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With its own dedicated theatre, all technical content will be organised by leading lighters, Bob Bohannon, Helen Loomes and Sophie Parry.

EM Magazine

NOVEMBER/DECEMBER 2023

PUBLISHER: Ralph Scrivens
ralph@energymanagermagazine.co.uk

PRODUCTION: Sarah Daviner
sarah@energymanagermagazine.co.uk

ACCOUNTS:
accounts@energymanagermagazine.co.uk

PRINT: Mixam Print

ENERGY MANAGER MAGAZINE

is published 10 times a year
by Energy Manager.

www.energymanagermagazine.co.uk

42 Wymington Park, Rushden,
Northants, NN10 9JP
Tel: 01933 316931
Email: mail@energymanagermagazine.co.uk

REGISTRATION: Qualifying readers receive Energy Manager free of charge. The annual subscription rate is £80 in the UK, £95 for mainland Europe and £115 for the rest of the world.

Single copies £10.

Some manufacturers and suppliers have made a contribution toward the cost of reproducing some photographs in Energy Manager.

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ISSN 2057-5912 (Print)
ISSN 2057-5920 (Online)

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ENERGY ACT 2023 – A DECADE IN THE MAKING

Emmanuel Ninos, Partner, Jennifer Charles, Partner, and Marianne Anton, Counsel, Watson Farley & Williams.

The new UK Energy Bill was introduced into the House of Lords in July 2022, taking over a year to make its way through the parliamentary process, resulting in the Energy Act 2023, which gained royal assent on 26 October 2023.



Emmanuel Ninos



Jennifer Charles



Marianne Anton

Those familiar with the energy industry will be aware that the main pieces of legislation that govern electricity and gas in Great Britain are the Electricity Act 1989 and the Gas Act 1986, respectively. These have been amended over the years by a series of Energy Acts including in 2004, 2010, 2013 and 2016.

The current Energy Act has been a long time coming; the Energy Act 2013 was the last major piece of electricity-related legislation enacted in Great Britain (the Energy Act 2016 mainly made provision for oil and gas matters, with only a few provisions on the closure of the Renewables Obligation). It brought in a suite of measures known in the industry as the Electricity Market Reform, or EMR, via amendments to the Electricity Act 1989 and powers to make regulations relating to the schemes it introduced. As summarised by Ofgem, "In 2013, the government introduced a policy of Electricity Market Reform (EMR) to incentivise investment in secure, low-carbon electricity, improve the security of Great Britain's electricity supply, and improve affordability for consumers".

In announcing the new law, the government called it the "biggest piece of energy legislation in the UK's history", stating that it lays "the foundations for an energy system fit for the future".

We will be exploring the changes introduced in more detail in future articles in the coming weeks and months, but at a high level, the key changes introduced are set out below. It is a wide ranging and comprehensive set of provisions, covering everything from regulation of new energy activities (e.g. CCUS, hydrogen production) and heating activities (e.g. heat networks) to consumer protections (e.g. special administration regime for CCUS operators, and energy performance of buildings).

Part 1 covers the licensing of carbon dioxide transport and storage. Changes include:

- updating the principal objectives and duties of Ofgem and the Secretary of State for energy to cover these activities;

- updating the list of "prohibited activities" that require participants to obtain a licence or exemption;
- powers to introduce competition in the grant of licences for these activities;
- enforcement and powers to impose criminal sanctions;
- a special administration regime that applies to these activities;

Part 2 covers the government support regimes that will apply for carbon dioxide capture, transport and storage and hydrogen transport, storage and production. This includes:

- provisions relating to revenue support contracts, with the overall structure being similar to that used to administer the low carbon CfD regime;
- introduction of a hydrogen levy to fund the support scheme for hydrogen;
- decommissioning of carbon storage installations;
- granting powers to the OGA to examine information and samples;
- enforcement provisions (including financial penalties and sanctions);

Part 3 introduces the licensing of hydrogen pipeline projects via gas transporter licences (granted under section 7 of the Gas Act 1986);

Part 4 covers regulation of new technology, including:

- low-carbon heat schemes;
- hydrogen grid conversion trials;
- powers to modify the Gas Act 1986 to cover hydrogen;
- fusion energy facilities;
- renewable transport fuel obligations;
- removals of greenhouse gases;

Part 5 sees the introduction of an independent system operator and planner (ISOP). This includes:

- the general duties that will apply to the ISOP;
- licensing requirements (for electricity system operation and the gas system planning);

Part 6 covers the governance of gas and electricity industry codes and introduces:

- designation of the key codes and central systems;
 - licensing and selection of code manager;
- Part 7 is the location for market reform and consumer protection. This includes provisions for:

- amendment of the principal objectives of Ofgem and the Secretary of State for energy (as enacted in s3A of the Electricity Act 1989 and s4AA of the Gas Act 1986);
- granting powers to enable competitive tendering for electricity projects (via amendment to the Electricity Act 1989);
- licensing and operation of multi-purpose interconnectors;
- electricity support payments for energy-intensive industries;
- extension of time to exercise powers in relation to smart meter licensing;

Part 8 covers the regulation of heat networks. This includes:

- designating a regulator for heat networks and assigning heat network zones;
- creation of a Heat Network Zones Authority and zone coordinators; and
- enforcement powers and imposition of penalties;
- Part 9 covers energy smart appliances and load control;
- Part 10 covers energy performance of premises;
- Part 11 covers energy savings opportunity schemes;
- Part 12 covers core fuel sector resilience, granting powers for resilience purposes and corresponding powers to make regulations;
- Part 13 covers offshore wind electricity generation, oil and gas;
- Part 14 regulates the civil nuclear sector;
- Part 15 sets out general provisions, including power to make consequential provisions and further regulations.

If you are interested in discussing any of these areas and the impact they may have on your business, please do get in touch with the authors via <https://www.wfw.com/>



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SP ENERGY NETWORKS AND ENERGY SYSTEMS CATAPULT FORM STRATEGIC PARTNERSHIP

Part of SP Energy Networks RII0-ED2 Whole System Strategy, this is the first of several key strategic partnerships that will help unlock the value of Whole System thinking and support the transition to Net Zero.

SP Energy Networks and the Energy Systems Catapult have entered into a new, strategic partnership to help unlock Whole System thinking. The partnership's first project will begin in November and will see Energy Systems Catapult and SP Energy Networks implement industry best practice into its business alongside development tools and training materials to support the evolution of Whole Systems in SP Energy Networks.

Together, the distribution network operator and the independent, not-for-profit research and development centre for accelerating Net Zero energy innovation, will work to identify approaches that will support efficient investment in the electricity network and to achieve a just transition to Net Zero for customers.

A Whole System approach considers how physical assets and technologies need to integrate with policy, market and digital developments across energy vectors, including heat, electricity and fuel,

and sectors including domestic, commercial and industrial, and transport. Encouraging cooperation and coordination across various stakeholders, alongside the changing energy needs of customers, to develop and deliver approaches that will benefit end users and support the transition to Net Zero.

On partnering with Energy Systems Catapult, Mark Goudie, Whole System Manager of SP Energy Networks said: "We're thrilled to be working with the Energy Systems Catapult using their energy transition expertise and independent, national and local Whole System analysis and modelling capabilities to help us further develop our Whole System thinking.

"Our mission is to unlock the full value of Whole System thinking, by collaborating not only with other electricity companies, but also key stakeholders including gas and water networks, innovators, network users, non-regulated companies, local areas and communities to ensure efficient investment in the electricity network and to achieve a just transition to Net Zero for customers."

Nathaniel Bottrell, Senior Advisor - Whole Systems & Networks, at Energy Systems Catapult, said: "Energy Systems Catapult

is delighted to be supporting SP Energy Networks to take a Whole Systems approach to accelerating Net Zero. Through the strategic partnership we will understand the challenges and opportunities being faced by Network Operators as they transition to a strategic role, facilitating new markets to actively manage the network.

"Energy Systems Catapult has a unique position, bridging the gap between academia, industry and government which enables us to bring cutting edge thinking and innovation best practice to bear on challenges being faced by SP Energy Networks.

"Whole System thinking allows us to uncover how changes in individual elements of the energy system, or the connections between them, will impact the broader system dynamics. Ensuring plans for evolving the future energy system to Net Zero will unlock opportunities and investments that accelerate the transformation of the UK's energy system, to reduce carbon emissions, rapidly, in the most efficient and cost-effective way." <https://es.catapult.org.uk/>



Fossil fuels – world cannot wait for alternative energy sources

The world cannot wait for alternative fuel sources and needs to take action now to cut the impact of fossil fuels, a leading international fuel tech company said recently.

New analysis has revealed that human fossil fuel emissions are threatening the key 1.5C climate threshold twice as quickly as previously thought.

Researchers say the limit could be continually breached as early as 2029, rather than the mid 2030's. A key factor in the shift has been record emissions of carbon dioxide over the past three years, scientists say.

The 1.5C rise in global temperatures is a central part of the 2015 Paris climate agreement, where world leaders pledged to keep the rise well below 2C while making every effort to keep the increase below 1.5C this century.

Ben Richardson, of SulNOx Group Plc,

which specialises in reducing the impact of fossil fuels, said: "This year we have seen global temperature records tumble, extreme weather events and lives and livelihoods threatened," said Ben. "Many developing technologies are still years away from large-scale implementation, and at the COP28 climate summit at the end of November we are likely to hear more arguments about the phaseout of fossil fuels. "The simple truth is, fossil fuels are not going away anytime soon, so as well as developing alternative sources of energy, governments and big business should be examining how they can reduce the impact of the fossil fuels they use."

SulNOx Group PLC, which operates in 29 countries around the world, specialises in natural, biodegradable fuel products that have been shown in independent tests to significantly increasing fuel efficiencies by



around 8% across widely used hydrocarbon liquid fuels including diesel, petrol and biofuels while also re-ducing CO₂ emissions and other harmful pollutants such as fine particulate matter, a leading cause of lung disease and other respiratory illnesses.

"The importance of increasing efficiencies and reducing the impact of fossil fuels has never been greater," said Ben. "There are immediate, cost-effective and sustainable solutions available which should realistically dominate transportation and other sectors in the short to medium term whilst we await the longer-term green solutions." <https://sulnoxgroup.com/>

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SUEZ AND VODAFONE PARTNER ON CONNECTIVITY FOR NEXT GENERATION OF SMART WATER METERS

SUEZ, leader in digital and circular solutions in waste and water services, and Vodafone, the leading technology communications company in the UK, have agreed to a five-year partnership to expand and enhance the range of smart metering network technology with an integrated, seamless, and high-performance solution for water utilities resource management.

The partnership framework is intended to offer an alternative to existing smart water network solutions. It will deliver a cost-effective, vendor-agnostic Advanced Metering Infrastructure (AMI), where the system automatically transmits the data directly to the utility company. The new solution is based on Narrowband Internet of Things (NB-IoT)¹ network technology.

As water resource management grows increasingly critical in the UK, smart monitoring, and detection systems, such as AMI, are becoming essential tools for water utilities. They help collect real-

time data for accurate billing, leak detection, and demand management, improving water conservation and operational efficiency.

Two of the major challenges for water companies when adopting AMI is the availability of low-power networks for smart meter connectivity and the variety of hardware options. In partnership, SUEZ and Vodafone will provide a tailored network design solution, combining Wize technology and NB-IoT to ensure comprehensive, high-performing coverage for each water company, irrespective of geographical characteristics and population density, resulting in an affordable and easy-to-deploy smart metering infrastructure.

Over time SUEZ and Vodafone intend to work with manufacturers to streamline data sets, data transmissions, and remove the need for multiple systems to gather the metering data so it is easier and more cost-effective for water companies to benefit from smart monitoring and detection on their network. Aggregating data from different communications technologies into a single platform will bring the power of SUEZ's advanced analytics and demand reduction tools (ON'Connect™) to NB-IoT smart metering solutions.



"SUEZ is the European leader in smart water metering thanks to its long-lasting expertise all along the value chain, from meters to data analytics. With this partnership, Wize technology, which has been successfully deployed for over 15 years thanks to its unrivalled performance, is now perfectly complemented by the arrival of NB-IoT. This unique positioning is a major step forward in terms of flexibility and efficiency for our customers," stated Mitch Donnelly, Managing Director of SUEZ Digital Solutions UK.

Gemma Barsby, Head of IoT, Vodafone UK, said, "At Vodafone IoT we understand that there is not a one size fits all solution to smart metering deployment and work closely with the UK Water industry to find the right solutions for our customers. By partnering with SUEZ, we have been able to develop a simple solution to deliver on their customer needs. By bringing together our market leading IoT Connectivity offering with extensive NB-IoT Coverage and Wize's compatible hardware, it makes it easier to ensure water companies can benefit from cutting-edge technology." www.suez.com www.vodafone.co.uk

¹ NB-IoT is a cellular communication standard developed to enable efficient and cost-effective communication between IoT devices. Wize is a low-power, long-range, and bi-directional radio communication protocol (LPWAN) with 15 years evidence of high performance in smart water metering worldwide.

Digital innovation project to drive net zero kicks off in West Midlands

A digital innovation project to share electricity network data with local authorities, enabling them to plan investment in energy, transport, heating and housing more effectively, is being trialed in the West Midlands.

The PRIDE (Planning Regional Infrastructure in a Digital Environment) project is being led by National Grid Electricity Distribution, with support from project partners including West Midlands Combined Authority and Advanced Infrastructure.

PRIDE will bring together datasets from a range of sources on a single digital platform to support and speed up local decision-making on regional energy planning as the UK moves towards net zero.

Local authorities will be able to use the platform to access electricity network data

which will give them valuable information about factors like electrical capacity when drawing up their Local Area Energy Plans (LAEPs), enabling them to target investment more effectively.

In return, National Grid will get data from local authorities about their net zero ambitions and will be able to incorporate these into its future network planning to make sure the network is ready ahead of need.

Liza Troshka, Innovation Engineer at National Grid Electricity Distribution, said: "The PRIDE project aims to establish how digital tools can support collaboration between electricity distribution network operators and local authorities to create a more coordinated and integrated process when planning and connecting



decarbonised heat and transport solutions.

"By sharing data, we can work even more closely together to help deliver Local Area Energy Plans, reducing cost and timescales, and ensuring the electricity network is ready ahead of need to ensure a cleaner and fairer energy future for all."

The £558,491 project is being funded by £499,874 from Ofgem's Strategic Innovation Fund (SIF), managed in partnership with Innovate UK, with the remainder coming from project partners.

The first phase of the project began in October 2023 and runs until March 2024. www.nationalgrid.co.uk

CONSTRUCTION STARTS ON MERSEY HEAT ENERGY CENTRE TO SUPPLY LOW CARBON HEAT TO THOUSANDS OF HOMES AND BUSINESSES

Peel NRE has started construction of the Mersey Heat Network Energy Centre at Liverpool Waters at Princes Dock. Led by Peel NRE's district heat network specialist Ener-Vate, the project is set to become a major part of Liverpool's low carbon energy infrastructure.

The first phase of the multi million pound Energy Centre will provide low carbon heat and hot water to thousands of homes and businesses around the city reducing the reliance on fossil fuels and saving 2,000 tonnes of carbon emissions every year – the equivalent of taking 1,000 cars off the roads.

The Energy Centre will be home to one of the UK's largest water source heat pumps, taking heat from the water in the nearby Leeds/Liverpool Canal and using it to heat surrounding homes and businesses via a 6km district heating network.

Peel NRE has appointed renewable energy company Vital Energi to design and build the Energy Centre. Partners from Peel NRE, Ener-Vate and Vital Energi came together

to mark the start of construction at the site off Great Howard Street which it is expected will be complete by September 2024.

Jo Longdon, Commercial Director, Ener-Vate said: "The Ener-Vate team are thrilled to be a part of such an incredible initiative taken by Peel NRE, we have been part of this exciting project from the very beginning. This heat network will be initially installed in the Liverpool Waters area but it has the ability to be scaled up to provide low carbon heat and hot water to the City of Liverpool and provide many heat users with affordable, low carbon energy. This project will hopefully be pioneering for this strategic waterfront regeneration location and beyond and be an anchor for growth along on the journey to city-wide decarbonisation."

Andrew Wightman, Pre-Construction Director at Vital Energi said: "Projects like Liverpool Waters, which fully embrace renewable energy, will be fundamental to Liverpool, and the UK in general, meeting

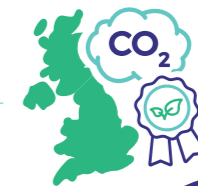


their net zero targets. Peel NRE have established sustainability at the heart of this development, and we are delighted to be delivering the low-carbon infrastructure. The Energy Centre has been designed to expand alongside the Liverpool Waters development, so will play a pivotal part in the long-term green future of Liverpool's dockside."

In addition to the new Energy Centre, Vital Energi will be extending the district heating system throughout the area. 2km of highly insulated district heating pipework has already been installed, with the expansion adding an extra 1.2 km of district heating pipework which will run throughout Trafalgar & Central Docks and bring low-carbon heating and hot water to more residents and businesses.

www.peellandp.co.uk/peelnre
www.liverpoolwaters.co.uk
www.ener-vate.co.uk
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At Salix we're passionate about delivering decarbonisation projects across the UK.

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In the last two years Salix has delivered more than £2bn of government grant funding to tackle the decarbonisation of heat.

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- Public Sector Decarbonisation Scheme
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- Social Housing Decarbonisation Fund
- Home Upgrade Grant

Our primary aim is to help the UK meet its ambitious net zero goals.



salixfinance.co.uk



Veolia operates the first solar car park to deliver renewable energy for a hospital in the UK

Leading sustainable resource management company Veolia, working with 3ti solar car park specialists, have started renewable electricity generation at Eastbourne District General Hospital (EDGH). By installing a new Solar Car Park (SCP) the hospital is the first in the UK to take this significant step which will produce 1,000 MWh of solar-generated electricity annually, and lower CO₂ emissions by 222 tonnes in the first year.

The new solar array comprises over 2,412 solar panels across eight canopies that cover 400 car parking spaces. As high energy users, the hospital will make significant savings by generating its own renewable electricity on site, and reduce the hospital's reliance on electricity from the national grid.

The new SCP also addresses the need for workplace electric vehicle

(EV) charging by providing ten solar-powered EV charge points for staff use. By covering the car parking areas the solar canopies also provide shelter from the elements, and give enhanced security in the form of overhead lighting.

The SCP is part of the £27m energy management contract with Veolia to upgrade Eastbourne District General Hospital, and deliver wide ranging energy upgrades and target carbon savings of 4,129 tonnes per year. With funding provided through the Public Sector Decarbonisation Scheme for affordable, low carbon energy efficiency upgrades across the public sector, the scheme is one of the first to take a whole building approach that accounts for how facilities and the energy delivery systems interact with each other, while maintaining an indoor environment that enhances patient care.



Veolia has been working with Eastbourne DGH since 2009, and currently provides energy and facilities management to over 100 hospitals in the UK which support the healthcare for around 8.1 million inpatients each year.

In becoming the benchmark company for ecological transformation, Veolia is committed to tackle climate change, resource depletion, biodiversity collapse, and pollution. By expanding the use of existing solutions, and developing new innovative solutions, the company is accelerating the process to radically change patterns of production and consumption and placing ecology at the heart of every process. www.veolia.com

WEST MERCIA ENERGY LAUNCHES TWO NEW FRAMEWORKS

West Mercia Energy (WME), a publicly owned central purchasing body who specialises in energy procurement and management across the public sector, is proud to announce the successful awarding of two new energy frameworks.

The frameworks, procured in full compliance with Public Contract Regulations, cover the Flexible Supply of Electricity, and Water, Wastewater, and Ancillary Services.

Flexible Supply of Electricity Framework Awarded to npower Business Solutions

WME has awarded the "Flexible Supply of Electricity" Framework to npower Business Solutions, a renowned supplier in the public sector energy market.

This new framework will enable WME to continue to support the ever-changing needs of their customer base, as they look to revolutionise public sector energy procurement towards a net-zero future.

The flexible framework provides a simple and compliant route to market and is available for any public body to access. It can be used to facilitate the flexible procurement and supply of electricity to Half Hourly metered, Non-Half Hourly metered and Unmetered supplies.

As well as benefiting from defined

quality standards supported by robust KPIs, the framework covers a wide range of additional areas including net-zero products and solutions, and social value.

The procurement of this framework is the culmination of many months of detailed planning and delivery by the team at WME who were delighted to get the contract over the line this week.

Sarah Middleton, Public Sector Channel Head, nBS added "We are thrilled to welcome WME and members back to the nBS fold. The team are keen to share our substantial public sector experience to support WME's environmental, economic and social objectives".

The framework will run until 31.03.2028 and is now available for access by any public sector organisation.

Water, Wastewater, and Ancillary Services Framework Awarded to Wave

In a parallel development, West Mercia Energy is pleased to announce the awarding of the Water, Wastewater, and Ancillary Services framework to national water retailer, Wave.

The latest Water framework will provide West Mercia Energy's clients with a quick, simple and compliant route to market, delivering quality of service, competitive prices, and a commitment to supporting

clients with their water efficiency targets.

This partnership underscores WME's dedication to helping the public sector to manage their water resources efficiently and sustainably.

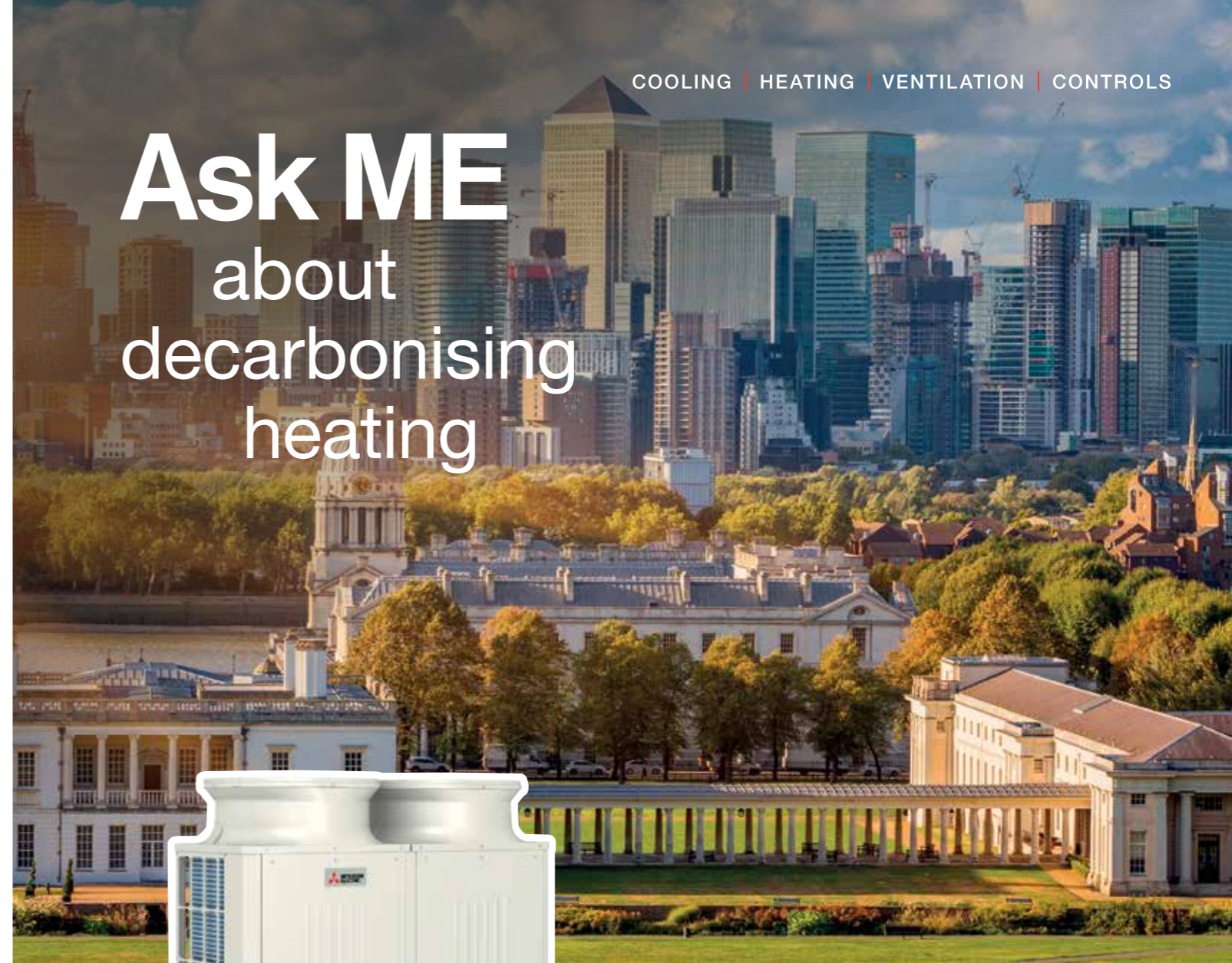
On the award of the new frameworks, Nigel Evans, WME's Managing Director commented, "We are delighted to get these new frameworks in place and open to the public sector to access. We are pleased with the outcomes and look forward to working in partnership with nBS and Wave to deliver forward thinking, innovative solutions to our customers".

About West Mercia Energy

West Mercia Energy is a leading public purchasing organisation with over 30 years' experience of successfully managing energy contracts for the public sector through a range of PCR compliant energy frameworks.

WME's customers include Local Authorities, Town & District Councils, Blue Light Services, NHS, Charities and Education settings for whom they deliver energy procurement strategies to suit all risk appetites and offer both fully managed and procurement only service levels. To learn more about West Mercia Energy and their extensive list of energy frameworks, please visit www.westmerciaenergy.co.uk

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FIVE STEPS FOR TURNING NET ZERO AMBITIONS INTO DELIVERABLE PROJECTS

Sam Hunt, Director of New Energy Systems at SMS plc, shares how businesses embarking on the critical net zero journey can turn goals into feasible, cost-saving projects.

By 2050, all UK industries are required to achieve net zero emissions – a monumental task that demands immediate action. Whilst this may seem like a distant reality, the truth is businesses need to start acting now to translate these ambitious goals into tangible projects that result in substantial savings.

Data is indispensable on the journey to net zero. Accurate and reliable data serve as the compass that helps steer organisations toward sustainable practices and successful carbon reduction projects. However, the path forward is not always clear, and one roadblock energy managers may frequently encounter is transforming good-intentioned objectives into actionable projects. Overcoming this challenge requires careful planning, innovation, and strong collaboration. Here are the top five steps to get started on the journey.

1. LEVERAGE ENERGY DATA TO ENABLE THE PRECISE MEASUREMENT OF PERFORMANCE

To effectively achieve carbon reductions, organisations must start by obtaining a precise picture of their current carbon footprint. This starts with a deep dive into the fundamental aspects of energy consumption. Start by focusing on the primary gas and electricity supply for each facility, utilising half-hourly readings to gain the granularity necessary to make informed decisions on both operational improvements and new technologies.

Half-hourly data is essential to improving operational energy and carbon performance as it allows granular comparison of site consumption and load with its history, with other sites and with other variables.

Data is not just important for operation – it's fundamental to the success of carbon reduction technologies. Accurate data is critical as it provides the necessary foundation for sizing and designing energy technologies, be they solar PV, electrified heating, or other measures.

2. ANALYSE YOUR DATA TO GATHER VALUABLE ENERGY MANAGEMENT INFORMATION

With data in hand, the next step is to extract meaningful insights. By doing so, organisations can gain a deeper understanding of their energy consumption patterns and identify areas for improvement. Analytical methods involve comparing energy consumption differences among similar sites using key performance indicators like kilowatt-hours per square meter to identify high-consumption sites. Subsequently, assessing consumption changes over specific timeframes helps uncover inefficiencies, like unnecessary energy usage during low-activity hours.

During this stage it is important to have available, complete, high-quality data on a platform capable of hosting multiple sites and providing tools for in-depth analysis, including non-energy data such as floor area, operating hours, occupancy and outside air temperature.

3. USE INSIGHTS TO IDENTIFY, ASSESS AND ENGINEER CARBON REDUCTION OPPORTUNITIES

Once insights are gained, organisations can move on to assess potential carbon reduction opportunities. This step involves a careful evaluation of feasibility and impact. Engaging experts with technical knowledge to survey sites is crucial for evaluating factors such as lighting, heating systems, ventilation, and potential upgrades. An equally important consideration is the availability of adequate space to accommodate carbon-reducing technologies.

Furthermore, a key aspect of this process involves conducting a comprehensive cost-benefit analysis. This helps organisations calculate the costs associated with implementing changes to their energy systems and forecast the savings, demonstrating a clear return on investment.



4. TURN OPPORTUNITIES INTO DELIVERABLE PROJECTS

Having identified opportunities, the final step is to turn them into tangible, deliverable projects. This phase involves engaging the supply chain, obtaining quotes for equipment and services, and effectively managing contractors. Collaboration with suppliers and installers is crucial for ensuring that costs and timelines align with project expectations.

In some cases, conducting trial projects is beneficial, especially for novel technologies or situations with higher risks. These trials, initially applied in one or two sites, allow organisations to demonstrate feasibility. Implementing changes in phases, rather than a full building retrofit, minimises disruption.

5. CREATE CONTINUAL CYCLES OF IMPROVEMENT TO DRIVE LONG-TERM SUSTAINABILITY GOALS

Sustaining continual improvement goes beyond initial implementation. To meet net zero objectives, organisations must engage in effective improvement plans. A robust method of supporting this goal is implementing a ISO 50001 certified management system, an internationally recognised framework for best practice energy management.

Beyond this, promoting awareness and engagement among staff is vital, such as demonstrating how individual actions contribute to the net zero trajectory and tailoring communications toward stakeholders with carbon influence. Additionally, you should consistently share objectives and progress across the organisation to raise awareness. By integrating these strategies, organisations can sustain their commitment to sustainability and work towards long-term goals together. www.sms-plc.com

ROCKETING PRICES DEMOLISH THE FINANCIAL CASE FOR REGOS

Jaron Reddy, UK & Ireland Manager, ENTRNCE

The cost of Renewable Energy Guarantee of Origin (REGO) certificates hit a record high of £20 in October 2023. This represents a doubling in price since less than a year ago – in November 2022 REGOs were going for an average of £8.75. But the hike in price is even more startling when seen in a longer-term context. When analysts Cornwall Insight began their quarterly REGO pricing survey in December 2019, prices were comfortably below a pound per REGO. Going even further back, suppliers could snap them up for about 20p.

The historically low price of REGOs meant that energy suppliers could use them as a way to “green” their products – retailers could buy their energy from a variety of sources, including those providing fossil fuels, and purchase enough REGOs to cover consumption through green tariffs. But, the truth about ‘renewable’ supplier tariffs is far from simple.

SERIOUS HIDDEN RISKS OF REGOS

Even in the days when REGOs cost just a few pence, this strategy had more holes than a crumpet. When a business signs up to a REGO-backed “green” tariff from their supplier, this does nothing to cut their energy-related carbon emissions in the real world. Their energy supply still

comes from the grid, where ‘clean’ energy can't be separated from ‘dirty energy’. (We've compared it to trying to drink just the apple from a mixed-fruit smoothie.) And the suppliers buying REGOs from generators were never really supporting the creation of new renewable capacity.

There were always serious hidden risks for businesses using REGO-backed tariffs to meet their climate targets. They made it too easy to accidentally overstate emissions reductions, jeopardising regulatory compliance as well as progress towards net zero goals.

Now the financial case doesn't stack up either. It's unlikely that the price of REGOs will ever fall back below £1, for many good reasons. (That's assuming that reform of the energy retail market doesn't wipe them out anyway.)

BUSINESSES NEED TO TAKE CONTROL

On the other hand, the financial case for taking control of your energy supply is more attractive than ever. Investing in on-site assets means that your business is visibly supporting the generation of new renewable infrastructure. Alternatively, a Corporate Power Purchase Agreement (CPPA) means signing a contract directly with a green generator to power your business.

There will still be times when your company's energy use doesn't match up

with the output of the solar panels on your factory roof, or the wind turbines of your CPPA partner. That's where accurate data can be utilised to show that you're doing the best job possible. So, ENTRNCE created the Matcher, a powerful data platform, to reveal where an organisation's energy is coming from, every half an hour.

Crucially, the Matcher can simulate the addition of hypothetical clean solutions to an organisation's portfolio, such as CPPAs or onsite solar PV. This allows you to see how different types of renewable generation will work for the needs of your business and perhaps identify necessary battery storage. This means you can have more confidence in making the big investment decisions, because they're backed by the data.

Using ENTRNCE's Matcher means you can be more confident in your energy and carbon reporting, whether that's for mandatory compliance or your own climate goals. Using a data-driven approach with the Matcher means you have clear evidence of your carbon-cutting work.

The only appeal REGOs ever had is that they were seen as a cheap way to green your energy supply. Now they're not even cheap, the logic behind using them is crumbling. Smart businesses should futureproof their carbon reporting and protect their reputations by making real changes now. www.entrncc.co.uk



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THE ROUTE TO NET ZERO: FIVE UPCOMING TRENDS FOR 2024



Kam Singh,
director of
carbon solutions,
EMCOR UK

As we approach 2024, organisations will require long-term, legitimate decarbonisation plans to meet their 2030 net zero goals. The built environment currently contributes 40 per cent of the country's total carbon footprint. The way energy is purchased, used, supplied, and reported will need to be comprehensively addressed to reduce this figure.

Here are five key trends that I see shaping the year ahead.

STRATEGIC ENERGY PRICE RISK MANAGEMENT

Recent global events have caused much volatility in the energy pricing markets. Unfortunately, the elevated prices that we see as a result of this instability could easily become the new normal. Organisations should now ensure that they manage energy price risk much in the same way as other business risks, and ensure that they have rolling 3-year views of their energy market positions.

With the expectation that prices will remain at a higher rate for the foreseeable future, I believe that a better, more strategic approach to long-term energy management is also needed. Developing strategic energy management projects informed by knowledge of detailed energy profiles could help smooth out some of the price shocks, open the door to renewable energy options through on-site generation, and ultimately reduce emissions.



LEGITIMISE CARBON OFFSET SCHEMES

Simple certification for carbon offset schemes will no longer be enough as many third-party carbon reduction schemes have been increasingly called into question in recent years.

Renewable Energy Guarantees of Origin (REGOs) may offer net zero certification, however, there are questions around the potential over-allocation of these against the actual amount of REGO backed electricity available in the market. This brings the credibility of the scheme into question.

As companies move to longer-term energy pricing/procurement plans, the legitimacy of their net zero claims can improve through Power Purchase Agreements (PPAs). PPAs establish proof of direct collaboration between renewable energy providers and their clients.

Rather than offloading carbon onto third party projects, PPAs mean that an organisation can evidence, for example, that it receives 30 per cent of its renewable energy from a specific wind farm. PPAs will consequently provide long-term, financially stable, and best of all – authentic – solutions to net zero carbon.

SMART BUILDING ENERGY PROFILES

Energy management also needs better on-the-ground attention, especially for multi-site organisations. In the UK we've had half-hourly metered electricity supplies for all sites with a demand exceeding 100kW for almost 30 years. This should allow all businesses to at least review the daily load profiles for their buildings and make informed decisions on energy efficiency.

AI monitoring software, IoT solutions, and predictive technology is providing advanced data management that can be applied at an individual asset level to assess when maintenance is required before it is needed, the efficiency of equipment and if it's operating in line with demand. I also stress the importance of this due to hybrid working, as offices do not need to run on full occupancy levels and systems should instead be smart enough to respond to different usage patterns.

Sensors can send information to the building controls to adjust how systems are run, to respond to the demand in the building. For example, CO₂ sensors can be used to assess building occupancy levels, with the data then being used to adjust all running systems as a result.

ADDRESS SCOPE THREE EMISSIONS

Many organisations have a good handle on their Scope 1 & 2 emissions (largely gas/electricity/fuel), but the scope 3 supply chain emissions are a significant issue for most organisations who have committed to net zero.

Reducing the emissions of global supply chains will require cross-organisational collaboration and open communication. Larger organisations who rely on smaller suppliers can help them meet these goals through education and support schemes. For example, collaborations with software providers can be developed, so smaller organisations can more accurately measure their emissions.

DEVELOP ESG FRAMEWORKS

Finally, all these steps need to be approached in a structured manner. I predict that organisations will increasingly refocus onto Environmental, Social, and Governance (ESG) frameworks. These structures allow businesses to identify specific metrics and develop data-driven improvement plans across all areas.

A good ESG framework should be aligned to the new requirements of the Corporate Sustainability Reporting Directive (CSRD). The CSRD requires all companies listed and operating within EU regulated markets to meet their sustainability reporting standards.

MAKE MEANINGFUL CHANGES

While these trends could shape carbon reduction in 2024 and the years that follow, if we truly want to hit climate change goals, we must take an even longer-term view. My predictions show how data-driven insight, reporting, and legitimate decarbonisation methods are set to be implemented. This will change how carbon is managed across the built environment for the better, forever. <https://www.emcoruk.com>

SOLVING THE CHALLENGES OF PARTIAL DISCHARGE TESTING

Partial discharge (PD) testing has a crucial role in determining high-voltage asset health. When creating a test schedule, the challenge is ensuring that high quality data is collected, and faults are identified promptly. Here Thomas Whyte, Senior Engineer at EA Technology outlines the issues and explains the best practice approach to ensure an optimised testing and maintenance regime.



Partial discharge is a localised electrical discharge, which as the name suggests, does not completely bridge the space between two conducting electrodes. It occurs when an area of electrical insulation breaks down, usually due to the electrical stress, and can be caused by voids, defects or impurities within the insulation material. It can happen in a range of electrical components including transformers, cables, switchgear and other high-voltage (HV) equipment. The damage that PD causes can seriously impact the lifespan, reliability and performance of HV equipment and lead to failures and supply outages. In fact, 85% of disruptive substation failures are PD related¹.

There are broadly three types of PD. Internal PD occurs within the bulk of the insulation material, while surface PD happens at or near the surface of the material. There is also corona PD that occurs from sharp points of electrodes into gas. This type of PD is not usually detrimental itself but when it occurs in an enclosed space the chemical compounds created can degrade the insulation and contribute to surface PD.

DESIGNING A MONITORING AND TESTING REGIME

Detecting and monitoring PD is essential in preventing equipment failures, which can result in power outages, the fines that can come with these and the cost of equipment repair and replacement. However, this can be challenging, often due to the variability of the P-F curve of the assets. This represents the progression from the potential failure point (P), at which point the defect can be detected, to the functional failure point

(F), when the asset fails. The gap between these points, the P-F interval, is the period when operators can act to address the issue and prevent a potentially serious and financially costly equipment failure.

Periodic testing is the conventional approach but setting the optimum test interval can be a challenge due to the variability of defects and economic and logistical considerations. There is a range of factors that can impact the P-F curve including the type of PD, the type of asset and insulation, the discharge amplitude, environmental conditions and the position of the discharge.

At EA Technology we have seen many cases where the P-F curve spans just a few months. With a two-month P-F interval there is only a one in six chance that the fault will be detected in time with a yearly test and this is only improved to one in three if testing occurs every six months.

For assets that require closer attention, an alternative approach is permanent monitoring using a fixed monitoring solution, such as EA Technology's Astute HV Monitoring®. Typically, PD sensors are attached to the outside of switchgear and around cable earth connections and this can normally be done without the need for an outage. This allows swift detection of PD issues and effective monitoring of the assets for advanced warning of potential failures. This enables shutdowns to be scheduled to inspect and repair the problem if needed with minimal interruption to customers. Permanent monitoring can also be a cost-effective approach as the annual cost of the monitoring can be saved several times over by preventing one serious failure.

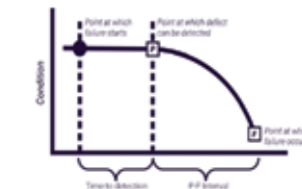
An example of how permanent monitoring has worked in practice is an EA Technology customer that implemented fixed

monitoring to mitigate the risk of an aged 11kV switchboard. Within 18 months, an emerging failure was detected on a voltage transformer, with data showing a rise in PD activity from zero to a high level in a matter of minutes. An outage was scheduled to inspect the transformer. Significant damage was found, indicating that the component was approaching its functional failure point. Based on this assessment, the P-F interval was estimated to be just two months. Thanks to the timely intervention, customers experienced no disruption or interruption to supply and no other components on the switchboard were affected.

Effective PD testing is essential to protect the lifespan of high-voltage electrical assets and ensure safety and reliability. Determining the optimum testing regime can be challenging due to a range of variables relating to both the equipment and type of PD. Therefore, engaging with a leading supplier of testing and monitoring solutions can help ensure the correct option is chosen for each application to ensure long-term peace of mind.

EA Technology has a wide range of both fixed and handheld solutions for PD testing such as the Astute HV Monitoring and UltraTEV® Plus², as well as an extensive range of services to help improve the safety and performance of electrical assets.

To find out more visit <https://eatechnology.com/>



¹ <https://eatechnology.com/services/condition-assessment/switchgear-condition-assessment/partial-discharge-surveys/>

THE EVER-INCREASING BENEFITS OF OWNING A POWER AND ENERGY LOGGER

In recent years Power and Energy Loggers (PELs) have become more prominent in the facility manager or site electrician's arsenal as their many different use cases increase, particularly those concerning energy efficiency and maintaining the economic and reliable performance of the electrical installation.

Whether it be for identifying **inefficient equipment**, which is responsible for 20% of the electrical energy used by the average UK SME, or reporting **out of hours electricity use**, which accounts for 46% of UK SME electricity consumption, many businesses are already benefitting financially from investing in a PEL.

Add to that the PELs ability to identify poor **phase loading and balance**, which would otherwise result in one or more phases carrying a higher current than the others. This increases losses due to heating and

reduces the available supply capacity, and at its worst, could lead to a voltage imbalance that negatively affects some of the 3-phase equipment in the same installation. Fortunately, the measurement of voltage and load (current) balance, and therefore the identification of imbalance, is easily achieved using a PEL.

A Power and Energy Logger will also monitor and record **power factor**, with poor (low) power factor reportedly affecting almost 50% of UK businesses resulting



in higher energy bills. Poor power factor also impacts on the reliability of the installation itself and can cause a variety of electrical issues that may result in the early failure of capital equipment. This equipment often gets replaced at great expense without the root cause ever being observed or identified. Poor power factor can also impact heavily on the capacity to add new loads when a business expands.

Logging with a PEL to determine **maximum demand** is rapidly growing due to the complexity of the diversity calculations

required, the fact that the figures in the IET On-site guide are out of date, and the large margins for error built into the calculations. In many recent cases logging has revealed an actual maximum current demand significantly lower than that arrived at using the prescribed diversity calculations, and generally with significant implications on cost savings pertaining to expansion work or determining supply suitability.

PV / Battery installation surveys are being performed using PELs prior to embarking on a solar PV project, enabling businesses to gain a comprehensive understanding of their electricity usage patterns by measuring consumption throughout the day and night, assessing variations on a daily, weekly, and monthly basis, and identifying seasonal fluctuations due to factors such as lighting, heating and air-conditioning. The data captured by the PEL provides valuable insights into the actual energy consumption patterns, identifying peak demand periods and usage trends. Information that is imperative when sizing battery systems.

In addition to these existing uses for Power and Energy Loggers there are a few "modern day" issues that are now being reported, one of which is the increasing numbers of businesses that are having problems with their **EV chargers unexpectedly shutting down**. This mostly concerns



light industrial, commercial and other similar sized facilities that take a 230V single-phase or 400V 3-phase supply from their energy supplier, rather than those on higher voltage supplies with their own substations.

Aside from the EV charger being faulty or poorly installed, one of the main reasons for them shutting down is being found to be due to a high mains supply voltage, with every EV charger having a manufacturer-set threshold over which they will not operate.

The permitted voltage tolerance in the UK is -6% +10% which for a single-phase supply gives an upper limit of 253V, and 440V between phases for a 3-phase supply. It is the responsibility of the Distribution Network Operator (DNO) to maintain the supply voltage to within these limits and accordingly, many EV charger manufacturers set a maximum supply voltage threshold based on that. However, there are a growing number of businesses with EV chargers experiencing problems, with single-phase mains voltages as high as 259V, and phase to phase voltages of 450V being reported.

The same issue is also starting to rear its head in the PV world with grid tied inverters that should be exporting energy failing to do so and reporting high grid voltage alerts instead, and installations with combined PV / battery systems having batteries set to charge during the night on low-cost tariffs, that simply haven't. This is again caused by a manufacturer-set threshold designed



to protect against over voltage.

While it is the DNO's responsibility to maintain the voltage within limits, customers with **EV and PV shutdown issues** are finding the best way to get them to investigate and resolve the problem is to prove to them that it exists. To do that they need to somehow measure and record the mains voltage over time with something appropriately accurate, and for this they are best served by using a PEL.

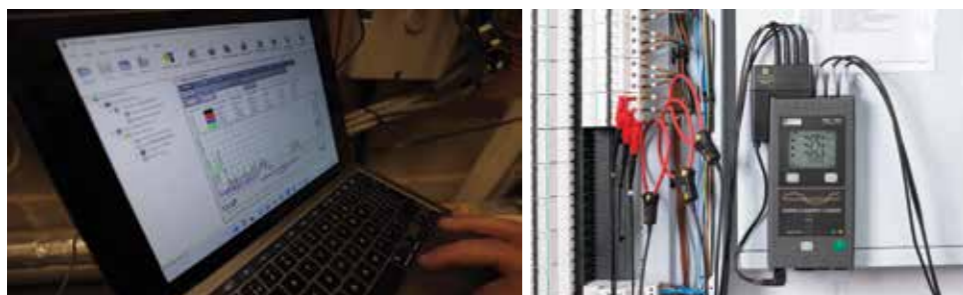
To summarise, the logging of electrical parameters in an installation is becoming increasingly common for a variety of reasons, and these new EV and PV issues provide further justification for facility managers and site electrician's considering benefitting from investing in a PEL.

Whatever the electrical installation logging requirements the best solution is to use a 3-phase portable power and energy logger like the PEL104 from Chauvin Arnoux. The PEL104 is a powerful tool that measures and records key parameters such as

voltage, current, frequency, power factor, as well as power and energy usage. It even measures and records individual current and voltage harmonics, a feature generally reserved for power quality analysers.

It can log from a few seconds to a few months, with all measurements being recorded to a standard SD card which can be read directly with a PC. Alternatively, measurements can be retrieved via Wi-Fi or the integrated web server. The PEL104 is complemented by Chauvin Arnoux's PEL Transfer and Dataview PC software packages which makes it easy to analyse the results and to generate preformatted reports.

With all of this in mind, there has never been a greater need or a better time to buy a PEL, but when you are choosing a power and energy logger it pays to think carefully about the instrument you're buying. PELs are not all the same and are not hard to use, but there may be times when a little advice and guidance will be welcome. Chauvin Arnoux UK not only have a reputation for delivering quality products, but also for providing expert support should it ever be needed. Why not put us to the test. www.chauvin-arnoux.co.uk



REGISTER YOUR FREE PLACE NOW AT EMEX, THE UK'S LEADING ENERGY MANAGEMENT AND NET ZERO EXHIBITION!

Returning to London's ExCeL on 22 & 23 November 2023, it is proud to be the largest gathering of energy managers and sustainability professionals in the UK.

Now in its tenth year, EMEX 2023 is even bigger and better than before and offers our audience even more in the way of learning, networking and technology to aid the transition to a net zero future. Read on to find out more...

ADVISORY BOARD

2023 sees the advent of the first EMEX Advisory Board to help guide and shape the future of the show. Comprising a select group of industry experts, the Board has been put in place to ensure the event fully meets the needs of the sector and will give strategic level input during the development of the event, ensuring it offers maximum value and relevance to both our visitors and exhibitors. We're delighted to welcome the 2023 Board members and look forward to working closely with them to continue to make the show even bigger and better going forward.

PROGRAMME OF LEARNING

The opportunity to learn and increase their industry knowledge has always been a powerful driver for visitors to the show. The free-to-attend conference programme once again covers a wide variety of themes and issues catering for every step of the net zero journey. Spread across four different theatres, it's jam-packed with some of the foremost thought-leaders in the space, as well as a huge range of practical case studies from those who are hands-on in the implementation of creating an energy efficient future.

Led by Lord Rupert Redesdale over eighty expert speakers including David Melhuish, Chief Development and Sustainability Officer, The Gym Group; Eloise Ferrara-Neched, Senior Procurement



Manager, Print, Travel & Events, Royal Mail; Emma Bushell, Energy and Carbon Manager, City of London Corporation and many, many more will be presenting a wide range of panel discussions, technical and innovation showcase sessions, learnings and advice to visitors on how to move forward with their own net zero agenda. Check out the event website for further details of all the sessions.

EMEX is proud to be offering new features in its tenth year: Wates Group are one of the UK's leading providers of planned and responsive maintenance services in the social housing sector and the show is delighted that they are taking centre stage this year with the Wates Pavilion. They will be showcasing the services and products of companies that can improve energy use for residential properties as well as save money on household energy bills. Innovation partners already confirmed to appear include: ABS Group, Verv, Signify and The Energy Savers Limited.

Also new for the 2023 show are interactive roundtables where visitors can be part of in-depth discussions on a key theme or topic. Why just sit and listen when you can be part of the debate? Already confirmed so far are discussions hosted by Inenco and SMS and more are being finalised. These are unique opportunities to drill down into some of the most important issues in energy management today.

TECHNOLOGY INNOVATIONS

We're pleased to welcome both new and returning exhibitors to the show, with

many of the 100+ companies showcasing innovative energy efficient solutions. This is a real opportunity to be amongst the first to see how rapidly developing technology is helping to reach sustainability goals. To see which products and services are appearing at EMEX, the event website gives further information so you can plan ahead. Whether you're just starting out or looking for the right product for the next step of your journey, the busy show floor is the place to be.

MAKE THE RIGHT CONNECTIONS FOR YOUR NET ZERO JOURNEY!

Of course, many of our visitors come to EMEX each year to grow their professional networks. Whether it's informal chats over a coffee, or a pre-arranged meeting in one of the expo's many break-out areas, having the largest gathering of energy managers in one place means you can make the right connections for the next twelve months over just two days!

EMEX welcomes over 4,000 visitors from the smallest companies to the largest multinationals, from limited budgets to those who have millions to invest in sustainability solutions and from across the wide spectrum of both the private and public sectors. Whether you're coming to source products and equipment, conduct meetings with industry peers or acquire knowledge and best practice learnings from the educational agenda, EMEX is the place for you.

Visit <https://emex-2023.reg.buzz/em> to register your FREE place now.

UNLOCKING THE FUTURE OF BUILDING PERFORMANCE: CIBSE BUILD2PERFORM LIVE 2023

In the ever-evolving landscape of sustainable construction and building performance, staying ahead of the curve is crucial.

For professionals in the built environment, there is no better place to learn, connect, and be inspired than CIBSE Build2Perform Live 2023. This year's event taking place on 5 and 6 December 2023 at the ExCeL London, promises to be an unparalleled gathering of industry experts, innovative technologies, and thought-provoking discussions. Join us as we explore the impressive programme and world-class speakers, providing a glimpse into what makes this event an essential experience for anyone in the industry.

CIBSE Build2Perform Live 2023 boasts an impressive programme that covers a wide array of topics crucial to the future of building performance. This year, the event features seven theatres including our Vision Theatres which are hosted by CIBSE CPD-approved companies, ensuring that you receive valuable insights and expertise from industry leaders. From sustainability and energy efficiency to smart technologies and human-centric design, the programme is thoughtfully curated to address the most pressing challenges and opportunities in the industry.

HERE'S A SNEAK PEEK AT SOME OF THE KEY THEMES THAT WILL BE EXPLORED:

- Design for inclusion, well-being, and sustainability. How do we design buildings to foster inclusion, well-being, and sustainability?
 - What does the Building Safety Act mean for Building Services projects?
 - Retrofit at scale: how many, how deep, at what cost
 - Advances in urban digital planning and modelling for climate-resilient, healthier urban areas, and buildings
- In addition to a jam-packed technical programme, CIBSE are delighted to introduce a brand-new zone for 2023,



SLL - Light2Perform is a dedicated area within CIBSE Build2Perform Live, featuring leading lighting manufacturers, contractors, wholesalers, and retailers. With its own dedicated theatre, all technical content will be organised by leading lighters, Bob Bohannon, Helen Loomes, and Sophie Parry. Sessions featured will look at:

- Emergency Lighting
- External Lighting
- Dark skies
- Light Pollution
- Decarbonisation (BS EN 12464)
- Health & wellbeing
- Regulation
- Sustainability
- Updates on both the TM65 & the TM66
- Launch of both the LG7 (New office Lighting Guide) and LG14 (Control of Electrical Lighting)
- Young Lighter of the year

CIBSE also has key partners with lighting and electrical services partners including with the LIA (Lighting Industry Association), ECA (Electrical Contractors Association), CIBSE, SLL (Society of Light and Lighting) and the ILP (Institute of Lighting Professionals). Furthermore, CIBSE Build2Perform Live includes a diverse group of

expert speakers, each with a wealth of knowledge and experience in their respective fields, including:

- Hywel Davies (Chief Technical Officer, CIBSE)
- Colin Goodwin (Technical Consultant, CIBSE)
- Susie Diamond (Partner at Inking)
- Antoinetta Canta (Design leader and project manager, Arup)
- Ken Gordon (Lead author of CIBSE TM51 Ground Source Heat Pumps and CEO GSHPA)
- Chris Twinn (Principle, Twinn Sustainability Innovation)
- Helen Loomes (SLL President)

In the realm of building performance, CIBSE Build2Perform Live 2023 is undeniably a beacon of inspiration, knowledge, and progress. With its dynamic programme and world-class speakers, it promises to be the pivotal event of the year for professionals in the built environment. Don't miss out on this opportunity to unlock the future of building performance – secure your spot for free and be part of the transformation. We look forward to seeing you there!

Register, for free, to be the first to hear the latest news: <https://go.cibse.org/nationalevents-B2p-2023-emm>

MHHS: TIMING IS EVERYTHING, AND THE CLOCK IS TICKING

Justin Vroone,
Chief Commercial
Officer, IMServ

Market-wide half hourly settlement – like it or loathe it, the one thing you can't do is ignore it. A final implementation date in 2026 may give the impression this can be deposited in the do later pile, but in fact now is precisely the time for utilities to start planning in earnest if they don't want to be caught out. The programme may have been pushed once, but it's unlikely to shift again. In fact, by working backwards from the revised final migration and transition dates, it becomes apparent that time is in fact a little tight, and 2024 is the critical year.

THE FIRST MOVERS HAVE MOVED

Let's be clear: the first movers on MHHS have already made their moves. Early-engagers will soon enter the SIT (system integration testing) stage, which commences in November this year. Suppliers and Service Providers alike have put their hands up to go first and will benefit from an earlier, closer look at the precise machinations of the new regulation, and will be primed and ready ahead of their competitors when mandatory implementation comes. Crucially, they will have a longer window to carry out migration and address any teething problems that may arise.

SIT entry is now closed, so these first mover advantages are now off the table. For the rest of the market that raises the questions of when they can and when they should follow with their own MHHS implementation programme.

SECOND VS LAST MOVER ADVANTAGE

The next window for entry into the MHHS programme proper will be when Qualification begins at the beginning of 2025. There will be several intakes, or tranches, and the decision for utilities will be whether to aim for an earlier or later tranche.

One school of thought will be to leave it late in the hope of reaping some last mover advantages. For example, the later entrants will benefit from seeing any unexpected challenges arise for their more proactive peers, and may themselves have fewer surprises in store. They may also reason that this will give more time for service providers to fully work through their MHHS offering, though I would argue that any

provider serious about operating in the UK market will be jumping straight into tranche one, if not already part of the SIT cohort.

Late entry is likely to be most attractive to smaller suppliers, with meter points measured in the hundreds-of-thousands rather than the millions. They may reason they have less to migrate and therefore require less of a window versus bigger peers, plus suppliers may have been around the block a few times already by this point and be in a position to handhold nicely.

However, there are real risks of leaving it late. I agree that larger suppliers will likely want to move earlier in order to maximise the window available to them to make the migration. However, there is no guarantee that all of these suppliers will complete their migration smoothly and in a timely manner. The MHHS programme as a whole only has capacity to migrate a finite amount of data per month, and late-waiters may find that capacity is tied-up by those ahead of them in the queue who are overrunning. Similarly, if relying on service providers to help manage the migration, late entrants may find their partners of choice fully booked.

Positioning for entry into an early tranche still provides some of those late-mover advantages, as those involved in the SIT phase will have hammered out some of the kinks already. However, it also provides maximum contingency and minimises risk.

And of course – and this may be something that excites the boardroom more than the operations folk tasked with implementing MHHS – part of the case for change is that MHHS enables innovative new energy services and tariffs. Therefore, earlier adoption means earlier opportunity for commercial innovation too.

IMPLEMENTATION IMPLICATIONS: QUESTIONS TO ASK

Assuming you are convinced that an early tranche is the way to go, what does that mean? 2025 qualification testing still seems a long way away, right? Not necessarily. Ask yourself these questions:

- Am I ready for MHHS?
- Are my systems ready?
- Have I selected systems providers for the post MHHS world? Are they the same as today? Should I consolidate them?
- Is my system design agreed?
- Are my service partners agreed for qualification testing?
- Is my portfolio ready for the migration once we have completed qualification and secured PAB approval to proceed

Bear in mind that IT systems will be placed under much greater load than before. For each meter, suppliers will be going from one meter read per day or even per quarter, to 48 every day – that's 4,320 per quarter. There is no need to panic – these are perfectly handleable data volumes – but it does underline the need to check that systems are up to scratch.

Now, think about the length of time it might take to do the following: assess current software and service providers and IT systems; make a recommendation for change to the board; compile the business case; negotiate terms and sign contracts; offboard old and onboard new suppliers; implement IT system changes; quality and assurance testing for any changes. Think of how many stakeholders may be involved in each of these, and how many weeks or months each might take. Factor in human considerations such as holidays, Christmas etc.

Remember that changes to systems require time for users to rebuild familiarity, and that while the bulk of the changes may be seamless, time is often eaten up by the exceptions.

Consider again: does early 2025 still seem far away?

2024: GET YOUR MHHS HOUSE IN ORDER

There is a compelling case for aiming for an early tranche for qualification testing in 2025. In order to be ready to do so, 2024 will be a crucial planning and preparation year for utilities. Some may review their existing suppliers and systems and find them all satisfactory, but many may find that change will be required. The only way to know which situation you may be in is to engage early, preferably with a data service provider which is deeply embedded in readiness for the MHHS SIT phase already. Preferably, this partner will be across the advanced, smart and unmetered data services, as well as the corresponding metering services, such as IMServ.

Of course, it's always possible that implementation deadlines are pushed back, buying utilities some breathing room. It would be unwise to gamble on this being the case though – these dates already reflect the replan approved earlier this year and I suspect this will be a firm deadline. What's more MHHS will be a license condition requirement, so such an approach would be rather cavalier.

It seems clear then: now is the time to get the MHHS house in order.

<https://imserv.com/>

ENERGY COMPANIES ARE PAYING CUSTOMERS TO USE LESS ELECTRICITY – HERE'S HOW BUSINESSES CAN GET INVOLVED

Adam Hall, Director of Energy Services
at Drax Energy Solutions



In the ever-evolving landscape of energy solutions, the Demand Flexibility Service (DFS) invites businesses to actively shape their energy consumption while reaping substantial financial rewards. This game-changing development is a visionary approach from the National Grid Electricity System Operator (NGESO), and your business could get involved this winter.

THE POWER OF DEMAND FLEXIBILITY SERVICES

Demand flexibility has been gaining momentum in the energy industry, and the National Grid ESO introduced DFS last winter to incentivise consumers and businesses to reduce their power consumption in specific periods.

Through collaboration with customers, Drax was a key player in supporting the Demand Flexibility Service and will be again this winter. Drax helped reduce peak electricity demand by 340MWh, equivalent to powering 680,000 homes and delivered a combined revenue of £1 million to participating businesses. This could be your business this winter.

HOW DOES DFS WORK?

By incentivising businesses to reduce their electricity consumption during peak periods or shift their energy use to times of lower demand, NGESO aims to create a more balanced and sustainable energy ecosystem. This approach not only reduces the strain on the electrical grid but also decreases the risk of blackouts and additional power generation, often supplied by fossil fuels, during peak demand times.

Here's a simplified breakdown:

- 1. Participation:** Not all energy suppliers are currently approved to this scheme. Therefore, businesses will need to check if their energy supplier is participating in DFS this winter. Once this is confirmed,

businesses can directly opt in through their energy provider or through an intermediary. For a business to participate, they will need to be half-hourly metered.

2. Demand Response:

During periods of high demand on the grid (or during DFS test events), NGESO will contact providers with the amount of volume they require and for which periods they need it. Those participants, such as Drax, would then instruct their customers to reduce their electricity consumption, which could be done by temporarily interrupting processes, adjusting heating or cooling systems, or rescheduling non-essential tasks.

3. Rewards:

Businesses that successfully respond to these signals and reduce their electricity consumption during peak times are financially rewarded.

WHY GET INVOLVED IN THE DEMAND FLEXIBILITY SERVICE?

The Demand Flexibility Service provides businesses with a range of advantages. Firstly, by participating in DFS, businesses can earn additional revenue by reducing their electricity consumption during peak demand periods, as they receive payments from the NGESO for their efforts.

Secondly, embracing demand flexibility aligns with corporate sustainability goals and demonstrates a commitment to decarbonising the grid and reaching net zero. It's a tangible way for businesses to contribute to a greener future and help keep Britain's lights on in challenging seasons.

Lastly, DFS encourages businesses to adopt energy-efficient practices and technologies, leading to better energy management and reduced waste for a sustainable future.

GETTING STARTED WITH DEMAND FLEXIBILITY SERVICE

To get involved with the Demand Flexibility Service, businesses should contact their energy solutions providers to opt in and discuss the subsequent actions before winter 2023/24. The process typically involves an assessment of energy use patterns and the installation of necessary equipment for demand response.

ARE THERE DEMAND FLEXIBILITY SERVICES ALL YEAR ROUND?

Not currently. However, alongside supporting the NGESO, we've launched ElectriFlex this year, which offers customers the benefit of flexing their consumption and subsequent revenue throughout the whole year, every year. With our expertise in market trading, we can continue to pass on revenue to our customers and incentivise long-term, flexible thinking for the future. This will be an exciting turning point for the UK's energy supply, and we look forward to helping more businesses join the flexible future.

For more information about Drax's support of NGESO's Demand Flexibility Service, visit https://www.drax.com/uk/press_release/drax-supports-uk-energy-security-by-helping-businesses-use-less-power/

To learn more about the National Grid Electricity System Operator's implementation of the Demand Flexibility Service, visit www.nationalgrideso.com/industry-information/balancing-services/demand-flexibility-service-dfs



A NUDGE IN THE RIGHT DIRECTION

Adrian Barber, from Prefect Controls, investigates how behavioural change can be used to drive down energy use in student accommodation.

There is a widespread consensus that the key areas that will help the UK to meet climate and environmental goals relate to how we travel, what we eat, what we buy, and energy use.

Our consciousness of where products and food originate and choosing to avoid the carbon hungry transport of these, and ourselves, around the globe are biggies when it comes to combatting the climate crisis.

Future technological innovations cannot be relied upon solely to deliver all the necessary emission reductions. Behaviour change concerning transport, diet, heating and consumption is essential in achieving our goals and potentially delivering wider benefits. These 'co-benefits' include dietary change, more physically active travel, less consumption etc., all of which could lead to healthier lifestyles and the inherent positive effect on healthcare provision and services. Not to mention helping towards our carbon reduction targets.

Polling shows that the public want to know how to play their part in tackling carbon-intensive consumption. Strong leadership, clear concise communication and setting a good example are ways in which behaviour change initiatives will filter from government – to organisations – to individuals.

In a localised community, such as universities, there is considerable potential to approach targets through behavioural intervention. But, for meaningful change,

the process must be carefully considered.

To begin with, how are we defining the problem in behavioural terms? What is the behaviour that requires change? Who is doing it? And where is it occurring? Which future actions need to be promoted, and which of them will potentially have the greatest impact, are easily initiated, and can be measured.

Reading around the work of Susan Michie, Professor of Health Psychology at UCL, will help to understand the COM-B model, the Theoretical Domain Framework, and the resulting, Behavioural Change Wheel. These are used to formulate intervention plans for positively influencing behaviour. Fundamentally, when current behaviour and the plans for change have been defined, analysis is carried out to determine whether people have the capability to do it, if opportunities allow them to do it, and whether they want to do it. A modification in any of these can induce change. Interventions can then be brought in to support the requirements. These include Education; Persuasion; Incentivisation; Coercion; Training; Enablement; Modelling; Environmental restructuring; and Restriction.

Behavioural interventions have considerable potential in reducing energy use in universities, particularly student accommodation. Improvements in building and construction techniques will play a role, but for existing property and the long-life expectancy of new builds, behavioural change is playing a central role

in emission reduction strategies. A key issue is that the occupant of a room is usually not directly, financially responsible for energy costs, and their own consumption is not at the forefront of their mind.

We are noticing a combination of interventions, including enablement, restriction, education, and persuasion, are helping to drive change in properties where we operate.

We enable behaviour change by restricting the ability for energy to be used unnecessarily. We ensure energy is only consumed when required and limit the time that boosted heat is available. Information provided at point-of-use, explaining the issues, educates occupants to why it is important that measures are in place to control consumption. A practical example for use of hot water, is a simple device attached to the wall in a shower. It detects water flow and starts a counter which displays the time a shower has been running. Information provided, at point-of-use, highlights to residents the average shower lengths of their peers, and the effect that excessive showering has on global consumption.

These are small changes when viewed in isolation, but this kind of 'nudge' persuasion through education and enablement, combined with sophisticated monitoring across thousands of rooms soon adds up, and for our customers, is proving effective in making significant water and energy savings. www.prefectcontrols.com

HOW BEHAVIOURAL CHANGES IMPACT CARBON REDUCTION

Renewable energy and other approaches to achieving sustainable development are increasingly taking main stage in discussions about the future of UK industries. By drawing on the latest scientific evidence, industry leaders are recognising the enormous pro-business and pro-growth opportunities that decarbonising all sectors of the UK economy can unlock. At a wider scale, the Government has set out the policies and proposals it deems necessary for decarbonising all sectors of the UK economy considering its commitment to a net zero target that reduces the UK's greenhouse gas emissions by 100% from 1990 levels by 2050.

What is lesser communicated are the ways in which Government can encourage people to change their behaviours, and perhaps even more ambiguous are the extents to which social and behavioural changes can impact carbon reduction. There are various demand-side solutions which are well-documented. Anyone who has started their journey to becoming carbon literate will likely be aware that shifts towards a more sustainable diet, less flying, circular economy principles and other behavioural changes can contribute to reducing an individual's carbon footprint. However, behavioural impacts on the UK's decarbonisation goals are deeper than appears on the surface. Focus should also be directed to enhancing decarbonisation projects in the public sector, whose diverse workforce are largely untrained in sustainable practices and often not involved in the project delivery transition from construction to operation.

One pathway to net zero is represented through the government's various grant and loan schemes that support decarbonisation of the public sector and housing. The Department for Energy Security and Net Zero has continually refined the Public Sector Decarbonisation Scheme through its phases to support the aim of reducing emissions from public sector buildings by 75% in 2037, compared to a 2017 baseline. The scheme is strongly focused on decarbonisation and supports low carbon heating systems and enabling measures such as energy efficiency technologies. On the surface, an approach which prioritises proven technologies that can be installed in a physical form to produce tangible results appears to be robust, versatile and seems to hold out on the promise of delivering public sector net zero targets.

Mateen Sedenu is Senior Energy & Carbon Analyst at Salix Finance



However, are we doing enough to embed behavioural change? Are we missing a trick?

Picture a school successfully applying for a grant scheme to decarbonise their heating and install additional energy efficiency measures. They've been able to replace their end-of-life gas boiler with an air source heat pump and are expecting to significantly reduce their annual carbon footprint. There is also an expectation and reliance on the system to reduce consumption and improve energy use; the end-goal of this is contributing to net zero and lowering energy bills which cause a strain on many public sector organisations. However, bad habits come in wide ranging forms in the context of sustainable practices. From occupants keeping office lights on outside normal operational hours to a caretaker failing to clear an air source heat pump unit of debris such as leaves and dust which impedes airflow. These acts, whilst on an individual basis are likely unintentional and due to lack of expertise through a failure to educate building users in sustainable practices, can raise consumption and energy requirements to operate the heating system. Even if the installation of Building Energy Management System (BEMS) provides visibility of consumption, specialist knowledge is required to analyse the results and implement an appropriate, effective solution; something that many organisations' energy managers (a broad term that can encompass an unqualified schoolteacher or a highly skilled building engineer) lack.

The efforts that have been made towards decarbonising the public sector as part of the net zero strategy have put us on the right track. However, the concentration on technical fixes should not negate policy focus on behavioural changes which are enacted through collaboration between building designers, their clients and the future occupants and operators of the buildings undergoing sustainability transformations. Currently, many public sector decarbonisation strategies are far removed from the occupants of the buildings that they serve.

There are instances where decarbonisation projects are introduced into buildings and holistic thinking about whole energy use is initiated. Without an approach that engages building occupants and operators throughout the project

delivery process, these behavioural changes are often related to individual adjustments of everyday habits.

Some schools have integrated successful projects into the curriculum. A chemistry lesson that covers how the flow and return temperatures of the heat pump powering the school's Science Block are regulated by the laws of thermodynamics - in place of a textbook's generic diagrams - can be more engaging and effective in creating a carbon literate cohort aware of the changes that can be made to adopt better sustainability practices. However, these initiatives are difficult to quantify in terms of impact and they place a large burden on lesser qualified staff to deliver such teachings.

To go one step further and ensure the direct engagement of personnel who will be the occupants and operators of sites after the installation of decarbonisation improvements, this will require specific frameworks that provide an understanding of how best to manage a site transitioning to low carbon heating as this can enhance a building operator's understanding of best practices and foster the efficient use of new technologies. The concept of 'soft landings' refers to approaches which enhance the transition from construction to operation, specifically creating the environments that optimise operational performance. An important consideration is to ensure that this transition is embedded throughout project delivery, instead of at the handover point (or in many cases not at all). Despite the Government Soft Landings Framework launching in 2016, there has been slow adoption of these practices to improve both quality and operational performance of building projects from inception to completion.

There is inherent uncertainty in predicting levels of behavioural and subsequent system change in the future. Nonetheless, decarbonisation projects in the public sector must incorporate best practice approaches which include embedding concepts such as 'soft landings' to ensure that sustainability impacts are enhanced and public funds for carbon reduction projects are used most appropriately. www.salixfinance.co.uk

SEELEY INTERNATIONAL APPOINT CPA ENGINEERED SOLUTIONS AS UK NATIONAL DISTRIBUTOR FOR BREEZAIR EVAPORATIVE COOLERS

Seeley International are pleased to announce that they have signed an agreement with CPA Engineered Solutions for the exclusive national distribution of Breezair evaporative coolers in the United Kingdom, effective from 15th October.



Breezair is world leading in evaporative cooling, the ideal solution to cool commercial and industrial spaces at a fraction of the cost compared to conventional A/C systems. Fully manufactured in Australia, Breezair is the most reliable and durable brand available in the market, with premium features that guarantee cool temperatures and improved Indoor Air Quality.

"This key appointment will expand Seeley International's presence in the country, ensure improved support to the UK market and timely supply of products and spare parts." Says Fabio Marioni, UK and Ireland Sales Manager at Seeley International. "CPA is a solid, long-standing company, with a capable and trained technical and sales team, covering the entire country".

CPA Engineered Solutions, based in Central Scotland, will ensure total

customer service to the current customer base. They will oversee site surveys, installation, and maintenance for any new and proposed projects.

"United Kingdom is a key market for Seeley International and it is critical that we have the right distribution arrangements in place to ensure we build on our local distribution network and provide wider access to the range of award-winning and market-leading Breezair brand," said Sam Peli, Seeley International General Manager Sales EMENA. "This is a significant step in Seeley International's global growth plans and represents a new level of commitment to the local market. Our objective is to realise the significant growth potential we see for Breezair evaporative cooling products in UK in the years ahead, which will benefit us all."

"This prestigious brand fits seamlessly into our Controlled Air Division, a dedicated business unit

committed to offering products that enhance indoor air quality and energy efficiency. We are fully equipped to manage the national distribution and look forward to a long and successful partnership and their loyal customers" states Alan Collin, CEO of CPA Group.

"CPA have been our customers for many years" continues Fabio Marioni "we are confident that this is another step towards an even more tight partnership with them."

If you are a contractor, end-user, consultant, or in general you wish to get more information on Breezair evaporative cooling, you can contact CPA Engineered Solutions at: sales@cpa-group.com +44 (0) 1501 825024 www.cpa-group.com

ABOUT EVAPORATIVE COOLING

Evaporative cooling units only use water to cool the air. No chemical



refrigerants are involved in the process. Moreover, Evaporative air conditioners use far less electricity compared to refrigerated systems: that all adds up to very responsible environmental and energy saving characteristics.

No matter how hot it gets outside, evaporative coolers use the same amount of power and still deliver 100% fresh, cool air inside. This is in direct contrast to refrigerated systems, which require increasing amounts of power as outside temperatures rise. Evaporative coolers' cost-saving capabilities actually increase, when the heat is at its highest. At the same time, their performance also increases as temperatures rise – again, in complete contrast to refrigerated systems.

Using little electricity, no compressor and with low running costs, evaporative cooling is the perfect solution for industrial and commercial environments, that often have no cooling system installed at all. Air conditioning is not a viable option, because in

warehouses or industrial plants, the capital and running costs would be extremely prohibitive for end-users.

Furthermore, evaporative coolers use 100% fresh outside air. Outside air ventilation is now globally acknowledged as a core component of healthy and comfortable buildings. Evaporative cooling units bring 100% fresh air, never recirculating indoor air. This can be a great solution to improve Indoor Air Quality, as incoming air naturally pushes the stale air outside of the building from doors, windows or extract system.

ABOUT SEELEY INTERNATIONAL

Seeley International are Australia's largest air conditioning and ducted gas heating manufacturers and a global leader in developing ingenious, energy efficient cooling and heating products. Headquartered in Adelaide and with factories in Adelaide (South Australia) and Albury (New South Wales), the company was founded by Frank Seeley,

AM FAICD who remains Chairman.

Seeley International have been manufacturing air conditioners since 1972 and, unlike many of their competitors, design and manufacture most of the components products within Australia. Seeley International are world leader in Evaporative Cooling solutions: with offices all over the globe (Italy, France, USA, South Africa and of course Australia), the company ensures a strong level of commitment to the local markets and an everyday support to dealers and distributors.

Renowned for ingenuity and innovation, Seeley International lead the market in the design and manufacture of air conditioning systems based on Evaporative Cooling technology, with award winning brand names including Breezair, Coolair, Climate Wizard and Coolerado.

More info on the announcement at: <https://www.seeleyinternational.com/uk/news/appointment-of-new-uk-distributor/>

VEXO S-BMS REDUCES HEATING ENERGY CONSUMPTION BY 36% IN RESIDENTIAL CARE HOMES

Discover how VEXO's Smart Building Management System (S-BMS) successfully tackled the challenge of high energy consumption in residential care homes. By implementing remote monitoring and control solutions, VEXO's S-BMS integrated with LoRaWAN devices provided individual room temperature control and efficient management of the central boiler room. The results were remarkable, with a 36% reduction in heating energy consumption and a 25% reduction in total energy usage during the most recent heating season, proving S-BMS can be a cost-effective solution for energy management in a wide range of building types.

THE CHALLENGE

The existing system used a conventional BMS to control the boilers and primary heating circuit, allowing all radiators to be manually operated with no active measures to reduce energy consumption. This meant that a lot of energy was being spent where it wasn't needed, which led to higher energy bills.

The client was looking for a remote monitoring and control solution for their central boiler room to reduce heating energy consumption in several residential care homes across their county. They needed a wireless, retrofittable, long-range solution that was easy to install, compatible with their BMS and that could be used to monitor and control boiler outputs based on hot water and heating demand as well as factors such as occupancy level and outside air temperature.

SITE OVERVIEW

The retirement housing complex was built in 1984 and consists of 3 floors with 49 studio flats of different sizes, together with communal areas, office and cleaning and cooking facilities. The estimated floor area is 3400m².

The heating system consists of two 150kW boilers supplying hot water to a Domestic Hot Water tank used to supply Hot Water for communal use, cooking and hot water supply to the flats. The site is heated using 290 radiators that are fitted with TRVs. A single Variable Temperature circuit supplies water to all radiators.

THE SOLUTION

Until 2021 the plantroom consisted of a Siemens weather compensating boiler sequencer for heating and direct fired water heaters for hot water (HWS) generation. In the

summer of 2021 the control was replaced with VEXO S-BMS.

It was important to find a solution that allows the temperature in individual rooms to be controlled remotely, allowing the automatic control system to set day and night-time target temperatures, without any major repairs and without disrupting the comfort of the occupants, whilst optimising the central boiler room.

The solution was to install multiple VEXO's S-TRV thermostatic valves. The VEXO S-TRVs are integrated with the VEXO Smart Building Management System (S-BMS) which supports native LoRaWAN devices. The BMS control logic manages each group of one or more TRVs to operate shared spaces with setpoints set by S-BMS and not adjustable by the occupants outside of a specific range.

In addition, LoRaWAN room Temperature/Motion sensors are used to control intermittently occupied spaces so that the S-TRVs switch to lower setpoints when the rooms are not occupied.

All S-TRVs feedback information to S-BMS reporting if heating is required by the S-TRV. S-BMS uses the total S-TRV heating requirements combined with outside air temperature to optimise heat supplied to the building under different conditions and minimise gas usage.

Installation of the S-TRVs was carried out with no issues, replacing existing thermostatic TRV heads with the VEXO S-TRV either directly or using adapters. In addition certain areas were fitted with wireless window sensors to detect open windows.

RESULTS

The energy use for the most recent heating season where the building was under S-BMS control (2021/22) was compared with energy use for the period 2019/2020 which is the last heating season before the Covid pandemic. Like-for-like comparison of energy use was achieved by using the Degree-day data to adjust monthly energy data so that the monthly energy use for each heating season are for an equal number of degree days. Energy savings due to reductions in heating energy use were then estimated by removing



the base load due to hot water generation energy use. The results were as follows:

36% HEATING ENERGY SAVED

25% TOTAL ENERGY SAVED

These outstanding results from the project have been widely recognised by the industry as VEXO S-BMS picked up the following awards:

- Energy Project of The Year (Residential) – The Energy Awards 2023
- Product/Service Innovation of The Year – The Commissioning Specialists Association Awards 2023
- Winner of Residential Buildings Category - The ASHRAE UK Technology Awards 2023

It is assumed that the requirements for hot water in the building are equal in the two analysis periods and are unrelated to external climate conditions.

However, details of the control of the Hot-water system in 2019/20 are unknown, and the S-BMS control of the hot water system is designed to minimise boiler operation. In particular, S-BMS uses thermostatic tank temperature control with night setback which results on lower boiler usage than continuously maintaining the tank temperature at a fixed value.

Therefore, there may be a reduction in HWS energy costs due to reduction in losses associated with Hot Water generation. However even if the HWS energy use was reduced by 10% due to S-BMS control optimisation, this would still result in a reduction in heating energy use of 30%. www.vexoint.com

THE ENERGY CONSORTIUM (TEC) PLEDGES TO SUPPORT THE EDUCATION SECTOR'S NET ZERO JOURNEY

The economically constrained education sector faces a major challenge in decarbonising electricity and heat. Given the cheap price of gas, switching to lower carbon, often more expensive alternatives, is not always a feasible choice.

TEC, a not-for-profit which provides educational organisations with energy procurement and energy management services, is looking to expand its remit to support members' decarbonisation ambitions.

With 144 members, representing 72% of higher education establishments as well as several museums and galleries across England and Wales, TEC is in a unique position to advance the sector's net zero journey.

The member owned organisation has recently hired Dr John Brenton into the newly created role of Head of Carbon Reduction Solutions. John has launched a survey to its membership to find out what support educational organisations need to advance their decarbonisation plans.

John, who formerly led carbon management planning at the University of Bristol, said: "TEC has been very successful in helping members to procure energy in a carefully risk-managed way. However, there is scope for us to facilitate access to a greater breadth of services, particularly around carbon reduction.

"Overall, up until now, the sector's focus has been on controlling energy costs and energy consumption. Whilst some universities and colleges have made great strides in carbon reduction, there are many barriers to overcome to make decarbonisation economically feasible."

John believes that the sector has a genuine appetite to decarbonise but that there are tensions between an impetus for growth, carbon ambitions and economic constraints. He thinks that more incentives are needed to encourage universities and colleges to reduce

their demand and use lower carbon sources. John would also like to see greater government funding for energy initiatives such as feasibility studies.

These issues will be explored at TEC's upcoming annual conference on November 9th. John will be leading a session on the sector's journey to net zero and believes that sharing knowledge and best practice will be a hugely beneficial outcome of this.

"We will be using the event as a forum to explore some of the overarching findings from the survey", John said. "For example, we might discover that location dictates certain problems which require specific solutions. Or we might be able to group together intuitions who are all interested in a particular technology so that they can exchange knowledge and share success."

Going forwards, John believes that smart controls, improving the efficiency of equipment, access to clean energy at the right price, building new buildings to high standards and optimising the space organisations use, will all be key carbon reduction strategies for educational organisations.

Some of TEC's members are already deploying low carbon initiatives including solar energy, smart building controls and energy demand reduction initiatives. Through its Energy Framework, TEC is supporting some of these projects. The University of Wales Trinity Saint David has installed solar panels across its campus following on from a partnership between TEC and its Framework Supplier EDF.

Overcoming the financial and logistical barriers to decarbonisation

is a challenge that all universities face. Specially designed for educational organisations, the Framework ensures a simple and compliant pathway to installing self-generation equipment – without a procurement process. This makes it easier for energy managers to ringfence budget, gain internal stakeholder buy-in and get the project off the ground.

Universities are also facing growing pressures in the acceleration to net zero. A commitment to sustainability is now a top criteria for students in choosing an educational organisation according a survey carried out by the Times Higher Education. Deploying low carbon projects will be a win-win for universities and their student body.

TEC is optimistic that the organisation can find new ways to support the education sector to drive the net zero charge.

John said: "The sector is keen to try new things. Universities and colleges are uniquely future focused with strong student and staff voices, which help put the focus on sustainability issues.

"Some of our members have strong net zero or carbon neutral targets and some have made declarations of climate emergencies. Others may not be so far along their decarbonisation journey. The bottom line is that economic constraints will always make this challenging. At TEC, we are confident that we can find solutions and facilitate conversations to help members overcome this challenge and realise their sustainability goals." <https://www.tec.ac.uk/>

EUROPEAN & GLOBAL MARKET FOR HEAT PUMPS LOOKS FOR WIDE EXPANSION



Chris Goggin looks at the expansion of the global heat pump market as they will play a pivotal part in UK, European and international decarbonisation plans. Rinnai observes the market conditions that will likely see heat pump technology become standard household appliances on an international scale.

Heat pumps will make a significant contribution towards global decarbonisation aims, of that there appears to be little doubt. The international heat pump market is projected to substantially expand as fossil fuels are phased out in favour of clean carbon neutral energies. Heat pumps are becoming seen internationally as trusted tools of decarbonisation with major economies across the globe adopting them as a preferred method of heating and hot water delivery to domestic and commercial sites.

Heat pumps will certainly be a major contributor towards the introduction of clean renewable energy across EU member states. The EU aims to increase the number of heat pumps installed in member countries with its REPowerEU plan. The plan covers diversifying energy supplies, producing clean energy and reducing overall energy consumption.

Current estimations on heat pumps that have been installed across Europe are around 20 million. 3 million of these heat pumps were purchased during 2022. European heat pump sales throughout 2022 resulted in a 39% increase, up 5% when compared to 2021.

France bought and installed more heat pumps than any other EU nation in 2022 when compared to 21 other European heat pump markets. 621,776 individual heat pump units were sold and installed in France throughout 2022. UK statistics show that the UK had sales of 55,168.

Scandinavian and Baltic EU states maintain the highest levels of domestic heat pump adoption – Norway has 60%, Sweden 43%, Finland 41%, and

Estonia 34%. Norway has 1.4 million actively operational heat pumps that provide essential heat and hot water to domestic properties.

Heat pumps provide heating and hot water towards 16% of all domestic and commercial properties across Europe and there are further plans to install an added 60 million more by 2030. Heat pump technology is a certified method of clean energy dispersal and international market projections expect further expansions in size and scope. The current European heat pump market is healthy whilst the future heat pump market will continue to grow.

America is another area of importance regarding domestic and commercial property heat pump adoption. More heat pumps were sold and installed than gas furnaces during 2022. Heat pump sales amounted to 4.3 million whilst sales of gas fuelled heating and hot water systems were 3.9 million.

The residential heat pump market in the US was valued at \$13 billion in 2020 and is expected to grow at a CAGR (Compound Annual Growth Rate) of 5% between 2021 – 2030.

American heat pump adoption has resulted in an 11% increase in sales of air sourced heat pumps during 2022. Heat pump sales throughout US territory have steadily increased for 20 years. In 2001, 1.44 million air source heat pumps were sold. In 2021, customers purchased 3.92 million air source heat pumps.

As in Europe, the American heat pump market performs strongly and is expected to grow over the coming years. In 2022 the US was the most dynamic heat pump market in the world – with a 15% increase in recorded sales.

Another significant player in the international heat pump market is China,



which manufactures 40% of the world's heat pumps. China is the globe's largest producer of heat pumps with many of the finished units being exported to Europe.

Heat pumps are a recognised technology throughout all Chinese regions and play a key part in heating and hot water delivery as well as air conditioning. 58.4 million heat pumps have been installed in China as of 2020 - 33% of the world's installed heat pumps. China is the biggest market for air source heat pumps with sales increasing by 7% in 2021 and 12.5 million units in operation.

In 2022 China recorded a 20% increase in air to water heat pumps compared to sales statistics in 2021. Over 1 million air source heat pumps were sold in China in 2022. China is currently the third most dynamic international heat pump market with a recorded annual 13% increase in national sales.

According to the website Global Heat Pump Statistics (April 2023) "Leading manufacturers are seeing promising signs that today's momentum and policy support could put the industry on a trajectory that triples sales by 2030 – and they have accordingly announced plans to invest more than \$4 billion in expanding heat pump production and related efforts, mostly in Europe."

Heat pump sales increased by more than 11% globally in 2022. Widespread UK heat pump adoption is yet to be fully announced through sales and industry growth statistics. However, it can be observed that the heat pump industry and market is expanding exponentially, with the UK expected to also increase the size and levels of activity within the domestic heat pump market. Doing so will ensure achievable domestic and commercial property decarbonisation. Visit www.rinnai-uk.co.uk

HOW DO COMMERCIAL HEAT PUMPS WORK?

Heat pumps have a leading position in the pecking order of appliances that can work on commercial sites and property and drive towards NetZero and decarbonisation. The ever-growing interest in heat pump technology means an equal amount of curiosity is devoted to how a heat pump works.

What are the main internal mechanisms that enable a smooth operational product life cycle of a heat pump? And what are the inner mechanisms that provide product functionality?

Rinnai have launched a range of blogs and Vlogs entitled Rinnai Pathways which seek answering questions such as this one visit <https://www.rinnai-uk.co.uk/rinnai-knowledge-hub/rinnai-news> for the latest content.

A commercial heat pump operates and uses similar technology in a similar way to an everyday consumer product, a common refrigerator. A 'fridge' operates by extracting heat from within the fridge cabinet and exhausts this heat into the room. A heat pump follows a similar process however it is installed outside and extracts heat from the outside air and then transfers the heat generated into a body of water.

A heat pump has four main components within the closed circuit which is also known as the refrigerant circuit.

These components are:

- 1. The Compressor.** A compressor is used to move gaseous refrigerant through the refrigeration circuit, and a heat exchanger, which extracts heat from the source. The heat is then passed on to a heat sink through another heat exchanger.
- 2. The Condenser.** The condenser is a form of heat exchanger and is used to transfer the heat from the hot compressed gas into the water without coming directly in to contact with each other. As a lot of the heat is removed from the gas it will now change state from a gas to a liquid but will still be high pressure.
- 3. The Expansion Device.** The expansion device allows the pressure of the refrigerant to be lowered which in turn will allow its state to be changed at lower temperatures which is crucial for the whole process.
- 4. The Evaporator.** The evaporator is the component that starts the

Rinnai's Pete Seddon details the workings of a commercial heat pump



process all over again and is another form of heat exchanger. By using a fan, it draws air across the Evaporator which allows the refrigerant to change state back into a low-pressure gas ready to go back into the compressor. This then goes back to the compressor to continue to the cycle.

There are of course a lot more components within the heat pump that are integral to its operation and the overall heat pump efficiency such as thermistors to monitor the temperature of the refrigerant and the Control Board to ensure the desired output is achieved.

Commercial heat pumps can transfer heat even in minus temperatures, air source and ground source heat pumps could generate heat as low as -20°C ambient temperature. Conversely, they also create heat at extremely high temperatures. This is achieved because of the low boiling point of the refrigerant gases.

Commercial heat pumps generally use



less energy to operate than they output in heat energy, making them extremely efficient – however when the temperature lift for commercial water heating or space heating is substantial (Temperature lift = outdoor air temperature and the temperature heat is delivered at within the building).

The heat pump efficiency i.e., COP or SCOP will reduce, therefore many heat pumps work at their optimum with low temperature heat distribution systems (such as underfloor heating) and why performance reduces dramatically when a heat pump is required to supply heat at high temperature for conventional domestic hot water.

Rinnai's H3 range of products include domestic and commercial heat pumps that offer immediate property decarbonisation. Rinnai is determined to provide UK customers with cost effective low carbon solutions towards domestic and commercial hot water and building heating provision. Visit www.rinnai-uk.co.uk

DECARBONISING THE ENERGY INTENSIVE FOOD AND DRINK INDUSTRY: TECHNOLOGIES FOR LOWER EMISSIONS AND GREATER ENERGY SAVINGS



Energy issues faced by the food and drink sector are potentially hard to balance. Stuart Little, Business Development Manager at Powerstar, considers two main priorities and explains how Voltage Optimisation technology and modern transformers are helping businesses – both retailers and manufacturers – to achieve the objectives of lower carbon emissions and reduced energy spend.



Food retailers have a clear need to decarbonise and prioritise net zero – the public expect it and the majority of consumers would prefer to make a difference with an environmentally friendly shop, with 61% considering sustainability more important than it was even two years ago¹. Food and grocery retailers with strong Environmental, Social and Governance policies will continue to benefit from the power of the consumer's green pound.

For food manufacturers, the demand to decarbonise comes directly from supermarkets and grocery retailers now looking to reduce Scope 3 emissions and scrutinising their supply chain accordingly. But, in a cost of living crisis, the sector is heavily impacted – 30% of consumers would prefer to shop sustainably were it not for the pressure of rising food prices (source as above). Food is the UK's largest manufacturing sector (by turnover) and the fourth largest energy consumer with energy costs making up around 15% of total costs for the average food and drink manufacturer. Yet suppliers must

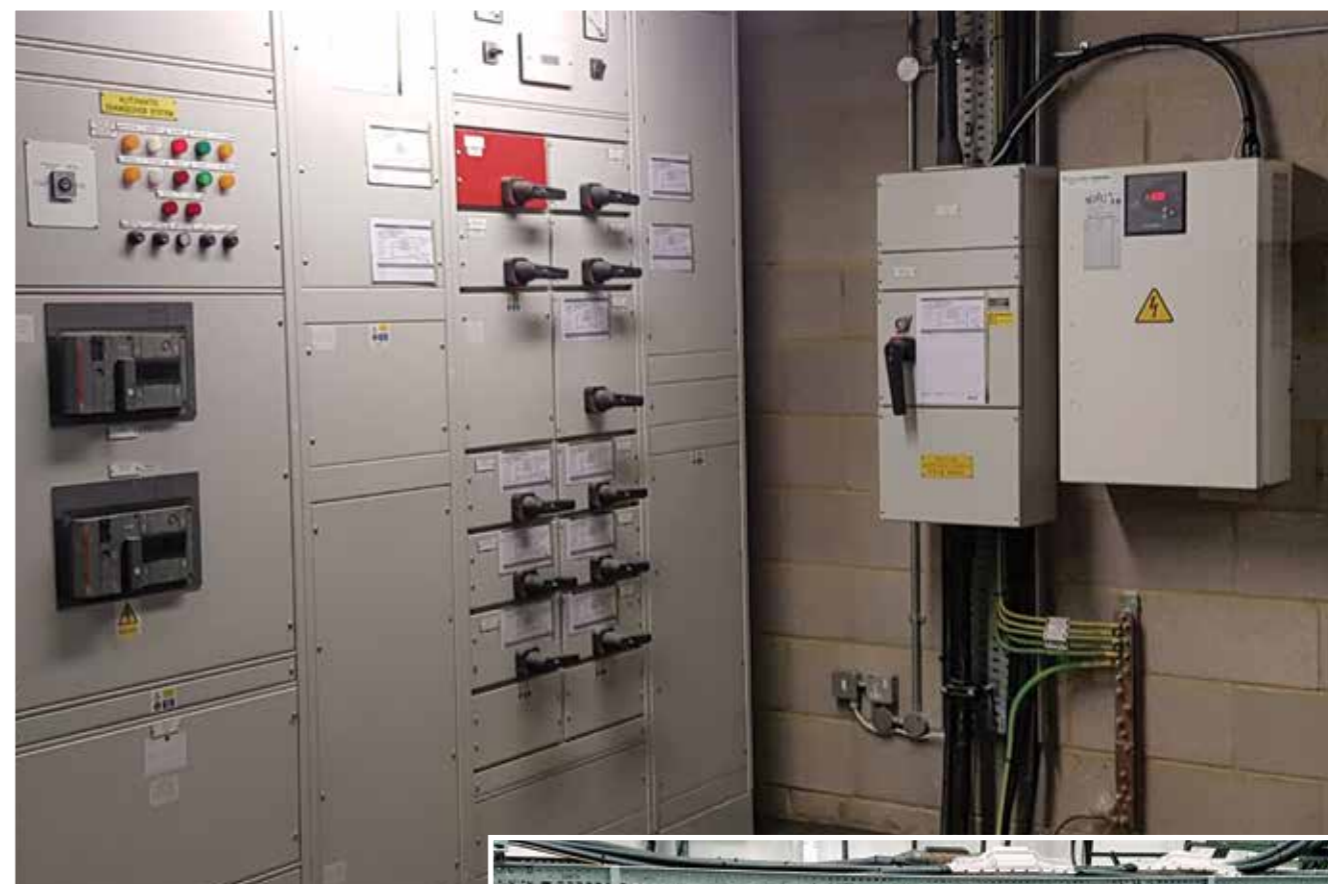
¹ <https://grocerytrader.co.uk/sustainability-is-more-important-to-61-of-uk-consumers-than-it-was-two-years-ago-but-cost-and-access-are-barriers-for-lifestyle-changes-finds-nielseniq/>

reduce emissions to satisfy their retail customers, while achieving greater energy efficiency to keep costs down and meet the demands of UK consumers.

Reviewing energy management strategies – site profile and energy usage, infrastructure, and assets – can help balance the demand to decarbonise with the imperative to reduce energy spend. And transformer technology and Voltage Optimisation (VO) offer demonstrable benefits for retailers and manufacturers, alike.

Many UK manufacturers rely on transformers to 'step up' or 'step down' voltages to required levels and transformers improve both the safety and the efficiency of power systems across a broad range of applications. But the UK's transformer fleet is aging, with around three quarters exceeding intended design lifespan. This impacts on the reliability of the transformer and on its efficiency – as low as 85% for older transformers as compared to modern, low-loss transformers which can achieve energy efficiency ratings of up to 99.75%, with associated carbon emission reductions and cost savings.

VO optimises incoming Grid supply to ensure it best meets the needs of the site. To meet legislative requirements,



typical supply is at a higher voltage than suited to most UK electrical equipment – averaging at 242V, when most UK equipment is rated to operate at 220V. This overvoltage can damage equipment through unnecessary wear and tear, leading to increased maintenance needs and replacement costs. The wasted energy from overvoltage creates unnecessary carbon emissions and unnecessary energy spend.

The Co-operative Group and Quorn Foods are retail and manufacturing organisations each known for the emphasis they place on environmental concerns. As the fifth largest food retailer in the UK, the Co-operative Group has over 2,500 local, convenience, and medium-sized stores. To reduce carbon emissions and save on energy across a large and diverse estate requires a customised solution and each of the VO units specified by Powerstar is bespoke, to best fit with sites' individual electrical profiles. Powerstar were able to guarantee energy savings and compatibility, and provide transparency across projects with dedicated project management and ongoing performance analysis. Taking one South Shropshire store as an example, the 13.7% average annual energy consumption saving equates to a reduction in energy spend for this one store of over £12,000.

For Quorn Foods, a company committed to achieving net zero for its own operations by 2030, Powerstar's



detailed survey at one site identified two incoming supplies where replacement of the existing transformers was recommended. A new Powerstar amorphous core distribution transformer with integrated VO has reduced energy consumption by over 10% per annum, equating to more than £70,000 savings on energy bills, and cutting carbon emissions by 365 tonnes per year.

For any UK manufacturer, energy efficiency and the need to reduce carbon in pursuit of net zero are pressing issues. For food and drink manufacturers, and for their retail customers, they are fundamental concerns. As consumers'

buying decisions place greater weight on sustainability, retailers must emphasise their commitment to net zero. Manufacturers, in turn, need to demonstrate the steps they are taking to decarbonise, to keep and secure customer contracts. In an uncertain economic climate, the capability to lower energy spend while fulfilling these environmental obligations is a win-win for food businesses, both retail and manufacture.

To find out more about Powerstar's range of energy management technologies, contact us: <https://powerstar.com/> Or visit us at EMEX – Stand B10.

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CHP – HERE TO STAY

Alan Beech – Clarke Energy

The UK's infrastructure is already constrained, making it challenging to deliver green electricity where it's needed. System upgrades are in the pipeline, but even without planning objections or funding restrictions, they will take years to complete. So, how can we simply electrify our economy to meet net zero? The answer is, we can't, at least not for many years to come.

Even on the UK's windiest and sunniest day, when all renewables and the nuclear fleet are at full throttle, they make up only 80% of our generation stack. Even though the average carbon content drops to 80 gCO₂/kWh, we continue to burn gas in our centralised Combined Cycle Gas Turbines (CCGTs), which make up around 15% of the generation stack.

While CCGTs are efficient at producing electricity, they don't recover waste heat. By the time the electrons reach their destination, many are lost due to system losses. So, any efficiency gained, compared to a locally installed generator, is wasted. Add waste heat recovery to the local generator, whether from the engine's cooling system or its exhaust gas, and you can push efficiencies above 90% – this is called Combined Heat & Power (CHP). When evaluating carbon savings compared to average of 193 gCO₂/kWh in 2022, it's evident that every hour we continue to burn gas without CHP is a missed opportunity to significantly increase efficiency, the cornerstone of sustainability. Until we can eliminate burning gas at central power stations, CHP should be running, delivering optimum efficiency and reducing global CO₂ emissions. It would be madness not to!

CHP and conventional gas boilers are not the only sources of heat. Heat pumps offer a potential solution, but challenges such as ensuring the electricity used is truly green and addressing potential

environmental impacts from sourcing water need to be considered. In ideal conditions, heat pumps can achieve excellent coefficients of performance (COP), but they still require electricity to operate. In a constrained UK electrical network, the question arises: can we secure the necessary grid connections for these, as well as other forms of electrification infrastructure such as electric vehicle (EV) charging stations? The answer may be CHP working in tandem with heat pumps and EV charging stations, providing a dependable source of heat and electricity while supporting the constrained grid, for those who do not have the benefit of a gas supply.

I'm sure you are challenged with achieving net zero and have company targets to meet, almost certainly using Scope 1 to measure your direct energy use, which includes any mains gas brought to site. The problem is thus – to benefit from the carbon and financial savings of CHP, you need extra mains gas to generate electricity. Heat will effectively be free, offsetting gas used in your conventional boiler. However, this extra gas increases your Scope 1 reporting, even though the CHP is actually reducing global emissions of CO₂.

In a responsible society, we should prioritise doing what's right over mere appearances. We must carefully consider the genuine benefits and wider implications of everything we do.

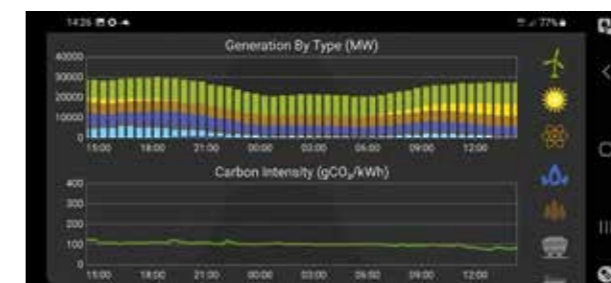
Reducing energy use wherever possible (simply switching it off), decreasing consumption (installing LED-style lighting), employing renewable energy where practical (setting up solar panels), and being efficient with essential energy consumption (when you need heat and electricity, choosing CHP should be an easy decision) are crucial steps.

Additionally, it's worth noting that mains gas is on its own path toward decarbonisation, with increasing injections of green renewable biomethane and plans for hydrogen blending, sourced from excess wind and solar power. INNIO Jenbacher gas engines can already run on 100% hydrogen, with the capability to be converted during their operational lifetime. Therefore, CHP will not become a stranded asset, it will be a critical part of your energy infrastructure and transition into the net zero world.

In conclusion, we now know that quality CHP not only reduces CO₂ emissions but also enhances site resilience (through black start and island mode capability), with payback periods often below two years. These substantial savings could and should be reinvested in green hybrid technologies that complement CHP.

Can we afford to wait for 100% renewable electricity to be available 24/7? Can we wait for the planning approval and construction of upgraded electrical infrastructure to distribute electricity

from point of generation to point of use? Can we afford to wait for commercially available hydrogen? As a responsible citizen or organization, your next action should be to make a meaningful contribution to the fight against global warming – whatever that may be. And remember, don't be greenwashed!
www.clarke-energy.com



LET'S THINK DIFFERENTLY ABOUT OUR BUILDINGS



Simon Ward, Director of Sales, UK & Ireland – Distech Controls
Technology has developed rapidly and the way we use and operate buildings is constantly evolving. Building Management Systems (BMS) are becoming increasingly sophisticated, and we should now be looking at ways we can make our buildings more sustainable, autonomous, and human-centric.

We are in a completely new world when it comes to technology. The changes we have seen take place in the development of technology in the last five years, even in the last year, have been transformative and have taken place far quicker than I believe many people expected.

So, what does it mean for our commercial properties and Building Management Systems (BMS)?

The advancements in technology have allowed us to look at our buildings in a different way and there are three key trends emerging that are driving changes in how we use and operate our buildings – we want buildings that are more sustainable, can operate autonomously and those that place occupants at the heart of each process.

Let's take a look at sustainability first. It is certainly a hot topic in the building industry and beyond. The issue of emissions and the subsequent impact they have on people and the planet is now coming into

focus and their importance is continuing on an upward trend. According to research the building industry is responsible for 40% of energy consumption and about a third of global greenhouse gas emissions. The construction and building controls industries have an opportunity to support companies reduce carbon emissions and ensure buildings are as energy efficient as possible. Through HVAC controls alone, it is estimated that energy savings and subsequent emission reductions of up to 30% are possible. When you then introduce data collection through sensors and controllers, it can be used for impressive energy management.

Delivering on these aims will help building owners reduce energy and operational costs, it will help facility managers save energy and time, whilst consulting engineers can offer their clients reductions in energy usage and costs.

The second area is based on autonomous buildings. An autonomous building is a building that can make its own decisions in order to

optimise user experience, energy consumption and its maintenance over time. There are two major influences on an autonomous building that of the users inside of the building but also its integration into the larger ecosystem. We want buildings that can self-adapt to people and systems inside the building but also can react to demands or conditions external to the building systems.

Autonomous buildings build on the concept of a smart building. Autonomous buildings will not only identify the problem but also take actions to solve it. But, why is building autonomy so important? Autonomous buildings will allow building owners to enhance the value of their assets, it will help facility managers to streamline processes and save time and it will give consulting engineers and integrators the opportunity to future-proof their clients' buildings.

Let's finally look at human-centric buildings. It is estimated that we spend approximately 90% of our time in enclosed spaces. The recent pandemic has

made us more aware of the importance of well-designed buildings that operate efficiently and that place health and wellness at the forefront. Occupants want to live and work in healthy and trustworthy spaces and having a fully functional BMS to ensure wellbeing is critical. New building standards such as WELL have recently emerged to guide people to create better spaces for the occupants, for example various sensors such as CO₂ and VOC are now recommended.

With the use of new building control technology we can understand more and adapt to the occupant journey. For example, setting the right conditions in a meeting room if it is booked for a specific time but also, if the room is cancelled, changing those settings and turning off the lights. By ensuring their buildings are human-centric, owners can enhance tenant retention, facility managers and consulting engineers can aid in the wellbeing of occupants.

However, none of this is possible without a fully functional BMS and data.

There are platforms coming to market that offer system integrators, facilities managers and buildings owners far more data about their buildings. For instance, the new ECLYPSE Building Intelligence is a microservices-based software platform which facilitates the design, deployment, operation and maintenance of buildings with unprecedented efficiency. The vision for ECLYPSE Building Intelligence is to make buildings more sustainable, autonomous and human-centric, whilst ensuring it is easy and simple to deploy and also leveraging the power of a data model.

This type of software could be a game changer for system integrators who can leverage unparalleled openness and interoperability to deliver advanced digital services. Buildings implementing intelligent solutions ensure the highest level of occupant satisfaction and minimal operational costs to maintain the highest level of asset value.

Combined with intelligent software must be intelligent controls. Distech Controls has taken the ECLYPSE Building Intelligence software and incorporated it with its most powerful HVAC / IoT Edge controller, ECLYPSE APEX. ECLYPSE APEX solves building connectivity challenges between IT & OT/IoT systems and digital services thanks to embedded technologies such as RESTful API, Docker and AI accelerator support. The many stakeholders involved with operating and creating efficient environment within the building will benefit from the impressive features of ECLYPSE APEX. For instance,

with its ability to host third-party solutions and its unparalleled openness to use protocols such as LoRa, facilities managers can cost-effectively deploy any type of LoRa wireless sensor, offering total visibility of their site's status with an uneven level of granularity, from energy consumption to occupancy rates to garbage levels, in order to provide optimal services at minimal cost. Secure boot and additional physical security measures have been incorporated to help overcome today's security challenges. Different communication protocols such as BACnet MS/TP, BACnet/SC, BACnet/IP, Modbus RTU, Modbus TCP, M-Bus and MQTT are also supported to ensure ease of communication, authentication, and error detection.

Each building is unique, and each organisation occupying all or part of a built space has specific needs. However, as you can see there are common themes running through everything and that is the need for sustainable, human-centric and autonomous buildings. Intelligent buildings are no longer the future, the technology is here to help us transform our buildings, we just need to harness it. Let's create efficient, attractive and valuable buildings fit for the future.

Simon Ward, Sales Director UK & Ireland, started his career at Distech Controls in 2015. He has built a successful sales team in the UK, positioning Distech Controls as a tier 1 vendor in the UK and Irish markets.

Contact: +44 203 445 0605
Email: sward@distech-controls.com
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Image © East Street Imagery

THE TIME IS NOW FOR COOLING CONVERSATION

Did you know that in September, the first-ever World Health Organization 'Indoor Air Conference' was held? This event closely followed the UK Government's initiation of an inquiry into heat resilience and sustainable cooling, as well as a nationwide effort to pass the Clean Air Bill in Parliament. These developments demonstrate a fundamental shift in the public discourse surrounding clean air, instigating substantial transformations within the ventilation and construction sectors. Given the profound changes occurring within the industry, how can builders and architects leverage these shifts to achieve commercial success?

CHANGING CONVERSATIONS – HEALTH, WELLBEING, CLIMATE AND AIRFLOW

Fresh air has become a hot topic, with Covid-19 leading to an increase in awareness of the importance of ventilation and its intrinsic relationship with health. In tandem with this, the world was collectively ramping up efforts to achieve goals of Net Zero emissions. As the climate warms, we will have a greater need to keep buildings cool, but how can this be achieved without adding yet more carbon into the atmosphere?

The conversation doesn't stop there. More recently comes an understanding of how 'fresh' air impacts wellbeing, unpacking the role good air quality plays in everything from the speed of recovery in hospitals to the ability to concentrate during exams. Studies have linked excess CO₂ levels to a drop in productivity and attainment, and even the act of breathing itself has become a rapidly evolving wellness trend.

Combined, the impact of Covid and public health on ventilation, the need to cool buildings sustainably, and the impact of good ventilation on wellbeing are arguably all pushing the ventilation industry into its biggest period of change in a generation. Now, we must grab this opportunity with both hands and begin to ignite some big changes.

HOW DOES THE INDUSTRY CAPITALISE ON THIS?

But where to begin? To start, the increased understanding of a building's

need to 'breathe', as sustainably as possible, will have to be factored into building design when it comes to both new buildings and retrofits.

Europe is already leading the charge on this, with the emergence of decentralised ventilation systems as an approach to helping ventilate buildings more effectively and efficiently – and this technology is starting to reach the UK.

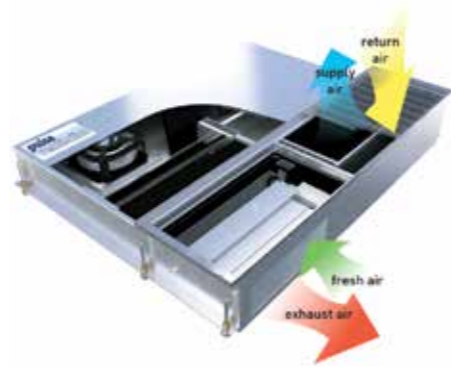
THE BENEFITS OF DECENTRALISED

Decentralised ventilation systems, particularly when paired with heat recovery technology, can achieve a high level of energy efficiency. Working to minimise waste by ventilating spaces only when necessary, such systems have the ability to adapt to varying needs and uses of a space. For instance, the ventilation requirements for an all-hands company meeting differ from those of regular hotdesking, and decentralised ventilation systems are built to cater to the multifunctional uses of a space. Beyond this, integrated decentralised systems also elevate indoor air quality, reduce carbon emissions, and enhance overall comfort.

At MAP, we have recently launched the FVPpulse decentralised ventilation unit, in collaboration with LTG Aktiengesellschaft, a pioneering German company specialising in air and climate technology. Inspired by the concept of breathing itself, The FVPpulse consists of a supply and return unit that mimics the natural movement of air. A stark movement away from centralised HVAC systems that have been the default choice for managing ventilation and air quality in buildings to date.

THE TIME TO TALK IS NOW

The industry is currently in an exciting phase, spurred by the growing



recognition of the vital role that "healthy" indoor air quality plays in our overall well-being and our journey toward achieving Net Zero emissions. This shared awareness is catalysing a significant global transformation. Recent events have provided us with valuable insights, emphasising the need to prioritise building ventilation to enhance the health of occupants while adhering to sustainability goals. Furthermore, commercial success will be inherently connected to these priorities.

So, what's next? It's incumbent upon our industry to seize this opportunity and embrace the challenge by taking bold strides in designing, constructing, and operating our buildings. We must collaborate, share knowledge, and devise inventive solutions to meet these new standards.

Change is underway, and the time to take action is now.

www.mapuk.com

WHAT IS THE REAL RISK OF FIRE FROM SOLAR PANELS?

With recent reports of a domestic solar panel exploding on a roof at a West London council house, is there a hidden danger lurking? How does this impact confidence and the growth of solar photovoltaic (PV) panels across both domestic and commercial sectors?

Richard Williams is foremost an engineer, as well as founder and managing director of Aztec Solar Energy Ltd, with over 30 years in the energy services sector. Here he shares his views on safety issues facing the sector.



Last year, primarily due to the energy price crisis and a sustainability drive, the solar power industry saw a significant jump in solar PV installations. According to data from the Microgeneration Certification Scheme (MCS) - the standards organisation for solar energy and heating - 130,596 solar panels were mounted on UK roof tops in 2022.

This figure represented growth in one year which was previously only experienced in the three years between 2019 to 2021 combined, with the exception of those years following subsidy changes. These figures include all solar PV systems with a generating capacity of up to 50 kilowatts and registered with the MCS, notably therefore the figure is likely to be even higher, with an increasing number of installations in the UK not registered at all.

It does mean there are over 1.3 million registered solar power installations across the country, two thirds on the ground and the remainder on residential and commercial roofs, generating at least 15GW of solar power in the UK.

PV solar panels promise cost savings in terms of energy bills and are described as the clean and green electric energy. Seen in many a field and roof top, the growth of the solar PV panel has been significant and is changing the energy landscape.

BUT WHAT CONTROLS ARE IN PLACE AND WHO IS MONITORING SAFETY?

Some may be shocked that PV installers are not legally bound to follow the guidelines or obtain accreditations from certifying organisations such as the MCS.

The big issue is that anyone can install a solar panel in the UK. Yes, work must be cleared by the local council and the government 'recommends' use of a registered electrician, but it's not a necessity by law.

As with all electrical installations, electrical incidents may happen, which is

why all electricians are qualified and must undertake regular competency training and on-going refresher training. Arc faults and faulty wiring can cause solar panels to catch fire and the risk of a solar panel catching fire is very low, but it is not zero.

Solar panel fires can be caused by improper installation or maintenance, and by damage from extreme weather events, such as hail or lightning. Higher voltages can be prone to arcing and is a known common cause of fires, but through the installation of micro inverters connected to the panel to convert the output to a safer level they considerably reduce the risks. As does using reputable and registered PV installers and, like maintaining your car, checks need to be done on all PV installations regularly. PV panels are often forgotten about and left to deteriorate and with those systems come risks, as with any neglected equipment.

It's important to be up to date with the latest safety recommendations and regulations, and as with all things new, products evolve. Technologies continue to develop and with that have come new solar panels that are more resilient and offer an even greater reduction in fire risks.

Understanding these products and their installation comes from experience and working in an evolving sector and with experts who can recommend the most appropriate panels and systems for installation.

The first step would simply be to ensure those installing your PV system and / or battery storage are registered with the MCS and has been installed in accordance with IET guidance. This will verify the competence of the installer and the installer is duty bound to use verified products, so ensuring safety and quality.

Anyone concerned about their PV systems should seek further advice and consider retrofitting a micro inverter AC system or module level optimisation. Look at the maintenance programme and ensure the system has been checked through periodic testing and by a professional. If at all worried and you suspect signs of overheating, isolate the supply, and call the installer.

As with all technologies that have been installed effectively and are maintained and managed, be assured solar PV panels will deliver clean, cost-effective power safely. www.aztecsolarenergy.co.uk



WHY A SMART EV CHARGING REVOLUTION IS NEEDED TO ALLEVIATE PRESSURES ON THE GRID

William Goldsmith, Global Head of Grid Services at ev.energy

There has been a rapid rise in the uptake of electric vehicles in recent years and, considering the ZEV mandate coming into force in 2024, this is only expected to increase. Yet, more work is needed to deliver infrastructure suitable for mass adoption. The most pressing task is ensuring the grid can support the growing electricity demand.

Meanwhile, energy providers are tasked with generating 100% zero-carbon electricity by 2035. However, it was recently revealed that the UK's Energy Systems Operator is struggling with connecting renewable energy developers – many are facing waits of up to a decade to be connected. Moreover, concerns around electric vehicle (EV) charging infrastructure being unable to match the rapid rise in EV uptake persist. These challenges require bold, collaborative action.

Grid infrastructure is just one part of the story. To create the green, reliable grid that Great Britain needs, we must embrace new technology to revolutionise

grid dynamics. Smart charging - which uses innovative technology, data, and communication to optimise EV charging in line with grid supply and demand - provides grid operators with a secret weapon. This technology can ultimately evolve EVs into a significant asset for the National Grid, as opposed to a strain.

HOW DOES SMART CHARGING WORK?

Grid supply and demand changes throughout the day and by season, for various reasons, such as a peak in usage or a shift in weather conditions, causing a fluctuation in prices and carbon emissions.

Currently, most drivers plug in their EVs in the evenings and begin charging right away, coinciding with the natural peaks in domestic energy demand when many return home to cook dinner, put a wash on, and watch TV. This causes a significant strain on the energy grid, meaning costs are usually at their highest.

If there is less power being made through renewable sources, such as solar and wind, limited supply could increase prices even further. In some cases, costly, high-carbon and unsustainable energy sources, such as coal or gas, may be used to keep up with this peak in demand.

In Great Britain, wholesale energy prices, the cost at which energy

suppliers buy power, are updated every 30 minutes. These prices may then be passed on to households, depending on the tariff they have with their energy supplier, to encourage using energy at off-peak times and reduce strain on the power grid.

Smart charging presses "pause" on charging until the demand on the grid has gone down and allows drivers to power up the battery in their EV when energy is cheapest and most environmentally sustainable.

THE BENEFITS OF SMART CHARGING

With smart charging, EV owners can reap the rewards of lower-priced, lower-carbon energy by charging at off-peak times when energy is more readily available, such as through the night, or during "low-carbon events" – for example, during a storm when greater amounts of energy can be produced by wind. Optimising charging this way also helps in balancing the electricity grid.

Smart charging technology can predict and select the best times to charge based on one's energy tariff and the estimated carbon intensity of the grid. This simple change could save approximately £702 on energy bills and reduce the personal carbon emissions of charging your car by up to 15% each year. One year of smart charging saves 140 kg of carbon – the equivalent to the carbon sequestered in seven 10-year-old trees.

For solar panel owners, apps such as ev.energy can find the local solar forecast and automatically charge an EV with self-generated, zero-carbon, renewable energy when the sun is shining, creating a further opportunity to save and reduce demand on the grid.

For network operators, smart charging provides a powerful tool to integrate the rising number of electric vehicles and power them with green energy when it's in abundance, while also bolstering their networks, all faster and at less cost.

Smart charging is therefore a win-win situation for households, energy providers, and the government, delivering the changes needed to empower a



clean transport revolution while also hitting the UK's net-zero targets in context of the Paris Climate Agreement.

DELIVERING A CLEAN, RELIABLE GRID FOR THE UK

UK regulations around smart charging are already among the most advanced in the world - it is therefore essential for the UK to protect its leading position and buoyant at-home EV charging market. In order to maintain healthy competition, and allow the industry to scale smart EV charging at speed, the government could provide policy support to ensure open

standards remain as technology evolves.

Looking ahead, further investment in V2X technology - which allow vehicles to send energy back to the grid or into the home to ease strain during peak times - and smart on-street charging infrastructure will be needed to meet grid demands and ensure an equitable transition to electric vehicles for those without off-street parking.

ENABLING NET ZERO

Optimising energy use and grid stability through dynamic and intelligent EV charging is key to enabling net-zero – through reducing peak loads,

minimising energy waste, and optimising for renewable energy sources.

Smart charging is an affordable, convenient, and environmentally responsible solution which can seamlessly integrate with the grid, allowing utilities to better manage their resources and accommodate the growing EV population while reducing the need for costly infrastructure upgrades. Further government support to facilitate smart charging uptake more widely will not only make the switch to EVs more convenient and affordable, but also create a doorway to a smoother net zero transition. <https://www.ev.energy/>





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WHAT IS THE GREENHOUSE GAS STANDARD ISO 14068 AND WHAT DOES IT MEAN FOR YOU?



Elinor Kershaw, JRP Solutions, Principal Consultant – Net Zero and ESG.Greenwashing, unsubstantiated emissions statements and incomplete scoping, whether by accident or design, are all blurring visibility around what is actually being achieved by organisations in the quest for Net Zero. Introducing an internationally recognised standard for Greenhouse Gas management and related activities will be a significant step forward in aligning Net Zero claims with achievements. But what is ISO 14068 and what does this mean for you?

WHAT IT ISN'T

- New ideas or principles
- A substantially different framework
- A replacement for the Science Based Target initiative (SBTi) to demonstrate commitment and reaching interim targets
- Yet another thing to sign up to

WHAT IT IS

ISO 14068 is a comprehensive standard for verifying when carbon neutral is reached and being maintained. It brings 'carbon neutral' and 'net zero' together properly for avoidance of doubt and provides a clear structure in one place which supports a pathway to carbon neutral/net zero.

The standard is comprehensive – it includes scopes 1, 2 and 3 and uses ISO 14064-1:2018 as the source of the required inclusions. It excludes the purchase of renewable energy as reductions and gives clear advice on avoiding double counting.

CAN WE USE ISO 14068 NOW?

The draft of the standard was released for review in November 2022. The review closed mid-April 2023, after which a report on the review was issued and amendments or proposal for finalisation are being considered at a higher level. It is anticipated that the final standard will be published by spring/summer 2024. We do know enough, however, to ensure that the work we do now will all contribute to certification to the standard.

NET ZERO OR CARBON NEUTRAL?

These two terms are often mis-used or confused. **Carbon neutral** – is a condition in which during a specified period there has been no net emission of GHGs to the

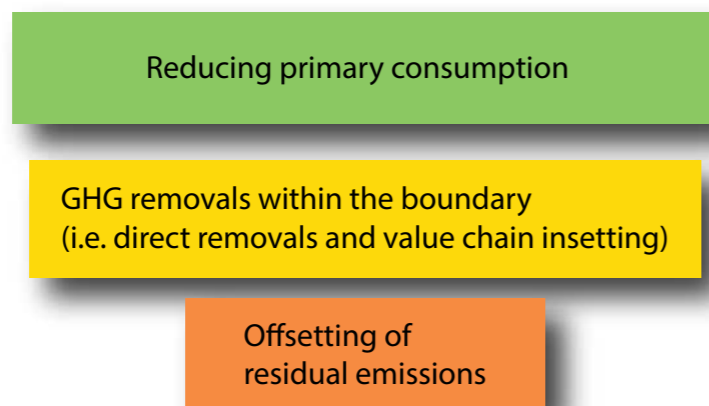
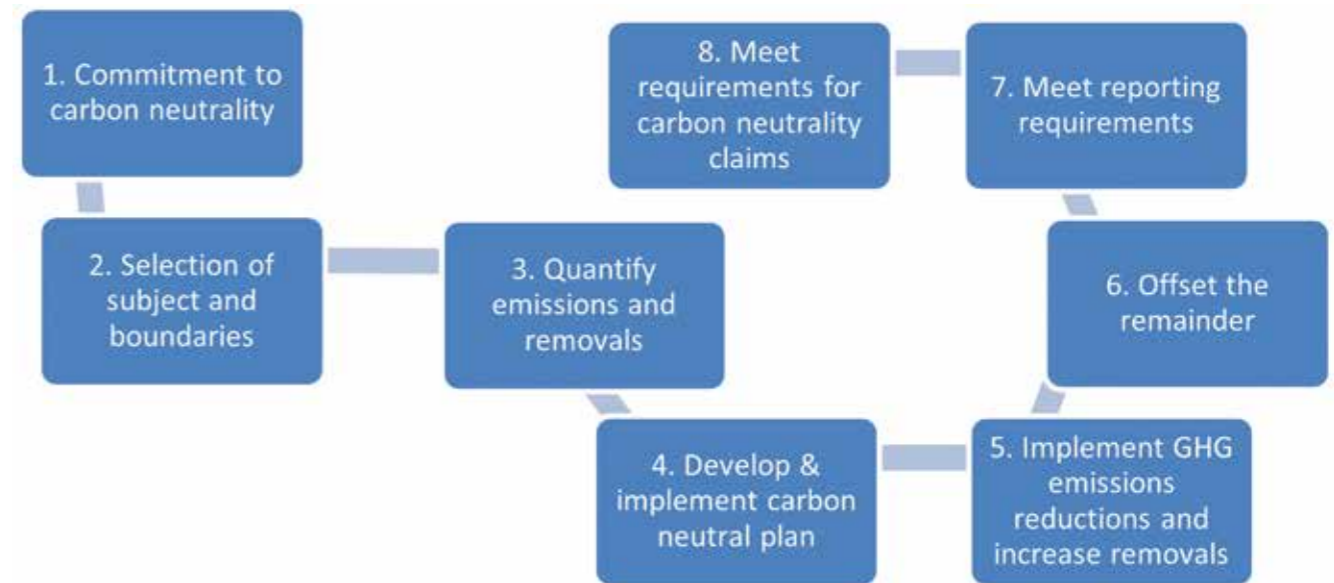


Fig. 1.

THE APPROACH TO ISO 14068



atmosphere as the carbon footprint of the subject has been counterbalanced by offsetting. Achievement of this condition is not limited to the GHG emissions and GHG removals within the boundary of the subject and can include counterbalancing measures such as the use of carbon offsets as long as these meet certain criteria.

Net Zero - means cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere, by oceans and forests for instance.

ISO 14068 is the standard that measures carbon neutrality.

The carbon neutrality management hierarchy can be illustrated as shown in Fig. 1.:

WHEN WILL YOU BE USING ISO 14068?

- When planning a carbon neutral/net zero strategy to ensure your end point will meet a verifiable standard
- Once you believe you have reached carbon neutral/net zero¹
- If a key supplier/stakeholder

¹ If you need 3rd party verification now the pathway is a Carbon Assurance Verification/ Validation Statement compliant with ISO 14065: 2020

is making a carbon neutral/net zero claim to check credibility (in time we will see certification to assist with this)

CORE PRINCIPLES OF ISO 14068

There are 10 core principles to the standard:

- **Transparency** - Public disclosure to enable stakeholders to make decisions
- **Conservativeness** - Assumptions, values and procedures ensure current progress is not overstated
- **GHG hierarchy approach:**
 - Reductions
 - Removals within boundary & value chain (insetting & offsetting)
- **Supporting transition** - Enables sustainable development and moving away from "business as usual"
- **Ambition:**
 - Meaningful contribution to global net zero target
 - Those with higher capacity, historical responsibility and higher emissions act with higher ambition

- **Urgency**
 - Immediate and ongoing action
 - Interim targets for substantial reduction in the short term
 - Ongoing action over the long term

- **Science-based approach** - Based on latest climate science and periodic reviews when making decisions
- **Avoiding adverse impacts** - Actions towards carbon neutrality minimise adverse impacts on the environment and society beyond carbon
- **Accountability** - Rests with the entity which controls the subject of any claim or objective
- **Value Chain and Life Cycle Approach** - Includes the whole value chain upstream and downstream

For further information on the ISO 14068 standard and how you could start planning for it, a very useful webinar was held earlier this year – a link to the recording can be obtained here: <https://www.jrpsolutions.com/form/webinars>

For more information on any of the above call 0800 6127 567 or email info@jrpsolutions.com

ENVIRONMENTAL REGULATIONS FOR REPLACING COMBUSTION PLANTS

Insights from Dr Sophie Archer, NFU Energy's Environmental Compliance Consultant

In the ever-evolving landscape of renewable energy and environmental compliance, it is imperative for businesses operating Combined Heat & Power (CHP) engines to stay well-informed about the latest regulations. One set of guidelines that significantly impacts plant replacement in the UK is the Medium Combustion Plant Directive (MCPD), enforced by the Environment Agency (EA). The primary goal of the MCPD is to control emissions from combustion plants, thereby ensuring cleaner and more sustainable energy generation.

When considering the replacement of an existing plant accredited under schemes like the Renewable Heat Incentive (RHI), Renewable Obligation Certificates (ROC), or Feed-in Tariffs (FIT), it is crucial to be aware of the following environmental permit requirements:

MCPD PERMIT FOR PLANTS OVER 1 MWh INPUT

Medium Combustion Plants (MCP) are combustion plants with an input capacity exceeding 1 MWh and must obtain an MCPD permit from the EA before commissioning. This primarily affects boilers with a capacity of 850 kW and above, ensuring strict monitoring of harmful environmental emissions.

COMBINED HEAT AND POWER (CHP) ENGINES

Facilities utilising one or more CHP engines need to aggregate their capacities for regulatory compliance. The total capacity of on-site CHP engines must

be calculated to determine whether the facility complies with Specific Generator regulations. It's essential to remember that a 450 kW engine may exceed 1 MWh input, making it an MCP and necessitating compliance with permitting requirements sooner than expected.

REPLACING CHPS WITH AGREEMENTS OR ACCREDITATIONS

CHPs with capacity market agreements or FIT accreditations obtained prior to October 2016 are categorised as Tranche A generators, exempt from permitting until January 2029. However, if these plants are entirely replaced, they lose their existing status and become new installations, subject to current MCPD requirements.

PARTIAL REPLACEMENTS

Plants undergoing partial replacements costing less than 50% of a completely new plant's total cost can maintain their existing status and the associated MCPD compliance deadline. This provision allows flexibility for plant operators, allowing them to adjust their installed capacity, if necessary, thereby extending their compliance deadline by recommissioning as <5 MWh input.

EXISTING PLANTS OVER 5 MWh INPUT

Existing plants - those put into operation prior to 20 December 2018, that are over 5MWh input must have an environmental permit in place by 01 January 2024.



EXISTING PLANTS UNDER 1 MWh INPUT

Existing plants with an input capacity of less than 1 MWh have until 01 January 2029 to apply for an MCPD permit. Timely planning is essential to meet this deadline and ensure compliance.

In conclusion, comprehending the MCPD and its implications for replacement plants is paramount for energy producers striving to maintain environmental compliance. Whether contemplating complete replacements or partial upgrades, navigating these regulations can be intricate. To streamline this process and adhere to environmental standards, it is advisable to collaborate closely with regulatory authorities and seek expert guidance from NFU Energy.

For support at every stage of this journey, please contact the NFU Energy team at 024 7669 6512 or via email at sales@nfuenergy.co.uk

For more information, please visit www.nfuenergy.co.uk



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