

# Water-Source Heat Pumps (WSHP)

## Information Sheet – Commercial Systems

### Key benefits

- Renewable & highly efficient
- Space heating + hot water + cooling
- Government incentives for 20 years
- Compact & easy to install
- Low maintenance & long-lasting

### Renewable & highly efficient

Heat pumps simply exchange heat between the natural environment and your heating system.

Water-source heat pumps are the most efficient type, providing 4-5 units of heat per unit of electricity used.

Watercourses remain at 8-10°C during winter, which makes water-source much more efficient than air-source.

Unlike ground-source where heat extraction reduces the ground temperature, water-source heat pumps remain highly efficient all year round.

Reducing energy use by a factor of 4-5 results in a drastic reduction in carbon emissions. By using renewable electricity, it is even possible to go 100% green.

Heat pumps are the most effective method of decarbonising heat, a key step towards reaching net zero.

### Space heating + hot water + cooling

Heat pumps typically provide space heating at up to 45°C and hot water at 60°C. Higher temperatures can be provided if required.

Water-source heat pumps are also ideal for cooling. In many cases the low watercourse temperature allows 'free cooling' with very low running costs.

### Government incentives for 20 years

The Renewable Heat Incentive (RHI) provides 10 p/kWh for heat used, guaranteed for 20 years and CPI-linked.

Projects must be installed and commissioned by **March 2021** to qualify.



### Compact & easy to install

With water-source heat pumps, there is no need to dig huge trenches or expensive boreholes.

A heat collector placed in the watercourse can extract heat from a small footprint, and only requires a narrow trench back to the property.

### Low maintenance & long-lasting

Water-source heat pumps have a lifetime of around 25 years, much longer than most traditional heating systems.

They are cheaper to run than traditional heating systems and require almost no maintenance.

### What does a WSHP system consist of?

The key elements of a closed-loop WSHP are its three closed circuits:

1. Collector loop – water and glycol are circulated between the heat pump and the heat collector situated in the watercourse
2. Refrigerant circuit – the heat pump circulates refrigerant via a compressor and expansion valve, increasing the temperature differential
3. Heating circuit – leading directly to the building radiators, UFH or HVAC system

## Is my heating system suitable?

Radiators, underfloor heating and forced air/HVAC systems are all suitable for integration with a WSHP.

Efficiency is highest when heating to low temperatures, so the best performance is found for systems with a space heating flow temperature of up to 45°C.

In most cases the WSHP will provide 100% of the heating/cooling requirements, and does not require any more space than a traditional heating system.

## Are heat pumps suitable for old buildings?

Yes absolutely. Heat pumps perform best when the flow temperature is low, which is easier to achieve for well-insulated properties. But older, less efficient buildings can also be suitable, with some careful consideration.

Some adjustments to the internal heating system may be needed. For example, fan-assisted radiators provide a high heat output at a much lower flow temperature.

Alternatively, a 'bivalent' system could be used, with a backup heating system taking over when demand is high.

## Which water bodies are suitable?

Any building with a heating/cooling demand within around 150 metres of water is likely to be suitable.

Any water body may be suitable including rivers, lakes, ponds, estuaries and the sea. Water has a very high heat capacity, so even a small stream can provide enough heat for several large businesses.

## What collector types are available?

'Pond mats' consist of HDPE pipe coiled onto a steel frame, weighted down to rest at bed level. These are well-suited to ponds, lakes and very slow-moving channels. They will extract around 1 kW per m<sup>2</sup> of collector area.

'FireFlo' panel collectors are the best option for moving water, extracting around 6 kW per m<sup>2</sup> of collector area. We manufacture our own stainless steel panels, carefully designed to be robust and low-maintenance.

For large projects, 'open-loop' systems may be used to abstract and filter water. This is typically suited to MW-scale installations such as those for district heating schemes. We can provide a full range of detailed design and installation services for open-loop heat pumps.



FireFlo heat exchange panel (500x1000mm stainless 304)

## How quickly can it be installed?

In total commercial projects typically take 6-9 months from start to finish, including feasibility, design, consenting and installation/commissioning. Please note that to qualify for RHI the system must be commissioned by **March 2021**.

Most projects require a Flood Risk Activity Permit, some may also require Listed Building Consent. Full planning permission is not normally required.

## Next steps

Please visit [renewablesfirst.co.uk/enquiry](https://renewablesfirst.co.uk/enquiry) to provide us with details of your property. We will check whether the site is suitable and provide a budget cost and project performance estimate free-of-charge.

Alternatively, please feel free to call our office on 01453 887744. We would love to hear from you.

## Company information

Renewables First has been designing, installing and operating renewable energy projects since 2002.

Our clients include businesses, utilities, local authorities, community groups and domestic homeowners.

We specialise in water-source heat pumps, hydropower schemes and onshore wind turbines. We are based in Stroud, Gloucestershire and work across the UK.

*Our sister company GoFlo Screens Ltd manufactures market-leading self-cleaning screens for water intakes.*

