

HOW DATA CENTRES CAN BECOME AN ALLY TOWARDS NET ZERO

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EM Magazine

MAY 2024

PUBLISHER: Ralph Scrivens
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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

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.

PAPER USED TO PRODUCE THIS MAGAZINE IS SOURCED FROM SUSTAINABLE FORESTS.

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All contents © Energy Manager Magazine 2024

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

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REPORT SHOWS BUILDING ENERGY STORAGE PROJECTS NEXT TO WIND FARMS CUTS ELECTRICITY SYSTEM COSTS AND INCREASES ENERGY SECURITY

A new report by RenewableUK shows that building more energy storage projects alongside onshore wind and solar farms reduces electricity system costs, benefitting billpayers in the long term.

These storage projects are also vital in providing flexibility in our clean energy system to ensure it continues to meet electricity demand at all times, especially as demand is set to grow with the take-up of technologies such as electric vehicles.

The report, entitled *"Making the most of renewables: the role of onshore co-location in accelerating an integrated energy system"*, sets out the case for reforming the planning system and introducing financial support mechanisms to encourage more battery storage and green hydrogen projects to "co-locate" at sites where clean electricity is generated throughout the UK. This means they could be built on wind and solar sites which already have planning permission and share existing grid connections rather than having to wait for years in a queue, saving time and money.

The queue of all energy projects awaiting connection has now reached over 700 gigawatts (GW) according to National Grid statistics, of which 97GW are battery storage projects. To put this into context, the UK's entire operational wind capacity (onshore and offshore) currently stands at nearly 30GW.

Co-locating solar projects with battery storage could reduce the cost of building and running battery projects by 50%. And

cumulatively, research by the Carbon Trust suggests that enabling a more flexible energy system with storage would save the UK up to £16.7 billion a year by 2050 in electricity system costs, ultimately benefitting bill payers.

RenewableUK's EnergyPulse database shows that at present only 12% of wind and solar farms throughout the UK are co-located with batteries or hydrogen electrolyzers, but the report states that has the potential to surge in the years ahead to meet the expected increase in electricity demand if the right policy framework is put in place.

The report calls for National Grid ESO to identify and quantify the value of the flexibility which co-location offers to a net zero system, as this would stimulate new investment. The wide range of measures also include providing new streamlined guidance for planning authorities to bring forward projects, and resourcing planning bodies better to enable decisions to be taken more swiftly.

The innovative "energy parks" which combine renewables and storage produce a more constant supply of clean electricity, which helps to tackle the issue of variability; in high winds, the grid cannot always cope with the vast amounts of clean power being generated by wind, and although some grid upgrades are underway, other solutions are needed to make the best use of the UK's abundant renewable energy resources.

The report's author, RenewableUK's

Senior Policy Analyst Yonna Vitanova, said: "The value of storage in our modern energy system is under-appreciated and under-valued. This has to change if we're to make the most of innovation clean technology, drive people's electricity bills down and increase Britain's energy security."

"The growth of much-needed energy storage projects, co-locating alongside wind and solar farms, is currently being hindered by out-dated policies and regulations which were drawn up in a different era. There isn't even a clear definition of co-location applied consistently across planning policies, grid and market arrangements – which is one of the factors hindering the speed of deployment of co-located projects."

"Renewable energy developers should be able to include co-location in their business plans more easily, with a clearer rules and regulations being put in place to unleash the benefits which co-located projects can provide to the system and ultimately to consumers. Building a more flexible system by tackling the current barriers to co-location will require a coordinated effort and a holistic strategy cutting across markets, grid, planning and technical barriers, as this report shows. Although this is challenging, it will ultimately benefit billpayers in the long term by cutting electricity system costs".

The report is available here: www.renewableuk.com/resource/resmgr/onshore_co_location_final.pdf

Heat pump and battery storage installations lead the charge in 2024

Commenting on the latest MCS installation figures shared via the MCS data dashboard, which highlight trends for January – March 2024, Ian Rippin, CEO at MCS, said: "The latest data shows the heat pump market continues to go from strength to strength. There were 4,508 certified heat pump installations in March alone, making it the second-best month in the Scheme's history. Looking at the first quarter as a whole, we've seen a 30% increase in average monthly heat pump installations compared with 2023 – which was the best year ever for the technology."

"This shows that homeowner confidence in renewable heating is growing, and

as more consumers take advantage of government initiatives – such as the Boiler Upgrade Scheme, ECO4, Home Energy Scotland, VAT reduction on battery storage, and many more – expect to keep seeing these high numbers.

"The data also shows that battery storage installations are on the rise, with March exceeding 1,000 installations for just the second month ever and marking a 707% increase on the total for March 2023.

As consumers become more aware of the benefits of installing battery storage alongside solar PV (both for lowering energy bills and for selling surplus electricity back to the grid), this is a technology that is going

to become increasingly commonplace.

"Finally, March also saw the Isle of Anglesey become the fourth local authority to exceed a 20% uptake in renewables. It means that 1 in 5 households now have an MCS installation on the island, putting it alongside Orkney (28%), Western Isles (25%) and Ceredigion (23%) as the regions with the highest proportion of homegrown energy."

For near-real-time dynamic visualisations of the uptake of small-scale renewable technologies across the UK, view the MCS Data Dashboard here <https://datadashboard.mcscertified.com/>

GLOBAL NET ZERO TARGETS IN JEOPARDY, REVEALS EIC REPORT

In an alarming revelation, the inaugural "Global Net Zero Jeopardy Report" by the Energy Industry Council (EIC) has found that only 11% of energy industry leaders believe global interim targets for achieving net zero will be met.

This scepticism underscores a critical and growing gap between current industry reality and the ambitious net zero goals set by policy makers for 2030-35. This is despite a more optimistic outlook for 2050 targets, where 45% of respondents still see a pathway to success of global net zero targets, according to the report.

When asked about their views on meeting net zero targets in their respective countries, study participants had a slightly more optimistic outlook compared to their views on global targets. Only 16% of respondents felt optimistic about achieving their country's interim net zero targets, while 66% believed that the national 2050 goals were still achievable.

"This disparity in optimism underscores a crucial point," says EIC's Chief Executive Officer Stuart Broadley. "While the immediate future appears daunting, with

most leaders now holding the view that interim targets are unachievable, there is a stronger belief – both within our home nations and collectively as one global community – in our ability to correct our course by the ultimate 2050 target date. This optimism is due to the potential for technological advancements and the conversion of policy into implementation."

The report, based on surveys and interviews with 38 energy industry leaders, highlights the bleak global outlook for meeting interim climate targets. This is muddled by unclear policies and significant disparities in capabilities and priorities of different nations.

For longer-term targets, there's cautious optimism, supported by legally binding targets and the impact of technological and capacity growth advances. Yet, scepticism arises from skill shortages, enforcement failure, and funding gaps. Some participants see only a major catastrophe being the catalyst for action, while others call for more proactive and mandated government directives for net zero achievements.

The report shows that 61% of interviewed

executives stress the need for more investment and incentives to launch net zero projects, pointing to the high costs of green transitions and the importance of ensuring profitability for sustainability. Meanwhile, 45% cite unclear and inconsistent government policies as obstacles, advocating for stronger, more supportive regulations and international cooperation to foster a unified approach to sustainability. Regarding capacity, 22% highlight supply chain and infrastructural limitations, noting the gap between current capabilities and the requirements for a full transition to net zero.

Survey results reveal 87% of participants hold governments primarily responsible for not meeting net zero targets, urging policy and regulatory reforms to mitigate climate change. Industry, seen as a key player in innovation and emissions reduction, is deemed the second most accountable. The call is clear – for immediate, collaborative efforts led by strong governmental policies to drive sustainability.

For more information and insights, the full report is available at: <https://www.the-eic.com/>

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NATIONAL GRID TO HELP SCHOOLS ADOPT SOLAR POWER WITH NEW PARTNERSHIP

Schools seeking to install solar panels to cut carbon emissions and energy bills are being offered funding in a new venture from National Grid.

The electricity distribution company is launching a funding initiative as part of a five-year pledge to help schools in areas of high economic deprivation to reach net zero goals.

Working with Solar for Schools, it's looking to give grants for solar projects at schools in its South Wales, South West and Midlands licence areas. The £2.7 million commitment forms part of National Grid's Social Contract, which aims to add value to the environment and to the lives of communities and colleagues.

Ellie Patey, National Grid Electricity Distribution's Community Engagement Manager, said: "This new fund aims to help more schools adopt solar power to decarbonise and to reduce energy costs. It's also an important way to engage pupils in ways to reduce carbon and emissions.

"Working together with Solar for Schools means our grants can unlock significant financial and carbon savings, as well as educational benefits, over and above what could have been achieved working in isolation."

Two Birmingham schools are the first to benefit. The Ark Victoria Academy and Ark Kings Academy have just had new solar systems installed and have saved £3,500 in the last month, with projected savings forecast to be more than £1.2 million over the lifetime of

the solar panels.

The solar is also expected to save more than 1,153 tonnes of CO₂ over its lifetime; equivalent to taking 260 fossil-fuelled cars off the road for a year. The savings made by the schools will be reinvested back into education or vital school infrastructure.

As part of the project, around 2,000 students at the two schools have taken part in hands-on educational workshops, assemblies and a library of STEM-related resources, covering energy, efficiency, sustainability and economics.

Ann Flaherty, Solar for Schools UK Director, said: "Our education programme links the solar on the roof with the curriculum in the classroom. We always say, learn from your school buildings not just inside them. By getting solar on the roofs of schools we're empowering students and helping them see they can do something locally to reduce carbon, that helps nationally to meet targets, and that's globally helping to reduce our emissions."

Bryan Knope, Head of Estates for Ark



Schools, said: "We're delighted to have received this National Grid funding and to be working with Solar for Schools to install photo voltaic panels at our schools in Birmingham, London and Hastings. Reducing CO₂ emissions is a top priority for Ark. We've set ourselves a tough target to cut consumption by 20% this year, and solar is one of the tools Ark is using to improve sustainability. The live energy-savings dashboard provided by Solar for Schools is also helping us to form a more detailed picture of consumption. Together with smart metering, we're now able to report in more meaningful ways and use this data to shift behaviour."

National Grid's £2.7m grant will ultimately enable Solar for Schools to raise additional funding to enable about £10m worth of solar projects to happen – on schools that would otherwise not be able to go solar.

Robert Schrimppf, Solar for Schools CEO, said: "We hope that other companies will follow National Grid's example to drive impactful change and decarbonisation."

Applications for National Grid solar panel grants are now open. Schools can find out more about grant eligibility criteria and register their interest at: <https://funnel.solarforschools.co.uk/NationalGrid>

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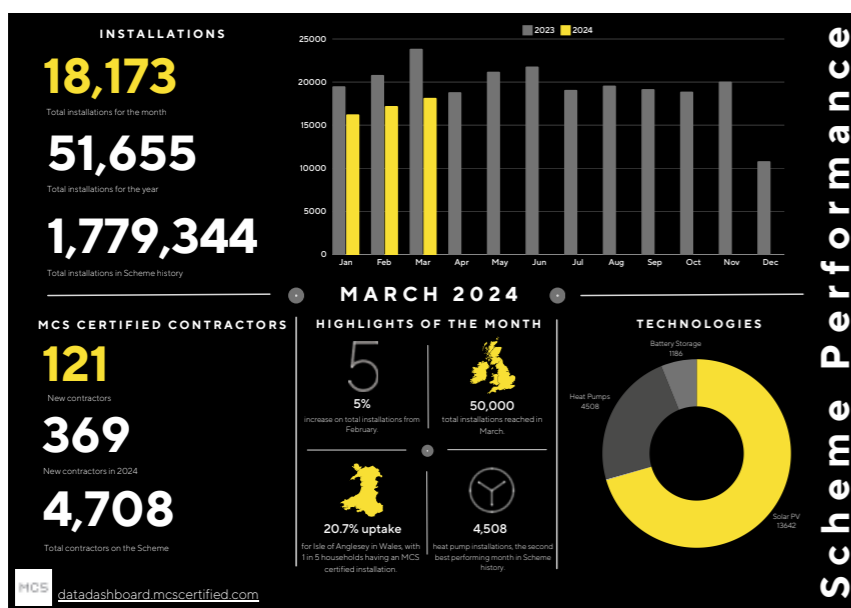
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SEVEN TIPS FOR ENERGY TRANSFORMATION BUSINESS CASES

Rosa Rotko, Energy Transformation Specialist, Mott MacDonald

Energy and carbon managers might wish for unlimited funds to tackle the challenges of net zero, but they are competing for limited investment resources against many corporate priorities.

According to a poll conducted by Mott MacDonald among ports and shipping industry professionals, 39% found it challenging to secure committed plans and budget for their carbon management projects.

It's an issue found across sectors. In my role I engage with a range of large energy users, such as airports, manufacturing firms, water companies and hospitals. A common problem is building business cases for energy transformation and net zero programmes when the costs and benefits fall across the business.

To gain the full picture it is necessary to engage with a wide range of internal stakeholders, including colleagues working in operations, facilities, fleets, commercial, finance, and sustainability. Likewise, some of the costs might be borne by, or benefits accrue to, external stakeholders such as tenants or service providers at the site.

Here are some tips that may help you draw up a comprehensive and persuasive business case.

1. CAPTURE ALL POTENTIAL REVENUES

Stacking the full range of revenue potential arising from any investment is a powerful tool. For example, energy generation and storage assets can offer new revenue streams through private wire sales or offering ancillary services to the grid. Emissions reduction initiatives might be monetisable as carbon credits. Earnings from additional service provision, such as electric vehicle charging or low carbon shore power, might need extra consideration across the business because of the different



business models involved. Finally, one should count the increase in customer usage of facilities and additional non-energy related income (such as regulatory revenues linked to utilisation, ability to increase rent or earn commission).

2. OFFSET COST SAVINGS

Pay-back periods are normally calculated by looking at how long it takes for the net cash inflows from an investment to equal the initial cost. However, it is also important to look at cost savings or avoided costs elsewhere in the business. These could include operational savings (e.g. reduced maintenance of the heating system, fleets or machinery); avoided costs related to grid capacity reinforcement (due to investment in flexibility); and the avoided costs of carbon offsetting in the future, in the absence of investment in emissions reduction. Remember to consider forecasts for wholesale costs and non-commodity costs over the duration of the investment, as energy price assumptions make a huge difference.

3. DEMONSTRATE THE VALUE OF PRICE CERTAINTY

Reducing price volatility and being able to accurately estimate energy costs is a huge benefit. Being exposed to volatile national and global energy prices increases hedging costs and forecasting risk. This exposure can be mitigated through self-generation, demand reduction or load shifting

initiatives. It is important to articulate the value of price certainty, how it feeds into long-term budgets (perhaps linked to a regulatory cycle) and how it affects others such as tenants.

4. ASK TO RECYCLE ENERGY COST SAVINGS INTO FURTHER PROGRAMMES

Some organisations are not allowed to recycle OPEX savings due to regulatory reasons, but others have a practice of 'returning' any savings to the overall budget. For net zero related initiatives, where there is an ongoing investment need for decades, it would make sense to recycle any resulting energy savings into new measures to cut bills and carbon even further.

5. SHOW THE FULL RANGE OF CO-BENEFITS

Beyond the direct costs and revenues, any decarbonisation measures have a wider range of co-benefits which sometimes are equally, if not more, important in driving action.

On the financial side, there might be a positive impact on real estate value arising from energy efficiency or provision of new services such as charging infrastructure. For listed companies, investor perception and impact on share price is an important consideration.

Customer satisfaction is another important metric. Corporates are looking at emissions in their supply

chain, and assuming their partners will contribute positively. There is an increasing expectation of access to low carbon electricity and cleaner fuels at sites like transport hubs.

Reputation with consumers, employees, local authorities and politicians can sometimes be the make-or-break issue for decarbonisation investment: action could determine the ability to grow, while inaction could risk protest by environmental groups.

There are many other intangible variables. For example, some organisations may be influenced by the requirements of accreditations or certifications they are working towards, or by their regulatory or public interest regime.

6. ENGAGE WITH PARTNERS WHO BENEFIT AND COULD CONTRIBUTE TO THE COST

A particular problem for organisations is coordinating carbon management activity across multiple stakeholders who benefit from efforts at the same site. These include landowners,

operators, tenants and service providers.

It could be necessary to appoint a project manager with a remit to engage with stakeholders, and to build up a coordinated programme with supporting funding commitments. Identify who makes investment decisions for each party, and what drives them; it would be useful to learn how partners' business models work, to understand how they can contribute to carbon reduction and the funding of projects. The business case needs to be translated into language which those decision makers can understand – for example, spelling out the impact on rent for tenants, or the impact on utilisation rates for operations.

7. SHOW POTENTIAL FUNDING SOURCES

A big question is how to balance the financing of capital costs between borrowing, grants, third-party investments and your own balance sheet.

A useful first step is to build an energy transformation roadmap, showing when investment is likely to be made and the expected payback periods. Then it will be easier to consider whether investments can be made on your own balance sheet or in partnership with

others such as energy solution providers.


This needs to be overlaid with other capital programmes, to understand where related funding pots might sit: for example, a building modernisation programme could also include energy efficiency or heating upgrades.

It is always handy to have some 'shovel ready' project briefs written up, in case there are underspends elsewhere or a relevant grant funding round or loan funding scheme opens up. This can sometimes be a fast-moving space, so keep abreast of developments by subscribing to alerts from the Government, relevant local authorities, the UK Infrastructure Bank and others with an interest in your sector.


Hopefully this article raises some points that might be useful for building a business case for energy transformation and net zero programmes. It might trigger you to think of how to consider the potential benefits holistically, including intangible benefits. There are likely to be other factors within your organisation that can be added to this mix, to make an argument for further investment which helps to tackle climate change. www.mottmac.com

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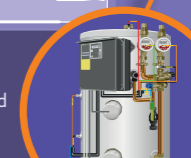
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IS THE BUILT ENVIRONMENT READY FOR EVOLVING CYBER THREATS?

For quite some time, large organisations have been prime targets for cyber-attacks due to their profitable nature.

However, with more advanced techniques and the development of artificial intelligence, small and medium sized businesses are increasingly finding themselves in the crosshairs as well.

Despite cybersecurity being integrated into every aspect of our world, research shows only 2% of organisations in the UK have the 'mature' level of readiness against cybersecurity risks. From office complexes to residential blocks, ensuring the cybersecurity of buildings is a key aspect to safeguarding both physical assets and personal data.

Jasper Nota, an esteemed ethical hacker from Secura, which is a subsidiary company of Bureau Veritas, discusses how building operators and security officers can safeguard their smart buildings.



Nota is the founder of the Hacker Playhouse, which is an awareness kit that demonstrates the simplicity of hacking popular smart devices, such as unlocking smart door locks and disabling alarm systems. For further information, readers can explore the Secura website: <https://www.secura.com/services/iot/consumer-products/iot-hacker-playhouse>

1. NETWORK SECURITY

Networks must be designed with security in mind. Firewalls, intrusion detection systems, intrusion prevention systems and proper network security protocols can all help to safeguard the infrastructure. However, it's imperative to presume that cybercriminals could bypass one of these adopted defence mechanisms. Therefore, a defence-in-depth security architecture is recommended.

For example, dividing a network into separated sub-networks will help prevent the lateral movement of attackers whenever they gain a foothold within the network. Implementing (certificate-based) network access controls will ensure that unauthorized individuals who gain entrance to the premises will not automatically gain access to the internal network whenever they plug a device into a network port.

With all this in place, it's still critical to continuously monitor network traffic as it can enable early detection of suspicious activities, allowing for a timely response to potential threats.

2. PHYSICAL ACCESS CONTROLS

Using robust access control systems, such as key cards that cannot easily be cloned, will help regulate who can enter the building, and designated restricted areas within the building. Restricting physical access to networking equipment, smart devices and server rooms can prevent an attacker from tampering with electrical devices. Through insecure (debug) interfaces, an attacker could easily compromise a device they have physical access to. The trust relationship between that device and other devices within the network could be abused to further attack the environment. Thus, it is crucial that systems are only accessible by authorized personnel. In case that this is not achievable, proper anti-tampering mechanisms should be added to the system design. Additionally, applying security cameras, and security guards may help to deter unauthorized access to equipment.

3. DEVICE AUTHENTICATION AND EXPOSURE

Security officers should ensure that only authorized users can access resources and perform specific actions on systems. Enforcing strong password and lockout policies, using multi-factor authentication, and using IP-based allowlisting are several examples that can decrease the likelihood of unauthorized access to sensitive resources. It is also advisable to map the external attack surface to determine which systems can be reached remotely. For example, conducting a search on Shodan, which is a search engine for connected devices, to determine whether the BACnet protocol is externally exposed. In addition to this, recurring audits of user permissions can help identify any gratuitous privileges, reducing the attack surface for potential breaches.

4. REGULAR UPDATES

System manufacturers often release security updates to mitigate newly discovered vulnerabilities in software and hardware components. Security officers must stay aware of these and promptly push these updates to mitigate the risk of exploitation by cybercriminals. Note that updates should always be tested in a test environment before pushing them to production. Whenever vulnerabilities that cannot be mitigated with a security update are discovered within hardware components, manufacturers tend to release new hardware designs. Security

officers should decide whether the risk can be accepted for their environment or whether they need to replace the device.

5. THIRD-PARTY SECURITY

Ensure that all third-party vendors and suppliers adhere to strict security standards (e.g. IEC 62443) and protocols to minimize the likelihood of incorporating insecure devices into the infrastructure, and supply chain attacks. Inquire from third-parties whether they conduct security assessments to assess the security posture of their products, and whether products obtained any security certifications such as Common Criteria.

6. EDUCATE BUILDING OCCUPANTS

Human error can play a huge role in weakening the security posture of (smart) buildings. Occupants and staff should be educated about best practices for cybersecurity, including the importance of strong passwords, recognising phishing attempts, noticing when people are shoulder surfing or tailgating, and reporting suspicious activities promptly. Regular training sessions and awareness campaigns can empower individuals to play an active role in protecting building assets and data.

7. PREPARE FOR THE WORST

Preparation is key. Despite proactive measures, security breaches can still occur. In the event that this happens, building operators and security officers should have a comprehensive incident response plan ready, which outlines procedures for detecting, containing, and mitigating cyber-attacks. This includes designated teams, communication protocols with stakeholders, and procedures for data recovery and restoring the systems in place. Regular drills and simulations can help test the effectiveness of these plans and prepare in advance.

In an increasingly interconnected world, prioritising cybersecurity is not just a matter of protecting the building itself, but about safeguarding the safety, privacy, and well-being of everyone within these spaces. By implementing robust access controls, securing network infrastructure, staying vigilant with updates and educating occupants and staff, buildings can strengthen their defences for the future.

For more information on how Bureau Veritas can help strengthen your cyber security, please visit <https://www.bureauveritas.co.uk/our-markets/cybersecurity>

THE BIGGEST PROBLEM WITH WATER HEATING?

YOU DON'T KNOW WHICH PROBLEMS YOU HAVE!

Adrian Barber suggests ways to maximise water heating efficiency.

Many student accommodation properties have multiple local hot water cylinders supplying groups or 'clusters' of rooms. Cylinders are generally plumbed in, locked in a dark tank cupboard, and only see the light of day following 'lack of hot water' complaints.

Water cylinders engender many and varied issues. But identifying these problems, then locating and fixing them is time consuming and costly for maintenance teams. Older systems become a game of 'whack-a-mole' – one issue is resolved, others spring up. Problems cost time and money and disrupt room occupants!

The biggest problem with water heating, is that you don't know which problems you have, or where they are.

With space heating in student dwellings, managers appreciate that monitoring and controlling at point-of-use is most effective in managing consumption. The more data, the better the management strategies. Even minimal savings per room become significant when multiplied by 500 occupants. When data capture is applied to water heating there are many other advantages too.

PROBLEM SOLVING

Most issues occur because it is simply not known what is happening in the system e.g. Volume of water entering; Water temperature within the tank; Leak/wastage; Flowrates through pipes; and tap temperature. Gathering this information requires several monitoring points with sensors and meters collecting data.

The new generation of 'smart' tank has such capabilities. Pre-plumbed and pre-wired with factory-fitted on-board controls ensures a consistency of production quality, and a familiarity of installations across a site. Fitting time, and costs are cut, and maintenance is more efficient.



When connected to a centrally controlled system, data is transmitted to a hub where Energy, Maintenance, and H&S Teams can see precisely what is happening throughout their system. In addition, unusual usage patterns, leaks/wastage, and faulty components are reported.

SAVINGS

Three levels can be identified for Water heating efficiency-analysis.

- 1. Replacement:** Cylinders are generally considered to be 'a fit-it and forget-it' product. Many are simply past their best and need changing. Greater efficiency will be immediate from a new cylinder, whatever its monitoring capabilities.
- 2. Pro-active analyses:** Accurate and intense monitoring of both energy and water consumption accumulates data as never before. From this, heating strategies are better defined. This results in stricter temperature control, and greater maintenance efficiencies.
- 3. Nuances:** An example is a pipe sensor. A small device that pinpoints invisible yet significant wastage. It detects water flow, and temperature at point-of-use. Dripping taps or faulty toilet cisterns are no longer imperceptible. Maintenance Teams are alerted. The swifter their action, the lesser the amount of water wasted.

SAFETY

Water safety is a subject where greater understanding of events and logging data is critical. What is the water temperature: In the tank? -When it leaves the tank? -At the outlet? Is Legionella a risk? Are Water Safety Plans adhered to? Can this be evidenced? Are taps and showers presenting scolding hazards?

These questions are answered when a water system is monitored absolutely.

CUSTOMER RELATIONS

The quality of student accommodation has soared in recent years, delivering superb facilities and outstanding comfort. Rental values are commensurate. But with this, increased resident expectations.

Unreliable water supply is unacceptable. As are frequent knocks on doors from maintenance teams hunting for problems. Remote monitoring reveals accurate location of faults, speeds up repair, and encourages scheduled maintenance regimes. All of which reduces interaction with, and interruption of, occupants.

If a problem is known, it can be dealt with. But currently, those responsible for water heating efficiency, like their cylinders, are in the dark! www.prefectcontrols.com

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"The prepayment opportunity that our SMART Meters offer our customers provides an instant boost to cash flow" **Chris Smith, Managing Director.**



- Approved to new Measuring Instruments Directive (MID) standards
- Prepayment of your electricity supplies
- Exclusive access to PayPoint retailers
- Top-up online or via our FREE app
- Friendly disconnection override
- Remote supply disconnect/reconnect
- As installed by British Gas and other major energy supply companies



Happy residents

Energy Controls' SMART meters come equipped with many customer-friendly optional settings designed to prevent out-of-hours power loss. These include **pushbutton emergency credit and disconnection override periods** as well as **predefined holiday dates** when power will remain on even if the credit expires. Not only do these settings reassure consumers, they also take the pressure off the re-selling of energy, leaving you free to get on with running your business.



Happy customers

But you don't have to take Chris's word for it. Simply read what the Gypsy and Traveller Team Manager for West Sussex County Council had to say:

"Working with Energy Controls, we have introduced a new cashless PayPoint system for the SMART meters at our Traveller Sites. This system has been a huge improvement for the Council because not only does this mean our staff no longer have to handle cash, the PayPoint service gives our residents greater flexibility and independence. I would not hesitate in recommending Energy Controls and their products and services."

The Manager at Southend YMCA went even further:

"Energy Controls supply 21st century thinking and a great web based service, with lots of useful functions, allowing you to see how much energy has been consumed on an individual basis. We highly recommend Energy Controls to any business. The whole experience of having the latest metering system installed was too good to be true and very straightforward."

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DATA CENTRES AND THE FUTURE OF LOW CARBON HEAT IN THE UK

Shahid Rahman, EMEA – Data Centre Strategic Account Lead (Engineered IT Cooling Solutions) at Mitsubishi Electric

Data centres are essential in a world where we rely on a substantial flow of information for almost every part of our lives, including commerce, government, education and even entertainment. But they are significant energy users, and their impact on the global energy supply and the environment is a major challenge. In fact, increasing regulation has slowed or halted some data centre development – the Dutch government banned new hyperscale projects for 9 months, and the Irish government has introduced policies to scrutinize data centres more closely.

All of this means that decarbonising these spaces is a top priority for the country to reach net zero by 2050.

What's more, data centre users are increasingly concerned with their carbon footprint. This has created increasing pressure for data centre developers and operators to provide robust, fault-free services while reducing energy use and emissions – a difficult balancing act.

Thankfully, solutions already exist that are able to make data centres more energy efficient and minimise their impact on the environment, including adopting a more sustainable way to generate and use heat.

REUSING HEAT FROM DATA CENTRES

One way that data centres can cut the carbon impact of heat is by reusing it. There has been a great deal of focus on using cooling technologies that meet energy-reduction targets, but shifting the focus onto the reuse of heat energy actually gives data centres the potential to decarbonise further and build a greener future. In fact, excess heat from data centres can be used to heat other nearby buildings – including homes – and provide them a more sustainable heating source.

A great example of this in action is taking place in Germany. The new German Energy Efficiency Act has made the reuse of 'waste' heat a requirement, and data centres in particular will have to achieve 10% heat reuse from 2026, and 20% by 2028.

Several approaches to heat recovery can be applied, depending on a data centre's heat output and location. One heat recovery model is district heating

and cooling as a service: a heat pump recycles the water from the district heat network to cool the data centre. The waste heat from the cooling activity is then collected by the heat pump and pushed to the city network. The reheated hot water from the data centre mixes with the water in the general heat network, increasing the return temperature. Overall, energy consumption across the whole heat network is reduced, and so are energy costs and carbon footprint.

Many leading data centre developers and owners are embracing the benefits of heat reuse. For example, Amazon's Tallaght data centre located in Dublin uses a system where heat generated by servers is transferred to an air-handling unit and then recycled to warm water. The water is then directed to an energy centre outside the warehouse, where heat pumps further increase the water temperature. This innovative approach not only results in an estimated annual reduction of 1500 tons of carbon dioxide emissions but also provides heating for over 505,000 square feet of local public buildings, 32,800 square feet of commercial buildings, and 133 apartments.

HEAT PUMPS AND HEAT NETWORKS TO IMPROVE ENERGY EFFICIENCY IN DATA CENTRES

Embracing technology like heat pumps and heat networks is also critical for reducing the carbon footprint of data centres, and providing heating and hot water more efficiently.

Heat pumps are particularly useful for making the most of waste heat. Data centre output heat is around 30°C to 35°C. Heat pumps can use water at this temperature as a heat source, topping up the temperature to 70°C or even 80°C. This heat energy can be used in the data centre (or nearby buildings) to meet domestic hot water (DHW) demand in washrooms and showers, for example.

Alternatively, it can be used on a wider scale in heat networks connected to buildings and homes located further from the data centre. Households can then be provided with heat and hot water via a large network of pipes. The Climate Change Committee (CCC) estimates that 18% of UK heat could come from heat networks by 2050 (up from 2% today).

MAKING THE RIGHT CHOICES FOR HEAT REUSE

When considering heat reuse as an option for a data centre, there are a number of considerations to make from the earliest stages of design and specification. When looking at linking the data centre to a new or existing heat network, the first step is to ensure that there is an outlet for the waste heat a reasonable distance from the data centre – or that there is an existing heat network that can use extra capacity – through heat mapping.

It is then vital to understand what the cooling demand of the data centre is across the year, and to size and specify cooling equipment. The ideal solution is a water-to-water heat pump, or a heat pump chiller. The heat output of the heat pump can then be calculated to establish the annual heat output profile.

A successful match of data centre heat output and local heating requirements is what designers will look for when setting out these projects. Buildings that are close to the data centre, such as nearby offices or public buildings, may not have high heat requirements. However, heat networks which supply domestic customers have higher and more predictable heat demand profiles. Buildings such as hospitals, schools and leisure centres are also sources of heat demand that must be considered.

ENERGY EFFICIENT DATA CENTRES WILL LEAD THE WAY TO NET ZERO

There is huge potential for data centres to adopt heat recovery solutions and become part of the UK's drive to decarbonise heating. Approaches like district heating and cooling allow society to reuse the excess heat from data centres using a heat pump. This kind of process not only enhances energy efficiency in data centres but also contributes to providing neighbourhoods with heat and hot water in a more sustainable way.

As such, framing the data centre sector as part of the solution for our decarbonised future, rather than simply an energy user, has clear benefits for future development and growth. <https://es.mitsubishielectric.co.uk/>

HOW API TECHNOLOGY CAN TRANSFORM YOUR ENERGY AND CARBON MANAGEMENT

At a time when there is burgeoning pressure for businesses to embrace and drive sustainable practices the integration of technology is key, not only to streamline costs and enhance efficiency, but also to navigate the complex landscape of energy and carbon management.

1. REAL-TIME MONITORING AND ANALYSIS.

APIs can play a crucial role in energy monitoring and targeting software by enabling the integration of various systems and devices. APIs enable data exchange between a range of systems and can allow energy and carbon management platforms access to up-to-date information from various sources. This capability provides instant access to real-time data and helps businesses spot inefficiencies, track consumption patterns and respond swiftly with corrective measures.

2. SEAMLESS INTEGRATION

Energy and carbon management relies on a vast array of data from across the business, often from diverse sources and systems. API integration acts as a bridge that facilitates integration and ensuring an effortless flow of data that eliminates data silos and promotes a holistic organisational view. As energy

monitoring needs grow, APIs allow for the easy addition of new devices and data sources without significant changes to the existing infrastructure.

3. AUTOMATION

Effective energy and carbon management calls on large quantities of data. From collecting monthly consumption data to generating reports and measuring the success of energy saving projects, automation reduces manual intervention. Automation increases efficiency, saves time, and ensures high-quality, timely and consistent data. APIs can be used to connect software with control systems, allowing for automated adjustments based on energy usage data, which can lead to more efficient energy management.

4. COLLABORATION AND COMMUNICATION

The ability to share data effortlessly via API technology stimulates

Tom Anderton, Head of Customer Success at TEAM Energy, looks at four ways that Application Programming Interface (API) technology can enhance an energy and carbon management solution and change the way businesses can build a pathway to a sustainable future.



collaboration. API connectivity improves communication and information sharing across the wider corporate landscape. Enhanced collaboration supports streamlined compliance, operational transparency and promotes a shared commitment to sustainability.

Successful energy and carbon management relies on accurate, complete and consistent data. In an age when organisations are managing multiple data streams across their business operations, from Internet of Things (IoT), Business Intelligence and Management Information to BEMS data, API technology plays a critical role in accessing and sharing advanced data insights. The data provided by APIs can inform better decision-making regarding energy policies and strategies. As businesses continue to embrace meaningful sustainability, the role of API technology is fundamental in harnessing enterprise-wide data to shape a greener and more efficient future. www.teamenergy.com

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HOW TO TRANSITION TO NET ZERO: AN ENGINEER'S PERSPECTIVE



It's no secret that time is running out on our journey to net zero. Taking the path of decarbonisation is challenge enough for small enterprises but this escalates to a daunting scale when it comes to large energy users across multiple buildings and sites, including business use estates and education, particularly university campuses. It's all well and good encouraging the people going about their business on the estate to use less energy, but compliance can't be forced and

even with perfect adherence it's only going to get you so far. It can seem a daunting challenge, even for seasoned Estates Directors.

Nick Boid, Technical Director, Energy at Buro Happold, provides insight into how large estates can get the ball rolling and what to expect along the way, there is a lot of ground to cover before you can start to plan to decarbonise.

WHERE TO START?

The key to any solution always lies within your understanding of the problem, making the transition to net zero is no exception. You need to first understand where you are currently, to see how far away you are from where you want to be. This means the first step for any estate is to establish the baseline, in other words, do you have good metering data? If the answer is no, then the first step will be to get that data. This could mean installing temporary metering equipment, something Buro Happold have done for a number of clients to get a sense of what they are using, when and where. After all, if you can't measure it, you can't manage it!

If you do have comprehensive metering data and with it a full picture of your estate's energy usage, your first step will be to analyse and importantly, understand that data. Consider where the estate is performing well and where changes need to be made. Look at ways to reduce your energy consumption before you take any further steps because this will only aid the rest of the journey.

A big benefit of being in control of your energy data is that you can use it to inform decision making, particularly when it comes to funding. In order to facilitate

future changes to decarbonise it will be critical to funders, whether internal within the organisation, or external, to truly understand the benefit that will be created against the investment. Having visibility of what energy is being used every month, how it is being generated, how much is being spent, and what the carbon emissions are will be invaluable when it comes to getting finance.

CAPACITY THAT IS FIT FOR PURPOSE

And timing is everything (apart from data). From an engineer's perspective, it's especially useful to know when energy is being used, when in the day and when in the year. Energy used for heating, for example, is going to be disproportionately used in the winter. Analysing how much energy an estate uses during peak times will drive the capacity of the equipment you need and will typically determine your capital cost. The trap a lot of estate owners fall into is assuming that the equipment they currently have in place is the right capacity, so replace it like for like. However, in many cases estates have an unnecessary capacity surplus because it hasn't been installed based on actual use. This reaffirms the importance of having in depth metering data, in an ideal

world this would be half-hourly usage data, because you can potentially make a substantial saving on the new solution by not oversizing the new equipment.

BUILD A DEMAND MODEL

The next stage for Estates Directors in the transition to net zero is building a demand model based on the energy use data. You can then compare the model to industry benchmarks for energy use, making it clear which buildings are performing well and allowing you to identify any potential outliers. This approach of cross referencing also enables you to validate the data, if it looks wildly different from the industry benchmarks then the chances are, there is something wrong with your measuring equipment. Inevitably some assumptions will need to be made when creating a model, but you can build in the life cycle of the estate, including known capital plans, for example, are there plans to demolish some buildings or sell any?

An additional benefit of building a model is that it highlights the high energy users on the estate, for example, if there is a data centre on the estate this will likely use the most energy. Once you understand the uses of energy across the estate, you can then look at the

applicable options for energy efficiency such as replacing lighting with LEDs or implementing scheduling controls. You should also be able to see what, if any, building improvements need to be made and where, do you need to improve the glazing in some buildings but the cladding in others, for example.

A good model will then reveal the savings you will make from improving the energy efficiency of the estate. On average, you can expect around a 10-30% saving but this will vary from estate to estate depending on factors such as age and condition.

SWITCH TO CLEANER, GREENER ENERGY SUPPLY

Once the model is complete you can turn your attention to more sustainable energy sources. This will be unique for each estate, dictated by the estate's characteristics. For example, is there a data centre on site? You could utilise the waste heat this kicks out to heat other buildings. Have you got any groundwater, or water sources that could be used as low-grade heat sources combined with heat pump technology? Would a wind turbine be appropriate or solar PV panels for renewable electricity generation? It's also worth considering if you can store energy. Having the capability to store low carbon energy for example, through battery storage, can offer flexibility in how you use the energy produced on your estate and help prevent waste.

The answer could be a combination of clean energy solutions. Are there any steps you need to take before changing your energy supply? If you're operating an existing heat network using steam, the most sensible first step is to try and lower your operating temperature. This will make your energy solution more efficient in the short term and prepare the network for lower temperature heat generation technologies such as heat pumps in the future.

Something you might find surprising is that it's much harder to upgrade/ retrofit buildings than it is to switch energy sources. The general consensus seems to be that we have to upgrade all our buildings until they are all at a certain standard, and then we make the heat generation switch to say, heat pumps. However, this fails to consider that the cost per tonne of carbon saving gets higher the more retrofitting you try to do. Usually, there is also a limit as to how much disruption you can cause. For example, will work have to stop

while you are retrofitting a particular building or is there somewhere you can temporarily move the operations? One solution is to prioritise making small, less invasive changes to the building fabric ahead of changing the energy source, for example removing drafts and reglazing windows. This would decrease the level of disruption while increasing the efficiency of the new energy source, and of course, reduce the associated running costs.

WHEN IT COMES TO CUTTING OUT CARBON - MAKE A PLAN

You know what they say, fail to plan, plan to fail. Once you have your metering data, model and have thought about plausible clean energy sources it's time to sit down and synthesise this into a decarbonisation plan. This needs to cover the broad strategy, proposed timeline and an estimated budget that includes both the cost of the net zero transition and the impact on operating cost. You can't do everything all at once, so think about the most sensible path to get to where you need to be. For example, if you have a heating system with five boilers, it may not be financially viable to replace them all at once. But you could replace one now and the rest over a period of say, 10 years, which would both spread the cost and give you time to get comfortable with the new technology.

In your plan it's particularly important to consider how you're going to fund the transition to net zero. Can senior management solely fund the project? Will you need to find a private investor or apply for public funding? There are many private organisations looking to put money into the improved energy performance of large estates, so this is worth considering. It is quite clear that in this current economic environment that the pot of public money for decarbonising public estates will be limited. Which means that, even to partially fund the transition to net zero, you need to have a comprehensive plan ready to submit quickly because the competition will be fierce.

Once you've started implementing changes, it's important to go back and keep your plan updated on how things are going. Keep a close eye on factors like energy price changes and review your plan every couple of years.

WHAT IS THE BIGGEST CHALLENGE?

The biggest challenge faced by most estates when it comes to transitioning

to net zero is getting off the gas grid.

Large estates often already have an onsite heat generation solution such as gas CHP. Historically this has worked well because gas is cheap, so it has avoided estates having to fulfil their heat demand requirements through expensive electricity. However, with the main priority now being to achieve net zero, this doesn't make sense from a carbon point of view. Electricity is becoming cleaner, and crucially, we need to stop burning gas.

Transitioning to electrification of heat and the effect this has on the campus electrical demand and infrastructure is a major challenge facing many estates and one that needs to be solved in a pragmatic way. One way to approach this is to confirm what headroom is currently available on your incoming supply and focus on what buildings can be implemented into that first phase heat transition. Then you can consider increased grid connection and infrastructure reinforcement as a longer-term plan.

Inevitably the transition to net zero for any estate is going to be a lengthy, multifaceted process. All estates will use roughly the same decarbonisation route map, but of course, the specifics will vary widely.

The main pieces of advice to get you moving in the right direction are to get good metering data, make a plan and start by getting started. Even taking small steps towards decarbonisation will be better than doing nothing at all. <https://www.burohappold.com/>

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WITH MAJOR TARGETS SCRAPPED, WHAT'S NEXT FOR NET ZERO – AND WHAT DOES IT REALLY MEAN IN 2024?



Don McLean, CEO, IES

PUTTING DECARBONISATION INTO PRACTICE – REGARDLESS OF POLICY

Scotland remains steadfast in its net zero 2045 target, and encouraging industry to accelerate their efforts will be essential to meeting this ambition. The issue is beyond politics, and everyone has a role to play in decarbonisation – but not everyone knows the art of the possible.

We've seen an encouraging trend in organisations acknowledging that while the government isn't going to 'do' it for them, they can act with autonomy. Carbon-intensive industries are where we can make the biggest difference – and the built environment is a major player in this regard. Given that a significant 39% of global energy-related carbon emissions derive from the built environment, reducing energy consumption and tackling the harmful outputs of the places in which we live and work can go some way to addressing the global issue at hand.

In the UK, many of us are fortunate to be able to access the energy we need. The challenge will be maintaining this standard of living as fossil fuels deplete. We need to make smart energy swaps now to benefit people and the planet in the long term.

The key thing is to make the 'how' as simple as possible – from cutting costs to making decisions much simpler. But with 'net zero' now a heavily politicised term, and conversations – and misinformation – around everything from heat pumps to solar panels rife, building owners may not know where to begin.

This is where data should come into the decision-making process, enabling building owners to shape good intentions into decarbonisation strategies and avoid a costly 'stab in the dark' when it comes to cutting energy consumption and emissions.

Creating digital twins of buildings means we can model operational scenarios and select the best way to move forward. Compliance energy models that have been archived can be re-awakened, taken through further modelling, and transformed into Performance Digital Twins for in-use building evaluation. This enables building owners to analyse where the most energy is being used and how, informing decisions around how to reduce it.

The ambition is that as technology advances, we scale this approach from individual buildings to campuses, cities, counties, and beyond. We've already proven that it's possible at a district level at Warrington Borough.

BUT IS 'NET ZERO' REALLY ACHIEVABLE – AND DO PEOPLE ACTUALLY KNOW WHAT IT MEANS?

By using data to create an action plan, organisations can strive towards meeting their environmental targets, as well as supporting wider ambitions at a societal level. But it's worth noting that while setting a 'hard' target for net zero is helpful, it is still not ideal. The race to net zero instils urgency, but it doesn't tell the whole story. In reality, we can create and operate buildings that are net zero – which would be a huge step forward – but they will still be putting carbon into the atmosphere and offsetting it elsewhere. We should strive to get to a position where we are actually taking carbon out of the atmosphere, instead targeting 'negative carbon emissions'.

For now, we should empower organisations with the tools to do what they can. There are no 'perfect' solutions, but some are better than others, and acting on evidence is the best we can do to make the biggest difference.

<https://www.iesve.com/>

Almost every day, stories of extreme weather events and rising global temperatures populate our news feeds. Our environmental crisis is more visible than ever, with climate change widely viewed as a growing threat and jurisdictions in 40 countries having declared a climate emergency.

Evidence of the impact that CO₂ levels are having on our planet is mounting, and people and industry are taking note. People are demanding change; we even saw a group of women win the first climate case victory recently, with the court ruling that Switzerland's efforts to meet climate targets were inadequate. So it's both disappointing and concerning to see Scotland's ambition to reduce carbon emissions by 75% by 2030 recently declared beyond reach – and now officially scrapped. However, were these targets ever realistic?

We're at a critical stage for climate change, and this announcement – coupled with the news that Ministers have missed so many annual targets – sends the wrong signal to the people and businesses that will be integral to bringing about change. But we must continue to look ahead; backtracking on targets doesn't take away the time sensitivity of the issue. Our planet is walking a plank that's getting increasingly shorter every day.

A GUIDE TO SBTI'S NET-ZERO STANDARD (2024)

The Science Based Targets initiative (SBTi) Corporate Net-Zero Standard (Version 1.2, 2024) serves as a crucial guide for companies aiming to align their greenhouse gas (GHG) emissions reduction efforts with global climate goals. Here's a detailed look at the key sections and their implications for setting ambitious, science-based targets:

NET ZERO STANDARD FRAMEWORK

This section establishes the structure for setting comprehensive science-based targets, which includes:

Near-term Science-based Targets:

Companies must set 5–10-year GHG mitigation targets consistent with limiting global warming to 1.5°C. These targets serve as immediate action milestones, critical for maintaining the global emissions budget.

Long-term Science-based Targets:

These targets define the required reduction in value chain emissions by 2050 or sooner, aligning with net zero emissions in 1.5°C pathways. They ensure long-term business planning aligns with global climate goals.

Neutralisation of Residual Emissions:

Any remaining emissions after achieving long-term targets must be neutralised, typically through credible carbon removals, ensuring a company's net zero claim is robust and meaningful.

Beyond Value Chain Mitigation:

Companies are encouraged to engage in mitigation efforts beyond their immediate value chain to contribute to global decarbonisation efforts, although this is not a substitute for direct emissions reductions.

MITIGATION PATHWAYS

This part delves into the scientific basis for target setting, emphasising:

Scientific Foundation: The necessity for targets to be rooted in climate science, ensuring they contribute effectively to limiting global warming to 1.5°C.

Pathway Utilisation: How different mitigation pathways, both cross-sectoral and sector-specific, inform the setting of credible, achievable targets.

PROCESS TO SET SCIENCE-BASED TARGETS

A crucial section providing a methodology for target setting, including:

Base Year Selection: Companies must choose an appropriate base year for tracking emissions reductions, ensuring data accuracy and representativeness.

Emissions Calculation: A comprehensive GHG emissions inventory is required, covering at least 95% of scope 1 and 2 emissions and a significant portion of scope 3 emissions (exclusions in the GHG inventory

and target boundary combined must not exceed 10% of total scope 3 emissions).

Target Boundaries: Near-term targets must cover a minimum of 95% of scope 1 and 2 emissions and, if applicable, 67% of scope 3 emissions. For long-term targets, the coverage increases to 90% for scope 3 emissions, ensuring a broad and impactful target scope.

Target Setting Methods: The Standard outlines various methods for setting targets, ensuring they align with the ambition levels dictated by climate science.

CORPORATE NET ZERO STANDARD CRITERIA AND RECOMMENDATIONS

This section lists the essential criteria for SBTi validation and additional recommendations, focusing on:

Ambition: Targets must align with the 1.5°C warming limit, reflecting the highest level of ambition in emissions reductions.

Timeframe: Near-term targets should be set within 5-10 years, whereas long-term targets must aim for net zero by 2050 at the latest, ensuring timely and meaningful action.

Reporting: Regular and transparent reporting of emissions and progress towards targets is required, fostering accountability and stakeholder trust.

SECTOR-SPECIFIC REQUIREMENTS

This section highlights the importance of tailoring net zero strategies to address the specific challenges and leverage the unique opportunities within different sectors. Key requirements include:

Customised Targets: Companies within certain high-impact sectors, such as energy, manufacturing, and transportation, are encouraged to develop targets that reflect the specific pathways and mitigation strategies viable for their industry.

Innovative Solutions: The section underscores the need for sector-specific innovations that can drive significant emissions reductions and contribute to the global transition to a net zero economy.

Collaboration and Alignment: It highlights the importance of intra-sector collaboration to overcome common challenges and achieve collective progress towards net zero goals.

ANNEX D: REPORTING REQUIREMENTS

Annex D underscores the role of effective reporting in maintaining accountability, building stakeholder trust, and demonstrating a company's commitment to achieving its science-based climate goals:

Regular Disclosure: Companies are required to report their GHG emissions and progress towards their science-based targets on an annual basis.



Comprehensive Reporting: The guidance specifies that reports should cover all relevant emissions across scopes 1, 2, and 3, ensuring a full account of a company's GHG impact.

Adherence to Principles: Reporting should follow key principles such as transparency, consistency, accuracy, and completeness to ensure the reliability and credibility of the information disclosed.

ANNEX E: GUIDANCE FOR COMPANIES IN LAND-INTENSIVE SECTORS

This section focuses on sectors where land use significantly influences GHG emissions, such as agriculture and forestry. The key requirements include:

Inclusion of Land-Use Emissions:

Companies in land-intensive sectors are required to account for and report emissions from land use, land-use change, and forestry (LULUCF) within their GHG inventories.

Sector-Specific Targets: The annex emphasises the need for these companies to set specific science-based targets that address the unique challenges and opportunities associated with land-use emissions.

Best Practices for Measurement and Management: It offers guidance on best practice for measuring, managing, and reducing GHG emissions related to land use, ensuring that companies adopt comprehensive and effective strategies.

The updated guidance does not include any new criteria and no criteria have been removed. The main changes consist of clarifications to ensure consistency between SBTi guidance documents and revise some naming. The update aims to improve clarity by providing additional explanations and enhance readability.

The SBTi Corporate Net-Zero Standard, with its detailed target setting requirements, including target boundary, coverage, methods, and criteria for ambition, timeframe, and reporting, provides a comprehensive roadmap for companies committed to credible, impactful climate action. Following this Standard ensures that corporate emissions reduction strategies are scientifically grounded and aligned with global efforts to combat climate change.

www.optimised.net/science-based-targets

HOW DATA CENTRES CAN BECOME AN ALLY TOWARDS NET ZERO

Commitments and action towards sustainability is more important than ever, and businesses must take action now. Data centres are regularly a topic of conversation due to the high energy consumption needed to power them. For example, it is estimated that global data centre and network electricity consumption in 2022 was around 1-1.3% of global final electricity demand, with data centres accounting for almost a fifth of Ireland's entire electricity use.

It's essential that we start making change with tangible targets and

Anthea van Scherpenzeel, Senior Sustainability Manager, Colt DCS



responsible roadmaps to reduce the effect of data centres' energy consumption on the planet. And yet, many in the industry are overwhelmed in how they begin on their sustainability journeys. Whether it's a lack of environmental, social, and governance (ESG) data, internal expertise, or a culture that prioritises speed and performance over green credentials, the IEA states that improvement is needed as soon as possible in the data centre market.

Looking ahead, in order to successfully address environmental challenges at the rate required to reach a worldwide net-zero economy, science-based targets and roadmaps must be established. It is the duty of those in the market to progress in

adopting the most sustainable practices possible so that, as demand rises with new technologies and developing markets, its ESG impact can be reduced. It is more important than ever that actions align with science that sits behind the Paris Agreement, as the AI industry alone is predicted to consume as much energy as the Netherlands by 2027.

HOW CAN WE SET SCIENCE-BASED TARGETS?

Science-based targets highlight organisations short- and long-term commitment to combatting climate change. If targets support the Paris Agreement's aim to limit global warming to 1.5°C above pre-industrial levels, then it is seen to be science-based. The sixth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) was released not too long ago, and it reiterates the near linear link between the increase in CO₂ emissions due to human activities and future global

warming. In line with the most recent Net Zero Standard set forth by the Science-based Targets initiative (SBTi), Colt DCS resubmitted its science-based targets in 2023. The aims include fuel, power, waste, and water, among other environmental issues. These objectives are essential for data centres themselves to make progress, as well as helping customers achieve their own net-zero objectives.

In order to prevent the worst effects of climate change and establish a global net zero economy, businesses must cut their greenhouse gas (GHG) emissions in accordance with science-based targets and roadmaps that specify the amount and pace of reduction. This extends to Scope 3 emissions – which are frequently the hardest to monitor and manage – where data centre and business leaders must ensure that partners are on the same path to sustainable practices. To be held accountable, the data centre industry must commit, create, submit, share, and disclose their science-based targets.

While science-based targets are essential for reducing environmental impacts, data centre operators also need to make sure that their sustainability initiatives addresses all 3 ESG pillars. Many companies concentrate on the 'E', since it is simpler to evaluate the data's

granularity, but social and governance issues are also crucial. A deeper focus on the "S" and the "G" can prove to be a crucial distinction, whether it's in terms of interacting with local communities, protecting, or making sure that governance and reporting are up to par.

MOVING FROM PROMISES, TO ACTION

Now that these science-based goals have been established, data centres should then look at turning promises into action. Intelligent transitions to new, environmentally friendly materials, technologies, and energy sources lessen the environmental effect of data centres. Reducing a data center's carbon footprint can be achieved, for example, by using refrigerants with a lower global warming potential or by moving to greener fuel options and obtaining renewable energy.

In order to guarantee that sustainability becomes an essential component of business strategy, a cultural shift is also required within organisations. In addition to reorienting internal attitudes, achieving goals rests heavily on working together with customers and suppliers. At the heart of the sector needs to be agreement and alignments – as sustainability can't be a tick-box exercise.

Measuring progress is a crucial part to the path to sustainability. Good communication with suppliers and partners is essential for tracking Scope 3 emissions in reporting, not only for data centres but also for the companies that use them. This data exchange will be more crucial than ever to obtain a comprehensive picture of sustainability consequences along the whole value chain, especially with the impending EU Corporate Sustainability Reporting Directive (CSRD).

SCIENCE-BASED TARGETS ARE THE WAY FORWARD

A major reduction in the carbon footprint of the digital infrastructure sector may occur if the data centre industry implemented science-based goals and policies as best practices. Rather than merely focusing on everyday operations, the ultimate goal should be on entrenched acts that start as soon as property is purchased. Data centres need to ensure that every aspect of the site lifecycle—including operations, materials, construction, and equipment—is as sustainable as feasible. Monitoring embedded carbon is crucial to tracking the entire impact of a project. <https://www.coltdatacentres.net/>

HOW THE INDUSTRY CAN ERADICATE ENERGY SUPPLY VOLATILITY

The move to a renewable future has begun in the public sector, with almost eight-in-ten (79%) business leaders saying they have either already entered into a renewable energy power purchase agreement, or plan to do so within the next two years. This is, of course, a good thing. However, it does present issues for the energy industry due to the additional risks involved in supplying renewable energy. This has made it difficult for suppliers to keep costs down and revenues up. Yet, it is imperative that they do. Cost continue to remain front of mind for three-quarters (74%) of business leaders when they are making decisions about their energy supplier. The well isn't infinite.

As we know, energy costs are more volatile today than ever before. Much of this has been caused by the unpredictability of supply – whether due to geopolitical instability or climate patterns. However, the move to renewables and the inherent unpredictability of them has only exacerbated the issue.

This supply volatility is something the industry has had to take seriously. After all, the main goal of an energy supplier is to supply energy to its customers. Margins have been squeezed by the unpredictability in real-time prices, improper pricing, and incorrectly accounting. Yet, they can also be squeezed by the retail energy provider (REP) overpaying for the energy in the first place.

A MORE VARIABLE CLIMATE

What a REP pays for energy can massively vary, and much more so than ever before. Energy demand has always been linked to weather patterns. After all, air conditioning units are needed more when it is hot, and gas heaters are

Daniel Cross, Sr. Director of Load Forecasting, POWWR

needed more when it is cold. However, as we move towards an era when renewable energy makes up a higher proportion of the energy mix, climatic variables also impact the ability to produce that energy in the first place.

Solar and wind power generation can be particularly volatile. Solar farms only work optimally when the sun is out. Wind farms are unreliable in a light breeze and can even freeze in the winter.

Of course, a REP is fiscally required to pay for the energy that their customers are using. Because of this, it is imperative that they price their contracts correctly to cover all eventualities, while remaining competitive. This is easier said than done. Prices of wholesale energy change rapidly and are difficult to predict. Plus, they are more volatile than ever before. We used to see an extreme pricing event only every few years, now we see them almost seasonally.

THE IMPORTANCE OF ACCURATE FORECASTS

Energy cost and supply volatility presents serious financial and operational challenges for REPs. Because of this, they are looking to proactively control energy sourcing and consumption through a diverse set of strategies. If a REP is incorrectly hedged or priced for any length of time during a price event, the ramifications could be catastrophic. They need to flatten the curve.

Luckily, help is at hand. Buoyed by recent advances in artificial intelligence (AI) and machine learning, technology can be used to accurately forecast load (how much energy its customers will

require) and load generation (how much energy will be produced) better than ever before.

The data itself can come from a mixture of historic and live data points within the supply chain, buoyed by the proliferation of the Internet of Things (IoT) sensors. Once AI and machine learning is used to unlock this data, REPs have the insight they need to know what energy they need to push onto the grid, and when. This enables them to hedge more effectively and mitigate the risk of falling foul of a future extreme price event.

DON'T GET LEFT BEHIND

The energy industry is at a critical point. With over one-third of the world's largest public companies making net-zero commitments and much of the private sector following suit, new products and services are required. It is important that they don't get left behind. Almost three-in-five businesses (59%) say they have either already engaged in the process of securing flexible green energy tariffs or plan to do so within the next two years.

REPs need to provide the market with what they want. To do so effectively, though, they need to flatten their risk curve by better utilising AI and other technology to obtain accurate forecasts and pricing. Only then can they offer reliable, renewable energy that keeps the lights on whatever the circumstances. <https://www.powwr.com/>



SELLING YOUR POWER: THE EVOLUTION OF THE POWER PURCHASE AGREEMENT

Power Purchase Agreements (PPA) are not a new phenomenon, they have been used for many years to help organisations buy their power from renewable sources. However, as the prevalence of renewables has increased, the PPA market has had to evolve to meet demand, with new and innovative contract options that better reflect the UK's transition to low-carbon sources of energy.

Putting this into context, in the early 2010s, renewables accounted for around 7% of the UK's electricity generation mix while coal's share stood at around 40%. By 2022, renewables exceeded a third of the electricity generation mix and coal's share had been reduced to 1.5%.

This has led to the increased use of PPAs. In fact, in its latest 'Corporate Energy Market Outlook', published earlier this year, BloombergNEF revealed that 2023 marked the seventh year that the global corporate PPA market had reached a new high, largely as a result of a surge of activity across Europe, including the UK.

Many organisations have announced PPA deals with renewable generators, keen to reduce the risk from the energy market volatility we have seen in recent years, and hit their sustainability targets.

As a result, there is also a huge opportunity for independent energy generators - including those organisations with onsite assets such as solar photovoltaic (PV) and wind - to sell their power to corporate energy buyers through a PPA.

BEYOND FIXED OR FLEXIBLE

Over the past few years, we have seen PPAs evolve considerably, with increasing innovative structures and contracts beyond a simple 'fixed or flexible' choice.

For example, we now offer a wide range of PPA options for independent energy generators. These include our Flex Innovate PPA, which has all the benefits

Vish Sharma, Head of Power Purchase Agreements at npower Business Solutions



of a regular flexible PPA but with added features and flexibility, and the N2EX PPA, which enables a generator to trade its volume on the N2EX day-ahead auction. The Contracts for Difference (CfD) PPA is suitable for assets with a CfD greater than 5 MW as well as technologies which have been awarded the CfD, while our System Sell Price (SSP) PPA is an option for generation with sporadic output, or newly commissioned plant.

Which PPA is most suitable will depend on a number of factors, including the level of your annual output, the nature of your generation source, your risk appetite and ultimately, whether you want a steady and risk-free revenue stream, or wish to optimise profits with a flexible agreement.

All of the PPAs currently available have been developed to provide generators with multiple options so more of their energy can be procured by corporate energy buyers. The energy market is constantly changing, which naturally leads to more innovation in the way PPA contracts are developed.

THE BENEFITS OF SELLING YOUR POWER

There are a number of benefits to selling your excess power via a PPA:

- **Additional revenue** – This will depend on the type of PPA, for example a fixed PPA provides a straightforward income stream and is protected from volatile energy market fluctuation, while a flexible PPA gives you control over when and how much power you sell over the course of the contract
- **Investor confidence** – PPAs can cover an existing generation asset or provide assurance and confidence to investors in the financing of

new renewable projects. So, if your organisation is considering investing in a renewable energy asset, then getting a PPA in place could help secure investment

- **Supporting the energy transition** – with more and more businesses procuring their power from clean energy sources, independent generators have an important role to play in both meeting this demand, and contributing to the UK's overall net zero strategy.

SUPPORTING A SECURE AND SUSTAINABLE ENERGY TRANSITION

What the past two years have taught us, is that the UK needs to accelerate its progress towards a homegrown, clean and secure energy system.

Independent generators will play a vital role in this, and PPAs provide the best route to market for their power. Today, constant innovation means that there are several options beyond a simple choice between 'fixed' or 'flexible'.

That said, policy needs to support the development of more independent assets, either as primary businesses, or to enable the commercial and public sectors to install on-site generation to then be able to sell their excess power to other businesses.

From funding options to reducing planning red tape, there is more that can be done to unlock the power potential of independent generation over the next critical few years.

For more information, visit npowerbusinessolutions.com/corporate/generation

MINE WATER IN HEAT NETWORKS

Last month, the Minister for Energy Security and Net Zero visited a project in Gateshead that received almost £6 million of funding from the Heat Networks Investment Project (HNIP). The project is a great example of heat network versatility and the potential opportunities for harnessing renewable and low carbon heat for homes, businesses and other buildings across the country.

In Gateshead, a geothermal system extracts underground heat reserves from abandoned mineworking. A water source heat pump utilises water from old, flooded mines 150 metres below the town centre, harnessing its heat energy and sleeving this to homes and buildings in the area. The system then returns the water back to the mine to be reheated, ready for the process to repeat. The project has progressed rapidly since it began construction in June 2021, providing low carbon sustainable heating to 350 homes, public and private offices, a college and an arts centre. The network provides up to 50% of the heat required by those connected to the network, putting the council way ahead of the game in their ambition to be zero-carbon by 2030.

The innovative solution in Gateshead is just one example of where disused coalmines can be used in positive ways to help accelerate decarbonisation efforts, building on the legacy of the UK's first industrial revolution towards a new green age revolution. As the UK shuts down coal production in favour of renewable and nuclear energy generation, research by the Ordnance Survey has highlighted that just over 6 million homes, and over 300,000 offices and businesses live above abandoned coalmines¹. This demonstrates how a large proportion of buildings are living on top of an untapped renewable resource that can be harnessed to provide low carbon heating for generations to come. Over 60 local authorities have been identified by the Coal Authority and Ordnance Survey



that could benefit from the geothermal energy provided by old coalmines².

These projects are also creating new green jobs in low carbon industries, opening opportunities in many sectors from engineering and financial procurement to community engagement and local development. The Heat Networks Industry Council estimates that the expansion of the UK's heat network sector presents the largest investment opportunity in Europe, creating around 30,000 jobs across the UK³.

Another project funded by GHNF in the South West of England plans to harness deep geothermal heating from hot granite rocks beneath Cornwall. The project aims to provide cheaper, low carbon heat in the next few years to a new 3,800-unit development, along with the existing Royal Cornwall Hospital, decarbonising our vital NHS facilities. Another geothermal project just east of Cornwall is now close to completion, harnessing energy from beneath the famous Eden Project, transforming a former clay mine to a stunning, zero carbon garden and visitor attraction.

Geothermal heating is just one of the plethora of technologies available to help decarbonise the way we heat our buildings, and GHNF is continuing

² Project explores potential demand for mine water heat - GOV.UK (www.gov.uk)

³ About - Heat Networks Industry Council % (heatnic.uk)

to fund new innovative solutions that will help the UK reach Net Zero whilst providing cheaper, reliable, sustainable heating for occupants. In the most recent announcement, projects in the North of England were provided funding to harness waste heat created through industrial processes and waste management. One project in Bolton is set to extract heat energy through a combined sewer running through the town centre, and another in Hull East will utilise waste heat from a local industrial facility. The industry is continuing to innovate with new technologies being deployed to deliver efficient heating and hot water. Heat networks funded by GHNF are currently set to provide low cost, low carbon heating at scale to over 32,000 residents.

Heat networks have the potential to provide up to 20% of the UK's heating provision, and it is projects like the one in Gateshead that highlight the sustainable heat sources hidden across the UK that can help to reduce reliance on fossil fuels and increase the country's energy security. As energy bills increase, and focus on the climate becomes more crucial, the benefits unlocked by heat networks are needed more than ever.

Read more about some of the heat networks we're supporting here: Some of Our Funded Projects - GHNF. <https://tp-heatnetworks.org/funded-projects/>

POWERING THE AI REVOLUTION THROUGH ENERGY STORAGE

The Artificial Intelligence (AI) surge is driving demand for electrical power, with datacentres predicted to consume over 20% of global energy by 2025.

At a time when the climate crisis is intensifying, there is a critical need to power these datacentres sustainably and meet their electricity requirements with renewable energy. This pressure is exacerbated by the need to ensure energy security and limit the energy cost volatility that has challenged businesses and consumers in recent years.

At the core of the problem is the sheer power required by AI chips. The most popular AI chip, Nvidia's A100, requires ~400W of power for each instance. When this is replicated tens of thousands of times over in the datacentres of Google, Amazon, Microsoft and others, it adds up to AI becoming a formidable consumer of electrical power.

ADDRESSING ENERGY NEEDS

While AI power consumption might be seen as a challenge for a world trying to reduce carbon emissions, the reality is that it is a necessity for any developed economy to ensure global competitiveness.

However, as technology advances, so do power requirements. The top-performing Nvidia H100 AI chip consumes 700W of power which is equivalent to a standard microwave oven and thousands of these will be required in an AI datacentre. UK-based AI Supercloud company NexGen Cloud, for example, is planning to deploy 20,000 Nvidia H100s by summer of 2024, while Microsoft has committed to a £2.5 billion investment in the UK, with the ambition of doubling its AI datacentre capacity in the UK by 2026.

Alan Greenshields,
Director of Europe at ESS Inc.



IMPACT OF INCREASED AI DATACENTRE DEPLOYMENT

Increasing deployment of datacentres to meet rising demand has major implications for the environment, grid stability and energy sources.

The power used for the day-to-day running of data centres has meant they now contribute more to global carbon dioxide levels than the aviation industry underscoring the need to meet this demand with renewable energy.

Thankfully the adoption of renewable energy for AI is already taking place with major datacentre providers like Google Cloud committed to a carbon-free operations by 2030, while Digital Reality has a global renewable coverage of 62% across its data centres.

Others need to follow suit if an AI-driven climate crisis is to be avoided. It is crucial new datacentre power demands are met through the mass deployment of wind and solar energy.

ENERGY STORAGE PROVIDES CLEAN BASELOAD ENERGY

Solar and wind are low-cost and low-carbon, but their intermittency poses a challenge to AI datacentres that operate 24/7. A potential solution is energy storage, in particular long-duration energy storage (LDES).

New LDES technologies, like ESS' iron-flow batteries, become crucial in addressing the intermittency issue. These solutions can store up to 12 hours of renewable energy, meeting datacentre demands even when the sun is not shining and wind is not blowing.

However, adding renewables and energy storage to the grid at large is not straightforward. Despite national climate targets, the UK grid is facing delays of up to a 15-year wait to connect new clean energy projects to the grid.

DEVELOPING MODERN GRID INFRASTRUCTURE

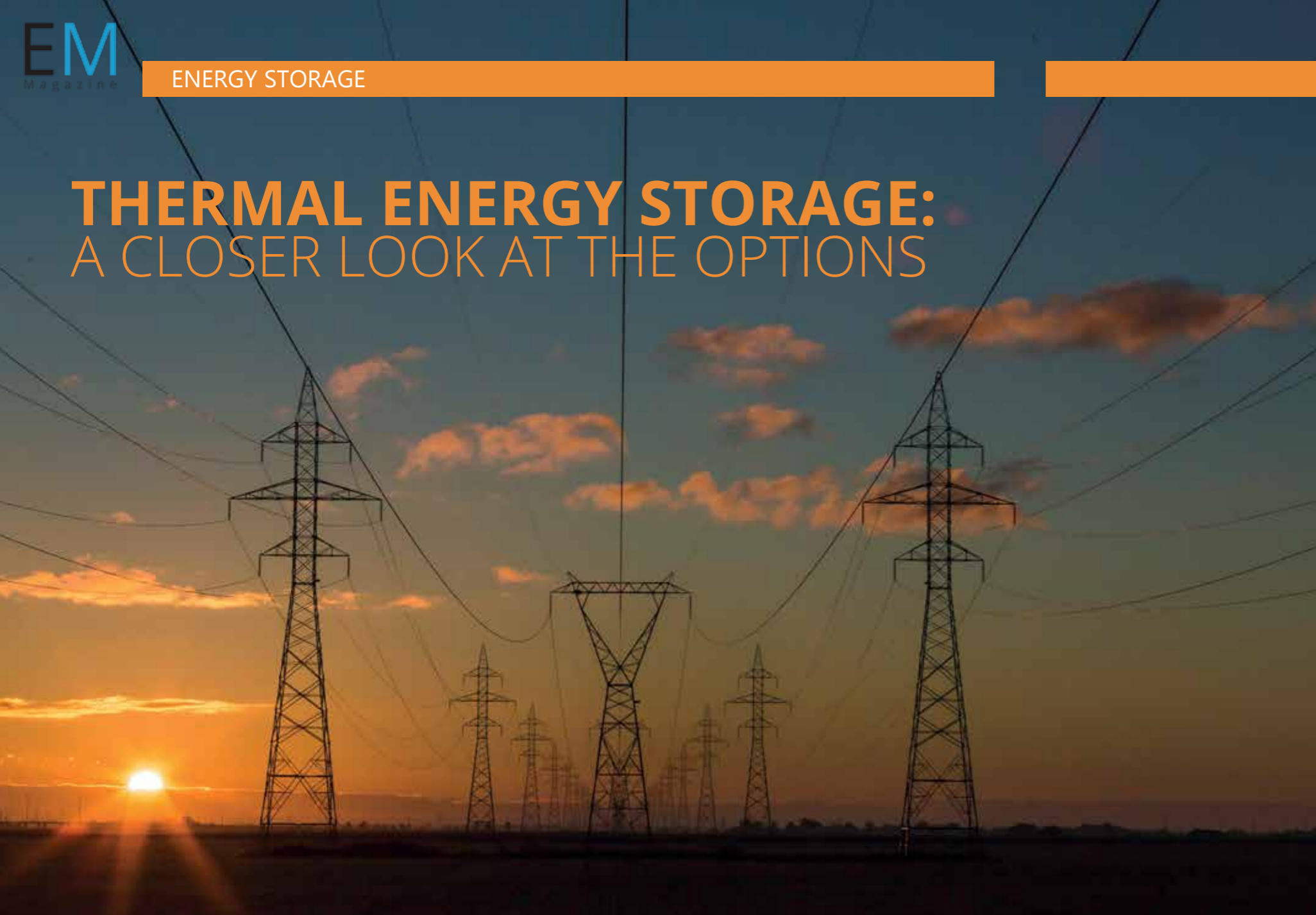
When powered by the grid, datacentre demand can affect local grid reliability in addition to broader climate impacts. Last year, the head of a Norwegian arms company blamed cat videos for their adverse effect on his organisation's production of munitions for Ukraine; a datacentre located near the munitions factory was consuming vast quantities of electricity from the grid, affecting their production.

New energy storage technologies afford an opportunity to drive the deployment of new architectures, such as microgrids, that can balance the unpredictability of renewables with the resilience and reliability needs of AI.

This is not theoretical. Today, a microgrid installed at a technology recycling company in the USA using an ESS Energy Warehouse has been integrated with a solar array. This system is helping not only reduce peak demand and provide 24/7 clean energy but is also mitigating the impacts of grid outages to ensure reliable, resilient operations.

New AI technologies, powered by new clean energy technologies, have the potential to deliver a climate-positive feedback loop as further datacentre demand is met by new clean technologies deployed at scale. This portends a future where datacentres' potential climate liability has become an asset delivering global benefits. <https://essinc.com/>

THERMAL ENERGY STORAGE: A CLOSER LOOK AT THE OPTIONS



The need for an increased reliance on renewable energy regularly surfaces as we try to combat climate change. The latest COP28 agreement spelt it out clearly, calling for a tripling of renewable energy capacity and doubling of energy efficiency improvements by 2030. It is a bold but necessary ambition to get anywhere close to achieving net zero goals in the timescale needed.

A subject that is often overlooked is how best to manage the unpredictability of renewable energy supply. And, when it is discussed, it often focuses on issues at a



high level, like grid distribution and national power supplies. However, it can take up to 15 years for expansions to electricity grid transmission and distribution networks to come into effect. With the need for immediate action to limit the impact of climate change, there is an urgent need to look beyond centralised power generation, and towards localised heat generation.

The peaks and troughs in supply from wind and solar resources, and the considerable increase in demand as heat is electrified means it makes sense to look at opportunities for new synergies between the power and heat sectors.

Thermal energy storage (TES) and other forms of long-duration energy storage (LDES) are two promising avenues to maximise the potential of an evolving situation.

The need to adopt methods of TES as we continue the journey towards a more sustainable future is clear. And, as technologies evolve to meet this demand, it is worth considering the

wider impact these options might have on our environment, beyond factors like capital costs, efficiency, and energy output. Here we look at two alternatives and consider some of these issues.

STORING ENERGY FOR HEAT: CONVENTIONAL BATTERIES

Today the most common forms of energy storage for heat are thermal storage via sensible and latent heat storage using phase-change materials (PCMs), and thermochemical storage. Electrochemical storage options are divided into two categories; capacitors and batteries. Whilst capacitors offer higher efficiencies and increased lifespan compared to batteries, they carry far less charge per unit per mass in comparison.

Batteries have also been the subject of much research on their use in energy storage systems, including integration with renewable technology systems.

Lithium Iron Phosphate batteries (LIPB) have been the subject of several studies evaluating their use, such as on wind farms to store energy for use when the wind isn't blowing. Their efficiency improves dramatically when more than one battery is used, allowing for complete charge and discharge cycles.

Other papers have focused on improving their efficiency, for example by controlling their operating temperature by using heat mats, or have looked at their impact on the environment through life cycle assessments (LCAs).

A NEW ALTERNATIVE: THE STEAMBATTERY

At Spirax Sarco, together with colleagues at Chromalox, we have developed an innovative form of TES: the SteamBattery. This stores heat generated by an immersed electrical heater as high-pressure hot water in a well-insulated vessel.



When steam is needed from the SteamBattery, it is taken from the ullage (gas) space of the vessel, and is either used directly as steam, or indirectly through means of a heat exchanger to connect with a "wet" heating system. The condensed steam is returned to the vessel. As the steam is used, the pressure lowers to the point where the SteamBattery is fully discharged.

It is recharged by the immersed electrical heater, which is able to use electricity from direct renewable sources or from the grid when low-cost renewable power is available. It can both discharge steam and be charged simultaneously, giving flexibility in how it is employed, and as buffer storage. Able to fully charge within 8 hours, it is able to do so overnight.

CONSIDERING THE WIDER ENVIRONMENTAL IMPACT

Using current literature on LIPBs alongside our model, and existing studies for the SteamBattery, we aimed to compare the environmental impact of these two energy storage solutions. There were some limitations, due to the boundaries set by the LIPB studies; notably a cradle-to-gate approach that doesn't consider either their transportation or disposal at end-of-life.

Once the system boundary was established, a range of comparative environmental impacts could be assessed. Due to differences in the models used between the LIPB study and that for the SteamBattery, we found 10 of the 18 in the LIPB study offered a direct comparison.

Greenhouse gases (GHG): These are the most relevant to climate change impact, and are measured in kg of carbon dioxide equivalence. The results shows that the SteamBattery would emit 8.58 kg/1000 kWh of energy stored throughout its lifetime, whereas the LIPB emitted 16.10/1000 kWh throughout its lifetime. Effectively, the SteamBattery has half the CO₂ emissions of the LIPB throughout its useful lifespan.

Effect on ecosystems: We examined six environmental impact categories,

including those that cover ecotoxicity and eutrophication in marine and freshwater environments, plus acidification and ecotoxicity in terrestrial ones. For both freshwater and marine environments, the SteamBattery was found to be 95% less impactful compared to the LIPB. This was largely accounted for by the cathode plate manufacturing process needed for the LIPB.

When looking at the terrestrial impacts, a different picture emerges. The SteamBattery's sulphur dioxide production was 83% less than the LIPB. However, its dichlorobenzene equivalent was higher than the LIPB. A closer examination, considering the impact loads of both products across the different environmental categories, concluded that this was an area for potential improvement rather than a serious flaw.

The assessment further highlighted SteamBattery's reduced impact on natural resources, such as fossil fuels and water. Notably, the highest environmental loads were predominantly associated with the LIPB, particularly in marine and freshwater ecotoxicity, whereas the SteamBattery's most significant impact was considerably lower in terrestrial ecotoxicity.

As the need for sustainable steam systems grows, there is a clear imperative to consider more than simply avoiding fossil fuels. The planet's resilience and future depend on a host of other factors, with environmental considerations high on the list.

This initial study shows a more holistic survey of potential options should always be considered before final decisions are made.

SOURCE:

Borbala Rebeka David, Sean Spencer, Jeremy Miller, Sulaiman Almahmoud, Hussam Jouhara: Comparative environmental life cycle assessment of conventional energy storage system and innovative thermal energy storage system ²⁰²¹ www.uk.spiraxsarco.com

DO AIR SOURCE HEAT PUMPS WORK IN COLD WEATHER?

VITAL ENERGI EXPERTS TELL ALL



Air source heat pumps are one of the most effective technologies for reducing carbon. They harness the natural heat energy present in the air to warm up a space. They work by extracting heat from the outside air and transferring it into a building. The pump uses a working fluid (refrigerant) to absorb heat from the outdoor air, which is then compressed to increase its temperature. This refrigerant is then circulated through a heat exchanger to distribute this heat into a building.

SO, IF THEY ABSORB HEAT FROM THE AIR, HOW ARE THEY AFFECTED WHEN IT'S COLD OUTSIDE?

You might think that if the temperature outside falls below zero, the heat pump will stop working, however even in cold air, there is still

sufficient heat for the heat pump to absorb and convert into useful energy.

We had a chat with Vital Energi's **Elliott Sharpe** (Strategy & Partnerships Director), **Dave Wilkinson** (Design Director), **Chris Green** (Engineering Director), and **Liam Grice** (Senior Engineer), who advised how you can maximise a heat pump's efficiency during cold weather, the best location for it, how you can prepare it for cold weather, and more.

How efficient is an air source heat pump in cold weather?

When we talk about efficiency of an air source heat pump (ASHP), we often consider how many units of heat we get from an ASHP for each unit of electricity used. Because it gets its energy from the surrounding air, we might get 3 units of heat for every 1 unit of electricity, so an efficiency of

300% in the summer months. As the outdoor temperature drops as we head towards winter, the efficiency of an ASHP does reduce. As this reduces, we could find a situation where the heat pump is producing 1 unit of heat for every 1 unit of electricity, which is 100% efficient, this might not sound all that bad, but heat pumps can deliver much higher efficiencies than this when deployed correctly.

How do you maximise efficiency during winter?

Generally, during cold weather, the heat pump is operating at its worst efficiency when most heat is required. Careful design of the heat pump and the system it is connected to is important to maximise the efficiency. Understanding that heat pumps may have a reduced capacity at low temperatures is important in correctly sizing the heat pump to

cope with this. If you buy a 300kW boiler, that boiler is 300kW all year round. That's not quite the case for an ASHP, which might provide 300kW in a +10°C ambient temperature, and only 150kW during the coldest of days. The efficiency of heat pumps increases as their supply temperature reduces, so its beneficial to design heat emitters to operate effectively at lower temperature e.g. underfloor heating can work on a 45C flow. Including buffer vessels or thermal storage can also provide flexibility which can lower the cost of heating from the heat pump. Optimisations of the heat pumps defrost cycle are essential for achieving the best winter performance and should be carefully considered.

Is there anything you can do to prepare your heat pump for cold spells?

Absolutely! The main objective should be to ensure that the heat pump is operating as it should. Proactive maintenance will assist with this, where the entire system should be inspected, refrigerant and oil levels checked, and any issues addressed. Consider scheduling maintenance before winter begins to ensure optimal performance.

In cold ambient temperatures, the heat pump will enter a defrost cycle more often. For optimum efficiency and performance, the air source collector should be unrestricted and free from debris. If you notice any excessive ice build-up on the air source collector it might suggest that the defrost cycle may not be functioning correctly.

Is there an optimum position or location where an ASHP will perform better during colder months?

ASHPs use fans to move ambient air over the collector. Any restrictions to the air flow will reduce performance. The air is cooled as it passes over the collector, so it is important to minimise air recirculation. Manufacturers guidance should be followed to make sure there is sufficient free space around the heat pump and consider any additions such as acoustic panels and their impact on air circulation. Computational Fluid Dynamics (CFD) modelling is a



ASHP being crane lifted to the roof of a Westminster City Council building

useful investment to make during the design process to make sure the air source collector position is optimised.

Are there specific refrigerants or technologies that can improve winter performance?

When choosing a heat pump, it's crucial to assess its suitability for various operating conditions over its lifespan. Understand your load profile to determine peak performance needs. If the ambient temperature drops below the design threshold, the system's heat output and efficiency will decrease. Consider these factors carefully to select the optimal heat pump technology and refrigerant that precisely meets your requirements.

How can defrost cycles be optimised to reduce energy consumption and output limitations?

Typically, when ambient temperatures are below 7°C, ASHPs will need to regularly complete a defrost cycle to remove frost which forms on the coil surface as moisture from the air freezes. The process requires energy to melt the frost, and generally the heating output is reduced during this time, so it is critical the process is completed quickly and efficiently. This can be optimised as part of the commissioning and O&M

activities, making sure all temperature probes are fitted correctly and the settings are correct so the defrost process is not more frequent and longer than needed. It is a balance though, because not defrosting correctly causes severe performance issues. If all the frost has not melted and drained away, this will refreeze and eventually create ice which blocks the coil. Manual intervention is often then needed to get the system running optimally again

Are there any energy conservation measures that can be implemented during the winter months which will help a heat pump run more efficiently?

There is a term often used which is 'fabric first'. What this means is, the first port of call for any project should be to try and reduce your energy demands first, before looking into any new technology. This fabric first approach could be improving the performance of your windows, to reduce how much heat you lose. It could mean adding more insulation to walls and ceilings. All of these measures will result in your site/building requiring less energy.

Visit www.vitalenergi.co.uk/heat-pumps/ to discover more about heat pumps.

WHAT WILL THE PROPOSED 23% REDUCTION IN ELECTRICITY COSTS REALLY MEAN?

As the UK moves towards a general election both the opposition party and current UK government are viewing energy costs as a weapon that can be used to attract electoral ballots. Both parties are reviewing their approach to truncating domestic and commercial energy costs.

The current opposition party has made public proposals to reduce electrical costs by 23% to moderate UK customer energy costs. Rinnai has produced modelling and a set of calculations that are based on an accommodation block and feature four separate appliances in a heating hot water delivery system as below -:

1. R290 Commercial heat pump System = 6x 50kW R290 HPs + 6x 800L HP Buffers.
2. R290 Commercial heat pump system + Electric storage water heater = 4x 95kW iMAX HPs + 2x 800L HP Buffers + 2x 800L E-cylinders electric water heaters e/w 60kW Immersions.
3. Heat Pump + gas fired continuous flow water heater System = 4x 95kW iMAX + 2x 800L HP Buffers + 4x N1600 continuous flow water heaters + 2x 800L cylinders.
4. Gas-fired continuous flow waters = 8x N1600 continuous flow water heaters + 2x 1000L cylinders.

Following is a set of calculations based on the proposed 23% reduction in electrical costs the opposition party suggested as future policy using the above systems and appliances.

This analysis was carried out to understand how the operating cost of each system differs when using forecasted electricity costs, which suggest a reduction of 23% in national grid consumed electricity, compared to the current government forecasted national grid figures.

Figure 1 represents the current governments costs when used in an accommodation block application. In Figure 1 please note that HP equates to Heat Pump and WH translates as Water Heater (system).

A Rinnai R290 heat pump will cost £105,192.60; a heat pump and electric cylinder will cost £165,664.60; a heat pump and

water heater system will cost £89,731.90 whilst a natural gas system will produce costs of £79,980.61. All costs are measured over a 5-year period.

Figure 2 is another graph that represents the costs related to Rinnai products considering the 23% reduction in electric costs the opposition party are forecasting. A Rinnai R290 heat pump will cost £80,998.30; a heat pump and electric cylinder will charge customers £127,561.74; a heat pump and water heater will cost UK customers £76,291.29, whilst a natural gas system will cost £79,980.61. Again, all costs are also based on 5-year period.

Under the current opposition party proposals to reduce electricity costs by 23% a clear beneficial increase is denoted in customer fiscal outlay over a 5-year period. In both graphs the costs relating to the natural gas system stay static and can therefore be overlooked.

Costs of operating a R290 heat pump over 5 years is presently £105,192.60 and under current opposition plans to reduce electrical costs by 23% will be £80,998.30.

A heat pump and electrical cylinder over 5 years presently costs UK customers £165,664.60. Under opposition plans to offer reductions in electrical costs the same product will cost £127,561.74.

Whilst a heat pump and water heater using the same metric as above currently costs £89,731.90. After reducing electrical costs by 23% the exact same product will require £76,291.29 over a 5-year period.

Clear reductions over a 5-year period are clear when observing heat pump and hybrid systems. Widespread electrification is a main objective by UK policy makers who aim to impose the cheapest electricity costs on UK households by 2035. Investing in a domestic or commercial application electric hybrid heating and hot water system could potentially result in huge reductions of operational costs.

One strong conclusion to be drawn from these figures is that all sites, consultants, contractors and end users should consider all factors before making a commitment to a system or appliances arrangement.

Contractors, consultants and installers who recognize the complexity of the current energy market should form partnerships with those organizations which have arranged their entire product offering to meet and exceed current and future energy policy.

To take advantage of Rinnai services for calculating capital expenditure, operational expenditure and carbon visit <https://www.rinnai-uk.co.uk/contact-us/carbon-cost-comparison-form> and fill in your project details. Alternatively contact us today on 0300 373 0660.



CAN COMMERCIAL HEAT PUMPS BE USED FOR COMMERCIAL DHW?

The term Domestic hot water requires some definition as it can be misleading. DHW (Domestic Hot Water) is considered as hot water

used solely for domestic properties and dwellings. This is not entirely accurate,

DHW is used for domestic purposes such as showers, sinks, bathing, and general ablutions. DHW heating means that hot water is used in both domestic and commercial DHW purposes.

Climate change is high on the international policy schedule with focus directed towards reducing CO2 emissions. The heating sector is seen as a significant area that requires the reduction of CO2 emissions. This is leading to many questions regarding new technologies and purposes for commercial DHW heating. Therefore, within this blog we address the frequently asked question: "Can Commercial Heat Pump technology be used for commercial DHW?"

COMMERCIAL DHW AND A BUILDING'S ENERGY

Quantities of energy a property requires for commercial heating can be decreased by best practice design principles. Guaranteeing the property is thermal efficient will lead to the building requiring less energy for commercial heating and commercial DHW. Although, DHW heating is not concerned by this idea as demand is likely to remain continuous.

Domestic and commercial premises that include DHW facilities are likely to be supplied by a gas-fired appliance, such as a Continuous Flow Water Heater or Gas Fired Storage Water Heater.

One of the problems faced with commercial DHW production is that it can be liable to naturally occurring bacteria proliferation. Bacteria can develop if the DHW is not produced or stored properly. The easiest method of counteracting bacterial growth is to decrease storage volumes or use appliances that achieve temperatures above 60 degrees Celsius.

Following the above methods will ensure that bacteria will not have time to grow or will be eliminated promptly by heightened temperatures. The latter is ideal for gas-fired appliances as they can achieve elevated temperatures quickly as system operation includes high temperature on call.

Until low carbon to zero carbon



gaseous fuels such as hydrogen and rDME become available gas appliances will continue to use fossil fuels as their source of energy. Commercial Heat pump technology can therefore play a key role in immediate domestic and commercial decarbonisation.

CAN COMMERCIAL HEAT PUMPS BE USED FOR COMMERCIAL DHW?

Commercial heat pump technology can be used for commercial DHW, whether they be commercial air source heat pumps or ground source heat pumps.

CONSIDERATIONS FOR HEAT PUMP PURCHASE

Temperature requirements – commercial Heat Pumps will require a tank to transfer and store heat. This will therefore require temperature management owing to the potential proliferation of bacteria in the water.

Legionella control – ACOP L8 as well as Building Regulations need stored water to be kept at 60 degrees Celsius. This temperature ensures the reduction of Legionella proliferation.

Hot water – Legionella bacteria would be killed off at 55 °C. There are also other measures we can take into fact with the system design to further reduce any Legionella bacterial growth.

Oversizing – Prevent oversizing on storage and make sure the water held within the system is used at least once or twice per day. For commercial Heat Pumps with a maximum limit of 55 °C we could look at including immersions within the cylinder. These immersions could be programmed to operate daily at 60 °C or above, thus killing the bacteria. This process would be classed as a pasteurisation cycle.

In conclusion, commercial heat pumps can supply commercial DHW. However, designers must be considerate of the design considerations and performance requirements to ensure optimum system is positioned.

For more information and schematics on domestic hot water heat pump design, download our brochure today!

Or visit the Rinnai commercial heat pump page: <https://www.rinnai-uk.co.uk/products/commercial-heat-pumps>

We recognise that air source heat pump design is not a straightforward task, so we aim to take the pain out of the process with our design support, capital expenditure, operational expenditure and carbon modelling.

For a free consultation with our heat pump experts contact us today on 0300 373 0660 or more information can be found on Rinnai's website and its "Help Me Choose" webpage. Visit www.rinnai-uk.co.uk or email engineer@rinnaiuk.com



Figure 1

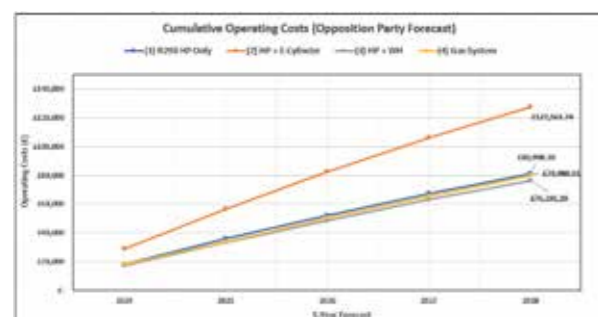


Figure 2

RINNAI HEAT PUMPS ON SITE AT STOCKPORT COLLEGE

Stockport College have recently completed a £25M campus redevelopment programme to ensure that all courses have the highest standards of facilities and resources.

The college also aims to be a sector leading employer so that staff thrive and deliver the highest quality of education and experience to all the students and stakeholders.

Rinnai hot water heating products have been used by Stockport College within their training facilities. The state-of-the-art commercial heat pumps, continuous flow water heaters and boilers will be used as training equipment for the next generations of plumbing and heating engineers.

This includes the Rinnai 11i light commercial/domestic range of tankless continuous flow water heaters plus the new i32 Inverter Monoblock LOW-GWP Heat Pump (4kW) and the 150 Litre Heat Pump Thermal Cylinder Single Coil.

Rinnai's range of Monobloc air source heat pumps are available in an assortment of variants, from 4 to 110kW. Stockport has taken the 4 kW models. The air source Low-GWP heat pump technology allows up to seven units to be cascaded together, making the Rinnai heat pump range an ideal choice for any heating or hot water demand. The innovative ability of the system to switch between heating, hot water, and cooling mode ensures that the Rinnai range has flexibility and durability as standard.



The units omit minimum acoustics via an installed ultra-low sound capability making Rinnai heat pumps suitable for any area with prohibitive sound legislation. Rinnai's range operates within compliance of all stringent sound standards ensuring low-sound functionality.

All Rinnai heat pumps use R32 or R290 refrigerant, renowned for reducing electricity consumption and for holding a lower global warming potential (GWP). Rinnai's HPI commercial heat pump range is ratified with an ERP rating of A+++ and includes an ability to switch between settings of heating, hot water and cooling.

Also on site at Stockport College's training facilities are the Zen and Zen Plus home hot water & heating systems which marry established and proven manufacture durability with new technologies to offer great energy efficiencies, user control and comfort. The Rinnai Zen and Zen Plus system will increase comfort and reduce energy usage whilst also providing a highly economically solution for today's changing marketplace.

Some of the features of Zen & Zen Plus are: IOT controller as standard; Fast heating mode; DHW pre-heat function - saving wasted water; Energy monitor function allows user to monitor energy usage; flue runs up to 30 meters, Rinnai boiler App for android and IOS.

The Rinnai heat pumps and cylinders and the 11i models, plus some of the Rinnai Zen domestic boilers, will be used in the training facility where students will learn about installation, stripping down, pipework, flues - the whole Nine Yards!

The 11i units are an advanced variant of traditional multipoint water heaters, and they are far more efficient than traditional storage systems. They are ideal for sites such as restaurants, fast food outlets, guest houses, small hotels, day care centres and any other

type of light commercial or domestic application requiring high volumes of water at intermittent times of the day, delivered at accurate temperatures to ensure user comfort and safety.

KEY FEATURES

- Hydrogen Ready - for 20% Hydrogen and methane blending
- Ultra Low-NOx surpassing ECO-DESIGN requirements
- Internal wall mounted.
- Room sealed.
- Temperature range of 37-65 degrees centigrade
- Ignition Direct Electronic
- Easy installation
- Light Weight - 14kg
- Push Fit Flue System
- Simple Wiring
- H (541) W (373) D(173)
- Inbuild Frost Protection
- Ideal replacement for traditional water heaters
- Ideal for temporary or emergency hot water
- Available as Natural Gas, LPG & BioLPG Water Heater

Rinnai's H1, 2 and 3 range of products includes domestic and commercial heating and hot water heating products and systems in all fuels and energy vectors that offer immediate property decarbonisation and lower carbon levels.

Rinnai is determined to provide UK customers with cost effective low carbon solutions towards domestic and commercial hot water and building heating provision.

For more information on the Rinnai range of training and CPD courses visit <https://www.rinnai-uk.co.uk/training/appliance-training-enrollment> and book on a course today.

INNOVATIVE UNIVERSITY PROJECT IS AMONG FIRST TO BE AWARDED FUNDING UNDER NEW SCOTTISH GOVERNMENT GRANT

The University of Edinburgh is among public sector bodies making progress towards net zero targets, thanks to a multi-million-pound government grant programme delivered by Salix, writes Heather Jones, Senior Programme Manager.



Scotland's Public Sector Heat Decarbonisation Fund aims to support local authorities, universities and arm's-length external organisations to decarbonise their buildings with a focus on heat.

The scheme, funded by the Scottish Government, was launched in July 2023, and opened to applications in November.

As well as the University of Edinburgh, other successful organisations to be awarded funding so far include Fife Council, Perth and Kinross Council, Scotland's Rural College (SRUC), North Lanarkshire Council, Dumfries and Galloway Council and Edinburgh Napier University.

These are ambitious projects all set on tackling the climate crisis we face. And our role at Salix is to support each project achieve its goal. As well as working with the Scottish Government we work with governments across the UK in driving the transition to a low carbon future.

The Scottish funding will help the organisations transition away from fossil fuel-based heating by supporting works that centre around the replacement of heating systems, accompanied with retrofitting energy efficiency measures.

Although these are the first projects to be awarded, a full list of successful applicants is expected to be released later this spring. These are being carefully assessed by our teams at Salix.

Our chief Executive Emma Clancy is determined to see a collaborative approach on the issue and is keen to see results. She said: "We are delighted to be able to work with these organisations to support their decarbonisation journey and ultimately helping them towards net zero ambitions.

"The broad range of projects showcases some incredibly innovative solutions to the decarbonisation of heat in buildings, and we look forward

to seeing the works come to fruition."

As part of its funding, the organisations will work closely with Salix to deliver the projects.

THE FUNDING AND PROJECTS TO DATE:

The University of Edinburgh has been awarded £2,079,459 with this project focusing on reducing the heat demand at four key university buildings across the university's estate, namely the James Clerk Maxwell Building and Christina Miller Building at their Kings Campus, and halls of residences Grant and Turner House in the city. As part of the project a heat recovery pump will recycle waste heat from one of the University's data centres and upgrade it for use within a local district heating network.

Fife Council has been awarded £2,404,911. Two sites will be upgraded with this funding: St Andrews RC High School and Beacon Leisure Centre. They will install combination of air-to-water heat pumps and water source heat pumps as the primary heat source as well as heat demand reductions at St Andrew's RC High School

Scotland's Rural College SRUC has been awarded £387,130 and this project will be SRUC's first step on their journey towards net zero. The works will include retrofitting insulation at Grade II listed Kirkmichael House

Perth and Kinross Council has been awarded £324,546. This project will focus on upgrading the existing heating supply for Auchtergaven Primary School, a small, rural school situated north of Perth in the village of Bankfoot, with just over 120 pupils on their roll.

North Lanarkshire Council has been awarded £2,345,176.00. This project will redevelop the existing Strathclyde Park Watersports Centre into a 'Net Zero Health Hub' at the heart of the country park. Works covered by the grant will include a

whole building retrofit, redesign and building extension to create additional space for recreational use.

Edinburgh Napier University has been awarded £1,241,966.00 and this project will focus on upgrades at the BE-ST innovation centre (Built Environment - Smarter Transformation, formerly Construction Scotland Innovation Centre). This work will include the removal of gas-based fossil fuel heating system as part of retrofit including mechanical ventilation and heat recovery, a sustainable innovative curtain wall system, a solar PV integrated roof system and a sustainable LED ready lighting control system.

Dumfries and Galloway Council has been awarded £2.5 million. The Dumfries Ice Bowl is a popular community venue and home to a dedicated ice hockey and skating rink, and a six-rink curling pad. It is a major sports hub from serving grassroots coaching to international curling and hockey tournaments, as well as figure skating. The project focuses on building upgrades through the replacement of the mains gas system with a low emission water source heat pump with heat recapture technology.

Climate crisis is the biggest issue of our time and organisations must push forward to address the key challenges we face.

Scotland's Public Sector Heat Decarbonisation Fund encourages innovation and action as organisations develop a united approach to tackling our impact on climate.

At Salix, we are looking forward to working with the successful projects in Scotland, working with the teams, the organisations and with the Scottish Government.

Afterall, we have no time to waste, every day we see the impact of global climate change. Every day we must act.

Read more about our work at Salix at <https://www.salixfinance.co.uk/>



HOW BUSINESSES CAN FUTURE-PROOF THEIR SOLAR GENERATION ASSETS



The world's commitment to reducing CO₂ emissions to fight climate change has fuelled a surge in renewable energy, particularly wind and solar power. Corporate investment in energy generation assets has accelerated rapidly in recent years, and it's expected to increase at pace, driven not just by environmental concerns but also by the strategic and economic benefits renewable power offers businesses.

The movement towards onsite power generation has the capacity to reshape how companies think about and manage their energy needs, but as more businesses follow suit, how can renewable energy generation remain profitable and market resilient?

USING AVAILABLE RENEWABLE RESOURCES

Commercial and industrial organisations can benefit from onsite generation in a number of ways. After the initial investment has been paid, renewable energy generation assets have extremely low costs for producing electricity. Unlike fossil fuels such as gas or coal, there are no additional charges to source sunshine or wind. Once installed, the energy system can generate electricity at almost no expense, meaning that even at very low electricity prices, it is still profitable to generate renewable electricity onsite.

As well as a reduction in bills, businesses can benefit further by lowering their carbon emissions to support sustainability goals. They can increase their energy security by reducing their reliance on the grid for power, and any surplus electricity produced can be sold through a PPA, providing an extra source of revenue.

Stephan Marty, CEO, Wattstor

TOO MUCH OF A GOOD THING?

Considering all the benefits renewable energy can provide, it's no surprise that 25% of businesses in the UK are investing in onsite power generation. However, as more companies join in and bring projects online, businesses need to consider any potential barriers that may arise when implementing an energy system.

At grid level, one potential challenge with renewable electricity generation is that it can't be stored without the use of battery storage. Without it, the amount of electricity being generated and used needs to be balanced on a second-by-second basis. Businesses often have a PPA agreement to export any excess power into the market or to local businesses to support demand.

However, with an increased number of independent power generators exporting surplus power, the volatility of electricity prices has also increased over the past few years. We're already seeing increased periods in Europe where the wholesale price of electricity is either zero or negative.

This is a phenomenon known as "solar price cannibalisation".

Typically, solar price cannibalisation occurs during periods of high sunshine and wind, when renewable energy sources are abundant, or at times of low electricity demand such as on a Sunday or during the summer holidays.

If electricity prices are zero or negative, any electricity that is exported to the market and not locked into long-term PPAs has no value. In the future, this could mean securing a premium PPA could prove more difficult for generators.

Solar price cannibalisation could also make businesses less motivated to invest in onsite generation. If periods of zero electricity prices become more common, organisations may prioritise purchasing cheap or even free grid power at certain times, rather than focusing their investment on their renewable generation assets.



INVESTING IN BATTERY STORAGE

Thankfully, there are relatively simple ways to avoid the negative consequences of solar price cannibalisation. One way to future-proof renewable energy build outs and maximise return on investment is to add battery energy storage. Adding battery storage means that the energy generated onsite can be stored and used at a later time to power operations, heat or cool business premises, charge EVs and more – rather than be sold to the market for little or no money.

Battery storage also allows businesses to store electricity for later use when simultaneous consumption and generation are not possible, such as during nighttime operations when there is no sunshine or on a sunny weekend when offices are closed. This reduces businesses' need to rely on the grid for surplus electricity during periods of no energy generation. Additionally, battery storage allows for delayed exporting onto the grid to support peak demand.

Investing in renewable energy is essential to achieve zero emissions, and is the best way for businesses to mitigate the cost volatility of fossil fuels. However, when looking at the long-term return of a project, the cannibalisation effect should be considered. When investing in renewable energy, it is vital to consider battery storage as part of a whole system solution.

Although the upfront costs may be a concern, Wattstor's fully funded energy systems enable sites to create significant savings, make money from electricity markets, boost their ESG credentials, and stabilise their electricity prices, all without risk.

Find out more about implementing renewable energy projects at <https://wattstor.com/renewable-onsite-energy-guide/>

NAVIGATING SUPPLY CHAIN CHALLENGES IN THE RENEWABLE ENERGY SECTOR

Marc Haley, co-founder and director of The E-Merge Group, discusses the deployment of renewables and how to overcome issues within the supply chain.



The primary challenge being faced by the industry, and leaders within it, revolves around ensuring a smooth supply chain to deploy tech, plus a timely connection to the grid to power up sources.

As businesses still face significant delays in the connection of renewable technology to the grid, companies are pressing the government to reassess planning regulations that will ultimately streamline grid processes. These delays, sometimes lasting up to 12 weeks, are often attributed to complications in grid connection and can be a deterrent to any businesses considering renewable solutions.

Additionally, the sector faces ongoing hurdles related to planning and regulation, despite overarching political support. Complex procedures such as environmental assessments and public consultations frequently lead to project delays and increased costs - further emphasising the need for streamlined approaches.

Marc comments: "I have seen first hand renewable firms struggling to be successful as they battle the connection times to the grid. Deploying this technology isn't easy and many firms have paid the ultimate price due to the delays – being forced to cease trading."

OVERCOMING THE CHALLENGE

As the sector navigates these challenges, businesses are dependent on deploying EV and renewables solutions through contractors and subcontractors. Additionally, staying well-informed and cultivating strong relationships with relevant authorities and clients can also improve delivery.

Proactive communication, obtaining permits and engaging with the community to streamline the approval process better enhances the chance of the project moving forward. The E-Merge Group also capitalises on incentives and subsidies for EV infrastructure to alleviate

installation costs for clients, while also educating wider teams on how they can leverage funding opportunities for more efficient project implementation.

REFLECTING ON THE WIDER SECTOR

Recent findings revealed that Britain now boasts nearly 60,000 public EV charging points, marking a significant 47 percent increase year on year. However despite this progress, there remains a pressing need for further action. Comparisons to the number of EVs on the road highlight a noticeable misalignment, indicating the necessity for a more robust infrastructure to support the growing demand for electric vehicles. Addressing this issue requires a concerted effort to accelerate the connection of wider technologies to the grid, ensuring seamless integration and accessibility.

Deploying EVs through subcontractors offers a promising solution to cover a wider geographical remit, enabling greater reach and impact. Collaborating with the local authorities and stakeholders is crucial to prioritise a healthy supply chain, supported by dedicated funding aimed at achieving net zero targets. By working together, the industry and policymakers can pave the way for a sustainable energy future.

Despite the constraints, The E-Merge Group has demonstrated resilience by successfully installing more than 50 charge points and 100 connectors to meet the evolving needs of the market. The company deployed more than 2MWs of renewable energy and 1MWs of EV charging infrastructure in just 12 months, showcasing its commitment to sustainable energy solutions. The E-Merge Group benefits from a network of subcontractors, allowing for increased flexibility and efficiency.

To find out more about The E-Merge Group, please visit: emerge-renewables.com

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WHAT'S HAPPENING IN THE REGO MARKET?

REGOs have gone through a period of intense change. Prices have surged exponentially in recent years, as the graph below shows. Demand has grown and supply has dropped, and intermediaries have entered the market. But what's caused this degree of flux – and can we expect stability any time soon?

WHAT ARE REGOS?

Renewable Energy Guarantee of Origin certificates (REGOs) are the UK's currency of renewable energy certificates (RECs). They're transferable statements that represent proof that a generator produced 1MWh of electricity from a particular renewable power source and fed it into the National Grid.

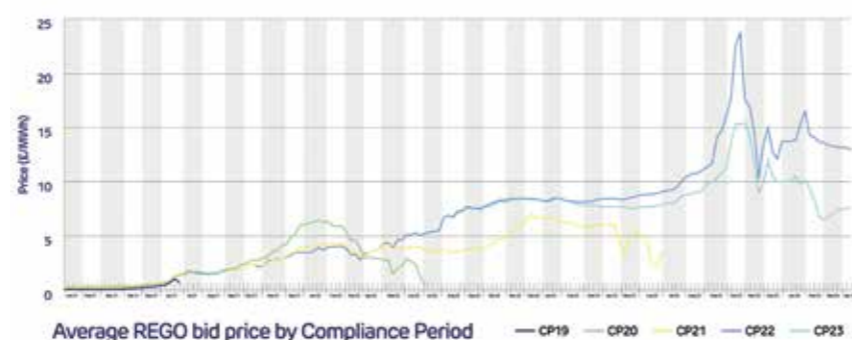
When an energy supplier buys a MWh of renewable electricity from a generator, it can choose to buy the accompanying REGO, too. It passes this to (or registers it in the name of) its customer – the end consumer – as proof of renewable power purchase and consumption.

REGOs – and RECs in general – enable organisations to prove their low (or non-existent) Scope 2 emissions. They also facilitate the accurate calculation of a carbon footprint, as a baseline against which to track decarbonisation efforts.

WHAT DROVE THE PRICE SURGE?

Supply and demand changes have seen the price of REGOs rocket by a factor of over 100x in the last four years.

The pressure on organisations to decarbonise and promote their environmental, social and governance (ESG) and corporate social responsibility (CSR) progress has grown, so demand for REGOs has increased. This pressure's come from both end-customer requirements and supply chain stipulations – many corporates will only work with suppliers



with proven sustainability credentials.

Additionally, supply levels have dwindled. Following Brexit, European RECs (Guarantee of Origin certificates – or GoOs) became an invalid way of verifying renewable supply in the UK. That cut off a huge chunk of availability. But suppliers offering 100% renewable electricity contracts still need to prove the source of the corresponding energy. And organisations with sustainability pledges still need to prove the source of the energy they consume.

The REGO market's developed, too, as additional players have entered. The added profit cut that intermediaries have introduced has affected prices. But these buyers-and-sellers have brought transparency to the market, meaning end users are more likely to get what they pay for.

WHAT'S HAPPENING NOW?

Over the last 12 months, the market's seen some degree of price balancing. The price surge has slowed – but of course REGOs still cost multiple times what they did only a few years ago.

So certain organisations may start diversifying their REGO investment across generation technology types – and, accordingly, price points. Others may look to spread their sustainability efforts across additional decarbonisation methods. These

might include, for example, the purchase and installation of solar panels or wind turbines, or the set up of 'direct wire' agreements with renewable generators.

WHAT NEXT FOR REGOS?

Although prices are still high and other sustainability measures are available, REGOs will continue to play a key role in organisations' decarbonisation efforts. The need to promote and prove sustainability credentials is only going to increase. And the alternative – paying for fossil-fuel power – is already difficult to justify for businesses making any kind of sustainability claims.

REGOs will continue to offer an accessible way for organisations of all sizes and buying powers to reduce reportable emissions. Experts are also predicting stabilisation and correction of REGO prices over the coming years. This is thanks in part to increased supply from the introduction of new, large-scale renewable-asset farms, such as Dogger Bank off England's north-east coast.

The scrutiny of organisations' claims about their sourcing of renewable energy is likely to increase, too. This will see the growth of the 24/7 matching market – REGOs assignable to each half-hour chunk of energy consumption – to enable more granular proof. www.drax.com

HOW "DROP-IN" RENEWABLE LIQUID FUELS COULD TRANSFORM OFF-GRID HEATING AND DHW FOR BUILDING SERVICES AND CONSULTANTS

As fossil fuel consumption is gradually diminishing from global energy options, the UK will have to locate and utilise alternative energies, some of which will be entirely unfamiliar to British customers. One of these future and somewhat unfamiliar fuel sources will be Renewable & Recycled Carbon Dimethyl Ether (DME).

DME is a sustainable fuel that can be produced through a wide range of renewable feedstocks such as waste which allows for quick and long-term sustainable production. DME is chemically similar to LPG and can be blended, 'dropped in', to existing supply LPG chains, without the need to modify equipment which is a major plus for existing systems and appliances. DME can also be used on its own, as a 100% pure fuel, particularly for industrial or commercial users.

DME combusts cleanly and releases no "soot" emissions and contains many fuel properties that make it easily used in sites and appliances using diesel. It possesses a very high cetane number which is a measure of the fuel's ignitability in compression ignition engines.

DME is safe and reduces greenhouse gas emissions by up to 85% thus better improving local air quality when compared to traditional fuels. NOx, SOx and PM readings are all heavily reduced through the implementation of DME. Future capacity of European DME production is set to rise sharply in an approaching time frame further increasing the likelihood of it being introduced nationally at some stage soon.

Netherlands-based renewable and recycled carbon DME producer Dimeta is a collaborative effort by two of the world's leading LPG (Liquefied Petroleum Gas) distributors, SHV Energy and UGI International. Dimeta is at the forefront of contributing to a more sustainable future and increasing access to affordable low-carbon energy by spearheading the production and use of Renewable and Recycled Carbon DME commercially to decarbonize the LPG industry in the UK, Europe and United States.

Dimeta and Rinnai aim to raise customer understanding of both

Rinnai's Chris Goggin looks ahead to the advent of renewable liquid fuels in the mass markets.



renewable and recycled carbon DME whilst promoting their usage for on off-grid properties. Dimeta is contributing towards the standardization of DME boilers and DME water heaters by assisting in defining UK manufacturing values. Centralized industry standards are to be cleared by regulators later this year. By 2024 boilers that accept renewable and recycled carbon DME could be ready to purchase.

Rinnai and Dimeta have signed a MOU (Memorandum of Understanding). Both companies will work together to explore blending DME with LPG and used in existing appliances. Dimeta and Rinnai will also aim to develop 100% DME dedicated appliances, including RDME water heaters, RDME boilers and Hybrid RDME heating systems.

The collaboration between Dimeta and Rinnai will initially focus on the European market to further their knowledge and highlight the importance of collaboration across the whole value chain.

Rinnai is committed to design and produce RDME low carbon heating to properties not connected to the UK national grid. Rinnai offer technical, economic and practical solutions for UK customers who seek decarbonising DHW and property heat and support



installers by sharing this information.

Renewable and recycled carbon DME, DME, BioLPG and LPG provide vital suppliers of energy to off-grid properties. Rinnai and Dimeta understand that replacement fuels that must not only perform at an identical standard to traditional off-grid fuels but must also ensure decarbonisation. Rinnai are working towards providing UK off-grid customers with a selection of energies and products that encourage carbon neutrality.

Rinnai's H3 range of products include domestic and commercial gas-fired water heaters, solar thermal systems, electric cylinders and low-gwp heat pumps which offer immediate property decarbonisation.

Sign up to the Rinnai Pathways newsletter for regular information and support regarding the changing face of energy and policy in our industry www.rinnai-uk.co.uk/contact-us/newsletter-sign

BS ISO 14068-1:2023

WHAT IS BS ISO 14068-1:2023 - CARBON NEUTRALITY ABOUT?

Greenwashing, obfuscations of scope and unsubstantiated emissions statements are not helping organizations to achieve and evidence climate or carbon neutrality. For a more credible alternative, BS ISO 14068-1:2023 is a new international standard setting out strong principles and detailed and verifiable requirements on quantification and reduction or removal of GHG emissions. Users gain clear, best practice guidance that will allow them to make verifiable claims of carbon or climate neutrality.

There will be a period of 24 months from the date of publication of ISO 14068-1:2023 before the PAS 2060:2014 document will be withdrawn. This is to allow users to address changes that may be needed to meet the revised requirements detailed in the new BS ISO 14068-1:2023 standard.

WHO IS IT FOR?

BS ISO 14068-1:2023 can be used by any organization, in the private or public sectors, that wishes to make either the organization or a product climate neutral. Organizations can be of any size, but exclude territories such as cities. Products may be consumer-facing or business to business, and include all types of goods and services, including events and financial services.

WHAT DOES IT COVER?

BS ISO 14068-1:2023 specifies principles, requirements and guidance for achieving and demonstrating carbon neutrality through the quantification, reduction, removal and offsetting of greenhouse gas (GHG) emissions. BS ISO 14068-1:2023 establishes a hierarchy for carbon neutrality where GHG emission reductions (direct and indirect) and increased GHG removals enhancements take precedence over offsetting. The hierarchy is then used to determine a pathway to carbon neutrality, including short and long-term targets for minimizing the carbon footprint.

WHY SHOULD YOU USE IT?

- **Climate action.** BS ISO 14068-1:2023 gives organizations a structured process for developing a detailed carbon neutrality management plan with short- and long-term targets. It gives organizations



an effective tool with which to combat the climate emergency.

- **Quality.** In contrast to unsubstantiated claims of neutrality, claims under BS ISO 14068-1:2023 have to be based on all GHGs, take a lifecycle approach and can only be made after the development of long-term planning, with real GHG reductions in place, and offsetting restricted to residual emissions using high quality carbon credits. Adopters can be confident that claims made using BS ISO 14068-1 are meaningful.
- **Credibility.** Use of this internationally recognized standard can likewise confer market benefits by increasing the credibility and verifiability of a product or organizational claim of carbon neutrality. Stakeholders can have increased confidence that claims are transparent and reliable, increasing their loyalty to organizations that adopt BS ISO 14068-1:2023.
- **Global recognition.** BS ISO 14068-1:2023 provides a common set of criteria for measuring and reporting carbon neutrality. This ensures consistency across different organizations and industries, underpins easier comparisons for carbon neutrality efforts between entities, allows stakeholders to assess and benchmark efforts, and supports global recognition for claims of carbon neutrality.
- **Convenience.** BS ISO 14068-1:2023 is designed to work with either ISO's own quantification standards or other equivalent protocols.
- **Flexibility.** BS ISO 14068-1:2023 can be used by any sized organization,



Photos courtesy of BSI

in any country or sector. It can also be applied to whole organizations or individual products.

- **Responsibility.** The standard encourages organizations to take responsibility for minimizing their own carbon footprint before paying third parties to offset their emissions.
- **Cost effective.** The standard's hierarchy determines a pathway to carbon neutrality that prioritizes emissions reductions. These are often the most cost-effective way of reducing a carbon footprint, avoiding the need for potentially costly carbon credits.
- **Risk mitigation.** Adopters of BS ISO 14068-1:2023 will be in a strong position to manage current and emerging regulatory and market risks in relation to GHG emissions.
- **Competitiveness.** A demonstrable commitment to climate action can also mitigate reputational risks and enhance brand value, market access and competitiveness.

To learn more about how BS ISO 14068-1 can benefit your organization, download the free Executive Briefing: <https://pages.bsigroup.com/1/35972/2023-12-15/3t76qp6> www.bsigroup.com

THE MOST IMPORTANT THINGS HAPPENING IN ESOS RIGHT NOW

The Energy Saving Opportunity Scheme is a UK government scheme that aims to encourage large UK businesses to implement energy saving measures and support the government in reducing the country's carbon emissions and help work towards achieving net zero by 2050.

Currently, the UK is in Phase 3 of the ESOS scheme, with organisations that must comply with the scheme being required to submit their reporting by 5 June 2024.

Over recent months, there have been several changes to the scheme that may impact the way businesses make their submissions and what they will need to include to ensure their compliance.

In this blog, TEAM Energy's Lead ESOS Assessor and Senior Energy Consultant, Sam Arje, will explore five of the most important things that are happening in ESOS right now.

The Environment Agency announced that they will not take action if organisations do not submit their notification of compliance by the 5 June 2024. However, organisations that comply with ESOS must register their account with the new IT system by 5 June 2024, and submit their notification of compliance by 6 August 2024. Giving businesses more time to comply with ESOS Phase 3.

Organisations will be required to submit a yearly ESOS Energy Action Plan following their ESOS submission, providing annual progress reports on how they are implementing their energy saving opportunities and commitments.

The Energy Action Plan will be recorded by the Environment Agency and published publicly. If an organisation does not make any energy saving changes to their business or if they do not complete the Action Plan, this will also be published publicly. Public Disclosure could have several implications for businesses, including reputational impact, competitive sensitivity and risking penalties for failing to comply with ESOS.

Organisations that have ISO 50001 will also be impacted by changes. Previously organisations that are certified under ISO 50001 were exempt from ESOS reporting. However, changes to the scheme now require these organisations to submit detailed reporting, including data on energy saving achieved by the organisation since the previous compliance period.

Despite the ESOS Phase 3 deadline extension, Phase 4 of the ESOS scheme is still due on 5 December 2027, with the 4 year compliance date between 6 December 2023 – 5 December 2027. Phase 4 is also expected to see changes as it will focus on both energy efficiency within organisations



and will require more details on how they plan to become net zero.

Discover more about these changes and how they will impact your organisation when complying with the ESOS scheme.

If your organisation needs to comply with ESOS, TEAM's expert ESOS Lead Assessors are knowledgeable and up to date with ESOS compliance legislation and what will be required from organisations. www.teamenergy.com



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The renewable energy sector is booming, and the demand for trained personnel is on the rise. As more and more countries advance their efforts to reduce their carbon emissions, the renewable energy industry is set to play a pivotal role in meeting this challenge. This has led to a surge in job opportunities in the sector, and there is an urgent need for skilled personnel to meet the demands of this rapidly expanding industry.

The REI's accredited Master in Renewable Energy Award has been designed to educate individuals with an in-depth overview of the sector as a whole and to expand their knowledge in specific technologies which are of most interest to them and their career development.

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<https://www.renewableinstitute.org/testimonials/>

For more information or to secure your place now, please contact the REI on +44 131 446 9479 or email us at training@renewableinstitute.org



The Renewable Energy Institute

BUSINESSES WITH POTENTIAL FOR SIGNIFICANT SAVINGS BY SWITCHING WATER SUPPLIERS

In 2017, the water market in England was deregulated to encourage competition and improve customer service. This means businesses, charities, and public sector organisations could select their water suppliers for the first time, opening the door to potential savings of 10% per year. However, many businesses have yet to capitalise on this opportunity.

In light of this, a new study by business utilities comparison site ClearSight Energy has spotlighted the business sectors that could benefit most from switching water suppliers, with private hospitals and restaurants among those set to save the most.

The analysis estimated water usage for different business types in England, comparing it to national suppliers' rates. Although it can vary depending on where a business is based, assessing the number of establishments highlighted potential annual savings for businesses and sectors through supplier selection.

Private hospitals rank first for potential savings from changing water suppliers, with each hospital having an average potential savings of £8,572. This is the equivalent of £1.86 million when multiplied across the estimated 218 private hospitals in the UK. Each year, private hospitals across the UK use around 46,977 cubic metres of water each. That's the same amount of water it takes to wash 657,678 loads of washing.

Poultry farms come in second, with potential yearly savings of £5,394 per farm. This is the equivalent of £12.6 million when multiplied across the 2,337 poultry farms in the UK. Each year, farmers use an estimated 29,560,876 litres of water to rear one billion broilers (chickens raised for meat), around the same as 325,170 bathtubs filled with water.

Restaurants take the third position, with each establishment having potential savings

of £2,647 per year. When multiplied across the estimated 42,477 full-service restaurants in the UK, it equates to combined savings of around £112 million. Each year, restaurants across the UK use approximately 14,508 cubic litres of water each, equivalent to about 61,325 cups of coffee.

Dairy farms place fourth, with each farm potentially saving £1,638 yearly. An estimated 7,850 dairy producers across the UK could share a combined savings of £12.7 million annually. On top of this, it was revealed that the price difference between the lowest-priced and most expensive water suppliers is £24,851 a year.

Schools round off the top five with potential savings of £974 each year. When multiplied across the 24,442 schools in England, it equates to more than £23.8 million combined savings. That amount of money could cover 8.8 million school meals. This is equivalent to providing 125 schools with lunches for their pupils for an entire academic year.

Placing sixth are beauty salons, with each of the estimated 48,425 hair and beauty salons operating across the UK potentially saving up to £274 per year. This equates to a combined savings of £13.2 million nationally on the 1,502 cubic metres of water used daily in each location.

Cinemas rank seventh, with each establishment having a potential savings of £133 per year. It was also estimated that the 846 cinemas across the UK could save a combined £112,480 with a simple



switch. One of the most significant expenses to a cinema's water bill is the estimated 4.8 litres from moviegoers flushing toilets, which is responsible for around 63% of customer water usage.

Office buildings have the eighth highest potential water savings at £88 per building per year. The amount of water used in the 4,308 office buildings across the UK each year is the equivalent

of 39 million office water coolers, and when combined, they could save a combined £377,927 on their business water bills.

Barber shops round off the ninth place. By switching suppliers, the average barber shop could save around £56 each year on their water bills. It's estimated that all the barber shops across the UK could save a combined £1 million on their water bills each year. Each of the estimated 19,000 barber shops uses around 306 cubic metres of water each year. That's the equivalent volume of half a million pints of beer.

The analysis uncovers substantial potential savings for businesses willing to switch water suppliers. From cinemas to dairy farms, sectors across England stand to benefit financially, with savings reaching into the tens of millions for some. Although savings can vary dramatically depending on where a business is based, this insight significantly underscores the importance of exploring alternative suppliers to operational costs.

Speaking on the findings, a spokesperson from ClearSight Energy said: "This study highlights a significant opportunity for businesses across England to reassess their water supply choices, potentially unlocking substantial savings with sectors like cinemas and private hospitals poised to benefit the most.

"Many people might not realise that schools have to pay their own bills. They receive core funding from the government to aid essential running costs, including salaries for teachers and staff. However, the schools are still responsible for budgeting, and even though savings can change depending on where a school is based in the country, these potential savings could still provide equipment or educational trips." <https://www.clearsightenergy.com/>

Annual Water Savings for Businesses by Switching Suppliers

Rank	Business	Avg. Yearly Water Usage (m³)	Highest Yearly Supplier Cost (UK)	Price Difference: Highest vs. Lowest Supplier	Potential Savings Per Location (10%)	Sector Savings Potential (10%)
1.	Private Hospitals	46,977	£159,327	£130,051	£8,572	£1,868,774
2.	Poultry Farms	29,561	£100,259	£81,836	£5,394	£12,606,405
3.	Restaurants	14,508	£49,204	£40,163	£2,647	£112,451,280
4.	Dairy Farms	8,976	£30,445	£24,851	£1,638	£12,858,300
5.	Schools	5,340	£18,112	£14,784	£974	£23,817,860
6.	Beauty Salons	1,502	£5,096	£4,159	£274	£13,276,363
7.	Cinemas	729	£2,471	£2,017	£133	£112,480
8.	Office Building	481	£1,631	£1,331	£88	£377,927
9.	Barber Shops	306	£1,038	£847	£56	£1,061,114

DESPITE THE RAIN, POTENTIAL UK WATER SHORTAGES STILL LOOM

The last 18 months leading up to March 2024 saw a record amount of rainfall across England, with Press Association analysis of Met Office statistics showing that 1,695.9mm of rain has fallen since October 2022.

This, the Guardian reports, is the highest level for any 18-month period in the country since comparable data first started to be collected back in 1836.

March itself saw 62 per cent more rainfall than average, with many counties seeing at least double the amount of rain than would be considered typical, including Dorset, Hampshire, Wiltshire, Cornwall and Gloucestershire.

Given all this wet weather, it might seem a bit of a stretch to suggest that water shortages and hosepipe bans could well be the reality come the summertime if conditions turn hot and dry - but this is exactly what scientists are now predicting because of a failure to store all this rainwater properly.

For example, no new major reservoirs have been built in the last 30 years or so, wetlands have either been drained, farmed or built over and rivers have been engineered so that water flows more quickly into towns and cities, which leads to flooding. Water shortages are the inevitable consequence of this resource mismanagement when the weather warms up.

These shortages mean that public supply will take priority over other uses, such as industry and agriculture, which will face abstraction restrictions that could mean operations have to come to a halt for some time. Bans will also likely be imposed on filling up ponds and swimming pools, as well as cleaning municipal buildings, washing cars and watering gardens.

Speaking to the Guardian, professor Hannah Cloke - water specialist at the University of Reading - observed that while it's always beneficial to see high water supply levels as spring and summer approach, different regions may still see supplies dwindle if an extended dry spell manifests.

"Unfortunately, these all or nothing periods of rainfall we are experiencing in the UK are likely to increase as heat continues to build up in the atmosphere and oceans. We need to realise that our water infrastructure is creaking and

requires billions of pounds of investment," she said.

The expert continued, noting that as population growth continues to expand, water supplies are being put increasingly at risk. Rainfall patterns are also changing because of climate change and there has been insufficient investment in the changes required to "plug the gaps".

"We have already seen in some areas what happens when high demand for water follows prolonged periods of drought: the pipes can run dry," Ms Cloke warned.

Jamie Hannaford, hydrologist with the UK Centre for Ecology & Hydrology, made further comments, saying that despite the incredibly wet winter, if below-average rainfall is seen over the next few months or so, coupled with high temperatures, pressure could be put on water supplies in places with limited groundwater storage.

Regions such as upland northern and western parts of the country rely on reservoirs and rivers for water, but these sources can be rapidly depleted if spring brings with it warm, dry weather - even after a particularly wet winter, he added.

WHY COULD WATER SHORTAGES STILL BE SEEN?

There are various factors at play that could see water shortages become a reality, despite heavy rainfall over the last year and a half.

Climate change, for example, means that the UK can no longer solely rely on its annual rainfall levels to replenish natural water sources.

Previously, it seemed unnecessary to make investments in water storage facilities because there was so much rain to play around with, but as Mr Hannaford explains, water shortages are now becoming more frequent occurrences after flood events.

He cited the summers of 2018 and 2022 where exceptional drought conditions were seen, with exceptional floods taking place in between, with recent years displaying a "pattern of hydrological volatility".

Destruction of natural habitats like wetlands is also having an impact, as these used to store a huge amount of water,



but as the centuries have gone on, land has been dried out to make it easier to build on and to work for agriculture.

Farming practices also see the soil stripped of its nutrients and organisms, which makes it sandier - and this means that water is no longer stored in the ground, but falls through the soil and ends up in waterways instead.

And, of course, water leaks are a big problem for a large part of the country, with billions of litres of water lost each day to leakage.

The big issue here is that much of the sewer network dates back to Victorian times and is no longer fit for purpose, with significant investment now required to ensure it can withstand the pressures of 21st century society... investment that water suppliers seem somewhat reluctant to make.

Water usage is another reason why shortages may be seen this year, despite the amount of rain we've seen recently.

Businesses and individuals alike can do a lot to reduce their water footprint and help safeguard resources for future generations. For example, rainwater harvesting can prove particularly beneficial, as can installing energy-efficient appliances, investing in sustainable urban drainage systems and water recycling.

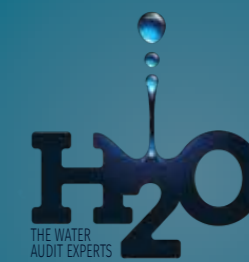
For corporations, the first step towards reducing your water usage and consumption is to have a water audit of your site carried out. This will show you how and where you're using water, so you can determine the best way to go about conserving supplies and start operating more efficiently.

If you'd like to find out more about this kind of service and how it could benefit you, get in touch with the Switch Water Supplier team today. <https://www.switchwatersupplier.com/>

PUBLIC SECTOR

WITH NO SIGN THAT THE SQUEEZE ON GOVERNMENT SPENDING WILL BE RELAXED ANY TIME SOON, PUBLIC SECTOR FINANCES WILL CONTINUE TO BE UNDER THE MICROSCOPE.

The challenge laid down to public sector bodies is simply this - find more efficient, cost-effective ways to spend taxpayers' money, while maintaining service levels. Waste is simply no longer an option, from procurement through to utilities.



H2O Building Services helps public sector bodies reduce unnecessary costs by cutting their water bills. By lowering water usage, improving efficiency and monitoring bills for overcharging, we save organisations an average of 30% on their water costs. When you are looking for ways to keep a lid on budgets, that is not to be sniffed at.



CUTTING WATER COSTS

Our professional consultancy team can draw on more than 30 years' experience¹ in the water industry. We understand water supply and sewerage services inside out and we specialise in managing costs across large, complex organisations.

We offer a complete end-to-end service for water cost reduction, from checking your bills are accurate and fair through to installing on-premise systems which will help save you money over time. We have earned a strong reputation for outstanding service and achieving impressive results for public sector clients.

Read about how we saved Haringey Council £40,000² after carrying out a full audit of water usage across all of its premises. Or find out how we saved HM Prison Service £57,000³ after identifying a water leak at HM Pankhurst, and also by cutting sewage charges for laundry effluent.

GETTING STARTED

In the first instance, we will ask a public sector client to supply water billing records for all of its properties, stretching back several years if possible.

We understand that public sector organisations are large and may operate a high number of premises. But this is a crucial step which can straight away help us identify whether charges look right for the type and use of the property.

After carrying out a thorough analysis of billing records, we will audit water use⁴, including carrying out site visits where we think it necessary. The water audit will form the basis of all recommendations we make for cutting water costs, from reducing water use to seeking refunds for overcharging, tackling leaks and waste to ongoing monitoring.

Share:



WATER BILL REFUNDS

If we spot mistakes in the water bills for any of your properties, we will advise whether they have led to you being overcharged. If you have paid too much for your water services, our experienced consultants will seek a refund on your behalf from your water supplier.



REDUCING WATER WASTE

One of the biggest causes of inflated costs on water bills is waste. If, for example, you have one or more leaks at any of your properties, you will be charged for that excess water which you never use. In addition, you could be incurring extra costs for water drainage, not to mention potentially massive bills for water damage repairs.

We offer full site surveys as part of our consultancy service, including water leak detection⁵. If we identify a problem, we will first compile a full report, outlining the size of the leak, the potential damage it might be causing, and the impact on your bills. We will then submit a cost proposal for repairs, aiming to achieve a robust, quality solution in the most cost-effective and least disruptive way possible.

We can also recommend installations aimed at improving water efficiency⁶ at your premises.

These include things like Flow-Tec P.I.R urinal flush controls, Pressure Reducing Valves (PRVs) and Aeroflow low flow showers. We can also advise on water recycling⁷ for using waste water in things like lavatory systems. Again, all proposals are fully costed, and we will also include an expected payback period, usually achieving an average of between 9 and 12 months.

1. www.h2obuildingservices.co.uk/about-us/
2. www.h2obuildingservices.co.uk/case-studies/haringey-council/
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ONGOING MONITORING

We understand that reducing costs is not a one-off exercise, but part and parcel of daily life for public sector organisations. We can help you keep on top of your water billing long term, making sure you are never charged more than you should be and keeping your water usage in check.



Through our water bill validation⁸, we will check each bill before you receive it, vetting it against actual usage and resolving any discrepancies with your supplier before it comes to authorising payment.

We also offer Advanced Meter Reading (AMR)⁹

a highly sophisticated water tracking technology, which can monitor water flow on an hourly basis. Any unusual spikes in water usage automatically trigger an alert, which we will pick up and respond to straight away.

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