

## **ADVANCED AIR SOURCE HEAT PUMPS FOR UK AND EUROPEAN DOMESTIC BUILDINGS**

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To date, the role of heat pumps in UK and European housing has been largely restricted to new-build, utilising ground source units coupled to under-floor heating systems. Therefore the challenge is to develop air-source heat pumps whose role is to displace the traditional domestic fossil fuel boiler with the minimum of domestic disturbance by utilising a system capable of heating radiators to sufficient temperatures to maintain comfort and safety. The technical challenges to be overcome at this stage are maintaining high coefficient of performance in spite of the high temperature lift encountered when utilising cold air as a heat source and delivering to a heating circuit originally designed for water at temperatures of 60°C or more. Options to deliver this include an economised vapour injection compressor and displacing the traditional expansion valve with an expansion turbine and experimental results from both of these approaches will be presented here.

Keywords: air-source heat pump, high temperature lift, economised vapour injection, rotary compressor/expander