

Learning from Germany's heat policy controversy

IGEM Country Brief
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About IGEM

The Institution of Gas Engineers & Managers (IGEM) is the UK's Professional Engineering Institution, supporting individuals and businesses working in the global gas industry. IGEM was founded in 1863 with the purpose of advancing the science and relevant knowledge of gas engineering for the benefit of the public.

As a not-for-profit, independent organisation IGEM acts as a trusted source of technical information, guidance and services for the gas sector. In today's net zero context, IGEM is focused on engineering a sustainable gas future – we do this by:

- Helping our members achieve and uphold the highest standards of professional competence to ensure the safety of the public
- Supporting our members in achieving their career goals by providing high quality products, services and personal and professional development opportunities
- Acting as the voice of the gas industry when working with stakeholders to develop and improve gas policy.

Background

Germany is the fourth largest economy in the world and largest energy consumer in Europe. In 2010 Germany embarked on an ambitious energy transition known as the “Energiewende”, directly translated as “energy turnaround”, which garnered broad cross-party support on a platform of expanding renewable energy and phasing out both coal and nuclear power generation. Along with many other developed nations it has made bold commitments to reducing its carbon emissions. As part of its Climate Action Law, Germany has committed to achieving climate neutrality by 2045.

Renewables

Germany is a leader in the adoption of renewable energy sources, including offshore wind, solar PV, and biomass. These sources have witnessed considerable growth in recent years with renewables making up circa 44% of Germany's power production (2022).

Although the government aims to speed up the growth of renewable energy production within this decade, its parliament recently removed a draft target for 100% renewable electricity by 2035, instead requiring 80% of electricity to come from renewable energy by 2030 and to be ‘nearly’ climate neutral by 2035.

Fossil Fuels

Germany also relies heavily on conventional energy sources such as coal and natural gas. Germany has set 2038 as the latest date for coal phase out, however the government is striving to phase out coal by 2030.

Natural gas has played an important role in Germany's decarbonisation efforts thus far due to its lower carbon emissions compared to coal and oil. Natural gas accounted for 13.8% of Germany's power production in 2022, however it is very dependent on gas imports to supplement its energy needs.

Germany has initiated significant shifts in its energy and security policies since the Russian invasion of Ukraine. This includes a decision to invest in Liquefied Natural Gas (LNG) infrastructure and the start of construction for two new LNG facilities. Recognising the growing importance of hydrogen in the long run, the German government has also expressed its commitment to ensuring that any LNG infrastructure built is compatible with hydrogen.

Hydrogen

Germany has a National Hydrogen Strategy which includes support for hydrogen applications in industry, transport, electricity, and building/heating sectors. The strategy is based predominantly on hydrogen production through renewable energy, although in a 2023 update to the strategy the government has recognised the need for hydrogen produced using fossil fuels, with related CO2 emissions captured and stored.

In 2023 the government doubled its domestic green hydrogen production target from 5GW to 10GW by 2030, however most of Germany's hydrogen demand is still expected to be met through imports – evidenced by recent news of Germany-UK partnership discussions on the potential for the UK to export green hydrogen to Germany via pipeline. Germany has ambitions to build 1,800 km of refurbished and new pipelines for a 'hydrogen start-up grid' as early as 2027/2028.

Heat Policy

Across Germany's 41 million households, heating accounts for 15% of greenhouse emissions (2022). According to 2021 figures, 80% of heat demand in Germany was fulfilled by burning fossil fuels. The use of fossil fuel-run heating systems will be banned entirely from 2045, however interim steps to phase out fossil fuel heating systems has caused significant controversy. Early in 2023, Germany's Chancellor Olaf Scholz put forward a new domestic heating Bill to legislate for the replacement of fossil fuel heating systems with low carbon alternatives, such as heat pumps, powered with a minimum of 65% renewable energy. According to the legislators' definition, heat pumps, district heating, biomass boilers, electric boilers and hybrid boilers (under certain conditions) would meet this requirement. The move would have banned the sale of almost all new conventional gas and oil-fired boilers by 2024, effectively forcing homeowners to install a lower carbon alternative.

However, the ban faced considerable pushback due to concerns over its implementation and financial implications for homeowners.

The new heating Bill was dubbed the 'heat hammer' due to the perception that it would 'hammer' consumers' finances if they were forced to replace their gas or oil boilers with expensive alternative systems. The upfront cost for homeowners of installing a heat pump in Germany can range from €9,430 to as high as €53,000. This wide range accounts for variations in heat pump systems and the costs associated with optimising the building's internal systems and thermal properties. Even with subsidies, typically ranging from €3,000 to €10,000, the costs have been deemed prohibitively expensive, when comparatively, the cost of installing a gas boiler in Germany ranges between €1,500 to €3,000.

Described as 'one of the greatest political dramas in recent German history', the new legislation caused unprecedented public backlash which saw coalition in-fighting, public protests, and consumers rushing out to buy new fossil fuel heating systems to replace their old systems ahead of the ban. A move reflective of the fact that 40% of all boilers in Germany are more than 20 years old and will require replacing in the near future.

According to one consumer poll, 70% of respondents wanted the Bill to be withdrawn. Following the controversy, Germany's highest court prevented parliament from considering the legislation and supported opposition arguments that more detailed consideration was needed before putting a ban in place.

A compromise was eventually reached with the revised Bill allowing for new gas boilers to be installed, provided they can be made hydrogen-ready. The Bill also delays the date for phasing out fossil fuel boilers by at least two years.

What lessons can be learned?

The 'heat hammer' controversy in Germany offers valuable insights for all countries transitioning to decarbonised heating. It has highlighted the complexities and political sensitivities involved in transitioning to low carbon heating systems, especially regarding public acceptance and the financial burden on consumers. The German government's struggles, including decreased popularity among voters and criticisms from environmental groups, underline the challenges in balancing environmental goals with public sentiment and economic realities.

For the UK, learning from Germany's experience is crucial. The UK's transition to decarbonised heating is a significant challenge, akin to the historical shift from coal to natural gas heating. The UK government is tasked with outlining a long-term heat policy framework, considering various economic, technological and social aspects. Moreover, in the UK, the debate over the alternatives to gas boilers, such as heat pumps and hydrogen, is ongoing. Heat pumps, which extract warmth from the air or ground, work most efficiently in well-insulated homes. The UK faces the challenge of upgrading many poorly insulated houses, which adds to the cost and complexity of transitioning to heat pumps. The UK government has recently increased the level of financial support, through the Boiler Upgrade Scheme, but there remains a substantial gap between the current funding and the target of installing 600,000 heat pumps annually by 2028.

The key lessons for the UK from Germany's 'heat hammer' experience include:

Public acceptance: The public will not simply accept all changes required of them to achieve net zero domestic heating. Policies based on mandating change or effectively banning certain technologies, without appropriate communication and support, will risk backlash. It is evident that public acceptance is crucial to success and therefore extensive engagement and careful consultation with the public is essential.

Consumer optionality: Installing new heating technologies and upgrading building infrastructure is very costly. The importance of consumer optionality must not be underestimated, so for those unable to bear the burden of costly building upgrades, alternative options should be made available (such as hydrogen-ready boilers and hybrid heating systems).

Timescales and financial support: The timescales for transitioning to low carbon heating systems must be realistic and fair for all consumers, with appropriate levels of financial support provided, particularly for vulnerable and low-income households.

The UK's transition to decarbonised heating will require careful consideration of these factors to avoid similar controversies, with clear, practical and financially viable policies to ensure a smooth and successful transition.

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