

H100 Fife trial: Hydrogen heating will increase UK energy bills

Set to go live this year, around 300 houses in Fife, Scotland will switch over to hydrogen for heating, hot water and cooking. The [H100 Fife trial](#) is funded by the Scottish Government, regulator Ofgem, and the four gas network operators SGN, Cadent, Northern Gas Networks, and Wales & West Utilities.

Following the cancellation of similar trials in the English towns of [Whitby](#) and [Redcar](#), Scotland has become an outlier in the UK with its plan to trial hydrogen in homes.

What is the consensus on hydrogen heating?

The evidence against hydrogen for heating is conclusive. The influential UK Climate Change Committee stated in its 2025 [Scotland's Carbon Budgets](#) that there is “no role for hydrogen in heating for buildings.”

In addition to this:

- A meta-review of more than [50 independent studies](#) concluded that hydrogen will not play a significant role in decarbonising home heating, with it being less efficient and more expensive than tried and tested technologies like heat pumps.
- The [National Infrastructure Commission](#) advised the UK government to rule out hydrogen for heating, saying it has “no public policy case”.
- Former [energy minister Lord Martin Callanan](#) warned “burning hydrogen in boilers across the country is uneconomical, logistically impossible, and would be hugely damaging for our climate and people’s pockets,” urging the government to [abandon hydrogen heating](#).
- The [Institute for Energy Economics and Financial Analysis](#) (IEEFA) concluded plans to use hydrogen for home heating and cooking are “out of touch with the limitations of hydrogen and the risks posed by home use”.

Cost: Hydrogen will increase energy bills.

Hydrogen heating would increase consumer costs [by 86%](#), according to the median estimate of a set of 54 independent studies on heating with hydrogen.

Green hydrogen requires vast amounts of renewable electricity to produce, making it very expensive – about four to six times the cost of natural gas per unit of energy, per [HSC calculations](#). Analysts project green hydrogen prices will remain [stubbornly high](#) for decades, while electric heat pumps have the potential to [halve UK heating bills](#)

The area of Fife where the trial is taking place, Buckhaven, is one of the [most deprived](#) areas of Scotland. Residents are being offered £1000 and new appliances to take part in the trial, but have not been given any information about the likely cost of continuing to heat their houses with hydrogen after the trial is finished.

Given its high costs, hydrogen heating will increase energy bills and risks pushing more consumers into energy poverty. Substantial long-term government subsidies will be required to prevent this, creating a drain on the Scottish economy.

Safety: Hydrogen is less safe in homes than electric heat pumps.

Hydrogen is more flammable and explosive than natural gas. This was demonstrated by the UK Government Hy4Heat programme, which showed that a like-for-like changeover from natural gas to hydrogen would result in [4 times](#) more accidents.

In an attempt to bring hydrogen to the same level of risk as natural gas, the Hy4Heat report recommends additional safety features, including 10cmx10cm vent holes high up in external walls of every room with a hydrogen appliance. Even so, the risk of a hydrogen fire or explosion would be 3 times that of natural gas. In an event like a house fire, hydrogen also risks escalating that fire.

Electric options like heat pumps are safest in the home, with no risk of gas or hydrogen leaks..

Emissions: Hydrogen emits air pollutants and is a global warming agent.

When combusted in domestic appliances like cookers and boilers, hydrogen produces nitrogen oxides (NOx), an air pollutant that is also emitted by diesel engines with well-documented adverse [health](#) effects related to respiratory issues.

Hydrogen is a much smaller molecule than natural gas, which makes it much more prone to leak from pipes, processing equipment and domestic appliances. It is also an indirect greenhouse gas, with a [global warming potential](#) 35 times that of carbon dioxide (CO2) in the first 20 years after its release, and 12 times over 100 years. Due to this, the leaking of hydrogen from domestic distribution has potentially significant climate consequences that require further study.

Energy efficiency: Hydrogen uses far more energy than electric heat pumps.

Much of the large amount of renewable electricity needed to produce green hydrogen is lost as waste heat, from production through to its final use. Consequently, it takes between 3 and [5.5 times](#) more renewable electricity to heat homes with hydrogen than using the same electricity to directly heat homes with heat pumps.

This means hydrogen heating bills could be up to 5.5 times higher than electric heating bills if there is no government subsidy. It also means that green hydrogen heating will generate up to 5.5 times more CO2 emissions than heating with heat pumps, even for very clean electricity, because all electricity has some [associated CO2 emissions](#).

All housing types are suitable for heat pumps, with claims that they are unsuitable for old, draughty properties [debunked](#) by a UK government report.

Conclusion: Households must be supported to switch to cheaper, safer, cleaner and more efficient solutions than hydrogen heating.

All available objective evidence points to hydrogen being unsuitable for heating and cooking in homes. It is simply more expensive, less safe, and generates higher CO2 emissions and pollutants than other decarbonisation options. Ultimately, it will put more families into fuel poverty.

We recommend the Scottish Government removes support for the Fife trial to align with the overwhelming evidence against the use of hydrogen for heating, and instead directs support towards clean, efficient electric technologies like heat pumps and heat networks, as recommended by expert bodies.

More broadly, we urge the UK Government to provide certainty on heat pumps and heat networks as the best route forward to decarbonise heating by confirming that there will be no role for hydrogen in home heating, as previously advised by the UK Climate Change Committee and the National Infrastructure Commission.

Supporting households to make the switch to heat pumps will lower energy bills, reduce air pollution, slash energy consumption and eliminate fossil fuel reliance in the long run, thereby improving energy security.

Green hydrogen has an important role to play in the energy transition, but it must be reserved for industrial sectors that can't be electrified - like manufacturing fertiliser, chemicals and possibly steel.

Hydrogen has no place in the home. With all evidence already clear on hydrogen heating, the Fife trial represents a costly misuse of public funds.

About the authors

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The [Hydrogen Science Coalition](#) (HSC) is an independent expert group of academics, scientists and engineers working to deliver an evidence-based view on hydrogen's role in the energy transition for media and policymakers, free of vested interest. For more information, read our [five guiding principles](#) on hydrogen's role in the energy transition.