



PILOT
UK OFFICE
HEATING & SOLAR PV
CASE STUDY
2024





A Commitment to Excellence from Start to Finish

At ARC, we do more than supply high-quality heating solutions, we build lasting partnerships. From the initial consultation to installation and aftersales support, we work alongside our customers and first-class installation partners every step of the way. We understand that choosing the right heating system is a life-style choice and long-term investment, which is why we only offer products that deliver outstanding comfort, performance, energy efficiency, and durability.

Our solutions are built to last, engineered with precision, and designed to perform in even the most demanding environments. Our long-term partnerships with leading manufacturers like ETHERMA ensures we know their products as if they were our own which means we are 100% confident they meet the high standards we expect, because we don't compromise on quality, and neither should you.

More than just a supplier, we're your partner in comfort and efficiency, providing expert guidance, seamless installation, and dedicated aftersales support. When you choose ARC, you're choosing reliability, expertise, and a commitment to working together from start to finish.

THE BRIEF



“Provide a turn-key solution from planning, system design and installation to the removal of the old equipment”



Replace an outdated and inefficient gas-based heating system in an office/warehouse building with a modern, energy-efficient electrical system.



Objective

To transition from an old gas boiler/radiator and direct-fired unit heater system to a new, electrically powered heating and hot water solution.

To improve energy efficiency and reduce operational costs.



Building Information

Office/warehouse building

1980's build with original heating system



Current System

Gas boiler/ radiators for offices

Direct-fired unit heater for the warehouse

Gas boiler also supplies hot water

System installed around 1989 and is highly inefficient



Client's Initial Scope

Air Source Heat Pump with wet system radiators for the offices.

Infrared heating panels for warehouse heating.

Wall-mounted electric water heaters for WCs and tea points.

Upgrades to the LV electrical system.

Decommissioning and removal of all existing heating equipment.



THE ARC SOLUTIONS



WP1 Infrared Heating Installation

Offices - Infrared (in-ceiling grid)
Heating Installation
Warehouse - Infrared Spot & Zone
Heating Installation
Ancillary Rooms – Ceiling mounted
infrared panels installation
Electrical infrastructure upgrade
Control system - Installation,
System Setup & User Training



WP2 Solar PV System Installation

G99 Application Approved
Mobilisation (hardware
deliveries & scaffolding)
Mechanical and electrical
installation
System Commissioning



WP3 Hot Water Tank Installation

Replacement of hot water tank
to service kitchens and WCs



WP4 Decommissioning Existing Heating System

Enabling works (draining
system, disconnecting gas, etc.)
Heating infrastructure removal
Removal of office radiators
Boiler room strip-out
Waste Removal



WP5 Internal Decorating

Redecoration of Offices and
Warehouse Ancillary Rooms

Value for Money

The customer got a full infrared heating system, a 148kWp Solar PV system, an energy efficient hot water heating system and redecorated offices for less than the cost of a heat pump to service the offices



WP1 INFRARED HEATING

Working in the same way as the sun, the infrared heat is directed down to the occupants, without heating the air.

Infrared is one of the most comfortable, efficient and environmentally friendly heating solutions

Solution: IR Heating Installation

Why is IR so comfortable, efficient & environmentally friendly?

- Can be controlled by zones and used for 'spot heating'
- Directly warms the occupants = greater comfort
- Savings of 30%-70% over convection-based systems
- Improves peripheral circulation directly warming the body
- Healthier environment for asthma sufferers / those with respiratory issues
- Reduces the transfer of heat from the building envelope
- Speeds recovery when using open doors
- Minimal maintenance and servicing

Selecting the best IR for your space

Medium Wave

Ideal for zone or ambient heating within larger spaces
Element temp ~ 320°C
Installation height 3m-20m

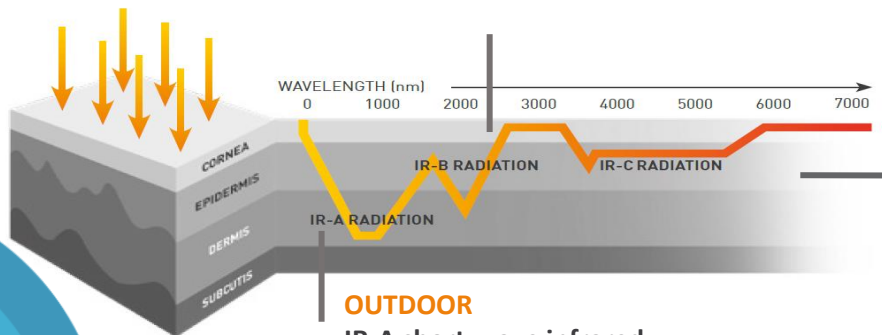
Long Wave (Far IR)

Ideal for zone/primary heating residential, offices, retail
Surface Temp 70-120°C
Installation height <3m

INDUSTRY & THE WORKPLACE

IR-B medium-wave infrared:

300 - 500 degrees



OUTDOOR

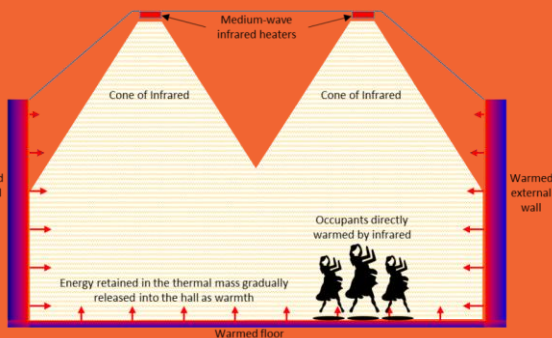
IR-A short-wave infrared:

Infrared radiation heater
>900 degrees

INDOOR

IR-C long-wave infrared:

LAVA® infrared heating
<300 degrees



Solution: Manufacturing with

ETHERMA°

EFFICIENT. ELECTRIC. HEATING.



HEALTHY

Comfortable warmth with low-temperature-radiant heat with no electromagnetic field



ECONOMICAL

No maintenance costs, operating cost savings thanks to increased heat sensitivity



SUSTAINABLE

Clean power from water, wind and solar power. Self-sufficiency thanks to its own power supply.



EFFICIENT

Heat is generated where it is needed, 100 % loss-free. Pinpoint accuracy thanks to individual room controls



SIMPLE

Uncomplicated, rapid assembly - thanks to intelligent installation systems on all ETHERMA products



WP1 INFRARED HEATING

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WP1 INFRARED HEATING



Product Selection – Offices, Communal Areas, Toilets



ETHERMA LAVA Panels

The key difference between Infrared heating and other heating systems lies in the innovative way in which infrared technology dissipates heat. Infrared heaters heat objects and people directly, instead of heating the air around them. This means that heat is retained within walls, floors and furniture and is radiated back into the room for comfortable and long-lasting levels of heat.

LAVA Infrared panels use two heating cables which neutralise the magnetic field and can withstand 240°C. The twin cables are set in an aluminium foil which accelerates the heating process, reduces the infrared radiation from the back of the panel and creates a very homogenous heating temperature on the front panel surface.



Very low investment costs



Modern, frameless aesthetically pleasing design



Simple and flexible installation on the ceilings and walls, without any demolition works



Ideal for allergy sufferers (no dust turbulence)



“Needs” based heating



Maintenance free



Hardly any heat loss and maximum radiation



Made in Austria

ETHERMA EEZ PANELS

For warehouse spaces with high ceilings, suspending the infrared heaters lower will improve the effectiveness of infrared heating systems as this optimises the direct heating effect of the heaters on the occupants. Infrared heating has many advantages in that it is easy to install, highly controllable, has no maintenance requirement, and is mounted out of reach of people. The EEZ radiant ceiling heater was developed to provide complete as well as additional heat and protection against the cold drafts of windows or loading bays. EEZ radiant heaters give an even, direct heating effect and can therefore be used to provide Total, Zone or Spot heating solutions.



Full area heating or zone heating



Hygienic room climate



Straightforward installation



Dark Radiator



Surface structure optimises radiation



Maintenance free



Rust proof body



Made in Austria



WP1 INFRARED HEATING

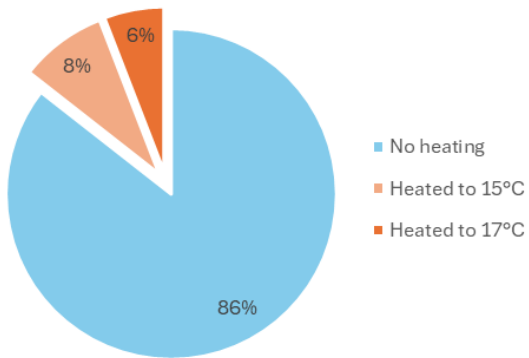




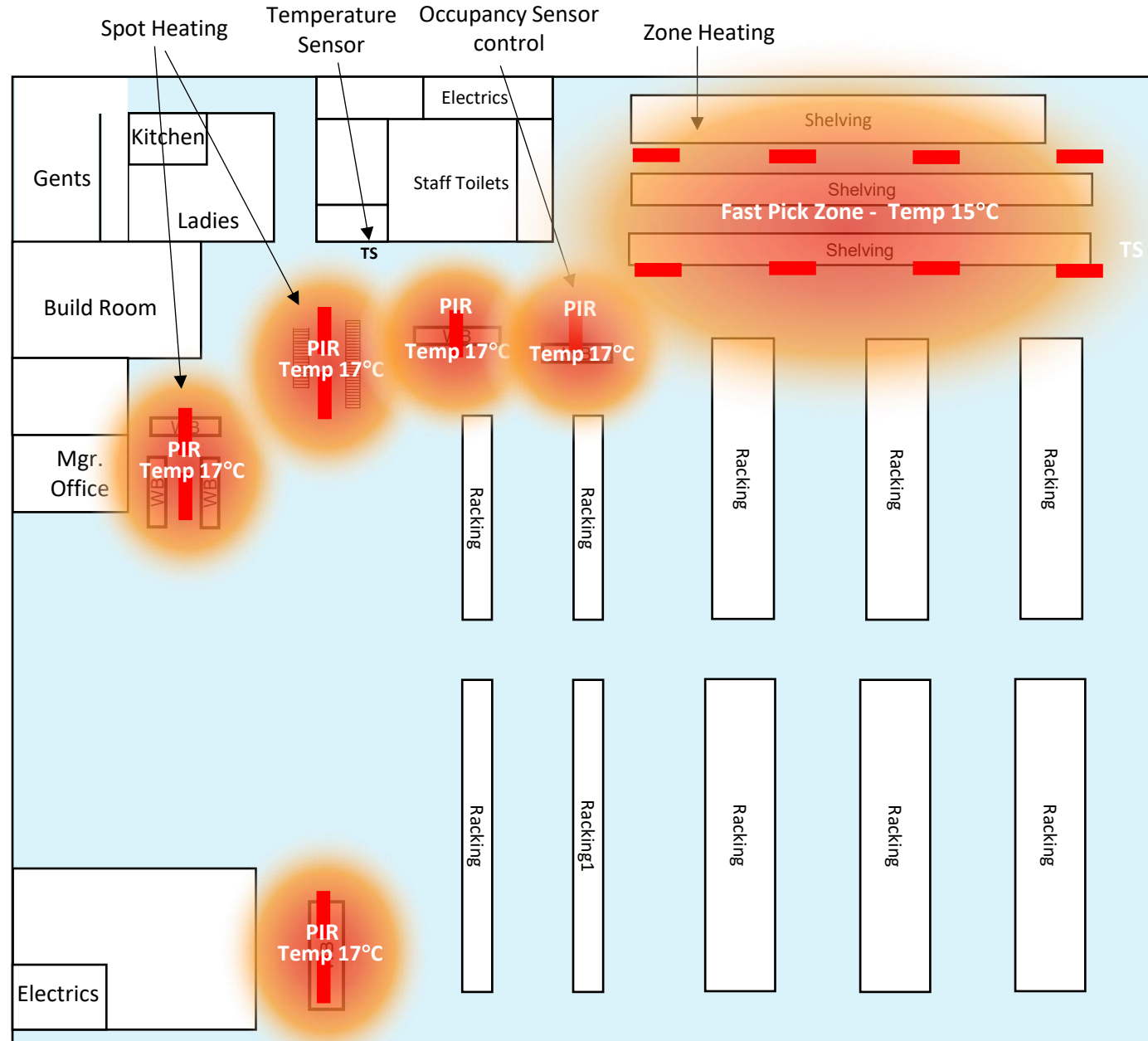
WP1 INFRARED HEATING

Targeted infrared spot heating allows us to efficiently heat only the occupied areas of the warehouse, saving energy compared to heating the entire space.

Warehouse heating Areas

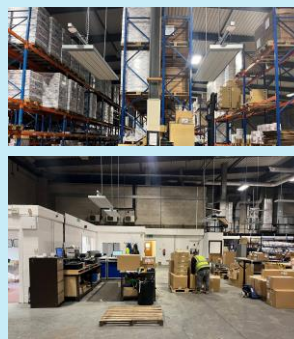
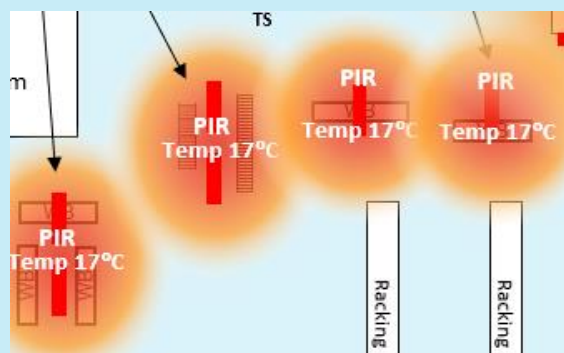


Product Selection - Warehouse Heating





The ability to accurately heat areas of the warehouse to different temperatures prevents overheating = energy saving



WP1 INFRARED HEATING

Target heating provides comfort while only heating 14% of the warehouse





WP1 INFRARED HEATING

Heating Save is an online Building Energy Management System which Manages (amongst other things):

1. Electric Heating Systems
2. PV Generated usage
3. Battery Storage Usage

Some customers have made savings of more than 50% using occupancy management

Solution: Heating System Components – Building Energy Management Heating Controls

Complete control 15% saving

Heating diary for each zone for each day of the year, night setback & background temperature

Optimum start time 12% saving

Heat loss algorithm learns the heat-loss-profile of your rooms (heating zones) to calculate the latest time to apply heat to a zone to be at the right temperature at the time you state. This means the heating is switched on later on warm days and earlier on cold days

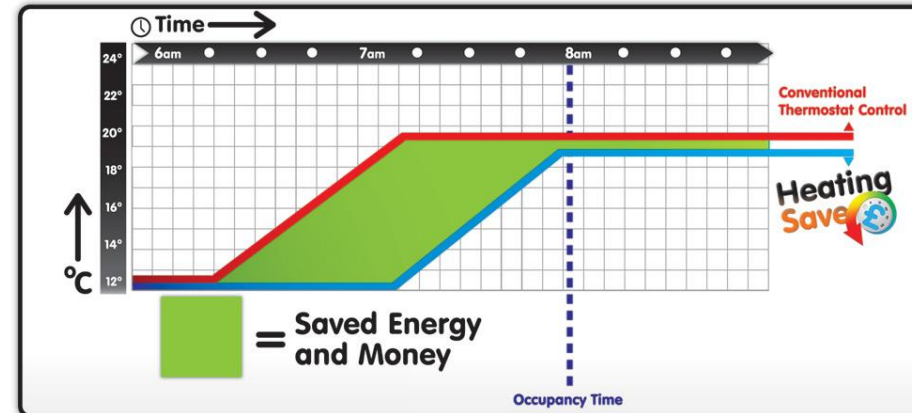
Reduce thermostat temperature overshoot 3% saving

Accurately monitors the heating zone temperature cycling much more closely to the required zone temperature

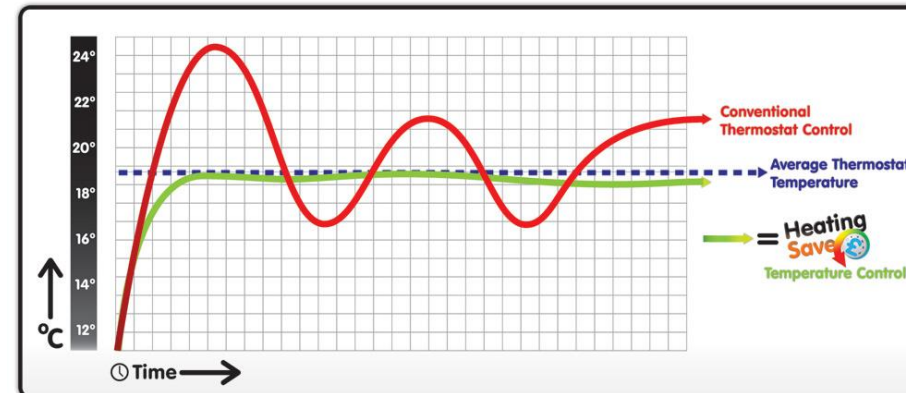
Occupancy sensors 11%+

Automatically turn down/off when the heating zone is unoccupied and turn up the heating when people are about. Enormous savings here for variably occupied buildings.

Savings from optimising start time



Savings from reduced temperature overshoot

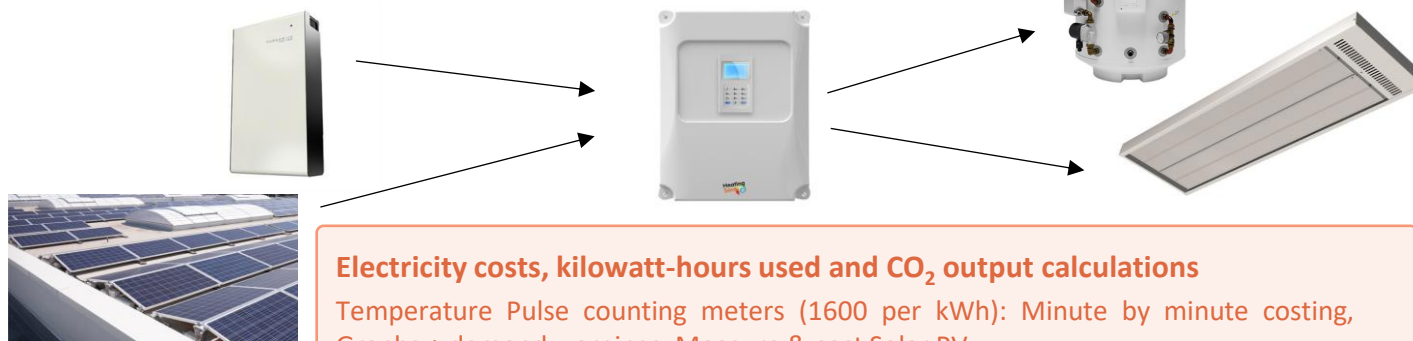


Monitor and control heating remotely

- View current temperature by zone
- Monitor & adjust set points
- Boost any heating zone
- Turn off current temperature requirement
- Control multiple systems & sites
- Password protected
- Web based through any smart phone (iPhone, Android & Windows)

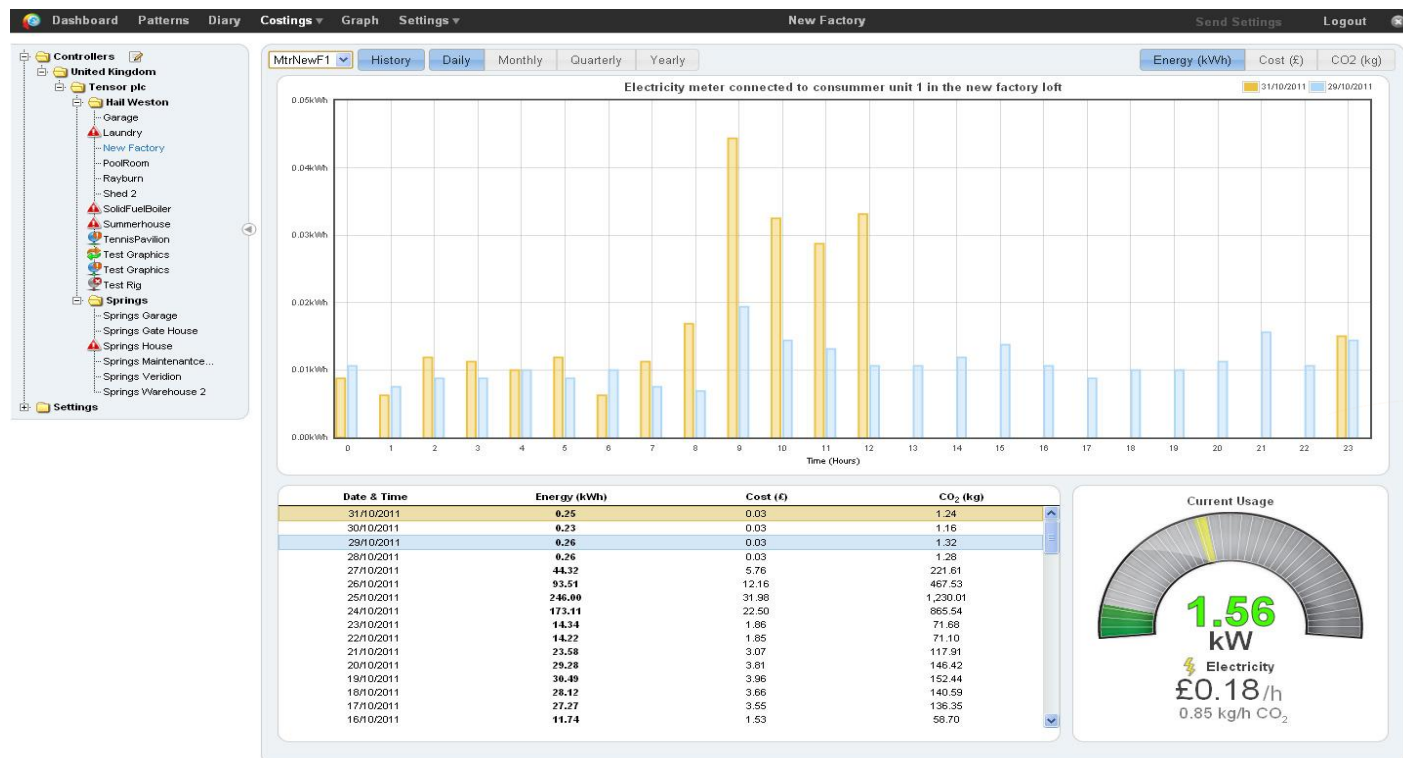
Intelligent selection of energy source

Where alternative energy sources are available, i.e. Battery Storage or Solar Panels



Electricity costs, kilowatt-hours used and CO₂ output calculations

Temperature Pulse counting meters (1600 per kWh): Minute by minute costing, Graphs + demand warnings, Measure & cost Solar PV



WP1 INFRARED HEATING

Control heating locally

- System generates a Zone (Room) specific QR code
- Once scanned you are directed to a room specific control screen
- If heating is 'on', you have the option to 'cancel' or alter the room temperature (within predefined limits).
- If heating is 'off' you can 'boost' for a pre-set duration and temp e.g. 2 hours at 19°C.
- After 1 minute of inactivity, you are timed-out and have to rescan the QR code.



WP2

SOLAR PV

Solar panels have emerged as one of the most sought-after renewable energy technologies, delivering exceptional returns on investment.

Countless UK businesses have already switched to solar, harnessing the power of the sun to fuel their operations whilst helping towards a sustainable future.

Solution: Solar PV Partnership with DMB | SOLAR

Save money and protect our planet



Utilise clean, renewable energy to offset your corporate carbon footprint, lower your energy demand from fossil fuels, and reduce your pollution

Achieve a healthy ROI:



A typical commercial solar panel system will provide electricity for more than 25 years, achieve returns of more than 12% per annum, and pay back installation costs within 6-8 years

Significantly reduce overheads



Generate and store free, clean energy on-site and improve your bottom line with up to 100% savings on your electricity bills

Create a competitive advantage



Visibly promote your green initiatives, improve corporate reputation and strengthen relationships with supply chains and customers. Embrace your position as a leader in environmentally conscious business practices.

Secure your future energy:



Pre-purchase electricity at a fixed unit price, forecast your long-term energy costs, and protect your business against future increases in utility prices

Protection from power shortages



Generate and store your own energy, reduce reliance on the National Grid and protect your business from potential rationing and brownouts

Solution: Solar Photovoltaic System

148.72 kWp PV Generator Output

66,445 Kg/Year CO2 Emissions Avoided

141,385 kWh/year PV Generator Energy (AC Grid)

ROI Between 5-7 years

IR Heating system will use only 63.5% of electricity generated

*Predictions based on a 10-year radiance test – actual results are dependant on future radiance levels



WP2 SOLAR PV

DMB Solar have been experts in solar solutions since the very beginning, with over 30 years experience in the field, they are our go to partners for all things Solar.

Their experts conduct and provide thorough assessments of the energy needs and goals and design a customised energy solution bespoke to the businesses wants and needs.

They look at the radiance levels over a 10-year span, to accurately predict what can be achieved, specific to your area

Their solution is low maintenance, requiring regular cleaning and annual maintenance. Their systems are built to last, their package is tailored to you, and their experience second to none.



WP2

SOLAR PV

- Installation of 338 solar panels
- Maximum output of 148.72 Kilowatt-peak (KWp)DC
- Reduced Carbon Footprint by 66.4 tones of CO₂ per year.



Scan the QR code to
watch the installation



Solution: Hot Water Heating System- Mixergy X 150 litre direct, vented



Unique volumetric heating

Only heat what you need, saving money on hot water bills and reducing carbon



Hot water on demand

Build a schedule that ensures you always have enough water available



Heat Faster

Delivers hot water up to 10x faster than conventional tanks



Constant control

The Mixergy App and control gauge show you how much hot water you have available at any time



Electric heating

3kW Incoloy immersion heater for direct electric heating and integration with smart electricity tariffs and solar PV



Solar PV

Easy connection to solar PV



Technical Data

Model	150L
Product code	MX-150-ELE-549
Nominal capacity (litres)	150
ErP rating	B
Insulation thickness (mm)	50
Connection size/type	22mm/comp.
Immersion heater rating (kW)	3
Height (mm)	1075
Diameter (mm)	545
Weight empty (kg)	38
Weight full (kg) *	188
Standing heat loss ** (kWh/24h)	0.68-1.22
Standing loss (W)	51
Minimum reheat time (15-65 °C)	44 mins
70% charge reheat time (15-65 °C)	123 mins
100% charge reheat time (15-65 °C)	176 mins



WP3 WATER TANK

Mixergy has become a market leader in hot water tank innovation by doing things differently.

They are using technology to find cost-effective and convenient solutions which help people live more sustainably.

They do this by giving customers the ability to take control of their energy consumption, reduce their energy bills, and optimise the use of renewable energy.



WP4 DECOMMISSION EXISTING HEATING

At ARC our approach is holistic. We handle all aspects of heating projects, including system removal, energy assessments, installation, and integration.

Solution: Decommission Existing Heating

Enabling works – draining system, disconnecting gas etc.

Heating infrastructure removal

Removal of office radiators

Boiler room strip-out

Waste removal (lagging material and scrap metal)



WP5 INTERNAL DECORATING

Making good at the end of the installation may seem fairly insignificant, but we understand that when you invest your time and money into a new heating system, you want it left in good condition. Our offering is a turn-key solution and we're with you from start to finish.

Floor level wet system radiators removed, walls refinished and repainted in the offices, WCs and warehouse ancillary rooms



CONTACT US

Wondering how ARC Thermal Solutions
can help you with your project?

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