

# RENEWABLES



Alternative energy sources and technology advances gives clients more choice than ever before. With constant changes in legislation and social responsibility, means demand can fluctuate.

However, SBS aims to work with a selection of providers to help fulfil project requirements from heat pumps to solar options, the choice is extensive.



- ◆ HEAT PUMPS
- ◆ BIOMASS BOILERS
- ◆ SOLAR
- ◆ CYLINDERS
- ◆ UNDERFLOOR HEATING (UFH)
- ◆ CHP
- ◆ RAINWATER HARVESTING

With a wide range of renewables and RHI extending across a wide range of products, the sector keeps growing. At Smith Brothers, our customers have access to our supply chain so design, technical support and after sales service can be offered through the manufacturers.

## HEAT PUMPS



Heat pumps are designed to move thermal energy opposite to the direction of spontaneous heat flow, by absorbing heat from a cold space and releasing it to a warmer one or vice-versa. A heat pump uses some amount of external power to accomplish the work of transferring energy from heat source to output.

### AIR SOURCE

Air source heat pumps use the heat in the ambient air, to provide efficient heating and hot water at air temperatures as low as -25°C. Installation can be indoors or outdoors and with the UK having mild winters, excellent performance levels can be reached. Another feature associated with the product is low installation costs and minimal space requirements.

### GROUND SOURCE

The earth has energy from solar radiation and rainfall, so a ground source heat pump extracts this energy either horizontally or vertically. Although more costly to install, higher efficiency is usually achieved, regardless of seasonal variations in temperature.

### AIR TO AIR (GAS ABSORPTION)

An all in one heating and cooling system which works in reverse to a refrigerator providing low cost heating. The extremely efficient process can produce five times more heat than the electrical energy it uses. The added benefit is that the process can be reversed in the warmer months to provide cooling air.



## BIOMASS BOILERS



Biomass means a fuel of organic material (usually wood or plant) of recent origin, rather than fossil fuel which has taken millions of years to develop. As these organic materials absorb carbon dioxide (CO<sub>2</sub>) during growing, they cancel out any CO<sub>2</sub> production during combustion.

The biomass market most commonly uses wood pellets, logs and other wood waste materials such as MDF, chipboard, plywood, timber, OSB, MFC sawdust and other woody biomass materials.

The system uses a feeder mechanism taking fuel combined with air, and transferring it from the hopper to the combustion chamber. Therefore achieving over 90% heat production.

If a company uses biomass boilers and also manage a replanting programme, CO<sub>2</sub> neutral can be achieved.

For industrial customers who can source waste wood, Talbot's biomass boilers are an excellent choice for low carbon, meaning the cost of heating will be low.



## SOLAR

Solar power is the conversion of sunlight into energy. The products available are from various brand leading manufacturers offering flat plate, vacuum tube (tubular), on-roof and in-roof options.

For convenience SBS can offer solar packs which come complete all on one pallet ready for installation.

### THERMAL

Solar thermal is thermal energy generated from solar energy, for use in the industrial, residential and commercial sectors. The heat can be used in all types of applications such as providing hot water or warming swimming pools. This system is often used alongside a solar cylinder to maximise heat transfer space requirements.

### PHOTOVOLTAIC SYSTEM (PV)

A PV system is designed to supply usable electric power by using the Sun as a power source.

Systems can be built in various configurations such as:

- Off-grid without battery (array-direct)
- Off-grid with battery storage for DC-only appliances
- Off-grid with battery storage for AC and DC appliances
- Grid-tie without battery
- Grid-tie with battery storage



## CYLINDERS



Although cylinders have been around for years, they have developed considerably and can now offer a renewable solution itself or alongside other renewable systems.

### SOLAR

Available in different sizes, vented, unvented or sealed system types are available and manufactured from copper to stainless steel. The cylinders aim for maximum heat transfer of solar energy into stored water. They are available as direct and indirect versions. Direct units have an immersion heater to meet any additional load, while indirect units use input from the householders' traditional heat source (boiler) to top-up water temperature to the required level.

### BUFFERS

A buffer tank is integrated into a system when additional volume of hot water is required to provide uninterrupted operation of a heat pump. The tank increases the volume of water a heat pump has to heat, allowing excess heat to be stored until it is required. They can be manufactured from copper or stainless steel, for use on both vented and unvented (sealed) systems of variable sizes.

### AIR SOURCE

Hot water storage cylinders are designed specifically for use with an air source heat pump, with a back up immersion heater used if and when required. With direct and indirect options of various sizes available, they are an efficient and environmentally friendly way of providing hot water. Certain models operate quietly below 40dB(A) and have a plug & play (no F-Gas qualifications needed to install, only G3) feature along with excellent CoP ratings.



## UNDERFLOOR HEATING (UFH)

Smith Brothers work with leading brands, enabling our customers to have access to the best systems available to meet any demands of a new build or retrofit project. Systems come in electric or wet.

Installing wet underfloor heating tends to incur lower running costs and can work well with other renewables systems. However, electric often finds itself placed in domestic bathroom applications but either option can be supplied through SBS.

For any project, if you send through your UFH requirements to your local SBS branch, they can generate a quote or get manufacturers involved should tech support be required.

### BENEFITS OF UNDERFLOOR HEATING

- Invisible, energy-efficient solution
- The cost of underfloor heating is significantly lower in the long term
- Pleasant radiant heat over a large area
- Can be optimally combined with renewable energy sources
- Reliable, proven products
- Underfloor heating can easily be retrofitted

### SHOULD I INSTALL A WET OR ELECTRIC UNDERFLOOR HEATING SYSTEM?

#### ELECTRIC

##### SMALLER AREAS:

Typical installation of electric UFH is in smaller areas (22m<sup>2</sup>), where it is not suitable for a wet system to be installed.

##### RENOVATION:

Electric underfloor heating system is perfect for renovation projects, as it does not alter the overall floor height.

##### MAINTENANCE COSTS:

An electric system is not connected to a boiler, so there is little maintenance going forward.

##### INSTALLATION COSTS:

The floor system itself can often be installed by a budding DIY'er, however an electrician is highly recommended to complete the wiring.

#### WET

##### LARGER AREAS:

To fully benefit from the energy efficiency, it is suggested installing it in areas beyond 22m<sup>2</sup>.

##### RENOVATION & NEW BUILD:

Wet systems tend to have a higher installation height, which makes them more suitable for new build projects. There are smaller diameter pipe options, which might be more suited for renovation projects.

##### MAINTENANCE COSTS:

There will be ongoing boiler service costs, which are offset by the energy efficiency of the system and reduced heating bills.

##### INSTALLATION COSTS:

Many manufacturers have approved installers to connect the system. The initial setup costs will often be offset in a medium/long term cost comparison.



## CHP

Combined heat and power (CHP) plants, take advantage of cogeneration to generate both electricity and usable heat, which ideally is closely located to the heat/power area requirement. The result is a very high primary energy efficiency of over 100%.

By comparison, conventional power stations such as a large-scale gas-fired plants will only achieve a primary energy efficiency of between 30 to 50% and lose the majority of the energy as waste heat. This waste heat will be used as heat energy to heat water, or as process heat for industrial operations. The electricity produced is used in the plant's own building or fed into the public utility grid in return for remuneration to the energy supplier.

Whether using a CHP plant to generate heat and power for one multi-family dwelling, an entire housing development, a commercial building or an industrial process, solutions are available for cost effective operation with natural gas or biogas, with various electrical and thermal outputs.



### FEATURES

- Extremely efficient, lowers operating costs and is a more sustainable operation
- Low CO<sub>2</sub> and NO<sub>x</sub> emissions – supports environmental legislations
- Remote monitoring and control – greater visibility
- Achieve even higher efficiencies
- Suitable for new build and existing buildings with year-round heat and electrical demands
- Flexible solution to sustainable heat and power
- Low noise and quiet operation models
- For single use or in conjunction with condensing boilers
- Versatile solution to energy-efficient, low carbon heat and power generation

## RAINWATER HARVESTING

The system works from utilising rainwater that is usually harvested from a building and can be used in both a domestic & commercial environments. Collection can be both above or below ground via a gravity fed system or pressurised, where needed. With filters and excess flow outputs, via one way valves installed on tanks/pipework, the system can be developed to limit the requirement for heavy maintenance costs. The manufacturers have retro-fit options where needed.



# Renewables at SBS

Leeds Solar Install



SBS Vehicle Fleet



As well as selling renewable products, Smith Brothers use renewable technology within our branches, to help reduce our carbon footprint and become more sustainable.



Rainham Branch Charger



Northampton Biomass Boiler