Innovator Library

Version 1.0

This document in no way implies that The Agency endorses or recommends any particular energy innovation solution or business. Whilst The Agency do make reasonable efforts to review and validate energy innovations, ultimate responsibility and risk lies with the end-user business (referred to party) to verify the information and undertake all due-diligence prior to procuring or adopting energy innovations.

Commercial Solutions

Can't see what you're looking for? Get in touch.
Let us go to market for you – our Europe-wide database of innovators will deliver your best fit.

Power		
Intelligent, low-cost plug sockets & platform	✓	Monitor and reduce office and plug in energy usage
Thermal battery solution for MW applications	✓	Zero carbon industrial heat
Flexible lightweight thin-film solar PV	✓	Solar for vehicles
Innovative long-duration flow battery storage	✓	Much longer supply duration than Lithium Ion
Lamppost/column mounted small wind turbines	✓	Access renewable power generation
Bifacial solar canopies	✓	Maximise onsite generate from carparks & walkways
Modular battery system to replace diesel generators	✓	Green outdoor events and construction activities
Distributed energy storage for industrial and commercial customers	✓	Deploy self-learning battery systems as scale
Smart ground-mounted solar PV array	✓	All-in-one solar system. Simply set up, connect, and produce clean energy
Lightweight solar PV solutions	✓	Solar for thin/weak roofs
Small scale vertical axis wind turbine	✓	Designed to harness chaotic winds in urban environments

Heat		
Compact vertical/horizontal mounted solar thermal	✓	Renewable hot water and heating
Intelligent TRVs and management platform	✓	Reduce wasted heat energy
Smart, efficient radiators and hot water cylinders	✓	Increase the efficiency of heat pump and solar systems
Combi boiler water and energy saving device	✓	Faster hot water delivery, save water and gas, reduce carbon emission
Wafer-thin infrared heating system	✓	Heat people, not space, and detect room occupancy
Thermal storage for refrigeration demand	✓	Reduce energy demand for cooling & avoid peak costs
Smart heating technology	✓	Award winning, British, patented smart heating technology

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Controls / Software		
Energy monitoring platform that goes to Device Level	✓	Improve the operational performance of your facilities
Real-time estate energy data and optimisation modelling	✓	Access real-time data to improve energy efficiency
Power your overhead power line monitoring	✓	Predict potential faults and relay this data to a central control panel
Intelligent isolator switch	✓	Take control of your HVAC energy usage and appliance performance
AI-led digital twin & controls for complex sites	✓	Identify, optimise & optimise automate building energy efficiency
Traceable green energy platform	✓	Guaranteed renewable supply match to generators
Hybrid intelligent electricity transformers	✓	Lower losses, small footprint & great data granularity
Data insights to reduce energy usage and Co2 footprint	✓	Data informed decision-making
Clean energy data visualisation tool	✓	Opportunities in renewables, hydrogen, carbon and energy storage
Voltage optimisation device including a monitoring platform	✓	Helps organisations understand how to improve energy efficiency
Energy and security monitoring platform	✓	Low-carbon energy security for high-growth markets

Fabrics		
Fuel-reducing engine additives	✓	Increases fuel efficiency in vehicles, reducing carbon emissions
Additive to help with consistent flow of water in pipework	✓	Reduce consumption levels
Acoustic & thermal shutter-blind combination	✓	Aline to triple glazing with lower cost & easier installation
Ultra performance vacuum glazing	✓	Thinner, Warmer, Quieter
Innovative, high performance, pre-insulated ductwork system	✓	Save energy, cut costs, reduce environmental impact, and deliver clean air

Housing Solutions

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Power		
Small-scale hydro engine turbine	✓	Cost-effective compared to solar & wind
Solar PV Solutions	✓	Solar for thin/weak roofs
Smart ground-mounted solar PV array	✓	All-in-one solar system. Simply set up, connect, and produce clean energy
Heat		
Compact vertical/horizontal mounted solar thermal	✓	Renewable hot water and heating
Low-profile skirting board radiator	✓	Compatible with heat pump or traditional systems
Smart, efficient radiators and hot water cylinders	✓	Increase the efficiency of heat pump and solar systems
Combined heat pump and heat recovery system	✓	Utilise wasted heat and hot water
Combi boiler water and energy saving device	✓	Faster hot water delivery, save water and gas, reduce carbon emissions
Smart heating technology	✓	Award winning, British, patented smart heating technology
Controls / Software		
Energy monitoring platform that goes to deceive level	✓	Improve the operational performance of your facilities
Carbon reduction platform	✓	Access real-time data to improve energy efficiency
Retrofit MVO modelling tool	✓	Ensure planned works are optimal and coordinated
Smart air bricks for ventilation	✓	Reduce heat loss & control moisture levels

Housing Solutions

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Materials		
Sustainable modular homes	✓	Quick build low emission homes
Modular internal wall insulation	✓	Fast installation & low tenant disruption
Natural fibre insulation	✓	Natural insulation with low embodied carbon
Acoustic & thermal shutter-blind combination	✓	Alike to triple glazing with low cost & easier installation
Ultra performance vacuum glazing	✓	Thinner, Warmer, Quieter
Innovative, high performance, pre-insulated ductwork system	✓	Save energy, cut costs, reduce environmental impact, and deliver clean air
Additive to help with consistent flow of water in pipework	✓	Reduce consumption levels
Reduce heat loss through your roof	✓	Reduce thermal bridges in your loft space

Intelligent, low-cost plug sockets & platform

Innovation Overview:

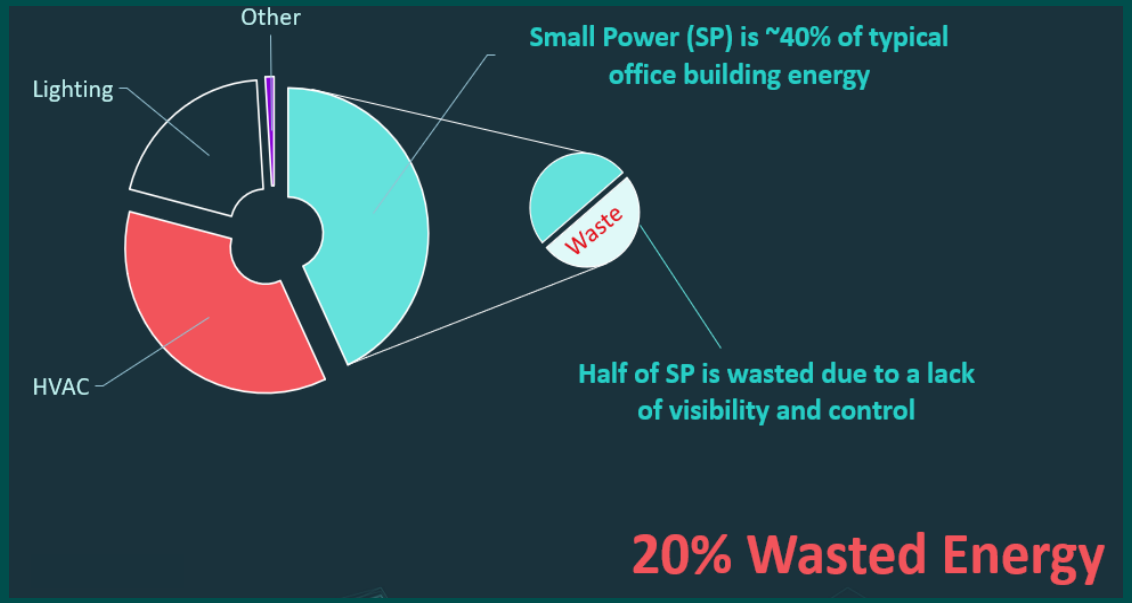
- These are smart plug sockets that recognise your devices, monitor their energy consumption, and automatically switch them off when they're not needed
- Wall sockets, desk extensions and fused spur options

Application:

- Commercial office spaces, lab spaces, temporary accommodation platforms – anywhere with high use sockets
- Best in large scale deployments i.e. 100+ sockets

Benefits/ USPs:

- Able to target up to 20% office power
- Efficiencies gained without staff behaviour change
- Gamified participation through carbon intensity warning
- Low-cost implementation
- Targets hard-to-reach devices



Thermal battery solution for MW applications

Innovation Overview:

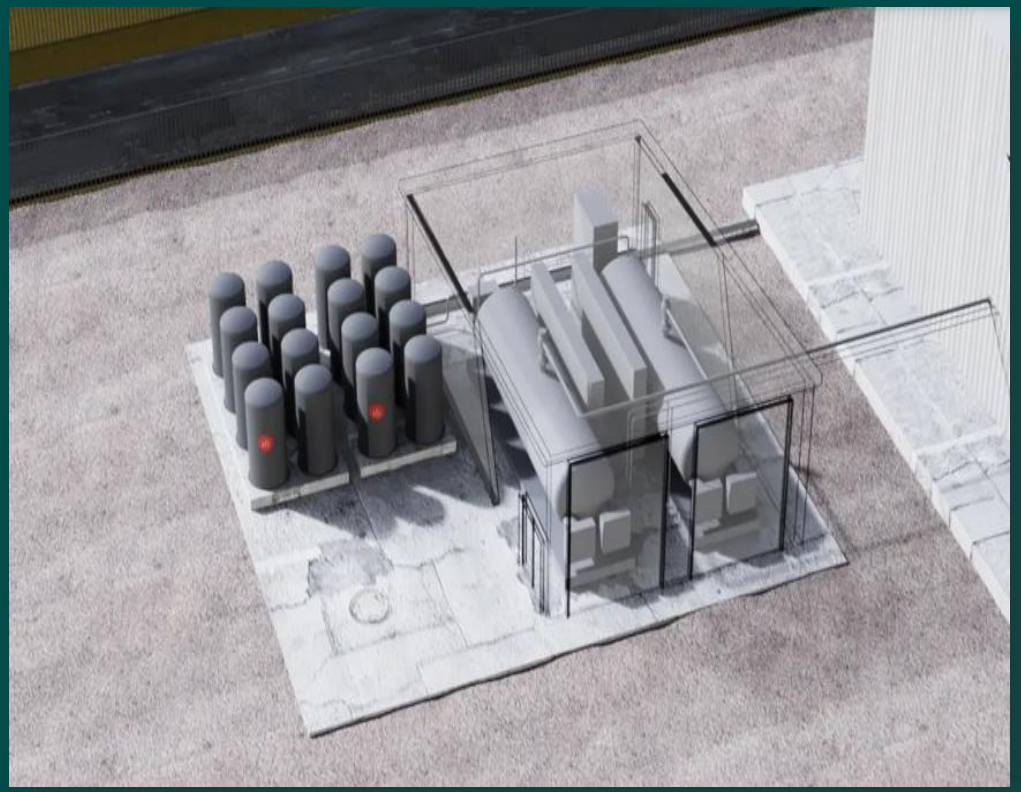
- This solution is a thermal store that uses low carbon electricity to provide heat: industrial steam and hot water
- Provides an alternative to fossil fuel boilers for industrial and commercial heat

Application:

- Commercial / industrial businesses / sites with opportunities to install (or have installed) ‘behind the meter’ solar, this is because direct grid connected power is at a disadvantage on a £/kWh basis versus gas

Benefits/ USPs:

- Provides low cost, energy storage using materials that are non-flammable, non-toxic, easily available, affordable, and recyclable
- Steam up to 10 bar
- Water up to 150°C
- Thermal oil up to 200°C



Flexible, lightweight thin-film solar PV

Innovation Overview:

- This is a solution for the transport industry, fitting solar mats to the roof of commercial EV or diesel vehicles (trucks, trailers, buses, waste collection vehicles) to increase range/ reduce fuel consumption, across the globe, saving fuel CO2 and reducing maintenance costs for customers
- Customers in 29+ countries, 4500+ installations, 140+ active customer accounts
- These mats are connected to the smart charge controller which supports battery health and can directly power alternator. Also comes with telematics platform

Application:

- Clean-tech, haulage, and logistics sectors UK and international
- Pilots with Stockport waste vehicles, other case studies with bus companies and DHL

Benefits/ USPs:

- Realistic contribution towards decarbonising fleets and heavy vehicles
- Increases range of EV vans and LGVs which experience limitations
- 2-year warranty on the product and a 5-year warranty on the workmanship of the mats
- Will output 90% after 10 years and then 80% after 20 years
- Payback based on fuel saving alone = 3 years, closer to 2 years with other benefits

	Rigid	Trailer	Fridge Van	Electric Van	Refuse	Bus
Annual Fuel Saving*	700L	700L/500L	550L	500KwH / 4% Range	1,100L	1,800L
Annual CO_2 Saving*	1,800KG	1,800KG	1,400KG	N/A	2,900KG	4,800KG
Telematics & GPS	✓	✓	✓	✓	✓	✓
Average ROI	12 - 18 Months	18 - 24 Months	2 Years	N/A	18 - 24 Months	3 Years

Innovative long-duration flow battery storage

Innovation Overview:

- This solution is a membrane-less flow battery that uses abundant raw materials for long-term energy storage (>10 hours)
- This system has low CAPEX and OPEX requirements; high efficiency and sustainability, high energy density and non-flammability
- They have now successfully developed a 100 Wh prototype device

Application:

- UK utility providers
- National grid
- Data centres
- Renewable energy storage

Benefits/ USPs:

- Low CAPEX and OPEX requirements
- Sustainable and recyclable materials
- Non-flammable
- 3 times reduction In battery footprint/volume
- Potential CO2 savings: - ~0.9 ton/hour at total capacity
- Higher efficiency and energy density

	Price	Duration +8 hours	Raw material availability	Lifespan	Membraneless
HalioGen Power	✓	✓	✓	✓	✓
redflow	X	✓	–	✓	X
INVINITY ENERGY SYSTEMS	X	✓	X	✓	X
ESS INC	X	✓	X	✓	X
eos	X	✓	X	✓	X
StorTera	X	✓	X	✓	X
LI-ION	X	X	–	X	N/A

Lamppost/column mounted small wind turbines

Innovation Overview:

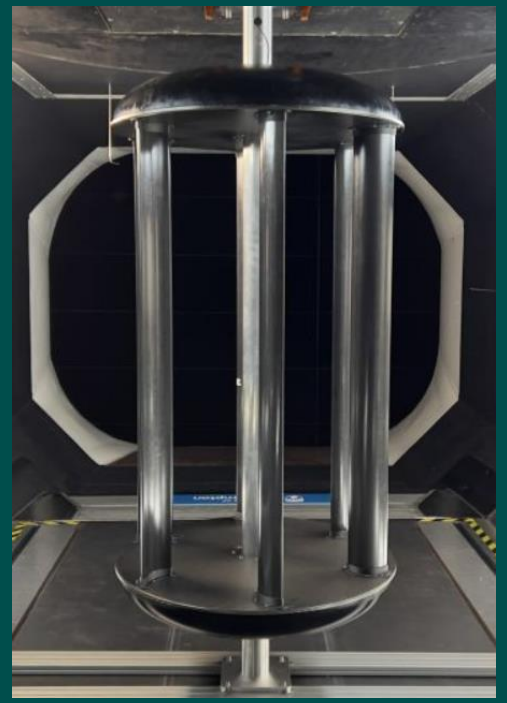
- This solution is a smart vertical axis wind turbine that collects airflow from highway traffic (roads), building corridors (building rooftops), and natural wind
- Built to take advantage of the growing demand for localised energy

Application:

- Roads (adjacent to highway)
- Buildings (commercial rooftops)
- Bridges and Masts

Benefits/ USPs:

- Increase energy density / yield from rooftops with PV
- Increase energy generation yield per m^2 and 24/7 365 days a year
- Small footprint – able to deploy in close proximity arrays
- High serviceable lifetime with componentised design
- Multiple mounting options
- Sensor technology – capture performance and environmental data
- Scalable and modular design from 1kwh rated output



Bifacial solar canopies

Innovation Overview:

- This solution is a powerful, bi-facial PV, modular, off site fabricated, parking canopy system which allows owners to generate megawatt scale electricity from their existing parking assets, using that energy to offset their own grid demand, export energy for grid balancing, support for areas with lack of infrastructure/grid capacity or use for EV charging role out

Application:

- Commercial and public sector with parking assets

Benefits/ USPs:

- Bifacial PV is on average 20% – 35% more powerful than standard monofacial PV panels
- Stand-alone solution making it easier to install reducing installation time by up to 70%
- Simulations have calculated an 80-bay car park with optimal conditions (Azimuth Due South – Angle of Tilt 15°) and module output (6,320 kWh) would generate 261.4MWh and slash carbon emissions by 50.5 tonnes Co^2e
- Multistorey carpark variant (MSR) can be bolted in off a structural bespoke design, ensuring that through deck fixing are suited to the original construction design and meet all planning requirements
- Private Wire connections to your own buildings or tenants onsite
- EV Charge Points, slow to rapid can be supported

Modular battery system to replace diesel generators

Innovation Overview:

- This solution is a portable battery worth 15kW and 45kW. A clean, silent battery alternative which not only reduces running costs & carbon emissions by up to 90% by not burning fuel, they also help reduce noise, and set up time

Application:

- Temporary power requirement at event, broadcasting/film making, maintenance contractors, those needing emergency power

Benefits/ USPs:

- A practical way to deliver greener temporary power
- No messy diesel to deal with, no smoky exhaust fumes and no need to refuel
- Zero noise disturbance
- Compact and rugged – easier to position even outdoors and less cabling

Distributed energy storage for industrial and commercial customers

Innovation Overview:

- A battery storage solution, reducing energy costs by up to 70% by storing cheap power, reducing excess charges, and providing high power when needed to solve for grid constraints
- Already have relationships with EV OEMs and a network of vehicle breakers for access to batteries

Application:

- Industrial and commercial customers to deploy self-learning battery systems at scale
- Short-term lease (1-3yr) suitable for tenants

Benefits/ USPs:

- Roughly 2-3 times cheaper than standard Li-ion offering
- Towable unit so easily portable for construction or temporary works
- 300kWh unit for off-grid sale (~£75k) or on-grid lease inc. balancing services
- Repurposed batteries - Intelligently managed repurposed electric vehicle batteries, reducing CO2 by 60%
- Self-learning software - Energy prediction and optimisation based on machine learning and AI
- Can be white-labelled with client branding

Smart ground-mounted solar PV array

Innovation Overview:

- This smart solar solution uses an all-in-one, sculptural design and intelligent solution to produce clean, sustainable energy
- Featuring plug-and-play solar power generation

Application:

- Domestic and commercial use to support lower energy costs

Benefits/ USPs:

- This product has a considerably longer peak phase than a rooftop solar system and produces energy even in the fringe hours of the day
- Efficient power generation: up to 40% more yield thanks to smart tracking, with needs-based precision whenever you require electricity
- Smart cooling and smart cleaning prevent the usual losses caused by heat and dirt accumulation by up to 15%
- All-in-one solar solution without complex installation (plug and play)
- Thanks to smart tracking, the product folds out automatically every morning and tracks the sun during the day with its 2-axis controller

Lightweight solar PV solutions

Innovation Overview:

- These are a lightweight crystalline PV solution targeting roofs not suitable for traditional solar. 430w and 520w panels
- Weight: 3.5kg vs 15kg/m2
- Price: 10-151% more expensive than traditional solar
- Efficiency: 19% vs 21% traditional

Application:

- 40% commercial roofs cannot support weight of traditional solar, others cannot be penetrated by fixings, avoids competing with traditional solar
- Targeting stadiums, airports, commercial roofs and temporary site cabins, looking for min 100kW per project

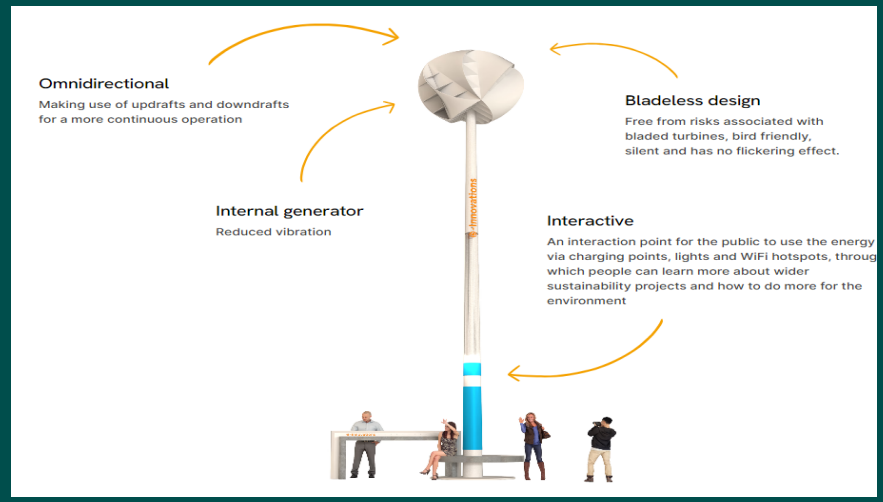
Benefits/ USPs:

- Significantly reduced weight whilst maintaining good efficiency
- Long warranty/ predicted lifespan (25yr linear power warranty, 12yr manufacturer's warranty)
- Modular option might suit those on shorter tenancies
- Large target market

Small scale vertical axis wind turbine

Innovation Overview:

- This solution a patented micro wind turbine capable of harnessing winds from all directions (horizontally, vertically, and anywhere in between), this unique capacity makes it the first of a new category of wind turbines. Its spherical, blade-less design makes it safe and ideal for self-standing or mounted on building facades and other infrastructure
- While most existing wind turbines operate based on lift or drag, this solution relies on the Venturi Effect. Channels on its surface internally conduct the air over various sections, creating zones of higher and lower pressure
- These strategically placed zones generate a spinning force, enabling rotation along a single axis, regardless of wind direction. An internal generator captures this rotational movement, producing electrical energy for onsite infrastructure, microgrids, or storage in a battery bank



Application:

- This solution is aimed at cities where large buildings or steep terrain create strong/chaotic winds. Suitable locations within those cities can be in public or private areas

Benefits/ USPs:

- The first truly omni-directional wind turbine. This solution is the first truly omni-directional wind turbine, allowing it to harness winds from any direction simultaneously. Its unique bladeless design allows for the generation of clean electricity in the areas of greatest energy consumption
- This is the solution to harnessing powerful, yet chaotic winds found in our towns and cities, being the first turbine to harness both horizontal and vertical flows

Compact vertical/horizontal mounted solar thermal

Innovation Overview:

- This solution uses mono-crystalline silicon cells and borosilicate glass tubes combined with a high-efficiency heat plate and integrated reflectors, to create a roof mounted efficient solar thermal heating collector system

Application:

- This solution is suitable for end-consumers with a constant heat demand such as hospitals, new residential and multi-dwelling residential developments, hospitality, leisure centres as well as different forms of manufacturing, incl. food & beverage, hotels, multi-family apartments, social housing, schools, hospitals, food & beverage (F&B), textiles, and paper manufacturing
- Existing case studies include: the British Library in London, University of Westminster, Office in Swansea, and projects in Switzerland

Benefits/ USPs:

- More energy in less space, this solution delivers up to 50% greater financial returns per m2 in comparison to conventional PV and solar thermal technology
- Up to 4 times the carbon savings (when compared with PV), this solution saves up to 4x more carbon per m2 in comparison to conventional PV and solar thermal technology
- Up to 50% greater returns
- A versatile and beautiful solution to delivering on your ESG targets, this solution is a visually stunning representation of a commitment to sustainable energy, whether on a flat or angled roof or a buildings' façade
- Protects customers from volatile fossil fuel prices and exposure to ever increasing energy and climate change legislation

Intelligent TRVs and management platform

Innovation Overview:

- This solution is a dynamic energy management platform – comprising intelligent radiator valve actuators, cloud-based control centre and in-room QR code-based control for comfort optimisation

Application:

- At present they are focused on “wet radiator” heating systems but intend to launch an electric radiator variant followed by other heating/cooling systems beyond that

Benefits/ USPs:

- This solution heats rooms according to occupancy and need, to the right comfort temperature, preventing heating of empty rooms
- Full Control with AI and Booking Integration
- Room control for occupants by the Unique QR codes
- Can be installed on a running heating system in a matter of minutes and use LoRaWAN long range communication meaning no wiring is needed.
- Carbon Meter - records and reports room level energy consumption and savings
- TRV – 10-year lifespan
- ROI Up to 3 years, 1-2 years in some cases
- 30% + average energy savings, in some cases 45-50%

Smart, efficient radiators and hot water cylinders

Innovation Overview:

- Radiator – This solution is a water filled electric radiator powered by HET technology. The technology uses a radiator as the emitter to provide heat to the room at a maximum surface temperature of 55 degrees
- Water Cylinder – This solution is a dynamic hot water system using the same HET principals. The cylinder can act as an energy storage device by utilising solar PV directly into the vessel via a DC immersion element, or via an AC PV diverter

Application:

- Directors of Asset Management, Directors of Capital Delivery, Energy managers of Local Authorities, Housing Associations, Blue Chip organisations, social housing landlords
- This solution already operates in the Social Housing Sector, and seek to expand into the leisure industry, NHS, MOD, MOJ

Benefits/ USPs:

- The maximum electrical load of the radiator is 600 Watts, regardless of size. 600 Watts is enough to heat the water inside the panel to 55 degrees, and via convection this heats the room. No need for 2kW high instantaneous overheating, with no controllability
- The low energy heating, and direct electric cylinder provides a viable alternative to heat pumps. When paired with solar and battery storage technology, properties can operate off grid for significant amounts of time
- The water cylinder can work with any primary heat source – gas boiler, heat pump, or direct electric, with the aim of reducing the heating demand from the primary heat source

Combi boiler water and energy saving device

Innovation Overview:

- This solution can speed up hot water delivery, save water, saves gas; and reduce carbon emissions
- The retro-fit model allows for simple installation and works with any make of combi-boiler

Application:

- Domestic and small commercial buildings
- Tested at The University of Salford and John Moores University for carbon and water savings

Benefits/ USPs:

- Using Combi save could save you up to £250 per year in water and gas bills
- A two-person household could save up to 28000 litres of water per year
- Carbon savings 130kg per year

Wafer-thin infrared heating system

Innovation Overview:

- This solution is an environmentally friendly and ground-breaking alternative to conventional heating systems. Using carbon nanotechnology which emits far infrared rays, this system provides direct heat to objects than people rather than heating up and drying out the air

Application:

- This solution can be used in both Domestic and Non-Domestic buildings

Benefits/ USPs:

- No moving parts
- Hidden system
- Reduced damp & condensation
- Can be controlled remotely
- Lifespan of components is more than 50 years
- Warranty is 20 years

Thermal storage for refrigeration demand

Innovation Overview:

- This solution is a thermal energy storage system, which stores cold energy to support industrial and commercial refrigeration systems
- The cold is stored in an ice slurry, comprising tiny ice crystals (0.1mm diameter) suspended in a liquid. Use of ice slurry allows for very fast discharging, and thus efficiency of the system

Application:

- Any industrial or commercial user of refrigeration systems can benefit from this system
- They are initially targeting larger facilities across food supply chain, chemicals / pharmaceutical, and data centres, where refrigeration is used for processes and space cooling

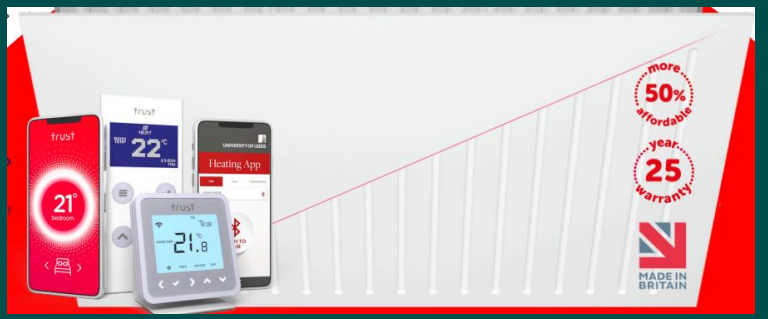
Benefits/ USPs:

- Load-shifting – charging overnight, using low-cost and low carbon-intensity electricity, discharging during peak daytime electricity pricing, which is also high carbon-intensity
- Charge from on-site renewables (PV and/or wind), either using surplus generation, or by simultaneous install
- Optimising core chiller efficiency. Typically, chiller systems are inefficient when not operating at maximum. Through using this solution to support part-load requirements, core chiller systems can operate efficiently (so reducing “wasted” electricity / carbon consumption)
- Replace operational heat demand which would otherwise be produced from electrical or gas consumption

Smart Heating Technologies

Innovation Overview:

- This solution is a reliable heating system that will allow you to maintain the optimum temperature in every room, all year long, in the most efficient way possible
- Developed over five years with the University of Huddersfield, the NEOS is backed by extensive research and independent validation, ensuring reliable performance



Application:

- Housing Associations, Private Sector Housing, Offices, Commercial Buildings

Benefits/ USPs:

- Compatible with any thermostat technology, The heating system is versatile and fully bespoke
- The globally patented cool-wall technology ensures maximum heat is directed into your room, reducing up to 40% heat loss to the back wall
- Modular Design – The distinctive interchangeable design ensures you should never need to replace the entire unit again, only the outer casing, resulting in significant cost savings and minimal maintenance
- The soapstone core maintains warmth for prolonged time periods using stored electricity. This feature reduces energy consumption and significantly lowers heating bills
- The aluminium recyclable casing is 290% more conductive than mild steel, ensuring faster and more effective heat transfer compared to any other metal on the market

Energy monitoring platform that goes to device level

Innovation Overview:

- This is a digital software solution that can monitor the assets, analyse deficiencies in the existing set up, suggest changes to maximise efficiency and then implement the changes by controlling the assets remotely
- This platform provides a flexible interactive approach to the retrieval and analysis of current and historical BMS and IoT data
- Reporting function helps identify opportunities to improve performance and enhance maintenance of monitored assets by identifying assets that may be malfunctioning, misconfigured or are using abnormal amounts of energy, and to highlight trends in energy consumption and carbon footprint

Application:

- Building owners, developers, landlords, facilities managers, and maintenance companies

Benefits/ USPs:

- Proven technology – up to 25% instant energy savings
- More features than competitors – e.g. Machine learning – predict future trends, 3D plant walk around, Health & Safety tools
- Predictive maintenance capability

Real-time estate energy data and optimisation modelling

Innovation Overview:

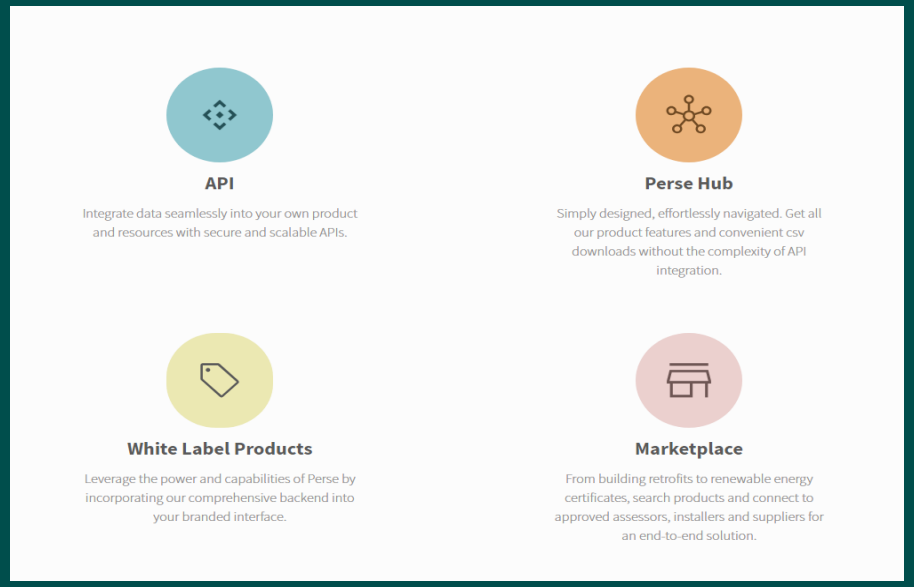
- This solution helps reduce carbon emissions and energy costs by providing real-time data and personalised recommendations for energy efficiency
- This supports the transition to net-zero emissions, making it easier for users to adopt sustainable practices

Application:

- Property sector: Real estate, including residential, commercial, and industrial properties
- Financial sector: Banking, investment, insurance, and other financial services
- Energy sector: renewable energy, EV charger installers, electricity generation and distribution companies
- Sustainability sector: Environmental consulting, green technology companies

Benefits/ USPs:

- Profiles: Real-time data on energy, carbon, and cost for grid connected assets such as buildings, vehicles, and energy generation
- Recommendations: Automated and personalised recommendations for cost and carbon reduction, including energy comparisons and measures
- Analytics: Unlock opportunities with comprehensive market data analysis across location, asset types, consumer preferences, trends, flexibility, and unit economics



Power your overhead power line monitoring

Innovation Overview:

- This is a suite of connected solutions to improve the power grid in three main areas: Real-time Incident Detection, Predictive Maintenance (Early Fault Detection), and Power Grid Efficiency Optimisation (Dynamic Line Rating)

Application:

- Power transmission (TSO), Power distribution (DSO) and power generation companies
- Anyone who owns or operates over-head power lines

Benefits/ USPs:

- Early detection of problems with overhead power cables
- 4-fold ROI

The device is attached to the cable with a standard clamp for power lines. It is possible to install it in a hot line, and even by using drones.

Tilting, oscillations and abnormal vibrations, among other variables, are measured and processed both at the device and at the cloud side, for letting the system warn about the lines' health issues.

Self-sufficient. Each device harvests solar energy for recharging a built-in battery. The device can tun autonomously up to 8 months even without recharging the battery.

The device is designed for connecting to the internet through several communication layers such as 3G/4G, Wi-Fi or LoRa. By request, it can be connected by satellite.

Intelligent isolator switch

Innovation Overview:

- This solution is a smart rotary isolator switch and machine learning algorithms allow you to report on energy usage, optimise performance and predict maintenance issues such as coolant leakage or filter blockages

Application:

- Commercial and industrial estates with HVAC or heat pump systems. Future applications include solar PV, VSDs and motors
- Working alongside key HVAC manufacturers such as Mitsubishi

Benefits/ USPs:

- No construction works required – simple 30-minute install
- Cost effective alternative to BMS upgrades
- Avoids extensive or disruptive construction works
- Can extend lifespan of existing kit through better data on performance
- 30% savings achieved in a real-world case study

AI-led digital twin & controls for complex sites

Innovation Overview:

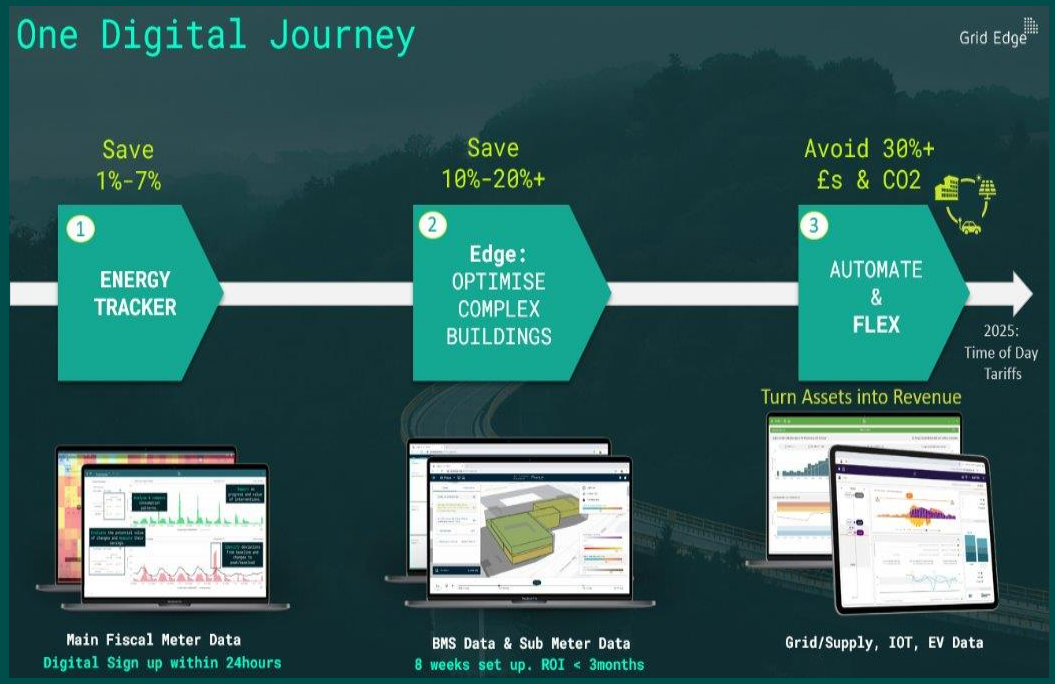
- This AI-enabled technology is used to develop a digital software solution to monitor and assess where energy is being wasted inside a building, how existing technologies are performing, forecast how best to use the assets inside a facility and or how other technologies linked to the platform can have even greater impact in reducing energy consumption in the future

Application:

- For commercial and domestic new build and retrofit, including heritage applications
- Already used at shopping malls, airports, commercial office buildings, arts venues, schools, colleges and local government buildings

Benefits/ USPs:

- For initial view on energy use a site does not need to be fully metered, just need the MPAN – savings can be immediate
- Proven technology – 20-50% energy savings
- ROI – 3 months (£8k initial set-up, then £800-1,000 monthly fee)
- Ability to integrate with other technologies/products to increase the energy saved
- Helping clients to use data to make efficiency savings, performance improvements and cost improvements
- The technology can help building operators to flexibly manage their energy demand, helping to reduce strain on the grid and enable more renewable power to enter the UK power mix



Traceable green energy platform

Innovation Overview:

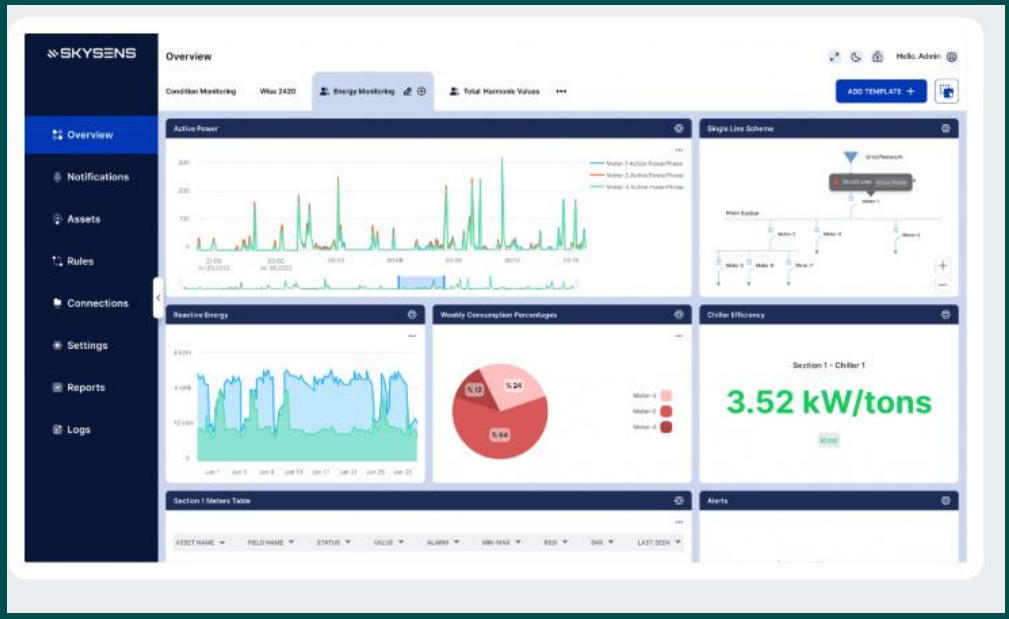
- This solution is an agile predictive monitoring platform which enables industrial plants to track and trace energy inefficiencies in their facility easily with wireless sensors and analytics without huge investments and complex systems
- The system tracks different energy sources such as electricity, gas, heat, steam, pressured air and different assets such as electric motors, pumps, boilers and other connected and non-connected assets with wired and wireless sensors
- Analyses anomalies and alerts users if there is any wasted energy

Application:

- Industrial and manufacturing plant customers, airports, seaports, municipalities
- Mostly manufacturing plants who have unconnected systems and wide area operations with big energy consumption

Benefits/ USPs:

- This solution usually results in 5-10% reduction in specific energy source (electric, steam, gas) in industrial facilities.
- In one of its case studies, for Bridgestone Tyres manufacturing plants (3 separate facilities in Turkey) they helped them reduce their steam consumption by 12%



Hybrid intelligent electricity transformers

Innovation Overview:

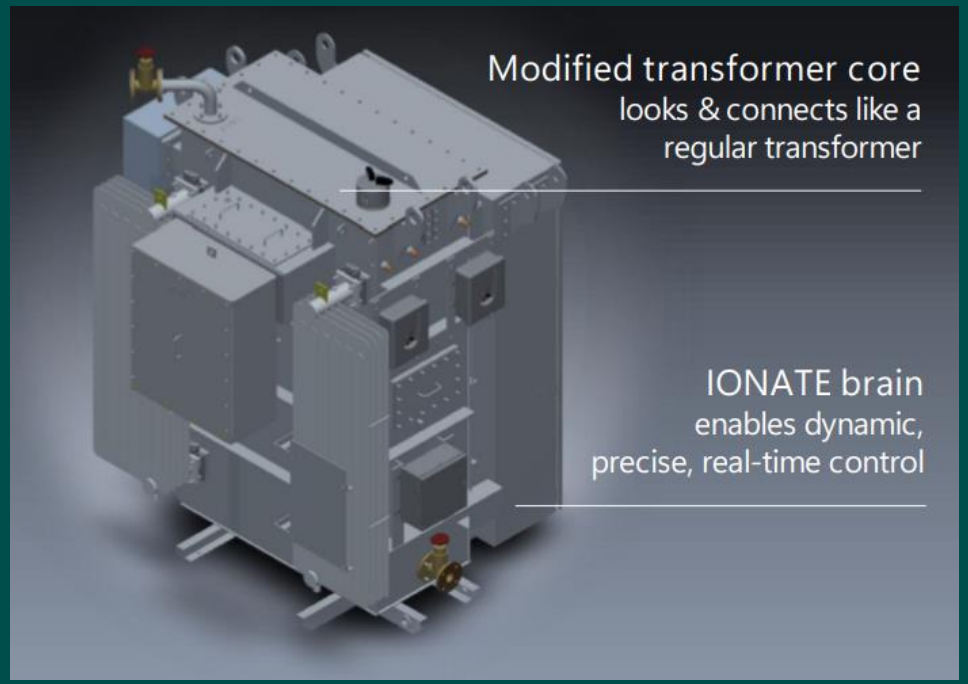
- This solution delivers urgently needed functions all in one device, replacing the traditional transformer and making layers of expensive add-on control electronics redundant
- Each product reduces asset costs and complexity, improves efficiency and capacity, while diminishing failure rates through improved power quality

Application:

- Utilities – distribution network operators, MV and LV networks of 132kV down to consumer voltage
- Private industrial asset owners – e.g., data centres, microgrids, iDNOs, manufacturing, processing, etc
- Renewables & Storage – Developers, owners, and operators of renewable generation plants and grid-scale battery storage

Benefits/ USPs:

- Multiple of these solutions in a network act as nodes for systemic responsiveness
- This solution creates a self-balancing electricity grid ready for Net Zero
- Real-time visibility and control: this solution provides real-time visibility (sensing data accessible from day one) and instantaneous control (voltage, harmonics, power factor) with millisecond-level precision
- System-Wide Benefits: This solution significantly enhances the entire electricity grid's performance, including more distributed energy resources (DERs), higher transfer capacity, lower losses, and demand-response capabilities



Data insights to reduce energy usage and Co2 footprint

Innovation Overview:

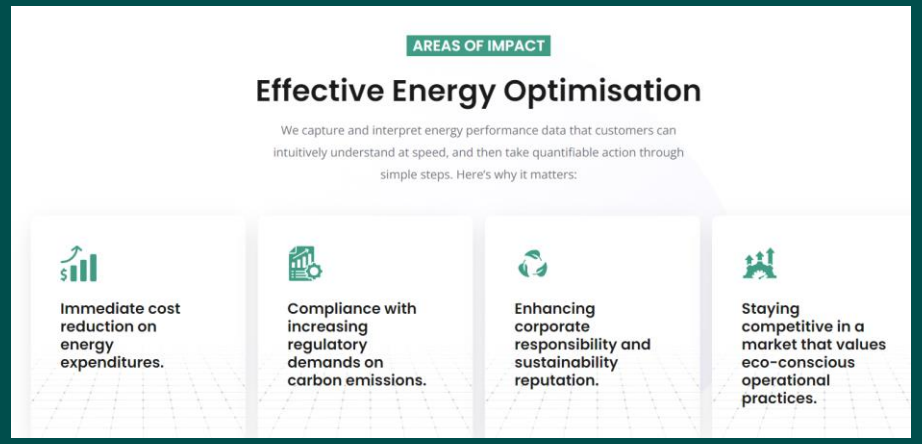
- This solution provides granular real time data on energy consumption to middle market organisations who need to reduce their costs and carbon footprint and who cannot access this information easily or cost effectively from current market offerings

Application:

- Education; schools (public and private), universities (including halls of residence)
- Commercial real estate; co-working and typical landlord/tenant models (public and private)
- Leisure centres/gyms (public and private)

Benefits/ USPs:

- **Greater visibility and intelligence to reduce day-to-day consumption** is facilitated by real-time, granular data and visual display, leading to targeted, quantifiable, specific consumption analytics data within 2 weeks of installation. Specific output of the highest consuming elements to assess/benchmark, thereby reducing base load
- **An integrated approach** displaying output to building users (tenants, or pupils/students), benchmarking and gamification across multi-site locations inform culture and behavioural change towards net zero
- **Data-informed decision-making drives the most impactful net zero outcomes relating to retrofits**, building a marketplace for trusted supply chain retrofit partners and innovators, thereby amplifying the impact of our data insights



Clean energy data visualisation tool

Innovation Overview:

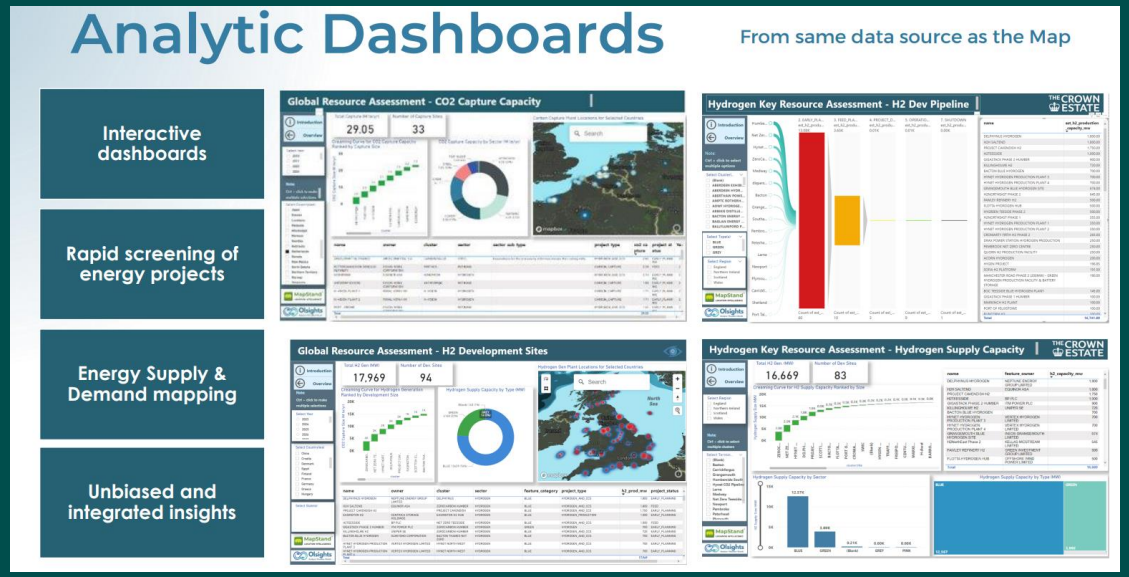
- This solution consolidates major project enablers such as energy production insights, infrastructure, grid power connection, land use, enabling policies, and lifecycle economic simulation
- This tool allows stakeholders to make quick decisions with its visually intuitive interface. It aids new energy developers, permitting authorities, and supply chain companies in sizing up and screening optimal opportunities in renewables, hydrogen, carbon capture, and energy storage

Application:

- New Energy Developers, Permitting Authorities, Supply Chain Companies, Grid Operators, Financial Institutions, Consulting Firms, Utility Companies

Benefits/ USPs:

- Simplifies the understanding of the energy transition landscape
- Speeds up energy system integration and analysis
- Allows clients to customize solutions and explore multiple scenarios
- Currently used by SSEN to optimize the grid connection application and approval process, addressing the UK's 15-year grid connection backlog



Voltage optimisation device including a monitoring platform

Innovation Overview:

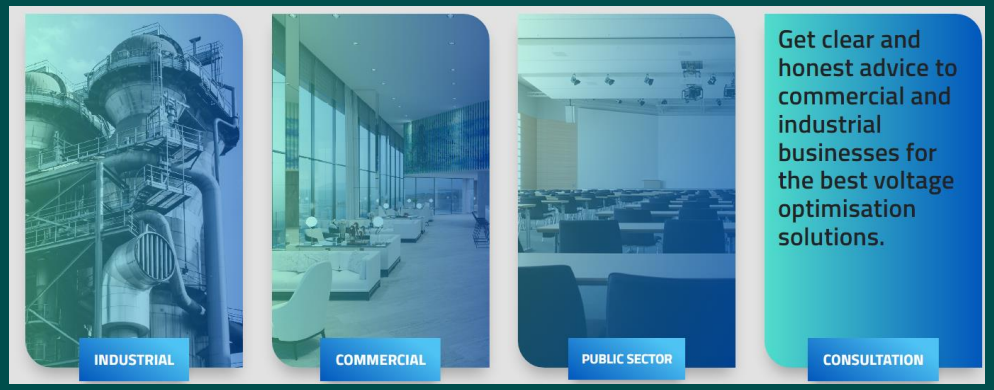
- This solution provides advanced VO solutions, designed to reduce energy consumption by adjusting the voltage supplied to equipment, ensuring it operates at optimal efficiency
- Voltage optimisation is a pivotal first action on the journey to a more sustainable future, tackling energy reduction at the point of supply

Application:

- Industry
- Public Sector
- Commercial Sector

Benefits/ USPs:

- Expertise: With our long established UK manufacturing partner, this solutionoffers high quality British made products & tailored solutions that meet the specific needs of each client
- Compliance: Meet with carbon reporting legislation & avoid fines and penalties
- Cost Savings: Businesses can significantly reduce their electricity bills and operational costs
- Sustainability: Our VO solutions support the GMCA pledge to reach net-zero target of 80% emissions reduction by 2050



Energy and security monitoring platform

Innovation Overview:

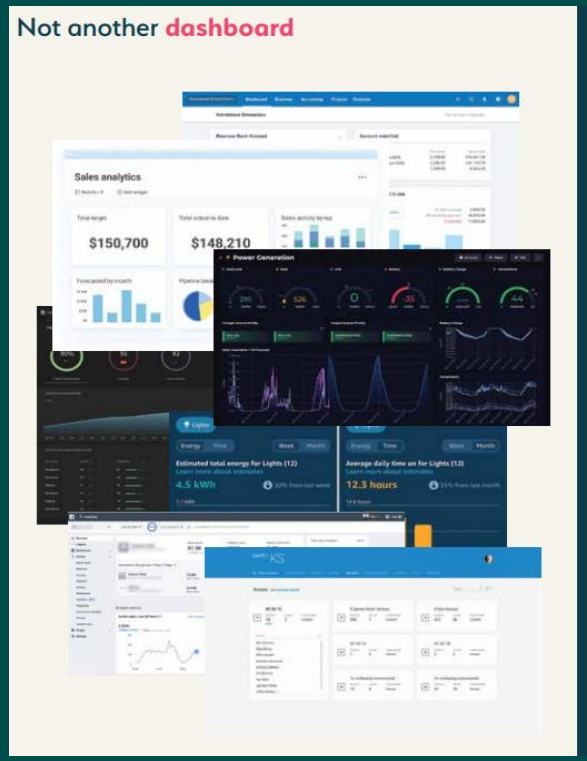
- This solution is a smart building system that seamlessly integrates with every aspect of managing flexible workspaces
- By combining access controls, energy monitoring, accounting, room booking, asset tracking, and membership management into a unified platform, streamlining operations and enhance efficiency
- The system's intuitive features, such as dynamic adjustments to lighting, heating, and occupancy, not only reduce manual intervention and energy wastage but also reimagine the way buildings interact with occupants and surroundings

Application:

- Smaller office spaces, public buildings such as schools, community centres, sporting clubs and religious buildings which is not a key area of focus for many building management/monitoring platforms

Benefits/ USPs:

- Monitor and help reduce energy use
- Integration with other functions within a building – heating, lighting etc
- ROI within 3-6 months



Fuel-reducing engine additives

Innovation Overview:

- This solution is a revolutionary oil-based additive, designed to reduce fuel consumption and Co2 emissions by up to 20% whilst also reducing wear and tear

Application:

- This can be applied in all types of transport, plant, equipment and machinery by reducing the friction in the engine, gearbox and transmission

Benefits/ USPs:

- Increased fuel economy resulting in reduced carbon emissions
- Contributes to your net zero commitments through reduced Co2 emissions up to 20%
- Up to 20% reduction in fuel costs
- Reduces maintenance and running costs through supporting extended service intervals
- Gives a rapid Return on Investment and positive cash flow impact thereafter
- Lowers the total cost of asset ownership
- Extend future capital replacement investments – assets will run longer

Additive to help with consistent flow of water in pipework

Innovation Overview:

- This solution is an additive for closed loop heating and chilled water systems to improve the efficiency of the bulk water used within these systems
- Proven to save HVAC consumption by up to 15%; designed to improve the heat transfer properties of water

Application:

- Building & Homeowners, Facilities Management and Building Operators

Benefits/ USPs:

- Independently proven
- Non-corrosive
- Carbon emission reduction
- Easy to install
- Award winning & recognised
- 100% Organic
- Payback 0.5 – 2 years, and real-world case studies returning savings of 9-20%.
- Part of ‘Verified Carbon’ carbon marketplace enabling some free social housing installs

Acoustic & thermal shutter-blind combination

Innovation Overview:

- This solution a plantation shutter that has been cleverly combined with a high grade, clear, openable panel which sits directly behind the shutter, thus turning it into a fully independent window system

Application:

- Can be made bespoke to fit any window across any property

Benefits/ USPs:

- Has all the benefits of triple glazing without having to replace old windows
- Invisible thermal roller
- Insulates even when louvers open.
- Allows flow of natural light
- Easy to clean

Ultra performance vacuum glazing

Innovation Overview:

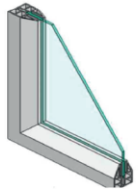
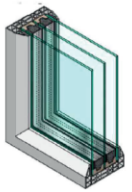
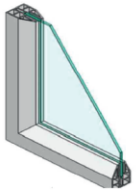
- This solution is a hybrid vacuum glazed unit suitable for fitting into any thickness of new and existing frame
- Superior U-value to triple glazing, but closer in weight to single glazing, making it an ideal replacement where weight and frame-loading issues are present

Application:

- Can be installed into new frames
- Can be retrofitted into existing frames
- Can be installed into any frame profile or material of commercial, domestic, schools, hospitality, offices etc, with minimum disruption

Benefits/ USPs:

- High thermal and acoustic insulation
- No internal condensation on the glass under 60°C
- Fully recyclable glass available
- Fully toughened glass available
- Can be used in existing frames e.g: timber, UPVC, aluminium
- More cost effective than any comparable option of upgrade on the market

Glass Type	Single Glazing	A Rated Double Glazing	Triple Glazing	Vacuum Glazing
				
Thickness (mm)	6mm	28mm	44mm	8.15mm
Weight (kg per M²)	15	20	30	From 15
LT %	88	78	71	Up to 80
U value-W/m2.K	5.82	1.65	0.8	0.47
SHGC	0.82	0.7	0.40	As low as 0.2

Innovative, high performance, pre-insulated ductwork system

Innovation Overview:

- This solution is an innovative, high-performance non-metallic pre-insulated HVAC ductwork system that is a transformational technology rooted in sustainable UK materials and manufacturing
- The new products are significantly ahead of any others currently available in the HVAC market and are unique in their fabrication, applications and advantages

Application:

- Key customers are the mechanical and HVCA contractors that purchase and install the ductwork, as well as those involved in property development and construction sector, including developers, architects, estate owners and managers, main contractors, M&E consultants and others

Benefits/ USPs:

- Up to 85% lighter
- Up to 70% savings in installation time - a single fit of ductwork, insulation and final cover
- Saves up to 45% of the energy costs - operational carbon reduction
- Saves up to 75% in the carbon footprint (CO_2) of the installation - embodied carbon reduction
- Saves up to 30% of the space required for an installation
- Optimises cradle-to-cradle circularity - maximum recycle, recover, re-use
- Maximum off-site fabrication and reduced site time, activity and risk
- Installed cost savings - less expensive than the alternative

HP1

Small scale hydro energy turbine

Innovation Overview:

- This solution has developed a completely new pico-power floating hydropower turbine generator, made from high density recyclable polymer that is capable of delivering uninterrupted, continuous renewable energy 24/7, at one of the most cost-effective levels available for residential consumers

Application:

- The turbine can be deployed in rivers that run next to industrial parks, or former Mills used in the production of textiles. In rural locations, its easy deployment and continuous power supply makes it a compelling choice over other renewable options such as solar or wind; and can form the basis of a complete renewable energy supply supplemented by other renewable technologies

Benefits/ USPs:

- Cost-effective compared to solar & wind
- Easy to install
- No impact on fish or the river eco-system
- Completely free from EA Permitting

Low-profile skirting board radiator

Innovation Overview:

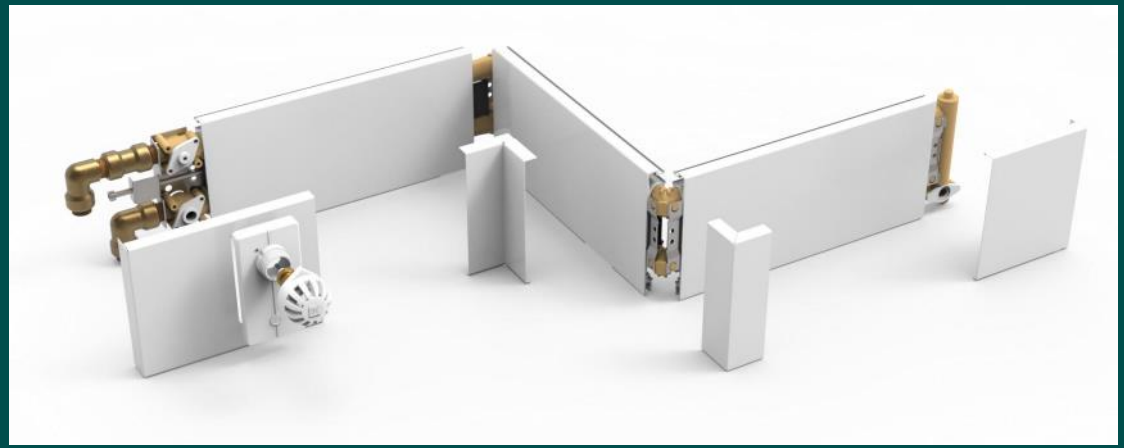
- This solution is a low-profile skirting board alternative to traditional radiators which is compatible with heat pump or wet systems
- Provides radiant heating similar to underfloor systems

Application:

- Domestic retrofit and new build
- Also suitable for commercial application

Benefits/ USPs:

- Works with any wet heating system
- True radiant heat
- Simple, low-disruption installation
- Also have infrared version
- Lower flow temperature reduces risks from burns or fall impacts for vulnerable people



Combined heat pump and heat recovery system

Innovation Overview:

- This solution is a self-cleaning heat exchanger and screen. Heat recovery system from wasted water that be used for heating and cooling
- This solution focuses on the cost-effective and environmentally responsible management of water

Application:

- Water Utilities, Public buildings, District Heating Systems, Shopping Centres, Leisure Centres, Industrial/Commercial

Benefits/ USPs:

- 75% reduction in energy use and reduces caron emissions by 50%
- Can be used for both heating and cooling
- Minimal construction/installation work plus low maintenance required

Retrofit MVO modelling tool

Innovation Overview:

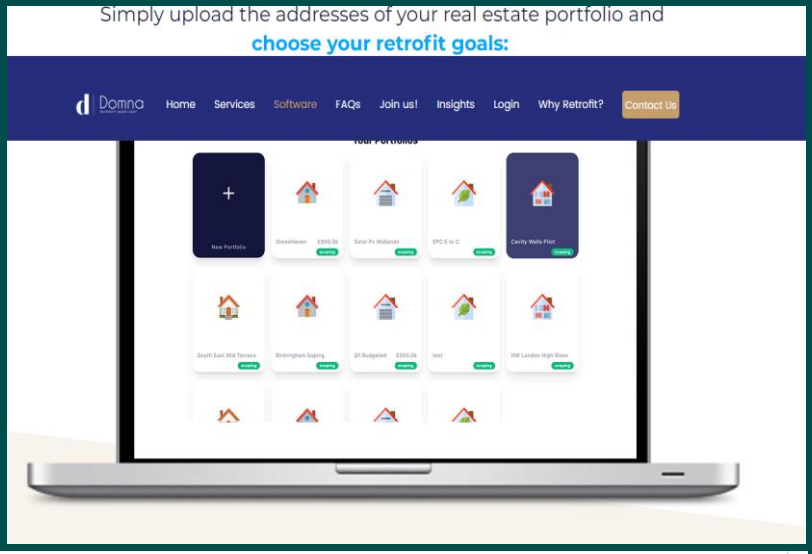
- This solution is a digital retrofit tool one-stop-shop to make retrofit easy and affordable for customers
- The solution manages the delivery of retrofit projects from assessment to delivery, using technology to optimise the process from start to finish

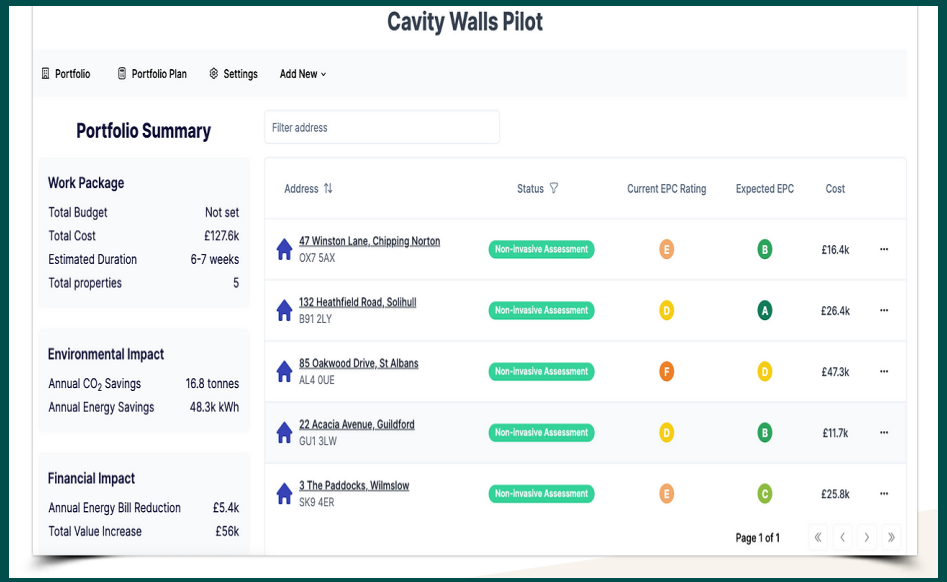
Application:

- For use in the Domestic Retrofit Market, Social Housing Providers, Landlords

Benefits/ USPs:

- B2B retrofit one-stop-stop, making retrofit 2-3x faster and 20-30% cheaper
- Prediction: outside in modelling to accurately predict work packages, costs and benefits, making it easy for clients to budget their retrofit projects from the offset
- Automation: Virtual ‘visits’, digital project management, automated workflows enhanced by technology
- Scaling: Done across hundreds, if not thousands of properties, allowing the production of repeatable work packages and go to tender on bulk work packages facilitating cheaper retrofit





Smart air bricks for ventilation

Innovation Overview:

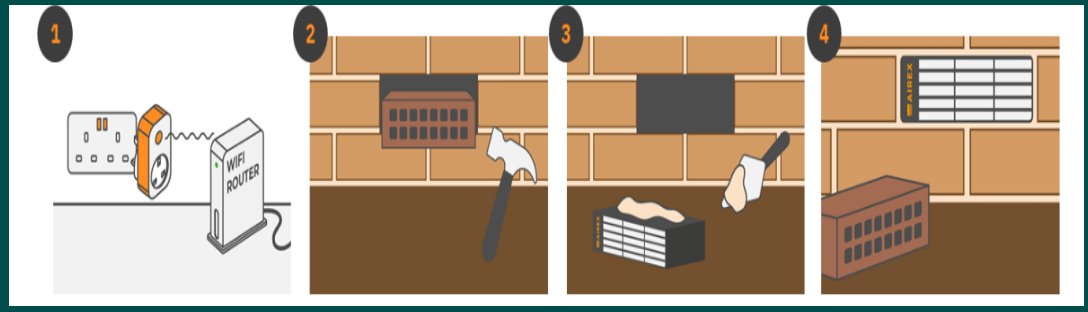
- This solution is a a smart ventilation brick that replaces existing air bricks at a sub-floor level (under the floorboards)
- This bricks have in-built sensors to measure the environmental conditions (such as temperature and relative humidity) and use smart software algorithms to automatically regulate airflow

Application:

- Domestic

Benefits/ USPs:

- Each brick closes to reduce heat loss and improve thermal comfort but opens to reduce humidity and stop mould and damp
- Robust trials have shown that it can save an average of 12% of whole home heat loss and led to the system being included in SAP (EPC). For most homes it can contribute 2-4 EPC points
- Installation of the vents is quick, simple and hassle free. It takes the certified installers around an hour per home to fit, no wiring or specialist electrician work is needed
- The home hub is installed inside the home and is connected to the internet via WiFi. Once up and running, it does not require any ongoing occupant interaction to operate effectively – fit and forget



Sustainable modular homes

Innovation Overview:

- This non-volumetric flat pack housing system solution has been designed around the sustainability hierarchy (rethink, reduce, reuse and recycle) and circular economy principles
- All of the components of the house have been standardised to facilitate rapid production, assembly and re-use

Application:

- This service is committed to developing and supplying low embodied carbon construction materials to enable everyone to make sustainable choices in how they build and live

Benefits/ USPs:

- All of the components of the house have been standardised to facilitate rapid production, assembly and re-use
- The incorporation of graphene into the recycled materials significantly improves key properties, improving the operational efficiency and further recyclability
- 25% cost savings
- 60% build time
- 80% carbon savings

Modular internal wall insulation

Innovation Overview:

- This solution provide internal wall insulation that addresses the failings of existing/traditional IWI methods which are high on disruption to tenants, and do not properly address the risk of condensation, damp & mould problems

Application:

- Social Housing Sector – To help eradicate fuel poverty
- Public Sector – To accelerate the transition to net zero through decarbonising the corporate estate

Benefits/ USPs:

- Unique & Sustainable – provides a Fabric First solution to improving the thermal performance of solid walled and hard to treat properties
- The system takes a modular, sustainable approach to providing high performance internal wall insulation (IWI)
- Fabricated offsite, each property is individually surveyed to create a bespoke system designed and manufactured as an adaptable lower carbon solution for the built environment

Natural fibre insulation

Innovation Overview:

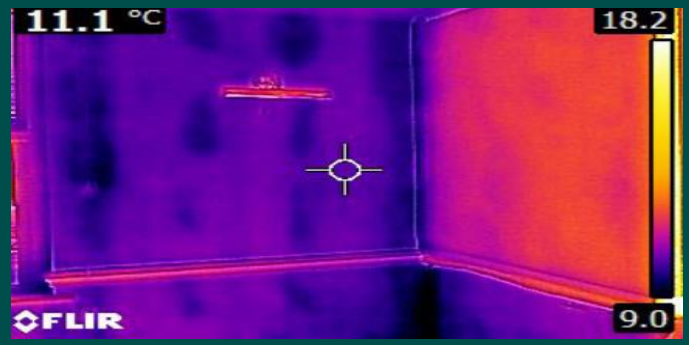
- This solution is an advanced replacement for traditional surface coatings, both internally and externally
- Cork is taken from trees without chopping them down. Instead, the bark is stripped away, and during the regeneration process the tree absorbs much more carbon dioxide than usual. This reduces carbon dioxide in the environment. The tree's bark grows back each time making it a sustainable resource (unlike quarried materials)
- All elements of the harvested material is used in industries such as wine corkage with the excess waste from the raw material is used to make this solution. Any remaining waste is used in Biomass. Even the application process means there is no wasted material

Application:

- It's deployed commonly in industrial applications, as well as the social housing, commercial sector, and domestic market

Benefits/ USPs:

- The cork finish can be left as a final finish, often over spraying existing render or pebbledash and it can be plastered over when used internally to give a normal wall finish that can be re-decorated
- Excellent insulating properties from a thin layer of material, preventing heat loss and also keeping heat out of buildings. As an example, we are often able to reduce heat loss by 30% in solid wall applications from a 4-6mm layer of material
- The thin nature of the material means features of a property are all retained without any loss of space. This is critical in many homes or for safety reasons such as un-insulated alleyways between properties
- Can be applied to a range of surfaces, including brick, wood, steel, plasterboard and plastic as well as industrial roofs and even encapsulating asbestos (15-year encapsulation warranty)



Reduce heat loss through your roof

Innovation Overview:

- This solution is a loft insulation technology – with the main goal to help reduce the chance of condensation and mould formation on ceilings where previous loft insulation has been fit inadequately

Application:

- For use in the domestic/social housing sector that helps to reduce the build-up of mould in the roof enhancing the thermal conductivity within the envelope of the property

Benefits/ USPs:

- Once fixed into place the product works in 3 different ways;
- Would allow a cross-air flow eave to eave to enhance ventilation
- Insulate compromised areas sometimes unable to get to conventionally
- Not susceptible to water as conventional loft roll holds and retains damp
- Approximate Costs per £80-90 / LM