Improving people's quality of life is at the heart of our business, which is why we collaborated with Cebr to produce:

Powering Energy Efficiency

A report that, in the midst of an energy crisis, showcases efficiency as a surprisingly under-represented topic – particularly in the UK and Germany.

THE AIM

The aim of the report is to change this by revealing the untapped potential of energy efficiency and the savings it can yield if governments take action now.

Cebr

GRUNDFOS

Possibility in every drop

Key findings

The wake-up call

International findings show that Germany and the UK both have highly stringent energy efficiency policies and targets – but fall behind when it comes to outcomes, especially when compared to other European countries.

A hidden industry

In recent decades, both Germany and the UK have been successful in reducing and decarbonising their overall energy consumption, but leave room for improvement when it comes to decarbonisation in the heating of domestic and non-domestic buildings. In Germany, the rate of building energy efficient renovations is only half of the 2% target (of the building stock per annum).

Homeowners’ interest

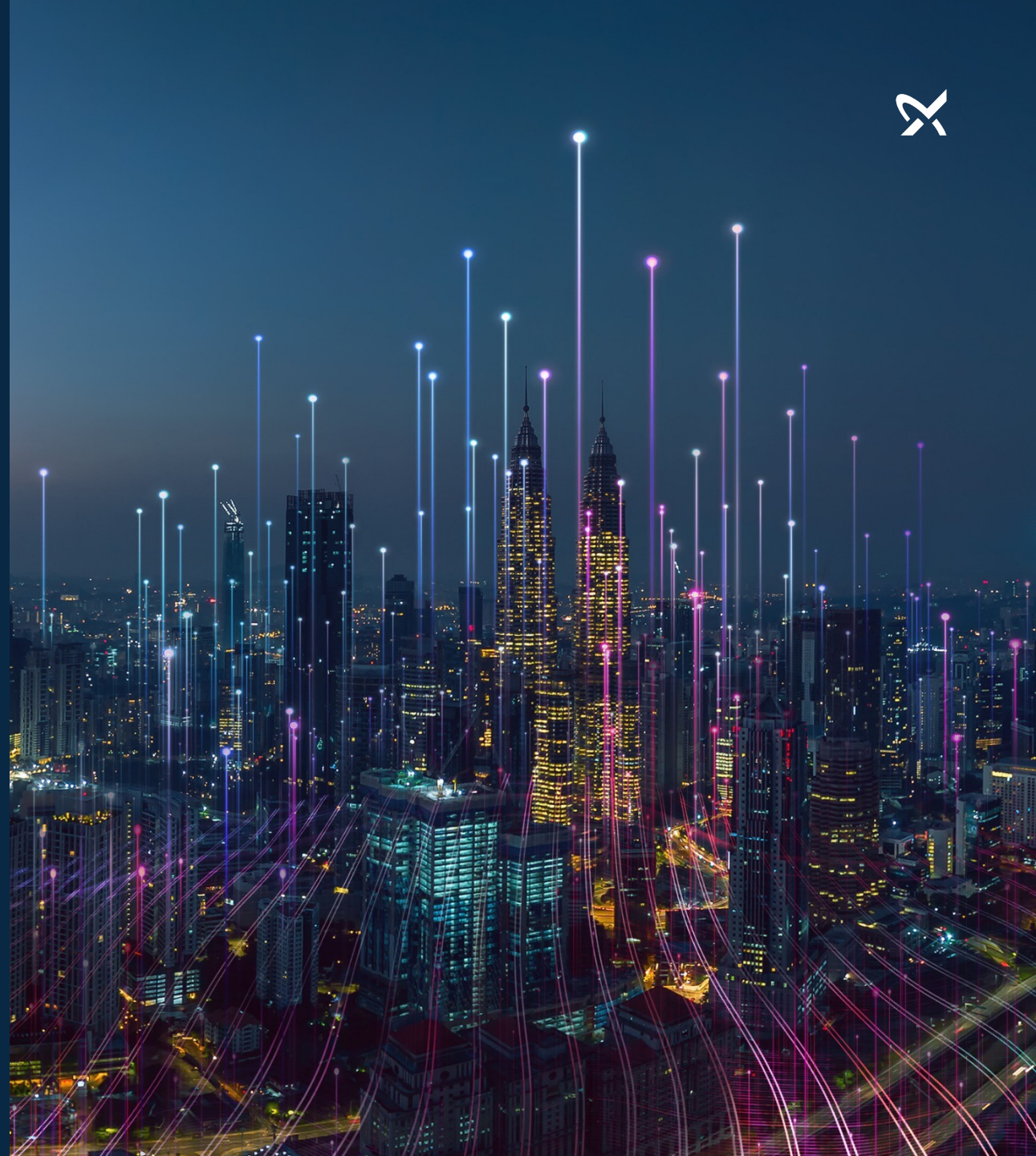
The potential to save money on energy bills is the most powerful motivator for households and businesses to improve their energy efficiency. Our survey shows that 60% of households and 50% of businesses are worried about rising energy bills.

Homeowners' awareness gap

Some of the main barriers to a greater adoption of energy efficiency measures include the perceived upfront costs of energy efficiency improvements, lack of information on their positive impact, and lack of available qualified installers. When asked what prevented them from improving the energy efficiency of their heating system, 25% of households and 32% of businesses named cost as the main reason.

Policy recommendations

In the context of today’s uncertain and ever-changing political and economic landscape, it’s essential that governments step up and make energy efficiency a priority. This report provides them with the required evidence and a compelling case - and we urge them not to shy away from taking action.



The wake-up call

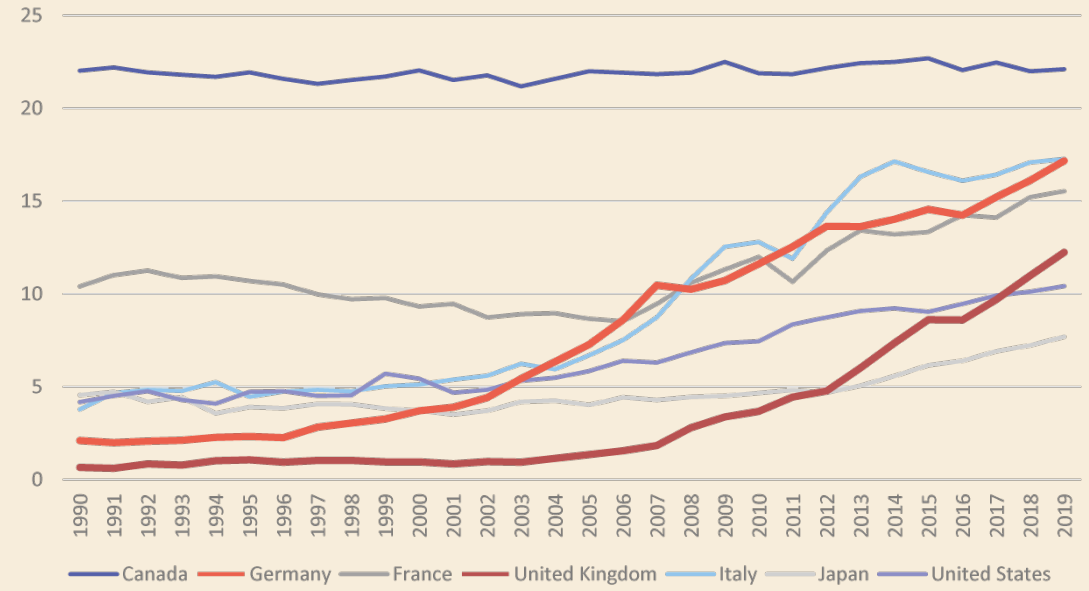
Germany and the UK have created ambitious targets and policies

Germany and the UK have created ambitious targets and strategies to reduce energy consumption and to decarbonise energy sources. While there is a strong environmental rationale behind these policies, there are also further socio-economic and geo-political reasons, such as the reduction of fuel poverty and the lessening of energy dependency on countries such as Russia.

Both countries' targets are ambitious by international standards, and they have significantly reduced and decarbonised the overall energy consumption.

Energy efficiency will become an increasingly important issue as countries such as the UK and Germany aim to transition from fossil fuels to more sustainable energy sources for heating homes and businesses. Reducing CO_2 emissions with 40% by improving energy efficiency is the single most important factor in meeting the Paris Agreement.

Figure 2: Percentage of energy consumption of G7 countries generated by renewables, 1990 – 2019, %



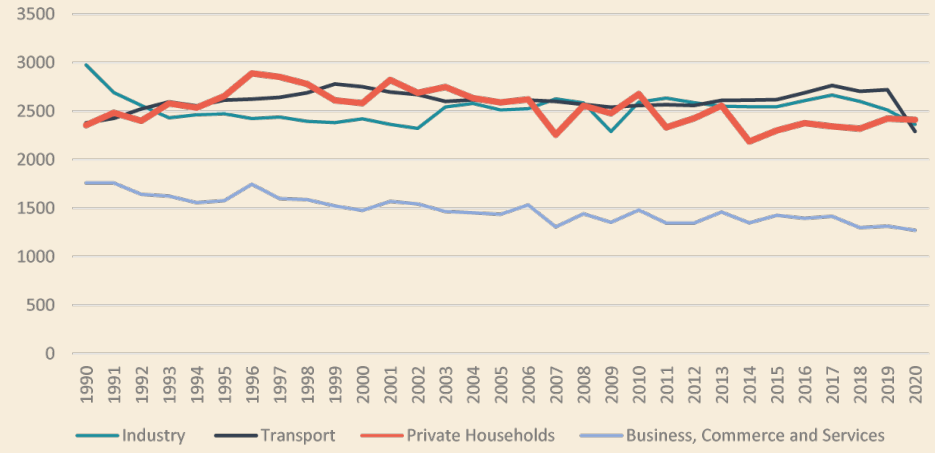
Source: World Bank Data

German policy in place

Germany has been pursuing the Energiewende, an energy transition policy which aims to shift the energy system from fossil fuels and nuclear power to renewable energy sources. This includes the share of renewables in electricity generation, improving energy efficiency and reducing greenhouse gas emissions.

Policies associated with the Energiewende have changed the overall image of energy consumption in Germany. In 2020, the residential sector accounted for nearly 30% of the total final energy consumption in Germany, with the industrial and transportation sectors following as a close second and third. The remaining 15,2% is attributed to the business, commerce and service sectors displayed in Figure 3.

Figure 3: Total Final Consumption by Sector in Germany, 1990 - 2019, Terajoules



Source: Federal Ministry for Economic Affairs and Climate Action

As seen in Figure 3, household comprises approximately 25,5% of Germany's total final consumption according to the IEA, while space heating dominates home energy usage with 68%.

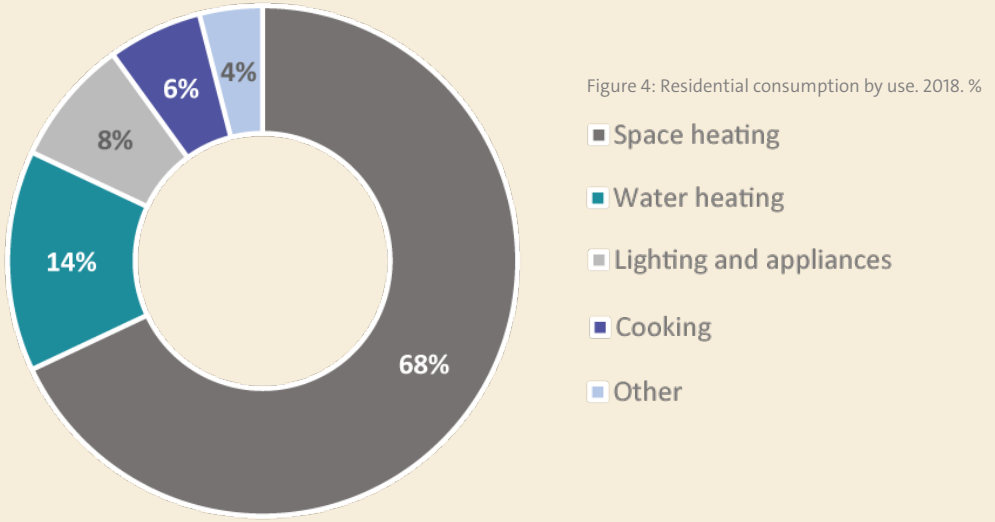


Figure 4: Residential consumption by use. 2018. %

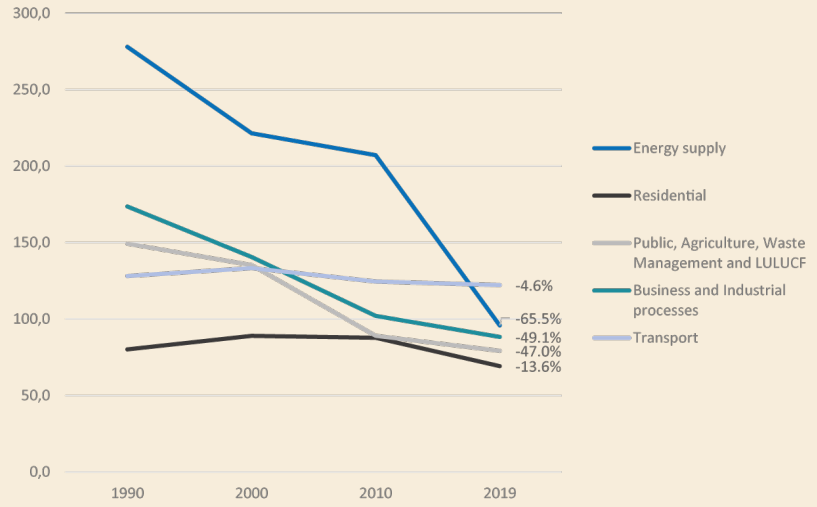
"Reducing energy consumed by residential heating is likely to have a consequential effect on minimising overall energy consumption in Germany. "

UK policy in place

The UK has implemented several policies and initiatives to reduce energy consumption. Their Climate Change Act from 2008 made provision for five yearly "carbon budgets", with a long-term aim of 80% reduced emissions by 2050, and established the Climate Change Committee to advise the government. In 2019, the "Net Zero" target was passed into law, committing the UK to reduce net greenhouse gas emissions to zero by 2050, with wide-ranging implications for the energy sector.

UK's total energy consumption has declined even though its population and economy have grown. As a result, the UK's energy and carbon ration have fallen. This process of decarbonisation has taken place at different speeds across sectors, as shown in Figure 11 below. The rapid change from coal to renewables and gas has led to energy supply emissions falling by almost two thirds.

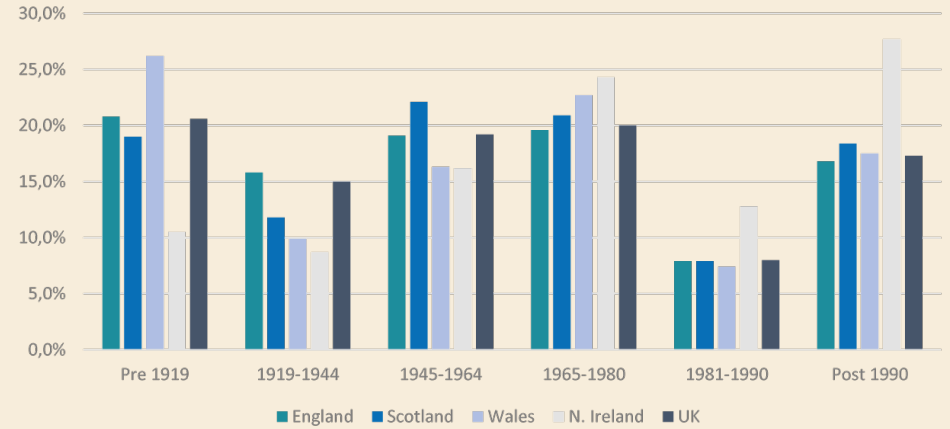
Figure 11: Territorial greenhouse gas emissions by sector, 1990 to 2019 (million tonnes of carbon dioxide equivalent)



A building's age is a major influence on heating systems and energy efficiency

- with 38% of UK's housing having been built before 1946.

Figure 12: UK housing age, by nation



Source: BEIS RHI Evaluation Synthesis

"We're seeing a lot of discussion around repurposing old buildings instead of building new ones"

- and that presents a huge opportunity for us, but it's a missed opportunity not to upgrade some of these products and simply replace them like-for-like.

Glynn Williams, Grundfos

International findings show that Germany and the UK both have highly stringent energy efficiency policies and targets

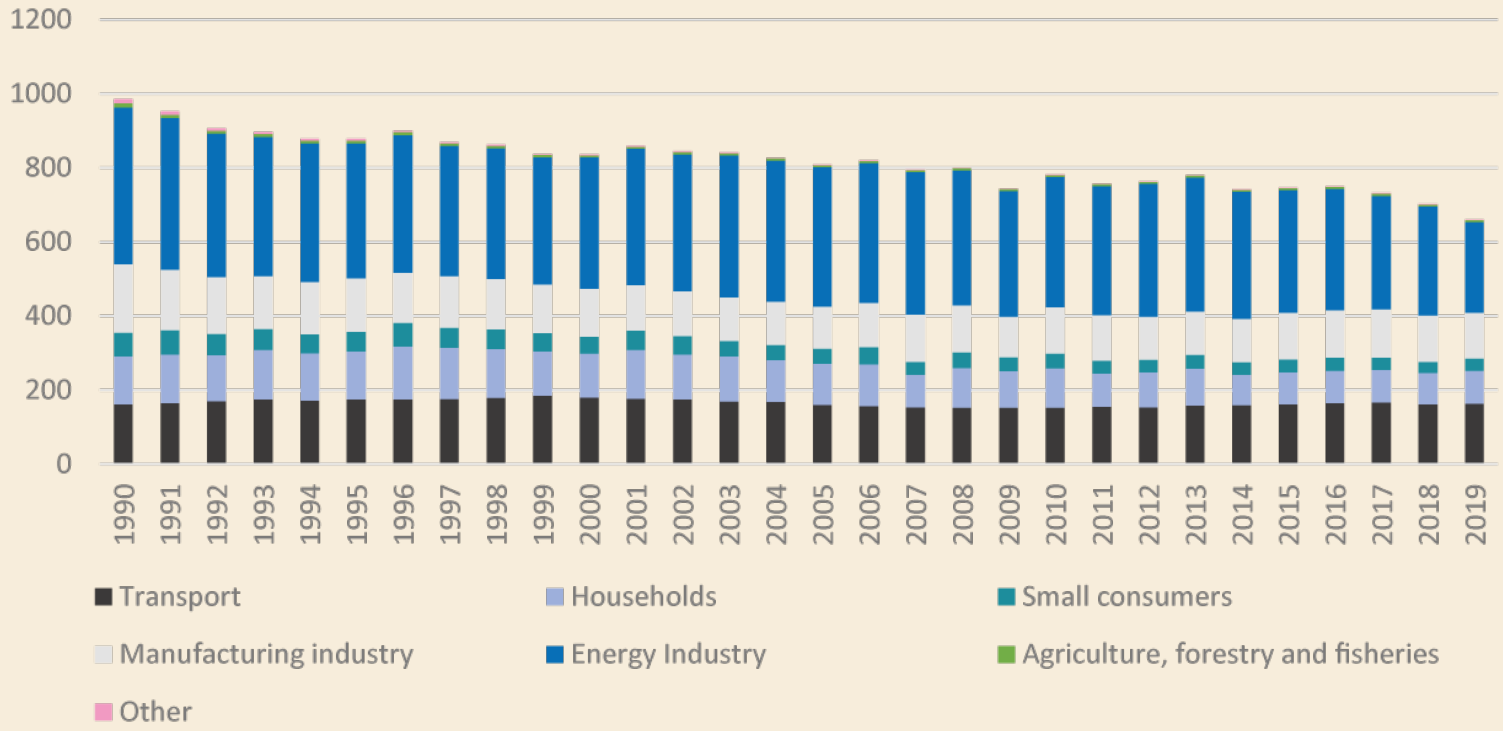
– but fall behind when it comes to outcomes, especially when compared to other European countries.

Their energy efficicency outcomes, with respect to the heating of buildings, are much less impressive, and show a relatively slower progress.

The hidden industry

German ambitions are high, but the residential sector is lagging behind

Figure 9: Combustion of Fossil Fuels by Sectors, CO_2 Mt, 1990 – 2019



Source: BMWi 2021

The energy industry is the largest contributor, even with a 42,2% decrease in its CO_2 output.

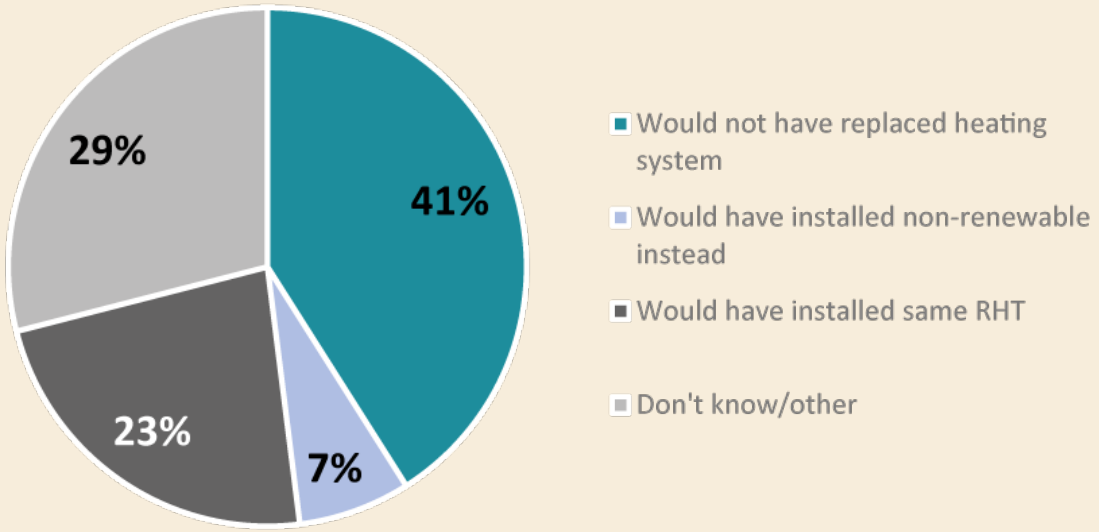
Despite specific measures designed to increase energy efficiency of buildings, such as setting legal requirements, grants, subsidies and low interest loans, **the building refurbishment rate in Germany has not reached the politically desired 2% per year (it remains around 1%).**

In Germany, the total building stock accounts for 38% of final energy consumption and 30% of overall GHGE. Based on an average energy consumption of 177 kWh/m^2, the estimated savings from investing in energy efficiency refurbishment range between 50% - 70%.

Financial barriers are a huge hurdle for improving energy efficiency

What would the owner/tenant have done in the absence of the Renewable Heat Incentive (RHI)?

Figure 13: Owner occupiers' decisions in the absence of the RHI



Source: BEIS RHI Evaluation Synthesis

Our survey found that perceived cost is by far the biggest reason for UK households and businesses not to improve the efficiency of their heating systems - cited by 31% of households and businesses in the UK.
The UK has tried to implement financial incentives over the years:

Warm Front Scheme: Launched in 2000, from 2010, it provided grants of up to £3,500 to 2.3 million households for improvements to insulation or heating.

Renewable Heat Incentive (RHI): Provided financial incentives to install renewable heating systems designed to offset the difference in costs between installing and operating the renewable heat technology.

Green Deal: This was intended to help 600,000 households, but ultimately less than 10% were successful. Delays in issue vouchers and in accreditation of suppliers were some of the reasons it failed.

"Although the Green Deal was not successful, there's somewhat of a consensus in the building sector that we need a long-term, low-cost solution."

- and there's perhaps less of a consensus on exactly the best way to do that.

Alex Luke, Onward

Homeowners’ interest

Homeowners have good reason to act

Energy efficiency in heating is an important tool to achieve reduction in energy use for the benefit of our world, and homeowners have good reason to act. With rising energy bills, the potential to save money is a major motivator for households and businesses to improve their own energy efficiency.

"Homes and businesses are losing out on as much as €7.6 billion (DE) of savings each year."

- In the UK, they are missing out on savings of £3.1 billion.

1 Rising energy bills are a major concern

56% of households in Germany view rising energy bills as a major concern

64% of households in the UK view rising energy bills as a major concern

50% of businesses across the countries say they are worried about energy prices

2 A significant amount of people have inefficient heating systems

13% of households in Germany complain that some areas of their home are too warm, while others are too cold

20% of households in the UK complain that some areas of their home are too warm, while others are too cold

Homeowners’ awareness gap

Despite the many benefits, there is a huge gap between the barriers and the benefits of energy efficiency, which we need to overcome

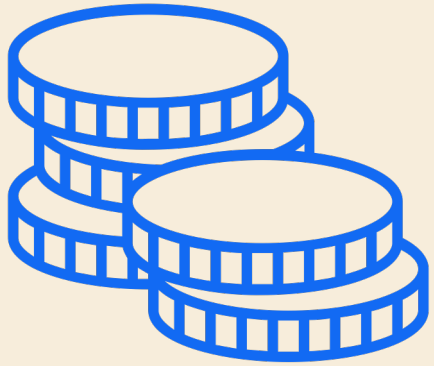
The biggest barrier to improve energy efficiency in heating is the upfront cost

Even though homeowners have many reasons to react, there are still key barriers to making further improvements and achieving better domestic and non-domestic energy efficiency in heating.

Our research and experts' roundtable show that, despite the long-term savings potential of energy efficiency, people are still put off due to the upfront cost and lack of information about the positive impact. In addition, government support is not sufficient to offset the impact. There is a huge gap between the barriers and the benefits of energy efficiency, which we need to overcome.

25%
of households

32%
of businesses



list upfront costs as the biggest barrier to improvement

Upfront cost is followed by these barriers:

INSUFFICIENT NUMBER OF QUALIFIED OPERATIVES

Businesses in both the UK and Germany are concerned about the lack of installers and maintenance professionals.

26% in Germany were affected in their decision to implement improvements

18% in the UK were affected in their decision to implement improvements

LACK OF INFORMATION

Lack of available support for domestic and non-domestic users - for instance, on the costs and environmental benefits of making heating systems more efficient.

A BUILDING'S AGE

Older buildings tend to be poorly insulated and fitted with less efficient heating systems, especially in the UK. Retrofitting is also more challenging.

DEFAULT TO LIKE-FOR-LIKE REPLACEMENT

Users may default to like-for-like replacement of heating systems or their components instead of modernisation and improvement.

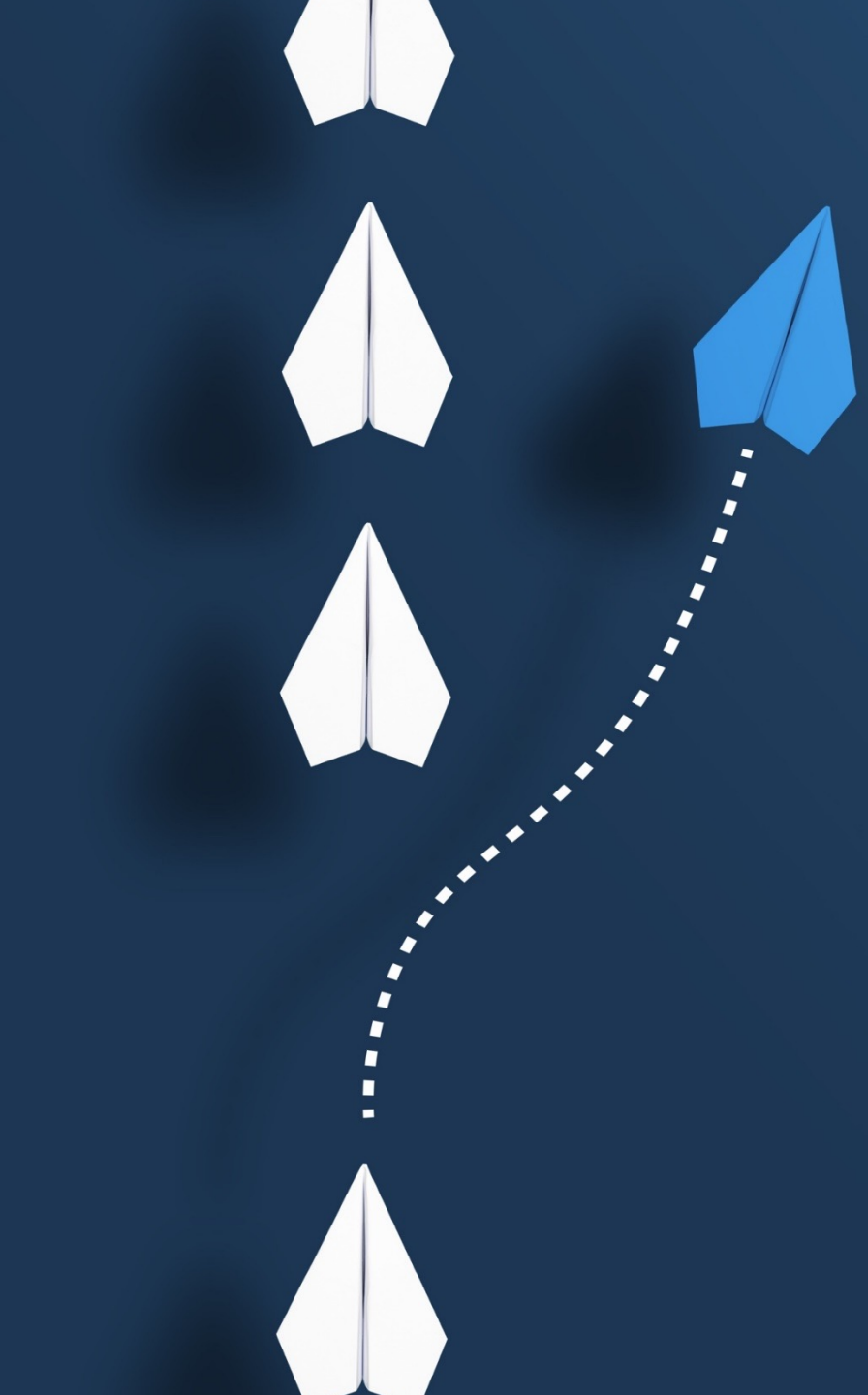
POOR GOVERNMENT SCHEME DESIGN

Drawn-out application processes, poor enforcement of standards or short-term schemes – they all lead to poor experience of accessing government support.

LACK OF INCENTIVES FOR LANDOWNERS

Incentives or regulations for landowners may drive encouragement to invest in efficient heating systems, ultimately helping homeowners who rent their homes.

Policy recommendations



WE NEED TO TAKE ACTION:

It is clear that the gap in knowledge must be urgently addressed and there is a lot the government can and should be doing through economic and environmental incentives to drive change.

We therefore ask Germany, the UK – and all other – governments to act.

We need to build the motivation for change through:

- Tax deductions and subsidies
- Regulations to guide retrofits and renovations
- Energy labels and EPC ratings
- Public awareness campaigns
- Installer best practices

In the context of today's uncertain and ever-changing political and economic landscape, it's essential that governments step up and make energy efficiency a priority. This report provides them with the required evidence and a compelling case - and we urge them not to shy away from taking action.

Policy recommendations

Recommended actions specific to Germany and the UK

Germany

- Promote a more rapid development of energy efficiency policy and regulatory frameworks for the residential and non-residential heat sectors to better match the progress made in the energy sector.
- Shift tax incentives by lowering tax on electricity and introducing relatively higher taxes on heating oil and natural gas for heating, to incentivise the switch to electricity for heating.
- Run information campaigns for consumers and businesses to streamline and clarify the incentives to upgrade heating systems to more energy efficient ones, and promote awareness of their benefits.
- Continue subsidy schemes for both insulation and efficient heating systems, but with a focus on SMEs and low-income households.
- Introduce minimum energy performance standards in privately-rented homes to counter the tenant/landlord disincentive problem.
- Accelerate and expand the smart meter roll-out to all households and enable the long-term digitalisation of the buildings sector to achieve energy savings and unlock flexibility of demand.
- Introduce a government funded training programme for installers and energy technicians (including chimney sweeps) to teach how to properly install and maintain energy efficient heating systems in domestic and non-domestic buildings, and introduce standardised rules and guidelines for installation and efficiency monitoring.

UK

- Ensure that information about the benefits of low carbon heating systems, e.g. in terms of typical financial savings, environmental benefits, and ease of installation is clear and available for domestic customers.
- Ensure that non-domestic users can easily access information about the life-time cost of different systems to help tackle misconceptions around the costs and benefits of energy efficient systems.
- Target domestic energy efficiency schemes to maximise additionality of take-up and the socio-economic benefits to the poorest households, and increase support for SMEs. For example, this could take the form of new grant funding schemes specifically aimed towards these groups.
- Continue to target domestic users who currently have inefficient, high-carbon heating systems, including those who are not on the gas grid.
- Provide targeted support and information for non-domestic users with inefficient, high-carbon heating systems. This may include those with older premises or those who are not on the gas grid, and for large premises potential benefits may be very significant.
- Publish estimates of and targets for energy efficient domestic and non-domestic installations on an annual basis, similar to the retrofit targets used in Germany.
- Ensure measures to guarantee consistent best practice in installation and retrofitting of energy efficiency improvements. These might include quality marks for traders, well-enforced rights of redress for those who have received substandard work, and improved skills provision for energy efficiency improvements.
- Prioritise schemes that balance out the upfront costs of installing new, energy efficient heating systems for domestic and non-domestic users.