands versus England and Germany versus Hungary.









The teams gave their all, both on the pitch as players and off the pitch as fans. After 36 games full of commitment and 345 goals scored, there was a deserved winner at the end of the day. In an exciting and hard-fought final, the new Vaillant World Champion, Belgium, defeated a strong English team by a narrow margin. Turkey took third place. The award ceremony was then held in the largest German football stadium, the home of Borussia Dortmund. In addition to the tournament winners, the Austrian team received the special award for Fair Play and the Spanish team took home the Best Supporters award for creating the most cheerful atmosphere.





There was much to experience at the Vaillant World Cup – fun, a great time with friends and colleagues, and the knowledge that the whole event was dedicated to a good cause. Because for every goal scored, a donation was made to SOS Children's Villages. The tournament and other initiatives from the numerous anniversary events managed to raise a grand total of €25,000 for the global aid organisation with which the Vaillant Group has been maintaining a partnership since 2013.

# FUEL CELL



Fuel cell heating systems are the most efficient technology for supplying buildings with energy on the basis of natural gas.



## FUEL CELL

# The goal in sight

THE VAILLANT GROUP IS WORKING INTENSIVELY ON THE INNOVATIVE TECHNOLOGY OF FUEL CELL HEATING. IN FIELD TESTS, THE TECHNOLOGY IS ALREADY PROVING ITSELF TO BE RELIABLE AND SUITABLE FOR DAILY USE. EVEN SO, THERE STILL REMAINS SOME POTENTIAL FOR IMPROVEMENT. MEANWHILE, THE VAILLANT GROUP HAS PRESENTED A SIXTH-GENERATION PROTOTYPE. SERIAL PRODUCTION IS SCHEDULED TO FOLLOW SOON.

It is a marathon over the full distance, with a straining last few kilometres but also with a worthwhile goal ahead: The market launch of the first fuel cell heating unit. A great deal of development work has gone into the project, a lot of patience, determination and perseverance. The result: The Vaillant Group has now presented the sixth appliance generation – the next stage of development. This time, the change compared with the preceding models is evident from its appearance alone. The compact, floor-standing appliance combines all of the components in a single casing. For the first time, a condensing unit is integrated in addition to the fuel cell module. Only a storage tank still needs to be added. “The advantages are plain to see. The appliance now takes up less space and, above all, is much easier to install,” explains Alexander Dauensteiner, Head of Technology Portfolio Development at the Vaillant Group. The new system is installed in just a few hours, which not only saves time but also, and even more importantly, cuts costs. That is the key factor: Reducing costs so that this innovative product can soon be offered at a marketable price. The technology itself is ready for the market now.

Applying the combined heat and power (CHP) principle, fuel cell systems generate electricity and heat simultaneously. This occurs in the form of a chemical reaction for which, initially, a reformer in the fuel cell appliance converts natural gas into hydrogen-rich gas. Inside the fuel cell, this reacts with oxygen from the air. Electricity and heat are generated as a result. As there is no mechanical process taking place inside the appliance, this happens almost in complete silence and without vibration.

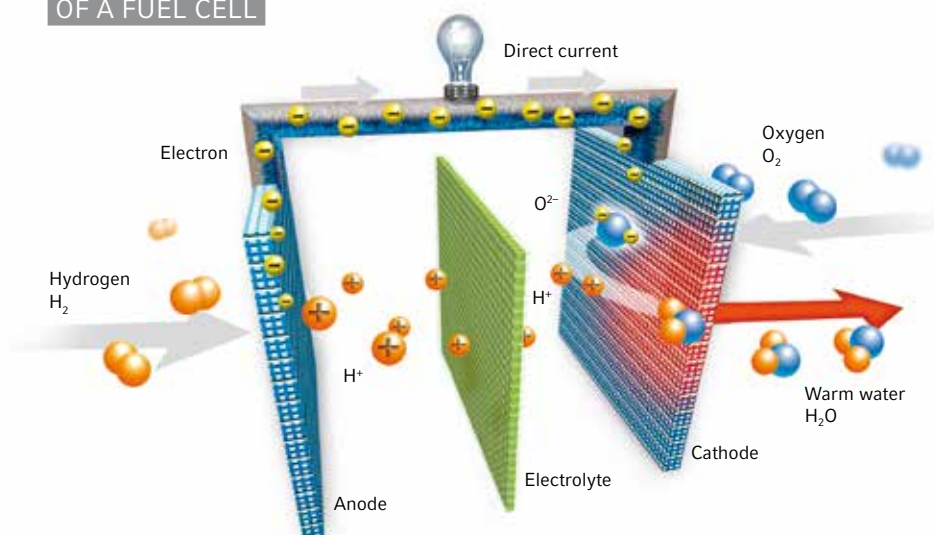
The system’s output has been designed to deliver around one kilowatt of electricity and two kilowatts of heat. For peak load periods in the cold season, the condensing unit is always at the ready. In terms of electricity generation, there are hardly any losses, which stands in contrast to generation in conventional power plants. Overall output efficiency is over 92 per cent, broken down into 32 per cent electrical and 60 per cent thermal energy. It is the most efficient technology for supplying buildings with energy on the basis of natural gas.

Simple – that is a basic principle. “We want to develop a robust appliance,” says

Dauensteiner. After all, the Vaillant Group is the only manufacturer that has experience in all of the major fuel cell technologies. In 2008, it was decided to use the solid oxide fuel cell (SOFC) instead of the available alternative, the so-called PEM fuel cell. The latter needs pure oxygen that must first be generated in the appliance; this requires elaborate technology. The solid oxide fuel cell does not – a clear advantage. The disadvantage: SOFCs are still more expensive than the PEM cell. The intention is that the additional costs should eventually be offset by increasing production volume.

Besides the development work, which is subsidised by the German Federal Ministry for Economic Affairs and Energy, the ongoing field trials do play a crucial part. Within their framework, around 200 appliances are currently in operation. Together they accumulated their millionth operating hour last year. As part of Callux, Germany’s largest practical test for fuel cell heating appliances intended for use in residential buildings, Vaillant is field-testing 120 fourth- and fifth-generation appliances. The project has been running since 2008 and is supported by partners from the energy and heating in-

## FUNCTIONAL PRINCIPLE OF A FUEL CELL



A fuel cell always consists of two electrodes – the anode (negative pole) and the cathode (positive pole). The poles are separated by an ion-permeable ceramic electrolyte. If hydrogen is added to the anode and air is added to the cathode, oxygen ions migrate through the electrolyte to the anode. At the anode, the oxygen reacts with the hydrogen to form water. The resultant products are heat and direct current, which can be converted into alternating current.

dustries as well as by the German Federal Ministry of Transport and Digital Infrastructure. With very good results.

The first practical experiences that were collected have already been incorporated into the fifth generation. The generation went into pilot production in March 2013 at the plant in Remscheid, where the Group's headquarters are located. In comparison, the new units were already considerably more compact, about 60 per cent cheaper to produce, and had a higher electrical efficiency than their direct predecessor models.

With this fifth appliance generation, the Vaillant Group then joined the pan-European practical test ene.field in 2014. By the end of the year, 66 appliances had been installed in the homes of end users. By the autumn of 2015, all of the scheduled 150 appliances should be installed, providing heat and electricity for single- and two-family houses of customers in Germany, France and Austria. This means that Vaillant is keeping right on track with the ene.field timetable. "We have sold all 150 appliances directly; demand continues unabated and is greater than we can currently deal with," says Dauensteiner.

Every appliance used in the field trials is monitored and provides the developers with valuable operational information. "The data from the field tests is allowing us to make further improvements," ex-

plains Jochen Paulus, Head of Technology Development Fuel Cell. This concerns, to choose one example, the fine-tuning of the control unit in the energy manager. The energy manager helps the user with some important decisions as well as, for instance, proactively suggesting a reduction in output when there is less need for heat during the summer. "This is how we ensure that the appliance can keep running for as long as possible, which results in a higher electricity yield for the customer," says Paulus. This is possible because fuel cell heating appliances can have their output modulated downwards stage by stage, unlike almost all motor-driven CHP systems. The average run time of the appliances installed to date as part of Callux and ene.field is more than 6,000 hours per year. Putting this into perspective: A year has 8,760 hours.

Moreover, the trials allow for conducting targeted tests with the appliances in the field. It is possible, for example, to ascertain systematically how many start-stop procedures the appliances can tolerate without problems. "The experience gained is positive in every respect. The level of reliability, in particular, is very good. We are nevertheless aiming to increase it further before the market launch," reports Paulus. In this area, too, the findings from the field trials are helpful.

Everything is already going smoothly for Kurt Zügner in Germany's Allgäu region. A fuel cell heating unit was installed at his house, where he lives and runs a business, in August 2014. "The fuel cell heating unit is as quiet as a whisper. It works excellently and without a single day's interruption," he reports. Mr Zügner is an engineer in the field of building technology and has been following the development of the fuel cell for 15 years now. He has great expectations for it. Such as optimal cost-effectiveness and substantially lower maintenance costs compared with conventional heating appliances, for example. When he finally heard about the possibility of becoming one of the first private owners of a fuel cell heating system, his decision was emphatic: "I want that system!" Of course, he also has a professional interest in it, with the environmental aspect naturally playing a significant part as well. The technology is the most efficient use of valuable primary energy, Zügner says. But before recommending it to his customers, he wanted to test it himself.

"You have to learn to handle the system sensibly," reports Wolfgang Seidewitz from Schildau near Leipzig. He, too, is one of the fuel cell pioneers. "If you use the washing machine, dryer and stove one after the other rather than simultan-

**ene.field**★

**callux**  
Domestic fuel cell practice test

Callux is Germany's largest field test for fuel cell heating systems intended for single- and two-family houses. The project is supported by partners from the energy and heating industries as well as by the German Federal Ministry of Transport and Digital Infrastructure. In the European subsidised project ene.field, nine fuel cell heating appliance manufacturers are testing all of the commonly used fuel cell technologies in a practical trial. This involves installing up to 1,000 units in residential buildings in twelve EU member states. The subsidised project ene.field is regarded as a cooperative flagship project for the marketing of stationary fuel cell heating units in the low output range.



ously, the self-generated electricity can be used a lot more effectively,” he says. He has been using a fuel cell heating unit in his single-family house since June 2014, likewise within the scope of ene. field. The ceremonial inauguration was even attended by Saxony’s Minister for Economic Affairs, Labour and Transport, Sven Morlok, and representatives of the municipalities. There were reports about it in the newspapers. It was an important event. “Although there are only two of us in the house, we consume as much energy as a family of four,” laughs Seidewitz. A greenhouse and the pump for the garden pond certainly make their presence felt on the energy bill.

His interest, too, can be explained partly by his occupational background. Seidewitz is a systems engineer and has a fascination for the innovative fuel cell technology. This drove him to search long and hard for empirical data from fuel cell users – to no avail. Now he records the performance data from his own appliance in a table every day. “I want to see what I consume and what I generate. In the winter months from December 2014 to February 2015, we were able to cover 83 per cent of our electricity demand with the fuel cell heating unit,” he reports with satisfaction. “For my wife, Jutta, in particular, independence from the power suppliers and from increasing prices is important.” Wolfgang Seidewitz is firmly convinced that this is the technology of the future. “Otherwise I wouldn’t have bought it.” The system’s effectiveness and efficiency have convinced him. In his view, the technology has an important additional benefit: “Fuel cells instead of building new power plants and high-voltage transition lines,” is how he summarises it.

Wolfgang Seidewitz and Kurt Zügner are just two of around two hundred convinced fuel cell trailblazers. As the ongoing field tests continue, the technology is getting a little closer to readiness for serial production and closer to the market every day. The next steps have already been determined. “What we need to do is to increase the production volume, establish supply chains, industrialise the technology and, thus, ultimately offer it at a reasonable price,” summarises Alexander Dauensteiner as he looks ahead to the challenges still to come. A little bit of road still lies ahead. The last few kilometres of a marathon.



The process of generating electricity and heat in the fuel cell heating appliance requires hydrogen and oxygen. The oxygen is taken from the ambient air. The hydrogen is generated through the preparation of natural gas into a hydrogen-rich fuel gas in the heating unit. Organic natural gas, too, can be used to further improve the environmental balance.

Fuel cell heating units convert chemically bonded energy directly into electrical and thermal energy. In doing so, they basically use reverse electrolysis, as hydrogen naturally reacts with oxygen to produce water.

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