

Heat pumps lead the way to net zero



Queens Quay development is the largest heat pump scheme in the UK and the first of its kind in Scotland. (Image: Vital Energi) »

As world leaders gather in Glasgow for COP26 in November, their aim is to secure global net zero by 2050. This means meeting ambitious emissions' reduction targets by 2030. This article examines the contribution heat pumps could make to achieving net zero.

Seven miles down the River Clyde from the Scottish Event Campus (SEC) where COP26 will be held is the Queens Quay development, the largest heat pump scheme in the UK and the first of its kind in Scotland. Councillor Iain McLaren of West Dunbartonshire Council spoke of the hugely positive impact of the scheme on Clydebank and West Dunbartonshire, which, "allows the council to address fuel poverty among tenants and residents by offering reduced tariffs compared to traditional heating methods, as well as achieve carbon reduction targets, removing more than 4,000 tonnes of carbon from the environment every year for the next 40 years."

Heat from the Clyde

Queens Quay takes heat from the River Clyde and circulates it through two 2.65 MW ammonia water source heat pumps to heat local homes and businesses. Part of a district heating system, it will supply council offices and more than 140 flats and retail units. Dave Pearson, Group sustainable development director at Star Refrigeration which manufactured the heat pumps for



The abstraction pumps drawing water from the River Clyde. (Image: Vital Energi) »

The International Energy Agency (IEA) reports that heating for homes and industry accounts for around 50% of total energy consumption worldwide. Just over half of the heat produced is used in industry while most of the remainder is for space and water heating. Yet only around one tenth of that heat is produced from renewable sources. In its recent report, Net Zero by 2050, the IEA said that the stock of installed heat pumps must increase tenfold from 180 million in 2020 to 1800 million in 2050 when it expects most heat in buildings to be supplied by heat pumps (56%), solar thermal

(18%) and district heating (15%).

“Gas and electricity costs are driven by outdated levies that load environmental taxes on to electricity prices, but not gas prices.” Laura Bishop, Chair of the UK’s Ground Source Heat Pump Association (GSHPA)

Green combination

The heat pumps at Queens Quay are driven by electricity and harness naturally occurring heat from the River Clyde. Air source and ground source heat pumps work in similar ways using



An example of a domestic application is this shared ground loop sys... »

Chairman of the UK's Domestic Heat Pump Association (DHPA), John Felgate, says that we must electrify heating in all buildings and heat pumps are an efficient way of doing that. With the rapid decarbonisation of the grid, he believes that electricity is the fuel of the future. Yet electricity pricing is still a stumbling block in some countries, especially the UK, where a high proportion of taxes and levies keeps electricity prices high and gas prices low. In Sweden, where there are almost no taxes on electricity but substantial taxes on burning gas, sales of heat pumps are 35 times higher than in the UK per head of population.

Laura Bishop is Chair of the UK's Ground Source Heat Pump Association (GSHPA), which offers independent technical advice, training and standards for the industry and lobbies the government on heat pump policy. "Gas and electricity costs are driven by outdated levies that load environmental taxes on to electricity prices, but not gas prices. These were set when electricity was generated by high carbon sources like coal, but with the huge reduction in the carbon intensity of the grid, it makes sense to transition the levies from electricity to gas. If gas and electricity costs were rebalanced, electric heating systems like heat pumps would be cheaper to run than gas boilers."



The challenges of switching

In the UK, where heating accounts for more than a third of CO₂ emissions, 85%

greener, users could save as much as 60% of energy compared with using a gas boiler, especially if they take advantage of time-of-use tariffs.”

Bishop agrees: “When lifetime running costs are taken into account, savings for ground source heat pumps can be between 30–70%, depending on the type and price of fuel that is being replaced.” She highlights the need for a temporary support mechanism to help drive the market, put downward pressure on installation costs, and help deliver the expansion of heat pump supply chains and training.

That heat pumps can contribute to achieving net zero is in no doubt, but industry experts agree this can only happen with political will and sufficient investment. In countries where there is clear policy strategy on decarbonising heat, such as Sweden, it is reflected in heat pump sales. A successful switch needs government support with grants and incentives and regulatory measures to make heat pumps more affordable and the use of gas less attractive.

As world leaders sit down in Glasgow for COP26, the potential of heat pumps is becoming clear, but they are the ones who must make it happen.

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ABOUT THE AUTHOR

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