

Hoval

The Hoval Group magazine | 01 | 2021

insights



We're right on course
for the future



Dear readers,

After living through the pandemic for more than a year and several lockdowns, we are all hoping that life will soon start to resemble something close to normality. As we reflect on the changes we have had to get used to over the past year, it is clear that it is not only social interaction that has transformed. Due to restrictions relating to COVID-19, progress in digitalisation has accelerated significantly. Recently, we have also seen a shift in demand in the heating market, the extent of which would hardly have been imaginable some months ago.

For how many years, or indeed decades, has the industry been talking about the backlog in upgrading heat generators in existing buildings? Well, this all appears to be changing – particularly in Germany, Switzerland and Austria, but increasingly in other countries too, there is much greater momentum in terms of modernisation. A trend of green renewal has reached the heating market. Alongside greater awareness of sustainability brought on by the pandemic, new regulations and subsidies are also playing a significant role. The amount of funding available in some countries would have been unthinkable years ago. The EU Commission also wants to invest heavily in the European Green Deal, with plans to allocate a staggering sum of one trillion (1000 billion) euros to green investments for a climate-friendly transformation of the economy. While it is not just the heating and air-conditioning market that these investments are focused on, this sector does represent a central pillar of the Green Deal.

We would all like to live in a world where it is easy to distinguish between climate-friendly and climate-damaging technologies. However, this distinction is often quite blurred, which is why, in this issue of Insights, we are taking an in-depth look at issues relating to reducing CO₂ emissions. One thing is clear: a greater diversity of technologies is needed to achieve the goal of reducing CO₂ emissions.

While many countries recommend heat pumps, wood pellet boilers or district heating for single-family homes, we must not overlook solutions such as gas boilers that use climate-friendly biomethane and hydrogen. After all, a gas boiler doesn't always have to be a fossil fuel appliance, and electricity is not automatically green. It may be surprising to learn that a gas condensing boiler in China, for example, causes less CO₂ pollution than an air/water heat pump.

In April 2021, we unveiled the new generation of our already legendary UltraGas® boilers. UltraGas® 2 achieves significant CO₂ reductions, particularly when installed as part of a modernisation project. It is ideal for bivalent operation with heat pumps or wood pellet boilers and can, of course, also run on renewable biomethane. In the near future, it will also be approved for use with hydrogen. We are convinced that, thanks to its many benefits, UltraGas® 2 offers tangible added value for our customers, as you will read in this edition of Insights.

Above all, Hoval stands for the people who work tirelessly with and for our customers. It is a team with a high level of expertise that is passionate about providing a reliable service to our customers. Be sure to read our colleague, Phil James', fascinating and somewhat surprising account of his experiences.

The next few months will probably continue to be defined by a high degree of momentum and uncertainty. The massive changes in the pattern of demand for our products, plus the turmoil in the procurement market for raw materials and microchips, are currently posing a challenge that reaches beyond our industry. Nevertheless, it is the positive aspects that clearly prevail. We operate in an extremely exciting sector with a lot of potential and there are promising new developments in the pipeline. Climate change continues to be one of humanity's greatest challenges, and will remain so long after COVID-19 has run its course. It is hard to imagine a more thrilling industry to work in.



Peter Gerner,
Hoval Group Senior Management
Co-CEO

LEGAL

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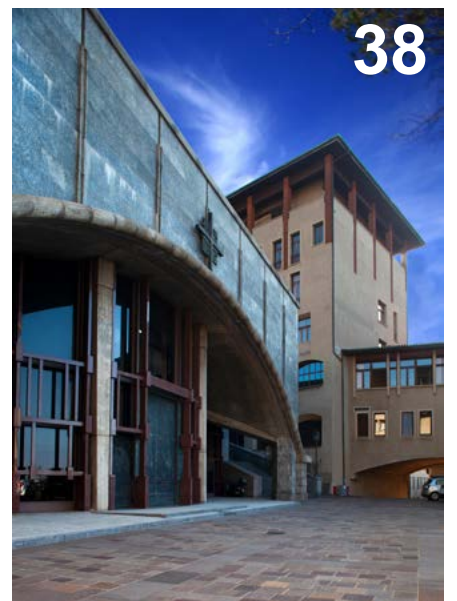
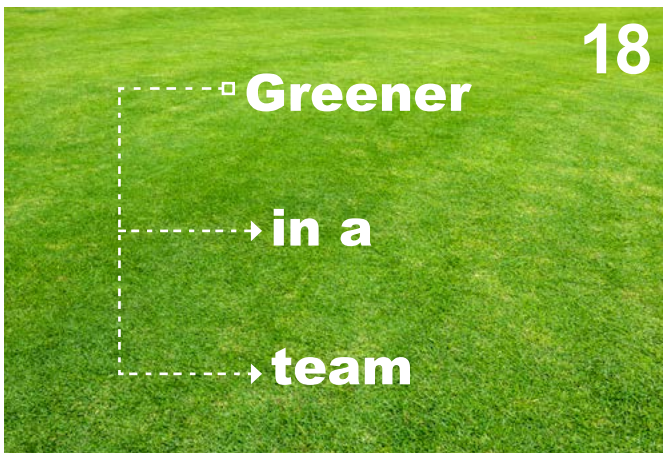
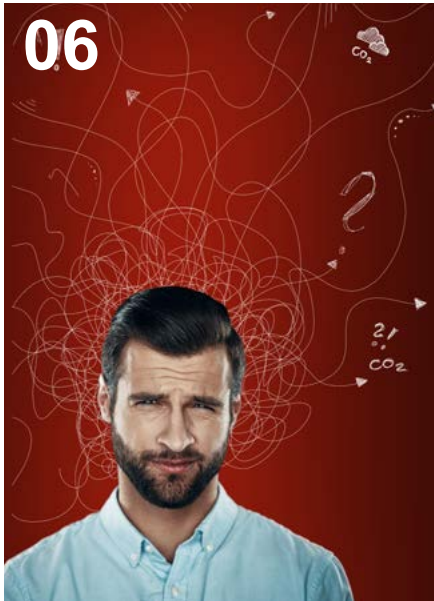
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THREE QUESTIONS ABOUT CO₂

You will be hard pushed to find anyone who doesn't have their own opinion on climate change, CO₂ and the greenhouse effect. However, when we discuss these issues and make decisions about them, we often lack key fundamental knowledge and comparative data. Hoval explored the three top questions on these issues and made some interesting findings.

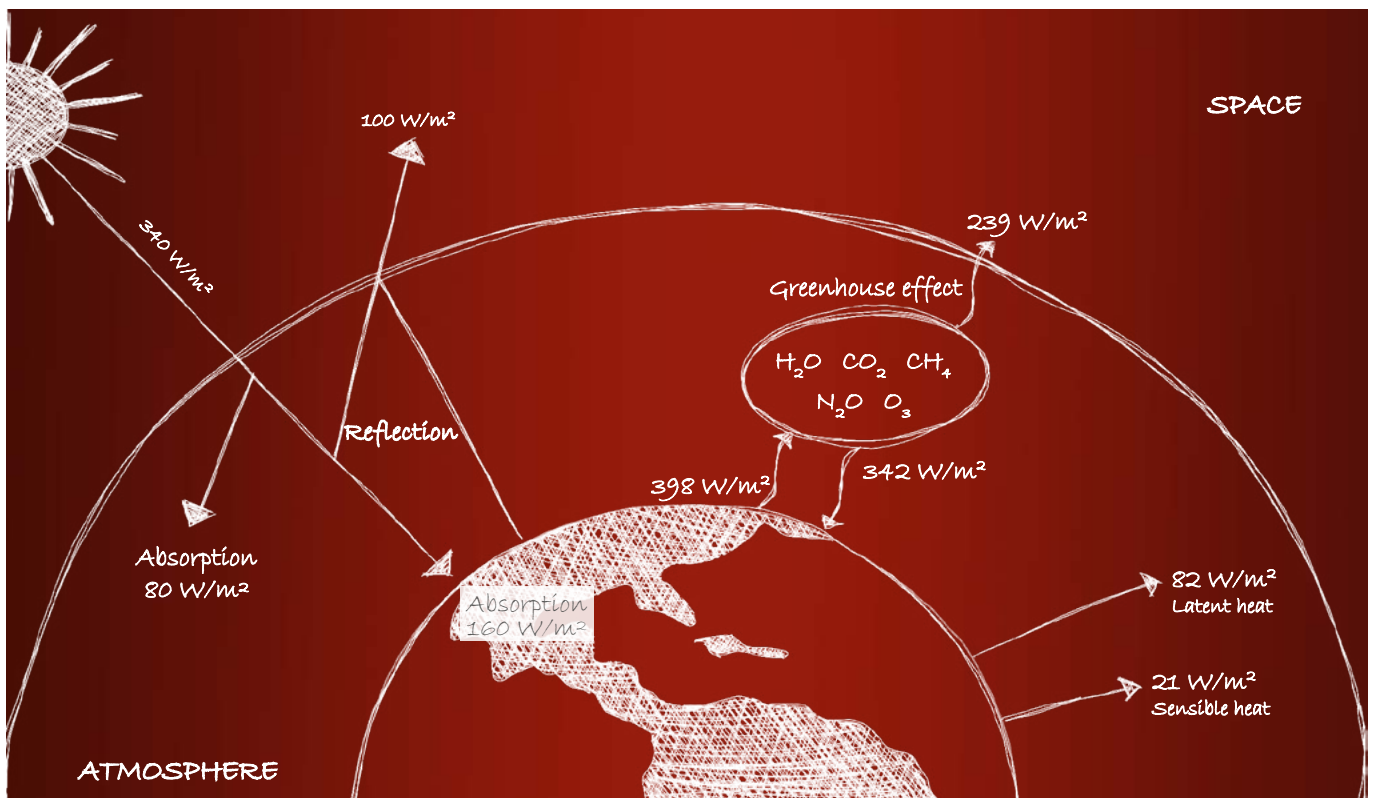
“I must admit that, as an engineer, I was quite sceptical for a long time”, says Stefan Müller, Director of Product Management, Heating Technology at Hoval. “However, for some time now, science and scientific modelling have been producing relatively clear and transparent facts and figures that prove the influence of man-made greenhouse gases on the greenhouse effect.”

Stefan Müller regularly researches reliable evidence on the influence of CO₂, applies it to his specialist area of heating technology and presents objective data to assist decision-making in his field.

Is CO₂ to blame for climate change?

The Earth’s temperatures have been systematically recorded since 1880. By 2016, the average annual temperature had risen by 1.1°C. In 2018, it was found that the 20 hottest years on Earth had been the preceding 22 years. Global warming is accelerating and the reason for this lies in man-made greenhouse gas emissions, principally carbon dioxide (CO₂), which in itself is harmless.

Solar radiation and the natural greenhouse effect are responsible for the climate system on our planet. The Earth’s surface absorbs about half of the solar radiation and radiates it back as long-wave heat radiation. This heat radiation is then initially absorbed in the Earth’s atmosphere by natural greenhouse gases and clouds, and then distributed as energy partly into space and partly onto the Earth. This creates a build-up of heat that is similar to what occurs in a greenhouse, hence the name of the effect.



The greenhouse effect describes the effect of greenhouse gases in the atmosphere on the temperature of the Earth’s surface. Source: wiki.bildungsserver.de



Natural greenhouse gases

The greenhouse effect is caused by water vapour (H₂O, found in clouds, for example), carbon dioxide (CO₂) occurring in nature, man-made methane (CH₄) caused by natural decomposition, nitrous oxide (N₂O, also known as laughing gas) from soils and oceans, ozone (O₃) and other factors.

This is the natural greenhouse effect that makes life possible on Earth. In addition to this, however, there is what is known as the anthropogenic greenhouse effect – in other words, the man-made greenhouse effect.

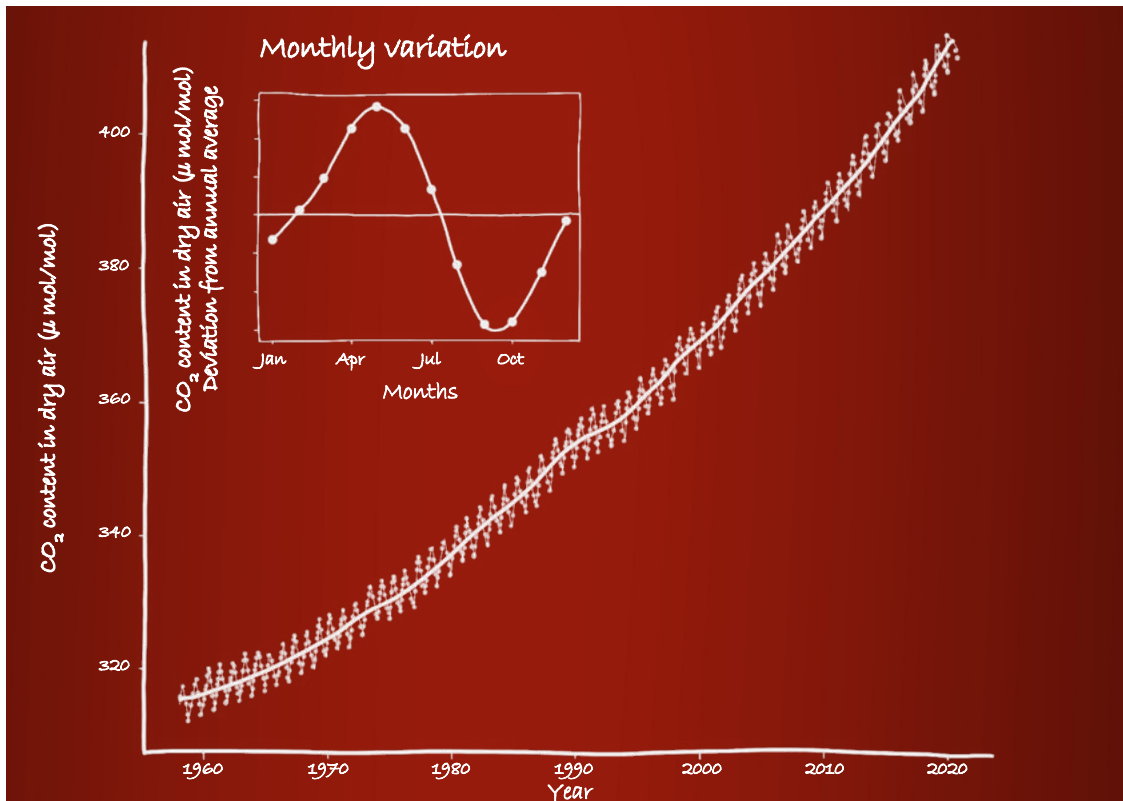
The natural greenhouse effect became intensified because humans were producing an increasing amount of additional and powerful greenhouse gases through burning fossil fuels, resulting in global warming and climate change.

A scientific milestone

A scientific milestone in proving man-made climate change is the use of the Keeling Curve. This graph shows atmospheric CO₂ levels measured by the Mauna Loa Observatory (in Hawaii) starting in 1958. The CO₂ level fluctuates in the course of the year, but rises steeply overall. Over time, the increase in CO₂ levels has also been recorded by other systems, including satellites.

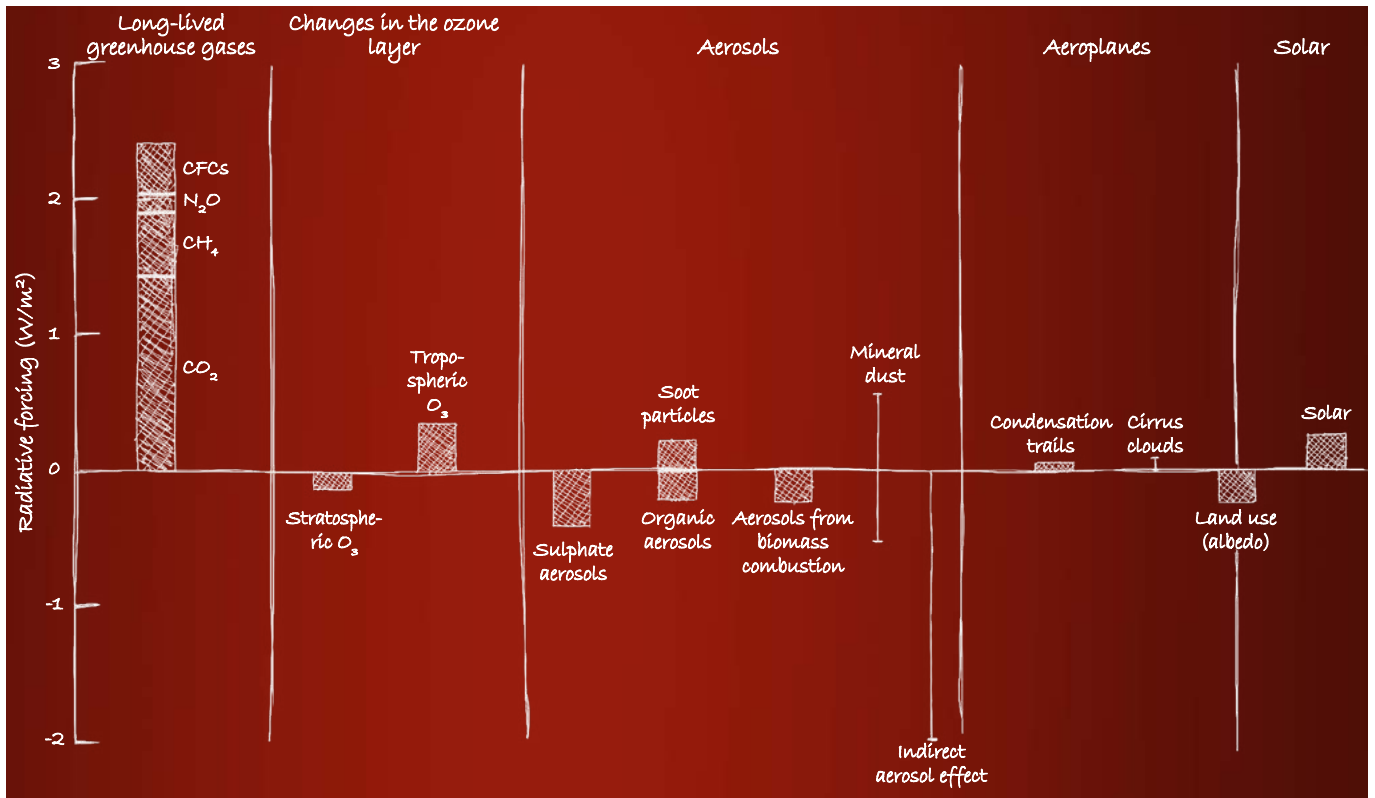
CO₂ alone is not to blame for the man-made greenhouse effect. However, it has the greatest impact among the long-lived greenhouse gases. It is mainly responsible for an effect known as radiative forcing. This indicates how much net radiation density, measured in watts per square metre, reaches the troposphere – where our weather occurs.

The chart on the right shows the change in radiative forcing between 1750 and 2000. Major efforts have already been made to replace chlorofluorocarbons (CFCs) in refrigerants. The latest generation of Hoval heat pumps, for example, uses propane as an eco-friendly refrigerant.



The Keeling curve shows how, despite monthly variations, atmospheric CO₂ levels have been rising since 1958.

Source: Wikipedia



Change in average global and annual radiative forcing due to greenhouse gases, aerosols and solar variability. Source: wiki.bildungsserver.de

CO₂ accounts for 72% of annual greenhouse gas emissions

CO₂ has the greatest impact on radiative forcing and, consequently, on the man-made greenhouse effect. Around 60% of additional global warming is due to the CO₂ emissions caused by industrialised mankind. 72% of annual greenhouse gas emissions come from CO₂.

So, to answer the question we started with:

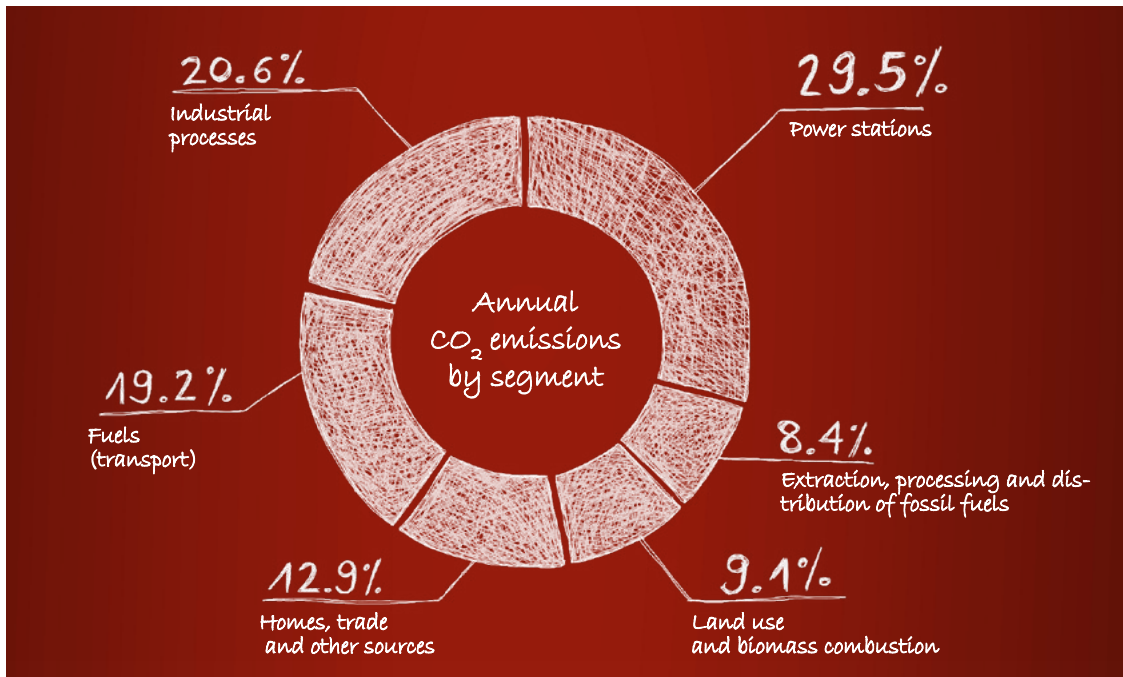
Among all human-generated greenhouse gases and influencing factors, CO₂ has by far the greatest impact on global warming. Our CO₂ emissions alone are responsible for two-thirds of the climate change effect.

How can we cut CO₂ emissions?

CO₂ emissions and their role in climate change represent a global problem. The dramatic increase is forcing all industries to take action.

At Hoval, we are aware of our responsibility for energy and the environment. Stefan Müller also has data to show how developments and products manufactured in our industry account for a share that cannot be ignored.





CO₂ emissions shown by segment. Source: Wikipedia

Buildings cause 13% of CO₂ emissions

“Homes, retail premises and other buildings account for almost 13% of annual CO₂ emissions. It is possible to reduce the demand for heating and cooling energy by renovating buildings. In contrast, it is almost impossible to lower the demand for hot water. However, the CO₂ efficiency of heat supplies can be significantly increased.”

In addition, a comparison was made of the contribution that the various heating systems can make in reducing CO₂ emissions.

Which heating system reduces CO₂ emissions?

The physical and chemical interactions that lead to global warming and climate change are complex, but so are other factors. The question as to which heating system is the most CO₂-efficient is also difficult to answer without looking at the bigger picture.

That is why Hoval has examined the comparison from a holistic viewpoint in the table on page 11.

If we take oil heating as the baseline, only the burning of coal is more harmful to the climate. When renovating, what should you replace an old oil-fired boiler with? What advice should be given to customers wanting to protect the climate?

A natural gas heating system with a condensing boiler emits 29% less CO₂ than an oil heating system. If 50% biomethane

is added to the natural gas – which will be the case in the future – the drop in CO₂ emissions is as high as 50%.

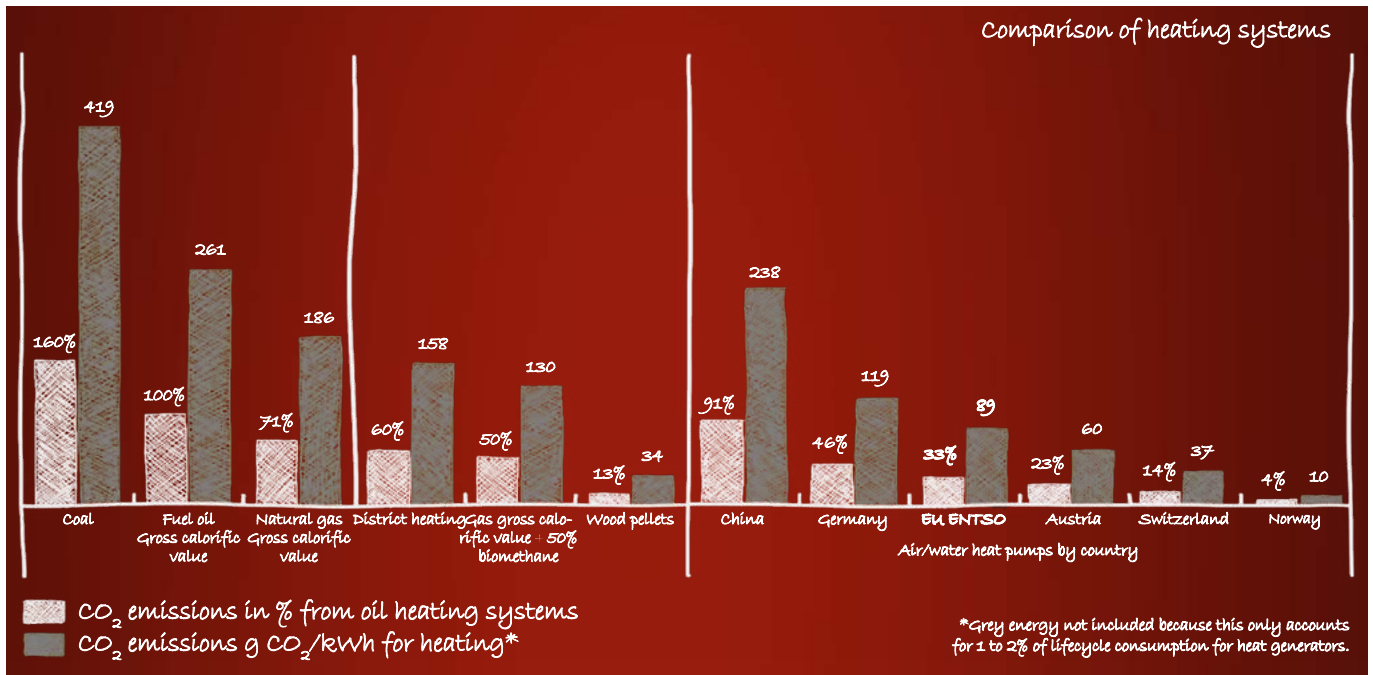
Wood pellets – a highly climate-friendly solution

A heating system with wood pellets is very climate-friendly, with only 34 g CO₂/KWh – the equivalent of just 13% of the emissions produced by oil-fired heating systems.

In the case of district heating, it is reasonable to assume CO₂ emissions of around 60% of those produced by oil-fired heating systems, based on the current average CO₂ emissions of large district heating networks.

Heat pumps merit a discussion all to themselves. The extent to which a heat pump can be described as climate-friendly when heating a building depends on the electricity mix on which the calculation is based. The CO₂ impact of electricity

Comparison of heating systems



Comparison of CO₂ emissions for different heating systems.

varies greatly depending on the analysis and the country. For example, if you calculate the CO₂ emissions of an air/water heat pump based on the average European electricity mix, the result is 33% of the CO₂ emitted by an oil-fired heating system.

CO₂ footprint of heat pumps depends on the electricity used

By contrast, if the same heat pump were to be operated in China, its CO₂ footprint would barely be reduced. Since electricity in China is mostly generated in outdated calorific power plants, the CO₂ impact of the heat pump in China would still be 91% of that produced by oil-fired heating. This suggests that, in China, it is more environmentally friendly to heat with a gas boiler than with a heat pump.

Norway demonstrates the other extreme. Due to its renewable electricity generation practices, heat pumps there are a real benefit for the climate. Their CO₂ footprint is only 4% of that produced by oil heating.

The carbon footprint of a heat pump differs even within the Germany, Austria and Switzerland region. Based on the average German electricity mix, it emits 46% CO₂ compared to oil heating. With the average Austrian electricity mix, it emits only 23%, and in Switzerland, only 14%. If you buy green electricity from renewable energy sources through your power company or even generate your own electricity

with a photovoltaic system on your roof, then you can achieve the incredibly low CO₂ values possible in Norway.

However, the only way to analyse the situation in Europe objectively and neutrally is to take into account the European electricity mix: viewing the situation from a national perspective is of little value. The country in which the generated electricity is consumed is irrelevant in a closely integrated European electricity grid and of no consequence to an issue in which the whole of humanity is at stake.

In summary, biogas, district heating (as long as it does not come from coal-fired power plants), wood pellet heating systems and heat pumps powered by renewable electricity are the most climate-friendly heating methods. For medium and larger capacities, hybrid systems consisting of heat pumps or pellet boilers in combination with gas boilers are also certainly an excellent solution (see article starting on page 18).

Ultimately, a balanced mix of all these solutions will help to achieve the goal of sustainably reducing CO₂ emissions. Not only that, but it will also create the more reliable supplies that are needed for day-to-day usage and emergency situations in winter.

UltraGas®

42





Find out more from Christian Kargl and Günther Köb in the video.

Out sailing with **Christian Kargl**

You may not think that sailing and heating with the UltraGas® 2 gas condensing boiler have much in common. But Christian Kargl, single-handed offshore sailor, and Günther Köb, Director of Product Management, Fossil Fuels, are here to show that they do.

So different and yet so alike

Günther Köb and Christian Kargl both agree that in sailing and heating alike, it's all about having the latest technology and the right expertise – all arranged in a compact unit. Keeping all the components in a vessel interacting efficiently with one another is the only way to cross the finish line not just at full speed, but also with environmentally friendly, sustainable credentials. And that's why sailing is like heating with the UltraGas® 2 – in both cases, every single component works in perfect harmony with all the others. Full speed ahead!

About Christian Kargl

Christian Kargl is Austria's most successful single-handed offshore sailor. In addition to gaining an entry in the Guinness Book of Records, he won the 2019 Mixed Offshore European Championship and is currently preparing for a solo transatlantic regatta.



“The efficiency of the UltraGas® 2 is amazing and compares very well to the revolution currently taking place in boat design.”

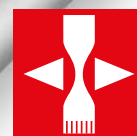
Christian Kargl
Single-handed Offshore Sailor
Mixed Offshore European
Champion

**Cost-effective
Safe
Compact**



Cost-effective operation thanks to the new Hoval TurboFer® heat exchanger

The TurboFer® heat exchanger is the newly developed, patented core component of the boiler. The unique design of the heat exchanger and its special injection technology generate turbulence on the heating gas side, increasing heat transfer and boosting efficiency. In combination with other UltraGas® features, such as high and low temperature return flow, a large water capacity, the Ultraclean® combustion system and the TopTronic® E system controller, the TurboFer® heat exchanger guarantees optimum condensing performance. The efficient UltraGas® 2 is designed for easy integration into existing systems. “This reduces the customer’s initial investment and enables them to reduce operating costs by up to 20 percent compared to conventional boilers”, explains Günther Köb, Director of Product Management, Fossil Fuels at Hoval.



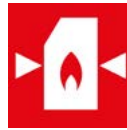
A fair wind heading





Secure investment in the future

Like all Hoval products, the UltraGas® 2 was built to last, with the motto “ready for future” in mind. Each individual component and choice of material was based on achieving a long service life – which is why high-quality stainless steel was selected for the hot water side. This promise is supported by an extended warranty on the boiler body. “The gas boiler can also operate on biomethane and hydrogen, equipping it for the ongoing energy transition from gas to biomethane and subsequently for a hydrogen-powered future”, says Günther Köb. Alternative, sustainable energy sources, such as solar, pellets and heat pumps, are also easy to integrate into the new generation of system boilers. “This means that the UltraGas® 2 already satisfies the requirements of future legislation. All of these factors make the UltraGas® 2 a future-proof investment”, Köb continues.



Compact and lightweight for maximum ease of installation

When designing the new generation of boilers, ensuring that the UltraGas® 2 would be as easy as possible to install was high on the agenda. There is no need for system components such as a circulating pump or a hydraulic separator. The optimised TurboFer® heat exchanger results in an even more compact and lightweight design. “This makes the boiler easier to transport and means that it takes up significantly less space in the boiler room. It is also simple to install and commission, and service and maintenance are a breeze too”, explains Günther Köb. UltraGas® 2 models up to 450 kW are less than 800 mm wide – compact enough to fit through any standard door. Larger models take up just half the space of other gas condensing boilers. This makes the UltraGas® 2 the perfect choice for large-scale renovation and new-build projects.

into the future





UltraGas[®] 2

State-of-the-art heating technology for a school in Poland

Learning relies on ideal conditions. That's why a school in Poland, the subject of this article, regularly modernises and extends its premises. The most recent phase of work involved renovating the heating system – and a future-proof Hoval UltraGas[®] 2 boiler is now setting the perfect temperature for learning.

“The core component of the heating system is the patented TurboFer[®] heat exchanger, which increases heating efficiency through improved heat transfer. This technology generates energy savings of up to 20 percent compared to conventional gas boilers.”

Michał Duliban
Project Manager
Hoval Poland

Schools are where the foundations for the future are laid. In a secondary school in Dynów, Poland, this principle is also applied to heating technology. In September 2020, the building, which welcomes approximately 300 students through its doors every day, had its heating system renovated. With on-site facilities including twelve classrooms, two computer suites, a canteen, a library and a sports hall, this was a big project. Hoval won the tender with the very latest generation of its UltraGas® 2 system boilers and comprehensive service from a single source.

“The local authority in Rzeszów, which is responsible for running the school, carefully scrutinised the requirements to be met by the modernisation of the building’s heating technology. The new heating solution had to meet many requirements associated with the renovation project”, explains Elizabeth Klaczak-Łach, Head of School, adding: “The new heating system had to be efficient, cost-effective and, above all, reliable”. To quote Michał Duliban, Hoval’s project manager: “The UltraGas® 2 ticks all of these boxes and is a genuine long-term investment”. In September 2020, the modern condensing boiler started its first heating season at the school.

Patented technology for enhanced cost-efficiency

The UltraGas® 2 belongs to Hoval’s latest generation of gas condensing boilers for heating and hot water storage. With its long service life and innovative technology, the system performs particularly impressively in the context of large-scale projects like a school. “The core component of the heating system is the patented TurboFer® heat exchanger, which increases heating efficiency through improved heat transfer. This technology generates energy savings of up to 20 percent compared to conventional gas boilers. That money can now be spent on educating children rather than heating the building”, says Michał Duliban, encapsulating what makes the system so special.

Heat output for now and the future

In public buildings, integrating new units into overall building management systems is essential. All Hoval new generation gas boilers are equipped with the TopTronic® E system controller. As well as enabling the different components of the system to be networked, the controller provides interface modules to make integration into the existing building technology easy. The school’s new heating solution also proves that it is fit for the future with its high level of flexibility in using sustainable energy resources. “The boiler

is designed to support the energy sources of the future, including biomethane, and is also equipped for a hydrogen-powered future. It can be connected to other sustainable forms of energy, such as solar, pellets or heat pumps, at any time”, confirms Michał Duliban.

Compact dimensions, powerful performance

Although the school is still undergoing expansion, space in the boiler room is at a premium. Therefore, the size of the new boiler was also a deciding factor. The new UltraGas® 2 technology renders some components redundant and the unit scores points by taking up much less space than comparable systems. The compact design also saves weight – yet delivers the same output.



Project Manager Michał Duliban and Head of School Elizabeth Klaczak-Łach in the school’s boiler room.



Service Partner, Marcin Orpizewski, and Michał Duliban were responsible for the project in the school.

□ **Greener**

→ **in a**

The new UltraGas® 2 is now available. The latest generation of Hoval condensing boilers is an essential component in applications involving renewable energies. A future-proof hybrid system combining a heat pump and gas heating is one example of where it can be put to good use.

→ **team**

It is imperative that the proportion of renewable energy used for heat generation sees a significant increase. National laws within Europe are stepping up their requirements in order to curb CO₂ emissions from heating systems and hot water generators.

Hybrid systems from Hoval offer a wide range of solutions to help achieve this target. A variety of alternative heat generators and solar systems can be easily combined thanks to the integrated TopTronic® E system controller.

This allows residential complexes, office buildings, schools and similar premises to have a simple modular setup for their heating and hot water generation, maximising CO₂ savings.



Combining advantages with a hybrid system

Hybrid systems combine the advantages of different heat generators. There are essentially three options available in this scenario: the UltraGas® 2 gas condensing boiler can be combined with a heat pump, a wood pellet boiler or solar collectors complete with buffer storage tank.

The key consideration in this green hybrid system is achieving highly efficient heat distribution. With TransShare 3K, Hoval supplies ready-for-connection distribution systems that are perfectly adapted to hybrid systems.

Taking a closer look at the three possible hybrid systems.

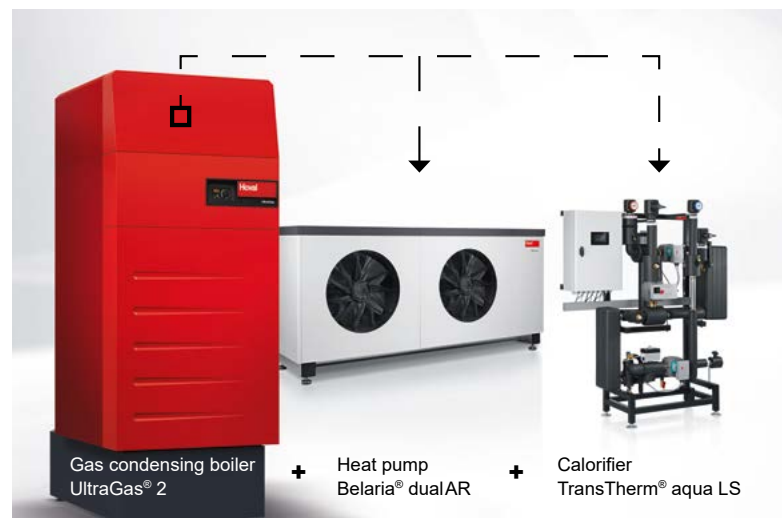
Hybrid system with heat pump and UltraGas® 2

Heat pumps such as the Belaria® dual AR operate with the greatest energy efficiency during spring and autumn, and in moderate winter temperatures. In hybrid systems, this means they are used to cover basic heating and hot water requirements, which correspond to around 70 to 80% of the energy needed. As a heat pump does not need any reserves for peak demand – for example, extreme sub-zero temperatures in January – it can be comparatively small in size, significantly reducing investment costs.

As the UltraGas® 2 gas condensing boiler can quickly step in with its high output capacity when demand peaks, heat pumps do not need to be operated under unfavourable energy conditions.

The new UltraGas® 2 also demonstrates impressively cost-effective operation. This is made possible by the innovative TurboFer® heat exchanger, improved control response and separate high and low temperature returns.

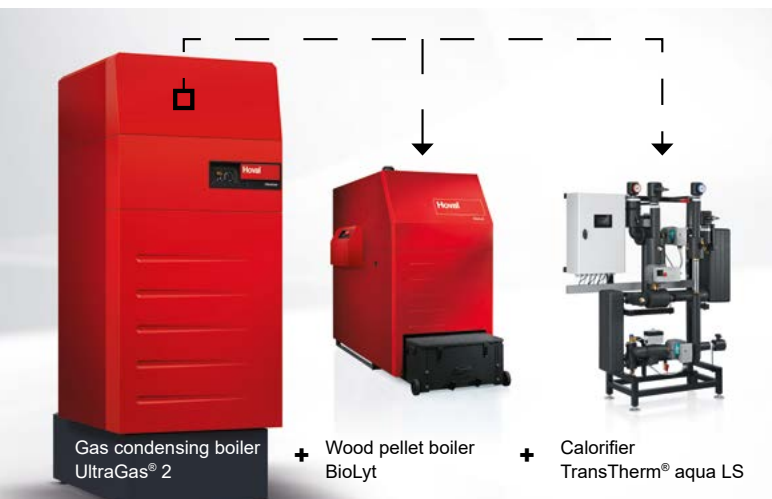
The separate returns allow for ideal temperature stratification of the water in the boiler, which increases efficiency. Thanks to a large water capacity, there is no need for a minimum circulation volume. The UltraGas® 2 can be operated with a large temperature difference between return and flow, which optimises how the condensing technology is used and, in turn, boosts the system efficiency by as much as 3%.



Hybrid systems even more efficient in combination with TransShare 3K distribution system

The TransShare 3K distribution system, featuring separate high and low temperature returns, achieves a further improvement in system efficiency of up to 8%.

Hoval individually designs and manufactures the TransShare distribution system for each system and supplies it as a ready-to-connect, insulated module. In addition to the two heat generators, the TransShare distributor represents the third building block of a hybrid system. A hot water storage tank and a calorifier for domestic hot water are also included.



Hybrid system with pellet boiler and UltraGas® 2

A BioLyt wood pellet boiler can also be combined with the UltraGas® 2 to create a hybrid system. In this case too, the pellet heating system is responsible for a significant share of the base load – 70 to 80 percent – and therefore does not have to be very large. The advantage of this a modest size is that it requires less space. The UltraGas® 2 not only ensures that peak demand in winter is covered, but also provides the entire hot water supply in the warmer months. This means there is no need to run the wood pellet boiler throughout the year – something that would be uneconomical and unecological, resulting in unnecessary NOx and particulate matter emissions.

Heat distribution for heating and domestic water is the task of the custom-prefabricated TransShare distribution system.



Hybrid system with solar collectors and UltraGas® 2

The power of the sun can also be harnessed to optimum effect in hybrid systems with UltraGas® 2 condensing boilers. Even if the share of thermal solar energy can only cover up to 30% of the building's demand in practice, it is still worth it for the climate and your wallet. In some cases, it may also make sense to integrate a third heat source into the hybrid system.

Additional benefits of hybrid systems

In these hybrid systems, the new UltraGas® 2 condensing boiler is therefore paving the way for economical and CO₂-neutral heating with heat pumps, pellet heating and the use of solar energy.

Another advantage of hybrid systems is their size. Since heat pumps no longer have to be designed for extreme sub-zero temperatures, for instance, a smaller unit will often be enough to do the job. This significantly reduces the system investment costs.

In addition, the entire heating system is more reliable because there are two independent heat sources.

To top it all off, the UltraGas® 2 boiler is itself capable of running even greener. It is equipped for regenerative biomethane and will be able to operate on up to 20% hydrogen.

The world of Hoval

The world of technology is complex and often out of sight. Not so at the headquarters of Hoval Germany. Here, visitors and partners have been able to experience heating, cooling and ventilation first hand since April 2021. The centrepiece is Hoval's own modular heating and air-conditioning solution, which incorporates Hoval's entire range of products and services.



“By expanding the facility at the Hoval headquarters, we are demonstrating our expertise at all levels. This is exactly what we want our guests to see when they visit the site.” Wolfgang Allgäuer
Managing Director Hoval Germany

up close



Hoval's spectrum of expertise is as extensive as the technology it delivers. Its solutions in the areas of heating, cooling and ventilation encompass everything from installations for small family homes and multi-storey residential buildings to large industrial complexes, logistics centres and even concepts for entire neighbourhoods. The company's modular approach consistently allows it to adapt these solutions fully to the individual needs of the customer. This principle is also reflected in Hoval's new office building, which houses digital meeting rooms, an open lounge area and a state-of-the-art training centre. A special feature of the renovation is the expansion of the company's own heating and air-conditioning system. "By expanding the system at the Hoval headquarters, we are demonstrating our expertise on all levels. This is exactly what we want our guests to see when they visit the site", says Wolfgang Allgäuer enthusiastically, with an eye on the project's completion in summer 2021.



Wolfgang Allgäuer and Manfred Gerngroß from Hoval Germany.



Heating, cooling, ventilation: the new hybrid solution provides pleasant temperatures at the Hoval Germany's headquarters.



TransShare, the heating and cooling distribution system, ensures efficient energy distribution.

The centrepiece: a modular system for heating, cooling and ventilation

As Director of Technology at Hoval Germany, Manfred Gerngroß turns visions into reality. This means creating solutions that are not just impressive on paper, but can also be implemented in family homes, blocks of flats, office buildings or production halls. Some years ago, Hoval decided to use a modular hybrid solution for a system in its own office building, consisting of a BioLyt (160) pellet boiler and an UltraGas® (250) gas condensing boiler. Now, the system has been expanded to include two Belaria® dual AR (60) air/water heat pumps and one Belaria® pro comfort (13) units that are also used to cool the building.

Fresh air – something that we all prize these days – is guaranteed thanks to several comfort ventilation units. "Our own system serves as the best example of the versatility afforded by our modular system solutions, which can be easily expanded at any time. The master integrated TopTronic® system controller connects all the components as effectively as possible and links up with the newly installed smart-home system", explains Manfred Gerngroß, before continuing: "It is our aim to make the consumption data and operating behaviour visible to everyone so that we then have the information we need to put the right optimisation measures in place".

Partner installers – part of the Hoval family

Successfully cooperating with partners and communicating directly with them are top priorities at Hoval. The redesign of the headquarters has created an even better environment for meeting with partners and sharing insights. “Every day, we put our professional partners at the centre of everything we do. In our dedicated training centre, we provide face-to-face training for specialist tradespeople, planners and, of course, Hoval employees, allowing them to get hands-on experience with the units”, states Wolfgang Allgäuer.



The Belaria® dual AR air/water heat pump can be used for heating as well as cooling.

In safe hands with Hoval

Hoval is on hand to support its customers and partners at locations beyond just its headquarters, however. The Heads of Sales know how important it is for customers to have a point of contact that they can turn to after a sale. “In after-sales, we work closely with specialist tradespeople and customers. They are in safe hands with Hoval, thanks to our round-the-clock customer service.”



Horst Buschmann
Head of Sales Central-North



Claudio Corrado
Head of Sales South-West

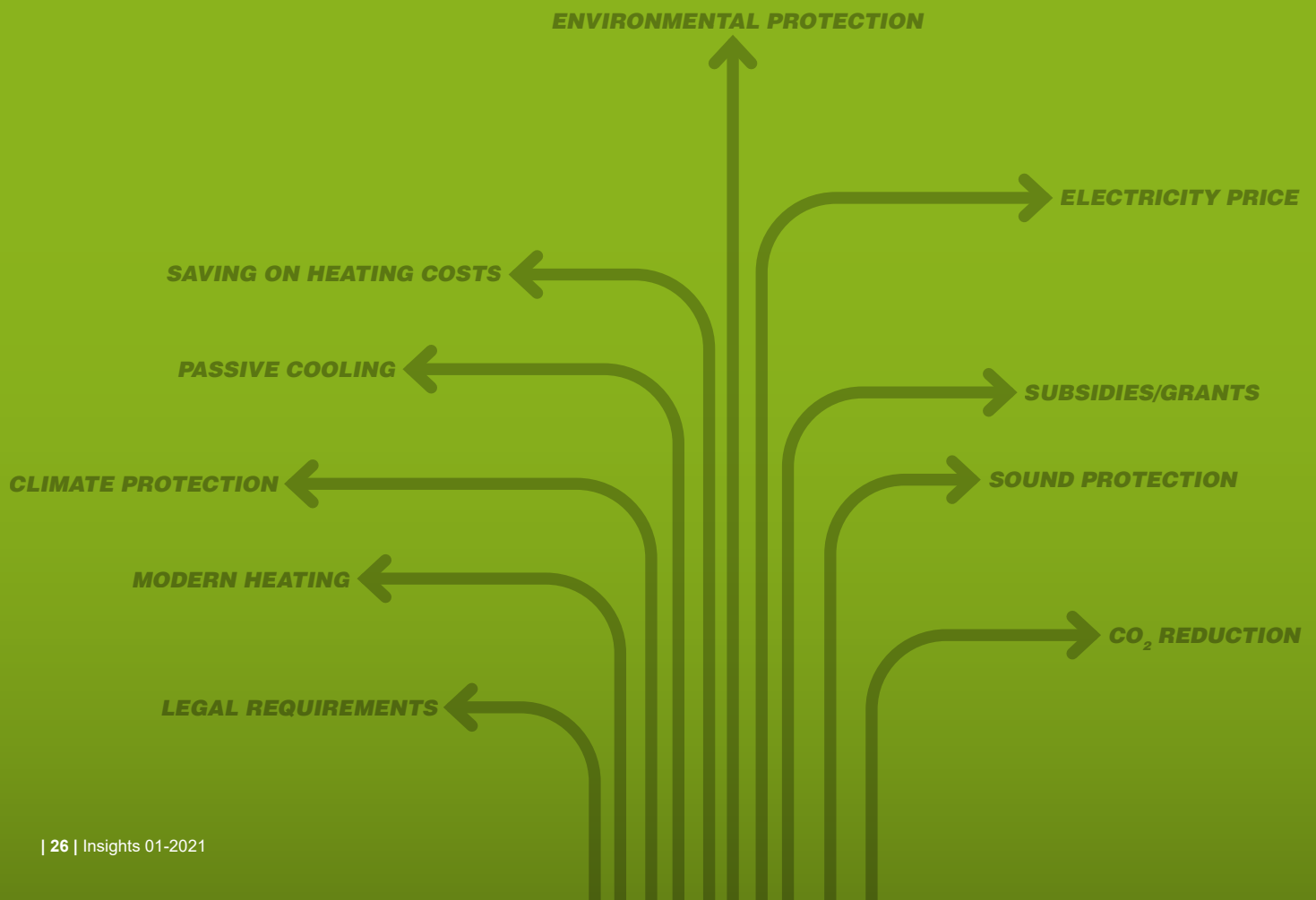


Hagen Jakubek
Head of Sales South-East

“In after-sales, we work closely with specialist tradespeople and customers. They are in safe hands with Hoval, thanks to our round-the-clock customer service.”

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Head of Sales South-East

MEGA-TREND



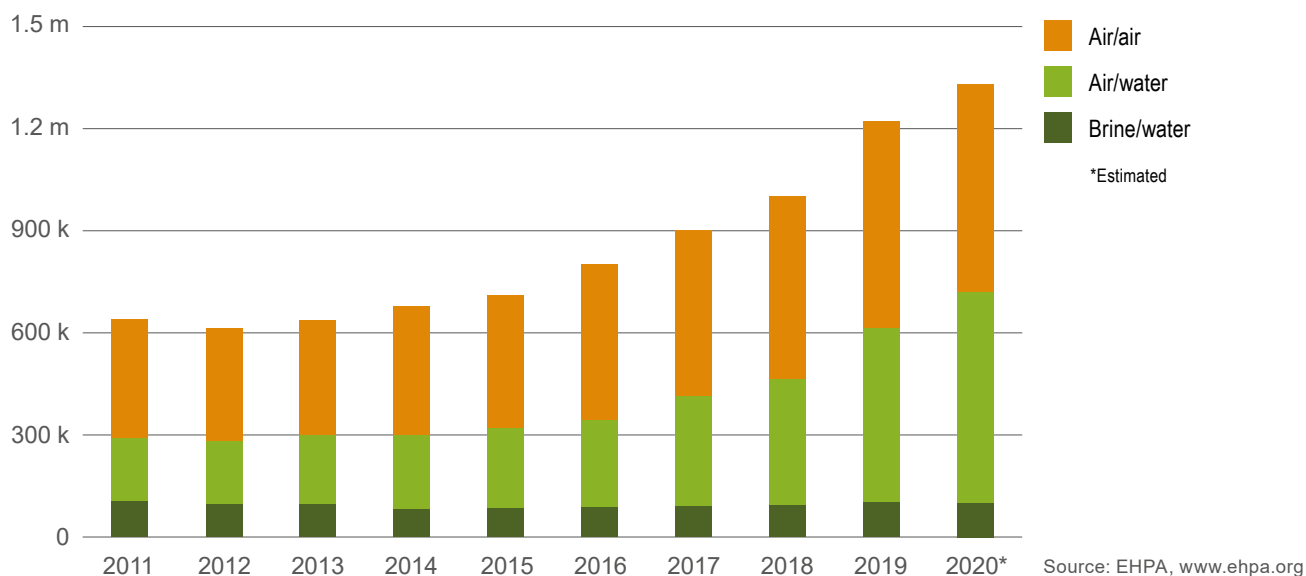
Alongside pellet heating, district heating and gas hybrid systems, heat pumps are gaining a reputation as the heating system of the future. No other system is attracting so much attention from home owners. And no other system is gaining market share with such momentum.

Heat pumps

In recent years, no heating system has attracted as much interest as the heat pump has. Back in the 1970s, Hoval's first heat pumps were solely niche solutions alongside the top-selling oil-fired boiler. Today, the market looks completely different. Oil heating systems are now effectively banned by new regulations, and heat pumps are widely viewed as the epitome of modern heating.



Sales development of heat pumps in Europe



1.3 million heat pumps sold each year

In the last five years, the market in Europe has almost doubled. The market volume has risen to an impressive 1.3 million heat pumps per year and is set to keep growing rapidly.

Taking only the area of water-borne systems into account, air/water heat pumps are making the strongest gains. By contrast, the brine/water heat pump segment, with its higher investment requirements, is not growing quite so strongly. Air/water heat pumps are performing so well because they are becoming increasingly quieter and more efficient, and their investment costs are lower.

According to the EHPA (European Heat Pump Association), the heat pump is the heating technology of choice for households in Austria, Switzerland, the Czech Republic, France, Italy, Norway and Sweden.

It is the foremost option in the minds of builders and homeowners carrying out renovations. People are also aware of the advantages it offers in the area of climate protection – which, of course, it can only do if the electricity it uses comes predominantly from renewable sources. As well as this, there is widespread awareness about the numerous subsidies available and the benefits of combining heat pumps with PV systems.

Electricity prices – the biggest obstacle

The most significant obstacle to the widespread uptake of heat pumps is the price of electricity. In some countries,

high electricity prices are still hindering the progress of this technology. Comparing the electricity prices it incurs with those of gas, pellets and district heating illustrates this point clearly.

At present, the heat pump market mainly offers solutions for single-family and two-family homes with outputs below 20 kW. However, there is a growing trend towards larger outputs and, in turn, towards a heavier focus on project-related business. With its hybrid systems, particularly those working in combination with the UltraGas® 2, Hoval can offer ideal solutions for total outputs of up to 1000 kW.

The EU's climate strategy and the associated regulations being implemented in member states continue to generate strong demand. France, for example, is banning monovalent gas heating for new single-family homes from 2022 and for new blocks of flats from 2025, and is also setting stricter limit values for refurbishments. The EcoBonus and new energy efficiency laws in Italy are set to improve opportunities for the use of heat pumps in areas such as hybrid systems.

Building energy laws in Austria and Germany, MuKEN energy sector provisions in Switzerland and, of course, country-specific subsidies and grants are all driving momentum.

Hoval Belaria® pro ready for the market of the future

With exceptionally low noise levels and high flow temperatures for renovations, the Belaria® pro delivers solutions that are geared towards the future.

Nevertheless, many installers still have unanswered questions: they may be asking what they need to do to prepare their businesses for this new heating technology, how they integrate Hoval's factory customer service into their own range of services, and what kind of training Hoval offers in the new generations of heat pumps.

Manfred Gerngroß, Director of Technology at Hoval Germany, offers this advice to every installer: "Talk to your Hoval customer advisor about it. They are the ones who know your business best, and they can work with you to put in place the measures you need to prepare your business in good time to accommodate the heat pump megatrend".



Hoval heat pumps, such as the Belaria® pro, are very much in demand.

Quiet nights



An ecological air source heat pump is providing comfortable temperatures in a multi-generational household. The Walter family, from Austria's Burgenland region, opted for a comprehensive solution from Hoval when modernising their heating system. A sustainable air source heat pump and a hot water storage tank now ensure pleasant room and water temperatures in this rural single-family home.

In rural Heugraben near Güssing in Austria's Burgenland region, the Walter family built their single-family home in 1982. Over the years, the house has been heated by a variety of sources. Initially, a wood boiler in combination with a Hoval oil-fired heating system provided warm temperatures and hot water. Later on, when it was possible to connect the house to the gas grid, a gas boiler took over this task. After 20 years of service from that heating system, Herbert Walter decided to replace it altogether and switch to an environmentally friendly air/water heat pump. One key reason for his decision was that the combined hot water tank had become too small when his daughter and granddaughter moved in. "Our old hot water tank held 150 litres – just not enough for a 4-person household. Since our gas heating system was also old, we decided to replace the whole lot", explains Herbert Walter. In addition to the CombiVal hot water storage tank, which now enables storage of 500 litres, and the EnerVal buffer storage tank, the core of the complete solution is the Belaria® pro comfort air/water heat pump. It is the latest model in the Hoval heat pump range and has been in operation in the Walter family home since summer 2020.

Air/water heat pumps: a sound investment in the future

The Walters had already been very satisfied with the service provided by Hoval back when they had the old oil-fired heating system. They had been able to rely on the heating system running smoothly and on responsive customer

service. Off the back of this, the family once again decided to turn to the heating technology expert for a complete solution in their renovation project. Their trusted installer – Haustechnik Güssing – recommended an air/water heat pump. Herbert Walter explains what persuaded him: "By using free energy from the environment, the new heat pump system is up to three times more efficient than the gas heating system. I was also able to take advantage of lucrative federal and state subsidies". The heat is delivered to the rooms via underfloor heating and radiators.



The modern outdoor unit is positioned on the east side of the house and is extremely quiet.

Quiet nights thanks to an ultra-quiet heat pump

The Belaria® pro comfort obtains the energy required for operation from the surrounding air. The modern outdoor unit is positioned on the east side of the house and is extremely quiet. Although one of the bedrooms is just above it, the Walter family can hardly hear it operating at all. The planning and implementation stages ran extremely smoothly, both in the boiler room and in the process of positioning the outdoor unit in the garden. The intuitive TopTronic® system controller makes it exceptionally easy to adjust the temperatures of the heating and hot water: this can be done conveniently from the living room using modern touchscreens or even on the go using the app.



The heating and hot water temperatures can be easily controlled using TopTronic®.

Heating technology for the future

The technology that the Hoval Belaria® pro air/water heat pump houses is also ready for what the future holds – as Andreas Grimm, Director of Product Market Management, Heating Technology at Hoval Austria, explains: “The use of the natural refrigerant propane makes the Belaria® pro heat pump particularly well equipped for the future. It already meets the legal requirements that are due to come into effect throughout the EU in the next few years with the aim of a phased reduction in CO₂ emissions”. Herbert Walter can also count on Hoval’s dependable support when it comes to ensuring reliable operation. With the TopSafe® warranty package, he will enjoy peace of mind for the next 12 years.



Through its compliance with regulations and smooth operation, the Belaria® pro gives Herbert Walter the peace of mind he needs.



“Because it uses a natural refrigerant, propane, the Belaria® pro heat pump is well equipped for the future.”

Andreas Grimm
Director of Product Market Management
Heating Technology at Hoval Austria

Hybrid solution with heat pump



at 1560 metres

In Davos, Switzerland, the heating systems in two blocks of flats were in need of replacement. Jacques Zuber, the co-owner and project manager, and Fabian Sprecher from plumbing company F. Sprecher AG worked with Hoval to develop an environmentally friendly and cost-effective solution.

“Hoval was the only manufacturer to offer a hybrid solution in which the heat pump and oil-fired condensing boiler were perfectly attuned and communicated seamlessly with one another.”

Fabian Sprecher
F. Sprecher AG



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The two identical blocks of flats were built back in 1968 – the first in the canton of Graubünden to be built using the prefabricated construction method. Looking at them today, you wouldn't know. The properties have been continuously modernised over the years and are in a very well-maintained condition. Jacques Zuber attributes this to “very open-minded and progressive commonhold owners”. He himself has lived here since 2002 and, as project manager, takes care of all conversion and renovation tasks for the commonhold association on a voluntary basis. This is a role in which he can make use of all his technical knowledge and expertise, gained through a 40-year career in planning and building large-scale plants in heavy industry all over the world.

The current project arose in the autumn of 2018. The 20-year-old heating systems in the two blocks of flats had become susceptible to faults. The systems were oil-fired only, each with a 16,000-litre tank. So it was that Jacques Zuber set to work on finding a new solution. “I analysed seven different systems, some in conjunction with energy consultants”, says Jacques Zuber. In the end, he narrowed it down to two, which he planned out in detail with heating specialist Fabian Sprecher: replacement with oil heating only, or a hybrid solution in which a heat pump would be combined with an oil-fired condensing boiler. Both options were presented to the commonhold owners. “The owners overwhelmingly opted for the hybrid solution using a large proportion of renewable energy, even though it was associated with some one-off additional costs”, Zuber explains.





The owners overwhelmingly opted for the hybrid solution using a large proportion of renewable energy, even though it was associated with one-off additional costs.

Just one heat pump for 18 residential units per building

The heating concept approved by the owners comprised two UltraSource® B comfort C (11) air/water heat pumps per building, as well as an UltraOil (80) oil condensing boiler, a CombiVal CR 800 domestic water storage tank and an EnerVal 800 buffer storage tank – all Hoval products. Heating specialist Fabian Sprecher explains the background to this decision: “If you have a hybrid system with products from different manufacturers, it can be difficult to align the system, leaving it prone to malfunctions. Hoval was the only supplier to offer a hybrid solution in which the heat pump and oil-fired condensing boiler communicated perfectly with one another”. But before Fabian Sprecher could place the order, Rico Gerschwiler, Hoval’s Technical Sales Consultant for Graubünden, got in touch with him. “He pointed out to me that Hoval had a new and even better solution in the form of the UltraSource® B comfort C (17) heat pump.” With this new, larger version, a single heat pump was sufficient for the total 750 square metres of net floor area and 18 residential units per building. Another welcome bonus was that the costs were also reduced. “Our long-standing, close partnership with Hoval has once again proven its worth”, says Fabian Sprecher.



Two UltraSource® air/water heat pumps, an UltraOil oil-fired condensing boiler, the CombiVal CR 800 domestic water storage tank and an EnerVal 800 buffer storage tank created the perfect hybrid solution.

Wood pellet boilers rapidly on the rise

Between 2005 and 2015, wood pellet boilers enjoyed huge popularity. Then interest in the climate-friendly boiler type waned. For the past two years, however, demand for wood pellet boilers has been experiencing a resurgence. Daniel Hegele, developer of biomass boilers at Hoval, explains why in this interview.





Daniel Hegele explains why wood pellet boilers are a worthwhile investment for renovations.

Wood pellet boilers were rarely the first choice when it came to deciding on a heating system in the past. Why was that the case?

One of the main reasons is that wood pellet boilers take up more space than a gas heating system or an air/water heat pump – and it's especially important to remember that you also need additional storage space for the pellets. Not only that, but the purchase and installation costs are higher than those associated with a gas condensing boiler, for example.

So what has changed to make wood pellet boilers more appealing again?

One factor is that people's mindsets have changed massively in recent years. Sustainability and climate-friendly heating in general are becoming more and more important considerations. New laws and regulations are also having an impact, as are the CO₂ taxes that are being levied in many countries. On top of that, grants for replacing old heating systems that run on fossil fuels are at an all-time high.

Where do you see the greatest potential for wood pellet boilers?

Most definitely in the oil replacement market.

Why is that?

Oil heating systems have become obsolete – you'll hardly ever find them in new buildings nowadays. However, there are still more than 7 million older oil-fired heating systems in the Germany, Austria and Switzerland region – and hundreds of thousands of those will have to be modernised in the coming years and decades. In the past, an old oil-fired boiler was usually just replaced with a new one, provided that no gas pipelines had been laid in the vicinity. However, for the reasons I mentioned before, fossil fuel oil is most definitely out of favour in 2021 – and wood pellets, which are a CO₂-neutral and regionally produced type of fuel, are the perfect alternative.

“Wood is a domestic, CO₂-neutral fuel – renewable heat that grows virtually on our doorstep. Alongside heat pumps, wood pellet boilers are the second key element on the road to achieving a successful energy transition in the heating market.”

Daniel Hegele
Developer of biomass boilers

Are heat pumps also benefiting from the oil replacement market?

Yes, they are. Heat pumps have become the most popular form of heating and are often a suitable choice when upgrading oil-fired boilers. This trend is set to continue in the single-family home sector, and our Belaria® pro, for example, is an ideal way to accommodate it. However, air/water heat pumps have their limitations in some areas, especially in medium to large buildings that require higher flow temperatures and an output of more than 20 kW. These include older two-family homes and blocks of flats, schools, smaller commercial enterprises and railway station buildings. In these cases, particularly if the local geology or drilling costs mean that a brine/water heat pump is out of the question, our Hoval BioLyt wood pellet boiler becomes an attractive alternative. It can cover heat loads of 13 to 150 kW (in cascade up to 300 kW) and continuously provides full output even at temperatures below zero, making it ideally suited to heating system replacement projects.

What other advantages does the switch from oil to wood pellets bring?

The subsidies and grants available for modernising oil-fired heating systems are higher than ever across the Germany, Austria and Switzerland region. This means that it is possible to reduce costs, and in some cases the state will pay for half of the total investment. In addition, the tank room that was originally used for the heating oil can be converted to store the wood pellets. And then, of course, there's the environmental aspect. Wood is a domestic, CO₂-neutral fuel – renewable heat that grows virtually on our doorstep. The combustion is clean and the price of pellets has been stable for years.

It is clear that there are more and more compelling arguments in favour of wood pellet boilers. Alongside heat pumps, they are the second key element on the road to achieving a successful energy transition in the heating market.

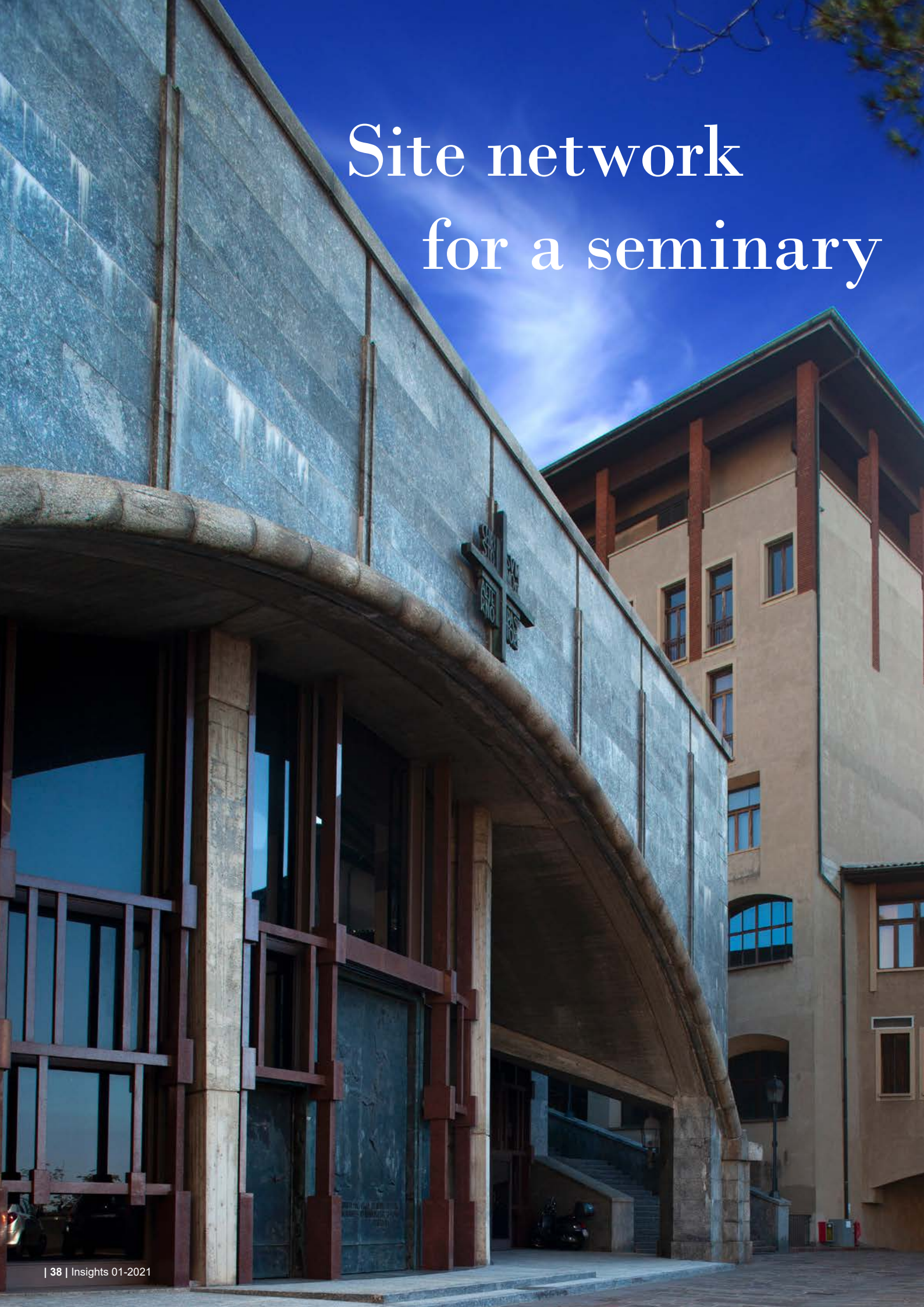
Why is Hoval the right partner for wood pellet heating systems?

At Hoval, we have had a great deal of experience with wood heating systems for many decades now and have always had a presence in this market. At the same time, we have a very large number of long-standing, satisfied oil-fired boiler customers – especially in the Alpine region and in southern Germany – who value our quality and expert service. For these installers and homeowners, Hoval is the perfect partner when making the switch to renewable heating. There are a number of things to consider when planning a pellet heating system, and we are happy to provide support and advice for all of them. For larger systems, Hoval can also offer extremely efficient hybrid solutions, combining pellets with gas or – a growing trend – pellets with heat pumps, ideally including solar energy. Every one of these solutions comes with an integrated system controller – and all from a single source. This makes Hoval unique on the market, something we are rather proud of.



Hoval BioLyt can continuously provide full output even at temperatures below zero, making it ideally suited to heating system replacement projects.

Site network for a seminary





At Bergamo's diocesan seminary, three UltraGas® condensing boilers generate district heating for a complex building. However, the TopTronic® E system controller makes operation simple.



The diocesan seminary stands atop a hill in Bergamo.

Split over eight levels and connected by two galleries, Bergamo's diocesan seminary perches on top of a hill like a small citadel. It is home to classrooms, prayer rooms, a library, gymnasium,

dining rooms, theatre, kitchens and a church. The highly energy-intensive heating system, dating back to 1963, needed to be replaced – so Hoval stepped in with a complete solution.



Three UltraGas® condensing boilers supply the site network with heat for heating and hot water.

More efficiency for heating and water heating

The new system is centred on three Hoval UltraGas® (850) gas condensing boilers, which supply the entire building complex with heat. In addition, a TransTherm® aqua F (6-50) fresh water module with TopTronic® E-FW controller has been installed. The system reliably covers the hot water requirements with outstanding efficiency, even when demand peaks.

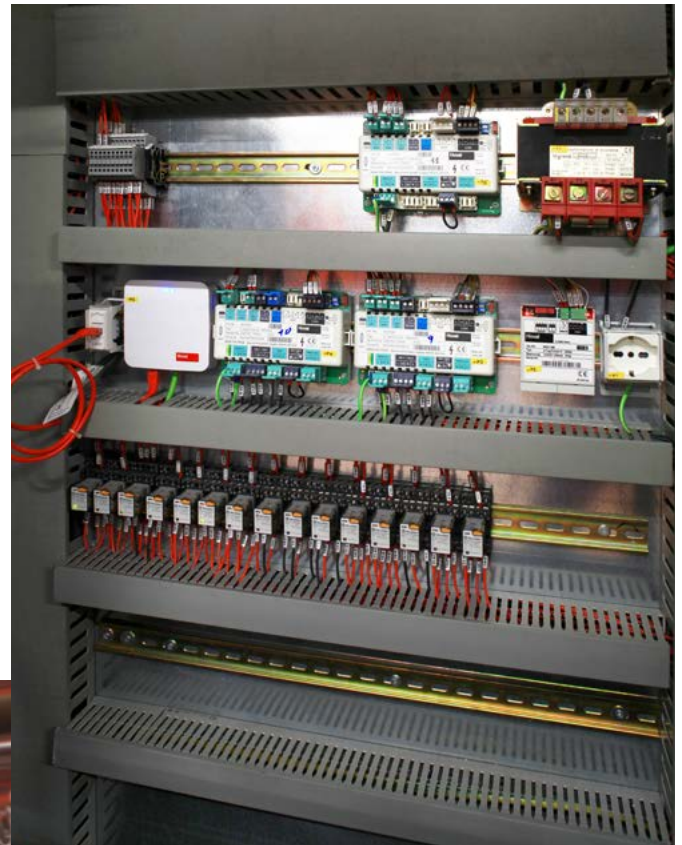
First choice for highly efficient district heating

Dieter Schenk, planner of the site network, explains why Hoval was chosen: “The customer was already familiar with how efficient the UltraGas® boilers are from other buildings. As a planner, I also find it makes sense to use boilers that have no minimum water circulation volume and no restrictions on the return temperature if I need the system to deliver a certain output”.

The seminary in fact houses a site network with several substations. It requires a certain amount of energy and a high flow temperature of 70°C. There are not many heating solutions on the market that can deliver the same performance as Hoval. Most importantly, with Hoval it was not necessary to install additional hydraulic separators or primary pumps to guarantee the necessary condensation.

One control system for everything and more

The Hoval TopTronic® Supervisor system controller continuously supplies and displays all the key operating data – for convenient viewing on a computer. The site network is controlled with the Hoval TopTronic® E system controller. In the seminary’s system, the TopTronic® E controls five sub-station direct circuits, the sub-station mixing valve and the process of charging the buffer storage tank that supplies the TransTherm aqua F fresh water module.



The system controller components are located in a control panel. The TransTherm® aqua F provides hot water in the seminary.



“Alongside the benefits of this control system, the strengths of the Hoval solution undoubtedly lie in the careful planning prior to installation and the after-sales service. The Hoval team was always there when we needed them.”

Luca Gottini
Owner of GT Service

Hi, my name is Phil James. In my 10 years as a Service Technician at Hoval UK, I've seen and experienced quite a lot – and here I'd like to tell you about one of my most unusual experiences.

No distance



Phil James has been a Service Technician at Hoval UK for 10 years now and has experienced a lot in that time.

It all started with a call from Mark Evans, Head of Service at Hoval UK. He said I needed to commission a couple of UltraOil boilers on the island of St Kilda off the west coast of Scotland. “The crossing takes four hours and the boat will pick you up again after a few days”, I was told by Mark.

“No problem”, I said, and with that I practically out the door on my way to the archipelago, situated 40 miles west of the Outer Hebrides. I was really looking forward to the assignment – but to be honest, not so much because of the routine job in the power station, which only supplied a few offices and radar installations. I was much more excited by the unique bird and wildlife haven awaiting me on St Kilda!

To my surprise, the crossing took not four, but 14 hours. After 12 hours at sea, we had to wait another two hours off the coast of St Kilda for the tide to go out so that the boat could run ashore – because St Kilda doesn't have a harbour.

While we were waiting, a man rowed over from the island to check the rat traps on board. If just one of them had been triggered, we would have immediately been sent back to the mainland to make sure no rats got onto the island. This is important to protect the one million seabirds that are on the island in July and August.

I finished my job on the island quickly, but the customer then told me: “Phil, the boat that was supposed to pick you up has broken down. You're stuck here for the weekend”.



too far

There wasn't much I could do about the situation, so I spent the next day walking around the paradise of nature surrounding me, marvelling at the beauty of the island. St Kilda is a dual World Heritage Site – so it's a pretty amazing place.

Nevertheless, the sight of a small boat caught my attention. I ran over and spoke to the captain to see if there was any chance of getting a lift. He asked, "Where do you want to go?", to which I replied, "Anywhere". And luckily for me, he took me with him.

We were heading for the isle of Harris to a tiny port called Leverburgh. The captain advised me that that I should go via Harris to get on a boat to Skye and from there back to the Scottish mainland.

So we made our way to Tarbert, the main community on Harris, and spent the night there. The next day I jumped on the boat over to Skye, where a taxi boat took me to the west coast of Scotland. From there I drove my own car home – another twelve and a half hours!

Oh yes, I also gave a man on St Kilda a little training in servicing the boilers. We shall see...

Phil



- | | | |
|----------------|---------------------|---------------------|
| ① Bream | ⑥ Tarbert | Journey there |
| ② Ballachulish | ⑦ Uig, Isle of Skye | Journey back |
| ③ Kishorn Port | ⑧ Kyle of Lochalsh | |
| ④ St Kilda | ⑨ Kishorn Port | |
| ⑤ Leverburgh | | |

Responsibility for energy and environment