FUTURE LEAP

ECO-FIT

DISCOVER | INNOVATE | COLLABORATE

RETROFITTING GREEN TECH

Future Leap is a community of change makers. The network gives organisations the space, knowledge, contacts and tools to accelerate their sustainability journey.

The launch of **Future Leap Eco-fit** sits perfectly within this ethos. Our mission is to provide network members with financing options to support their investment into:

- **Property Retrofit & Development**
- **Eco Products**
- **Environmental Technologies**

Future Leap **Eco-fit** is your trusted partner in seamless retrofit contract management. We specialize in bridging the gap between clients seeking efficient upgrades for their properties and skilled installers ready to bring those upgrades to life. Our comprehensive suite of services ensures a smooth and hassle-free retrofit process from inception to completion. With **Eco-fit**, you can expect a tailored and expertly managed experience that maximizes the value of your retrofit investments.

At **Eco-fit**, we are committed to empowering businesses with eco-friendly and energy-efficient solutions that not only minimize environmental impact but also boost operational efficiency and cost-effectiveness.

With our team of expert professionals and a deep understanding of the unique challenges faced by SMEs, we are dedicated to helping you transform your business into a beacon of sustainability. Discover how innovative retrofitting strategies can elevate your company's environmental performance while contributing to a greener and more sustainable future for all.

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WHAT WE DO

Client Consultation and Needs Assessment:
We begin by understanding your unique requirements, budget, and goals. Our team conducts thorough consultations to identify the optimal retrofit solutions that align with your vision.

Installer Network Engagement:
Leveraging our extensive network of trusted and certified installers, we handpick professionals whose expertise matches your project's needs. We prioritize quality, reliability, and experience in our selection process.

Bid Management and Proposal Evaluation:
We handle the complex bidding process, inviting installers to submit competitive proposals. Our team evaluates these proposals meticulously, considering factors such as cost, timeline, and approach

Contract Negotiation and Documentation:
We facilitate transparent contract negotiations between you and the chosen installer, ensuring all terms and conditions are favorable and well-defined.

WHAT WE DO

Quality Assurance and Compliance:
Our team conducts due diligence on suppliers to ensure installations meet your expectations.

Communication and Progress Reporting:
We maintain clear lines of communication between you and the installer, providing regular progress reports. This transparency keeps you informed about each stage of the project.

Issue Resolution and Risk Mitigation:
Should any challenges arise, Future Leap Ecofit will support in swiftly addresses them, minimizing disruptions and risks. Our experienced team is equipped to handle unexpected situations with professionalism and efficiency.

Post-Project Evaluation and Support:
After project completion, Future Leap Ecofit conducts an evaluation to gather your feedback and identify areas for improvement. We remain available to address any post-project concerns or inquiries.

SOLAR PANELS

Solar photovoltaics technology (PV) works by capturing the sun's energy using photovoltaic cells. The cells convert the light into electricity, used to power household appliances and lighting. The cells do not need direct sunlight to generate electricity, they will still produce a little electricity on a cloudy day.

The PV cells are made from layers of semi-conducting material, usually silicon. When light hits the cell, it is absorbed and creates an electric field across the layers. The more intense the light, the more electricity is produced. Individual cells only provide a small amount of electricity, so they are generally grouped together.

Solar cells produce Direct Current (DC) electricity. Direct Current is converted into Alternating Current (AC) using an inverter for use within the home or exported to the grid. The solar array is usually mounted on a roof but also can be mounted on the ground. The other option for mounting solar arrays is roof integrated PV in the form of solar tiles or slates.

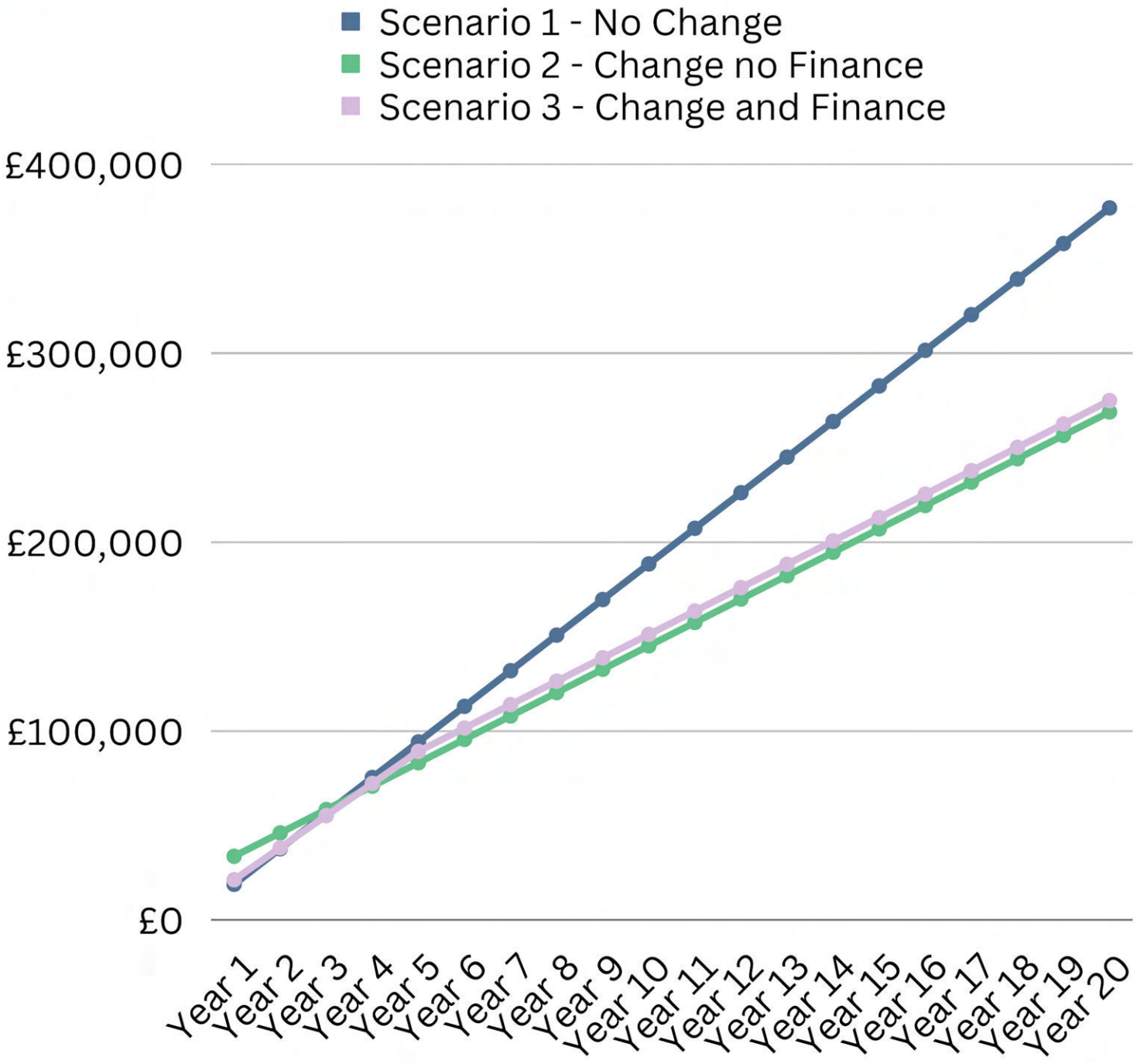
Northleaze Primary School,
North Somerset

Northleaze solar PV system is North Somerset's first community-owned school solar PV system. The project was funded and is owned by Low Carbon Gordano, a co-operative in North Somerset who help local communities to reduce their energy costs and become more sustainable.

Northleaze Primary school buys their electricity from Low Carbon Gordano at a discounted rate which reduce their energy bills. The school is also reducing their carbon footprint.

System size	**49.9kWp**
Annual output	**49,000kWh**
Annual CO2 savings	**25,000kg**

SOLAR PANELS



LED LIGHTING

LEDs are more expensive, but their energy consumption is extremely low, and can save you between £4 and £15 a year per bulb, depending on what kind of bulb you're replacing. LED lighting is measured in lumens. Lumens are a measure of the total amount of visible light from a lamp or light source. The higher the lumen rating, the brighter the lamp, and the lower the lumen rating, the dimmer the lamp. Using lumens lets you choose and buy the amount of light you want. Watts on the other hand, are a measurement of power consumption and energy used.

The table below shows the wattage you'd need to produce the same brightness with different types of bulbs (Lumens vs Watts).

Lumens	Old-style	Halogen	CFL	LED
1600	100W	70W	25W	16W
800	60W	42W	14W	8W
450	40W	28W	9W	5W

The table above can be used as a guide when converting your old bulbs to more energy efficient equivalents .

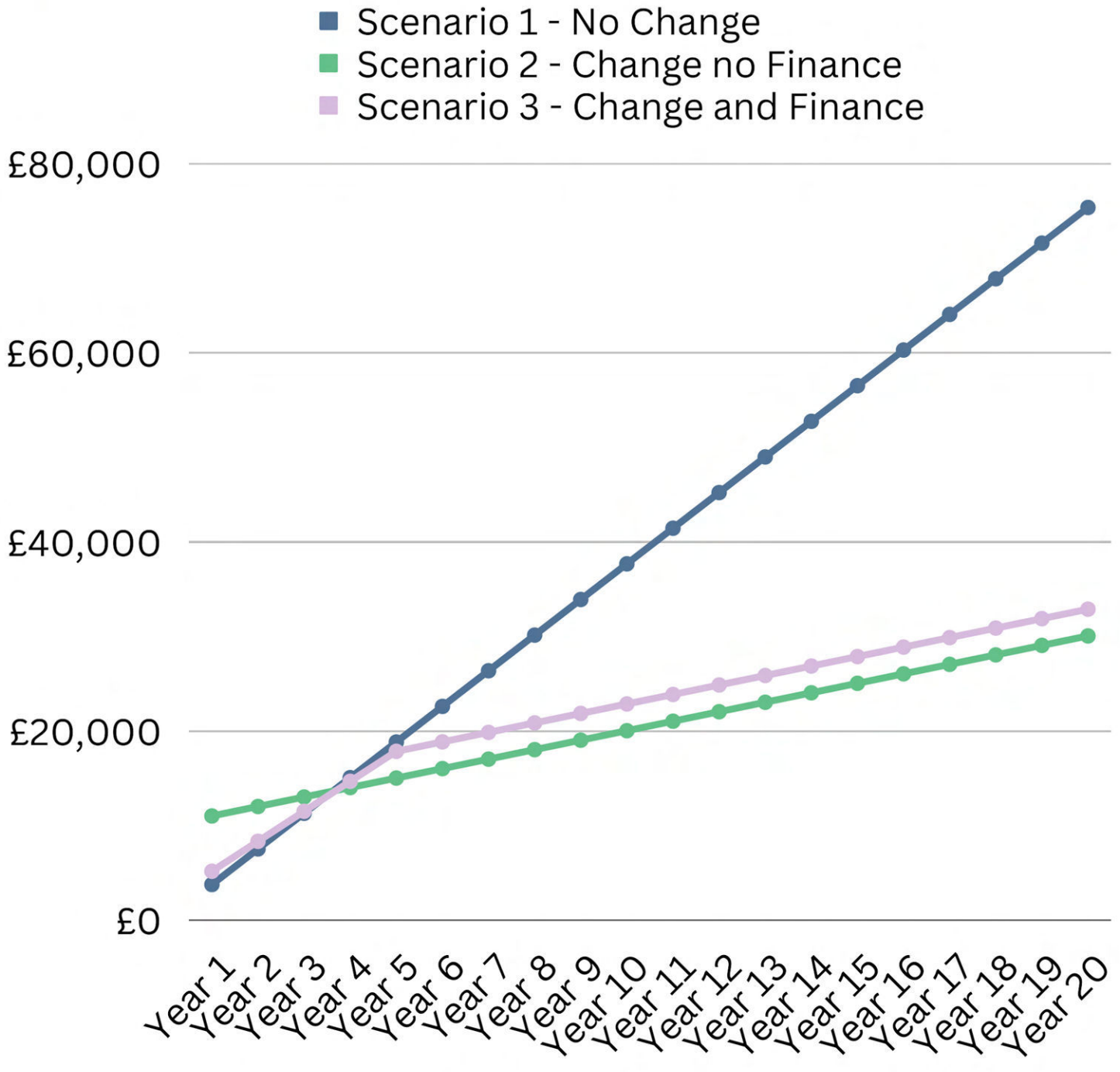
The table below shows potential savings switching traditional bulbs for LEDs

Lumen	Watt	Savings per year	Running hours per year
1100	100W	£15	562
825	75W	£10	503.5
660	60W	£7	445
440	40W	£4	394

The table below shows potential savings Switching halogen bulbs to LEDs

Lumen	Watt	Savings per year	Running hours per year
750	50W	£6	521
525	35W	£4	521

LED LIGHTING



HALCYAN WATER CONDITIONERS

The build-up of limescale in pipes and appliances have a significant impact on energy bills. When limescale builds up on heating elements it reduces their efficiency, meaning that you'll be paying more for your energy bills than you would if there was no limescale present.
60% of households in the UK are supplied with hard water which causes limescale in the home. This can add £500 or more to your annual energy bills as limescale covered heating element use more energy to heat the water. With just 3mm of limescale, energy consumption by 25%. This means energy bills are much higher than necessary, and so is the carbon footprint of the can increase home.

The Halcyan Water Conditioner is a technology that is designed to resolve the problems associated with hard water. It does this by;

- Removing existing lime scale.
- Creating softer water.
- Reducing lime scale accumulation.

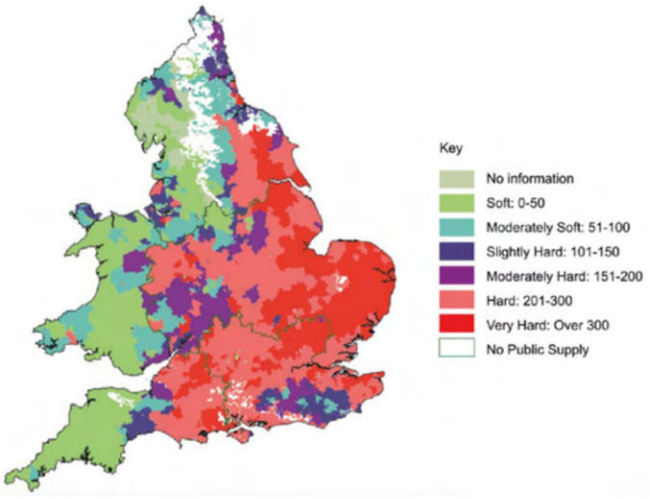
It prevents the formation of damaging limescale and dissolves any existing build up. The Halcyan Water Conditioner uses no salts, chemicals, nor electricity. It doesn't add or take away anything from the water, requires no maintenance and comes with a 30 warranty.

The water conditioner is fitted where the mains water pipe enters your property, and one device protects your entire home. Each Halcyan Water Conditioner patented alloy core is designed and configured with specially blended metals which changes the crystalline structure of the minerals in water, thereby reducing problems that are associated with hard water.

Water Regulations Advisory Scheme (WRAS) Approval

The Water Regulations Approval Scheme is an independent UK certification body for plumbing products and materials. Halcyan units are fully certified to UK drinking water standards, with their WRAS certification.

Figure below shows areas with hard water in England and Wales.



TERMEX – CELLULOSE WALL INSULATION

More and more customers are now asking for environmentally friendly insulation. Termex uses natural cellulose fibre made from recycled newsprint and cardboard and can be reused at the end of its life (50+ years). Cellulose wall insulation offers a natural net-zero method of keeping your house warm.

Cellulose wool can be blown into virtually any space: attics, under floors, between walls. Even in cavities if the conditions are right. Cellulose wool is blown into spaces dry and contains no toxic chemicals or fossil fuels.
It forms a seamless layer which also tightly fills all sorts of odd-shaped members and surfaces. It does not leave any waste to be disposed of after the installation. In most cases, cellulose insulation does not require any adjustments or significant changes in the existing structure of the building or dry lining.

Termex is quick, easy, and safe for any trained professional to install. There is no need to take up floorboards and there's no waste or mess. Homeowners can start benefiting from the insulation within hours. Cellulose wool are breathable and completely resistant to mould growth. Compared to other insulation, cellulose wool is affordable, cost effective, and sustainable. It's guaranteed to reduce your heating bill by 30-50%, with homeowners likely to start seeing a return on investment in as little as a couple of months.

SOLAR THERMAL

Solar thermal energy captures the heat energy, directly from the solar radiations. The higher gained temperature, the higher quality of the thermal energy. Solar thermal collectors are devices that convert the total received solar radiation into heat. Thermal energy gained from the sun's rays can be used in industrial, residential, and governmental sectors. Solar thermal systems are sized to meet 70% of domestic hot water demand and the boiler provides the rest. Solar thermal energy must be used on site, it cannot be exported. It feeds into the hot water tank though and can be stored for later and on this basis a bigger tank is useful.

There are two types of solar water heating collectors:

Evacuated tube collectors- have evacuated tubes each with a liquid filled copper conductor inside. As the liquid heats up, it rises to the top of the tube where the heat is transferred in a manifold to the water from the cylinder.

Flat plate collectors - the water passes through the whole plate where it is heated before returning to the cylinder. Flat plate collectors can more easily be integrated into the roof fabric and tend to have a lower profile than evacuated tubes.

Savings on solar thermal

Solar thermal most commonly replaces gas while solar PV replaces electricity demand. The gas price in the northwest based on the new energy price cap is 7.34p per kWh, while electricity is 28p per kWh. Electricity is therefore nearly 2.8 times as much as gas. While solar PV costs more initially it might therefore make greater cost savings during use.

Solar thermal can replace gas, or possibly oil in rural areas, while solar PV can replace electricity. The government figures for kilograms of carbon per kWh for each fuel type in 2021 can be seen below.

Solar Panel	Cost for typical system	Cost for gas in NW England	Cost for electricity in NW England
Solar thermal	£3000-£5000	7.34p per kWh	
Solar PV	Around £6500		28p per kWh

DOUBLE GLAZING

Most energy efficient glazing installed in UK homes is double glazed. This means the windows have two sheets of glass with a gap between them of usually at least 16mm. The gap between the panes may be filled with an inactive gas like argon, krypton, or xenon. These creates an insulating barrier to reduce heat loss through the unit. Triple-glazed windows have three sheets of glass and two insulating gaps.

When gas such as argon, which has low conductivity is used within this space, the window is then even more efficient at keeping heat inside the property. It also at interferes with sound waves from inside or outside the house, thereby reducing noise pollution. The inside pane of the double or treble glazed window units has an invisible metal oxide coating which lets in light and the warmth of the sun.

Energy-efficient glazing is rated according to its ability to reduce the amount of heat that can pass through the window, the capacity for sunlight to travel through the glass unit, and the capacity for air to move through the unit.

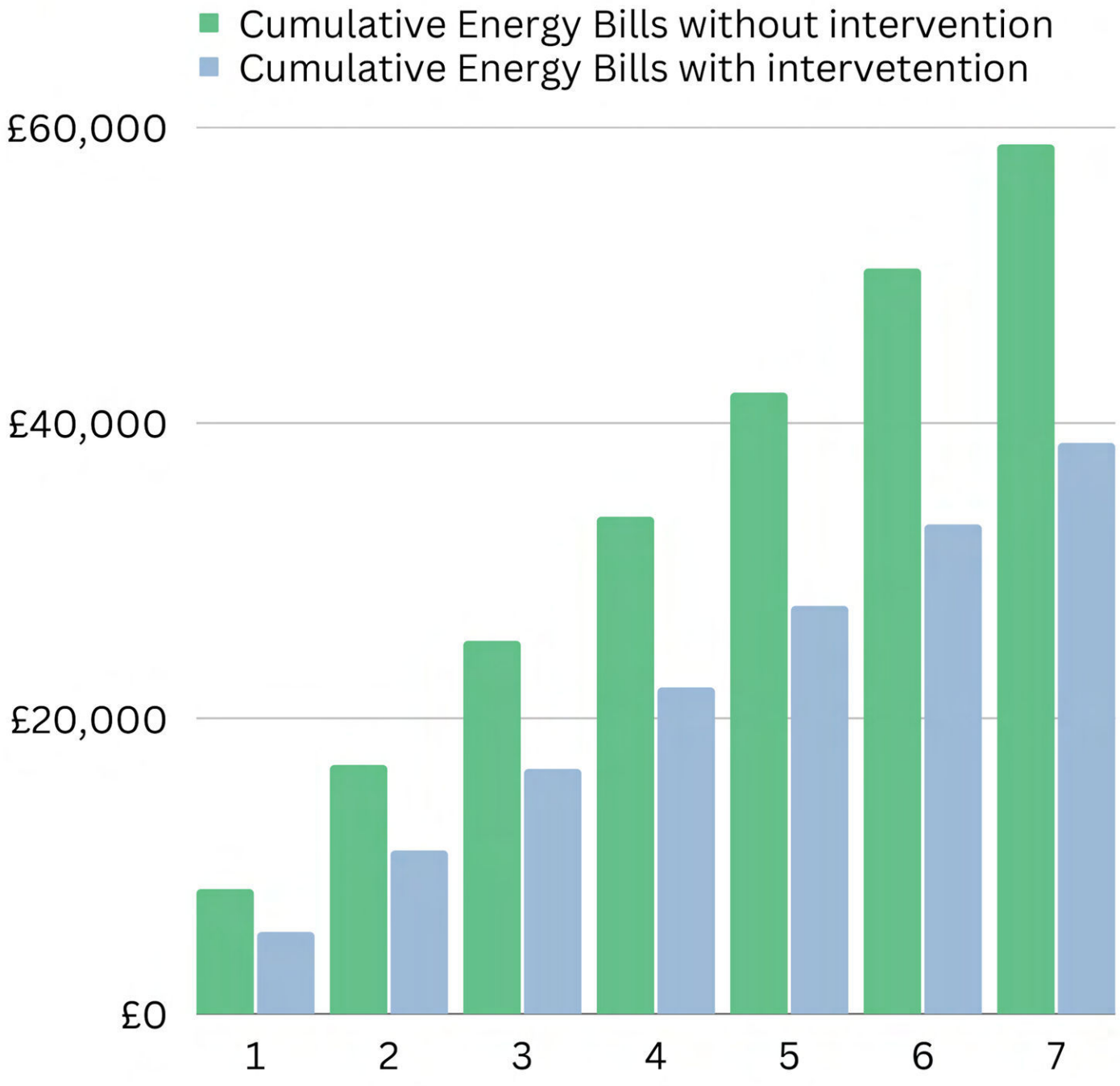
When energy rating is given, a whole window u-value is also calculated. The u-value refers to how easily heat can pass through the unit. The u-value scale works in the opposite way to an energy rating, in that the higher the u-value, the more easily heat can pass through the window and the window is less efficient.

Certain window manufacturers label the energy efficiency of their windows with an energy rating ranging from A++ to C, A++ being the most efficient. This rating system has been developed by the British Fenestration Rating Council (BFRC). A set of A-rated windows for a semi-detached house will typically cost around £7,500.

By installing double glazing in an entirely single glazed house, you could save the sums shown below each year for a gas heated home:

Energy rating	Detached	Semi detached	Mid terrace	Bungalow	Mid-floor flat
A	£120-155	£80-110	£65-85	£55-75	£40-55
B	£110-140	£75-100	£60-80	£50-70	£35-55
C	£105-135	£75-95	£60-75	£50-65	£35-50

DOUBLE GLAZING



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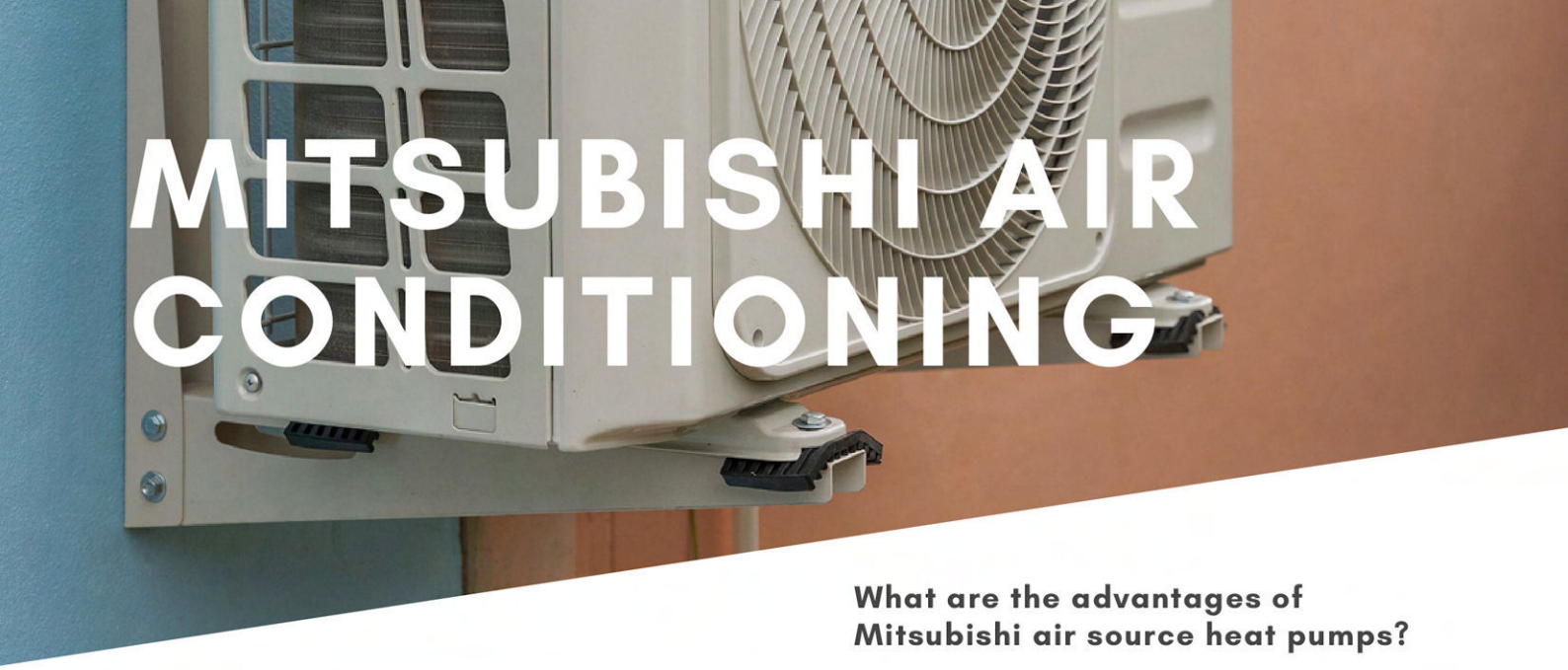


MITSUBISHI AIR CONDITIONING

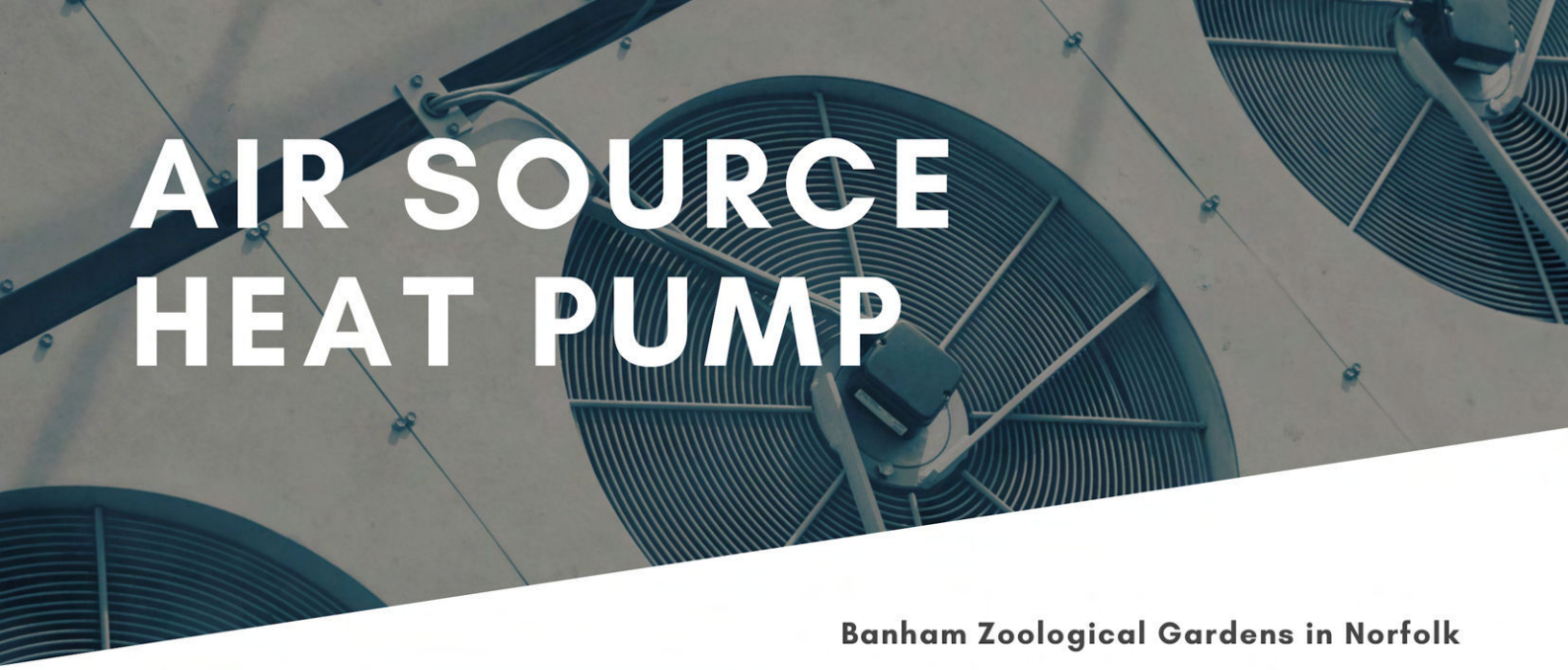
A Mitsubishi Ecodan Monobloc heat pump can be installed to replace an existing heating system or work alongside it. It is an ideal solution for new build properties and renovation projects because it's compatible with underfloor heating as well as traditional radiators. The Mitsubishi Ecodan Monobloc heat pump systems come equipped with their own inverter compression technology. This enables the heat pump to maintain the exact temperature desired at all times. When the demand for heating increases, the inverter speeds up its cycles to circulate more heat through the home. The Mitsubishi Ecodan Monobloc is an efficient air source heat pump that can operate in low temperatures of between -15°C and -20°C.

Air source heat pumps are simpler to maintain than other heating systems such as gas. However, it's always a good idea to check on the pump before winter. The filters, coils and fans should be checked for debris and cleaned once a year. Homeowners can choose between an advanced wireless controller or a web-enabled cloud controller app to monitor and control their system remotely.

What are the advantages of Mitsubishi air source heat pumps?

- No Gas or Oil Bills: You could save up to 30% of your energy bill by installing a heat pump. Air-source heat pumps can be powered by rooftop solar panels, leading to a lower running cost.
- Lower Carbon Footprint: Mitsubishi heat pump can reduce your building's carbon footprint by 40%.
- Efficiency: You get 4 times more heat for every kilowatt of electricity the heat pump uses.
- Cooling and Heating: Heat pumps have reverse valves that allow the user to reverse the flow of the refrigerant. Which means you can both heat up or cool down your room with a single heat pump.
- Low Noise: Some of Mitsubishi's heat pumps are ultra-quiet.
- Quality and Durability: Mitsubishi offers 3 to 5 years of warranty for its air-source heat pumps.

Brand	Price Range	Warranty	Efficiency
Mitsubishi	£2,500- 6,000	3- 5 years	A+, A++, A+++
Danfoss	£3,000- £5,000	3- 5 years	A+, A++
Calorex	£4,000- £7,000	3-5 years	A+
Daikin Altherma	£6,000- £10,000	3 years	A+, A++
Vaillant	£7,000- £10,000	3-7 years	A+, A++, A+++
Hitachi Yutaki	£4,000- £7,000	3- 7 years	A+, A++, A+++
Samsung EHS	£3,000- £7,000	3- 5 years	A+, A++



AIR SOURCE HEAT PUMP

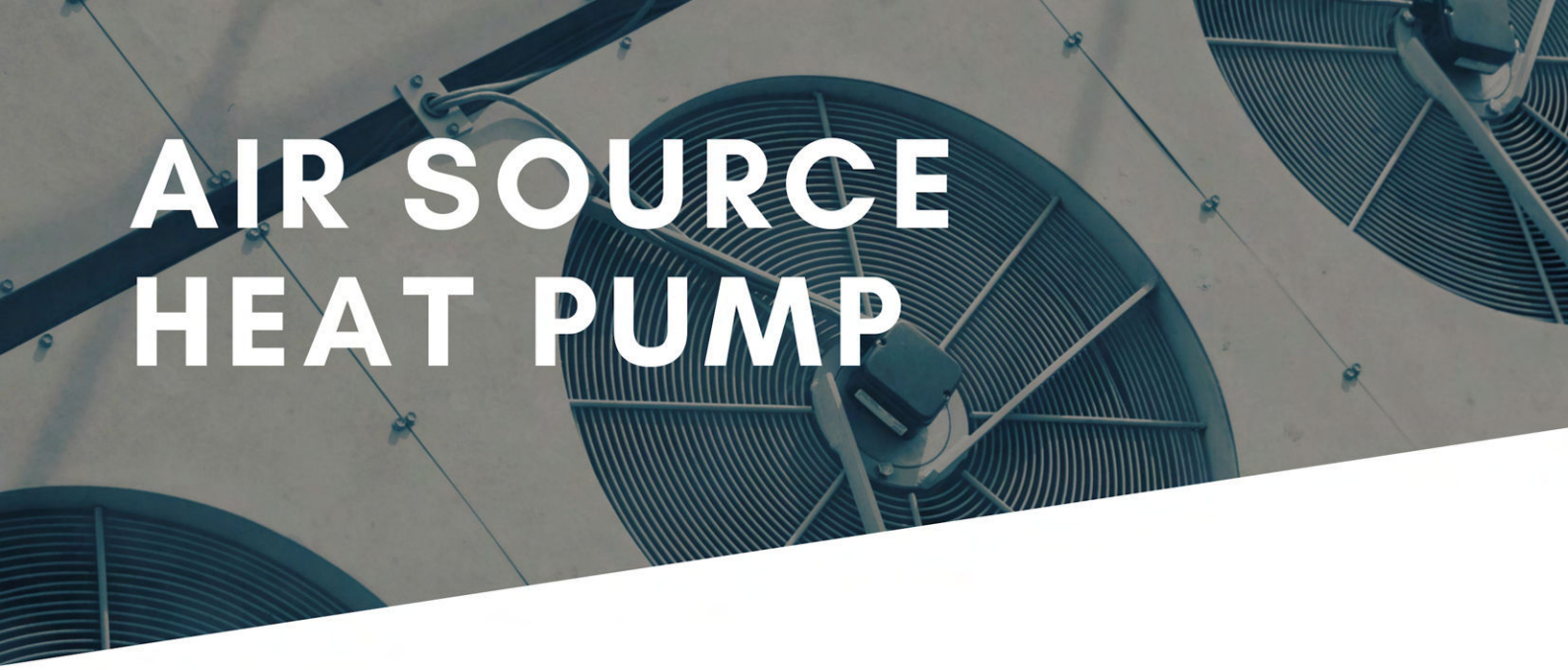
Air source heat pumps absorb heat from the outside air. They are the most common type of heat pump installed in the UK. Air-to-air source heat pumps transfer the heat by the air. The main unit is usually sited outside the home, and between one and four indoor units are mounted high on the wall. These indoor units are individually controllable and take the place of radiators.

The heat pump draws heat from the air outside, then uses it to warm to a special liquid called a refrigerant. As the refrigerant warms up, the liquid turns into gas which is compressed to increase its temperature. The heat generated by this process is transferred to a separate body of water which is distributed to a central heating system to warm the house. Once the gas cools down, it becomes liquid again and gets re-used at the start of the cycle.

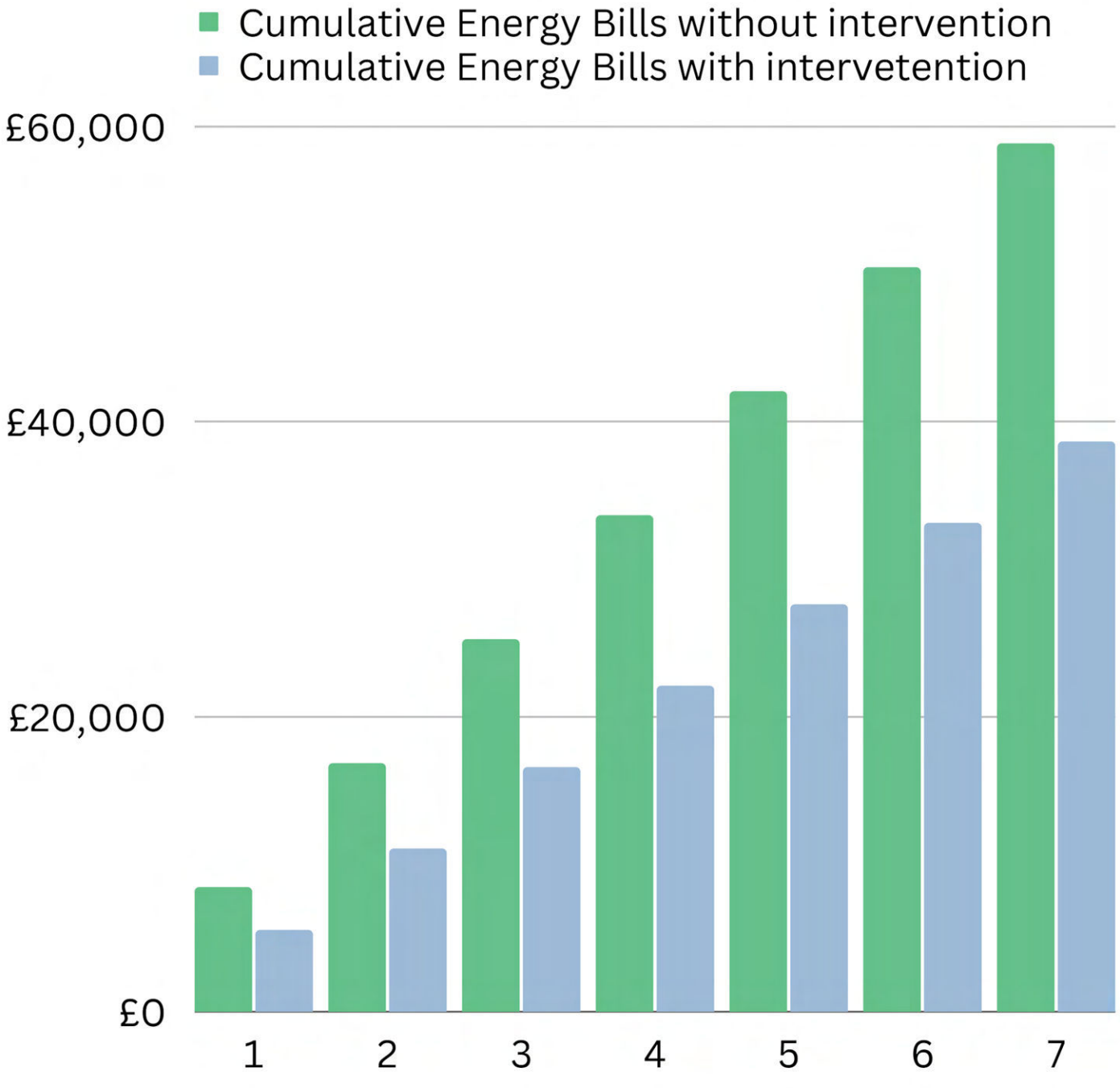
Banham Zoological Gardens in Norfolk

Set in 50 acres, Banham zoological garden in Norfolk is run by the Zoological Society of East Anglia. The zoo is keeping inhabitants of its Tropical House warm using air source heat pumps.
The heat pump's fan unit located outside the Tropical House works by taking energy from the air to heat water which is used for Tropical House's underfloor heating and air distribution units mounted in the ceiling. The system is ideal as the heat pump runs in long cycles which maintain a steady temperature.

By installing the air source heat pump system, Banham zoological garden has been able to efficiently heat Tropical House all year round. The system uses 70% less energy than an oil boiler, has reduced heating bills, made significant impact on reducing carbon emissions, having saved an estimated 170 tonnes of C02 since its installation when compared to an oil boiler.



AIR SOURCE HEAT PUMP



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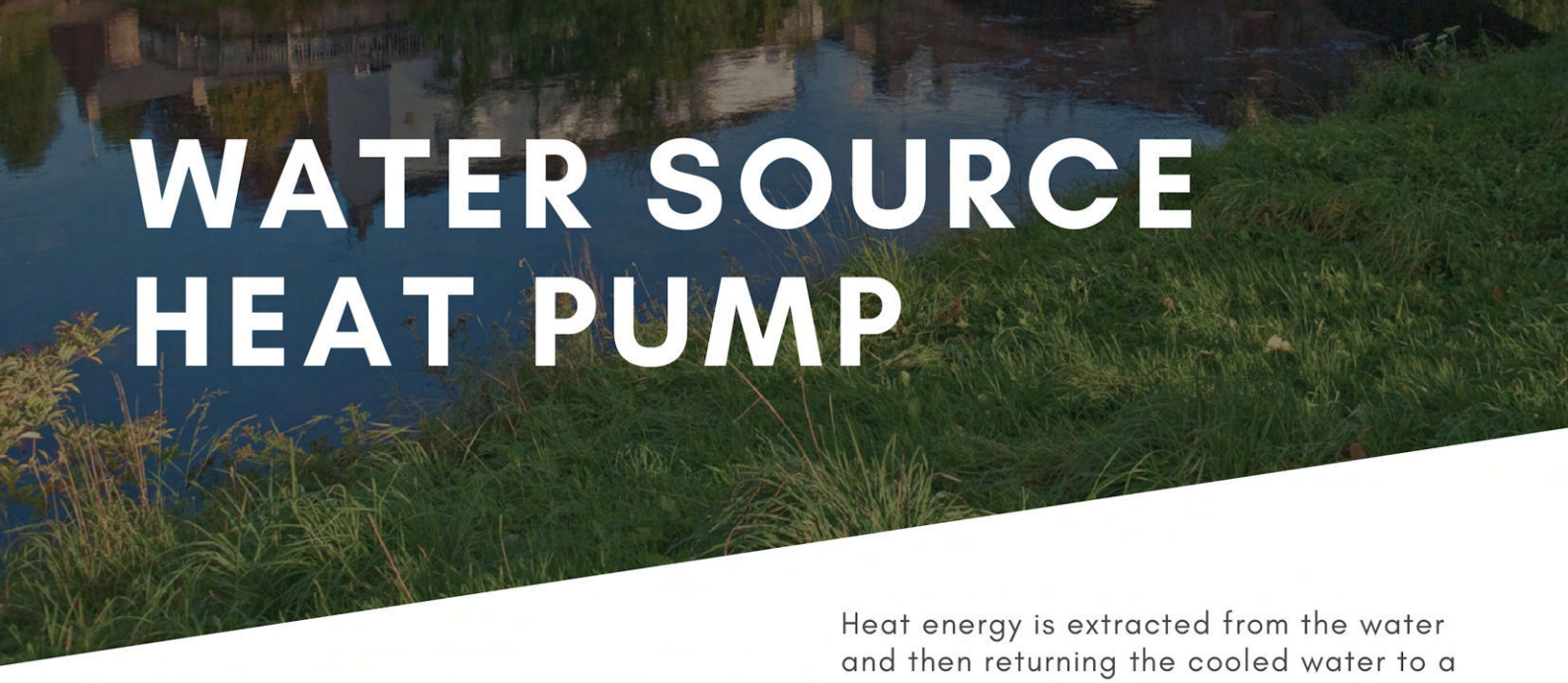


WATER SOURCE HEAT PUMP

A water source heat pump (WSHP) uses the heat energy from water to provide heating and hot water for your home. A WSHP receives water through pipes that absorb heat from contact with water. The water may be from a river, open water or even the sea in the case of a marine source heat pump.

There are two main Water Source Heat Pump designs; a closed loop system or an open loop system. In a closed loop system, sealed pipes filled with an anti-freeze fluid (refrigerant) are submerged under the water. The anti-freeze fluid is pumped through the pipes to gather heat energy in the water.

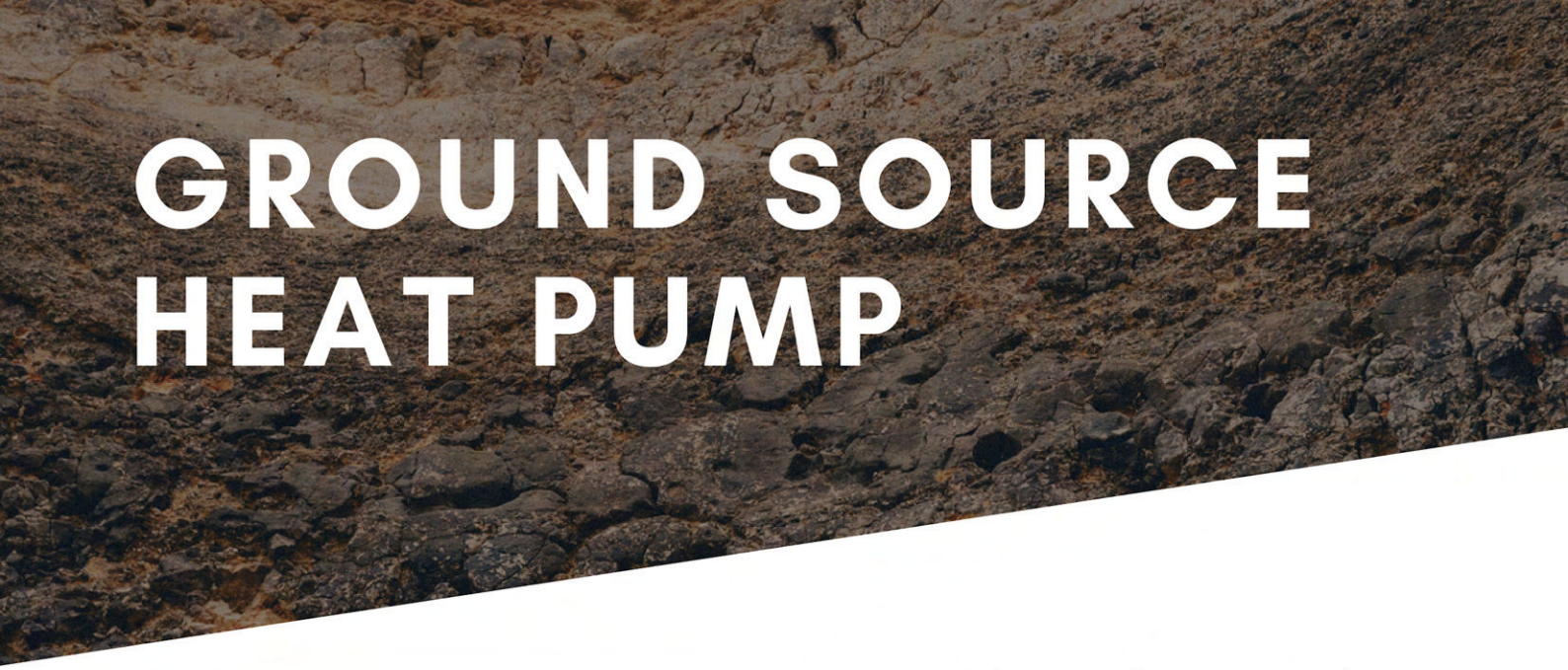
Heat from the water is absorbed into the fluid, which then passes through a heat exchanger into the heat pump. The compressor unit raises the temperature of this fluid through compression, and a heat exchanger transfers the warmth to the water that circulates round the central heating system. The heat is then transferred to the property via radiators or under floor heating. Once the water is cooled it is pumped back out to the submerged loop system and the cycle begins again.

In an open loop system, water is taken from a borehole and lifted to the surface. Heat energy is extracted from the water and then returning the cooled water to a separate borehole. Open loop systems move larger volumes of water through the heat exchanger than the closed loop system. As a result, open loop WSHPs are more efficient than equivalent ground or air source heat pumps.

Castle Park Water Source Heat Pump Project

The Castle Park Heat Project is one of the schemes launched by Bristol City Council in response to climate emergency. Water is pumped from the nearby floating harbour via the pipework which is submerged below the waterline. The water is filtered to prevent debris from entering the system. The filtered water is pumped through a second filter which removes smaller particles like mussel eggs which can hatch and grow in the pipework.

Once the water is filtered it passes through the water source heat pump where the ambient heat reacts with ammonia and creates low pressure vapour which can be compressed to a high-pressure vapour of around 110°C. Heat from the water source heat pump is directed into a thermal store which then feeds into the Bristol Heat Network where it contributes to heating 1,000 homes and businesses.



GROUND SOURCE HEAT PUMP

A ground source heat pump provides a clean way to heat buildings. It makes use of solar energy stored in the ground to heat buildings. Ground source heat pumps consist of a network of fluid filled boreholes, a compressor and pump unit. The fluid filled pipes are buried into the ground to absorb heat. A mixture of water and antifreeze is circulated around the underground loops of pipe. Heat from the ground is absorbed into the fluid, then passes through a heat exchanger into the heat pump.

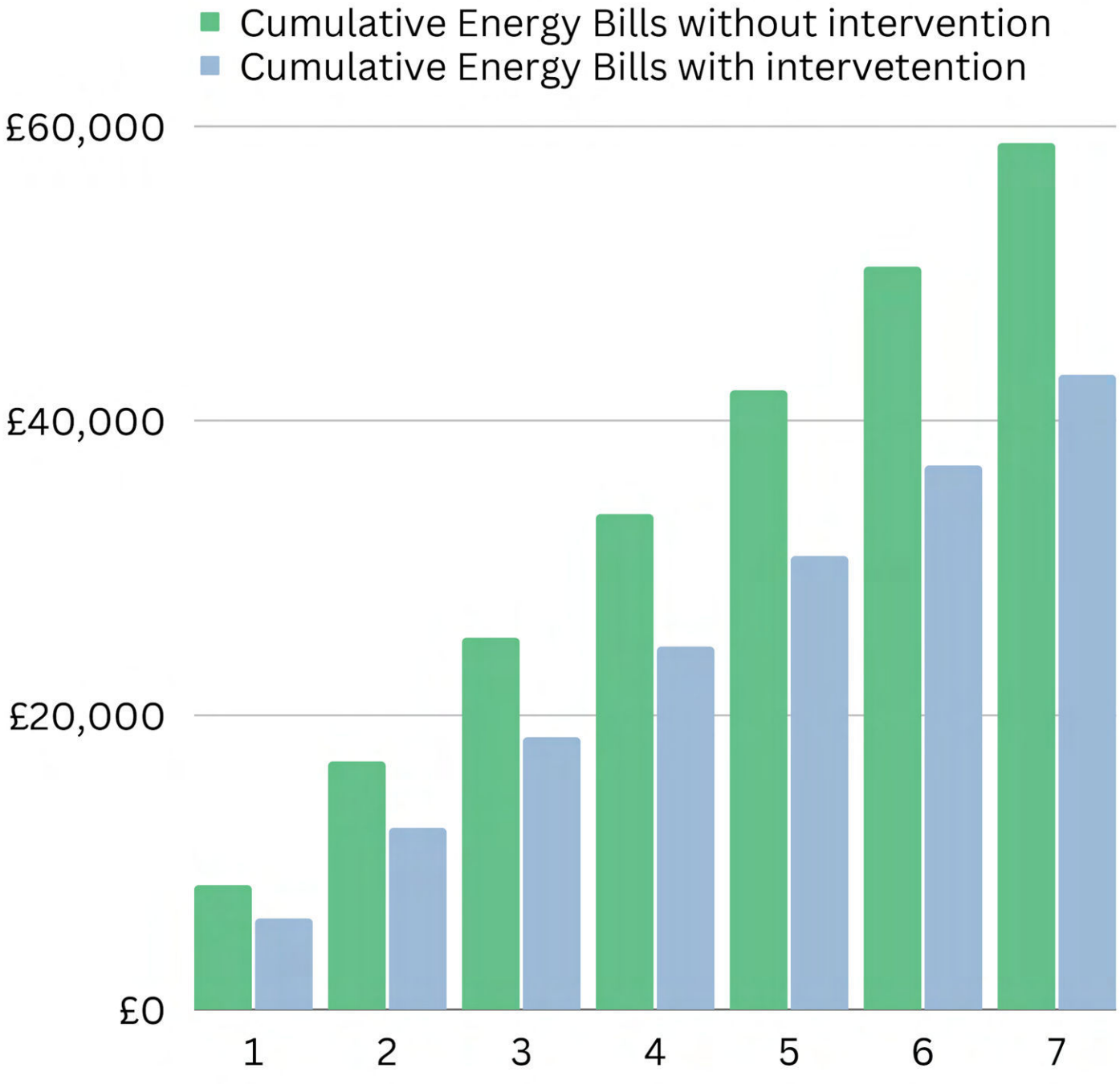
The compressor unit raises the temperature of this fluid through compression, and a heat exchanger transfers the warmth to the water that circulates round the central heating system. The heat is then transferred to the property via radiators or under floor heating. Once the water is cooled it is pumped back out to the buried pipework and the cycle begins again. The whole system is powered by electricity but can also be powered by energy from renewable sources such as a wind turbine or solar panel.

Case study: Bristol City Council, Ashton Rise

Bristol City Council built 133 new energy-efficient homes comprising of 2, 3 and 4-bedroom houses and 1 and 2-bed apartments as part of the commitment to build 2,000 new homes in the city including 800 affordable homes.
A mix of 3kW and 6kW low carbon ground source heat pumps were installed as the heating and hot water system. Shared Ground Loop Array design features decentralised ground source heat pumps, an individual ground source heat pump per dwelling and connected network of pipes which circulate heat at ambient temperatures (-5°C to 20°C) from the ground supplied via clusters of ground arrays.

The shared ground loop system transfers ambient temperature low grade heat energy from the ground to individual ground source heat pumps located inside each individual dwelling. Each ground source heat pump then upgrades the ground's heat energy to provide independently controllable heat via radiators or underfloor heating and hot water to a cylinder tank.

GROUND SOURCE HEAT PUMP



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BIOMASS BOILERS

Biomass is a renewable energy source that is generated from burning wood, plants, and other organic matter, such as manure or household waste. It releases carbon dioxide when burned, but far less than fossil fuels. The carbon dioxide released during the combustion was absorbed while the tree was growing, so they are essentially carbon neutral.

Biomass boilers are like conventional gas boilers that provide space heating and hot water for the entire home, but instead of using gas or oil to produce the heat, they combust sustainably sourced wood pellets, chips, or logs. Biomass systems burn wood pellets, chips, or logs to heat a single room, or to power central heating and hot water boilers.

If a biomass boiler is too big for your home, a smaller standalone wood burning stove may be used to heat one room by burning logs or waste wood. These wood burning stoves can be fitted with a back boiler that uses the heat produced when the wood is combusted to heat water, that can then be used for either space heating elsewhere in the home or for hot water only. A wood-fuelled biomass boiler could save you up to £1,100 a year compared to an old electric heating system.

You need to install a carbon monoxide detector in your home when you burn any form of hydrocarbon resource like biomass, natural gas, or coal. It's impossible to burn all fuel, and the combustion will produce dangerous gases like carbon monoxide, which can be fatal if inhaled.

Each year, approximately 8.5 million tonnes of wood go into landfill in the UK. This waste wood could be used in either biomass boilers if converted into the pellets or burned in wood burning stoves. This would not only provide heat and hot water, but it would also ease the pressure on landfill capacity.

How does Biomass boilers measure up against natural gas, heating oil and electricity? Using the kW per tonne it's possible to work out the pence per kilowatt-hour (p/kWh). This makes it easier to compare biomass fuels with gas, oil, and electricity.

Fuel Type	Price per unit	kWh per unit	Pence per kWh
Wood Chips	£100/tonne	3,500kWh/ tonne	2.9p/kWh
Wood Pellets	£200/tonne	4,800kWh/ tonne	4.2p/kWh
Natural Gas	4.8p/kWh	1	4.8p/kWh
Heating Oil	60p/litre	10kWh/litre	6.0p/kWh
Electricity	14.5/kWh	1	13.4p/kWh

MEET THE TEAM

James Sessions-Hodge

Head of Eco-Fit

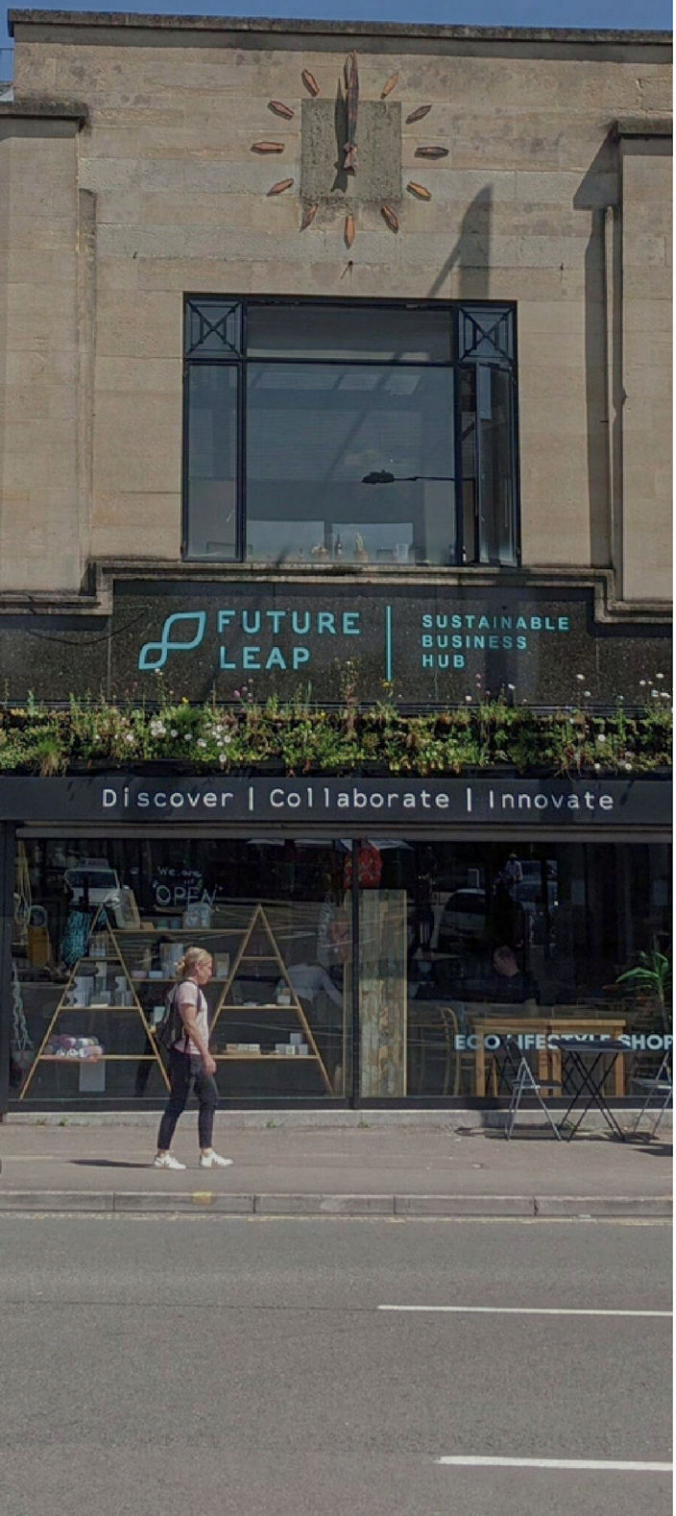
James has a unique ability to communicate clearly and engage closely with clients on all aspects of business, from environmental technology to project management and aftersales care. Experienced gained from a multitude of business sectors which includes FMCG area manager for Carlsberg-Tetley, property & sales management for Knight Frank, sustainable waste to energy technologies for the oil & gas sector and setting up a recycled rubber surfacing company which led to building recyclable artificial sports pitches across the southwest of England. He is a gifted orator with a drive and energy that motivates the teams he works with to deliver results. His passion for the environment and helping clients find the right solution are the perfect mix as he heads up the Eco-Fit business at Future Leap.

Molly Byrne

Director of Business Development

Molly has over 7 years of experience working within the sustainability, green technology and ESG markets in the UK and internationally. After graduating with a degree in Geography and Environmental Management, she started her career working in the renewable energy sector in Asia, managing impact investment projects in wind farms in South India and securing alternative financial returns through UN carbon credit accreditation. Her expertise is the development and implementation of both business and investment strategies to ensure financial returns, viability and positive environmental impact. In her role as Business Development Director at Future Leap, she is leveraging the existing Future Leap businesses activities to identify market gaps and the potential business opportunities they present.

CONNECT WITH US



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Learn more about Future Leap's Festival of Sustainable Business

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