

# Star Renewable Energy

High efficiency, natural working fluid heat pumps



**Neatpump**





## About Us

Star Renewable Energy is the innovative business enterprise of leading UK heating and cooling specialists, Star Refrigeration. SRE was set up to support the decarbonisation of the heating sector by delivering large heat pump systems for district heating & industrial processes.



Star's Neatpump is a renewable energy heat pump that extracts heat from rivers, lakes, sea water, mineshafts, aquifers, air, ground or even industrial waste streams. It offers businesses lower operating costs, higher overall site energy efficiency and reduced CO<sub>2</sub> emissions. Star's large heat pumps have sufficient capacity to supply large buildings and entire cities with both district heating and cooling at lower cost and less carbon emissions. When using renewable electricity, Neatpumps generate heating and cooling at zero GWP.

## Part of the Star Refrigeration Group

Founded in 1970, the company has expanded from an industrial refrigeration company to an international multi-faceted engineering group operating in over 50 countries.

The Star Refrigeration group of companies offers an innovative one stop solution from design through to lifelong maintenance. From bespoke chilling & freezing to first class consultancy & cutting edge renewables, we have grown in size as well as reputation, serving the industry for nearly 50 years.



## Applications



### District Heating

Seen as a key strategy for decarbonising our heat dense cities, when coupled with a high temperature water source heat pump the result is a 2050 ready solution that can be implemented NOW.



### Industrial Heating Processes

From sugar refineries to whisky distilleries, most industrial processes require heating and cooling to manufacture their product. By utilising a heat pump instead of burning fuel you can drastically reduce the carbon emissions on site.



### Other (Public/Private)

All buildings have to reduce their emissions NOW. Whether you are a hospital, university or a private business, we all have to take responsibility for our energy systems. With temperatures up to 80°C heatpumps can easily be retrofitted to your existing buildings.

## Core Benefits

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Star Renewable Energy design and manufacture bespoke heat pumps to meet your actual project requirements. With years of experience in delivering complex solutions, we can work with you from the beginning of your concept and offer our advice on design of the system all the way through to installation and commissioning of the machines.

We all know climate change is happening and the world has come together to set ambitious targets to limit the effects we will encounter. The UK & Ireland have declared a Climate Emergency so we must act NOW.

Cutting emissions to net-zero will only be possible by utilising existing technologies which are 2050 ready. Heat pumps are long term, proven and a viable technology capable of delivering zero carbon heat in a large scale.

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## WSHP - Water Source Heat Pumps

Can be utilised in a multitude of different applications to displace the burning of fuels for heat generation. Rivers and oceans provide the biggest opportunity to decarbonise our big cities.

WSHPs use water from industrial processes to produce heating & cooling at high temperatures, eliminating the need for steam.



- › Modular solutions ranging from 100kW<sub>th</sub> to 10MW<sub>th</sub>
- › Capable of reaching temperatures up to 85°C (and in specific cases beyond)
- › Can utilise a multitude of sources to take heat from
- › Can meet heating and cooling demands from one machine
- › Open loop to increase system efficiency and minimise OPEX

## ASHP - Air Source Heat Pump

SRE manufacture large ASHPs which, like the WSHP can be deployed as the solution to a variety of different heating scenarios. From tower blocks in city centres & district heating to university campuses and hospitals.



- › Temperatures up to 70°C
- › Modular approach
- › Unit capacities 500kW (larger capacity will be considered on request)

## Neatpump Components

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Star Renewable Energy Water Source Heat Pumps are specially designed to deliver flexible and efficient heating solutions for a wide range of applications.

### Spray Chiller Evaporator

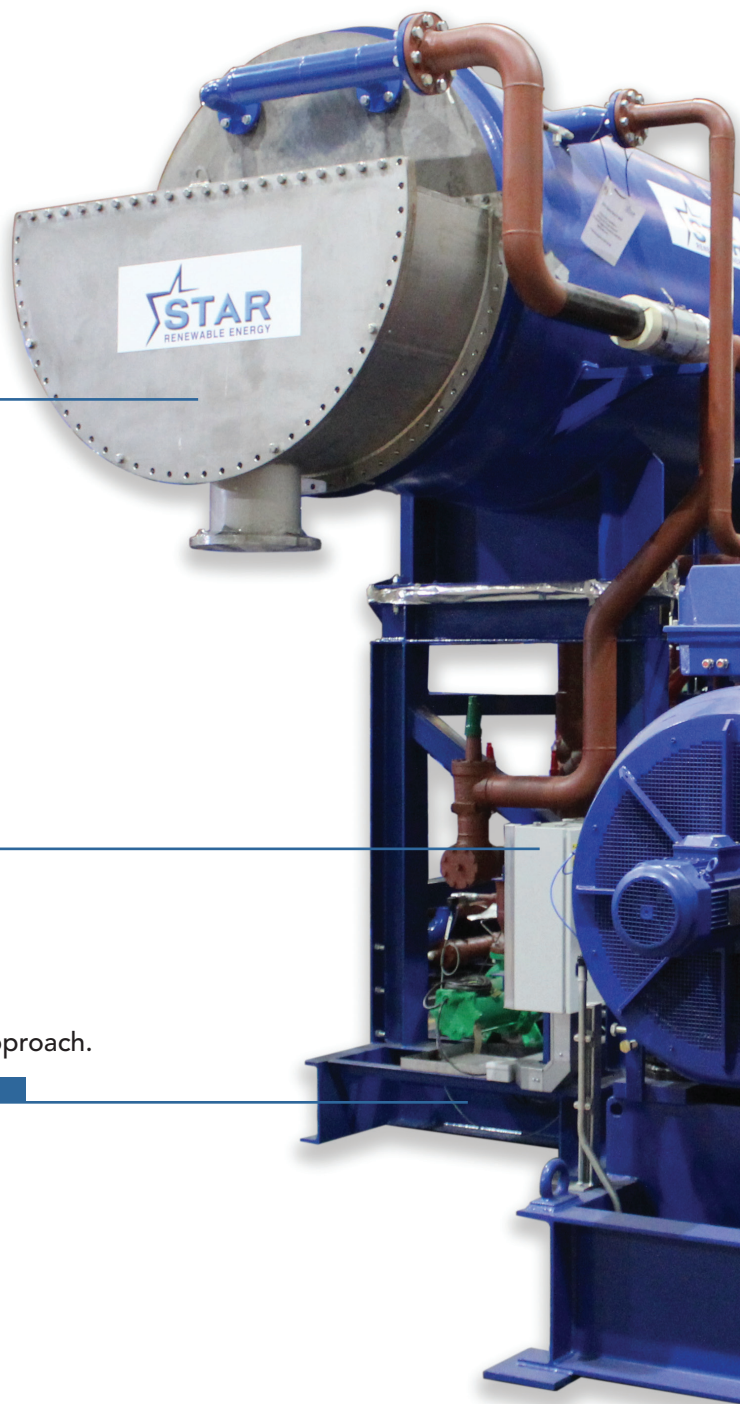
Designed to cope with extremely aggressive water compositions without the need for an intermediate loop.

### Electric Motor

High efficiency IE4 air cooled motor (can be water cooled).  
Option available for variable speed drive.

### Modular Approach

Tailor made to meet specific client designs in a modular approach.





## Heat Exchangers

Plate and Shell Heat Exchangers to minimise refrigerant charge and optimise system efficiency.

## Natural Working Fluids

The Neatpump uses ammonia, a 0 GWP and 0 ODP refrigerant making it 2050 ready.

Other refrigerants will be considered where applicable.

## Controls

Bespoke heat pump controls design in house to allow accurate monitoring and precision control.

Control panel can be fitted on the skid or placed remotely in a dedicated control room.

## Steel Base Frame

Fully welded steel base frame, for rigid construction and long life.



### Scotland's largest water source heat pump for district heating reduces local carbon footprint by 60%

Supported by the Scottish Government Low Carbon Infrastructure Investment Programme, Star Renewable Energy has recently joined forces with West Dunbartonshire Council and Vital Energi to deliver Scotland's first industrial scale water source heat pump for a district heating network. Star has engineered two 2.6 MW water source heat pumps as part of the £250m Queens Quay regeneration project in Clydebank, and will be installed in September once the development is complete.

"Providing low carbon heat to the Queens Quay housing development, as well as the college and local businesses really does put Clydebank at the forefront of renewable energy technology." West Dunbartonshire Councillor Iain McLaren.



### UK's first residential air source heat pump halves the cost of energy for flats in hillpark



The 400 kW air source heat pump is set to alleviate fuel poverty for seven existing high-rise blocks, a total of 350 social homes in Hillpark Drive, Glasgow. The Neatpump can heat water above 60°C, and paves the way to low carbon, affordable heating and hot water for vulnerable households. Designed in partnership with Glasgow Housing Association and WSP Parsons Brinkerhoff, this is the first community air source heat pump installation in Great Britain to provide renewables as a source of central heating for residential high-rise buildings.

"Heatpumps were not considered at the start of this project as we had never thought it would be possible to work with heat pumps on this scale. However, this is a different beast." Colin Reid, Energy & Sustainability Manager at Glasgow Housing Association (GHA).

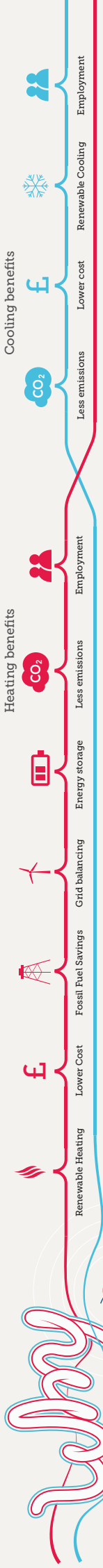
### Combined heating and cooling neatpump gives Nestle free hot water

In a bid to reduce the heating and cooling demand at the Nestle chocolate factory in Halifax, Star were challenged to create a bespoke solution which was more efficient than the current coal fired boilers.

The challenge was to utilise a heat pump that drew electrical energy and thereby reduced the load on the proposed replacement coal fired boiler. Star devised a heat pump which used ammonia as the refrigerant and screw compressors up to 90°C, enabling the technology to comfortably take heat from the 0°C process glycol at -5°C and lift it to 60°C in one stage for heating. The new plant provides both heating and cooling, consuming £120,000 less in electricity than the previous cooling only plant. This results in an annual saving of £143,000 in heating costs and reduces Nestle's yearly carbon emissions by 119,100kg.







we need heatpumps to deliver #COP21

**HEAT PUMPS** Provide **low carbon heating & cooling**

while the UK imports

**£16 bn** worth of fuel each year for heating

just **10%** of UK heating originates from renewable sources

Where do River Source Neatpumps come in?

They have the potential to provide Heating & Cooling for

**1.8 million homes** with at least

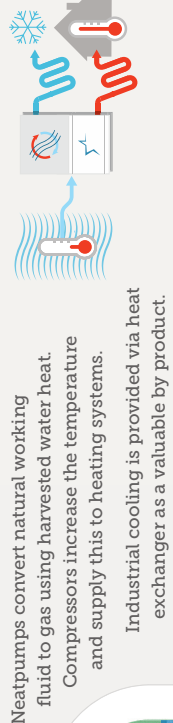
**6 GW** of heat in England's rivers alone

Neatpumps can also help reduce emissions by

**30%** when heating accounts for

**40%** of UK CO2 emissions on its own

## Joining up Heating & Cooling



**Grid Balancing**  
On when supply is high, relieving strain on the grid.  
Off when supply is low, relieving supply shortfalls.



**District Heating & Cooling**  
Supply housing districts and buildings where heat can be harvested from water.



**Wasteheat Recovery**  
Carbon efficient Waste Heat harnessed from industrial processing.



**#COP21**  
needs heating without fossil fuel.



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Star Refrigeration's network of offices across the UK provide services including maintenance, service, spares, new equipment/installations, retrofits and consultancy. We specialise in industrial refrigeration including temperature controlled storage & distribution, food production, beverage, process, pharmaceutical, petrochemical, leisure & ice, data centres and HVAC. Contact your local office for more details.

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