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European Markets Overview

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Foreword from the Chairman

The European Heating Industry (EHI) brings together the majority of European companies that are leaders in the production of efficient heating systems in Europe. Our engineers develop heating solutions for every need, from boilers to solar thermal systems, from heat pumps to fuel cells, from radiators to underfloor heating.

We are proud to share our competence and know-how of this market, which is now more than ever in evolution. Last year, we published our first Heating Market Report, providing the largest data set then available on the European heating market. Today, we follow up with the 2021 edition of this Report, a very special one as we illustrate the challenges our markets went through in one of the most challenging years to our memory.

What is extraordinary for the year 2020 is the heavy disruption that the COVID-19 pandemic caused to the whole of the European economy. The heating industry and its value chain of 1.8 million European, local jobs, greatly felt this disruption. Our data show divergent impacts on the European heating markets: some of them collapsed while others showed unexpected growth, while occasional supply chain failures showed how interconnected the European industry is today.

But throughout this year of uncertainty, EHI member companies have kept developing innovative products and services to enable the shift towards a carbon-free economy which puts people at its centre. Investments have increased in a broad range of technologies to decarbonise heating such as heat pumps, hybrid applications, use of hydrogen and green gases.

You can read about these technologies in this year’s Heating Market Report. In addition, we give an overview of the trends in Europe’s biggest markets, including a breakdown of the types of heating appliances sold in 2019 and 2020, as well as an overview of the current installed stock and of the broad spectrum of heating technologies available across Europe.

We know that a strong and sustainable European heating industry is at the heart of the economic recovery from the crisis due to the COVID-19 pandemic, and that it is fundamental in order to reach Europe’s climate goals. Keeping our continent economically competitive, socially and environmentally sustainable go hand in hand and will benefit EU citizens today as well as generations to come.

I hope you will enjoy the read.
How to make buildings fit for 55 – the role of the heating industry

The building sector accounts for 40% of the energy consumption and 36% of the greenhouse gas emissions in the EU, with heating representing the largest share of energy consumed.

This means that it is by decarbonizing buildings that Europe will reach its climate goals, which are to be climate-neutral by 2050, with an intermediate target set at cutting CO₂ emissions by 55% by 2030.

How do we make buildings ‘Fit for 55’, i.e., how do we reach our climate goals? Put it simply, buildings will have to reduce sharply their energy consumption for heating and increase their use of decarbonised fuels in the next decades.

The first hurdle in this transition is the slow pace of replacement of old and inefficient heating systems installed in our homes. In last year’s Heating Market Report we provided data on the efficiency of the “installed stock” across Europe: about 65% of 103 million heaters were old and would fall in class ‘C’ or ‘D’ of the energy scale. Today we report that the market situation is largely unchanged. Over 61 million of the installed heating appliances in the EU remain energy inefficient, and they are replaced at a low 4% annual rate.

And yet, innovative alternatives are available on the European market. These include renewable-energy based systems such as heat pumps and hybrids, green gas/ green fuels heating solutions and hydrogen ready appliances.

Amongst them, hybrid heat pumps and heat pumps are increasing in most European markets: we expect them to continue to do so in the path towards 2050. This is because they are among the most efficient heating solutions and are being supported by regulators at EU and national level as a key technology for decarbonising heating.

But there are several hurdles to a more significant roll-out of heat pumps. In a recent EHI Report¹ the heating industry points to the main hurdles for their higher deployment: these include the necessity to reinforce the European electricity grid; the lack of installers; the high upfront investment costs as well as aspects of needed innovation. Indeed, the Long-Term Scenario of the EU Commission for the decarbonisation of buildings in 2050 indicates that direct electrification in 2050 will reach only 34% of our buildings.

This is also because buildings are different across the EU, as are the heating needs, due to different climates, purpose of use, energy infrastructure, availability of renewable energy resources at local level, individual preferences of the consumer or the installers, and economic resources.

¹ EHI Report: “Rolling out heat pumps in support of the decarbonisation of heating”, October 2021
Hence, the optimal and sustainable choice of space and water heating system will depend on specific local circumstances. This is why the heating industry is innovating — in addition to heat pumps — in green gases-compatible heating appliances, in solar thermal solutions, in sustainable biomass and green fuels technologies. In this way, heating technologies will be the enabler of green energy in buildings.

Can regulation help this transition? We think so. The so called ‘Fit for 55’ package of European laws, unveiled in July 2021 by the European Commission, represents a unique opportunity to set the right conditions for this conversion to take place in the market.

What should policy do, in our view?

1. Increase the ambition to renovate buildings and to replace old heating systems, faster.
   Establishing a CO₂ emissions-reduction target for the building sector of 60% by 2030, would ensure buildings actively contribute to the new climate ambition, in line with the Renovation Wave and the Climate Target Plan. In addition, setting a target to increase the annual replacement of old and inefficient heaters to at least 6% per year would support the modernisation of the European heating appliances stock.

2. Drive consumers towards more efficient heating, through a future-proof energy label.
   Product policies such as Ecodesign and Energy Labelling must inform and push consumers to switch to sustainable heating systems. The energy label, in particular, should promote the replacement of old and inefficient heaters and the use of all technologies that will lead us to the decarbonisation of buildings.

3. Promote the use of all types of renewable energy for heating.
   The parallel promotion of electrification and of the deployment of renewable and decarbonised fuels and gases, such as biomethane, synthetic methane and hydrogen in the heating sector will ensure security of renewable energy supply needed for buildings.
4. **Support vulnerable households against higher energy bills due to CO₂ price.**

Introducing a polluter-pays principle to buildings can give an important stimulus for consumers to change heating systems towards efficient, sustainable ones. However, vulnerable households must be shielded from an increase in energy bills due to an extended CO₂ price. For example by providing adequate financial support to install modern and efficient heating appliances.

5. **Make heating a priority in any policy reviews concerning buildings.**

The most cost-effective way to decarbonise buildings will be a three-prong, system-approach. This means (1) increase energy efficiency by replacing an old, inefficient heater with an efficient one; (2) switching to renewable energy and (3) increasing the insulation level of the building; these three measures should go hand in hand because together they reduce the heat (and energy) demand of a building and cut its CO₂ emissions. Measures for “deep-renovation” of buildings as well as so called “staged renovation” should therefore have at their core the replacement of inefficient heating systems with efficient ones.

6. **Support the progressive and continuous digitalisation of heating systems**

Smart heating systems will help Europe achieve energy system integration by fostering the uptake of renewable energy and balancing the grid through demand-response, self-consumption and an integrated use of energy carriers (electricity and gases). Moreover, upgrading to intelligent room or apartment controls will add to consumers’ awareness, load balancing and demand-response benefits.

The heating industry is keen to work alongside policy to support a framework that facilitates the deployment of the innovative technologies and renewable energies needed to make our buildings climate-neutral by 2050. This is a goal which can be reached, if a supportive, enabling framework is put in place as soon as possible.
The heating sector in the European economy
The impact of the COVID-19 pandemic on the EU heating market

Started in early 2020, the pandemic caused by the COVID-19 virus struck the whole of Europe. In the attempt to restrict the circulation of the virus, national governments began to ‘lockdown’ their population at home and to suspend all but essential economic activity. The European heating industry was affected by the sanitary emergency insofar as factories in several countries were forced to close or dramatically reduce their activities. The impact was felt in different ways from country to country, depending on how tight the economy had been closed.

The national governments of Italy, Spain, France, Belgium and – a little later - the UK, enacted strong lockdowns, which greatly impacted the market. Although following different courses in each of these countries, sales decreased by up to 80% in the early months of the pandemic, compared to the same period in 2019. And the effects were felt beyond national boundaries: the extremely strict lockdown in Italy caused disruptions for the national manufacturing industry as well as for the entire European industry, because the Italian components’ industry has an important role in the heating supply chain at European level.

An opposite development could be seen in Germany and Poland. Both countries refrained from completely locking down their economies, with the positive effect that the heating industry recorded a normal market performance in the first half of the year. In Germany, there was also a shift away from the predominant sanitary installations, towards investments in new heating systems. The positive effect on the heating sector caused by this trend was intensified by the attractive financial support policies which came into effect on 1 January 2020. Even if these conditions did not develop positive effects until the second half of the year; they enabled both countries to achieve double-digit growth by year-end compared with 2019.
The heating sector recognized as ‘critical infrastructure’

Heating, cooling and production of sanitary hot water are essential for infrastructure facilities such as hospitals, care homes as well as the residential home sector. Their vital function showed its relevance particularly as people were forced to stay inside their homes or had to be cared for over long periods of time due to severe illness.

Due to the enabling role of heating technologies in such context, the German federal government was the first in Europe to formally recognize the heating sector as part of the ‘critical infrastructure’ of the country. Italy followed suit and reopened production plants, in a first phase in the components industry, which alleviated the difficulties with the EU supply chain. Equally, in Spain, during the State of Alarm, domestic hot water supplies and heating were declared essential to guarantee citizens and industries the needed level of sanitary support in time of a pandemic.

Recovery

The markets in Italy, France and Belgium, which had partially collapsed during the first half of 2020, regained momentum in the fourth quarter of the year. This market recovery was primarily based on the lifting of the lockdowns and – at least in Italy – was driven by new, attractive funding instruments which drew attention to the importance of the building sector and of a new way of experiencing life at home. As ‘home’ became also the office, the school and even the gym, so thermal comfort, indoor air quality, energy efficiency at home grew in importance. This trend continued in 2021 and has led to very strong market growth for efficient heating systems in these countries.

In Spain, the market for heating and domestic hot water production suffered the effects of the strong reduction in economic activity. Not only sales declined, but they also followed a different seasonality compared to previous years, marked by growth upon release from confinement. Although this has not been enough to compensate for the months of inactivity, growth started to be visible in practically all economic sectors as of the beginning of 2021.

Heating installers are important to bring the energy transition in European homes

To achieve the goal of carbon neutrality of buildings by 2050, carbon emissions from homes will have to be cut by 60% by 2030. This is an ambitious target to be achieved in a short time, and it requires that we install efficient and renewable-based heating systems much faster than today. Of the over 100 million heaters installed in Europe’s buildings today, more than 60% are old and inefficient and need urgent replacement.
How can we drive millions of consumers to replace their old heating system? A key role is played by installers. We know that when it comes to choosing a new heating appliance, consumers rely above all on the expert advice of an installer. This is because heating appliances are complex technical systems requiring a high level of expertise: they’re not off-the-shelf products which you can buy at the supermarket. A heating system needs to function within the specific building type, its piping and grid connection, heat demand etcetera.

Installers are specialized technicians with a specific training and the certification needed for the safety and optimization of a heating installation. In addition, they are trusted by consumers because they are regularly in contact with them, be it for periodic checks on the installation and to provide any needed maintenance service. A recent consumer study on purchase decisions regarding heating appliances carried out by Centerdata for the heating industry\(^2\), shows that close to 80% of consumers who recently bought a new heating system received advice from an installer. About 96% of them followed that advice either completely or to an extent.

Installers are therefore essential to bring to every home the technologies which are future and climate-proof and which are developed by the European heating manufacturing industry.

\(^2\) Centerdata, Consumer study on purchase decisions regarding heating appliances, October 2021, p. 15.
New technologies, new skills, new jobs: challenges and opportunities for installers

Technological advance represents both an opportunity and a challenge for the installation profession. This business sector is fragmented in many small and micro-sized companies, where often the time for learning new skills is limited. And yet, it is only by learning the skills to install innovative products in every home, every city, every country that we will achieve carbon neutrality by 2050. It is therefore important that installers take up the role of agents of the market transformation towards efficient, renewable-based heating systems.

To that end, they all need to be qualified to install new energy technologies like heat pumps, hybrid heaters, innovative boilers, micro-cogeneration units, solar thermal panels to name but a few. Today, this is not the case.

In Germany and in Poland, only 10% of installers are qualified to work with heat pump technologies. Similarly, in the UK, there are over 129,000 registered ‘Gas Safe’ installers but only 1921 registered installers of heat pump technologies. Other countries show more established installers’ basis: in France for instance, already 25% of the installers are qualified to work with heat pump technologies and it is estimated that in the next ten years, 5,000 jobs in the installation of new heat pumps will be created. In Italy, the total number of installers stands at 177,000 and 30% of those are qualified to install systems working with renewable energies.

**FIGURE 1** The graph below shows the predictions of needed installers of heating appliances by 2050 in Germany, based on two higher electrification scenarios: Scenario 1: to reach 3 million installed electric heat pumps requires +25% more installers than 2020 level (current installed stock of heat pumps in Germany: around 1 million) and Scenario 2: to reach 6 million installed electric heat pumps requires +100% more installers than 2020 level.
And numbers matter: today, there are over 1.5 million installers of heaters in Europe. But more are needed because we need to replace inefficient systems at a faster pace than today; and because it takes longer to install certain technologies, such as a heat pump, than it takes to install a boiler (i.e. minimum of 2:1 ratio between a heat pump and a boiler, especially in a replacement market).

More installers needed means an opportunity for growth of stable, local European jobs in the field of sustainable heating for decades to come. And yet, the profession of installer seems unattractive, especially for young people, which represents an issue in the long run. According to EHI data, installer companies have decreased in the last year in several European countries such as Austria, Czech Republic, The Netherlands, Spain while in Poland the number has not grown despite the recent market growth. Only in Germany and Italy has there been a slight growth in the number of installing companies (between 1% and 5%) in the recent years, but it is worrying that the average number of employees is getting lower in these new companies (4-5 people), which means that training in innovative technologies is more difficult.

FIGURE 2  More and upskilled installers are key to replace old installations with modern technologies
The heating sector in the European economy

What skills will be required to install new heating technologies? They’re about digitalisation, hybridization, electrification, system optimization, and new gases.

The job of an installer is not limited to advising clients about their next heater: it is about connecting it to your house and making it function. Installers are responsible for the correct setting and optimization of the heating installation (so called ‘dimensioning’). This entails an analysis of the heating needs of a building, as well as an accurate calculation of the size of radiators or underfloor heating that is needed for that specific house. And the appropriate connection of all the elements that compose the heating system. This step includes, more and more often, the installation of smart components, able to enter a dialogue with the energy supply outside the house, or with the other appliances of a building, as well as with users themselves, for example via their smartphones.

In addition, in Europe the Renewable Energy Directive requires installers to have a specific certification in order to install heat pump technologies; also, the F-gas Regulation requires natural persons who install, service, repair; decommission split heat pump technologies with hydrofluorocarbons (HFCs), do leak checks or reclaim HFCs to be certified. Therefore, installers of heat pump technologies and other experts need to be trained specifically in relation to refrigerants and dimensioning of the system, in order to handle heat pump technologies safely, ensure their optimal performance and prevent emissions.

All these elements point to a fundamental conclusion: the skills of installers must develop. Manufacturing companies are doing a lot to provide courses and training for installers. This must be complemented by the work of public authorities, with appropriate school curricula and with the goal of enhancing the attractiveness of this profession. Installers must become the agents of the heating transition.

Although education and professional training are a national or even regional responsibility in Europe, the role of EU regulation should be to support national efforts. We support therefore the EU Commission proposal to amend the Renewable Energy Directive on the qualification and certification requirements of installers. More than that, we believe that certification schemes should explicitly refer also to hybridization and to the possibility to use renewable fuels, because these are key instruments to increase the use of renewable energy in buildings.
2

Heating technologies
Whether you live in a cottage in Sweden, a skyscraper in Frankfurt or a guesthouse in Sicily, there is an energy efficient and/or renewable energy solution to heat your building and provide hot water for you. This is because the European heating industry develops sustainable heating solutions for every need, from boilers to solar thermal systems, from heat pumps to fuel cells, from radiators to underfloor heating. Each heating technology is perfectly adapted to the specific needs of each building and of its inhabitants, as well as to the availability of peculiar resources – e.g. a rooftop well-exposed to the sun. Each of these technologies is already contributing and will contribute in the future to achieving a carbon neutral building sector, reducing greenhouse gas emissions and saving energy.

2.1 **Heat pumps**

Heat pumps are very efficient, they increase renewable energy use in buildings and reduce greenhouse gas emissions. They can extract heat from different sources, i.e. from outdoor air, a ground source, a water source or from waste heat for space heating, domestic hot water, ventilation, and/or cooling. Their high efficiency is due to the fact that a heat pump can extract from the environment an amount of heat that is several times higher than the electricity it consumes. Further emission cuts can be achieved by using renewable electricity, e.g. from wind or photovoltaic energy sources, and decarbonised gases, e.g. bio-methane, bio-LPG.

They reach their highest efficiency in well-insulated buildings, where they can work at low system temperatures e.g. for underfloor heating. They are suitable for different types of buildings: residential or commercial. In Europe, they have a market share in new single family houses of 50% in average.

There are heat pumps and hybrid solutions available for any type of building – including existing buildings that are not well insulated – or market: heat pumps can be electric, thermally driven or be combined with a boiler (hybrid heaters).

Heat pumps are also very successful on the market; since 2012, sales have quadrupled. In 2021 the market for heat pumps in Europe will reach for the first time the number of 1 million pieces sold, with an almost 50% increase on the previous year. There are many reasons for this strong growth. The technological versatility and great energy efficiency of heat pumps (see above) are among them, together with ongoing legislative and financial support by the EU and national authorities, to help end-users sustain the investment cost.
Heat pumps are amongst the most efficient heating technologies on the market and as stated above, their sales are growing. However, there are several barriers to their even faster roll out. First, the upfront cost of heat pump technologies can make them economically unattractive for many consumers; in addition, there currently is a gap between electricity and gas prices. Financial incentives or regulatory interventions like well-designed carbon pricing can help in making the purchase and use of a heat pump technology more attractive and affordable. Second, there are challenges in the supply chain that need overcoming: the electricity grid will have to be reinforced, while both electricity and gas production will need to be decarbonised; the network of installers and maintenance must be expanded. Finally, there are technological challenges, and the European heating industry keeps innovating to solve them. For example, it will be important to keep reducing the size of heat pumps for the renovation market, as often buildings have only a limited internal space for heaters. Great advances have already been made to reduce the sound made by heat pumps – this is key, especially in more densely populated areas.

For more information on all heat pump technologies, please refer to the EHI report Rolling out heat pumps in support of the decarbonisation of heating.

**FIGURE 3** Heat pump
2.1.1 Hybrid heat pumps

The term 'hybrid heat pump' refers to a combination of an electric heat pump, a condensing boiler and a smart control. More in general, other heaters can have hybrid characteristics, meaning a combination of at least two different energy sources e.g. boiler and solar thermal panels.

How does a hybrid heat pumps work? Based on pre-set preferences chosen by users (e.g. minimise CO₂ emissions or running costs), the hybrid heat pump’s control will select the most appropriate operation mode for the heater in a given building, climate zone, and current energy prices. This combination of two technologies and energy carriers makes hybrid heat pumps very efficient and flexible: the heater will operate mostly as an electric heat pump, using the condensing boiler during the coldest days of the year or in situations where increasingly dynamic electricity prices are high. Hybrid heat pumps can be deployed in buildings which are not well insulated without further initial adaptations, capable to deliver higher system temperatures, and hence facilitating fast emission cuts. They would also pave the way for staged renovation of the building envelope: with lower heat demand, the heater will operate even more often in heat pump mode.

The sales of hybrid heat pumps are growing in many European countries and this is a trend that we expect to continue and expand in the next years. Today, the biggest European market for hybrid heat pumps is Italy. The success of hybrids is due to their flexibility, which makes them highly adaptable to Italy’s strong seasonal weather changes, and to their adaptability to the large renovation market of existing buildings. Being a no-regret option for increasing a buildings’ energy

![Figure 4: Hybrid heat pump](image-url)
efficiency and for fast electrification of existing buildings, at a reasonable cost in comparison to other efficient alternatives, hybrids currently also benefit of policy support.

Hybrid heat pumps are also increasingly successful in the Netherlands. This is because the Dutch government has set to reduce natural gas consumption in the coming years and considers hybrid technologies as one of the logical solutions for reaching 2030 climate targets and beyond. Hence, the use of hybrid heat pumps in renovation is promoted and growing, while electric heat pumps are being installed often in new buildings. Forward looking to 2030, the aim of the industry is to have 1.5 to 2 million hybrid systems installed in the Netherlands.

**Benefits:**

- Ready for green electricity.
- The large majority can already work with blends of natural (or green) gas and hydrogen.
- Fully compatible with 100% biomethane and synthetic methane.
- Developments are ongoing to make hybrids capable of working with 100% hydrogen.
- Great energy efficiency and CO₂ emissions reductions.
- Help balance demand on the electricity grid, limiting demand peaks thanks to condensing technology.
- Where dynamic prices are implemented, people may save on the electricity bill, shifting their consumption to times when demand (and prices) are low.
- Suitable for many building contexts: hybrid heat pumps are a very convenient means to renovate existing heating systems.
2.1.2 Electric heat pumps

Electric heat pumps use the energy stored in the environment or in waste heat for space heating, domestic hot water, ventilating, and cooling. They do so by using an electrically driven vapor compression cycle, to transport heat by means of a refrigerant fluid from the source (e.g.: air, ground water, waste heat) to the sink (i.e.: space heating or domestic hot water of the building).

Since electric heat pumps use environment or waste energy as a source, their CO₂ emissions are lower than most other heating technologies. Even further emission cuts can be achieved by using renewable electricity, e.g.: from wind or photovoltaic energy sources.

Today, electric heat pump technologies can be applied in many types of buildings. They reach their highest energy efficiency levels in new and well-insulated buildings, because they can work at low temperatures with low temperature radiators and/or underfloor or ceiling heating. In the replacement market, so-called high temperature electric heat pumps are an effective solution in less well insulated houses. They are increasingly available and able to fit in houses equipped with high temperature emitters. Dedicated electric heat pump technologies are becoming available for multifamily residential buildings and commercial/industrial applications.

Benefits:
- Ready for green electricity.
- They are highly efficient. A heat pump with a coefficient of performance of 4.0 can transfer 4 units of heat to a building, using 1 kWh of electricity input.
- Most of the energy used for heating is renewable.
- They reduce CO₂ emissions; greatest reductions with the use of renewable electricity.

FIGURE 6 Working principle of an electric heat pump

FIGURE 7 Sales of electric heat pumps in selected European Markets

3 Considered European markets are Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland and the UK (heat pumps data in Germany and Italy include hybrid heat pumps).
2.1.3 Thermally driven heat pumps

Thermally driven heat pumps use fuels such as natural gas or green gases (including hydrogen) as the source of energy to transfer heat from the environment to the interior of buildings.

There are three main technologies of thermally driven heat pumps, depending on how the environment heat is transferred from the outside to the inside of the building: by compression, adsorption or absorption. Each of these technologies is well-suited for certain applications:

- Thermally driven compression heat pumps are especially suited to commercial buildings (such as hotels, hospitals or schools) and large housings to produce heating, cooling and domestic hot water.

- Absorption heat pumps are well suited not only for new builds, but also for existing buildings. This is because they can very efficiently heat water, up to high temperatures. This characteristic makes them suitable for renovation projects where the original old types of radiators – called high-temperature radiators – have to be kept.

- Adsorption heat pumps are most efficient in new heating systems or in deep renovation where they are coupled with low-temperature radiators or surface heating systems.

**Benefits:**

- The large majority can already work with blends of natural (or green) gas and hydrogen.
- Fully compatible with 100% biomethane and synthetic methane.
- Developments are ongoing to make thermally driven heat pumps capable of working with 100% hydrogen.
- Highly energy efficient: they use existing renewable energy from the environment.
- Absorption technology works very well with existing heating systems.
- Make use of existing energy infrastructure.
2.2 Condensing boilers

Condensing boilers are efficient technologies, capable of providing heat to buildings as well as domestic hot water. They are called ‘condensing’ because they ‘condense’ the water vapour produced in the combustion process into liquid form. The heat of the water vapour is reused to warm up the cold water entering the boiler. This process ensures that most of the energy produced during combustion is recovered to heat the building.

The most common condensing boilers operate with gas, while condensing boilers running on other fuels are especially suited for off-grid buildings. Condensing boilers can easily be teamed with a solar thermal system to reduce fuel consumption by 10-20%. The use of condensing boilers with green gases (such as biomethane, hydrogen and bio-LPG) and fuels would enable further CO₂ emissions reductions, moving us closer to our EU-wide goal to decarbonise the building sector by 2050. Successful tests were run in 2020 for the use of renewable liquid fuels in heaters.

Our market data shows that condensing boilers running on gaseous fuels remain the most sold heating technology in Europe. Almost 5 million of them were sold in 2020, bringing substantial energy efficiency gains compared to the old and inefficient systems they replace. The highest energy efficiency gains are obtained by installing a condensing boiler and adjusting the system where needed thanks to hydronic balancing and the possible addition of heat emitters.

Benefits:

- Fully compatible with 100% biomethane and synthetic methane.
- The large majority can already work with blends of natural (or green) gas and hydrogen.
- Ready for green liquid fuels.
- Developments are ongoing to make boilers capable of working with 100% hydrogen.
- Up to 35% CO₂ emissions reductions when replacing non-condensing technology using natural gas. Deeper emission reductions with renewable gases.
- Around 20% energy efficiency gains by modernising the heating system.
- Easy combination with renewable heating and solar thermal.
- Gas condensing boilers rely on existing gas network.
- Potential to further reduce greenhouse gas emissions with green fuels.

FIGURE 10 | Sales of gaseous fuel condensing boilers in selected European Markets

4 Considered European markets are Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland and the UK.
2.3 Solar thermal

Solar thermal technology converts sunlight into heat, which is then used to produce hot water, heat or even cool buildings. Most solar thermal systems work in combination with a heater, for example a condensing boiler or a heat pump, which operates when heat demand is too high for the solar system alone. On average, a single-family house can satisfy up to 60% of its heat demand for domestic hot water with solar energy. A solar heating system is composed of: solar collectors, roof-mounted elements that collect energy from the sun, a hot water tank to store the water heated by the system, a circuit, and a heat exchanger to transfer heat from the collectors to the hot water storage tank.

Solar heat systems can also be used to top up central heating systems: in this case the saving on fuel is somewhere between 10% and 30% depending on the insulation levels of the building. It can be higher in the case of low-energy buildings. Solar thermally driven cooling systems – so-called solar air-conditioning – have a great potential, as the highest need for cooling goes hand in hand with the sun’s presence.

Benefits:
- Use of solar heat, which is available and free of charge.
- Saves energy by assisting the central heating system.
- Easy to install and use, low maintenance and low operating costs, long life span.
- Allows to integrate renewables within any heating system, both in existing and new buildings.
- CO₂ emissions reductions.

FIGURE 11 Solar heat system
2.4 **Biomass boilers**

Biomass boilers are the latest and most efficient technology to produce heat in the most ancient way: wood-firing. Each year, 40% of the wood produced sustainably in Europe is used for heating in European buildings, both residential and commercial.

Sustainably-sourced wood is a carbon-neutral renewable resource: when burnt, the same amount of CO₂ that was absorbed by the tree during its growth is released. Therefore, central heating biomass boilers can provide high thermal comfort while reducing greenhouse gas emissions. Moreover, the overall sustainability of biomass heating is further increased in areas where wood is locally available, which shortens transport routes and helps the local economy.

Modern heating systems use biomass in the form of pellets, wood chips or split logs. They can also be easily combined with solar thermal technologies.

**Benefits:**

- Very efficient use of a renewable fuel.
- Where biomass is locally available, biomass boilers create short transport routes, local jobs and domestic value.
- Great CO₂ reductions: sustainably sourced wood can be carbon-neutral.
- Can be easily combined with solar thermal technologies.

![FIGURE 12 Pellet-fuelled biomass boiler](image)
2.5 Combined heat and power, fuel cells

Electricity production and heat production go hand in hand. Producing electricity usually generates heat, so appliances that produce heat and power simultaneously can reach very high levels of efficiency.

The heat they produce keeps a building warm and provides hot water. Their electricity production can be used inside the building or fed into the electric grid. By using their fuel efficiently, cogeneration of heat and electricity contributes to reducing energy consumption and CO₂ emissions. Even greater CO₂ cuts are possible, by using green gases and fuels.

The use of heat from combined heat and power technology is particularly efficient at small scale. So-called micro-CHP and mini-CHP can be used in commercial and public buildings, apartments, individual houses and in some cases even in small collectives of houses. Several CHP technologies are available, using engines or fuel cells. Fuel cells achieve very high energy efficiency levels and already work with 100% hydrogen.

![Micro CHP system](image)

![An example of micro CHP system](image)
Fuel cells

Fuel cells use natural or green gas, which is converted into hydrogen. Since the gas is not burned, but used in an electrochemical reaction, fuel cells reach very high efficiencies.

They are well suited for typical single and two family homes, since most of these buildings are already connected to the existing gas grid. However, they are also suitable for new buildings and are available in higher capacities for use in commercial and non-residential buildings such as data centers.

**Benefits:**

- The large majority can already work with blends of natural (or green) gas and hydrogen.
- Fully compatible with 100% biomethane and synthetic methane.
- Some fuel cells are compatible with 100% hydrogen and developments are ongoing to make other micro-CHPs capable of working with 100% hydrogen.
- CO₂ reductions thanks to low fuel requirements.
- Electricity efficiency: by generating electricity at the point of use, CHP avoids losses typical of central power production and distribution.
- Heat efficiency of small CHP systems: heat generation at point of use avoids heat transport losses.
- Economic savings: reduce electricity purchase and allows the sale of surplus electricity back to the grid.
2.6 Water heaters

Water heaters are dedicated appliances that provide hot water for domestic purposes, e.g. showers or washing dishes.

The production of hot water makes up an important share of the overall residential energy consumption for heating purposes – between 10 and 20%. There are many technologies available, including heat pumps, boilers and solar collectors; in addition, there is a differentiation between on-demand and storage water heaters. The choice depends on the type of building and on the needs of those who will be using it.

On-demand water heaters heat water instantly as it flows through them. Most of these water heaters run on gas or electricity. These water heaters offer instantaneous delivery of hot water and provide great comfort in case of simultaneous use, for example when two showers are running at the same time.

Storage water heaters combine in the same appliance a hot water storage tank and a heating element (a burner, an electric resistance heater or an air source heat pump). These water heaters store hot water in the storage tank. Those running on electricity can help provide demand response services to the grid by allowing consumers to heat water with electricity when prices are lower. A typical example of such a system is a heat pump water heater, they are amongst the most efficient water heaters.

In other cases, hot water is provided by the same appliance that heats the building. This means that a heat pump, a boiler or solar collectors - or combinations of those, are connected to a hot water storage tank, which then releases hot water for domestic use. Other heating appliances, called combination heaters, provide heat for the building and on-demand water production.

Benefits:

- The large majority can already work with blends of natural (or green) gas and hydrogen.
- Fully compatible with 100% biomethane and synthetic methane.
- Developments are ongoing to make water heaters capable of working with 100% hydrogen.
- Variety of technologies to meet hot water demand in all buildings.
- Great comfort for users.
- Combination with solar thermal: energy from the sun may cover 70% of hot water needs.
- Heat pump water heaters: great energy savings.
2.7 **Hot water storage**

Interestingly, heating systems can even store energy – thanks to hot water storage tanks. Storing hot water is a good means to store energy, as water accumulates a lot of heat per unit of weight.

A hot water storage tank can help reduce energy consumption as it takes less energy to keep water warm (once it has already been heated) than it takes to heat cold water. Hot water cylinders can also help provide demand response services to the grid by allowing consumers to heat water with electricity when prices are lower. Energy is then stored in the tank in the form of hot water, ready to be used for washing or to heat the house when it is needed. Another advantage is that the energy from renewables, such as solar thermal, can be stored when available in abundance and used later.

![Hot water storage tank](image)

**Benefits:**

- **Comfort and flexibility:** hot water available any time for simultaneous use and at the desired temperature.
- **Energy efficiency:** modern hot water tanks are well insulated and ensure that the heat is transferred and stored correctly in the cylinder.
- **Demand side flexibility:** it allows to store renewable electricity and enables demand-side flexibility; when abundant, it is converted into heat and stored as thermal energy.
2.8 Surface heating and cooling

Many new buildings all over Europe opt for a surface heating and cooling system – hot or cold water is circulated via pipes, which are embedded in floors, walls or ceilings, and thus form an integral part of the building. These systems fulfil two functions at once: in winter they heat the rooms, while in summer they cool them down by running cold water through the pipes. Through their large-area installation, they ensure the distribution of heating or cooling in the room, contributing to a pleasant indoor climate all-year round.

A wide range of solutions is also available for old buildings. Surface heating systems generally work well with low heating temperatures (35/28°C) – perfect to maximise the efficiency of modern heating systems. The lower the heating system temperature, the higher its efficiency. Surface heating and cooling is also great for cosiness and comfort: smart control systems enable residents to create a heating profile for every room, tailoring comfort levels perfectly to the needs of residents. Embedding heating systems in walls, floors and ceilings also frees up a lot of space.

Benefits:

- Fully covering thermal comfort needs, all-year round.
- Highly energy efficient and optimal solution when combined with renewable heating.
- Suitable for all efficient modern heating systems in all types of buildings.
- Comfortable and frees up a lot of space.

**FIGURE 18** An example of floor heating system
### 2.9 Radiators

Today’s radiators are key components of efficient heating systems. Successfully increasing the efficiency of a whole heating system depends on all components being optimally adjusted to each other. Modern heaters tend to run more efficiently, when they run steadily at relatively low temperatures (i.e. 55°C or lower).

Modern radiators can achieve these low temperatures and still properly heat a building thanks to their innovative shapes and large heating surfaces. Modern radiators are also versatile: they can be integrated into any type of heating system, regardless of the heating technology used. This is why low temperature radiators should ideally form an integral part of the modernisation of a heating system.

Modern radiators do not only help to save energy; they also provide comfort. For example, thanks to remotely controlled radiator valves, users can set the temperature of individual rooms from their smartphone. The more aesthetic designs of modern radiators can even make them a design feature.

**Benefits:**
- Energy saving thanks to low-temperature systems.
- Great comfort and possibility to control remotely.
- Easy to install, minimum maintenance.
- Combinable with all modern heating technologies and renewable energies.

![A modern radiator](image)
2.10 Smart heating

Smart heating puts consumers in the driver’s seat. Thanks to its integrated communication device, a smart heater allows you to adjust the heating of your building to your needs and even to control it remotely. For example, allowing you to switch on your heating towards the end of your commute, so your home is already comfortable from the moment you arrive. Smart heating systems also enable so-called ‘remote appliance monitoring’ that allow your installer or service company to provide timely and pro-active maintenance to end-users, allowing them to enjoy uninterrupted heating comfort in their homes.

Smart heaters are ultimately interactive in nature. They can send and receive information to and from the user; communicate with other appliances in the house and even with the outside world, such as installers and energy utilities.

Smart heating is good for the environment. Smart controls help to boost the efficiency of a heating system, generating high energy savings. These systems also help to integrate renewable electricity from the grid, for example by setting your preferences to prioritise electricity consumption when renewable electricity is more abundant. This is most easily achieved with appliances like hybrid heat pumps, electric heat pumps and hot water storage tanks. With all these appliances, it is possible to anticipate or delay the time when they use electricity. For example, one could use a heat pump to heat a well-insulated house before arriving home, and still enjoy a warm living space for several hours. Another example would be to use a hybrid heat pump in electric mode when electricity is more abundant and economic, switching to the integrated boiler when it gets too expensive. Users could also opt to heat water with the back-up resistance of a well-insulated storage tank (power-to-heat) when electricity is cheap, and to use the hot water whenever it is needed.

Smart heating will be an integral part of the ‘smart homes’ revolution. The many different appliances inside a building (e.g.: heating and cooling systems, ventilation, fridges, electric vehicles), will be able to coordinate their operation, optimising comfort and bringing energy efficiency gains for consumers.

**Benefits:**

- Boost efficiency, generating high energy savings.
- Help to integrate renewable electricity from the grid: for example, setting the smart heater to prioritise electricity consumption when it is more abundant.
- Can be controlled remotely and easily adapt to consumer’s needs.
- Combinable with all modern heating technologies and renewable energies.
2.11 Hydrogen heating technologies

Hydrogen for heating?

Hydrogen has been used for heating since the second half of the 19th century. Back then, towns all over Europe used mixtures of several gaseous fuels, including hydrogen. With the construction of pipelines throughout the 20th century, local production of this so-called town gas declined, as methane was brought directly from wells to buildings.

Why heating with hydrogen today?

In the first place, because buildings must be climate-neutral by 2050 and we need to replace fossil fuels for heating with renewable and decarbonised sources of energy, including green gases like hydrogen, to achieve this goal.

From an energy-system point of view, hydrogen is a good complement to electricity with a view to decarbonise buildings, because it provides carbon-free energy storage capacity that can be used when renewable electricity is missing. This happens typically when the sun is not shining or the wind is not blowing: electricity cannot be stored to the extent required to supply the whole heating and mobility demand from our buildings.

Instead, hydrogen can be stored and distributed through the well-developed gas infrastructure system in Europe, which entails reasonable investments in comparison to the foreseen size of the hydrogen market. Moreover, hydrogen can provide daily, weekly and seasonal storage of renewables to produce heat and electricity on demand. Technologies using hydrogen thus can bring flexibility to the energy system, especially to meet the heat demand, which is higher in winter.

Secondly, heating technologies are ready for hydrogen. They can therefore help ramping up the hydrogen market in Europe and drive down prices for its production, thanks to a stable demand which buildings can provide.
Already today, many new gas appliances installed in European buildings are ready to work with blends of methane and hydrogen of up to 20%. In addition, there are fuel cells on the market today that are already capable of functioning with 100% hydrogen. Boilers and micro-cogeneration units that function with 100% hydrogen are under development and in the field-test phase.

In addition, manufacturers are developing 100% hydrogen-ready appliances. These are gas appliances that are installed as normal gas appliances, but can operate safely and efficiently using 100% hydrogen following a reconversion with a conversion kit and re-commissioning process in situ. These appliances would be able to function with any type of green gas (e.g. e-methane, bio-methane, hydrogen or blends with up to 20% hydrogen). The conversion kits would be supplied to the consumer when a region, city or part of a city converts to 100% hydrogen. Therefore, these heaters are fully compatible with renewable energy and pave the way for full carbon-neutrality of the building stock (no lock-in).

A legislative framework requires a larger range of heating technologies to operate with blends of up to 20% in 2026 and with 100% hydrogen, with or without conversion, in 2029 would streamline the market and secure investments.

From a consumer perspective, a hydrogen-ready heating appliance is interesting because it hardly requires any changes to the building. It also entails a very limited cost premium on the appliance: on average 30% more for a boiler, 8% for a hybrid heat pump, and 6% for a thermally driven heat pump compared to the methane-fuelled alternatives. And these current estimates costs are expected to decrease over time.

FIGURE 22 A fuel cell co-generates heat and power from hydrogen

5 Via the ecodesign regulations for space and water heaters
As for the cost of hydrogen itself, technology is in quick evolution. The increasing and reliable demand for hydrogen in buildings will provide a solid ground for investments in production, trigger economies of scale and bring down production costs. This will make hydrogen more and more affordable and available to all households.

Today, there are more than 80 projects across Europe that test hydrogen for heating directly or indirectly. The great variety of applications represents the flexibility of hydrogen in heating - ranging from 100% hydrogen heating as part of hydrogen valleys and local grids to hydrogen-methane blends of up to 20% hydrogen for the gas grid to heat and power plants utilising hydrogen both in central heating and cooling networks as well as off-grid. These projects are run by companies that are members of EHI and/or the European Clean Hydrogen Alliance. The majority of them are active or set to start by 2024 (see the map below). Hydrogen in buildings is already a reality.
The colors of all graphs on the installed stock refer to the Ecodesign Energy Labelling Regulation (EU) 2017/1369.

All data come from EHI market statistics and estimates.
3.1 **Austria**

Austria presents a rather diverse heating market, where heat pumps, biomass boilers and gas condensing, represent most of the new installations – beside a substantial share of district heating.

From 2015 to 2020 the Austrian market for energy efficient and renewable heating technologies has shown a moderate growth, with over 75,300 of these heaters sold in 2020. These new appliances are needed to replace the some 1,000,000 old and inefficient heaters installed in Austria’s buildings as of 2019. The replacement of non-condensing boilers and old biomass boilers are simply not happening fast enough. At the current rate of replacement, it would take decades to switch Austria’s buildings to efficient heating technology.

![Austria – sales of efficient heaters in 2019 and 2020](image-url)

<table>
<thead>
<tr>
<th>Type of Heating Technology</th>
<th>Market 2019</th>
<th>Market 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass boilers</td>
<td>11,900</td>
<td>12,700</td>
</tr>
<tr>
<td>Liquid fuel condensing boilers</td>
<td>4,400</td>
<td>3,000</td>
</tr>
<tr>
<td>Gaseous fuel condensing boilers</td>
<td>33,300</td>
<td>33,300</td>
</tr>
<tr>
<td>Heat pumps</td>
<td>21,600</td>
<td>26,300</td>
</tr>
</tbody>
</table>
From condensing boilers to heat pumps and biomass boilers, a wide range of efficient and renewable heaters were sold in Austria in 2020. Gas condensing and heat pumps remain the main technologies, followed by district heating. Each new condensing boiler can bring an efficiency increase up to 20% and CO₂ emissions reductions up to 35%.

Compared to other EU countries, Austrian sales of biomass boilers (17% of the heating market) and heat pumps (35%) are quite high. The market for heat pumps, in particular, has been increasing almost every year since 2011. This technologies, solar systems and district heating are strongly supported by incentives at the national, regional and local level.

Another important element on the Austrian heating landscape is the presence of district heating, which provided 14% of the country’s heating needs in 2014. District heating is a broad category, which includes large and relatively old high temperature systems, like Vienna’s. Vienna’s district heating network conveys heat from waste incineration, but mainly from gas to about a third of the capital’s households. In addition, there are more than 2,500 small and often highly efficient systems based on renewables (e.g.: biomass), which can contribute to the decarbonisation of buildings.
The evolution of the Belgian heating market has been affected by the COVID-19 pandemic and experienced a decline in sales in the second quarter of 2020. The highest drop was seen in the business-to-business landscape and less in the business-to-consumer. However, the market recovered quickly in the third and fourth quarters and it is expected to grow further in the coming years. As a result, the market for heat pumps increased by more than 30% in 2020. However, sales of condensing gas boilers recorded a fall of 4% and the overall market had a negative sign.

In Belgium, gas boilers have been the most common heating for several years due to an extensive gas network and the availability of relatively inexpensive gas from the North Sea and the neighbouring Netherlands. A large stock of old oil boilers is gradually being replaced by new, efficient appliances, including heat pumps.

In order to achieve ambitious targets for energy efficiency and zero energy/emission buildings, various combinations of energy-efficient technologies have been highly recommended. CO₂ emissions can be reduced installing renewable-based heaters. In this group of technologies, electric heat pumps are on the up, as new installations have been growing steadily since 2013. The heat pump business in Belgium grew strongly in 2020 and this trend is expected to continue as heat pumps are becoming the standards for new buildings.
In the liquid-fuel boiler business the market remains stable with 65,000 units sold in 2020. Nevertheless, the way forward is not well defined at this stage, especially because these appliances may use renewable fuels and be coupled with solar thermal and heat pumps (hybrids).

Almost 2,000,000 inefficient, old boilers are still heating Belgian buildings in 2020, of which more than 500,000 oil fuelled. At current replacement rate, it will take more than 30 years to replace them all with new, efficient appliances. The replacement would be highly beneficial to Belgium’s carbon-reduction goals: bringing at least 2,000,000 tonnes of CO₂ emissions reductions, not to mention high energy savings for consumers.

As in many other Member States, one element that requires further consideration is represented by the installers. The Belgian heating market is suffering due to the shortage of qualified installers.
3.3 **Denmark**

While most heating is district-based, Denmark presents a diverse market for individual heaters, with gas condensing, heat pumps and biomass boilers covering most of new installations.

A variety of efficient and renewable-based heating technologies were installed in Denmark in 2020. Heat pumps (12,100 sold in 2020) and biomass boilers (4,700) are the most common technologies to replace the still sizable stock of old and inefficient non-condensing gas and oil boilers – about 200,000 appliances in 2020, mostly in rural areas. From 2012, the substitution of old oil boilers systems with renewable-based ones has benefitted from a government-funded scheme. Every heat pump replacing an old oil boiler brings about 50% reduction of CO₂ emissions.

![FIGURE 27 Denmark – sales of efficient heaters in 2019 and 2020](image)
In urban areas served by gas networks, the old stock to be replaced is made of about 43,900 non-condensing gas boilers (2019). These inefficient heaters are being replaced at a pace of around 15,000 boilers/year – which represents half of the Danish market for efficient and renewable-based heaters. The ambition is to convert the old and inefficient appliances by 2030 to climate neutral alternatives. Substitution with condensing gas heaters systems will bring energy savings of around 20% and consistent CO₂ emissions reductions.

District heating plays an important role in Denmark, covering about two thirds of residential buildings in the country. District heating covers approximately 60% of all new buildings; the rest is covered by gas condensing boilers and heat pumps. However, the combustion of fossil fuels and non-organic waste made up about 40% of the fuel mix for district heating – almost a quarter of it being coal. Incineration of municipal waste is also widespread, while some of it is accounted for as biofuel. A transition to smaller, low-temperature and renewable-based district heating systems represents a unique opportunity for further efficiency gains and emission reductions.
3.4 **France**

The French market for heaters was deeply affected from the COVID pandemic in 2020. The second quarter led to a very strong reduction of the market, due to the lockdowns for the population and – for some weeks – on factories. Demand partly recovered in the third quarter, but the end of the year was negative for all product groups.

In terms of technologies, electric heat pumps have remained a large market, in fact the largest in Europe today. This is due to the abundance of electricity and the resulting relatively low prices, combined with support schemes. In 2020, about 178,000 heat pumps were installed in French buildings. Electric heat pumps are often used in new individual dwellings. When it comes to hybrid heat pumps, France remains one of the largest EU markets, although installations did not grow in 2020. Gas condensing technologies account for approximately two thirds of the French heating market, as over 500,000 appliances were sold in 2020. They are mostly installed as replacements of old appliances and in new collective buildings. The market of biomass boilers has remained all in all stable, although sales remain lower than the pre-crisis peak in 2008. In 2020, about 17,300 biomass boilers were installed in French households. The market of solar thermal, after a short stabilization in 2018, has started to decline again, mostly due to a lack in support schemes for renovation and to a building regulation which doesn’t promote the installation of solar devices in new buildings.

![FIGURE 29](image-url)  
**France – sales of efficient heaters in 2019 and 2020**

- **Biomass boilers**
  - Market 2019: 17,400
  - Market 2020: 17,300

- **Hybrid heat pumps**
  - Market 2019: 4,300
  - Market 2020: 3,700

- **Heat pumps**
  - Market 2019: 178,800
  - Market 2020: 177,700

- **Liquid fuel condensing boilers**
  - Market 2019: 9,000
  - Market 2020: 8,900

- **Gaseous fuel condensing boilers**
  - Market 2019: 506,200
  - Market 2020: 501,300

0 100,000 200,000 300,000 400,000 500,000
Accelerating the replacement of old appliances with new ones is key to reducing the greenhouse gas emissions of France’s buildings. Modernising the current stock of inefficient heaters (over 60% of the installed boilers are old and inefficient) can cut greenhouse gas emissions by at least 35% per heating system. In this field, condensing technology still makes up the majority of the market as most of the installed non-condensing heaters are replaced with a modern, state-of-the-art condensing boiler. However, at current replacement rates, it will take about two decades to entirely modernise the installed stock of old and inefficient heaters – hence the need to accelerate the deployment of efficient and renewable heating technologies.

A higher replacement rate will contribute to further raising the contribution of the heating (and cooling) industry to the French economy, which generates a turnover of over 6.6 bn EUR and directly employs 22,000 people.
3.5 Germany

Sales on the German heating market grew by 13% in 2020 to 842,000 units. This contrasted with the previous 20 years, during which the German heating industry had only achieved growth rates of between 2 and 3%. This recent highly dynamic growth was due to the following two factors: there was a demand shift from sanitary to heating installations and renewable energy-based heating installations gave the market an important boost.

**Demand shift from sanitary to heating installations**

One feature of the German heating market is the business model of the typical German installation company. More than 85% of sanitary, heating and air-conditioning businesses offer both sanitation services and heating engineering. On account of the very good margins achieved on sanitation investments, this sector has dominated for years with around 55% of the business volume. However, in the second quarter of 2020, the COVID-19 pandemic was already causing potential investors in new bathroom suites to postpone their investments, because they were reluctant to allow the six to eight tradespeople usually required for bathroom renovations into their private premises. However, most private investors did not regard allowing installers to replace the heating system in the cellar as a risk of infection, because the typical German cellar is separate from the living areas. As a result, the usual heating engineering and installation capacity constraints did not arise in this “corona year”, although sales and turnovers grew significantly.

**FIGURE 31** Germany – sales of efficient heaters in 2019 and 2020

- **Biomass boilers**
  - Market 2019: 22,500
  - Market 2020: 54,000

- **Hybrid heat pumps**
  - Market 2019: 800
  - Market 2020: 3,500

- **Heat pumps**
  - Market 2019: 86,500
  - Market 2020: 120,000

- **Liquid fuel condensing boilers**
  - Market 2019: 49,000
  - Market 2020: 42,000

- **Gaseous fuel condensing boilers**
  - Market 2019: 518,000
  - Market 2020: 553,500

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7 Hybrid heat pumps should not be added to calculate the total market size in this country. The data for hybrid heat pumps are already included in the separate categories of boilers and heat pumps.
Renewable energy-based heating installations gave the market a boost

New, attractive funding conditions for property owner-occupiers came into effect in Germany on 1 January 2020. The state would pay up to 45% of the total investment when a new heating system replaced an obsolete one. This top percentage was available in particular where oil-fired boilers were replaced by condensing boilers in combination with solar thermal systems, heat pumps or wood fired central heating systems. After a certain familiarization and learning process, this funding scheme helped to push the market to the record growth rate of 13% in the second half of 2020.

The sales of gas condensing boilers increased by 7% when funded in combination with solar thermal systems. Gas condensing heating systems achieved sales of over 550,000 units for the first time. Sales of heat pumps increased by 40%, and reached the record level of 120,000 units in 2020. Heat pumps in Germany are increasingly sold for existing buildings, in addition to new-built: in 2019, 20% of heat pumps sold were for existing buildings. In 2020 this share increased to 40% of the total heat pumps sold in Germany. The electrification of the German heating market is continuing to make highly dynamic progress.

After 12 years of decline or stagnation, wood-fired central heating systems increased by 138%, and pellets by the even higher figure of 208%, which was also boosted by funding. Solar thermal systems sales also developed positively with an increase of 26% after a continuous decline over 12 years. Solar thermal systems are funded in combination with condensing boiler technology.
3.6 **Italy**

In Italy, gas condensing technology remains the most common, due to an extensive gas network and the affordability of gas. In 2020, over 870,000 new, energy-efficient and renewable-based heaters were installed in Italian buildings, marking an increase of about 4.3% from 2019 – which is remarkable, considering the extraordinary nature of the period. Among these, 85% were gas-condensing boilers, the most common efficient technology used to replace the stock of old and inefficient non-condensing boilers. This market development generated a turnover of almost EUR 5bn in the period 2014-2020.

Importantly, the heating sector creates jobs: Italy is the second-largest EU manufacturing country for heating appliances, meaning heating will contribute in large part to the 115,000 estimated jobs per year that the energy sector is set to create by 2030.

Despite being a large market for energy efficient and renewable based heaters, installations of new appliances are still only making a small dent in the installed stock of old and inefficient heaters of Italy. This stands at a daunting 13.6 million systems (2019) and will take about 15 years to entirely modernise. As a matter of fact, the modernisation of the stock only really began in full force after the

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**FIGURE 33** **Italy – sales of efficient heaters in 2019 and 2020**

<table>
<thead>
<tr>
<th></th>
<th>Biomass boilers</th>
<th>Hybrid heat pumps</th>
<th>Heat pumps</th>
<th>Liquid fuel condensing boilers</th>
<th>Gaseous fuel condensing boilers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market 2019</strong></td>
<td>5,200</td>
<td>8,300</td>
<td>52,700</td>
<td>2,300</td>
<td>712,500</td>
</tr>
<tr>
<td><strong>Market 2020</strong></td>
<td>6,900</td>
<td>14,000</td>
<td>59,000</td>
<td>2,000</td>
<td>739,000</td>
</tr>
</tbody>
</table>

Hybrid heat pumps should not be added to calculate the total market size in this country. The data for hybrid heat pumps are already included in the separate categories of boilers and heat pumps.
entry into force of the Ecodesign and Energy Label Regulations for heaters. To accelerate the replacement rate, the Italian heating sector is strongly investing in communication and training, and has recently launched a label for already installed appliances. Such labels aim to raise awareness as to just how inefficient the appliances installed in their homes are when compared with modern technologies.

Moreover, Italy is the EU’s largest market for hybrid heat pumps, with an increase of almost 69% compared to the previous year. Their success is due to policy support and their versatility, which makes them highly adaptable to Italy’s strong seasonal weather changes. Solar thermal technology, on the other hand, has been decreasing since 2011, partly because the national legislation for renewables is not based on a principle of technological neutrality. Sales are now about a third of where they stood at the 2010 peak. Electric heat pumps have enjoyed high growth rates in the past years and the market reached 59,000 items sold in 2020. Among the reasons for this uptake includes the creation of a special tariff in 2014 to lower Italy’s electricity prices, which were very high.
3.7 The Netherlands

The Netherlands has the smallest share of inefficient heaters in the stock of appliances installed in buildings of any EU country. This is because the Netherlands was a very early adopter of the condensing technology.

The condensing boiler became popular in the mid-1990s due to a significant change in the regulatory framework and thanks to the presence of a well-developed gas infrastructure. This led to a dynamic market, counting between 400,000 and 460,000 energy efficient and renewable-based heaters installed every year in the country.

Had non-condensing appliances not been replaced as they were, the Netherlands would have been responsible for an additional 9.3 million tonnes of CO$_2$ emissions. Those replacements also contributed positively to the Dutch economy, where the heating industry represents over EUR 850,000,000 turnover and 5,000 jobs.

![FIGURE 35](image-url)
Gas condensing boilers have been the most common heating technology installed in Dutch buildings in the past years – almost 430,000 in 2020. Moreover, other efficient and renewable technologies are becoming more and more common, as the Dutch government has set to reduce natural gas consumption in the coming years.

In new buildings, heat pumps have become the norm. The trend was accelerated by a 2018 regulation that makes gas-based heaters effectively banned in new buildings, from July 2018. In the existing building stock and renovation, the use of hybrid heat pumps is promoted and growing. District heating has been put forward as another potential avenue, and the use of hydrogen and biomethane is being discussed as a way to heat buildings while using (and upgrading where needed) the existing and well-developed Dutch gas network.

![Figure 36](image-url)
3.8 **Poland**

Despite the pandemic which broke out in the spring, the year 2020 saw an expansion of the Polish heating market. One of the important factors of such market growth was the goal of improving air quality at the local level. Certainly, modern heating technologies are an excellent means to cut pollutants emissions. The increase in sales occurred for most product groups in 2020.

Indeed, there are in Poland programmes incentivising the replacement of low-efficiency, high-emissions coal boilers. For example, the long-awaited changes to the rules of the Priority Programme Clean Air, introduced in May 2020, resulted in an increase of the replacement rate of old and inefficient heating appliances. While the stock of individual heaters is being modernised, electricity generation remains overwhelmingly dominated by coal. This must change in the near future, for heat pumps to deliver their full potential of CO₂ emissions reductions.

All efficient and renewable-based heating technologies benefitted from the Programme Clean Air mentioned above. In 2020, just like the year before, heat pumps recorded a very strong increase in sales. The confirmed growth trend in the heat pump market segment is the result of a consistent policy framework, both at the European and at the Polish level. There is also a growing interest in hybrid systems composed of a heat pump and a gas condensing boilers or heat pumps in combination with solar thermal collectors. For example, the market growth of the hybrid system formed of a heat pump and a condensing boiler was over twofold. The sales of biomass and condensing gas boilers also increased.

![FIGURE 37](image-url)
In conclusion, the 2020 heating market followed a growing trend, although this growth was less dynamic than in the previous year. The overall growth trend means that more and more old heaters are being substituted with appliances that cut energy use and CO₂ emissions.
3.9 **Spain**

The Spanish market for domestic hot water and heating has been strongly affected in 2020 due to the COVID-19 pandemic as well as the decline in economic activity caused by the confinement measures imposed by the government.

Among the most prominent effects we could mention the following:

- A significant contraction in demand (installation of new products).
- Reduction in production levels in factories to adapt supply to a lower demand.
- Partial interruption of the supply chain and the mobility of goods for some weeks.

![Figure 39](image-url)
About 305,000 efficient and renewable-based heaters were sold in 2020. The most common technology was gas condensing, followed by electric heat pumps. Most new heaters went to replace part of the stock of around 6.5 million old and inefficient appliances installed in Spanish buildings. Only by replacing old gas appliances, which represent the bulk of the installed stock, will Spain achieve over 1250 GWh of energy savings. However, at current replacement rates, it will take more than 30 years to attain these results. Therefore, the Spanish heating industry has long decided to speed up the replacement rate and recently launched a label for installed appliances. Thanks to this label, consumers can evaluate the (in)efficiency of their installed heating system and easily plan its replacement with a new, much more efficient and renewable-based one.

Decarbonisation cannot be achieved without empowered consumers. Such a people-centred process will contribute to boosting the positive impact of the heating industry in Spain: 3,000 jobs in manufacturing and a turnover of over EUR 647,000,000, as well as the thousands of small companies active in installation and maintenance across the country.
3.10 **Sweden**

Heat pumps are the most common building-based heating technology in Sweden, followed by biomass boilers. 95% of the heat pumps are found in single-family houses, and the stock of heat pumps in Swedish buildings in 2019 amounted to around 880,000. Sales of heat pumps have increased steadily since the early 1980s and in 2020 a little under 60,000 hydronic heat pumps were installed in Sweden (air/air heat pumps not included).

Previously, the most common technology in Sweden were liquid fuel, non-condensing boilers. The change from old and inefficient appliances to more efficient ones was a key contributor to increasing energy efficiency and sustainability of the building sector. But this replacement did not happen on its own; on the contrary, it was helped by tax credits launched in the 1990s and 20009. Another important factor for the success of heat pumps in Sweden is the low price of electricity.

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**FIGURE 41** Sweden – sales of efficient heaters in 2019 and 2020

- **Biomass boilers**
  - Market 2019: 2,500
  - Market 2020: 2,200

- **Heat pumps**
  - Market 2019: 56,400
  - Market 2020: 58,800

- **Gaseous fuel condensing boilers**
  - Market 2019: 500
  - Market 2020: 400

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9 Swedish Energy Agency, Heat Pumps in Sweden - Factors behind the market developments, 2018
Biomass boilers are the second most common technology in single family houses and non-residential premises: biomass represented 14% of the total energy consumption for heating and hot water (district heating excluded). Gas boilers are not as used as in most other EU countries (figure 41); an important reason is the relatively limited development of the gas grid. On the other hand, the share of consumption of green gas is rather high: In 2019, the Swedish biogas consumption amounted to approximately 4 TWh, to be compared with a natural gas consumption just over 10 TWh in the same year. This is mostly biogas, used in the industrial sector: Biomethane is mixed in the natural gas grid and the share used in heating is around 20%.

District heating is the most common heating form in Sweden. In 2020 district heating accounted for approximately 58% of the total energy consumption in dwellings and non-residential buildings. The district heating market consists of several companies, often operating at a local level in natural monopolies; end users in district heating networks are usually not able to choose their heat supplier. On the other hand, there is competition between district heating and other products and services in the heating market. Because of this, the pricing of district heating is normally set against the prices for alternatives (e.g.: heat pumps, biomass boilers).10

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10 Source: SBBA (Swedish Heating Boilers and Burners Association)
3.11 Switzerland

The Swiss heating market remained stable during 2020 and the sales figures didn’t change much due to the effect of the COVID-19 pandemic on the market. Electric heat pumps and gas condensing boilers remain the two most popular technologies in the Swiss market.

Most of the stock of old and inefficient heaters to be replaced is made of non-condensing oil boilers, which are rather common in valleys where the gas grid is not developed. In 2020, electric heat pumps were the most common technology, with over 28,000 new units installed. Thanks to the low CO₂ intensity of the Swiss electricity mix, the carbon footprint of these electric heat pumps during operations is very small. Condensing boilers are also rather common: more than 13,000 gas condensing appliances were sold in 2020, mostly in urban areas connected to the gas grid. Despite the availability of wood, biomass boilers remain a small market in Switzerland, with about 2,000 heaters installed in 2020.
In 2020, the Swiss Federal Office of Energy has launched the “renewable heating” program, which aims to accelerate the replacement of heating systems using fossil fuels. The program highlights that there is a suitable alternative for every type of house - be it connection to a renewables-based district heating network, a heat pump, wood heating or a solar heating system. The program shows that installing heating systems working with renewable energy is very effective. It also supports plumbers and consultants in their daily work, because installing heating systems using renewable energy is also a challenge for the construction industry. The program therefore enjoys broad support.
3.12 **Turkey**

In 2020, the Turkish heating market has slowed down, notably in the second quarter due to the COVID-19 pandemic. Nevertheless, the situation improved in May 2020 and since then the market has been growing again. This happened, because many citizens invested in refurbishing their homes, in suburban areas in particular. Due to attractive mortgage rates given by state banks, home sales and new stock of housing accelerated. Factors such as a growing urban population and growth in economy will further increase the consumption base in the coming years.

Replacements hold about 40% of the market in Turkey. Almost all products installed are gas condensing boilers, which are replacing a stock of more than 8,000,000 older, non-condensing heaters. The construction sector has seen a continuous growth for the past 4 years; however, this trend has now changed in 2021. The reason for this is the high interest rate (20-23%/year) which in turn caused disruption in investments. As a consequence, the permits for new buildings decreased drastically from 2019 to 2020. This holds true for both the commercial and residential side.

The market of heat pumps has increased particularly in southern Turkey, although the numbers are still small. With 6,700 units sold in 2020, the market is expected to go up to at least 7,000 in 2021.
As a candidate country of the EU, Turkey is continuing the process of transposing EU legislation into national law. In April 2018, Turkey started implementing the transition from non-condensing to condensing technology, due to Ecodesign rules. This means that less efficient, non-condensing appliances were banned from the market. In 2020, over 1 million energy-efficient and renewable-based heaters were installed in Turkey, with a strong growth from the previous year.

![Diagram showing installed stock of heaters in Turkey in 2015, 2017, and 2019.](image-url)

**FIGURE 46** Installed stock of heaters in Turkey in 2015, 2017, and 2019
3.13 The United Kingdom

The COVID-19 pandemic and the shutdown that occurred in spring 2020 had a strong impact on the UK market for heaters. Sales for heating appliances fell in 2020. Most businesses closed in April and for part of May. Unlike for most of Europe, the UK only started lockdown at the end of March, so this month was not as impacted. This was not replicated in subsequent shutdowns.

For gas boilers, annual sales fell by 6.8% compared to 2019. The biggest fall was within floor standing boilers. For hot water cylinders, sales fell by 5.3%. Radiator sales fell 16% and commercial boilers fell by 14%.

The difference in totals between domestic appliances and radiators and commercial boilers is probably because the commercial and house building sector was slower to return to normal. This would disproportionately affect the radiator and commercial boiler sector. Many offices and commercial sites were closed for 2020 and so there was less demand for commercial heating. This would have affected natural replacements as well and these will have been delayed into 2021 or 2022 when some return to office-based work is expected.

What was notable however was that sales of domestic gas boilers rose by 9% in the last 6 months of the year compared to the same time period in 2019. This rise almost compensated for the dramatic fall in sales in April and May. This was due to a backlog in demand, people whose heater had not been able to be replaced in April and May then needed it changing. However, the biggest cause in demand was due to a large increase in home renovations. Because people were unable to go on holiday, they started to use that money to renovate their home. This normally leads to a heater replacement because of needing to move it when a kitchen or bathroom is replaced.
The expectation is that all heating product groups will fully recover in 2021 with the potential for a significantly positive year as a combination of renovation and full recovery leads to a short-term boom.

In terms of technologies, most products installed were gas condensing boilers. The very important sales of condensing technologies make the UK the largest market for heaters in Europe. This large and dynamic market, coupled with an early introduction of the ban of non-condensing technologies, has been very beneficial in reducing the stock of old and inefficient appliances.

The market for heat pumps grew also in 2020, although at a reduced pace compared to previous years. In fact, this market has been growing almost continuously since 2007 and now stands at over 32,000 units. Hybrid heaters are a niche today, but they have the potential to becoming very common, as they are well suited to the UK building stock and heating needs.

Moreover, the UK has been frontrunner in innovative projects to use hydrogen for heating – which burns without producing CO₂. Several pilots are ongoing in the country, investigating various aspects of hydrogen use: from the combustion of hydrogen for heating (pure or in blends with natural gas) to its distribution in gas networks, the UK is seeking how this fuel can best contribute to decarbonising buildings.
3.14 **Main trends of the Central and Eastern Europe**

The heating sector in Central and Eastern Europe is still highly based on old, non-condensing technology. Particularly relevant is the share of solid fossil fuels, with a relatively important number of coal-based appliances. As some of the countries in the region are facing serious issues related to air quality, substituting these old heaters is one of their main challenges. Several initiatives taken by the countries in the region aim at replacing coal boilers with natural gas boilers.\(^{11}\)

EHU has been monitoring the evolution of market trends and of the installed stock of heaters in several Central and Eastern European countries: Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia. In all these countries, the sales of biomass boilers and electric heat pumps have been growing since 2015. According to the European Commission, in 2030, biomass remains the dominant renewable heating technology. The following countries expect to reach a share higher than 80%: Hungary (92%), Romania (91%), Bulgaria (89%), Czech Republic (87%) and Slovakia (80%).\(^{12}\) The installed stock of inefficient noncondensing appliances (over 10 million appliances in these countries in 2019) is progressively being substituted with energy efficient and renewable based heaters. In general, markets in these countries tend to be rather dynamic, as individual heating systems gradually substitute stoves and – in certain countries, like Hungary and Romania – district heating.

As mentioned above, one of the characteristics of several Central and Eastern European countries is the relatively large stock of solid fuel boilers installed in buildings. Most of them are still old coal boilers. Their replacement is essential given that, on one hand, it will improve air quality and on the other hand, it will generate energy savings and CO\(_2\) emissions’ reductions. These boilers should be replaced by other technologies. A multitechnology approach is needed to cope with the fact that buildings are different across Central and Eastern Europe and so are heating needs, due to different climates, energy infrastructure, available renewable energy resources at local level, individual preferences and economic resources.


\(^{12}\) Assessment of heating and cooling related chapters of the national energy and climate plans (NECPs) - [https://publications.jrc.ec.europa.eu/repository/handle/JRC124024](https://publications.jrc.ec.europa.eu/repository/handle/JRC124024)
Another interesting characteristic common to many of these countries is the higher share of users connected to large district heating networks, compared to the EU average. For instance, in Czech Republic, over 40% of the population is connected to district heating\textsuperscript{13}. In Romania, the share is about 24%\textsuperscript{14}. However, many district heating systems in Romania do not benefit from many investments and have an uncertain future. Many district heating systems in Central and Eastern Europe are highly energy inefficient and need to be modernized. Considering that the predominant energy sources used are still fossil fuels (coal, oil and gas) makes interventions ever more urgent. For instance, 75% of district heating in Poland was generated in the combustion process of coal in 2017. Among the potential solutions are: the installation inside the district heating smaller heaters (including renewable based appliances) closer to the consumption point; the use of efficient and renewable-based individual systems.

\textsuperscript{13} District Energy in the Czech Republic - https://www.euroheat.org/knowledge-hub/district-energy-czechrepublic/

\textsuperscript{14} Data on district heating in Romania from the Romanian Cogeneration association, COGEN Romania - http://cogen.ro/
3.15 Main trends of burners’ market

A burner is a crucial component of a boiler, because it generates and accurately controls its heat source, the flame. The sales of burners monitored by EHI refer to four main national markets: France, Germany, Italy and the United Kingdom. The definitions of the product destination are slightly different for each country, so the numbers should not be directly aggregated. Therefore, this section focuses on trends, rather than on total sales numbers. The EHI statistics cover burners sold alone, i.e. separately from boilers. Burners can be sold integrated in a boiler – in this case their sales are already captured in the EHI statistics on heaters – or separately from it. Overall, the burners’ market is stable and mature.

Another characteristic of burners is that they can work with biomethane. Many burners on the market can use up to 20% hydrogen. The industry has already developed and keeps developing burners working with 100% hydrogen. Decarbonisation will come from both the efficient use of energy and its decarbonisation.

Residential and commercial sector, up to 400 kW

Sales of burners have been historically declining in this segment, due to the increasing presence of integrated boilers and burners. Many of these burners are sold as spare parts, to be installed in existing appliances. After the introduction of Ecodesign in 2015, the market slightly increased in France, Italy and the UK and then stabilised or slightly decreased. Burners sold as spare parts can increase the efficiency of a boiler and reduce its emissions; even higher gains, however, will be obtained by substituting the whole boiler with a new, condensing appliance. In 2020 the sales of burners were impacted in the second and third quarters by the COVID-19 pandemic.

Commercial and industrial sector, from 400 kW

These large burners are mostly sold alone. They can then be integrated in big boilers or used on their own for industrial processes like ceramic production or paint drying.

In this segment, the industry is developing innovative solutions, aimed to optimise combustion processes and to automatically adjust them, according to environmental and system variables. These new developments are important to achieve important emissions cuts, for example of NOx. In addition, the range of modulation is an important area of research from manufacturers. This is key to increase the efficiency in operations, as well as to extend the flexibility of burners and make them suitable for a growing range of applications.
The total number of sales is often related to the trends of the production segments for which these burners are used.

**FIGURE 50** Sales of commercial and industrial burners < 400 kW

**FIGURE 51** Sales of commercial and industrial burners > 400 kW
3.16 **Main trends of the market for heat emitters**

Most heated buildings in Europe rely on water to distribute heat in the various rooms. Hydronic (water-based) heat emitters, such as radiators, convectors and surface heating and cooling (e.g.: underfloor heating), can be found in almost 130 million EU buildings. Not only are they crucial for peoples’ comfort; they also bring energy savings and reduce CO₂ emissions.

Modern heat emitters settings called ‘low-temperature’ enable the use of efficient and renewable energy for heating purposes. They do so by maximising their heating surface (large radiators, wide heated floor areas) and by reducing their water content. This combination allows for the use of low-temperature water (< 50°C) to heat a room; and in principle the lower a heating system’s temperature, the higher its efficiency. This is why Europeans can achieve significant energy and CO₂ emissions savings in their buildings by modernising their heating and cooling systems and installing low-temperature heaters and heat emitters.

Radiators are the most common type of heat emitters. They are versatile, as they can be used with both low and higher temperature systems – which may be needed if the house is not well insulated. While their sales slightly increased between 2016 and 2017, the market afterwards declined until 2020. Among the various types of radiators, bathroom radiators have been growing the most because they are installed even in houses that do not have space heating radiators, for their important function as towel dryers.

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Data on radiators include the following countries: Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Poland, Spain and Sweden.
Radiators with integrated valves, which make it possible to increase further comfort and energy efficiency by adjusting the heat in a specific room, are also becoming more and more common. Since more and more buildings need to be cooled in the summer, new types of radiators are coming to the market. For example, there are radiators circulating hot or cold water according to the season and using fans to ‘multiply’ the heating or cooling effect.

Surface heating and cooling (used for floor, wall or ceiling) is an established technology for many new buildings, which have a low heat load. Moreover, this technology can be used for cooling. It has already become rather common in houses, but it is less installed in apartments and commercial buildings. There are differences across Europe: surface heating and cooling is most used in central Europe, less so in Eastern European and Mediterranean countries. The low system temperatures benefit the residents in two ways – they provide for a large energy saving potential and create an enormous increase in cosiness and comfort. This can be supported with intelligent single-room controls, which can be both wired and wireless. The embedded surface heating and cooling system offers the dual advantage of “heating in winter” and “cooling in summer”. This means that the ambient temperature can be set to a comfortable range throughout the year – in apartments, office and commercial buildings, as well as in halls.

![Figure 53: Installation of surface heating and cooling in apartments](image)

Source: Association of the European Heating Industry
Issued by: Interessengemeinschaft Energie-Umwelt-Feuerungen GmbH
European Markets Overview

**FIGURE 54** Installation of surface heating and cooling in houses

- **< 10%**
  - Very Low Penetration
- **10% to 33%**
  - Low Penetration
- **33% to 66%**
  - Medium Penetration
- **> 66%**
  - High Penetration

Source: Association of the European Heating Industry
Issued by: Interessengemeinschaft Energie Umwelt Feuerungen GmbH

**FIGURE 55** Installation of surface heating and cooling in non-residential

- **< 10%**
  - Very Low Penetration
- **10% to 33%**
  - Low Penetration
- **33% to 66%**
  - Medium Penetration
- **> 66%**
  - High Penetration

Source: Association of the European Heating Industry
Issued by: Interessengemeinschaft Energie Umwelt Feuerungen GmbH
NOTE ON THIS REPORT:

All data for the installed stock is rounded to thousand. Where actual data is not available, we have used estimates based on market knowledge and existing figures.

The country overviews found in this report were selected based on data availability and market size, with the aim of providing the most complete data set possible, and to illustrate important market trends across Europe.

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Product categories for EHI market statistics published in this report

GASEOUS FUEL CONDENSING
Gas condensing boilers, up to 400 kW

LIQUID FUEL CONDENSING
Oil condensing boilers, up to 400 kW

BIOMASS BOILERS
Biomass boilers, up to 400 kW

HEAT PUMPS
Hydronic heat pumps for heating purposes, not chillers, up to 400 kW

HYBRID HEAT PUMPS
Hydronic (no air to air) products that are a combination of one electrically driven heat pump and at least a second heat generator using a different end energy (for example gas, oil or wood/solid fuel) and sold as one product unit (for example in one box or with one order number) from the manufacturer. This hybrid heat pump product is managed by a master control, for space heating (with optional cooling / and / or domestic hot water). Up to 400 kW.

SOLAR THERMAL SYSTEMS
Solar thermal collectors, both flat plate and vacuum tubes, with the exclusion of collectors used in thermosiphon systems.
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