

GRID CONNECTION: IT'S NOT THE ONLY PATH TO HIGH PERFORMANCE CHARGING

See page 20

INSIDE THIS ISSUE:

18



Why energy
analytics matter

26



Why every AI
breakthrough depends
on reliable electricity

36



Pipeline to profit –
flexibility for heat
network operators

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ON THE COVER

Grid connection: it's not the only
path to high performance charging

See page 20



INSIDE

4 News

10 Opinion

12 Energy
Management

13 Legislation

16 Monitoring &
Metering

20 Microgrids

23 Renewable
Energy

24 Artificial
Intelligence

28 Heat Pumps

34 Heat Networks

38 Heating

40 Energy Storage

42 Water
Management

44 Events

SCHNEIDER ELECTRIC FINDS AI-ENABLED BUILDINGS CAN CUT ENERGY USE BY UP TO 22%, SAVE ON ANNUAL UTILITY COSTS AND CARBON

Schneider Electric, a global energy technology leader, has published new research at Climate Week NYC 2026 finding that AI-enabled buildings can cut whole-building energy use by up to 22% against traditional controls. The research highlights annual utility savings as \$13,600 to \$49,300 per building at current commercial rates, helping organizations reduce operating costs every year with the potential to scale across larger portfolios. The research also finds the carbon avoided is more than 100 times greater than the AI system's footprint.

As concerns grow over AI's environmental impact, buildings remain one of the world's largest sources of emissions, accounting for approximately 37% of global energy-related carbon emissions. Schneider Electric's new research, AI for Climate: Quantifying the Energy and Carbon Impact of Building Optimization, found that AI-driven HVAC optimization deployed through a smart building management system can contribute 7.2-12.7% of additional building energy savings. This shows how AI manages energy more intelligently, easing pressure on building systems and the wider electric grid.

- Other key findings include:
- Up to 60 metric tons of carbon emissions avoided annually per building (59,869kg CO₂e), comparable to the environmental benefit of planting 2,700 mature trees
 - More than 200 MWh of annual energy savings in some building scenarios, enough electricity to power dozens of average homes for a year
 - AI can more than double the energy savings achieved by smart building controls alone
 - Both cloud and edge AI deployments can deliver significant energy and carbon benefits
- "The future of building management



will be defined by how effectively organizations connect and contextualize data that was previously trapped in silos. An AI layer on top of existing business systems can turn complexity into intelligence and intelligence into action, reducing emissions, lowering costs and improving performance simultaneously," said Pankaj Sharma, EVP, Software & Services at Schneider Electric. "As energy demand continues to rise, the ability to deliver these outcomes together, rather than forcing organizations to choose between them, will be critical to achieving both business and sustainability goals."

The research uses building energy modeling validated against real-world pilot deployments to assess how AI-enabled HVAC control impacts energy consumption, carbon emissions and operating costs across Australia, India and the U.S in differing building scenarios.

The study examined how an AI layer deployed on top of digital building management systems can connect previously siloed data sources, continuously analyze building conditions, and automate HVAC optimization in real time. By incorporating data from occupancy patterns, weather forecasts, equipment performance,

and other operational inputs, AI can enable buildings to operate more efficiently while reducing the burden on facility management teams. The research also found that small and mid-sized buildings (less than 100,000 sqft) stand to benefit significantly from AI-enabled optimization. Historically, energy management systems have been considered too complex or costly for smaller facilities, where dedicated facilities expertise is often limited. By helping automate and simplify optimization, AI can make sophisticated building management more accessible, enabling smaller buildings to reduce energy consumption, lower operating costs and cut emissions. "AI is putting the power of energy intelligence into the hands of smaller building owners and operators. What once required significant expertise and investment can now be achieved more simply and at greater scale, helping organizations reduce energy waste, lower costs, improve performance, and make smarter decisions with confidence," added Sharma. Download the full report here. www.se.com

BSRIA PUBLISHES UPDATED GUIDE TO MECHANICAL BUILDING SERVICES

BSRIA has published major updates to its BG 31 The Illustrated Guide to Mechanical Building Services, providing an updated reference for construction professionals who are not specialists in the discipline.

The fourth edition comes nine years after the previous guide and reflects significant changes in regulation and technology over that period. Changes to Part L have increased the focus on energy performance and higher-efficiency building services, while heat pumps and heat networks are playing a growing role in how buildings are heated.

Fire safety also remains a key consideration in the design and installation of mechanical services.

BG 31/2026 brings these areas together with practical guidance on the heating, ventilation, cooling, hot water and control systems found in buildings. It is aimed at a broad construction audience, including project managers, manufacturers and clients who need to understand the systems without necessarily being building services specialists.

SYSTEMS AND REGULATION

BG 31/2026 explains the 'lean, clean and green' approach to reducing HVAC energy use and carbon emissions, starting with reducing demand through building design before considering efficient systems and low-carbon plant.

The guide reflects the impact of Part L on the specification of higher-efficiency plant, advanced controls and sustainable technologies, as well as the balance between upfront investment and whole-life costs.

Heat pumps and heat networks feature more prominently in the new edition. The guide describes heat pumps as becoming the preferred means of heating buildings and explains their growing use in modern non-domestic buildings and new homes. It also covers low-temperature heating and the principles and operation of heat networks.

Fire safety guidance covers compartmentation and firestopping, smoke and fire dampers, staircase pressurisation and smoke clearance, helping non-specialists to understand how mechanical services interact with a building's wider fire safety strategy.

OPERATION AND FACILITIES MANAGEMENT

The guide also provides a reference for control and building management systems, commissioning and handover, and the running costs of mechanical plant over its working life.

Mechanical services typically account for 15-25% of overall build costs in standard UK commercial and residential buildings, rising above 30% in complex buildings such as hospitals and high-specification offices. The guide also highlights the importance of considering running costs and whole-life performance alongside initial capital expenditure.

It covers ventilation, cooling and hot water systems, as well as how buildings connect to water, gas, electricity and telecommunications networks. Each system is introduced through key points, photographs and diagrams designed to make the principles and operation easier for non-specialists to understand.

BG 31/2026 The Illustrated Guide to Mechanical Building Services is available to download here from the BSRIA website.

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With the event now not far away, registering early means you can secure your pass, get the dates firmly in the diary, receive pre-event updates and start planning which speakers, sessions and exhibitors you want to see.

More than 4,500 professionals working across energy, sustainability, estates and the built environment are expected to come together for two days of practical learning, new technology, real-world case studies and conversations focused on the energy challenges organisations are facing right now.

And there is even more to discover in 2026.

The expanded event includes a **new Solutions Showcase**, putting real projects, technologies and measurable results in the spotlight, alongside a **new Keynote Theatre** exploring the major issues affecting energy and sustainability.

The **new Estates Gazette Theatre** will look at how technology, sustainability and targeted investment can improve the performance and value of buildings, while the enhanced **Power Responsive Theatre** will examine flexibility, demand-side response and distributed energy resources.

Visitors can also earn **CPD credits** through accredited learning, take part in focused roundtables and networking, join the informal Sustainability Talks, and access practical training from BSI. The Wates Innovation Theatre also returns for 2026.

Across the conference programme, the emphasis is firmly on ideas and experiences that can be applied back in the workplace.

Speakers joining the wider programme include **Emma Arnold, Director, Sustainability & Clean Energy at Trio**; **James Chaplin, Senior**

Registration is free for emex 2026, taking place at Excel London on 25–26 November.

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Registering early gives you plenty of time to explore the programme, identify the suppliers and technologies most relevant to your organisation, and make the most of your two days at the show.

Register for your free pass today and join the energy management community at Excel London on 25–26 November.

Manager of Curve Trading at EDF; and Paul Lynch, Head of Net Zero, Utilities Management at VINCI Facilities.

The Solutions Showcase will also host **'Beyond the Headlines: Turning Heat Pump Potential into Reality'**, bringing together Bean Beanland of Heat Pump Association UK, Andy Green of Baxi Commercial, Thomas Nowak of Quantum International and Peter Spurway of Carrier HVAC & Viessmann Climate Solutions to examine what successful heat pump deployment looks like in practice.

Alongside the conference, visitors can meet **100+ exhibitors** and explore

solutions spanning energy efficiency, smart buildings, controls, electrification, low-carbon heating, energy generation, flexibility and decarbonisation.

As **Pawel Szpinek, Facilities Manager at City of London Academy Southwark**, says: "emex is a standout destination for anyone looking to connect, learn and discover fresh ideas."

With the end of November getting closer, now is the time to secure your place and start planning your visit.

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PRIVA LAUNCHES CYBERSECURITY DROP-IN AT SMART BUILDINGS SHOW 2026

A team of experts from leading building automation company Priva will be on hand at the Smart Buildings Show at ExCeL London on 14–15 October 2026, offering visitors the opportunity to discuss questions and concerns about BMS cybersecurity at a dedicated Cybersecurity Drop-in.



Priva's Cybersecurity Drop-in offers visitors a simple Cyber Consultation designed to support anyone who is unsure about which cybersecurity responsibilities affect their organisation, which legislation and standards may be relevant to them, or whether their existing BMS hardware and systems are adequately prepared for current and emerging requirements.

The Drop-in welcomes conversations with anyone concerned about cybersecurity, including building owners, operators, facilities managers, BMS professionals and integrators who are unsure:

- Which cybersecurity responsibilities impact their organisation
- Which legislation and standards may be relevant to their systems
- Whether their existing BMS hardware and configuration are adequately prepared for current and emerging cybersecurity requirements

TIGHTER LEGISLATION & STANDARDS

Priva's Cybersecurity Drop-in responds to increased demand for information and answers about new and stricter requirements relating to the security of building networks and devices.

Legislation and standards including NIS2, IEC 62443 and the Cyber Resilience Act (CRA) are changing expectations around the security of connected systems.

These changes sit alongside increased emphasis from organisations on the resilience of the operational technology and systems on which their buildings depend.

The Drop-in will clarify responsibilities and provide a practical reference for customers and partners as they assess their own cybersecurity requirements. It will be of value to those responsible for BMS systems in critical sectors, including data centres, hospitals, energy facilities, water infrastructure and transport infrastructure, where organisations may be within the scope of the NIS2 Directive.

Visitors will be able to discuss their specific situation with Priva's cybersecurity specialists and gain a clearer understanding of the questions they should be asking about their systems, responsibilities and routes to compliance.

"There is a lot of discussion about cybersecurity and compliance, but it can be difficult for people responsible for buildings to translate that into practical action, particularly when they have legacy BMS hardware or systems that have evolved over many years," adds Jens Fiig, Managing Director, Priva Building Automation.

"The Priva Cybersecurity Drop-in will provide clarity and practical guidance for

any organisation that is concerned about its responsibilities. Our simple Cyber Consultation opens up the conversation so that we can support BMS professionals by better understanding what they are responsible for, what questions they should be asking their BMS provider, and where their current system sits against emerging requirements."

REGISTRATION & MORE INFORMATION

For more information about Priva's approach to cybersecurity, a new publication is available for download in advance of the Smart Buildings Show: *A Guide to Cybersecurity, Quality & Compliance*.

MORE FROM PRIVA

Smart Buildings Show is also an opportunity to explore the wider Priva portfolio, including Priva Nuro, our next-generation intelligent building solution our suite of Priva Digital Services. The Priva team will also be joined by colleagues from its partner company bGrid.

Register for the show and for more information on the Priva CyberDrop-in.

Visit Priva at Stand A28, Smart Buildings Show, ExCeL London, 14–15 October 2026, to speak to the cybersecurity team and visit the Cybersecurity Drop-in.

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WHY GRID RESILIENCE IS NOW A STRATEGIC IMPERATIVE

The electricity grid is becoming a major challenge for industries and businesses. Electrification of heating, transport and industry as well as growth in energy-intensive areas such as data centres, are increasing demand for electricity, while ageing infrastructure and extreme weather are putting additional pressure on the existing system. Consequently, energy planning can no longer focus only on how much power a business uses, or how it will reduce emissions. It must also ask whether power will be available, dependable and resilient when needed, and consider alternatives such as microgrids.

DEMAND IS OUTPACING GRID CAPACITY

Pressure on the electricity grid reflects a structural mismatch where demand is increasing faster than networks can be reinforced. That mismatch is already being seen in sustained load growth linked to hyperscale data centres and industrial expansion. At the same time, the UK's National Energy System Operator expects electricity demand to rise steadily through the 2030s, reversing decades of relatively flat consumption with energy efficiency offsetting underlying drivers.

As a result, network capacity has become a strategic issue for businesses that are inherently energy intensive, not just a concern for utilities. Grid upgrades can take years, while data centres can scale in months. Viable projects with capital to build it may be limited by when the necessary grid capacity will be available. This uncertainty is influencing investment decisions and operating costs.

POWERING DATA CENTRES

The growth in data centre capacity has shown the gap between how quickly businesses need more electricity and how quickly the grid can provide it. They require a constant supply of power, with backup systems in place if the main source fails. Their expansion is creating multi-gigawatt clusters, which place sudden and concentrated demands on already pressured networks.

However, data centres can expand within months, while grid upgrades can take years. Therefore, to keep projects moving while they wait for the necessary

Rebecca Scottorn, Partner,
L.E.K Consulting



grid capacity, operators are turning to onsite power. Onsite power can provide a controllable source of electricity while a permanent grid connection is being developed, with both likely to be critical for long-term energy resilience.

MODERNISATION AND TECHNOLOGY SOLUTIONS ARE ESSENTIAL

Utilities are investing in transmission and distribution upgrades, stronger substations, storm protection, digital systems, smart technology and cybersecurity. They are also investing in batteries and other flexible technologies to improve congestion and guarantee reliable power during periods of pressure.

Grid resilience should be considered alongside energy efficiency, renewable procurement and emissions reduction. A resilient network creates capacity for electrification, electric vehicles, renewable projects and growing industrial demand. A weak or congested network can hinder a transition plan, with a timetable defined by connection queues and equipment bottlenecks.

To manage these risks, businesses with critical energy needs must consider their own solutions in addition to broader grid investments. Microgrid architectures span a range of technologies; genset-BESS-grid & Green energy-BESS-grid solutions are the most common setups, with EMS as a core layer. They can operate as primary power, backup, or temporary setups, and can be alongside or independent from the main grid.

Besides data centres, microgrid opportunities are strong in other energy intensive sectors such as the food industry, logistics warehouses, and broader power-hungry industries where the need for reliable energy supply combined with growing demand are driving penetration.

PLANNING FOR A MORE FLEXIBLE SYSTEM

Short-term availability and long-term resilience are themes that extends across sectors. Renewable generation

can reduce reliance on conventional power, but its output can vary when electricity is needed most. This makes flexibility increasingly important, as storage can help balance changes in supply and demand, while dispatchable generation can provide additional support when the system is under strain.

For energy managers, the key point is not to make decisions in isolation. Instead, they need to understand how different sources of power can work together, and how much flexibility their operations require. This will help businesses judge whether their energy plans can cope with changes in supply, periods of system stress and delays to grid development, while supporting reliable operations over the longer term.

Delivering energy resilience and flexibility for businesses e.g., via microgrid solutions presents significant opportunities for the energy sector. New specialised value chains are emerging where project owners and systems integrators coordinate distinct roles across design, installation and operation, with OEMs seeing a lot of opportunity for these new applications

PREPARING FOR A RELIABLE FUTURE

As demand for electricity rises, companies that consider the resilience of their power supply when making investment decisions will be better placed to grow, electrify and manage uncertainty.

They should explore alternative power options proactively, while remembering to plan for and support the long-term development of resilient energy solutions. The strongest energy plans will therefore focus not only on securing cleaner power, but also on ensuring that electricity is available when it is needed.

Ultimately, grid reliability and innovative solutions are an important consideration for overall energy resilience across businesses and sectors. www.lek.com



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WHAT STEPS SHOULD AUTOMOTIVE MANUFACTURERS BE TAKING TO REDUCE THEIR ENERGY CONSUMPTION?

Reliant on processes such as steel production and the extraction and fabrication of materials including aluminium and plastics, automotive is one of the most energy-intensive sectors in manufacturing¹.

With operational costs continuing to rise, manufacturers need to take a more strategic approach to energy management. There are several practical steps they can take now to reduce consumption, lower costs and improve efficiency.

REPLACE OLDER INDUSTRIAL MOTORS WITH BETTER IE RATED ONES

Industrial motors are central to many automotive manufacturing applications, powering machinery, equipment and automated processes. Yet many manufacturers continue to use older, inefficient equipment, including fixed-speed drives.

Replacing ageing motors with high-efficiency alternatives carrying a higher International Efficiency (IE) rating can help manufacturers reduce both electricity consumption and associated costs, while also lowering their carbon footprint.

INSTALL VSDS ON CONTINUOUS APPLICATIONS AND HVAC SYSTEMS

Heating, ventilation and air conditioning (HVAC) systems are estimated to account for approximately 40% of a building's total energy costs². Installing variable speed drives (VSDs) on HVAC systems and other continuous, high-energy applications can help manufacturers better match motor output to demand.

VSDs can reduce energy consumption by up to 50% in applications such as conveyor belts, fans and pumps. They can also provide more controlled airflow and allow HVAC systems to be adjusted according to building occupancy.

OPTIMISE NON-PRODUCTION ENERGY USE WITH SMART BMS

Non-production areas can account for 20–40% of total site energy use, making them an important area for manufacturers to address.

¹ <https://www.thomasnet.com/insights/industry-highest-energy-use/?msocid=0346cc635add671022add90f5b3d6685>

² <https://www.dalroad.com/resources/the-energy-saving-benefits-of-vsd-for-hvac-applications/>

Richard Lawton,
Vertical Account Manager
at Mitsubishi Electric
Automation Systems Division



Smart building management systems (BMS) can connect people, machines and systems through real-time insights, helping automate HVAC and lighting based on occupancy and identify inefficiencies. By combining technologies such as industrial Internet of Things (IoT), edge computing and AI, manufacturers can also use data to optimise energy consumption across less visible areas of the plant.

IMPLEMENT BATTERY ENERGY STORAGE SYSTEMS

Battery Energy Storage Systems (BESS) allow manufacturers to store energy during off-peak periods and use it when demand and costs are higher. This can help manage demand spikes from energy-intensive processes such as paint shops and stamping lines, while making better use of on-site renewable energy. BESS can also provide backup power if systems fail unexpectedly, helping to minimise disruption to production.

UPGRADE WATER TREATMENT AND REUSE SYSTEMS

Automotive manufacturing is also highly water-intensive, with the average car requiring 39,000 gallons of water throughout its production lifecycle.³

Advanced filtration and recycling systems can treat wastewater for reuse in processes such as paint shops, reducing the amount of fresh water required. Greater control over water treatment can also help manufacturers manage associated energy consumption.

USE DATA-DRIVEN ENERGY MANAGEMENT

Energy management also needs to be supported by accurate data. Smart sensors and energy monitoring across

³ <https://ketos.co/water-stewardship-in-the-automotive-industry-automakers-and-water-sustainability>

equipment can help manufacturers identify high-energy processes, benchmark performance and pinpoint opportunities for reduction.

Integrating energy data with production monitoring and analytics software can give manufacturers a clearer view of where energy is being consumed and help them take targeted action. This can also provide a benchmark for performance and help plants establish a clearer picture of what good looks like.

ENGAGE WORKFORCES AND EMBED ENERGY CULTURE

Technology alone will not deliver sustained energy reduction. Manufacturers also need to make energy management part of everyday decision-making across the workforce.

Industrial automation software incorporating Supervisory Control and Data Acquisition (SCADA), Human Machine Interface (HMI) and IoT functionality can help teams monitor performance through clear KPIs and energy reduction dashboards.

This can move energy management away from being an afterthought and towards becoming part of the wider production process.

REDOUBLING THE FOCUS ON ENERGY REDUCTION

For energy-intensive manufacturers such as those in automotive, energy costs will remain an important consideration. Improving efficiency therefore requires a combination of measures, from upgrading motors and installing VSDs to using BESS, smart BMS and data analytics.

To find out more about Mitsubishi Electric's range of energy management solutions, visit: <https://gb.mitsubishielectric.com/fa/solutions/capabilities/energy/energy-management>

HOW TO CUT ESOS REPORTING WITHOUT REDUCING OPERATING HOURS: CASE STUDY, HEALTHCARE

A healthcare site does not get the luxury that most estates rely on when it comes to cutting energy use, since lights, heating and equipment cannot simply be switched off overnight or over a quiet weekend when the people depending on them are never actually away from the building.

For most organisations, an energy reduction plan starts with reducing hours, whether that means an empty office after 6pm or a closed floor on a Saturday, but a round the clock care setting has no equivalent to reach for.

A UK provider of residential and mental health care found a way around that constraint by targeting how much energy the building drew per hour rather than how long it operated, installing voltage optimisation to trim waste at the point of use instead of cycling load off and back on. The building kept running exactly as it had before, on the same schedule and with the same equipment, while what it consumed to do so came down.

Recorded on site rather than modelled in advance, the result came to a 5.61 per cent reduction in energy use, translating into 33,580.7kWh saved, 6.95 tonnes of CO₂ avoided and a cost saving of 8,462 pounds, all without a single change to how the site was occupied or run.

That distinction carries more weight in this sector than most, particularly with ESOS Phase 3's second progress update due 5 December 2026 and Phase 4 qualification landing on the same date, since every energy manager submitting a public figure needs a plan their board can stand behind. Most sectors can point to reduced occupancy or shorter operating hours to justify part of that figure, but a care setting cannot make that claim and does not need to when the saving itself holds up without touching occupancy or care standards at all.

Powerhub Solutions delivers voltage optimisation, refrigeration energy management and Pulse, an energy management system built for ESOS and SECR reporting, across more than 3,000 UK sites.

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RELAXATION OF MEES – A REALITY FOR COMMERCIAL BUILDING STOCK?

Into the public domain is the government's modifications to the non-domestic and domestic Minimum Energy Efficiency Standards (MEES). If you own a commercial property and hope to find out more how a new manifestation of NetZero can assist your business, please read on.....

The specific adaptation of policy that this article will focus on is the proposed modifications into non-domestic Minimum Energy Efficiency Standards (MEES). What are these modifications and how do they affect business owners and private renters?

A recent government statement has outlined the first aspect of change regarding MEES, that is designed to provide a more proportionate and flexible approach towards small business owners. There are three key revisions to the previous government's approach to MEES standards.

The first applies to the ruling that states from 2031 buildings over 1000 sq meters must upgrade their MEES status to band E from B. Other notable proposals include the 2030 EPC Band B upgrade for non-domestic buildings under 1000 sq meters being moved to 2031, and the abolishment of the 2027 band C upgrade - for domestic properties, will remain in 2030.

Reviewing in further detail regarding required MEES standards upgrades, non-domestic rented buildings over 1000 sq meters are now advised to enhance their MEES status from band E to band B by 2031. The previous date for final energy system refurbishment was 2030. This new direction will provide landlords

with an additional year to complete their new installations. This means that business owners must improve their energy systems by installing new or adapting existing heating and hot water apparatus to be more energy efficient by 2031. Landlords risk financial penalties as well as having their license to rent properties revoked if they do not comply.

Businesses that rent non-domestic buildings under 1000 sq ft will now no longer have to convert their on-premises heating and hot water system to band B from band E with no incoming deadline that enforces change. This proposal is designed to provide small business owners with a balanced approach that assists financial stability.

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The third proposal focuses on the abolishment of the band C upgrade of MEES standards for domestic rented properties. The previous government aimed to move this to 2027, instead the new date of compliance is set at 2030. This is also designed to alleviate landlords of costly modifications on their properties.

All three new regulations will combine to create a version of NetZero that is less immediate in its aim of decarbonisation but more thoughtful in respect to the financial considerations of landlords and renters of domestic and non-domestic properties. These proposals have been prioritised to ensure that any renovations towards energy systems are only considered and completed if they are practical, affordable and cost-effective.

In regard to these three new proposals of policy adaptations, what can the non-partisan observer extrapolate from this new governmental approach? All three suggestions that imply a change of direction in UK decarbonisation strategy are centered on the financial concerns of both renters and landlords of non-domestic and domestic properties. This means that the new government is prioritising fiscal fairness over an aggressive form of decarbonisation.

The reasons for this could be viewed as political, as a new government will soon be in place it would be a sensible move to reduce future costs across the property sector to both renters and landlords, as this will shape your appearance into a friendly form to both concerned parties.

An additional political benefit of rolling back elements of UK NetZero policy could be viewed as supporting a public view, or lack of. As NetZero has been demonised by opposing voices in UK media the public are keen to shift the pace of a national energy transition towards a more comfortable financial setting. A majority of the UK public understands that national energy stocks must be replaced with

clean alternatives but are equally concerned with financial impact.

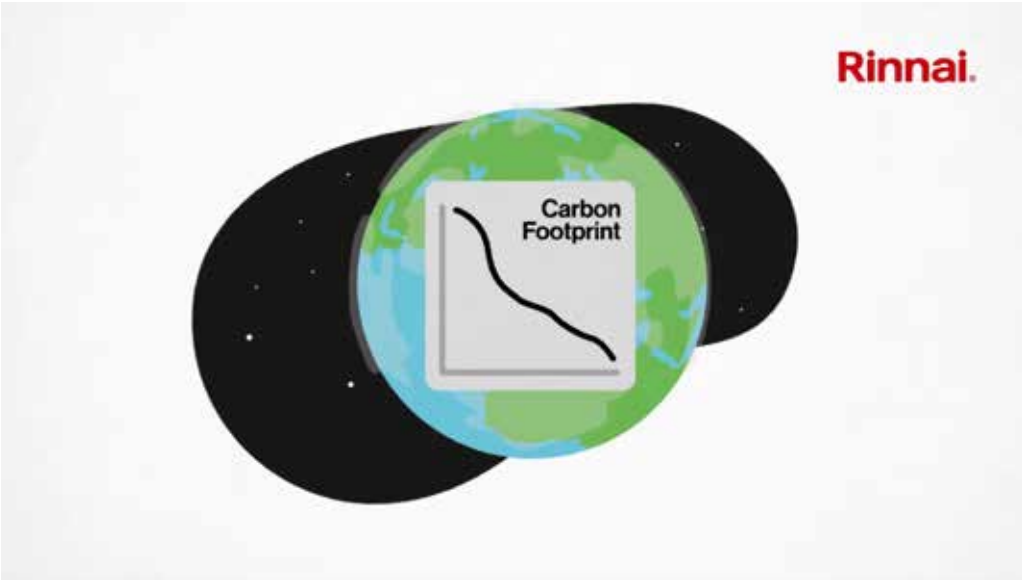
The three aforementioned MEES policy proposals support the idea that the UK government understands both the need for green energy and the potential effect upon UK citizens finances. A stance perhaps not fully undertaken or understood by the previous government.

Owners of properties that are used in a commercial context should therefore research manufacturers that produce cost-effective and efficient technologies that allow for operational costs to be lowered alongside carbon emissions.

Rinnai follows all domestic and international energy news and aims to share all information with UK customers. Doing so provides a solid foundation of knowledge that could assist customers during the process of product and energy selection.

To take advantage of Rinnai Design Support Services and review the ideal solution to reduce energy costs, maximise return on investment and apply renewable energy sources and lower carbon footprints, simply visit

<https://www.rinnai-uk.co.uk/contact-us/help-me-choose-product>



NEW F404T CLAMP METER'S BUILT-IN SELF-TEST CLOSSES A CRITICAL SAFETY GAP IN PV MAINTENANCE

Patented built-in self-test lets electricians verify the clamp meter is working correctly – before trusting it to confirm a circuit is safe to open.

Chauvin Arnoux has announced the launch of the F404T, a clamp meter engineered specifically for the safety demands of photovoltaic (PV) installations.

At its core is a patented Auto-Check function that lets electricians confirm their tester is operating properly and properly configured before relying on it to verify the absence of current through this simple check that determines whether a circuit is genuinely safe to open.

SOLAR NEVER SLEEPS AND NEITHER CAN SAFETY PROCEDURES

The rapid growth of solar energy has introduced safety challenges that traditional electrical installations simply don't present. Unlike a conventional circuit, a PV system generates energy continuously and remains live at all times,

even when isolated from the grid. For electricians and maintenance teams, this means that opening a circuit under load carries real and constant risk.

In PV installations, lockout/tagout (LOTO) procedures are based on confirming the absence of current (VAC) and not merely on the presence of no voltage. This difference is important since a standard current clamp which is misconfigured, poorly calibrated or simply defective may show a zero reading even though current is still flowing, thus giving the operator a false sense of security at the most critical moment.

A PATENTED SELF-TEST FUNCTION BUILT TO REMOVE THE GUESSWORK

The F404T meets this gap directly. At the touch of a button, the clamp generates a known reference current and checks its reading against it – confirming in seconds that the device is working correctly and configured properly before any work begins.

The clamp also automatically detects AC or DC values, removing a common source of operator error and saving time on-site! A small feature with an outsized effect on daily workflow for electricians moving between AC and DC segments of a PV system.

DESIGNED FOR THE NEWEST GENERATION OF SOLAR INSTALLATIONS

- Safety rating of 1500 V CAT III / 1000 V CAT IV, suited to high-voltage strings and utility-scale PV installations
- IP54 protection rating for reliable use in outdoor and rooftop field conditions
- Current measurement up to 1000 A AC / 1500 A DC
- Automatic AC/DC detection for faster, error-free measurement



THE F404T IS MORE THAN JUST A SAFETY TOOL – IT'S A COMPLETE DIAGNOSTIC SOLUTION

In addition to its use in LOTO verification, the F404T is a 2-in-1 clamp meter designed for daily electrical work. It measures current, voltage, resistance, continuity, and temperature, and offers a range of diagnostic functions:

- Min/Max recording to capture fluctuations over time
- Differential measurement (Δ REL) and relative measurement (Δ REL/R) functions
- Overcurrent detection to flag undersized conductors or catch premature tripping of thermal protection devices

These features make the F404T a clamp that electricians can use every day, not only during shutdowns but also to make sure that the operator safety is never left to chance.

AVAILABILITY AND PRICING

The F404T is now available via Chauvin Arnoux UK's authorised distributors in the United Kingdom, Scotland, Wales and Northern Ireland.

For pricing, specifications, or to arrange a demonstration, contact:
Telephone: 01924 460494
Email: info@chauvin-arnoux.co.uk
OR visit the website: www.cauk.net

ABOUT CHAUVIN ARNOUX UK

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WHY ENERGY ANALYTICS MATTER – REAL-TIME ANALYTICS FOR MORE EFFICIENT MANUFACTURING

Rising energy costs mean manufacturers are looking more closely than ever at how their factories consume power and where unnecessary energy is being lost. However, while most businesses know how much energy an entire site consumes, far fewer understand where that energy is being used, or wasted, at machine level. Here *Beth Ragdale*, software manager at Beckhoff UK, explains why real-time analytics is becoming one of the most effective tools for improving energy efficiency and reducing operational costs.

The UK Government has announced the British Industrial Competitiveness Scheme, which will help to cut energy bills by up to 25 per cent for more than 10,000 manufacturers in early 2027. This will be welcomed by the companies, but it shows how serious the energy issues are at the moment.

Without visibility into individual assets and processes, manufacturers can spend thousands on electricity without knowing which machines are operating inefficiently, where maintenance issues are emerging or whether equipment is consuming power when it is producing nothing at all.

The biggest opportunity lies in treating energy as another source of operational data, rather than simply another utility bill. If you know how much energy a machine should use to produce a part, any deviation tells you something. It could be an overworked motor, a compressed air leak, a vacuum pump running continuously or simply a machine that's still consuming power when it should be idle.

This shift from measuring total energy consumption to analysing energy at machine level is changing how manufacturers approach both efficiency and maintenance.

LOOKING BEYOND THE ELECTRICITY METER

Real-time analytics allows manufacturers to build a performance profile for every machine. Instead of simply recording how much electricity a factory consumes over a day or month, engineers can compare energy use against production output, operating conditions and machine health.

If a production line continues to draw significant power during downtime, it may indicate that equipment is not entering standby mode correctly, or at all. On a

packaging line, for example, infeed conveyors or rotary tables may continue to run when then machine is blocked further down the line. Equally, a motor that suddenly requires more power than usual may be signalling the early stages of mechanical wear.

The same principle extends beyond electrical consumption. Modern automation platforms can combine energy data with other signals from the machine, such as torque speed, vibration, temperature, valve states, flow rate, environmental conditions and machine state to provide a far richer picture of machine performance.

For example, increasing vibration alongside higher energy consumption often points towards equipment operating outside its normal condition. Rather than waiting for a failure, manufacturers can identify these trends early and investigate before production is affected.

Compressed air is another example. Often described as one of the most

expensive factors in manufacturing, even small leaks can waste significant amounts of energy. By monitoring pressure, flow and machine state in real time, manufacturers can detect changes that suggest leaks or air being supplied during idle periods, reducing both energy use and operating costs.

WHOLE FACTORY EFFICIENCY

Energy optimisation does not stop at the production line. While manufacturers often focus on improving machine efficiency, building management can have an equally significant impact. Heating production areas while loading doors remain open, lighting unused areas, running extraction when the process is inactive, or failing to recover excess heat all contribute to unnecessary energy consumption.

Modern automation systems increasingly allow manufacturers to combine machine data with building management information.



Instead of treating production equipment and facilities as separate systems, they become part of a single energy strategy.

DATA CREATES SMARTER MAINTENANCE

Energy analytics also supports predictive maintenance, one of the fastest-growing applications of industrial data.

For manufacturers producing high-volume consumer goods, even short periods of downtime can be extremely expensive. Rather than reacting after equipment fails, predictive maintenance uses operational data to identify developing problems before they stop production. Engineers can compare how a machine behaves over time. A drive that needs more current for the same movement, a gearbox that is running hotter than normal, or a fan that shows increasing vibration can all suggest that equipment is beginning to deteriorate.

Instead of discovering a worn bearing after a breakdown, manufacturers can spot gradual changes in performance, schedule maintenance during planned shutdowns and avoid unexpected production losses altogether.

The result is not only greater reliability but also improved energy efficiency, as machines operating within their intended

parameters typically consume less power than poorly performing equipment.

AI TURNS DATA INTO DECISIONS

The challenge for many manufacturers is no longer collecting data. Modern factories generate enormous volumes of information every second. Now, it's about how to make sense of it.

Artificial intelligence is increasingly becoming the link between raw industrial data and practical decision-making. Rather than engineers manually reviewing thousands of measurements, machine learning algorithms can identify patterns across energy use, compressed air demand, temperatures, vibration, motion profiles and production performance.

Those insights help manufacturers understand relationships that would otherwise remain hidden and create increasingly accurate predictions of future performance.

Looking ahead, manufacturers will move towards creating a digital profile for every machine. By combining operational history with live analytics, each asset will effectively develop its own performance passport, allowing operators to understand exactly how it should run for maximum efficiency, product quality and minimum energy consumption

VISIBILITY DRIVES EFFICIENCY

While sustainability targets and environmental reporting continue to influence investment, commercial pressures remain the primary driver for many manufacturers. Rising energy prices have made efficiency impossible to ignore.

The companies that gain the greatest advantage will not necessarily be those investing in entirely new equipment. Instead, they will be those extracting more value from the machines they already have by understanding how they perform in real time.

Energy analytics provides that visibility. Once manufacturers know where energy is being used, why consumption changes and how operational decisions affect efficiency, they can make improvements that reduce costs, improve reliability and support long-term sustainability.

As manufacturers continue to balance rising energy costs with productivity and sustainability targets, data will become one of their most valuable assets. By combining real-time analytics with intelligent automation, manufacturers can uncover hidden inefficiencies, make better operational decisions and reduce energy consumption without compromising output. To learn more about Beckhoff's automation and analytics solutions, visit www.beckhoff.com.



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GRID CONNECTION: IT'S NOT THE ONLY PATH TO HIGH PERFORMANCE CHARGING



As the number and size of EV charging sites grows, so does the complexity of powering them from the grid. Reuben Elman, infrastructure strategist at Formula Space, looks at some of the businesses that are successfully using batteries and storage solutions as a highly viable alternative to sitting in a grid connection queue.

The electric vehicle (EV) industry's biggest obstacle is still widely considered to be grid connection. When you speak to EV charging operators about their challenges, it sits at the top of the list. Above maintenance and customer experience. Even above cable theft.

Adding new charging sites, or significantly extending existing ones, traditionally means procuring additional grid capacity – which can be expensive and take a long time to achieve. The connections queue is not getting any shorter.

But one could argue this is a problem that operators are choosing to accept – because grid connection is not the only path to high-performance charging.

Alternative sources of power, including battery energy storage systems (BESS) and microgrids, have been



successfully operating in businesses for years. And in the current climate they can deliver a dramatically cheaper, faster, and more flexible approach to charging than waiting in the connection queue.

BATTERIES ENABLING HIGH PERFORMANCE MOTORSPORT

On the racetrack, high-performance charging from modest grid connections – or none at all – has been routine for several years now.

The 10-year-old fully electric Formula E championship generally races on temporary street circuits in city centres, all locations with no permanent infrastructure or grid connection. Car charging for the race is fully centralised, with each team given access to one standard charger (to charge two cars), for fairness. The energy comes from portable on-site biofuel generation and battery energy storage systems.

Formula 1 is moving in the same direction, though the F1 setup includes solar panels as well as HVO biofuel. Since 2025, a centralised compound has generated and stored this renewably sourced power in battery energy storage systems, making it available not only to all the teams competing, but for all the associated activities, such as the technical centre and the timing room, and the broadcast units.

The World Rallycross Championship switched to fully electric cars in its 2022 season, one of the first international championships to do so. Unlike Formula E or F1, this competition is a rapid sequence of short, flat-out heats, semi-finals and finals, often all on the same day. Rather than range, these cars need regular fast charging – which comes from shipping container battery banks, pre-charged to 900kW back at base using local green sources. There's no need for a grid connection at all.

Not only is a grid connection incidental to the performance delivered, but this approach has also delivered a massive 90% reduction in carbon emissions associated with each event.

CAR MANUFACTURERS ARE MOVING TO A SIMILAR APPROACH

In the commercial world, EV manufacturers are catching up to the advantages of battery storage beyond the car, too.

For example, Chinese manufacturer BYD's new 1.5 MW Flash Charging stations are paired with an ultra-fast-discharge energy storage system to help bypass grid restrictions. They're paired with a battery that gets recharged from the grid at slower speeds, and can act as both an energy reservoir to prevent



grid overload and a power amplifier that enables high-power charging.

When a vehicle plugs in, it draws from that stored energy rather than the grid directly, decoupling the high-power charging event from the grid connection entirely. The result is a system capable of taking a car from 10% to 97% charge in under ten minutes, without requiring a utility-scale grid upgrade at every location.

There are nearly 5,000 Flash Charging stations installed across China, and BYD expects a further 20,000 to be in operation worldwide by the end of 2026.

THE CAR PARK THAT POWERS ITSELF

Solar canopy structures – covered bays with photovoltaic panels integrated into the roof – have been available for some time. The canopy panels generate DC electricity which can be used to charge the cars parked below.

The solar power feeds into an on-site battery storage system, which acts as a buffer – accumulating energy during daylight hours and releasing it on demand when vehicles plug in. The grid connection remains part of the system, but it becomes a much smaller part of the proposition, topping up the battery when solar generation is insufficient to meet demand.

The result is that a much smaller grid connection can support a much larger charging operation than it otherwise would. One UK analysis suggests this approach can allow the installation of 125 kW chargers on a connection that would otherwise only

support 75 kW, without any grid upgrade, and without any wait.

The connections savings you make depend on the size of the parking areas you cover. But certainly organisations running larger car parking, such as airports, retail parks, and motorway services, are sitting on a generation asset they have not yet recognised. The infrastructure is available.

CHANGING PERSPECTIVES CAN PUT YOU AHEAD OF THE CURVE

These examples all demonstrate that you don't need a massive grid connection to deliver a high-power charging experience.

Grid connection fees and DNO timelines are largely outside any operator's control. But there are flexible solutions available in response to those fixed costs.

Battery-backed microgrids, solar canopy generation, integrated batteries and more – these are all engineered solutions, commercially proven in adjacent sectors, that the EV infrastructure industry has been surprisingly slow to adopt.

These are the conversations the industry needs to be having – not just in procurement teams or engineering reviews, but at the strategic level, where site development decisions are made.



The grid connection queue is a real constraint for EV charge point operators. But it is not the only route.

For more information about Formula Space's EV charging site design and infrastructure solutions, visit <https://formula-space.com>

WHY MICROGRIDS ARE BECOMING ESSENTIAL INFRASTRUCTURE FOR ENERGY MANAGERS

Power is no longer simply a facilities consideration, or an overhead to be managed in the background. Rising costs, constrained grid capacity, more frequent extreme weather and the accelerating electrification of heat, transport and operations mean that access to reliable power is becoming a strategic issue for organisations across the UK.

For businesses that cannot afford interruption, the consequences extend well beyond the meter. A loss of power can disrupt production, customer service and critical operations, while unmanaged peaks and inefficient energy use can erode margins. Energy managers are therefore being asked to balance three priorities that can no longer be treated separately: resilience, cost control and decarbonisation.

Microgrids offer a practical route to greater control. By coordinating on-site renewables, battery storage, controllable loads and intelligent energy management, they enable organisations to understand which loads are critical, where flexibility exists and when it makes most sense to generate, store, use or buy power. Rather than relying on standalone assets or reacting to disruption, organisations can build a more resilient, efficient energy system that supports day-to-day performance as well as long-term electrification.

MAKING ENERGY RESILIENCE PART OF EVERYDAY OPERATIONS

Today's power challenges extend well beyond emergency responses. While backup generation remains an important resource for sites where downtime carries significant operational or safety risks, organisations also need to manage costs, reduce emissions, and optimise day-to-day power use.

Standalone renewables can support sustainability goals, battery storage can help manage demand, and digital controls can improve visibility. The greatest value comes when these assets operate together as one coordinated system.

Microgrids are designed around this principle. They bring together on-site generation, energy storage and intelligent controls, allowing energy to be managed dynamically across a site. By balancing supply and demand in

David Pownall, VP of Power Systems, Schneider Electric UK&I



real time, they help organisations keep critical operations running while reducing exposure to wider grid volatility.

COORDINATING ENERGY ASSETS FOR GREATER CONTROL

For many organisations, energy infrastructure has developed in layers. A site might have a grid connection, backup generation, solar panels, battery storage, building management systems, and monitoring tools, all introduced at different points and for different reasons.

That can limit the value each asset delivers. A battery can reduce peak demand and support resilience. Solar generation can lower emissions and help stabilise costs. Digital systems can improve decisions about when and how energy is used. When connected, these technologies become part of a wider energy strategy.

A microgrid allows energy managers to think in terms of outcomes: continuity, efficiency, cost predictability and carbon reduction. The focus shifts from managing separate technologies to coordinating a site's energy use around the needs of the business.

MICROGRIDS IN ACTION: RESILIENCE AT SWANSEA UNIVERSITY

The value of microgrids to operations becomes clearest when power disruption has direct consequences for the way a site operates.

One UK example is Swansea University Bay Campus, where the university sought to improve energy resilience, reduce reliance on centralised power and make better use of on-site renewable generation. For a modern academic facility, with teaching rooms, computer labs, study areas, offices and EV charging, reliable power is central to day-to-day operations and the student experience.

The project brought together rooftop solar PV, additional solar generation above an EV carport and a 250kWh battery energy storage system, supported by Schneider Electric's EcoStruxure Microgrid software. This allowed the site to manage energy

across the building, battery storage and EV chargers, distributing power where it was needed most while providing real-time visibility of energy use, savings and CO₂ emissions.

By integrating solar, storage and digital control, the university strengthened resilience against external power disruption, maximised the value of renewable energy generation and supported more intelligent use of power across the campus. The project also created a live teaching asset for students, while supporting EV charging and contributing to a development that achieved a BREEAM Excellent rating.

FROM ENERGY RISK TO LONG-TERM BUSINESS VALUE

Electrification, digitalisation, automation and new technologies are raising the bar for reliability and flexibility in power infrastructure, just as energy markets remain volatile and grid capacity is under pressure in many locations.

For energy managers, the challenge is no longer simply securing enough power, but orchestrating how that power is sourced, stored, protected and optimised across the site. That means prioritising critical loads, unlocking flexibility, integrating on-site renewables, and using storage to manage both resilience and cost, without compromising operational performance.

Microgrids bring these requirements together in a practical, scalable way. By intelligently coordinating distributed energy resources and enabling islanding where appropriate, they help organisations ride through disruption, reduce exposure to price shocks, and make better use of available grid capacity, all while creating a clearer pathway to decarbonisation.

Power can't be treated as an overhead or a purely technical facilities issue. Microgrids are becoming a business enabler: strengthening continuity, safeguarding customer outcomes, improving operational efficiency, and giving organisations the control and confidence they need to operate – and invest – in an uncertain energy future. www.se.com

WHY GLOBAL UNCERTAINTY IS PROMPTING BUSINESSES TO EMBRACE SOLAR

Geopolitical instability, fluctuating wholesale prices and pressure on the grid have made harnessing solar power more important than ever for energy-intensive businesses.

For many firms, uncertainty around electricity costs now shapes investment decisions, production planning and the commitments they can make to customers and suppliers.

This is bringing solar into sharper focus, not only as a route towards net zero but as a practical way to improve financial certainty and energy resilience.

Despite solar being traditionally seen as a niche energy source, attitudes are changing. Leading provider of commercial solar solutions, Power Zero, is experiencing increased demand for solar Power Purchase Agreements (PPAs) from energy-intensive industries such as manufacturing and automotive.

Sophie Lamb, head of solar delivery at Power Zero, explains what is driving this shift in demand and how Coster Aerosols, a multinational manufacturer specialising in aerosol packaging components, spray systems and filling machinery, is harnessing solar to take greater control of its energy needs.

SOLAR AS A BUSINESS DECISION

"Cutting carbon remains important, but cost control, business continuity and security of supply now carry just as much weight.

"Manufacturers operate in an environment where electricity costs can change quickly, yet production cannot simply stop when prices rise.

"Businesses cannot control global events or wholesale markets, but they can control more of how their electricity is generated, purchased and used. That is a key reason why we're seeing high levels of interest in solar PPAs across Power Zero and the wider YLEM Group."

WHY BUSINESSES ARE TURNING TO SOLAR PPAS

Under a solar PPA, the provider funds, installs and maintains an on-site solar system, whilst the customer buys the electricity generated at an agreed rate.

This provides lower-cost, lower-carbon electricity without significant upfront investment, while reducing reliance on the grid and making a proportion of energy costs easier to forecast.

Sophie added: "Demand is particularly strong amongst organisations with large

sites and consistent daytime electricity use, including manufacturing, automotive, chemicals, pharmaceuticals, logistics and food and drink.

"On-site generation can reduce grid purchases and demonstrate credible environmental progress to customers and supply-chain partners."

PUTTING THE STRATEGY INTO PRACTICE

As part of a growth plan centred on sustainability and innovation, Coster entered a 15-year solar PPA with Power Zero for its Chesterfield site.

Power Zero funded and installed a 1.2MW rooftop solar array comprising 2,120 modules across seven roof aspects, supported by eight inverters.

The system is expected to meet approximately 25% of the site's electricity demand and aims to prevent 236 tonnes of carbon dioxide emissions annually.

Gary Durant, financial controller, at Coster Aerosols, said: "The PPA helps us reduce emissions and makes a significant share of our electricity costs more predictable, without taking investment away from the wider business.

"It supports our sustainability commitments while giving us greater confidence to plan, operate and grow over the long term."

Sophie added: "Coster shows how a solar PPA can address several priorities at once.

"Power Zero assumed responsibility for the system's design, installation, performance and maintenance. This reduced Coster's risk and allowed it to adopt solar without diverting capital from its growth plans."

WOULD STABLE ENERGY PRICES SLOW THE SHIFT?

Sophie explained: "Stable prices may reduce immediate pressure, but recent market shocks have shown how quickly conditions can change and how exposed businesses are when they rely heavily on grid power.

"A solar PPA is a long-term decision, not a response to one price spike. On-site generation, clearer costs and reduced emissions remain valuable when markets



are calmer. Stability is an opportunity to plan, rather than a reason to delay."

CHANGING PERCEPTIONS OF SOLAR

Solar was once viewed as a niche sustainability measure, but its rapid growth is changing how businesses see the technology.

According to the International Energy Agency, solar PV was the single largest contributor to growth in global energy supply in 2025, accounting for more than a quarter of the increase. An additional 600 terawatt-hours of solar electricity was generated worldwide during the year – the largest annual increase recorded for any electricity-generation technology.

Sophie said: "Solar is no longer simply an environmental statement. It is proven technology that can make a measurable contribution to operational resilience and long-term planning for UK business.

"For energy-intensive companies with suitable space and consistent demand, it is becoming an increasingly practical commercial decision."

BALANCING RESILIENCE WITH NET ZERO

Sophie concluded: "Cost control, continuity and net zero should not be treated as competing priorities. A well-planned solar strategy can support all three.

"No business can remove every risk created by global events, energy markets or grid constraints, but it can reduce its exposure.

"Coster demonstrates this in practice.

Through a fully funded solar PPA, the company is gaining greater control over its energy costs while supporting its growth and sustainability ambitions.

"Energy resilience is about giving businesses the confidence and flexibility to keep operating and growing, whatever happens in the wider market." www.power-zero.co.uk

MEET THE NEW BUILDING-MANAGEMENT TEAM

Modern buildings produce a constant stream of information from meters, sensors, plant and connected devices. Finding the detail that matters can still take time. A facilities manager investigating a fault or a rise in consumption may check several reports and alerts before the cause becomes clear. Engineers at an unfamiliar site face a similar problem when records are incomplete or difficult to follow.

t-mac is tackling this through its Virtual Assistant and a set of AI agents. The assistant gives users a conversational way into the platform. They can ask for information, go straight to a device and review its data without working through several screens. It uses the account and permissions of the person logged in and can make authorised changes to outputs.

DEVELOPING SPECIALIST AGENTS

The agents cover commissioning, facilities management and energy management. Their roles reflect work already carried out by building teams.

A facilities-management agent can watch operating conditions and flag patterns needing attention. An energy-management agent can review consumption, demand and cost across one building or an estate. This oversight helps teams handle more data without asking someone to watch every dashboard.

Each agent works within the user's permissions, and designated actions still require approval. Responsibility stays with the engineer, facilities manager or energy manager overseeing the work.

RETHINKING COMMISSIONING

Commissioning shows where this approach could save time. Engineers may need to review wiring diagrams, equipment schedules, controller documents, manufacturers' datasheets and network details before configuring devices, gateways and points in the platform.

Much of that work involves reading existing information and entering it into the system. The t-mac commissioning agent can interpret project documents and prepare the configuration. It can create devices and points, set communications details, check the setup

Ian Berry, Development Director at t-mac, looks at how AI agents could change the way buildings are commissioned, monitored and managed.



against project requirements and prepare commissioning records. It can also flag missing or conflicting information before work proceeds.

An engineer reviews each stage and approves the configuration before it is applied. Tasks involving device setup and reporting, which can occupy several days, could be completed within minutes. Engineers would have more time for design decisions, validation, optimisation and customer needs.

SUPPORTING BUILDING OPERATIONS

Once a building is running, the agents can help teams make sense of alarms, performance changes and unusual consumption. An alert might bring together operating conditions, device history and consumption data, giving the facilities team somewhere useful to begin its investigation.

As the technology develops, agents could carry out approved routine actions, such as changing an output or adjusting an operating setting. The system would retain a record of what was recommended, approved and completed.

The energy-management agent could eventually connect the way a building operates with the way its energy is bought. By reviewing consumption patterns, peak demand and cost

drivers, it could show how operating schedules affect expenditure. In time, it could compare available tariffs with the building's consumption profile and support future contract decisions.

The result would be a building-management team supported by digital colleagues with clearly defined jobs. Their usefulness will rest on measures such as the quality of their work, the problems they help uncover and the time they give back to skilled staff.

t-mac will unveil its Virtual Assistant at this year's Smart Buildings Show. Visitors can see it in action and discuss how specialist agents could support their buildings and estates.

ABOUT THE AUTHOR

Ian Berry is Development Director at t-mac, where he leads the development of building and energy-management technology that helps people access, understand and use operational data. www.t-mac.co.uk



BEHIND THE AI HEADLINES, THE SMARTEST BUILDINGS STILL NEED A HUMAN HEART

Adrian Barber, Head of Comms. at Prefect Controls comments on the AI bandwagon.

I was at a tech exhibition recently where AI was the word on every stand. Every banner, every demo, every conversation. But behind the headlines, much of it felt like technology for its own sake. AI was bolted on not because it helped the end user, but because it helped the company look current.

AI is a tool. Like any tool, it's only worth having if it adds real value. That brought me back to a simple truth.

Every building has a job to do. But behind every meter reading, every degree of temperature, every litre of hot water, there's a person trying to get on with their day. That's easy to lose sight of in an industry that talks mostly in kilowatt-hours and carbon savings, and now, AI.

Those numbers matter. But the real test of any smart building system isn't how clever it is. It's whether it makes life better for the people living and working in that building, and easier for the people running it.

WHAT THAT LOOKS LIKE IN PRACTICE

For occupants, it means comfort they don't have to think about. Rooms that stay warm. Hot water that's safe and always ready. Air that's monitored so it stays healthy to breathe, sleep and study in. And predictive maintenance means many faults are fixed before they disrupt someone's day, not after a call to the front desk.

It means safety working quietly in the background. Kitchen sensors that detect unattended cooking and cut the



risk of fire before it starts. Leak detection that catches water damage early, before it becomes a costly, disruptive repair.

And it means sustainability without sacrifice. The best systems don't ration comfort to hit a target. They simply stop energy going to waste, turning things down when a room is empty, when windows are left open, or when hot water isn't being used. Across a portfolio, that adds up fast. One student accommodation portfolio saved 8,000 tonnes of CO₂ this year alone, the equivalent of planting 350,000 trees or taking 5,000 cars off the road for a year. Smarter buildings don't just cut bills. They cut real, measurable carbon at scale.

For landlords and accommodation providers, it means visibility they've never had before. Real-time data across a portfolio, presented clearly, means problems are solved before residents even notice. That's better for compliance, better for duty of care, and better for the bottom line.

Underneath all this sits communication. Messages shown directly on the room controller, at the point of interaction, give residents a heads-up about planned maintenance, a safety alert or an energy-saving tip.

Nothing gets lost on a noticeboard, in an app nobody opens or an email nobody reads. Messages tailored to individual rooms build trust by showing that each person matters.

HOW THIS GETS BUILT

None of it works without control, visibility and intelligence running through the whole system. Sensors gather real-time data from every room. That data gives operators the visibility to act earlier. And built-in intelligence, including AI where it genuinely earns its place, turns that information into something useful: automated responses, predictive alerts, and messages that reach the right person at the right time.

That's the engine behind any worthwhile system. But it should never be the headline. The headline is always the person in the room, and the responsibility that comes with looking after the building around them.

Smart buildings should work for everyone who depends on them. Get that right, and the energy savings, safety improvements and sustainability gains all follow naturally. www.prefectcontrols.com



THE ENERGY BEHIND AI: WHY EVERY AI BREAKTHROUGH DEPENDS ON RELIABLE ELECTRICITY

Every chatbot, image generator and AI-powered search relies on data centres running around the clock. Those facilities don't simply consume electricity. They need a constant, dependable supply of it, every hour of every day. As more data centres are built, their need for reliable energy is becoming impossible to ignore.

It's easy to assume this is simply a generation problem. Build more wind farms. Install more solar. Increase capacity and demand will take care of itself. I don't think it's that simple.

For decades we've built an energy system around a single assumption: electricity is generated in one place and transported to another. That model has served us well, but it also means every new source of demand places another burden on the same infrastructure. AI hasn't created that problem. It's simply making it much harder to overlook.

BIGGER GRIDS AREN'T THE ONLY ANSWER

The UK is investing heavily in grid infrastructure because it has to. More renewable generation, electrified transport

Every major AI announcement is followed by the same conversation. We talk about faster models, bigger investments and the industries that could be transformed. Much less attention is paid to the infrastructure quietly making all of that possible. Here, *David Axon*, chairman of AirPlus Renewables, explains why the rapid growth of data centres is exposing the limits of a centralised energy system and why generating more electricity at the point of use must become part of the solution.

and the growth of AI all require a stronger network. However, the network is already struggling to keep pace. In some parts of the country, renewable electricity cannot always be accepted by the grid, meaning generators are paid to reduce output while consumers continue to fund investment in additional infrastructure. Nobody would argue against strengthening the grid, but the question is whether it should be expected to carry an ever-growing share of our energy demand.

If a business can produce some of its own electricity where it is consumed, that electricity doesn't need to travel hundreds of miles across the network. Scale that across thousands of commercial sites and the conversation changes. You're no longer asking how to move ever greater volumes of electricity around the country. You're asking where it makes most sense to generate it in the first place.

DATA CENTRES ARE CHANGING THE CONVERSATION

Data centres are often discussed as if they're a unique challenge, but they're really a sign of something much bigger. Hospitals, factories, logistics hubs and transport infrastructure are all becoming more digital. They're processing more information, relying on more connected equipment and placing greater demands on electricity than they did ten years ago. AI just happens to be accelerating the trend.

That means energy resilience is becoming as important as energy efficiency. Organisations aren't only looking at how much electricity they consume. They're asking where it comes from, how exposed they are to the grid and whether there are practical ways to generate more of it themselves.

LOOKING BEYOND SOLAR

Solar has transformed on-site renewable generation. It deserves enormous credit for that. It has also demonstrated that businesses are willing to invest in technologies that reduce reliance on imported electricity. There is no reason that conversation should stop with solar.

Wind has often been dismissed in built environments because traditional turbines were designed for open landscapes rather than the complex airflow found around buildings. That's left a significant source of renewable energy largely untapped.

At AirPlus Renewables, we've approached the challenge differently. Our technology is designed to make use of airflow that conventional systems tend to ignore, including the turbulent conditions commonly found around commercial buildings and infrastructure. XEVA® applies that thinking in a compact, modular system that can sit alongside other renewable technologies instead of replacing them.

Rather than treating the turbulent airflow around buildings as something to avoid, EDGEWIND™ Tech has been developed to make use of it. Conventional small wind turbines have typically been designed for smooth, uninterrupted wind found in open spaces, limiting their effectiveness in urban and industrial environments. EDGEWIND™ Tech takes a different approach, capturing both turbulent and non-turbulent airflow to generate electricity closer to where it is consumed. XEVA® applies this principle in a compact, modular system that can be installed on commercial buildings and other constrained sites, complementing existing renewable technologies such as rooftop solar rather than replacing them.

I don't see decentralised wind as an alternative to large wind farms or the national grid. It fills a different role. By generating electricity at the point of use, technologies such as XEVA® reduce dependence on grid infrastructure, which is becoming increasingly constrained and increasingly expensive to expand. The less electricity that needs to be transported across the network, the less pressure there is on a system that is already struggling to accommodate growing demand.

A DIFFERENT WAY OF THINKING

The growth of AI is forcing us to rethink more than computing power. It's prompting a wider conversation about how electricity is generated and distributed.

The question is whether every new electricity demand should be met by asking more of the same network, or whether some of that demand could be met much closer to the point of use.

For me, that's where the real opportunity lies. Data centres may have brought the issue into focus, but the lesson stretches much further. The businesses that build greater resilience into their energy supply today will be better prepared for whatever comes next. <https://airplusrenewables.com/blog>

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HEAT PUMPS IN ACTION: HOW COMMERCIAL HP SYSTEMS IMPROVE EFFICIENCY & LOCAL AIR QUALITY

Rinnai's *Peter Seddon* explains how heat pump technology in commercial applications can improve system efficiency and contribute towards national decarbonisation targets. Heat pumps are fast becoming a widespread and viable option for business owners who require heating and hot water. Find out how investing in a heat pump can benefit commercial projects.



Heat Pumps are a viable technology that efficiently provides warmth and heated water. Although the UK is still reliant on fossil fuels, heat pump adoption is a growing trend amongst UK customers. Currently just 1% of homes use heat pumps as a primary source of heating and hot water. For every heat pump sold, there are 15 gas boilers purchased.

But, as of 2024 UK heat pump sales were recorded at 98,345, up from 62,906 from 2023. Between 2025 and 2030 the UK heat pump market is expected to expand by 11.10% CAGR. So, how can a heat pump benefit the property of a business owner or homeowner?

Rinnai can demonstrate the benefits of real-life heat pump installations through three separate case studies that display the advantages of heat pump adoption in a commercial application.

CASE STUDY 1

The location is a three-story Welsh science park with a BREEAM excellent facility providing offices, laboratories, and workshops for up to 700 people. It functions as a central hub for start ups, research teams and established technology focused organisations.

Wales's first dedicated science park selected a custom Rinnai R290 High

Temperature ASHP system with full Modbus BMS integration to support its low carbon heating and hot water strategy. The installation includes ten 27 kW R290 heat pumps, sourced from Rinnai's 21–27 kW R290 range.

Each unit delivers a SCOP of 3.21 at a 65°C flow temperature, supported by a custom designed 3000 litre buffer vessel engineered specifically for the site's needs. The system is capable of producing high temperature output up to 75°C, and all units were supplied with anti corrosion protection to ensure durability in the park's coastal environment.

The science park required a robust, energy efficient, low carbon heating and hot water system suitable for a large mixed-use building. Specific needs included:

- High water temperatures for diverse building demands
- Meaningful carbon reduction to support sustainability goals
- Strict height and weight limitations for rooftop installation
- Resistance to corrosion due to coastal air conditions

To meet these challenges, the client sought a partner offering custom engineering, technical expertise, and full mechanical design support. The science park selected Rinnai after assessing the company's R290 high temperature

heat pump range, technical capability, and in house design experience.

Rinnai delivered a complete, site-specific solution including:

- 10 × 27 kW R290 ASHP units, each treated with anti corrosion coating for coastal protection.
- A custom built 3000 L buffer vessel engineered for mechanical compatibility
- Full Modbus BMS integration for streamlined control
- Optimised rooftop configuration to minimise height and distribute system weight

Rinnai's R290 technology is low-gwp, quiet operation, enables water temperatures up to 75°C, and ensures compliance with European F Gas phase down regulations. For tailored system selection the client also accessed Rinnai's design support tools.

The science park now benefits from a future proof, low carbon heating and hot water system that reduces operational impact while maintaining high performance.

Key outcomes include:

- Meaningful carbon reduction through R290 low GWP refrigerant
- High temperature output suitable for laboratories, offices, and workshops
- Greater energy efficiency, supporting long term cost control
- Resilient system performance

- with anti corrosion protection
- Seamless BMS integration for optimal operation

The Rinnai range also includes scalable larger systems for future expansion, such as the 40–410 kW R290 commercial series.

The Welsh science park now operates a reliable, efficient, and low carbon heating and hot water system aligned with long term sustainability goals.

CASE STUDY 2

An additional example of Rinnai's heat pumps providing operational efficiency to a commercial site is located at a landmark commercial office development in central London that required a high-performance domestic hot water (DHW) solution capable of meeting peak occupier demand while fitting within a tightly constrained plantroom envelope.

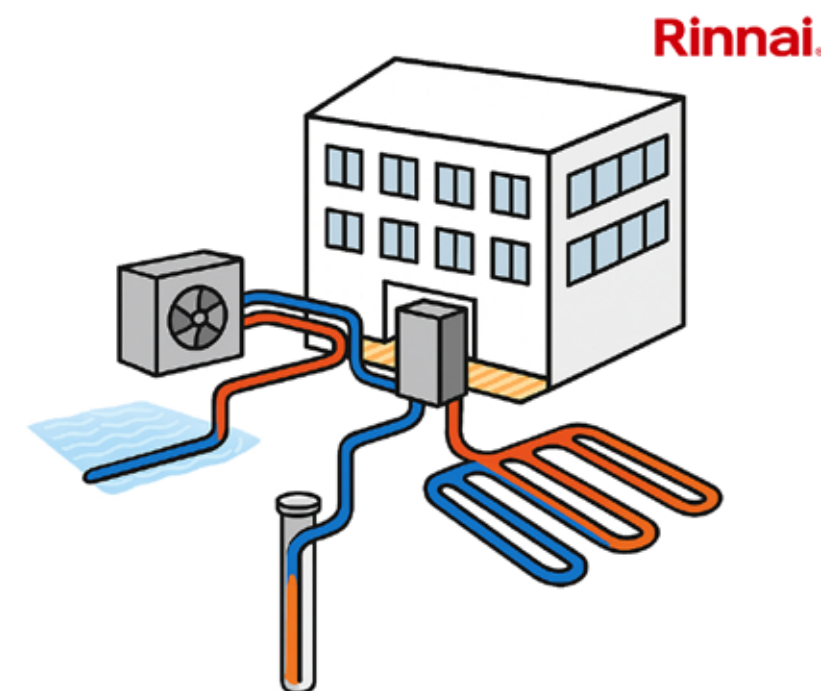
A leading building services engineering consultancy worked with Rinnai's low GWP commercial heat pump technology to design a DHW system comprising two 40kW R290 air source heat pumps, complete with plate heat exchangers and DHW storage.

The resulting solution successfully meets a daily hot water demand of approximately 1,600 litres, achieves a rapid recovery time of around 85 minutes at –7°C ambient temperature, and delivers a future ready, low GWP refrigerant strategy with integrated safety and control measures embedded into the system design.

To explore Rinnai's full commercial product range: <https://www.rinnai-uk.co.uk/products>

The client is a leading independent, global multi-disciplinary consultancy delivering innovative and sustainable engineering solutions for complex commercial developments. The practice is particularly experienced in the delivery of Grade A office buildings, where plant space optimisation, resilience, and low carbon performance are critical to both landlord and occupier requirements.

The office building required a domestic hot water system capable of supporting a daily demand of approximately 1,600 litres, with a maximum recovery period of 120 minutes, to ensure reliable service during peak occupancy.



Key challenges included:

- Highly constrained plantroom space, typical of dense city centre office developments
 - The need for robust winter performance
 - Compliance with evolving refrigerant and decarbonisation legislation
 - Confidence in system safety and long-term operational resilience
- Design performance was assessed at –7°C ambient temperature, ensuring reliable hot water availability even under peak winter conditions.

THE SOLUTION

Rinnai UK worked collaboratively with the project team to develop a high temperature R290 air source heat pump solution, specifically configured for commercial DHW production within a restricted plant environment.

The proposed system used two 40kW R290 inverter monoblock air source heat pumps, supported by high temperature plate heat exchangers, inline buffer vessels, and DHW pre feed storage, ensuring both hydraulic stability and rapid recovery performance.

To learn more about Rinnai's R290 commercial heat pump range: <https://www.rinnai-uk.co.uk/products/commercial-heat-pumps>

KEY SYSTEM COMPONENTS INCLUDED:

- 2 × 40kW R290 high temperature air source heat pumps
- Brazed high temperature plate heat exchangers, providing hydraulic separation.
- Inline buffer vessels, maintaining minimum primary water content.
- 800L PHE pre feed vessels, supporting peak DHW demand and recovery.
- Modbus activation, enabling seamless future BMS integration.
- Integrated refrigerant gas leak detection, enhancing on site safety.

The final design delivered a calculated DHW recovery time of approximately 85 minutes, comfortably exceeding the original performance requirement.

"The solution provided both the recovery performance and sustainability credentials required for a high specification commercial office environment." – Building Services Consultant

For support with system selection and early stage design: www.rinnai-uk.co.uk/contact-us/help-me-choose-product

The proposed DHW system delivered multiple performance and operational benefits aligned with modern office development expectations:

- DHW recovery achieved in under 90 minutes

Cont'd...

- Reliable winter performance validated at -7°C ambient.
- Low GWP R290 refrigerant, supporting future F Gas and decarbonisation compliance.
- Enhanced system safety, via integrated refrigerant gas detection
- Flexible monitoring and control, enabled through Modbus connectivity.

Rinnai UK's early design engagement helped provide confidence from concept stage through to proposed installation, supporting both technical compliance and broader sustainability objectives.

This project demonstrates how early collaboration and thoughtful product selection can deliver a high performance, low carbon DHW solution suited to the challenges of central London office developments, without compromising on safety, resilience, or space efficiency.

By combining the consultancy's engineering expertise with Rinnai UK's R290 heat pump technology, the project team achieved a future ready solution aligned with landlord, occupier, and decarbonisation goals.

CASE STUDY 3

A final example of the positive impact that Rinnai heat pump systems are demonstrated by the installation of a cascade of R290 air source heat pumps with thermal store, at a well-established, publicly accessible visitor attraction focused on environmental education and community engagement. The site required a future proof heating system aligned with its sustainability ethos.

A UK-based public visitor attraction within the environmental and education sector implemented a low carbon heating upgrade using a cascade of R290 air source heat pumps integrated with a thermal store. The system delivers a total of 71.2kW of heating output at design conditions and has been engineered to provide high temperature performance with a 70°C flow. As a result, the solution achieves improved energy efficiency while significantly reducing the site's overall carbon impact, supporting both operational performance and sustainability goals.

PROBLEM

The client needed to upgrade to a low carbon heating system while maintaining high-temperature performance suitable for existing infrastructure.

A key technical challenge was achieving reliable output at low ambient temperatures (-4°C) without compromising efficiency. Traditional systems raised concerns around rising operational costs and carbon emissions.

For more information, see **UK strategy for low-carbon heating and buildings**.

"We needed a solution that would deliver both performance and sustainability, without compromising on reliability during colder periods."

SOLUTION

A cascade system incorporating two 50kW R290 air source heat pumps was selected from the **Rinnai low-GWP heat pump range**.

R290 refrigerant was chosen due to its very low global warming potential and high efficiency performance, helping meet decarbonisation goals.

System design highlights:

- Designed to operate at $70/65^{\circ}\text{C}$ (flow/return) at -4°C ambient
- Output at design conditions: 35.6kW per unit (71.2kW total)
- Nominal flow rate: 2.148 L/s per ASHP
- Head pressure: ~ 105 kPa (with pump kit)

The system utilised a cascade configuration – supported by Rinnai's modular approach to heat pump design, enabling multiple units to operate efficiently together.

A thermal store was integrated between the primary and secondary circuits to optimise system stability and demand response. The secondary circuit operated at $70/59^{\circ}\text{C}$, requiring careful control of return temperatures.

Close coordination ensured consistent $70/65^{\circ}\text{C}$ operation between the ASHP cascade and thermal store, maintaining optimal performance across the system.

"The cascade design allowed us to balance load efficiently while ensuring the system could meet peak heating demands."

The completed system successfully delivered a high performance; low carbon heating solution tailored to the client's requirements.

KEY OUTCOMES:

- Reliable high temperature heating, even in winter conditions
- Reduced carbon footprint through use of R290 refrigerant
- Improved system efficiency via precise flow/return temperature management
- Flexible, scalable cascade system for resilience and load matching

The use of advanced R290 heat pump technology allows systems to deliver hot water temperatures up to $\sim 75^{\circ}\text{C}$, making them ideal for retrofit and high demand applications.

"The system has given us confidence in both performance and energy efficiency – it's a future proof solution."

This project highlights how modern heat pump technology, such as the **Rinnai commercial heat pump range**, can successfully deliver high temperature heating in complex, real-world environments.

Commercial heating will be dictated by the decision to embrace wider electrification throughout the UK. To prepare for this transition commercial and domestic property owners should be aware of the various heat pumps that are available on the open market.

Rinnai's range of R290 and low-GWP high temperature commercial heat pump technology consist of a wide range of models extending from our large residential air source heat pump range, which includes models between 6kW to 27kW, making them a flexible option for your hot water and central heating needs.

Rinnai's commercial heat pumps are available from 40kW to 110kW models that are proven to lower energy bills versus some conventional heating systems including fossil fuel boilers. The commercial range also used natural refrigerants such as R290.

To take advantage of Rinnai Design Support Services and review the ideal solution to reduce energy costs, maximise return on investment and apply renewable energy sources and lower carbon footprints, invest in a Rinnai heat pump.

HIGH TEMPERATURE HEAT PUMPS: THE KEY TO NON-DISRUPTIVE RETROFITS

Rinnai's Head of Technical, Pete Seddon, discusses how high temperature heat pumps can be considered a vital innovation in relation to the reduction of on-site disruption to a UK customer. Heat pumps have been identified as a tool of decarbonisation and installations are becoming more common in domestic and commercial applications. Find out how investing in a high temperature heat pump can minimise on-site disruption during installation.



Heat pumps are a key element in the aim of national decarbonisation but can be problematic when installing. If a low temperature heat pump is installed into a commercial premise a noticeable amount of disruption will occur.

Many changes to the heating system may have to be made including the radiators, pipework and electrical upgrades. The radiators may have to be replaced as heat pumps operate at a lower flow temperature (between 35°C – 55°C) than a traditional gas boiler that usually operate in between 60°C – 75°C . To provide enough heat for the property new radiators may potentially have to be installed.

Pipework may experience some changes also – low temperature heat pumps require a higher level of water flow rate than boilers to operate efficiently that smaller pipes do not encourage. Larger pipes transfer heat effectively and efficiently at lower temperatures.

Electrical upgrades will also be required if a normal temperature heat pump is installed. As the main source of power is transitioned from fossil fuels to electricity, a service panel that is only designed to operate at 100-amps will not be sufficient. Heat pumps require high voltage circuits when activated in cold weather.

High temperature heat pumps (HTHPs) can limit the adaptations to radiators or pipework when retrofitting. Because high temperature heat pumps produce water that is heated at similar levels when compared to a gas boiler, at 55 – 80°C – therefore there is potential for limited additional requirements to rip out radiators or replace pipework. The design of a high temperature heat pump means that an installation could work with existing infrastructure, not against.

When a high temperature heat pump is compared to a standard heat pump in terms of installation, a HTHP is less problematic, quicker. Radiator and pipework compatibility means the

HTHP can operate once installed.

Rinnai R290 high-temperature air source heat pumps are ideal for DHW and heating projects. The R290 commercial air source heat pumps can be cascaded for greater heating and DHW output and is a market leading LOW-GWP heat pump that offer advanced controls.

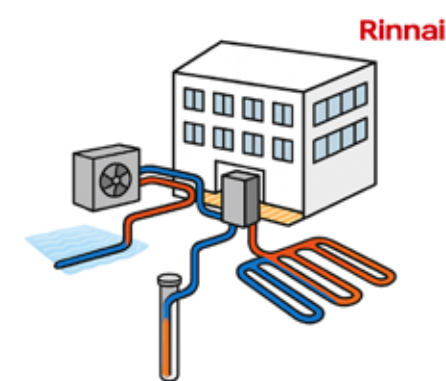
Learn more about Rinnai HTHPs today <https://www.rinnai-uk.co.uk/products/commercial-heat-pumps>

The R290 high-temperature heat pumps supply hot water up to 75 degrees ensuring system and design flexibility. The Rinnai range of heat pump technology comes with a smart control system that features demand side response functionality which further future-proofs sustainability.

All R290 models have low noise capability making them suitable for areas with prohibitive sound legislation. The air source heat pumps from Rinnai use R290 natural refrigerant gas which has a GWP (global warming potential) of three, ensuring that the Rinnai R290 high-temperature heat pump range is a sustainable and a future proof heating and DHW solution.

The range has a SCOP A+++ due to the increased efficiency achievable with the use of R290 refrigerant gas, meaning that the Rinnai range of high-temperature heat pumps is one of the most cost-effective and economical heating solutions available.

At Rinnai we recognise the importance of design support and system efficiency, to support this observation and customer commitment Rinnai utilise SPF (Seasonal Performance Factor),



capital expenditure and operational expenditure to deliver your projects design towards the best possible solution. To take advantage of these services use our "help me choose" service today, by following this link **Help me choose a product : Rinnai UK**

Rinnai also offer a range of products across several technological platforms and energies. Rinnai hybrid heat pump systems can accept clean electricity, natural gas and solar thermal. Rinnai Smart System can be programmed to switch fuels to maximise overall performance. www.rinnaiuk.com

ARE WE DESIGNING HEAT PUMP SYSTEMS FOR THE CLIMATE CHANGES AHEAD?



UK buildings have traditionally been designed around one dominant thermal challenge: keeping people warm. However, as our summers get hotter, those same buildings increasingly need to keep people cool.

The Climate Change Committee warns that heatwaves are expected to exceed 40°C in all parts of the UK by 2050. Without further adaptation, it estimates that heat-related deaths during heatwaves could rise from around 1,400–3,000 a year today to as many as 10,000.

For energy and estates managers planning heat pump projects today, that changes the brief substantially.

**Laura Bishop, Co-founder,
HI Group and HPA UK Chair**



Systems installed now should remain in operation for decades, so future cooling demand needs to be considered alongside heating requirements when making decisions about design and wider energy infrastructure.

BUILDING COOLING INTO PLANNING

Many heat pumps can operate in reverse, moving heat out of a building to provide cooling and bringing it in

when needed. For organisations already looking to replace fossil fuel heating, this creates an opportunity to consider future cooling needs as part of the same investment.

This is particularly relevant for large or mixed-use buildings, where thermal demand can vary significantly across a single site. A hospital, for example, has wards, theatres, offices and equipment-intensive areas with vastly different

requirements – some spaces may need cooling while others still require heat.

Certain heat pump configurations can meet these demands simultaneously by recovering heat from areas being cooled and transferring it elsewhere in the building. These demand patterns need to be understood from the outset, as they directly shape system design, sizing and control.

HOW DESIGN SHAPES PERFORMANCE

The ability to provide both heating and cooling depends on more than the heat pump itself. Existing distribution systems, emitters, controls and building fabric all affect what is technically possible and how efficiently the system will perform.

An air-to-water heat pump, for example, may be capable of reversible operation, but the pipework and emitters also need to support cooling. Ground-source systems offer different possibilities. Some can use the relatively stable temperature of the ground to provide passive cooling, using less electricity than active cooling.

Load profiles are equally important. The timing and scale of heating and cooling demand will affect system sizing, operating strategy and energy use. Where heat recovery is viable, it can further reduce the energy needed to meet simultaneous heating and cooling loads.

Taken together, these factors determine which system

configuration will deliver the best performance for a particular site.

WHAT COOLING MEANS FOR ELECTRICITY DEMAND

Greater cooling demand will inevitably increase electricity consumption. The Climate Change Committee estimates that cooling could add 15–30 TWh to annual UK electricity demand by 2050, equivalent to around 5–10% of current annual electricity use.

At site level, that additional demand needs to be considered alongside the wider electrification of estates. Heat pumps, EV charging and other electrical systems can all increase peak loads, with implications for grid capacity and infrastructure upgrades.

Onsite generation can help offset some of this demand. Solar PV is particularly relevant because cooling requirements tend to increase during periods of stronger solar generation. The extent of that benefit will depend on when electricity is being generated and consumed, reinforcing the need to understand a site's demand profile when planning its energy infrastructure. Used in combination, thermal storage helps to offset peak demand and extends the benefit of energy generated onsite.

PLANNING FOR FUTURE CONDITIONS

Historical energy use can tell us how a building has performed, but it cannot show how its cooling requirements

could change as temperatures rise. That makes forward-looking analysis increasingly important when making long-term investment decisions.

Dynamic thermal modelling can assess how a building is likely to perform under future weather conditions, identifying areas at risk of overheating and estimating peak cooling loads. It can also test the impact of measures such as shading, ventilation and changes to building fabric before determining how much active cooling is needed.

Combined with an understanding of heating demand, electrical capacity and planned changes across the estate, this gives energy managers a stronger basis for specifying systems that will remain suitable over their expected lifetime.

A LONGER-TERM VIEW OF SYSTEM DESIGN

Heat-pump systems installed today will operate in a UK climate that looks increasingly different from the one most of our buildings were designed for. Factoring future cooling demand into heat-decarbonisation plans now can help estates make better use of their investment and avoid costly changes later. For energy managers, cooling needs to be part of the conversation from the earliest stages of system planning. www.higroupltd.co.uk

SOURCES:

A Well-Adapted UK; The Fourth Independent Assessment of UK Climate Risk, The Climate Change Committee

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THE OVERLOOKED ROLE OF BILLING IN HEAT-NETWORK EFFICIENCY

Heat-network billing brings together several of the measures used to assess operational performance, including primary energy input, metered consumption, network costs and resident recovery. Examined collectively, this information can reveal changes in consumption, gaps in meter data, deteriorating infrastructure, distribution losses and tariffs that no longer reflect current operating conditions.

In my experience, accurate billing and apportionment form an important part of the energy efficiency ecosystem, giving energy and building managers a stronger evidence base for technical investigation, investment decisions and ongoing network improvement.

ESTABLISHING A RELIABLE POSITION

Effective management requires an accurate account of the energy purchased, the costs recovered and consumption recorded at property level. Supplier invoices should be checked against contract terms and reconciled with the energy delivered to the site.

This becomes more difficult across portfolios containing networks developed or acquired at different times. Supply contracts, metering technologies and billing methods may vary considerably, while historic tariffs can remain after the underlying contract or consumption profile has changed.

A common assessment method allows each network to be reviewed according to its supply arrangements, operating characteristics and available meter data. This provides the baseline needed to determine whether changes in cost or consumption reflect market conditions, resident demand, data quality or network performance.

Bogdan Palaghioi, Business Development Manager, Welcome Energy

USING BILLING DATA TO IDENTIFY PERFORMANCE ISSUES

Comparing primary energy input with recorded end-user consumption can help reveal discrepancies from distribution losses, communal consumption, inefficient plant operation, incomplete readings, or faults affecting individual meters.

Likewise, consumption patterns can provide further insight: a sudden reduction may indicate a communications failure, whilst an unexplained increase could relate to equipment performance, occupancy or an operating schedule that no longer reflects how the building is used.

Many existing heat networks operate at efficiencies of around 35% to 45%, meaning that more than half of the primary energy input may not reach end users as metered heat. Comparing energy entering the network with billed consumption helps quantify these losses, identify poorly performing sites and prioritise further investigation.

These figures will not diagnose the underlying problem independently, but they can help energy managers identify where technical assessment is required. Used alongside plant and network information, billing data can be used to benchmark whether previous interventions have improved performance.

MAINTAINING AN APPROPRIATE TARIFF

Energy contracts change, consumption fluctuates and recoverable costs develop over time. A unit rate based on historic expenditure may cease to reflect the cost of

operating the network.

Comparing supply expenditure with resident recovery shows whether the tariff remains appropriate. This reconciliation can identify under-recovery, unsupported charges or assumptions that no longer reflect site conditions.

Considering procurement, metering, consumption and recovery together also improves management information. Changes in expenditure can be traced to their likely source, supporting decisions around maintenance, metering infrastructure, energy procurement and network improvement.

APPLYING THE APPROACH ACROSS A PORTFOLIO

Welcome Energy recently reviewed more than 40 communal and district heat networks serving several thousand apartments across the UK. The portfolio had expanded through acquisitions and new developments, resulting in different metering technologies, procurement arrangements and billing methods.

We reviewed the energy contracts and utility invoices for each network, combining billing data with the client's existing supply, consumption and portfolio information to establish the relevant costs and their appropriate apportionment. This created a consistent basis for reviewing expenditure, consumption and recovery, while retaining the site-level detail required to develop appropriate unit rates, identify differences between networks and give the client clearer oversight of its recovery position.

This joined-up view supports fair charging, stronger financial control and better use of existing data, giving energy managers a clearer understanding of network performance and where maintenance, investigation or investment may be required.

ABOUT WELCOME ENERGY

Welcome Energy provides specialist metering and billing services for communal and district heat networks across the UK. The team reviews energy contracts, validates supply costs, manages meter data and delivers consumption-based billing services for heat-network owners, managing agents, developers and operators. www.welcomeenergy.co.uk



AI IN HEAT NETWORKS: THE KEY TO OVERCOMING THE HNTAS DATA CRUNCH?

The UK's heat network sector reached a milestone in July. The first tranche of reporting under the new heat network regulations is now due, giving energy managers a glimpse of the data-heavy future facing the sector. With the Heat Network Technical Assurance Scheme (HNTAS) expected to require even more detailed operational reporting, many operators are already seeing the scale of the challenge ahead.

Under draft HNTAS requirements, networks are moving from occasional billing reads to continuous, granular monitoring. Six core elements are covered, running from the energy centre through to the point of use. Five and 30-minute data collection, alongside the monitoring of flow temperatures, volume and a wider range of performance metrics currently proposed, will generate far more data than most legacy systems were built to handle.

A STEP CHANGE IN DATA DEMANDS

One or two meter readings a month used to be enough to satisfy billing requirements. Visibility beyond that was limited – spotting an outage early, or tracking consumption trends in any detail, typically meant paying for external software to extract and interpret the data.

HNTAS will shift the dial somewhat. Building software to manage this new level of detail from scratch used to take the best part of a year, but what if there was another way?

AI has the power to drastically cut that lead time down. Now, functional tools can be developed in a matter of days. Only the front-end design work, i.e. the parts a team member sees and interacts with, take up any meaningful time beyond that.

We engage with AI throughout our daily lives, often without realising it. So why not apply it to the systems heating our homes, and harness its benefits there?

FROM SPREADSHEETS TO LIVE DIAGRAMS

This was my thought process when I first attempted just that. An AI-powered dashboard built entirely by our own team, which is now in the beta testing phase and currently being used internally, Vista offers a centralised view

Adam Newman, Head of Technical Solutions at Insite Energy explains what benefits AI could offer the industry at a crucial time



of the metering data we hold across all teams.

What started as a solo project has since grown into a tool that replaces static spreadsheets and periodic reports with a live dashboard that shows every installed meter across a site, from individual blocks through to offices and commercial units.

Full historical Insite data, including any technical faults or gaps, for each meter is available to the team. A portfolio view sits alongside this, allowing entire estates to be assessed holistically as opposed to one site at a time.

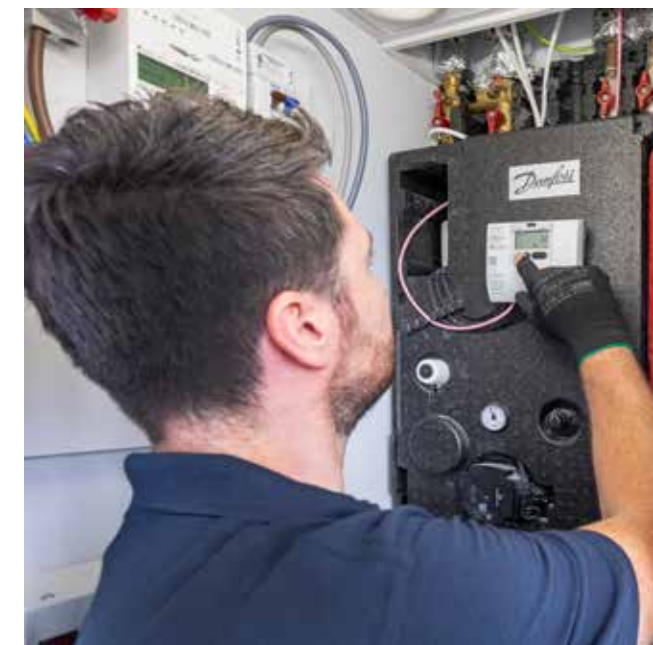
Gap analysis and assurance work, once carried out manually, now happens live. Raw data is turned instantly into site diagrams that support internal teams with site configuration, residential onboarding and billing queries.

Speed is another important consideration. Under the old monthly billing cycle, an outage could go unnoticed for up to 30 days. Vista flags a missed data transmission within two hours, giving teams the chance to resolve issues long before they show up as hidden heat loss or a compliance gap.

WHAT THIS MEANS FOR ENERGY MANAGERS

The benefits of an AI-incorporating approach go beyond compliance paperwork – a network running efficiently, with full data completeness, uses less energy to deliver the same output. That has a direct bearing on carbon emissions as well as cost; two priorities that sit high on many energy managers' agendas.

While Vista is still in the beta phase, its value lies less in the specific product and more in what it represents: a working example of how AI can be applied to a genuine operational problem,



built quickly and shaped around the expected regulatory requirements.

Other operators are likely to reach similar conclusions: having all metering data in one place supports clients as well as internal teams. AI-assisted tools, whether developed internally or sourced externally, offer a practical route to this.

There is also a longer-term regulatory dimension worth considering. HNTAS is unlikely to be the last scheme to demand this level of granular reporting, and the systems put in place now will need to adapt as requirements evolve. Tools built with flexibility in mind stand a better chance of keeping pace compared to bolted-on solutions made for a single purpose.

As HNTAS moves from consultation to enforcement, the service providers best placed to support compliance will be those who can ensure data completeness and confidence. Energy managers who oversee multiple sites will require that reassurance, whatever the regulations require at any one time. <https://insite-energy.co.uk/>

PIPELINE TO PROFIT – FLEXIBILITY FOR HEAT NETWORK OPERATORS

Enel X explores how heat networks can turn existing assets into a source of flexible revenue, without new investment or added complexity.

Heat networks are primed to become a central part of the UK's heating strategy as it accelerates toward net zero. Space heating in buildings accounts for roughly 17% of UK emissions, and pivoting away from individual gas-based systems will drastically reduce that number.

As such, the market is predicted to grow significantly. Today heat networks account for around 3% of space heating, but based on the UK's net zero projections, that should increase to 20% of the market by 2050. In Northern Europe, meanwhile, these technologies already account for over half of all demand in some cases.

For heat network developers, this is a clear commercial opportunity: a new and rapidly growing market. However, when building a new network or running one of the UK's 14,000 networks currently in operation, most developers and operators are overlooking a significant pipeline of additional profit.

Heat networks are an ideal source of flexible energy demand, and as the UK's grid becomes increasingly volatile – with higher peak demand and more intermittent generation – network operators are increasingly willing to pay for that flexible load.

FLEXIBILITY AS A ROUTE TO REDUCED BILLS AND INCREASED REVENUE

The primary consumer benefit of heat networks is cheaper, more affordable heat. Through a range of system-level benefits and bulk energy purchasing,



bills can be reduced for the end-user.

Energy flexibility, i.e., the ability to turn up or turn down a load, is also a route to cheaper bills. Without changing the services that customers receive, heat network operators can control when their assets draw – or in some systems generate – electricity. This allows them to pull power when electricity is cheap, for example, or curtail their demand when it is more costly. In short, flexibility allows for smarter energy purchasing.

Flexibility markets, however, are also a revenue stream for operators. In an analogous manner to turning up and down when electricity is cheap, heat networks can turn up or down when a flexibility market signal tells them to. These markets, via energy aggregators like Enel X, effectively reward this activity because it provides grid balancing services that are fundamental to the efficient and secure operation of the UK's grid. For example, if power is peaking, say, because all of the UK's EVs have plugged in after the commute home from work, markets will reward participants who are capable of temporarily reducing their demand. Heat networks are well-placed to meet these sorts of demand signals, generating a revenue stream from a range of flexibility markets in the process.

What are those markets? Well, depending on the assets and operating

profile of the heat network, they can participate in the Capacity Market, NESO balancing services, DSO flexibility, wholesale markets and more. And as long as there's a degree of inertia in a system, primarily in the form of thermal storage, then participation is simple and doesn't interfere with service delivery when deployed through the right platform.

JOINING A VIRTUAL POWER PLANT (VPP) FOR MAXIMUM BENEFITS

Heat pumps, electric boilers, CHPs and thermal storage can all take part in flexibility markets. These assets all have the ability to dynamically adjust their load to unlock additional value for heat network operators. In most cases, though, demand-side flexibility doesn't require new assets. It just requires heat network operators to enrol in a virtual power plant (VPP).

A VPP is a platform that pools a portfolio of flexible assets and coordinates them as a single, tradeable resource. Energy aggregators, like Enel X, operate VPPs. This means heat network operators don't have to take on the burden of understanding the complex flexibility markets, and the in-house expertise that would require. Instead, the aggregator will manage the process end-to-end, automatically

identifying the most valuable services for each asset, optimising participation and maximising revenue.

Being part of a larger VPP also has benefits beyond a single network's assets. Aggregated alongside hundreds of other assets and networks, participants can meet the minimum size and reliability thresholds that many flexibility markets require, opening up routes to revenue that would be out of reach alone.

WHAT'S NEXT?

For developers, flexibility can be designed in from the start. That means sizing thermal storage, electric boilers and heat pump capacity for market participation as well as peak heat demand. When done well, this can lower capital costs and reduce the grid connection capacity a scheme needs to secure. It can also strengthen the case for funding through schemes like

the Green Heat Network Fund.

For networks already running, the process starts with a detailed assessment. A VPP partner such as Enel X will gather an asset inventory, a heat demand profile, grid connection details, and any operational constraints to identify which flexibility markets suit the system best. The priority will always be to maintain consistent supply to end customers, but taking part in the right VPP will maximise the returns across the potential markets.

Enel X's platform already manages 11 gigawatts of flexible capacity across over 16,000 sites in more than 14 countries. That's proven scale, now being applied to a fast-growing heat network markets in the UK and Ireland. Ener-Vate and Mersey Heat are among the operators already putting flexibility to work with Enel X;



unlocking new income without disrupting the heat their customers rely on.

Whether you're planning a heat network or running one already, the opportunity is there. Don't overlook this pipeline to additional profit – get in touch with Enel X's UK flexibility team to find out where the value sits in your system.
<https://www.enelx.com/uk/en>



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DECARBONISING HOT WATER: THE CONTINUING ROLE OF NATURAL GAS

The UK remains heavily dependent on natural gas to heat properties and provide hot water. Official energy statistics indicate that gas remained the principal source of UK electricity generation in 2024 at around 30.4% of total generation, although renewables reached a record share overall (Department for Energy Security and Net Zero, 2025; Department for Energy Security and Net Zero, 2024). Industry and government data also show that boiler replacements continue to dominate the heating market, even as heat pump deployment is increasing from a lower base (MCS, 2024; Department for Energy Security and Net Zero, 2026).

Policy direction in England has been moving towards low-carbon heating in new buildings through the Future Homes Standard, which was announced to phase out fossil-fuel heating such as gas boilers in new homes and replace it with cleaner technologies, subject to final implementation timetables and building regulations (MHCLG, 2019).

Although policy and grant support are accelerating heat pump adoption,

Rinnai Director Chris Goggin investigates the ability of natural gas to cover all domestic requirements whilst the national task of decarbonisation continues. Natural gas is still integral to UK domestic and commercial property heating and hot water provision. Find out how natural gas can power the UK through decarbonisation aims.



gas boiler replacements still outnumber heat pump installations by a substantial margin in the existing stock. This means standalone gas boilers and systems are likely to continue playing a prominent role in UK heating in

the near term, particularly in retrofit markets (MCS, 2024; Department for Energy Security and Net Zero, 2026).

Natural gas is therefore likely to maintain a role in UK energy demand for the foreseeable future, even as

the system decarbonises. Britain's gas network remains extensive, with around 285,000 km of transmission and distribution pipework serving roughly 23 million properties, which explains why proposals for transition often focus on managed repurposing or staged reduction rather than rapid abandonment of infrastructure (Business Energy Deals, 2026; House of Commons Library, 2024).

Hybrid technologies are another area of heating decarbonisation. In principle, a hybrid system can combine a boiler with a heat pump so that households and businesses can reduce emissions without moving immediately to a fully electric solution, which may not always be practical because of technical, economic or property-specific constraints (Carbon Trust and Rawlings Support Services, 2016; Energy Systems Catapult, 2025).

A hybrid heating system typically accepts two separate sources of energy, most commonly electricity via a heat pump together with natural gas or LPG via a boiler. These systems are designed to optimise performance according to variables such as outside temperature, current energy prices, and space-heating or domestic hot water demand (Carbon Trust and Rawlings Support Services, 2016; SGN, 2025).

Using two energy sources in a single system can offer benefits for end users. One potential advantage is financial flexibility: where electricity prices are relatively high compared with gas, a well-controlled hybrid can help moderate running costs while still lowering emissions. Capital expenditure may also be lower than that of some full-electric retrofit options, depending on property characteristics and the extent of wider fabric upgrades required (Climate Change Committee, 2022; SGN, 2025).

In operational terms, a hybrid heating and hot water system combines technologies so that the heat pump can meet a larger share of demand in milder conditions, while the boiler can support peak loads or colder weather. In this way, the system can balance efficiency, comfort and resilience when correctly specified and controlled (Carbon Trust and Rawlings Support Services, 2016; Energy Systems Catapult, 2025).

This configuration can optimise the strengths of each technology under different weather and demand conditions; in particular, combustion-based water heating can help support domestic hot water performance where instantaneous or peak demand



would otherwise be challenging for an all-electric system without further upgrades (Carbon Trust and Rawlings Support Services, 2016).

A further benefit for the end-user is that both lifecycles of each technology is lengthened. As each technology does not have to apply full effort to satisfy demand, component and overall system longevity will be increased due to a lessening of required workload.

Hybrid systems can therefore offer a practical transitional route towards emissions reduction. Where projects cannot fully decarbonise immediately because of practical, economic or technical constraints, combining renewable and conventional technologies may provide a staged pathway that lowers carbon while maintaining service continuity and user choice (Climate Change Committee, 2022; Energy Systems Catapult, 2025).

Natural Gas still maintains a role in the landscape of UK energy consumption and will do for the foreseeable future. Traditional forms of fuel are hugely relevant in the current phase of active usage and will also be prominent if hybrid technologies are widely adopted. This means that even when fossil fuels are being substituted for cleaner energies and technologies, traditional fuels will still play a significant role in heating and hot water provision.

For support with your next retrofit project contact the Rinnai design team today <https://www.rinnai-uk.co.uk/contact-us/help-me-choose-product>

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COULD SODIUM-ION BATTERIES STRENGTHEN THE UK'S ENERGY SECURITY?

As we work with projects at Salix, and review technologies, we understand why batteries are recognised as a vital component of a secure and resilient energy system.

Whilst a large part of our work at Salix is supporting governments and delivering decarbonisation programmes for the public sector as well as housing, we are always looking at technologies being developed that could have an impact on our energy future.

There is certainly development happening regarding batteries. They are an important part of the energy picture, because by storing excess electricity and releasing it when demand is highest, they help ease pressure on the grid, improve energy security, and support the transition to a low-carbon economy.

In fact, Lithium-ion batteries have been the leading energy storage solution since the 1990s. They dominate the market due to their high energy density, long lifespan, extended cycle life, fast charging capabilities, versatility and high efficiency.

However, their production relies on increasingly scarce materials such as lithium, cobalt and nickel. The extraction of these materials is a highly energy and water intensive process and can lead to habitat destruction, water contamination and air pollution, damaging local ecosystems.

Equally, since many of these metals are found in less developed nations, the exploitative nature of extraction poses significant health and social risks. Furthermore, supply chain constraints and price volatility is increasingly tied up with geopolitical instability and growing global demand, particularly from the electric vehicle and electronics sectors, reducing resource security.

Lithium-ion batteries also pose several safety and environmental issues, both in use and disposal. The materials used are highly reactive, creating a risk of thermal runaway and fire. Likewise, improper disposal can result in hazardous substances being leached into soil, groundwater and waterways, causing damage to the local environment.

In response to these challenges, there has been increasing investment into the development of innovative energy storage solutions, which can offer improved sustainability, safety and long-term resource security.

One of the most promising alternatives to lithium-ion batteries is sodium-ion batteries.

Like lithium-ion batteries, sodium-ion batteries are rechargeable energy storage systems that operate by exchanging ions

Jasmyn Shah, energy and carbon analyst, Salix

between positive and negative electrodes during charging and discharging cycles. The difference is that they use sodium rather than lithium as the primary charge carrier. Sodium can be found abundantly and is readily available in seawater and the Earth's crust, offering a more secure and accessible alternative to lithium.

In addition, sodium-ion batteries do not require cobalt, nickel and copper to the same extent as lithium-ion batteries. Instead, they can utilise more abundant and cheaper materials such as iron-based compounds. This has the potential to reduce dependence on increasingly scarce raw materials, improve supply chain resilience, reduce production costs and minimise the use of ethically and environmentally contentious materials.

Sodium-ion batteries offer several additional advantages. Their reliance on abundant materials can make them a lower-cost energy storage solution, particularly as production scales up. Supply chains are generally less exposed to geopolitical risks and resource constraints, as these raw materials are both more accessible and cheaper, reducing price volatility in production.

Furthermore, sodium-ion batteries continue to perform well in low-temperature environments, with lower rates of degradation than many lithium-ion batteries. This makes them especially suitable for applications in regions where cold weather can adversely affect battery health and reliability. Additionally, sodium-ion batteries exhibit greater chemical stability compared to lithium-ion batteries, reducing the likelihood of overheating and combustion.

The sodium-ion battery may appear to offer the ideal alternative to lithium-ion batteries, with more abundant and lower-cost materials, reduced environmental impacts and improved performance in colder temperatures. However, there are some constraints which hinder their widespread adoption, and prevent them from replacing lithium-ion technologies across all applications.

Sodium-ion batteries are significantly less mature than lithium-ion batteries which presents several challenges. One of the main limitations is that they have much lower energy density than lithium-ion batteries. In practice this means that much larger and heavier batteries are required to store the same amount of energy and achieve equivalent performance than with a lithium-ion battery. This limits their suitability for applications such as electric vehicles, where



battery weight and density are critical factors.

In addition, as sodium ions are larger and more reactive than lithium, the repeated movement during charging and discharging can place greater stress on electrode materials. This can accelerate degradation and reduce the life cycle of these batteries, reducing the performance over time.

So, is the UK ready for a transition towards sodium-ion batteries? Realistically lithium-ion batteries are likely to remain the dominant energy storage technology for the foreseeable future. However, sodium-ion batteries are well positioned to complement, lithium-ion batteries rather than replace them. Due to their lower material cost, improved safety characteristics and strong performance in cold temperatures, sodium-ion batteries could be suitable to applications where weight, size and energy density are less critical.

One of the most promising uses could be for grid-scale energy storage, where the affordability and abundance of sodium offer significant advantages.

In these applications, the low energy density of sodium-ion batteries is less of a concern, as the batteries can be designed around the available space, rather than strict weight constraints. This would allow the limited supply of lithium and other raw materials to be prioritised for sectors where high energy density is essential, such as electric vehicles, portable electronics and aviation applications.

At Salix, we will continue to research and support emerging technologies like sodium-ion batteries to support the UK's growing energy storage needs, and contribute to a more resilient and sustainable energy system.

We have also launched our podcast *Tomorrow's Energy* to explore further the technologies and talk to the people driving our future.

All episodes are available for streaming or download from your preferred podcast platform including **Apple**, **Amazon** and **Spotify**. The recordings are also available from **our website**.

I am looking forward to seeing what happens next, as our energy future changes and we open our minds up to all kinds of new possibilities.

THE FUTURE OF ENERGY STORAGE ISN'T NEW BATTERIES, IT'S NEW DATA

Maximising the "lifetime value" of a battery asset is the overriding imperative for any asset manager in BESS.

During the procurement and construction phases, naturally focus falls largely on the hardware – getting the highest performing system in place, understanding degradation curves, and cycle performance.

However, these solutions should be just one component of the asset manager's toolkit. There is no use in paying the significant capital costs of high-tech solutions without also being acutely aware of what's going on behind the scenes of an asset when it is operating. Then, the focus should turn to prioritising how the chosen hardware can actually be run most effectively. This is the dominant factor which asset managers can control, and one which offers significant potential to make gains through intelligent use of data.

Battery assets are now so sophisticated that they generate a significant amount of leverageable data. By integrating SaaS (software as a service) solutions, asset managers can have eyes on input, output, efficiency and wasted energy. Operating on a sub-second basis, the software allows operators to access a selection of critical metrics in real time, which they can put to use to reap rewards across technical and commercial imperatives.

MEETING TECHNICAL KPIS

Technical Asset Management is at the heart of getting a battery to perform at its highest level as often as possible. Asset managers will be tracking performance against several metrics, including: availability (what percentage of the battery is online and available at any time); round trip efficiency (how much energy is lost between a charge and discharge cycle); or degradation/State of Health (how is the battery performing relative to the manufacturer's warranty).

Thomas Hitch, Business Development Manager at iON+



Over a battery's lifespan, finding marginal gains across multiple KPIs such as these makes a meaningful difference to revenue and competitiveness.

To keep meeting these goals, naturally maintenance will be required. Smart data makes diagnosing problems much quicker, meaning assets stay underperforming as little as possible. But asset managers need to strike a careful balance between not neglecting maintenance days and not pausing operations too frequently.

Drawing on data visibility, an asset manager becomes able to identify the windows for repair which align most closely with priorities. One operator might choose to bring forwards a maintenance schedule to ensure a battery has top performance for a High Revenue period. Another might pay extra for a higher tier of service level agreement (SLA) from their maintenance contractor, so they can bring a battery back 'online' faster in the event of an issue arising to prevent lost revenue. Data is key to being able to chart the best path.

MAXIMISING MARKETS

When it comes to Commercial Asset Management, asset managers need to ensure their top performing sites from a technical perspective are transacting in the right markets to make the most money.

BESS assets can earn revenue across three key markets: energy arbitrage; grid stability services; and capacity/reserve markets. Whilst third-party Optimisers are often responsible for which market to monetise the battery in, an asset manager's attention to system performance lays essential groundwork for them to make the best decisions.

Leveraging granular data will help asset managers assess these fundamentals – from availability to

reliability – and put their asset in the best position for commercial market success.

STANDARDISING DECISIONS

Having the right data at your fingertips to make these daily decisions is one half of the puzzle. The other half – and to push an advantage further – is using data to back up and track the efficacy of these decisions over time.

Different stakeholders – such as asset managers, Optimisers, and investment funds – view asset performance from different angles.

Accurate, integrated, and accessible data can give a full picture to all stakeholders of all aspects of an asset's performance, spanning different teams' concerns. This can help different perspectives be reconciled more easily, allow decisions to be reached more quickly, and performance to be tracked consistently across time and portfolios.

DATA AS THE DIFFERENTIATOR

Maximising the capacity of infrastructure is important not just for individual energy managers, but for the energy transition more widely. This will, of course, continue to benefit from advances in hardware, but there is no denying the role which data already plays in optimising this same hardware – especially as budget constraints may mean asset managers cannot always install the most cutting-edge technology.

After all, the most sustainable battery replacement is the replacement that doesn't need to happen at all. Asset managers should feel confident capitalising on infrastructure which is already in place, before taking a more critical and informed approach to considering future replacements or repowering. <https://ion.tech/introducing-ion/>

WHY A NATIONAL WATER STRATEGY MATTERS & WHAT BUSINESSES CAN DO TODAY

Water has become one of the UK's most pressing infrastructure challenges.

Population growth, climate change, ageing assets and increasing demand from industry are placing unprecedented pressure on water resources.

While much of the national conversation has focused on pollution and investment in water companies, many experts now believe the issue requires a more coordinated approach.

That was the message behind a new report from the Aldersgate Group, which has called for a National Water Strategy alongside reforms to regional water governance.

The organisation argues that water should no longer be managed through fragmented decision-making but instead through a long-term framework that brings together government, regulators, water companies, businesses and local stakeholders.

Although these proposals are aimed at policymakers, they carry an important message for businesses too. Organisations that rely on water can no longer afford to view it as an unlimited, low-cost utility.

Instead, water needs to be managed as a strategic business resource.

WHY IS A NATIONAL WATER STRATEGY BEING PROPOSED?

The Aldersgate Group believes the UK's current approach to water management is too fragmented to deal with future challenges.

Responsibility for water resources is spread across multiple organisations, regulators and regional bodies. At the same time, demand for water continues to increase from housing, manufacturing, agriculture, energy production and emerging sectors such as AI data centres.

Climate change is also creating more frequent droughts in some areas and greater flood risks in others.

The report argues that a coordinated national strategy would:

- Improve long-term planning
- Better protect water supplies



Image by congerdesign from pixabay.com

- Encourage investment in infrastructure
- Strengthen regional decision-making
- Support economic growth while protecting the environment

Whether or not these recommendations are adopted, one thing is already clear: businesses will increasingly be expected to use water more efficiently.

WATER IS NO LONGER JUST ANOTHER UTILITY BILL

For many organisations, water has traditionally received far less attention than electricity or gas. Businesses often invest heavily in reducing energy consumption while knowing very little about how water is being used across their sites.

Yet water costs extend beyond the supply itself.

Excessive consumption can increase:

- Wastewater charges
- Energy costs for heating or pumping water
- Equipment maintenance costs
- Operational downtime
- Environmental impact

Understanding water usage can therefore deliver savings across multiple areas of a business.

THE IMPORTANCE OF ACCURATE WATER INFORMATION

One of the themes running throughout discussions about national water planning is the importance of better information. Governments need accurate data to plan future infrastructure.

Water companies need better forecasting to balance supply and demand. Businesses also benefit from understanding exactly how much water they use and where opportunities for improvement exist. Yet many organisations still rely solely on monthly or quarterly invoices.

These bills provide a total figure but rarely explain:

- Where water is being used
- When consumption increases
- Whether leaks are present
- Which systems consume the most water
- How usage compares with previous months

Without detailed information, improving efficiency becomes difficult.

Water consumption analysis provides valuable insights

Modern monitoring technologies give businesses far greater visibility

over water usage than ever before.

Using Automated Meter Reading (AMR) and water flow data logging, organisations can monitor consumption throughout the day rather than waiting for invoices to arrive.

Detailed consumption analysis can identify:

- Unexpected overnight water use
- Hidden leaks
- Continuous flows
- Seasonal changes
- Equipment operating inefficiently
- Abnormal spikes in demand

These insights allow businesses to investigate problems before they become expensive.

WATER AUDITS TURN DATA INTO ACTION

Monitoring shows what is happening, and a professional water audit helps explain why. Experienced water consultants combine consumption data with site inspections to identify practical improvements.

A comprehensive commercial water audit may include:

- Reviewing water bills
- Checking billing accuracy
- Assessing meter performance
- Inspecting water infrastructure
- Identifying leaks
- Reviewing water-intensive processes
- Recommending efficiency improvements

Many businesses discover opportunities to reduce consumption without affecting productivity or operational performance.

EVERY DROP SAVED SUPPORTS LONG-TERM RESILIENCE

A National Water Strategy is ultimately about making the UK's water resources more resilient. The same principle applies at business level.

Organisations that improve efficiency today will be better prepared for future challenges, including:

- Rising utility costs
- Water supply restrictions
- Environmental reporting requirements
- Sustainability targets
- Business growth

Reducing unnecessary consumption also helps protect water resources for communities, agriculture and future development.

Good water management involves much more than reducing consumption.

Businesses should also consider:

- **Water bill validation.** Incorrect billing, estimated readings or

drainage charging errors can result in organisations paying more than necessary. Regular bill validation ensures businesses only pay for the services they actually receive.

- **Leak detection.** Even relatively small leaks can waste thousands of litres of water over time. A professional leak detection service identifies hidden problems before they become major operational or financial issues.
- **Water strategy.** As businesses expand, relocate or invest in new facilities, understanding future water requirements becomes increasingly important. Developing a long-term water strategy allows organisations to plan infrastructure, improve efficiency and reduce future risks.

- **Sustainability and corporate responsibility.** Water stewardship is becoming an increasingly important part of Environmental, Social and Governance (ESG) reporting. Customers, investors and supply chain partners increasingly expect organisations to demonstrate responsible resource management.

Reducing water consumption can help businesses:

- Lower their environmental footprint
- Reduce wastewater generation
- Strengthen sustainability reporting
- Support corporate environmental commitments
- Improve reputation with customers and stakeholders

Good water management is no longer solely about compliance; it

is becoming an important indicator of responsible business practice.

WHY SPECIALIST SUPPORT MATTERS.

Every business uses water differently. A manufacturing plant has very different requirements from a hotel, healthcare facility, office complex or distribution centre.

Experienced water management consultants understand these differences and tailor recommendations accordingly.

Rather than applying generic efficiency measures, they assess each site's infrastructure, operations and commercial objectives before identifying the areas where improvements will deliver the greatest value.

This allows businesses to invest where it will have the biggest impact while avoiding unnecessary expenditure.

PREPARING FOR THE FUTURE STARTS TODAY

Calls for a National Water Strategy reflect growing recognition that the UK's water resources require better long-term planning, greater collaboration and smarter management. While policymakers debate future reforms, businesses do not need to wait before taking action.

Improving visibility over water consumption, identifying inefficiencies and developing a long-term water strategy can deliver immediate financial savings while strengthening resilience for the future.

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THE NEXT THREE YEARS: WHY ENERGY STRATEGY IS BECOMING A COMMUNITY CONVERSATION

For major energy users, the next three years are unlikely to be defined by one big energy decision. Instead, a series of decisions – often made by different people, at different times and with different priorities – will collectively shape the cost, resilience and performance of the energy and water portfolio through to 2030.

Procurement strategy. Energy efficiency. Flexibility. Water resilience. Network capacity. Data quality. Investment decisions. Carbon reduction. Regulatory change.

All of these are becoming increasingly connected.

That creates a challenge for energy and utilities professionals. It is no longer enough to understand what is happening in the market. The bigger question is what those changes mean for your own estate—and which decisions need to be made now.

That is the thinking behind this year's Buying and Using Utilities Live, taking place at AMTC in Coventry on 14 October. Under the theme "The Next Three Years: Managing your energy and water portfolio through to 2030", MEUC is bringing major energy users and industry experts together to look beyond individual issues and consider the bigger picture.

The timing is particularly relevant, with applications opening for the British Industrial Competitiveness Scheme (BICS). But BICS is just one part of a much wider conversation about how businesses should manage energy costs, risk and investment over the coming years.

FROM INFORMATION TO ACTION

One of the challenges facing energy managers is not a lack of information. It is deciding what to do with it.

Better data may reveal unexplained baseload, billing errors, poor meter mapping or operational drift. New flexible assets may offer opportunities to reduce costs or generate revenue. A changing consumption profile may expose limitations in an existing supply contract. A new project may run into capacity constraints. Water risks that once sat outside the energy conversation may suddenly become operationally critical.

The Autumn 2026 programme has been designed around these kinds of practical questions.

Sessions will examine everything from procurement, efficiency and technology to water resilience, flexible assets, capacity

agreements and the growing impact of network, policy and infrastructure costs. Delegates will also look at how to prioritise projects across an estate when there are more opportunities than available budget, time or internal resource.

But perhaps just as important as the presentations is what happens between them.

THE VALUE OF THE ROOM

Energy management can sometimes be a surprisingly solitary role. Even in large organisations, there may be only a handful of people responsible for making sense of energy costs, contracts, data, projects and changing regulation.

Being part of a community of people dealing with similar issues provides something that reports and market updates cannot: context.

What are other businesses prioritising? Which questions are they asking suppliers? Where are they finding opportunities? What assumptions are they challenging? What problems have they encountered that others could avoid?

That exchange is central to the MEUC approach.

Throughout BUU Live, delegates will have opportunities to question speakers, challenge assumptions and share their own experience. The programme deliberately includes open "Engage, Query and Learn" sessions, networking breaks and an exhibition,

creating space for conversations that can continue beyond the formal agenda.

The day will finish with MEUC 7x7, bringing seven-minute provocations on topics including the "proof gap" around savings and carbon, capacity audits, the future direction of the energy and water markets, and a live return to the opening "Portfolio Shock Test" to see whether delegates' priorities have changed.

LOOKING BEYOND THE NEXT BILL

The value of being part of the MEUC community is ultimately about having somewhere to test your thinking.

Energy and utilities decisions rarely happen in isolation. They affect finance, operations, sustainability, procurement, capital investment and business continuity. Having access to people with different perspectives can help turn a complex issue into a better question—and sometimes a better decision.

That is what BUU Live is designed to provide: not a day of answers delivered from a stage, but a day of information, challenge, discussion and connections that can help major energy users think more clearly about what comes next.

Because managing the next three years is not simply about predicting what will happen. It is about being prepared to respond when it does.

You can reserve your place at Buying & Using Utilities LIVE here.



WATER STRATEGY

EARLY WARNING SYSTEM DEVELOPED TO PREDICT WATER CONFLICTS

A global early warning tool has been developed by Dutch government-funded organisation Water, Peace and Security (WPS) that can be used to help predict possible water conflicts as water-related violence increases around the world.



A global early warning tool has been developed by Dutch government-funded organisation Water, Peace and Security (WPS) that can be used to help predict possible water conflicts as water-related violence increases around the world.



According to the Guardian*, the tool will combine environmental factors like rainfall and crop failures

with social, economic and political variables to predict the risk of conflicts relating to water up to 12 months in advance.



It has already predicted that conflicts will be seen this year in Iraq, Mali, Iran, India, Nigeria and Pakistan, with developers claiming an 86 per cent success rate in identifying conflict zones where a minimum of ten fatalities could be seen.

86%

California-based thinktank the Pacific Institute recently published stats showing that water-related violence has climbed significantly in the last ten years, with recorded incidents more than doubling in the past decade compared with previous ones.

50%

And it seems that this upward trend is only going to continue, with the UN suggesting that as many as

5 billion

people could be faced with water shortages come the year 2050.

Share:



Charles Iceland is a senior water expert at the World Resources Institute (which is part of the WPS partnership) and he explained:



"The machine learning model is 'trained' to identify patterns using historical data on violent conflict and political, social, economic, demographic, and water risk.

"It looks at over 80 indicators

in all, going back up to 20 years. It is then able to use what it has 'learned' about the correlations among these variables to predict conflict or no conflict over the next

12 months given current conditions.

Peter Gleick, founding president of the Pacific Institute and a leading authority on water-related issues,



explained to the news source recently that as water grows in scarcity and because it's so critical as a resource, people will take whatever course of action they have to in order to ensure their basic needs are met**.

"The evidence is clear that there's growing violence associated with freshwater resources, both conflicts over access to water and especially attacks on civilian water systems," he said.



Incidents include shelling near a water pipeline in Horlivka, Ukraine, in June last year that left

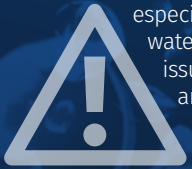
3 million

people without a reliable water supply, the shooting of five farmers in protests in 2017 in India over water and a gun attack on a water tanker convey in the Indonesian province of West Papua back in 2012.

In 2014, Islamic State was also accused of poisoning water supplies to Aleppo in Syria and in 2015 extremist militia Jabhat al-Nusra bombed an important water pipeline that resulted in the poisoning of over 100 residents.



So it seems as though this early warning system for potential water-related conflicts is very much in need,



especially given the fact that water stress and scarcity issues won't be going anywhere and, indeed, could get much worse in the future.

Are you considering reviewing your water strategy this year?†

Get in touch with the H2o Building Services team today to find out what can be achieved.

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