

Sustainable heating for your home –

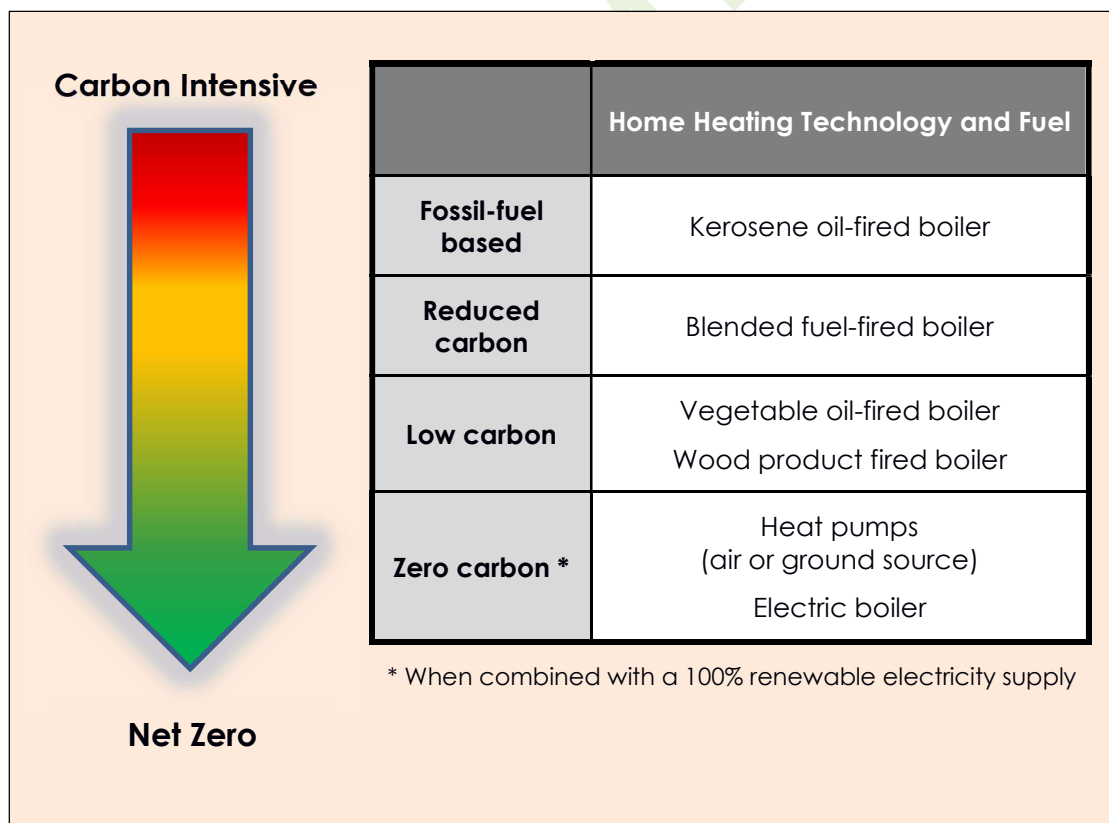
a) introduction to current and developing technologies

Sustainable heating has a number of technological solutions, which will not all be of equal interest to every householder. Factsheet No. 10 has therefore been split into parts for issue and reference separately. Other parts are:

- b) Liquid fuel replacements
- c) Log-gasification and wood pellet boilers
- d) Heat pumps
- e) Electric boilers and electric heating

❖ Current and developing technologies for heating your home

Rural communities like Barningham, which are off the gas-grid, are largely dependent on fossil-fuels for home heating. Some opportunities are already available for reducing damaging carbon emissions, with a number of evolving options likely to be available soon.



Heating technologies on the carbon intensive to net zero scale

❖ General considerations

- Many technologies continue to evolve and the attractiveness for implementation will improve over time, as costs come down and performance is demonstrated.
- Some of the technologies and fuels listed are transition options. They don't get us to net zero now but they will reduce fossil fuel use and carbon emissions.
- There is no single solution that will suit every household or house type.
- Using less heat will reduce your carbon footprint and improve the sustainability of your home heating regardless of which technology and type of electricity supply you use. Reducing the thermostat setting by 1°C can reduce energy consumption by up to 10%.
- Buy your electricity from a supplier that is building renewable capacity or has 100% power purchase agreements with renewable generators. This will ensure that the electrical use associated with your heating system is contributing to de-carbonisation of the national supply.
- If renovating, consider installation of a lower temperature system. Many new homes install underfloor heating, which usually runs at 35°C, much cooler than a normal radiator system. The cooler temperature means the boiler operates more efficiently and uses less energy, regardless of the source.

❖ Options and their current availability

- Liquid fuel replacements for domestic heating oil (kerosene) are proposed by OFTEC¹:
 - By 2027, widespread roll out of a **reduced carbon** fuel containing a mixture of 30% fatty acid methyl ester (**FAME**) oil, derived from vegetable oils, blended with 70% kerosene. This works well in domestic boilers and reduces emissions to a level equivalent to those from mains gas.
 - By 2035, replacement by Hydrotreated Vegetable Oil (**HVO**), a **low carbon fuel** derived from 100% plant-based sources.
 - The aim is to provide an affordable solution to properties off the gas grid, based on changing the fuel rather than the boiler.
- Boiler replacement options are commercially available now, including:
 - Log-gasification and wood-pellet boilers with a hot water store. These qualify for Renewable Heat Incentive (RHI) payments.

¹ Oil and Renewable Heating Technologies Trade Association in association with other industry partners
<https://www.oftec.org.uk/news/2020/01/22/trade-associations-launch-strategy-to-tackle-carbon-emissions>

- Air or ground source heat pumps, also qualifying for RHI payments. These generally require the installation of larger radiators throughout the house.
 - Electric boilers, which are expected to become financially viable by “smart” management, dynamic tariff charging and innovative high-density heat storage technology.
- Each of these options is described in more detail in the other Parts b to e of this Factsheet No. 10.

❖ Cost considerations

- The suitability of different technologies to your home is dependent in large part on the energy efficiency.
- If you live in one of the 3% of oil-heated homes with good energy efficiency (Energy Performance Certificate (EPC) Band A-C), you should be able to install any of the low carbon heating options currently recommended by government. These include:

Technology	Typical Installation Cost
Ground source heat pump	£22,500 ²
Air source heat pump	£11,000 ²
Biomass (wood-fired) boiler	£16,000 ²
Conventional electric boiler (25kW)	£900 (see Part e)
New “zero emissions” electric boiler	£4000 (see Part e)

- If you live in one of the remaining 97% of oil heated properties with poor energy efficiency (EPC Band D-G), you will probably need to improve your insulation first. Depending on the condition of your home, you may need to install some or all of the following measures:

Energy efficiency measures	Average installation cost ³
Improved loft insulation	£180 to £3,500
Replacement windows and external doors	£1,200 to £10,000
External wall insulation	£4,300 to £20,000
Cavity wall insulation	£300 to £1,200
Internal wall insulation	£2,500 to £11,600
Floor insulation	£550 to £900

² Average cost of certified domestic Renewable Heat Incentive (RHI) installations, reported to the Microgeneration Certification Scheme (MCS).

³ Department for Business, Energy and Industrial Strategy (BEIS), *What does it cost to retrofit homes*, 2017.

❖ The Renewable Heat Incentive (RHI)

- Government grants may be available to assist with installation costs, as covered in Factsheet No. 6, *Government schemes to help keep you warm*. This includes details of the Renewable Heat Incentive (RHI) scheme and other schemes for energy efficiency improvements.
- The Domestic RHI scheme provides subsidies for qualifying domestic renewable heating installations.
- The RHI does not provide up-front grants but instead offers a quarterly payment for seven years following commissioning based on the output of eligible systems.
- You can check whether your property is eligible here:
<https://www.ofgem.gov.uk/publications-and-updates/domestic-renewable-heat-incentive-essential-guide-applicants>
and review the list of eligible technologies here:
<https://www.ofgem.gov.uk/publications-and-updates/domestic-rhi-product-eligibility>
- To qualify, the property must have a domestic Energy Performance Certificate (EPC). You must install loft and /or cavity insulation if recommended on the EPC or demonstrate that you meet one of the exemptions, e.g., due to it being a listed building.
- You must select an appliance registered by the Microgeneration Certification Scheme (MCS) and use an MCS approved installer to install and commission it. Electricity meters for performance are also required for heat pump installations and meters for payment may also be required for any of the technologies.
- The RHI will pay a rate per kWh of heat according to which technology you are using. Current rates for qualifying systems are:
 - 7.01p/kWh for qualifying biomass systems
 - 10.92p/kWh for Air Source Heat Pumps
 - 21.29p/kWh for Ground Source Heat Pumps
 - 21.49p/kWh for Solar thermal energy systems
- The rates are adjusted each year by CPI inflation, although each year the starting rate available for new entrants may be reduced as the RHI scheme winds down.

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