

Report to: **Housing Review Board**

Date of Meeting: 26 March 2020

Public Document: Yes

Exemption: None

Review date for release None



Subject: **Air Source Heat Pumps**

Purpose of report: This report considers an element of the Council's carbon footprint relating to our housing stock and relates to the prevalence of fossil fuel heating systems and proposes a programme of installing air source heat pumps, building on our pilot programme.

The forthcoming stock condition survey will confirm our reliance of fossil fuel heating systems for Council homes and using this data we will be able to formulate a deliver programmes of boiler replacement and associated energy efficiency measures designed to reduce our carbon footprint, consistent with our Council ambition.

Recommendation: **To approve a starter programme of air source heat pump installation and use £150,000 from the boiler replacement programme in the Housing Revenue Account for this purpose.**

Reason for recommendation: To work towards the Councils ambition to reduce its carbon footprint and ultimately attain a carbon neutral position.

A report by the Committee on Climate Change (CCC) UK housing: Fit for the future, said that no new homes should be connected to the gas grid from 2025 at the latest. It warned that UK homes are not fit for the future with stalling efforts to cut greenhouse gases from housing and properties at growing risk of overheating and flooding. The proposals would see an end to boilers, radiators and cooking hobs in new homes. Super-efficient houses and flats should use low-carbon heating such as heat pumps and induction hobs to help meet carbon emissions targets.

There is similar pressure to decarbonise existing homes, which for us is a significant part of the Council's carbon footprint.

Officer: John Golding Strategic Lead – Housing, Health & Environment.

Portfolio Holder: Portfolio Holder for Sustainable Homes and Communities

Financial implications: In 2018 Gas & Heating was underspent by £280k and an equivalent underspend amount is expected to be reserved from this years budget to aid in 2020 boiler replacement and this programme.

Legal implications: There are no legal implications contained in the report.

Equalities impact: Medium Impact

The heating systems proposed will provide affordable warmth for tenants who should see reductions in heating costs.

Climate change: Medium Impact

Risk: Comments
Medium Risk

There may be some user resistance but the technology is now well developed and reliable when used properly.

Links to background information: .

Link to [Council Plan](#): Choose Priorities and delete what not appropriate.
Outstanding Place and Environment
Outstanding Homes and Communities
Outstanding Economic Growth, Productivity, and Prosperity
Outstanding Council and Council Services

1. **Outline Business case for Air Source Heat Pumps Climate Change Action Plan**

1.1 An air source heat pump is usually placed outdoors at the side or back of a property. It takes heat from the air and boosts it to a higher temperature using a heat pump. The pump needs electricity to run, but it should use less electrical energy than the heat it produces.

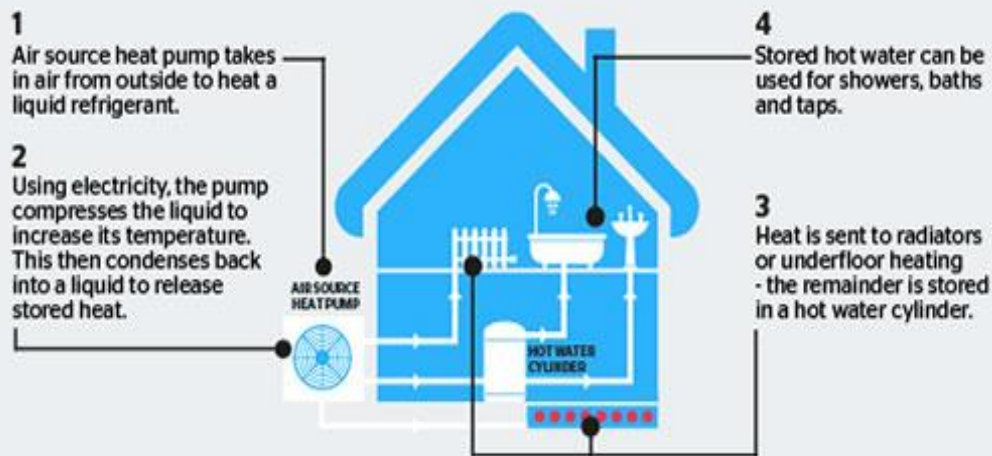
Types of air source heat pumps - There are two main types of air source heat pumps (ASHPs): air-to-water and air-to-air.

1.2 An ASHP works a bit like a refrigerator in reverse. The process consists of an evaporator, a compressor and a condenser. The ASHP absorbs heat from the outside air into a liquid at a low temperature, then the heat pump compressor increases the temperature of that heat. In the condenser, the hot liquid's heat is transferred to the heating and hot-water circuits. So it is used to warm up the home.

1.3 Air-to-water heat pumps - These take heat from the outside air and feed it into your wet central heating system. As the heat produced is cooler than that from a conventional boiler, you may need to install larger radiators or underfloor heating in your home to make the most of it. Air-to-water heat pumps may be best suited to new-build properties. It could cost less if the heat pump is included as part of the building specification, rather than having to retrofit underfloor heating later on.

1.4 Air-to-air heat pumps - These pumps take heat from the outside air and feed it into your home through fans. This type of system cannot produce hot water.

Air source heat pump



- 1.5 Unlike gas and oil boilers, heat pumps deliver heat at lower temperatures over much longer periods. During the winter they may need to be on constantly to heat the home efficiently. Users will also notice that radiators do not feel as hot to the touch as they might do when using a gas or oil boiler. Tenants need clear advice on how to operate the system.
- 1.6 Heat pump systems typically come with a warranty of two to three years. Workmanship warranties for heat pumps can last for up to 10 years. Many manufacturers also offer options for warranty extensions for a fee.
- 1.7 We can expect them to operate for 20 years or more, however, they do require regular scheduled maintenance. A yearly check/service and a more detailed check by a professional installer every three to five years should be sufficient.
- 1.8 The installer will provide written details of any maintenance checks that should be undertaken to ensure everything is working properly. Suppliers for exact maintenance requirements before you commit to installing a heat pump. We will be advised to carry out a yearly check that the air inlet grill and evaporator are free of leaves or other debris. Any plants that have started to grow near the heat pump unit will also need to be removed.
- 1.9 We will also be advised by installers to check the central heating pressure gauge as part of our checks.
- 1.10 To prevent the heat pump from freezing in cold winter weather anti-freeze is used. Levels of anti-freeze and its concentration is one of the things that a professional installer will check when he comes to service your heat pump.
- 1.11 Manufacturers such as Daikin; Valliant, and Dimplex offer ASHPs and associated equipment.
- 1.12 There have been some concerns over the servicing requirements and reliability, but these concerns are being addressed as the technology become more 'normal'.



- 1.13 In 2017 we undertook a scheme at Rodney Close, Exmouth where we provided our tenants with air source heat pumps. The Housing Review Board report is linked below:
<https://democracy.eastdevon.gov.uk/Data/Housing%20Review%20Board/20170112/Agenda/combined-HRB-agenda-120117.pdf>
- 1.14 The cost associated with our retrofit scheme at Rodney Close Exmouth was circa. £6,500 per property. It is important to improve the insulation as part of the installation to ensure that the heat generated is contained in the home. This will likely bring the price per property up to circa. £10,000 per home.
- 1.15 Our annual boiler replacement programme is typically circa. £500k. I am proposing we set aside £150,000 of this to initiate a programme of mainstreaming the installation of Air Source Heat Pumps in our stock, delivering 15 installations. There will be some procurement advantages of using a framework, perhaps through Advantage South West, our procurement club.
- 1.16 There may be an equally good case for the installation of **Ground Source Heat Pumps** (GSHP) which extract heat from the ground from a series of pipes buried in the soil either in a horizontal network or in deep vertical holes. The site characteristics will determine the suitability of the pump type.
- 1.17 We should select a road/estate where traditional boilers are coming to the end of their life or where we have an inefficient storage heater system in place where our properties are off-gas.
- 1.18 During the year we will work up a programme of boiler replacement over the thirty year HRA Business Plan period and taking account of the stock condition survey data due to be collected this year. We will aim to get to the point where a non-fossil fuel heating system is the default replacement.
- 1.19 The infographic in **annex 1** shows the building elements that need attention when improving the carbon footprint of our homes. It shows the standards that a low carbon, sustainable home should attain. The installation of new heating systems is one element of reducing the carbon footprint of our homes, but this needs to be complimented with improved energy efficiency measures as part of a comprehensive package of carbon reduction measures.

1.20 This is a complex and rapidly evolving area of technology and I would expect to see government intervention and incentives emerge over the next few years as we move away from reliance on fossil fuels for our heating systems.