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UK’S FIRST CONVERTED ‘ELECTRIC AVENUE’

Siemens has unveiled the UK’s first avenue, which is over half a mile in length, that has been fully converted to cater for electric vehicle (EV) charging. Located in Sutherland Avenue, W9, the project, in collaboration with ubitricity and Westminster City Council, has successfully converted 24 lampposts into EV charge points using existing city infrastructure. Residents can now charge EVs at various locations along Sutherland Avenue in London, with a further two adjoining roads due to be completed in the coming weeks.

The launch follows research conducted by Siemens showing over a third (36 per cent) of British motorists planned to buy a hybrid or electric vehicle as their next car, with two in five people (40 per cent) saying that a lack of charging points stopped them from doing so sooner. This makes it the biggest factor deterring motorists from purchasing an electric or hybrid vehicle.

‘Electric Avenue, W9’ showcases a shift in attitudes towards EVs that Britain’s capital is experiencing. Data shows 80 per cent of motorists in central London are now more concerned about their carbon footprint in the past five years. Westminster has seen a 40 per cent growth in EVs charged in the borough during 2019.

Powering ahead

Westminster City Council currently has more EV points than any UK local authority, with a total of 296 lamp column charge points in the city, 24 of which are located on ‘Electric Avenue, W9’. There are plans to reach a thousand charge points across Westminster City Council within the next year, as it has twice the number of locally registered EVs than any other inner London borough, and the most among all the other London boroughs.

Siemens and ubitricity have now completed over 1,300 installations covering the breadth of the city, significantly funded from the Go Ultra Low Cities Scheme, supporting Mayor of London, Sadiq Khan and the ‘Let London Breathe’ campaign and leading the way to improve London’s air quality.

“We know that half of London’s air pollution is caused by road transport and Westminster is a particularly busy area. While we cannot solve the challenge of air quality overnight, Electric Avenue, W9 is an important showcase of what’s possible using existing city infrastructure. It illustrates how residential streets will look in the near future, and accelerates the shift to zero emission vehicles,” said Cedrik Neike, Member of the Managing Board of Siemens AG and CEO of Siemens Smart Infrastructure.

The first avenue to be completed in the coming weeks is a further two adjoining roads due to Westminster City Council within the next year, as the project is doing something else, like sleeping, or under the Sun’s heat, which translates to long-term low costs for EV drivers and cities,” said Daniel Bentham, Managing Director of ubitricity UK, siemens.com

INDUSTRY’S FIRST HEAT READINESS STRATEGY

UK Power Networks has become the first UK electricity network to outline how its plans to help reduce the carbon impact of heating. Heat is the biggest single source of UK greenhouse gases, accounting for over a third of total UK CO2 emissions. UK Power Networks, which keeps the lights on for 8.3 million homes and businesses in London, the East and South East of England, is now holding a consultation on its strategy to encourage industry-wide collaboration and debate.

The network operator aims to be a facilitator of decarbonised heat for all customers and the strategy sets out a three-point approach:

- Inform on heat decarbonisation policy through provision of data and evidence
- Deliver a great service experience for customers during the energy transition
- Undertake least regret actions to ensure electricity network readiness

The document sets out a short-term strategy to begin facilitating the uptake of heating systems and support early entrants to the market. It aims to help electricity networks understand, mitigate and prepare for the potential impact of electric heating, and will show UK Power Networks where to focus.

The first step is to establish how electricity networks can support the decarbonisation of the two million homes in the UK that are not connected to the gas network and are instead burning oil or coal for heating.

Ian Cameron, head of customer service and innovation at UK Power Networks said: “We undertook an extensive stakeholder engagement programme in the fast-moving electric vehicle sector, which demonstrated how important it is to work closely and collaboratively with as much of the industry as possible. Building on our experience with electric vehicles, we know that the best solutions come from collaborations, often with firms and people that are newcomers to the energy industry.”

UK Power Networks surveyed attendees at a recent event and found two thirds of housing developers polled are considering installing low carbon heating in forthcoming developments, and that almost half (49%) view upfront costs the biggest barrier to delivering low carbon heat.

The company has already undertaken a series of innovation projects to broaden industry understanding of the impacts and opportunities around decarbonising heat, including the four-year Low Carbon London network and collaborative gas and electricity project

Green City Vision. Its experts are also exploring indicative approaches to expand multi occupancy building domestic customers to participate in the Net Zero transition at lower costs in its Urban Energy Club project.

Dr Joanne Wade DBE, deputy director of the Association for Decentralised Energy said: “Decarbonising heat is essential if we are to reach net zero carbon emissions, and UK Power Networks new strategy is an important statement of intent and contribution to the debate. The scale of the challenge means that no one organisation or sector can possibly have all the answers, which is why the consultation on the document is so important.”

To download the UK Power Networks Heat Strategy and take part in the open consultation, visit: https://innovation.ukpowernetworks.co.uk/
SMART LIGHTING IS TAKING THE INDUSTRY BY STORM – HERE’S WHY

Smart lighting systems embedded with various sensors and wireless technology can substantially reduce energy consumption compared to traditional lighting systems. One of the most prominent applications of smart lighting includes commercial and industrial buildings. Lighting in commercial and industrial buildings contribute to around 40% of the total energy expenditure.

Presently, the majority of the lightings installed in buildings stocks are based on the older and less energy-efficient lighting technology. The building owners and other stakeholders are increasingly becoming aware of and accepting the need for smart lighting to trim down energy consumption. This factor has resulted in the growth of smart lighting market during the forecasted period.

Furthermore, gradual transition from traditional lighting or lamps to more energy-efficient LED lamps is attributing to the growth of the smart lighting market globally. Ability of LEDs to adjust light color, intensity and directions is leading to faster uptake of these technologies in the lighting systems. LED lamps, having a high life expectancy and features such as dimming, varies light color and temperature. Rapid advancement in the technology is considered to be one of the major reason boosting the market growth. Rising urbanization and increase in construction activities is leading to surge in number of residential building, which is having a positive influence on the smart lighting market. High demand for energy efficient lighting is prognosticated to play a pivotal role in pushing the market in the forward direction.

Growing demand for lights equipped with wireless and sensor technology has further favored the growth of the market. Apart from these, high demand for smart intelligent street lights to avoid accidents and encourage smart city concept is fostering the growth of the market. The global smart lighting market is divided based on lighting type into five segments: LED lamps, fluorescent lamps, compact fluorescent lamps, high intensity discharge lamps and others. LED lamp segment have the highest growth potential during the forecast period attributed to the ability of substantially reducing energy expenditure in end user applications such as commercial and industrial buildings.

However, incorporation of LED lamps requires high initial investment due to elevated price of LED lamps compared to traditional lighting such as compact fluorescent lamps and fluorescent lamps. Overall the LED lamp type segment is expected to see a robust growth throughout the forecast period owed to its high life expectancy and features such as dimming and varying light color and temperature.

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Travel Watford Transport App

Powering the green revolution is the new and free travel app named “Travel Watford”, available on iOS and Android phones. The app draws on large banks of data, providing information on all the potential modes of transport to local destinations, including trains, fixed-route buses, the new on-demand bus service and the recently announced electric car club.

The goal of the app is to promote sustainable transport, helping Watford to become a greener, less congested and less car dependent town.

Bike Share Scheme

The Beryl bike share scheme is the first of its kind in Hertfordshire and is comprised of 200 pedal bikes followed by 100 e-bikes to be rolled out later in the year. The bikes are available 24/7 at 70 locations around the town and will link Watford’s Metropolitan Line Station with Watford Junction Station, increasing connectivity for travellers while meeting needs for additional sustainable modes of transport. The service can be accessed through the free Beryl App, which manages the process of paying for journeys around town. Elected Mayor of Watford Peter Taylor said: “This new bike share scheme will give people another option for travelling around our town, help to make our air cleaner and reduce congestion.”

“…This is part of a series of improvements which also includes introducing on-demand buses later this month and our new travel/Watford transport app. Everyone knows that our roads are busy and so it’s right that we take action to improve transport in Watford.”

https://www.watford.gov.uk/
https://beryl.cc/bikeshare/watford

RINNAI HOT WATER ON DEMAND – FUEL, ENERGY, ENVIRONMENT AND FINANCE EFFICIENT – AND NOW EASY TO CHOOSE

Rinnai – makers of units delivering limitless, on demand supplies of hot water - are offering end-users an easy-to-choose facility via online interface.

The end-user simply visits the www.rinnaiuk.com website for instant assistance on choosing the right products to deliver fuel, energy and environmentally efficient hot water, reliably and constantly. Says Chris Goggin, “Whatever your industry we have innovative products and systems that give your site or sites limitless supplies of temperature-controlled hot water which are designed with the environment in mind, with low emission technology and high efficiencies, as well as a host of other great features, as well as costing you significantly less than any other mode of hot water supply.

“We recognise that every application has its unique and that choosing the right product can be a little daunting so we invite end-users to visit our website www.rinnaiuk.com and find the ‘Help Me Choose’ facility and we will do everything else for you.”
Yorkshire and North East local authorities come together for first EV co-planning session

Yorkshire and the North East’s councils recently took part in the area’s first co-working session as part of an event led by Northern Powergrid, the electricity distribution network operator for the North East, Yorkshire and the Humber region, to support the launch of its AutoDesign tool. Using the new tool live at Leeds’ Cloth Hall, the councils’ planning and statistics officers for electric vehicle charging were able to do planning for EV hubs in their area in minutes, instead of the usual 10-day turnaround. It enables informed decisions by providing greater transparency around network capacity and clear indicators of possible and most cost-effective locations for new electric vehicle (EV) charging points.

The event came as the UK electric vehicle market continues to grow rapidly, with 9.9% of all electricity generated in the fourth quarter of 2019 coming from offshore wind alone.

Ann Wilson, the Strategic Freight Advisor at Tees Valley Combined Authority, said: “The launch event provided a valuable opportunity to test AutoDesign using real life locations and scenarios. Cost and availability of power are two vital considerations when undertaking EV planning and AutoDesign will be an essential tool in streamlining what was previously a lengthy process. “It was also useful to discuss the challenges of co-planning with both Northern Powergrid and our fellow local authorities. Understanding EV plans for the region will help us realise our ambitions to introduce a number of EV charging hubs across the Tees Valley.”

The feedback we receive from connecting local authorities for over a year and their ambitions to introduce a number of EV charging hubs across the Tees Valley will help us realise our ambitions to introduce a number of EV charging hubs across the Tees Valley.”

The event was possible thanks to funding from the Scottish Government through Salix, an independent, government-funded organisation that provides interest-free loans to the public sector for energy-efficiency projects. The council utilised Salix’s Recycling Fund (RF), a ring-fenced pot of money held by the local authority, which is created with capital provided by the Scottish Government through Salix and equally matched by the local authority. The fund aims to increase long-term investment in energy-efficient technologies across the public sector, by enabling councils to reinvest savings from previous projects to finance further energy reduction schemes.

Councillor Gordon Adam, chair of the Commercial Board, said: “Martin and the team have put a huge amount of time and effort into securing the fund and progressing the work. This is the largest fund in operation throughout Scotland and will be essential in reducing our spend and meeting our carbon targets. Scottish Government aren’t just investing in the projects, they are investing in the Council and our ambition.”

The project will see targeted improvements on over 50 sites, which will be broken down into lots based on geographical spread, involving both primary and secondary schools, leisure centres, depots, car parks and offices. Buildings will benefit from investment in a variety of technologies including LED lighting and controls, boiler replacements and over 2.5MW of solar PV and private wire supply. The funding will not only provide significant financial and energy savings for the Council but will enable the development of their estate for years to come through both holistic reinvestment and the reduction of maintenance costs. Salix are committed to a low carbon future and are tackling climate change through a strategic, long-term approach to reducing the carbon footprint of the public sector.”

Energysageofferestimatesinthefuturethatby2030,20%oftheUK’spowerlastyear(9.9%fromoffshorewind).Thefigureshowthatwindwillprovidethenumberonepowersource,withbothwindandsolarpowerproviding17.4%lastyear,whiledomesticgasmadeup36.9%ofUKelectricitygeneration.berievelynoun:“Today’srecord-breakingfiguresshowjusthowradicallytheUK’senergysystemischanging,withlow-costrenewablesonceagainbeingthemostpracticalandcost-effectivechoices.”

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Manius Valerius Maximus, 494 BC, was well familiar with a concept that many energy managers take for granted: to control you need to monitor. As the Roman empire expanded, monitoring became a key aspect of building and managing the empire. Information from provinces needed to arrive fast and orders enacted even faster. Obviously, there are similarities between a Roman Emperor and an energy manager, but there are key differences too, apart from their work ethics.

For an Emperor 2500 years ago, monitoring a province thousands of miles away was a major logistical exercise, requiring messengers, horses and ships, with a two-way communication taking weeks or months to deliver. The situation was nearly as problematic for energy managers until relatively recently when they needed energy usage data for their sites. In fact, a Roman emperor could receive faster information from a province than energy managers would about their utility meters, having to wait 3 months for a meter reading. Clearly there had to be some progress on speed of data gathering, which took 2500 years to arrive in the form of wired communication, i.e. telegraph, telephone, and fax. This was progress of a sort, how a meter reading could be phoned or faxed through, but not somewhere far away. In practice though, the water pit, the outbuilding, or the basement and plant room could be just too far away for the wireless signal to get out and reach a receiver. And what about powering the transmitter in the water pit? How long would the battery last? And, assuming the signal gets out, how would the data from a meter get to my desktop computer in a different city? Can I get the data to my software in the cloud or to an existing on-site BMS? Can the transmitter connect to my pulse, Modbus or MBus? Is it a high sensitivity transmitter which takes 2000 years to arrive in a city.

Nevertheless, tried and tested ways of doing things are difficult to shake off, ways which wouldn’t be out of place in iScape. The dictionary definition explains the state of being close to someone or something, something which could be a Latin word, perhaps Romans would use it in relation to their empire. But for iScape Propinquity describes a far more modern ambition: enabling energy managers to access the devices that gives them data, as if these devices were on their desk. Essential to this ambition is long range battery powered wireless transmitters that can operate in difficult environments and still be able to get their data out to a remote receiver for viewing on a display. Internet and wireless are now well-established tools of charge and foundations of an entire industry, the Internet of Things. Gone are the days where AMR (automatic meter reading) systems would have an impressive range of 100s of meters. Now range can be measured in many Kilometres. Fortunately, such technology was out of range of Romans, or perhaps their empire would still be around.

I install a wireless monitoring system, what would do if they had utility meters. Would they do magic. Range can be limited, batteries can run out too quickly, there may be interference and interface issues, and cost may be prohibitive. Not surprisingly therefore, an energy manager can be forgiven for being sceptical of wireless systems and prefer sending someone to do a meter read just as Romans would do if they had utility meters.

In fact, the question, “why should I install a wireless monitoring system, when I can send someone to read a meter”, was a difficult question to answer in 1999 when iScape produced its first wireless products. Since then, even daily meter readings are not enough for many energy managers, who demand half-hourly, 5-minute and even more frequent reads, including real-time data.

iScape’s experiences reinforce one lesson of the past 100 years or so since telephones were first introduced, that we need more and more information. Whether we can make sense of the information is a different but equally important consideration. iScape’s focus is on collecting information from remote and/or difficult places and forwarding them to systems that can make sense of it, be it humans or machines.

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THE FOUR ‘C’S OF THE ENERGY TRANSITION – CARBON, CAPACITY, COST AND CO-OPERATION

I n case you’d missed it – the energy transition is massive – in my recent blog on the future of energy I discussed how wildly wrong our predictions can be and just how much of a roller coaster the sector is on. When looking at the energy transition I believe there are four lenses through which to make energy decisions. We are moving from linear decision making in an age of energy abundance into a multi-angled challenge which constantly evolves over time...

CARBON INTENSITY – WHAT’S MY CARBON FOOTPRINT?

‘Carbon intensity is a complex challenge which is not only hard to nail down in the moment - but is even more difficult when you project into the future.’

Energy problems need input and outputs. In the case of electricity, the carbon intensity of those inputs can change each half hour, never mind five years in the future. Since 1990 the carbon intensity (average) has fallen by 38% and continued to reduce in all future energy scenarios I’ve seen. I do think a lot of these scenarios tend to underestimate the impact of a huge shift to electrification and the capability of renewable sources to respond to rapidly escalating demand. That said gas networks have their own plan for reducing the carbon intensity of the gas in the pipes... through bio-methane and hydrogen mixing so... the future may not be all electric...

CAPACITY – CAN I GET TO THE ENERGY I NEED?

Even if we can get an abundance of low carbon energy (i.e. Hydrogen or Electricity) the next challenge comes in getting it to the point of use...

There are not insubstantial challenges with local and national grid capacity in a number of energy scenarios. These directly impact both individuals and companies seeking to make energy decisions. At the residential level everyone on a street quite simply can’t have a 24kw fast car charger and if companies quickly electrify their fleets the grid connections to provide even overnight charging will be phenomenal. If you thought getting the electric to charge a potential twenty-five million electric vehicles was challenging then heat makes that look like a piece of cake

Heating UK homes at peak requires about 360GW (for comparison current ‘peak’ is about 51GW) of instantaneous energy for heating... Any shift to electrification of heating will massively increase demand on both national and local grids. Even hydrogen may not present the perfect solution – ‘Green’ Hydrogen uses electricity to generate it and huge volumes of storage would be required to enable enough to be there on super cold days.

COST – HOW MUCH WILL IT COST ME?

Carbon and Capacity both come at a cost. Resilient, zero carbon options don’t always come cheaply! With so many alternative options, delivering lowest instantaneous and lifetime cost presents a complex and diverse challenge.

Geography is also likely to become far more important. With Hydrogen deploying locally and grid re-enforcement relying on substantial infrastructure investment it may simply be that where you live or where a company is situated even at a parish level in the UK could influence the cost of energy. A little like for the two million off gas grid properties in the UK who currently have no choice but to opt for more costly LPG, we could see differences depending on Hydrogen availability or even local electricity grid capacity.

COOPERATION - HOW CAN I MAKE THIS HAPPEN?

‘The answer to the Carbon, Cost and Capacity conundrum is in Cooperation’

Finally, and most importantly the answer to the above three challenges is in cooperation. We simply must look to our neighbours to optimise. There are plenty of fantastic examples out there... we are just going to have to work harder and thin differently to get there!

- Whole system planning and local energy systems across zones – enabling capacity to be managed at a more local level.
- Using neighbours waste heat (Data Centres, Sewage, Air Con)
- Shared storage through heat networks enabling reduced demands on the system and energy sharing.
- Cooperation increases the number of no-regrets decisions. Energy saving and energy sharing typically always makes sense... and finding ways to limit demand (and peak capacity requirements) reduces cost for everyone.

This type of thinking takes an unprecedented level of coordination at the local, regional and national level. Success comes in a constant open dialogue about future and current needs – and also maybe giving up a little control for the greater good! The ultimate technology split is still a long way from being decided but what is clear is that Carbon, Capacity, Cost and Co-Operation are the cornerstones of any decision making around energy systems.

John.M.Armstrong@eon-uk.com
HAS YOUR COMPANY MISSED THE ESOS DEADLINE?

Although the Department of Energy and Climate Change (DECC) implemented the UK Energy Saving Opportunity Scheme (ESOS) as early as 2015, many companies are still lagging behind in complying with the directive. With the deadline for Phase 2 of the ESOS Regulations as the 5th December 2019, non-compliant businesses leave themselves open to the risk of enforcement action. Julian Grant of Chauvin Arnoux gives the low down on how you too can get caught up on ESOS and avoid paying eye-watering fines.

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The PEL energy logger with tablet for recording aspects of the energy supply

Organisations that qualify for ESOS must carry out an ESOS assessment which consists of audits of the energy used by their buildings, industrial processes and transport to identify cost-effective energy saving measures. These audits have to be conducted every four years and businesses must notify the Environment Agency by the set deadline of December 5th, 2019 that they have complied with their ESOS obligations. All qualifying organisations that did not complete an ESOS Assessment and submit a compliance notification by the compliance deadline will now find themselves at risk of enforcement action. For companies that have failed to comply with Phase 1, a number of penalties ranging from £4,000 to £90,000 have been issued. It goes without saying that Phase 2 penalties are believed to be at least as stringent. If you have received a worrying letter regarding ESOS, that is because the Regulators are currently issuing compliance notices to all businesses in the UK which may be required to participate in ESOS but have not yet submitted any records of their having completed a notification. If you haven’t submitted yours and are falling behind in your compliance, not all is lost. Remember that the period of time by which organisations are late, as well as their efforts to comply, will all be taken into consideration when determining any applicable enforcement action. In order to minimise the chances of penalties, ensure that you keep an evidence pack of all the work you did to complete your ESOS commitments – even if this is still ongoing.

A primary step in becoming compliant is to calculate your total energy consumption – i.e. the energy used by assets held or activities carried out by your organisation (be it the energy consumed by buildings, industrial processes or transport). Next, you must try to identify the areas within your business where significant energy is used and look for opportunities for savings. Crucially, as long as 90% of your total energy consumption is covered, you can use a mix of approaches with some of your energy consumption covered by ISO 50001; some by DECs or GDAs and some by ESOS energy audits. Gaining ISO 50001 accreditation (Energy Management System) ensures that you are fully ESOS compliant. It’s important to note that the ISO 14001 (Environmental Management System) certification does not guarantee compliance; however, evaluating energy usage as an environmental impact provides a good foundation for organisations to become compliant.

In order to ensure that the reports are accurate, you must appoint a lead assessor to carry out, oversee and review your energy audits and overall ESOS assessment. Lead assessors can be employees or external contractors, but the caveat is that they must be members of an approved professional body register. They must be able to carry out an energy monitoring survey to determine exactly where energy is being used. Maybe it’s not just the heating, lighting and operations and manufacturing processes. Computers and office equipment, items often left on out of hours, are equally culpable; an energy survey will provide the answers and make it much easier to take the appropriate remedial action.

The next step is to submit your ESOS notification of compliance to the Environment Agency when you have undertaken an ESOS assessment and are compliant with your obligations. The notification deadline was 5th December 2015 for the first cycle and then every four years afterwards. If you missed the deadline, then submit your notification as soon as possible so as to avoid the high penalties.

If you are one of the many companies that are still in the process of gathering data for their assessment, then it’s important to keep clear records of all the steps you have taken so far, as this will reduce the penalty fee even if the deadline has passed.

Finally, remember that energy monitoring should not be regarded as another hurdle for your business. It is an ongoing process that has continuing measurement and benchmarking at its core. After all, even if your initial energy saving efforts are every bit as effective as you hoped, there’s no guarantee that they’ll remain effective indefinitely; even the best equipment can break down and its performance will almost certainly deteriorate as it ages. On-going monitoring will help you to spot these issues and deal with them promptly. And, who knows, it may also help to identify even more ways of saving energy and money and staying compliant with future guidelines. www.chauvin-arnoux.co.uk
Wired or Wireless Sensors? The Advantages and Disadvantages of Wired and Wireless Systems

There's such a strong argument for installing sensors and automating building controls that many organisations we talk to are already convinced it's the way forward. But what people do want to know is whether they should opt for a wired or a wireless system.

Here we've taken the five main factors you should consider when choosing smart sensors and run through the advantages and disadvantages of wired and wireless sensor systems.

1. INSTALLATION

A quick, straightforward installation is one of the main benefits of wireless sensor systems. When you consider that the vast majority of those adopting the technology will be doing so in an existing building, it's not hard to see why this easy retrofit solution has gained so much traction.

Wireless systems could be your only viable option where hard wiring is difficult or impractical, such as in heritage buildings, glass meeting rooms, and other situations where there are construction limitations. For example, while running wires between buildings could be prohibitive, you could easily connect a neighbouring building to the network with wireless devices.

Installing wireless sensor systems doesn't require any drilling, wiring or structural building changes. That means reduced installation costs, minimal disruption to your workforce and interiors, and a system you can get up and running very quickly.

In contrast, a wired-in sensor system means you'll need to hire an electrician and more than likely pay an hourly rate. It can be a lengthy process with some necessary downtime, and drilling holes means some areas will need repainting and patching.

But while wireless system installation is often just a case of clicking or sticking the sensors into place, you do need to make sure the system is as resilient and offers as much coverage as possible by carefully planning the placement of sensors and receivers.

2. COST

There are two factors to consider here – the cost of the components and installation and ongoing maintenance costs. And, contrary to what many people expect, a wireless system isn't necessarily the more expensive option. That even rings true if you're constructing a new build rather than looking for a retrofit solution.

While initial costs can be slightly higher for a wireless system, any modifications you make in future will be much cheaper. If you're planning to expand your network in the future or you need some degree of flexibility – for example, if you sometimes move office partitions to change the configuration of the space – a wireless system is far more accommodating.

3. MAINTENANCE

There are two types of wireless devices – powered and self-powered. In powered wireless systems, the sensors and actuators will be battery powered. Before deciding whether that's feasible, think about the size of your building and the number of devices. If you have a smaller building it might be fine, but a large building could prove impractical. Not only do batteries need to be changed, they also need to be stocked up and stored ready for use, then replaced when finished.

Self-powered wireless devices harness the energy they need to function properly. Tiny changes in movement, pressure, light, temperature or vibration are all that's needed to power each device, making them virtually maintenance free. While this technology may be a bit more expensive initially than battery-powered devices, in the long run the system will actually be far more economical, as well as a much more sustainable choice for our planet.

4. CONNECTIVITY AND SECURITY

Unfortunately, there are still a few misconceptions around wireless technology – that it's not secure, that it’s forever be plagued by interference and signal-loss problems. In fact, these beliefs stem from early experiences with home security, entertainment and control systems, where signal difficulties were common.

Today, it's a different story. Wireless products are everywhere, from tablets and mobiles to security systems and surveillance cameras. Most of these applications are high-bandwidth and very sensitive to latency (delays in data transfer), but still perform reliably and consistently. Building automation is a low-bandwidth application that's not particularly sensitive to delays and latency, meaning wireless technology is more than capable of handling these demands.

Far from being a hindrance, wireless technology lends itself perfectly to IoT applications, allowing direct connection over Wi-Fi, 3G or 4G mobile data networks or local wireless networks. Many wireless devices have built-in intelligence that enables them to identify and link to the wireless building network automatically – simply pushing a button adds the device to the network.

Furthermore, wireless systems can be incredibly secure. In fact, wireless devices can use commercial, government, and even military grade encryption with multi-level authentication.

5. FLEXIBILITY AND SCALABILITY

As we've already touched on, one of the biggest benefits of having a wireless network is that they're really easy to add to or modify. That means you can easily repurpose sensors to get a stronger signal, or if the room function or layout changes. Perhaps you want a temporary installation in a rented building, or you're trialing the technology before deciding whether to roll it out.

It's also easy to scale up a wireless system over time – either as your workforce or business grows or so that you can stagger the investment.

Wireless technology lends itself really well to this, since new sensors and receivers can be easily added to an existing network. So any buildings begin by automatting control in a single zone – as a proof of concept, to measure results before proceeding, or to fit within budget constraints – and then expand from there.

Wireless technology also makes it easy to take advantage of upgrades and new technologies as they become available, allowing your building to become more efficient and save more energy over time. This can significantly enhance the long-term investment in your building.

We hope you've found this post useful. If you'd like to talk about which type of system is best suited to your building, feel free to get in touch. www.pressac.com

BUILDING OWNERS, OPERATORS AND MANAGERS CAN NOW STAY CONNECTED TO THEIR BUILDINGS – 24/7 AND REGARDLESS OF LOCATION

Launched earlier this year in the UK, Priva's Building Operator is designed to make the operation of buildings as simple as possible. As a cloud-connected application, it offers real-time insight into the status of building systems and allows users to make essential adjustments to their building management system from any device, freely and easily. Benefits include easy set point modifications; manual override of controls; top control schematics; and alarm handling and integration.

MOBILE FIRST, CLOUD FIRST

Priva's Building Operator empowers you to connect the day-to-day operation of buildings by providing insights, assistance and full control over essential processes in your building: indoor climate, lighting and energy consumption can be monitored and visualised via any smartphone, tablet or computer.

Thanks to easy set-up and installation of the application, the installation of Building Operator – typically undertaken by one of Priva's network of approved Partners – can be achieved in no time. Once installed, the ‘mobile first, cloud first’ approach remote assistance with any problems that might occur in the building.

REAL-TIME INFORMATION

Once the application is installed on a device, it connects to the cloud and gathers real-time information from the building management system (BMS). If the BMS identifies an issue with the temperature, lights or another aspect of the building, it will alert the building manager from the cloud, the platform's compliance with more than 75 local, regional and worldwide standards. Secondly, Priva uses the cloud connector to provide a secure interface between the control system and the internet. To assure data security, the cloud connector only has outgoing connections. This makes it invisible to the outside world - and thereby eliminates unauthorised traffic to protect data.

Thirdly, to protect against unauthorised access, there is an authentication layer based on the OAuth2 protocol - within which is an Access Control overview that manages all user rights. https://www.priva.com/uk
COUNCIL LED PARTNERSHIP TO DESIGN THE LARGEST SMART CITY REGENERATION PROJECT IN THE UK

Plans for the design of the largest smart city-wide energy system in the UK have been unveiled. The £2m scheme will cut energy bills and provide green heat, electricity and transport for residents.

The Peterborough Integrated Renewables Infrastructure project (PIRI) combines a next generation heat network, electricity network and EV infrastructure under one holistic scheme.

Led by Peterborough City Council, the two-year project has been granted funding to begin the design of a local, smart energy system. The project also includes SSE Enterprise, Element Energy, Cranfield University, Smarter Grid Solutions and Sweco UK.

PIRI is one of a series of energy generation, demand and storage, thereby unlocking efficiencies not deliverable under our existing, traditional energy systems. It is envisaged to be especially effective in areas where the electricity network is constrained, as well as serving as a blueprint for similar projects across the UK.

PIRI will be part funded by UK Research and Innovation (UKRI). Prospering from the Energy Revolution, UKRI is the UK’s major social and economic value for the Peterborough area from 2022. Significant private sector investment has been secured for and by members of the partnership who each have existing decarbonisation expertise.

The project’s one-of-a-kind winning formula is to create a pipeline of innovative and investable opportunities for and by members of the partnership who each have existing decarbonisation expertise.

Peterborough is one of the fastest growing cities in the UK while also being committed to reducing its carbon emissions. The PIRI project aims to deliver a significant drop in CO2 emissions by 2030, whilst cutting energy bills by up to a quarter.

PIRI is an exciting project for us to be involved in. We hope it will demonstrate the potential of smart cities to drive local decarbonisation in a commercially viable manner.

“PIRI is an exciting project for us to be involved in. We hope it will demonstrate the potential of smart cities to drive local decarbonisation in a commercially viable manner.”

Taking this holistic perspective means that far greater benefits will be realised, hitting the sweet spot between environmental gains and commercial viability, while Peterborough will lead the way as a sustainable city of the future.”

Professor Simon Patel, Pro-Vice-Chancellor, School of Water, Energy and Environment and International at Cranfield University, said: “Cranfield University has a growing portfolio of smart cities and is delighted to contribute its expertise to PIRI.

“Sharing the learning from practical projects like this has proven instrumental to ensuring that communities and industry benefit from innovative designs. This unique partnership will help Peterborough and the UK achieve real energy system improvements.”

Minister for Business, Energy and Clean Growth, Kwasi Kwarteng, said: “PIRI is an exciting project for us to be involved in. We hope it will demonstrate the potential of smart cities to drive local decarbonisation in a commercially viable manner.”

“Not only this but the EnergyMgr 2.0 utilises the latest technology to provide customers with average savings of 40% on their heating bills and coupled with our LED lighting solutions this can rise to 60%.”

Since acquiring Vickers Electronics, an energy management specialist with over 28 years’ experience of providing energy savings in industrial and commercial businesses, Pilot Group has invested heavily in product development.

All systems come with a complimentary 12-month warranty and service agreement, which includes an onsite annual health check. The warranty and service can be extended at any time to ensure that the energy management system contributes to energy savings with maximum efficiency.

The agreement includes full parts and labour warranty, annual service, engineer callouts and software updates.

www.thepilotgroup.co.uk

PILOT GROUP ENERGY MANAGEMENT SYSTEM TO SAVE ONE MILLION TONNES OF CO2 IN 2020

• The new Pilot EnergyMgr 2.0, launched in October has already seen a strong start to sales

• Pilot Group expect to save businesses more than one million tonnes of CO2 in 2020 and guarantee at least 25% saving on fuel bills

• New features added to the system means Pilot Group can meter energy usage

“PILOT GROUP’s EnergyMgr 2.0, launched in October, is expected to save more than one million tonnes CO2 being produced in 2020. Pilot Group has also made several new features available and numerous upgrades to the system to ensure that the energy management system delivers savings in both costs and energy usage using the latest technology.

The new intuitive interface will make it easier for customers to navigate menus with a new search function that displays utilities and equipment in real-time.

The addition of a multi-site feature means that customers can view performance, energy usage and make changes to each site from any internet enabled devices, providing customers ultimate control and visibility.

In addition, with a new intelligent reporting tool, the EnergyMgr 2.0 will automatically convert UK’s burned to CO2 tonnes, which allows customers to keep on top of CO2 used month on month, year on year.

By measuring how much energy is used, businesses can begin to see how changing some processes and ways of working can significantly reduce the overall carbon footprint. To achieve this, Pilot Group will work with customers to help create a bespoke energy saving strategy ensuring that optimum energy efficiency is realised.

The Energy Management System is on course to revolutionise the monitoring, control and management of heating, air conditioning systems and compressors as Pilot Group expected it to.

In addition to improved control and management of heating, the upgraded EnergyMgr 2.0 system can now control an existing lighting system, or new system which can be installed by Hiclare, resulting in an all in one, cost effective management system.

The EMS integrates a central control unit with an intelligent software and highly accurate digital sensors to optimise the performance of industrial heating systems.

Chris Pearson, Managing Director at Pilot Group commented: “At Pilot Group we believe in using technology to make the places we live and work smart, safe and sustainable.”

"Not only this but the EnergyMgr 2.0 utilises the latest technology to provide customers with average savings of 40% on their heating bills and coupled with our LED lighting solutions this can rise to 60%.”

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www.thepilotgroup.co.uk

ENERGY MANAGEMENT
SMART CITIES
ENERGY MANAGEMENT
TOWARDS NET ZERO – THREAT OR OPPORTUNITY?

In 2015, 197 Government leaders met in Paris and reached a Global Climate Change Agreement that was later ratified by 85 countries from around the World. In the same year the UN published their 17 Sustainability Development Goals (SDGs) which a number of organisations subsequently used as a framework for the development of their own Sustainability Strategies. Most notable of these early adopters was Unilever whose then CEO, Paul Polman said “the cost of not acting is higher than the cost of acting”. I recall attending a number of sustainability events and conferences around that time and had the distinct impression they were still, in the main, talking shops filled with good intentions and complex reporting but an absence of tangible action.

However, the emergence of a certain 16-year old Swedish environmentalist and movements such as Extinction Rebellion changed everything and people finally began to take notice and demand action from both businesses and governments alike. As the highly-respected naturalist and journalist, Sir David Attenborough recently said “Climate Change is the major challenge facing the World”. Then in 2019 the UK Government announced a legally binding target to become Net Zero by 2050 and also introduced Streamlined Energy and Carbon reporting (SECR) requiring approx. 11,900 organisations to report accurate and auditable annual energy reports. Organisations with an annual energy expenditure less than £40,000 will be excluded from the scheme.

Net Zero is not going to go away and relevant legislation is likely to increase. In addition, an increasing number of investors announced that they would no longer invest in fossil fuel businesses or those businesses that didn’t have a plan to improve their own sustainability. The business community finally began to wake up. Even economists such as JP Morgan and those offered by Goldman Sachs and BlackRock have predicted that companies to claim that business as usual is not an option. However, over time residual emissions and the need to offset should reduce as emerging technologies become mainstream and businesses adjust their net zero targets accordingly. Above all the Strategy and Implementation Plan needs to remain flexible and adjusted as new legislation is introduced and technologies emerge.

One thing is clear though business as usual is not an option. http://www.jrpsolutions.com/

In 2021, Thailand suffered the heaviest rainfall in over fifty years resulting in 884 deaths and millions of people either made homeless or displaced and, according to The World Bank, cost the Thai economy $45.7bn. Moreover, the manufacture of car components and hard disk were severely impacted and had a significant impact on car production across the World.

Extreme weather events also have a huge impact on crop production and commodity prices increasing the cost of food to consumers all over the World. Equally the focus on the mass production of a single crop such as avocados or almonds is to the detriment of biodiversity and can also result in the extinction of insect species and water shortages in water stressed areas.

Since the 1950s we have lived in an increasingly connected world otherwise referred to as globalisation where we no longer are self-sustaining but are interdependent for the supply of both raw materials and ingredients, finished goods, services and even labour.

So yes, extreme weather events in distant parts of the world do and will have a significant impact on UK organisations and households.

WHAT CAN BUSINESSES AND ORGANISATIONS DO TO IMPROVE THEIR OWN SUSTAINABILITY?

I am asked this question every day and the answer is always the same - ‘have a plan’.

As Mark Carney, Governor of the Bank of England, recently warned, “Firms ignoring the climate crisis will go bankrupt”. Firstly, though you need to understand where you are now and where you want to be in say 20 or 80 years time. I realise that long term strategies are often an alien concept to Western businesses but that is what is needed and, indeed, demanded for businesses to survive in this fast-changing world.

You may also have to include actions to make your own infrastructure, logistics and supply chains more resilient to the impacts of climate change

The next question is what does Net Zero mean to your business? Is it zero Scopes 1 & 2 CO2 emissions i.e. those emissions directly attributed to an organisation’s activities or do you also include all CO2 emissions from your supply chain i.e. Scope 3? Or do you reflect the UK’s Net Zero target which includes all green house gases?

This is not something that can be decided in isolation and needs the involvement and buy in of all key stakeholders within your organisation and not just the senior management team. From procurement and logistics to operations and sales and marketing. An output of this might be a Project Charter which clearly sets out what it is your organisation wants to achieve and by when and identifies the critical success factors.

Once a baseline audit has been completed you can then start to develop an appropriate sustainability strategy that will provide your organisation with a clear roadmap towards becoming net zero. Typically, this strategy will include the negotiation of new supplier agreements and/or the identification of alternative suppliers, waste, water and energy policies, new procedures, revised processes and possibly new working practices, investment in more efficient plant, behaviour change programmes, training and the development of new products and services to meet the growing demand from an increasingly environmentally conscious customer base.

One thing is clear though business as usual is not an option.

To receive Energy Manager Magazine FREE of charge, please visit: energymanagermagazine.co.uk/subscribe
NET ZERO

V. REALITY: New research highlights alternative fuel disconnect

- 96% said their company’s environmental impact was a ‘medium- to high-priority’
- Environmental impact is a more important factor than price when businesses purchase fuel
- Diesel is still the fuel of choice for 85% of respondent’s on-site equipment
- 82% of respondents have used alternative fuels to reduce corporate impact
- 62% of companies Aggreko polled that said they had considered using GTL, while a further 61% said they had explored use of natural gas as an alternative

NET ZERO

ENERGY STRATEGY: IS YOUR APPROACH TO NET ZERO ACTUALLY SUSTAINABLE ONE?

Senior Energy Management Consultant at SMS, Andy Bolitho, argues that a net-zero strategy needs to consider not only the demands and constraints of your business, but also its overall impact on the grid - particularly as we transition to the electrification of vehicles and heating.

As most energy managers will undoubtedly be aware, last June the UK Government announced a net-zero carbon emissions target for 2050, making Britain the first G7 country to legislate a commitment to remove its net contribution to climate change. Net zero hasn’t been much out of the news since, and as a result, a lot has already been said about the huge challenge that stands in the way of achieving this grand ambition. It is a challenge, however, that cannot or should not be underestimated or underestimated. After all, the future of our planet will depend on how effectively we overcome it.

As an energy consultant, perhaps the most significant and intriguing aspect of the net-zero emissions debate is what it all means for energy users - particularly the business kind. In an effort to manage and adapt it will of course play a critical part in the UK’s net-zero strategy. Indeed, reviewing the way in which we source and use energy is essential to achieving the goal. It will require a significant shift away from traditional energy systems and a move towards much greater participation in the energy market through flexible, low, and zero-carbon generation and smarter controls. Collectively, we will need to change our role from that of a consumer to a ‘prosumer’, interacting with the market and even potentially providing balancing services to the grid to enable the necessary penetration of renewable power into our energy network.

All of this means that we’ll have to engage with energy in a much more detailed and sustained effort. Though offsetting energy use, undertaking projects to reduce consumption or demand. Though offsetting does undoubtedly have a place in a net-zero strategy varying degrees, it should not be at the expense of action on energy and carbon, and should really only be addressing those emissions that cannot truly be avoided.

NO ONE-SIZE STRATEGY THAT FITS ALL

Clearly, and understandably in this regard, net zero may mean different things for different organisations depending upon their capacity for energy and carbon reduction, or the industries that they operate in. For energy-intensive industries, net zero might result in being heavily reliant upon grid decarbonisation and sourcing much of their energy consumption through self-generation or PPAs. Equally, for organisations with large and complex supply chains, or those with substantial fleets, net zero may see them working more closely with energy suppliers to address Scope Three emissions.

Whatever the route to net zero, the journey ahead represents a great opportunity for organisations and Government to come together to form a robust plan to combat climate change, and to plug the current policy gap that exists in order to deliver it. It also holds the potential to support our economy through unlocking investment in low- and zero-carbon generation, as well as through the export of knowledge and expertise to other countries. While net zero is a big challenge for the UK, the considerable benefits that such a strong approach can bring are immaterial in economic and environmental terms.

WORKING WITH A NET-ZERO PARTNER

It is incredibly encouraging to see organisations today adopt net-zero targets – many of them well in advance of our national targets. This sends a powerful message to the government and the general public on their intentions to address contribution to global warming, and to support the common goal of avoiding catastrophic climate change.

Whilst we are already working with progressive organisations like these at SMS – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies – and indeed many others who are only just embarking on their low-carbon strategies. As such, this report does not attempt to define one path but instead discuss the different options businesses can use to instigate change.

As Aggreko continue to explore and invest in new greener technologies, the report also reveals early results of emissions testing of HVO and GTL in its Stage IV generator fleet. The analysis was carried out by an independent engineering and environmental consultancy in compliance with ISO 17181 D2. Both fuels were tested and compared to EN590 diesel.

Chris concludes: “Some results in the report confirmed suspicions, whereas others surprised. What’s certainly true is that grand targets require a steady and sustained effort. We hope our report can play a part in that process.”

Download the full report at: www.aggreko.com/netzero
GETTING TO NET ZERO: WHAT DOES THAT LOOK LIKE FOR YOUR BUSINESS?

Helen Troup, Principal Consultant at Avieco

When you’re getting to Net Zero carbon emissions by 2050 – a great ambition and the kind of sustainability leadership for which we’ve been calling for decades. But it’s a huge challenge, and currently, our practice and policy mean we are still miles off achieving our national objectives.

Climate change is the biggest threat we face and achieving Net Zero will be tough. We will need all the technological solutions available to us to reduce emissions, capture atmospheric carbon and adapt to climate change impacts. We also need national & international political backing & collaboration and a massive increase in verified environmental offset projects.

But can you make a Net Zero commitment yourself – and achieve it? What does Net Zero mean for an organisation like yours?

I’m convinced that businesses and organisations can go Net Zero – but you need to go into it with your eyes open. Clearly no one organisation will be able to adopt all the technologies, lobby for policy, and plant enough trees to offset their own emissions. Your ability and appetite for any change will depend on the nature of your business and operations.

The only public sector organisations to reduce their energy emissions – sometimes up to 20%.

THE CHANGES WE NEED TO MAKE

Now you need to act. Getting to Net Zero is going to require all of us to make changes – personally, organisationally and nationally. Each scope offers different opportunities to cut carbon.

We will be talking about Net Zero from different angles and perspectives. In the first series, we’re going to explore each different scope to understand what impacts you have and what you need to do.

Below are some suggestions about how you can make your buildings more sustainable, increase energy efficiency, change or replace operational equipment, and reduce transportation emissions.

Making Your Buildings More Sustainable

I work with a wide variety of organisations to reduce their energy consumption and energy efficiency is always the quickest and cheapest way to cut emissions. If you are looking to reduce your scope 1 & 2 emissions, consider your building energy use. This could be building fabric measures to reduce heat and cooling loss, or servicing or replacing the boilers and chillers themselves.

Green tariffs are a good way to go. Ensure your utility provider has a green tariff that is backed by a guarantee of origin so you’re greening your electricity – or choose a supplier with their own generation asset. Businesses

Quick Hit on Scope 2 Emissions

Green tariffs are a good way to go. Ensure your utility provider has a green tariff that is backed by a guarantee of origin so you’re greening your electricity – or choose a supplier with their own generation asset. Businesses

Reducing Transport Emissions

If you have company vehicles, what vehicles do you choose?

Employees might like a free rein, but that can mean that your fleet ends up being more energy-intensive than it should be. One way to lower your emissions is to work with your lease company to switch to vehicles with high MPG. You should also be thinking about what you choose – there is an increasing pressure to improve air quality as well as reduce carbon emissions, so start the transition to hybrid and electric vehicles as soon as you can. You won’t be able to buy new petrol, diesel or hybrid cars in 15 years. There are issues about the range and also charging infrastructure, so again, this won’t be suitable for everyone immediately. But you will need to work out your disposal strategy for diesel vehicles – they’ll soon be stranded assets if they aren’t already. Beyond this, check up on maintenance processes and cleaning regimes – maintaining tyre pressure has a direct impact on MPG. You could look at a Power Purchase Agreement with a renewable generator directly if you can take a longer view of risk and return.

But in the end, you will need to work out whether it is all worthwhile and if it is something you can do. If it isn’t, then you may need to work out your disposal strategy for diesel vehicles – they’ll soon be stranded assets if they aren’t already.
AI IN BUILDINGS – THE VISION AND THE REALITY

Henry Lawson BSRIA

BSRIA’s latest research into Building Automation Controls markets (BACS) has been published in February 2020. It confirms the growing importance of software in buildings with Artificial Intelligence (AI) playing a particular role.

What do we mean by AI in buildings?

The term artificial intelligence (AI) tends to rear up in almost any current discussion about how to solve human, social or technical problems. While AI is almost as hard to define as intelligence itself, it typically involves “learning”, finding patterns and correlations and extrapolating from these. More advanced AI can formulate hypotheses which can then be validated. The results can range from relatively simple predictions, such as when I am most likely to want the heating to be on in my house, to highly complex ones involving a whole “world view”.

While the concept of AI has been around for more than 60 years, it is the combination of cheap, intensive processing power, almost unlimited data storage and cloud-based, reliable transmission of data that has made it a concrete and practical presence.

Buildings and their systems are clearly obvious candidates for AI. They are often large and complex and interact closely with the people and with activities inside them as well as with the wider outside world in all kinds of ways, in a manner that can change radically over time.

Buildings are also heavy users of energy and integration of AI with the physical world is likely to change what we can do with these old-fashioned systems such as heating, lighting or security. As a result, there will be less need for FMs to spend their time on the front-line, something that can be a drain on resources, particularly if your business is spread over multiple sites. Facilities management will become data-driven, enabling FMs to take a predictive, proactive approach, rather than continually reacting to situations.

Buildings of the future will be connected and automated, meaning the role of the FM becomes less hands-on and more all-seeing, all-knowing. With the wide range of data made available by IoT and sensors they will be able to plan and predict in a way that was impossible before.

There are three key areas where IoT and sensors will become commonplace for building automation, look for BSRIA 2020 update on its well-established BACS reports.

Unfortunately, one of the biggest changes in business in the last five years is that employees are working in a more flexible way, which monitor temperature, CO₂ and humidity, providing a comfortable working environment.

Whether your industry and whatever the size of your business it unlikely it will remain untouched by smart technology, during the course of the next decade. As technology develops it is likely to become cheaper and more accessible to all, with smart sensors and IoT systems no longer being the preserve of large corporates.

www.pressac.com
Chris Goggins of Rinnai looks, in detail, at the future of energy supply in the UK with some of the likely outcomes and possible scenarios in response to the inevitability of changing consumer habits and behaviour in the face of the urgent need to conquer climate change.

THE ENERGY QUESTION IS NOW A 'TRILEMMA'

There is a consensus that climate change must be halted now by a whole raft of changes to our behaviour and habits unless we wish to pay the price of dramatic global consequences.

Climate change affects all of us and unless we wish to see our children and grandchildren living in a world that could be the Switzerland of the future, we need to accept the logic that even fake news on Twittering can carry on Twittering.

This article identifies the three main emerging themes of the energy trilemma within the UK and critically discusses the three main elements of the energy trilemma:

- energy security
- sustainability
- affordability

66% of energy used (officially verified figures) domestically in the UK is produced in the UK. This supports the view that the UK heating industry and the UK government have a vested interest in ensuring the stability of the energy trilemma.

There appears to be an urgent need for awareness campaigns that aim to change our perception and habits of using energy in the home environment and to encourage homeowners to adopt more sustainable habits in changing the energy consumption behaviors of consumers nationwide. What is needed is authoritative evidence from other areas of the globe that change can happen and how best to effect the transition. This presents the government with an opportunity to take the lead in promoting and facilitating a change in the way that energy consumption is perceived and utilized.

Changing energy consumption behavior is crucially important if the UK are to produce ‘net zero’ emissions by 2050 and has been described by (Thaler and Sunstein, 2008, pp. 119) as ‘Nudge’ techniques are positioning government, experts, manufacturers and consumers towards energy efficient and environment friendly products that can boost demand for HVAC equipment in coming years. The global HVAC equipment market is expected to increase with a CAGR of 6.5% over the forecast period of 2019 to 2027. The Asian region is the most promising region as it is expected to benefit the most in coming years in its push towards a high-growth economy.

The UK government has taken a significant lead in campaigning to improve energy efficiency in energy consumption behavior. In the UK, 10% of the homes are heated using gas and the remainder are heated by electricity. The energy regulator has stated that the cost of energy has increased by 10% in the last year, with a further increase expected in the coming decade (DECC, 2012). This presents the government with an opportunity to take the lead in promoting and facilitating a change in the way energy consumption is perceived and utilized.

The energy regulator has stated that the danger of a national gas supply failure in the UK is for heating, so both the government and the energy regulator have stated that the cost of energy has increased by 10% in the last year, with a further increase expected in the coming decade (DECC, 2012). This presents the government with an opportunity to take the lead in promoting and facilitating a change in the way energy consumption is perceived and utilized.

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How smart hybrid heating systems can help RSLs play a crucial role in reducing carbon emissions

Ilan Rose, professional services director at PassivSystems

Registered Social Landlords (RSLs) have a significant role to play in helping the UK reach net-zero emissions by 2050. To do this, they need to find an affordable way to retrofit existing properties with low-carbon heating, without compromising comfort or hiking up bills for economically vulnerable tenants. The Future Homes Standard requires the installation of low-carbon heating in all new-build homes in England by 2025, with similar rules proposed for Scottish and Welsh homes by 2025, with similar rules proposed for Scottish and Welsh homes by 2025. and, as yet, the government has not announced if – or how – it will replace the subsidy. Savvy landlords are looking to make changes to their heating systems while incentives are still available.

A smarter way to switch to low-carbon heating

Hybrid heating systems can move to low-carbon heating than all-electric systems to automatically use the grid with a hybrid, dual-fuel approach to low-carbon heating can lead to valuable additional income for RSLs. This opens up an opportunity for RSLs to benefit from the financial value inherent in the demand response market. By using smart, integrated technology to dynamically switch between the use of electricity and gas, smart hybrid heating systems turn homes into ‘peak shaving’ plants – able to reduce the amount of electricity in use when the grid is under stress. This flexibility to support the grid with a hybrid, dual-fuel approach to low-carbon heating can lead to valuable additional income for RSLs.

Hybrid heat and demand response

A typical scenario would see the heat pump warm the house using cheap electricity overnight ready for the morning. Come mid-afternoon, the smart control system call on the gas boiler to quickly increase heat in the property. During early evening, the smart control system can switch between the gas boiler and electric air source heat pump to avoid adding to peak electricity demands on an overloaded grid. This shift of electricity use away from peak times and peak prices helps residents to reduce their energy bills and improves grid stability.

A smart control system, developed by PassivSystems, enables switching between the two heat sources to automatically use the most cost-effective heating mode at any time of the day or night. The control unit uses machine learning technology to understand the thermal characteristics of the property and create a mathematical model of the house and heating system. The smart control system combines the thermal model with weather data to choose exactly the right approach to keep the heat pump running gently while ramping up gradually throughout the night using a dynamically controlled flow temperature. This allows the house to cool slightly, reducing thermal losses, while keeping the heat pump running at the most efficient temperature. Machine learning enables the system to automatically tune the algorithm to the properties of the house. So, for example, the system would choose continuous heating for a slow responding system such as underfloor heating or turn off during the night if the house loses heat quickly. There are no further modifications or interventions required in tenant properties.

The strategy for controlling a hybrid heating system is to utilise the boiler to provide bursts of heat to warm the house up quickly, while the heat pump provides temperature maintenance and a base load during periods where a fully warm house is not required. Smart hybrid heating is proven technology that is in use today. A more affordable and less disruptive way to move to low-carbon heating than all-electric heat pumps, it can also unlock the value of demand response capacity in domestic homes – providing the means for RSLs to fund their transition to low-carbon heat.

www.passivsystems.com
HOW UK UNIVERSITIES CAN MEET CARBON REDUCTION TARGETS

Business Development Manager – Corporate Solutions at Mitsubishi Electric Living Environmental Systems UK

With students undoubtedly driving the conversation on climate change, it was a surprise to see that only a third of UK universities are expected to fall short of meeting 2020 carbon reduction targets.

With the year of reeling up soon, it appears just 49 of 154 institutions are on track to meet this target.

These figures come from the recent People & Planet University League table which monitors carbon management and reporting targets as well as actual performance in reducing emissions.

Worryingly, some universities don’t appear to have invested at all and struggling on top of this are those with several institutions achieving 0% in their carbon reduction and reporting no commitment to divesting from fossil fuels.

The table also shows that just eight universities have a policy to divest from fossil fuels. The trend towards divesting is on the rise and many investors are recognizing the opportunity to make a profit while supporting positive climate action.

Natural gas was highlighted in 2011, requiring universities to develop strategies and investment in renewable energy. Thus it seems many universities are arguably left without real guidance or incentive on top of this and urgency to make bold changes. Add a complete commitment to reducing emissions, which naturally removes the possibility of offsetting.

Office for Students, who replaced the Higher Education Funding Council for England, developed a carbon reduction strategy back in 2011, requiring universities to develop strategies to work across interdisciplinary departments, drastic, bold decisions are what we want from our centres of inspiration and innovation. No doubt this is what students who are passionate about advancing their career want also.

The University of Manchester, the University of Sussex and Cardiff University name to name a few.

The innovative developments demonstrated by numerous universities are highly encouraging, showing that where our institutions are prepared to make drastic decisions, significant carbon-reduction targets are being made.

And with the weight of intellectual resources held in UK universities, and the significant innovations being made, it promises to work across interdisciplinary departments, drastic, bold decisions are what we want from our centres of inspiration and innovation.

The reason for the increase in popularity is that continuous flow heating systems are proven to be more energy efficient than conventional ones and are the preferred method of hot water provision.

Competitively priced, the units offer all technological advances and innovations, all at a similar cost to specification competitor models.

The University of Manchester, The University of Sussex and Cardiff University, for example, have installed smart technology, around the university which essentially adjust energy use in rooms to solve the issue of heating being left on in an occupied room, or when windows are left open whilst the heating is on.

This would be an excellent initiative to implement in student halls, considering accommodation is often a large part of institutions’ total energy consumption.

Another easy win for universities would be to reassess air conditioning systems, and where possible, upgrade to systems which use lower Global Warming Potential (GWP) refrigerant R32. Such air conditioning systems use up to 20% less refrigerant than higher GWP refrigerant equivalents, making them more efficient.

And with more efficiency comes lower carbon emissions and lower energy costs.

Alternatively, institutions could invest in Hybrid VRF systems which limit the amount of refrigerant being used by using water as a replacement in occupied spaces, making them a simple way to stick within the carbon emission targets.

International travel also hinders universities ability to reduce carbon emissions. The trend towards collaboration between academics from different countries, as well as the growth of the conference scene has lead to a significant increase in plane trips. Of course, this collaborative effort is excellent and a sign of progression in UK education.

But video-conference technology has come on leaps and bounds and could be another easy win for carbon reduction.

POSITIVE STEPS

Of course, we can’t ignore the positive steps that have already been taken.

We only have to look at the number of universities declaring a climate emergency to realise which is been taken seriously.

The University of Manchester, The University of Sussex and Cardiff University name to name a few.

Promisingly, 76 universities have announced some form of divestment from fossil fuels, meaning greater investment in sustainable methods of heating and cooling.

The University of Northern’s new Wateside Campus, for example, will generate its heating and hot water via an on-site energy centre incorporating woodchip biomass boilers and a combined heat and power system.

The University of Nottingham similarly is making use of a range of renewable technologies across its estate to provide heating and hot water, including air and ground source heat pumps, solar electricity and biomass boilers.

Meanwhile, the University of Hertfordshire secured a BREEAM Outstanding rating for their zero-carbon accredited student accommodation site.

The student village utilises a biomass fuelled energy centre in order to generate energy for a large part of the campus.

Impressively, the University of Gloucestershire, who topped the People & Planet league table announced a total divestment from fossil fuels with an immediate effect back in 2018, as well as an overachievement of a 46% reduction in their carbon emissions, despite having expanded their estate! These reductions were a result of switching boilers to cleaner fuels, introducing LED lighting, using smarter building management and controlling and insulating. Another huge success.

The University from its inclusion to committing sustainable development into their courses, with their goal to change the ‘brain print’ of their students and graduates.

CONCLUDING REMARKS

The innovative developments demonstrated by numerous universities are highly encouraging, showing that where our institutions are prepared to make drastic decisions, significant carbon-reduction targets are being made.

And with the weight of intellectual resources held in UK universities, and the significant innovations being made, it promises to work across interdisciplinary departments, drastic, bold decisions are what we want from our centres of inspiration and innovation. No doubt this is what students who are passionate about advancing their career want also.

There are quick wins to be had for honing in on heating and cooling systems, which has been a significant focus for several universities for the past many years, these changes are coming too slow and without urgency.

However, with a lack of government support and increasing pressure on university facilities, is it any surprise that real progress is being slowed down by expectations these institutions have to the answers immediately, perhaps we should be doing more to incentivise universities, especially those that are manufacturing and advisory of point of view.

Climate change is a universal problem, so it lies within universities’ responsibility to offer solutions and advice where practical and possible.

A collaborative response is what will allow universities across the whole, reach carbon reduction targets and is what we hope will be the approach to climate change issues going forward.

www.rinnaiuk.com
HOW TO CUT ENERGY BILLS?
LOOK TO THE ROOF...

William MCDowell, National Business Development Manager for Zenon rooftops at Hambleside Danelaw

THE COST OF LIGHTING

It is accepted knowledge that it costs four times more to light a building than to heat. Light can be the biggest single energy use, as lights are left on whether or not they are needed – even when the building is empty!

On paper it may seem cheaper in capital cost to change internal supplementary lighting to LED, yet upgrading of the rooflight material to optimise natural daylight within will reduce the amount of supplementary electric lighting required for decades to come (modern GRP rooflights are guaranteed for up to 30 years). And, of course, natural daylight is a free resource! Indeed, anecdotal evidence indicates the payback on rooflights versus artificial light is just 10 years in pure energy costs. That does not take into account the benefits in terms of health & wellbeing (including safety) – and improved performance – of the workforce within the building.

THE COST OF HEALTH & WELLBEING

The Energy and Health & wellbeing benefits – as outlined above – also contribute towards BREEAM. The Energy and Health & wellbeing benefits of rooflights contribute towards BREEAM in Mat 01. Further, GRP rooflights with an independently-approved Life Cycle Assessment (LCA) can use that to contribute towards BREEAM in Mat 01.

THE COST OF HEATING

When it comes to heating costs, industrial – i.e. GRP – rooftops are no exception. Depending on the configuration, a U value as low as 0.9W m²K can be achieved, still within the typical configuration of a double skin/ composite assembly within a metal roof.

It is also worth considering that a well-designed building with a good spread of natural daylight will also benefit from passive solar gain that can reduce the demand for space heating for many months of the year.

BREEAM

Developments in production processes now mean that certain GRP rooflights can tangibly contribute an additional 1.5 points towards BREEAM accreditation, alongside the contribution rooflights are conventionally accepted to make.

The points can be achieved in new build, fit-out and refurbishment projects, and are gained specifically in Materials (Mat 02), when the specific GRP rooflight chosen carries an Environmental Product Declaration (EPD). The certification also counts as suitable evidence under Mat 03. Further, GRP rooflights with an independently-approved Life Cycle Assessment (LCA) can use that to contribute towards BREEAM in Mat 01.

THE ENERGY AND HEALTH & WELLBEING

The Energy and Health & wellbeing benefits – as outlined above – also contribute towards BREEAM. The choice will depend on whether to enhance workforce morale and increase productivity (NRM Rooflighting Best Practice Guide 05).

The type and quality of light affects visual comfort, through glare control and reduction of artificial internal lighting, and views out. The type and quality of light affects occupant health & wellbeing too. Equally, the type of light can be used to positive effect in the space below. The type of light is influenced by the rooflight material.

Conventionally, in large logistics or industrial buildings, the choice is between Polycarbonate and GRP (NRM NTD09). Polycarbonate delivers direct light whereas GRP delivers a diffused light. Direct light can cause solar glare and shadowing, which in turn can cause discomfort for occupants. Shadowing is also a safety issue, potentially increasing the risk of trips and falls. The diffused light from GRP rooflights provides more uniform internal light by dispersing that light over a wider area further reducing the supplementary artificial light requirement.

CARBON EMISSIONS

According to the Technology Strategy Board, the construction, operation & maintenance of the built environment accounts for 45% of total UK carbon emissions. New technologies in the manufacturing process mean that not all GRP rooftops are the same, with some versions using a stronger GRP substrate that is lighter in weight and has up to 40% less embodied carbon than traditional GRP rooflights.

Insulating cores vary too: honeycomb cellulose acetate offers lower embodied energy, increased light transmission and is biodegradable at end of life.

MAKING THE MOST OF ROOFLIGHTS

According to the Chartered Institute of Building (CIOB), 70% of the buildings currently standing will still be here in 2050. The challenge therefore lies as much in retrofitting existing building stock.

It is easier than you may think to address the rooftops. Depending on the area of operation/activity within the building, it is common to continue to use the building whilst the rooflights are replaced or upgraded. New technologies in the manufacturing process mean that not all GRP rooftops are the same, with some versions using a stronger GRP substrate that is lighter in weight and has up to 40% less embodied carbon than traditional GRP rooflights. Insulating cores vary too: honeycomb cellulose acetate offers lower embodied energy, increased light transmission and is biodegradable at end of life.

Of course, depending on the size (m²) of the roof, it may be a significant decision to make as to whether to upgrade/refurbish. It is possible to commission a rooflight manufacturer to evaluate the existing and provide a light and thermal transmission report in advance. Thus an informed decision can be made about the investment. Upgrading may involve re-sheeting, overcladding, or complete rooflight replacement. The choice will depend on a whole host of considerations in terms of aims and objectives balanced against practicalities of disturbance to and continuation of operations.

The best thing to do is research thoroughly, and utilise expert advice.

A range of useful technical guidance can be found here: https://www.hambleside-danelaw.co.uk/downloads/
WATER CONSERVATION – BE PART OF THE SOLUTION, NOT THE PROBLEM

With the shortfall in freshwater supplies already reaching crisis level in some parts of the world, and the Environment Agency warning that the UK could run short within 25 years, water conservation is one of the major challenges facing companies across the industrial spectrum. But environmentally sustainable products are available that can help companies become part of the solution, says David Amory, of AESSEAL.

The water crisis is playing out on a global scale. The UK Environment Agency has warned that England is set to run short of this vital resource within 25 years, while at a global level a number of major cities have been at risk of hitting ‘Day Zero’ – when the taps run dry.

While rising domestic water demands can contribute significantly to water stress, and climate change and population growth cannot be ignored as significant factors in the crisis, the fact remains that agriculture and industry withdraw the overwhelming majority of the world’s freshwater.

The shortfall must therefore involve collective and concerted action at every level. Many organisations have made a commitment to reducing their environmental footprint by embedding sustainability targets in strategies and appointing sustainability personnel to senior positions. However, this is not always backed up by investment in operational changes to tackle excessive water consumption.

In its recent report Treading Water the CDP, the global organisation which drives action by companies and governments to safeguard water resources, presented some starkly contrasting facts: while the number of companies setting targets to reduce water withdrawals doubled between 2015 and 2018, in that same period there was an almost 50% rise in the number of companies reporting higher water withdrawals.

So, what might incentivise senior management to make the leap from ‘good intentions’ to a proactive, effective sustainability programme? They could consider:

- Eliminating all water waste beyond the absolute minimum required for the efficient functioning of rotating equipment and the process
- Eradicating the leakage that leads to product dilution
- Improve reliability and put an end to unscheduled downtime
- Making significant energy savings
- Achieving swift return on investment and long-term operational savings

This can be achieved through a simple upgrade to advanced dual mechanical seals and seal support systems on rotating equipment such as pumps. Retrofitting legacy equipment is not an issue.

The only really difficult part is changing your mindset.

WATER-SAVING SOLUTIONS

Traditional gland packing and single mechanical seals are common root causes of excessive water use in manufacturing. Both often require substantial quantities of clean, cool water to provide lubrication and prevent overheating, yet even in optimal environments they display serious operational flaws. Leakage is a standard feature, causing product loss and contamination. Maintenance is intensive and mean times between failure (MTBF) short. But their greatest drawback is the sheer volume of seal flush water that is often injected from an external source to provide this cooling lubrication, the vast bulk of which goes down the drain or is evaporated off at the end of the cycle.

In a typical application, where water is measured for one minute, around 6 to 12 litres (1.6 to 3.17 gallons) of flush water is required. In continuous operation that amounts to roughly 3.2 to 6.3 million litres (0.8 to 1.6 million gallons) per year, for each seal (or pump).

Yet simply replacing gland packing or single mechanical seals with modern double mechanical seals and a water management support system will virtually eliminate leakage, improve pump reliability and reduce the amount of seal flush water required to virtually zero.

With dual mechanical seals, one of the two faces seals towards the process fluid and one to atmosphere, with a barrier space between the two. Like single seals, these require a constant, consistent flow of fluid (often water) to ensure the seal faces operate efficiently and dry-running does not lead to seal failure.

This is where the water management support system comes into play. Using a thermosiphon process, the support system supplies clean, cool water to the barrier space between the double seals at a pressure higher than the product pressure, ensuring a consistent, stable and clean fluid film keeps the seal faces cool and lubricated. This flush water is constantly recycled, flowing across the seal faces in a continuous loop and reducing leakage to the absolute minimum. Roughly one teaspoonful of water a day is lost, in the form of vapour.

Dual mechanical seals can meet the requirements of almost any application and can withstand extreme temperature and pressure fluctuations. There is virtually no industry for which this type of water saving technology is not suitable.

Even companies with a strong commitment to the International Standards Organisation ISO-14001 Standard for environmental management systems and ISO-50001 Standard for energy management systems must keep a close eye on the bottom line.

But by installing the correct dual seal and support system, from an annual operational budget you could subtract:

- The cost of energy to heat, cool or evaporate external flush water
- Equipment costs for the frequent repair or replacement of gland packing, failed bearings (caused by water ingress as a result of seal leakage) and, in worst-case scenarios, pump shafts or sleeves damaged by the friction of gland packing
- Routine and unscheduled maintenance engineer costs – this sealing technology is almost maintenance-free and causes no damage to bearings or pump shafts
- Efficient charges for discarded water

These savings comprehensively refute the practice of continuing to fit the same old sealing technology simply because it was specified by the original equipment manufacturer (OEM). The reality is that some seal suppliers offer cheaper bulk sales to OEMs, but then make up for that loss leader by selling replacement seals to end-users at a much higher price, so any perceived saving is questionable in the long-term.

There are clear operational and financial benefits to upgrading to more environmentally sustainable sealing technology. Less easy to calculate is the enhanced reputation that comes from being able, not just to declare a commitment to water conservation, but to evidence it.

www.aesseal.com
How to Achieve CHPQA Assurance to Maximise CHP Financial Incentives

Achieving the CHPQA quality mark is a vital step in maximising savings from CHP technology and avoiding rising energy costs, advises Hugh Richmond, CEO of Edina.

The unlock additional financial benefit from Combined Heat and Power (CHP) organisations must make sure their projects meet the standards for Good Quality CHP under the Combined Heat and Power Quality Assurance (CHPQA) programme.

CHP, also known as cogeneration, is a highly efficient process involving the simultaneous production of electricity together with heat, which is captured rather than being wasted, as is the case in traditional power generation.

For suitable sites, CHP is one of the most effective ways of reducing energy costs. It can deliver huge financial savings – resulting in rapid payback on investment (often within 2-3 years). It also offers a cost-effective way to reduce carbon emissions, while helping to improve energy resilience.

About CHPQA

CHPQA is a government initiative that provides a model for assessing and certifying the quality of CHP in the UK. The cogeneration assessment standard was devised in 2001 and aligns with the requirements of EU Directive 2012/27/EU on Energy Efficiency and UK Treasury’s 2008 White Paper on Heat and Power Efficiency. Under CHPQA, schemes are assessed based on their efficiency and environmental performance. If a scheme is certified as ‘Good Quality CHP’ then it will qualify for a range of financial incentives, provided that certain standards are achieved.

CHP Financial Incentives

Given recent huge hikes in the Climate Change Levy (CCL) tax, one of the most rewarding incentives is a partial exemption from CCL, which has been charged at much higher rates since 2019. Other major financial benefits include qualification for Enhanced Capital Allowances / Annual Investment Allowances and reduced business rates. Organisations must achieve CHPQA assurance to qualify for all three of these incentives.

1. Climate Change Levy (CCL)

The CCL is a non-domestic environmental tax on electricity, gas and solid fuels. It is designed to encourage organisations to be more energy efficient. CHP schemes that are recognised as ‘Good Quality’ under the annual CHPQA assessment that consume the electricity they generate on site are exempt from CCL payments on the gas used to generate the power.

2. Enhanced Capital Allowance/Annual Investment Allowance

Enhanced Capital Allowances (ECA) encourage investment in energy saving equipment by enabling the cost of investment to be written off against taxable profits. This scheme closes at the end of the 2019/20 financial year, but businesses can still benefit by claiming the Annual Investment Allowance (AIA).

3. Business Rates

Organisations using ‘Good Quality’ CHP to meet their on-site energy needs may benefit from preferential business rates.

Rising Cost of CCL

For many years the CCL rate increased only slightly year-on-year. This changed in 2019 when the government abolished the CRC Energy Efficiency Scheme (formerly known as the ‘Carbon Reduction Commitment’). The ‘lost’ CRC revenue has been offset by huge increases in CCL rates. In 2019 there was a 67% CCL rate increase on natural gas (from 0.203 pence per kWh to 0.339) and a 45% increase on electricity (from 0.583 pence per kWh to 0.847).

From April 2020, the CCL rates will increase on gas and decrease on electricity so that, from 2021, CCL rates on gas will be equal to 65% of the rate for electricity. This makes CCL exemption on natural gas fuelled CHP systems increasingly attractive.

Light energy users and charities do not have to pay the Climate Change Levy (CCL). Some CHP owners can also gain an exemption if they negotiate a Climate Change Agreement, but most other organisations are liable for this significant tax. Making use of efficient CHP systems will meet a certain power efficiency threshold for their installed capacity, relative to typical values for traditional production processes and machinery. The full list of QI indicators is included in the CHPQA Standard.

How to Qualify for CHPQA

The qualification process for CHPQA is a desk-based, self-assessment exercise. There are several routes to completion, with the appropriate route determined by the complexity of the CHP project and whether it is an existing or new scheme. A scheme is defined as simple if it meets all of the following criteria:

- Generating capacity < 2MW
- Single reciprocating engine
- Single conventional fuel used
- No heat rejection facility

Those responsible for simple schemes will have to follow the same basic process as complex schemes, but the forms required at each step are shorter and easier to complete.

Good Quality CHP

To qualify under CHPQA as ‘Good Quality’, operators must provide evidence that their CHP system is running at energy efficiency. At a minimum, the project must be more efficient, in terms of heat and power, than alternative energy options. Each CHP system will be evaluated based on data that confirm the fuel used, power generated, and heat supplied.

The CHPQA Standard sets out the definitions, criteria and methodologies for the operation of the programme. It should be interpreted alongside the more detailed CHPQA Guidance Notes, which provide compliance information, along with notes on how the Standard will be interpreted by various government departments and agencies.

The CHPQA Standard uses two key parameters to assess CHP performance. These are:

- Existing systems must achieve a minimum QI of 100, and a minimum power efficiency of 20%.
- New systems must achieve a minimum QI of 100, and a minimum power efficiency of 20%.

4. Power efficiency is a critical annual power output of a scheme, divided by the total annual fuel energy input. Schemes must meet a certain efficiency threshold for their installed capacity, relative to typical values for traditional production processes and machinery.

The full list of QI indicators is included in the CHPQA Standard.

Steps to CHPQA Success

As long as your site is suitable and your CHP system is correctly specified, installed and maintained, your CHP system should meet the performance requirements of the CHPQA programme. To meet the ‘Good Quality’ CHP classification it is important to consider the following:

- Generating capacity greater than or equal to 2 MW
- Prime mover, not a single reciprocating engine
- Non-conventional fuel used
- Fire boiler(s) included within scheme boundary

CHPQA assessment needs to be completed once each year to ensure that a CHP project is continuing to perform efficiently. Because previous years’ performance data is available for existing CHP schemes, there is a slightly different assessment process for new and existing schemes.

In order to claim the Climate Change Levy (CCL) exemption on ‘Good Quality’ CHP fuel and electricity, and the Annual Investment Allowance on eligible capital expenditure, it is necessary to apply for a Certificate of State of CHPQ (CSP Certificate). This can be requested by completing the appropriate section of the CHPQA form.
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WINDS OF CHANGE: EMBRACING THE OPPORTUNITY OF GROWING OFFSHORE SECTOR IN THE UK

Alexandre Golisano, Strategy Director, Power Systems at Schneider Electric

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The UK, the past few years have seen an increase in an array of extreme weather events. Hotter, drier summers and wet, stormy winters are placing more strain on our energy infrastructure and our vital industries. Back in 2018, the Environment Agency estimated that the economic damage of the 2015-16 winter floods (the most extreme flooding on record at the time) was around £1.6 billion. With heavy delays hitting the entire country, the beginning of this year in the form of storms Ciara, Dennis, Ellen and Francis, illustrating the dire need to climateproof our infrastructure and the environment as it’s effectively forced into ever-sharper definition.

Growing pressure is being applied by consumers and governments alike to avert the climate crisis by moving away from our traditional ‘dirty’ fossil fuel power sources towards low carbon solutions:

CLIMATE CHANGE IS (STILL) AN ENERGY PROBLEM

Although the UK and its like-minded international allies have been working towards targets to limit global warming for many years, the intergovernmental panel on climate change has agreed that our definition of a ’safe’ limit of climate change needs to change. With sea-level rise and the global temperature increase_c to cut as set out by the Paris Agreement, publicised for many years as the most progressive global climate change target, is now being revised. Instead, 1.5°C is the absolute maximum that can be mitigated in order to prevent numerous low-lying countries (such as the Netherlands) from being inundated as sea levels rise.

But seeing the climate crisis without also recognising the economic opportunities of building a more sustainable world would be a mistake. While we face significant challenges to limit our greenhouse gases and our contribution towards global warming, the opportunity to take a leading role in a new emerging ‘green economy’ approach. This is where the windy weather of the British Isles comes into play.

THE UK IS TAKING ACTION: BUT GOALS FOR THE FUTURE ARE AMBITIOUS

The UK energy sector in particular has already made significant strides towards decarbonising. Energy supply was the single largest generator of greenhouse gas emissions producing 242.1 million tonnes of CO2 in 1990, but by 2018 had reduced this by an impressive 59%

However, the UK is now the first country which has committed to achieve net zero emissions by 2050 – meaning that the government will need to rely on offshore power in their strategy to reach this goal.

To achieve this, the renewables sector in the UK is growing fast, supported by both private investment and the government’s introduction of Contracts for Difference in 2014-15, which have been successful in incentivising renewables projects by protecting businesses from volatile wholesale prices and guaranteeing a return on investment.

According to Renewables UK, the UK’s current operational capacity is 14GW, and offsho is over twenty two gigawatts. This is enough energy to power almost 16 million homes. One of the low carbon sources most suited to our current climate and environment, offshore wind already contributes a significant amount of renewable energy with 8.5GW installed, a figure which is forecast to increase to 38GW in 2030 and 75GW in 2050, with several new projects auctioning in the works.

While this target sounds ambitious, innovations both at home and in the global markets are supporting this boom in offshore wind power. The size of turbines is increasing, meaning that more power can be generated from each unit installed in a highly efficient way. With the number of ongoing projects in the UK also scaling rapidly, the cost of investment in the sector has dropped by approximately 40% in just the past two years. As a result, the cost of the electricity generated becomes more affordable, projected to drop below electricity wholesale prices in 2024.

Demand on the consumer side for green and affordable energy is strong, however the unpredictable nature of wind energy supply poses an obstacle to wearing our grid off ‘switch on’ energy sources.

Built for a traditional one-way power flow in a passive network, our grid is working on building up the digital capacity required to manage the reality of distributed renewable energy generation. The UK has adapted significantly since the days of coal-fired power, and improved infrastructure must be implemented to suit our new approach to energy.

WHAT’S NEXT FOR OFFSHORE IN THE UK?

Currently, the flow of data in our power grid is inconsistent across the country. Forty per cent of the power generated through renewables in the UK goes directly to Distribution Network Operators (other than the Transmission Network Operator). This creates a major obstacle for National Grid to embrace active management and balancing the grid’s load effectively, something which is essential to incorporating the variable output of renewable sources into our energy mix to deliver a reliable supply for both consumers and industry.

Data is fundamental for the power sector’s economy to unlock system and consumer benefits, flexibility, resilience and reliability in the most cost effective way.

In addition to improving reliability of the UK power supply, keeping up with innovation in the offshore wind sector is the best way for the UK to maintain its lead in this field. As the floodgates open in 2020 to 2023, with the number of turbines being installed in the UK also scaling rapidly, the cost of investment in the sector has dropped by approximately 40% in just the past two years. As a result, the cost of the electricity generated becomes more affordable, projected to drop below electricity wholesale prices in 2024.

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HYDROGEN IS THE SIMPLEST AND MOST ABUNDANT ELEMENT IN THE UNIVERSE, BUT IT EXISTS AS A GAS BY ITSELF – IT MUST BE SEPARATED FROM OTHER ELEMENTS. HYDROGEN CAN BE PRODUCED BY THE ELECTROLYSIS OF WATER, USING AN ELECTRIC CURRENT TO BREAK WATER INTO ITS COMPOUNDS.

When hydrogen is produced through renewable energy generation, such as wind turbines or solar panels, it creates what is known as green hydrogen.

A mix of technologies are essential for meeting our carbon emissions targets.

Green hydrogen will play a major role in providing an alternative to fossil fuels, as its production does not generate any harmful emissions. In fact, the UK Government has already invested heavily in green hydrogen projects.

H2, a wind farm 85 kilometres off the coast of Yorkshire, is planned to be fully operational by 2022. Boasting a capacity of 1.4 gigawatts (GW), the wind farm will provide power to over 1.3 million homes.

While these new farms sound simplistic, they do bring complications.

Managing the electricity generated to match the demand is becoming more complicated as more generation sources are added. Local storage can help with this, whether it be large batteries or green hydrogen. They also help increase the capacity factor storing the energy when the demand is not there. It is best to integrate the renewable power generated into the UK grid system.

GREEN INTEGRATION

Ensuring the relationship between the grid and renewable generation relies on gathering data. Integrating more volatile forms of renewable energy, like green hydrogen, only heightens the complexity of this infrastructure, creating new challenges of balancing supply and demand and energy storage.

As the UK invests in renewable generation sites, grid operators must invest in software to manage their integration.

COPA-DATA’s zenon can be used to integrate green hydrogen into both the electricity and gas supply. As smart grid software, the system continually monitors operations from the energy grid and wide-spread generation assets, identifying where energy is being generated and where it is required.

The energy storage process can be automated. Meaning that hydrogen stored can either be used for the network when needed or converted back to electricity if demand shifts.

This stream of demand and supply information is just one small fraction of the sheer amount of data that the software can gather from the grid and generation. With the zero energy Edition, it is possible to create an intelligent network, combining renewable generation data with grid demand and individual substances, sharing accurate forecasts of gas and electricity demand.

Investment in renewable energy is essential if we are going to be an energy problem, as it exists as a gas by itself – it must be separated from other elements. Hydrogen can be produced by the electrolysis of water, using an electric current to break water into its components. When hydrogen is produced through renewable energy generation, such as wind turbines or solar panels, it creates what is known as green hydrogen.

A mix of technologies are essential for meeting our carbon emissions targets.

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While these new farms sound simplistic, they do bring complications. Managing the electricity generated to match the demand is becoming more complicated as more generation sources are added. Local storage can help with this, whether it be large batteries or green hydrogen. They also help increase the capacity factor storing the energy when the demand is not there. It is best to integrate the renewable power generated into the UK grid system.

Offshore wind is rapidly emerging as a key potential power source for the production of green hydrogen. What will soon be the world’s largest offshore farm, Hornsea Project Two (HP2) in the North Sea, was awarded £7.5 million by the UK Government, bolstering Britian’s efforts to generate more renewable power.

In this article, Garry Forfar, Regional Manager for industrial software supplier COPA-DATA, explores the future of green hydrogen and the complexity of its integration onto the UK’s power grid.

EM Magazine • April 2020
The climate crisis is undoubtedly the most urgent issue of our time, as we see the recent floods devastating communities across the country. Globally, we recognise the need for immediate action and, as a consequence, grassroots change. There has never been a more pressing time for individuals to take action as we begin to witness the effects of climate change in the form of rising temperatures, extreme weather and alarmingly unpredictable patterns. So, what can we do to help?

The long-term solution is to, as a nation, reduce our carbon emissions. Within the UK, the public sector is a substantial consumer of energy and has a responsibility to become leaders of change, by making as many of its buildings as efficient as possible. Schools, as an example, are a major consumer of energy, being the hub of extracurricular activities and community events during evenings and weekends. Taking a holistic approach to transforming a building by installing multiple energy efficient and renewable measures is one of the key solutions to ensuring they are running in the most cost-effective way, at the lowest possible expense to the public purse.

Northfleet School for Girls in Gravesend, with the support of Kent County Council, has made some bold changes and taken responsibility for its carbon footprint. In 2018, Northfleet made history by implementing amongst one of the largest solar installations in the country and also upgraded their lighting to LED; both projects pioneered internally by the school’s environment team; a group of sustainability-conscious students with a passion for all things green. He involved the team in the project process, with a remarkable result. The financial savings stack up significantly, making a strong case for other schools to apply for funding. The school was awarded a loan amount of £129k for the solar panels, which will repay through the savings in eight years and save a total of £16k annually and £381k over the lifetime of the project. Meanwhile, the lighting upgrades were delivered through a £17k loan and will repay in just under four years, saving the school over £44k annually and £167k over the lifetime of the technology.

Andy, who is from an engineering background, highlights that being able to see the savings achieved in real time has made for a compelling comparison of the cost savings against previous years. Northfleet School has a live stream feed of the data on a TV in the school corridor, meaning that students and staff alike can see first-hand the savings stacking up; a visual aid for science, technology and maths lessons.

There is a need for us all to act before it is too late. Salix is looking to work strategically with schools to drive down their energy bills through a holistic approach, making them as efficient as possible. To talk to the dedicated team at Salix to find out how they can help your school, please contact schoolsapplication@salixfinance.co.uk

RENEWABLE ENERGY

SCHOOL INSTALLS AMONGST ONE OF THE LARGEST SOLAR PANEL ARRAYS IN THE COUNTRY

In 2018, Northfleet made history by installing the technologies, the school’s Finance Manager of Northfleet, says, “Kent County Council has already made for a ‘compelling comparison’ that tax benefit, then you have even more demand for chargepoints. However, organisations who offer company cars for their employees will have to manage the possible impacts of the BIK changes on a practical level and should start to prepare for them. If companies start to see the shift from current petrol and diesel company cars users into electric vehicles, they’ll have to investigate the possibility of installing more chargepoints at work. In addition, if employees shift from cash for car allowances, or are new to the company car scheme, and select an electric car because of that tax benefit, then you have even more demand for chargepoints.

Before making the shift to electric cars, drivers will need to understand the technical specifications, notably battery ranges, to ensure their driving requirements are met, and notify employers of any intention to switch. More EVs will need new chargepoints, and while the public infrastructure is expanding at a vigorous rate, there will be a requirement for more chargepoints at destinations outside of the motorway network. Companies need to assess if they have the space to install new or additional chargepoints – be it standard or rapid – and then implement policies to manage those spaces. The last thing you want is for drivers to hog a chargepoint once they have sufficient power, therefore blocking those who require a full charge.

As well as communicating the availability of chargepoints at the office, policies should also be considered for who gets priority, the cost of charging and ensuring home charging, and the impact this might have on the business. These tax changes will incentivise electric cars, helping the UK and organisations become more sustainable and achieve their net zero targets, but you’ve got to plan ahead to ensure a smooth transition for everyone.

To find out how Cenex can help your business transition to an electric fleet, contact us at info@cenex.co.uk

WILL LOWER EV BIK TAX INCREASE CHARGEPOINT DEMAND AT WORK?

Rob Anderson, Cenex

The uptake of electric vehicles (EVs) has been relatively slow – less than 3% of new vehicle registrations were plug-in vehicles last year. However, this is expected to increase, however, as from 6th April 2020 company car tax on EVs will drop from 16% to 0% for the financial year.

Anything that encourages the uptake of EVs is to be applauded. This change has long been needed as the previous Benefit in Kind (BiK) tax regime didn’t benefit low emission vehicle users. Now there’s a huge amount to gain and more company car drivers are likely to make the switch, if not for the environment then for the cash in their pocket. The savings this brings will be akin to a pay-rise for those already driving an electric company car, while the potential benefits will see many make the switch away from petrol and diesel engines.

Research from DriveElectric shows that eight out of ten business employees who currently opt-out of a company car scheme are ‘likely’ or ‘very likely’ to move back to an electric company car.

Fewer petrol and diesel vehicles on the road is a boost for the environment, as it means less air pollution, better air quality and a significant step on the road to Net Zero. However, organisations who offer company cars for their employees will have to manage the possible impacts of the BIK changes on a practical level and should start to prepare for them. If companies start to see the shift from current petrol and diesel company cars users into electric vehicles, they’ll have to investigate the possibility of installing more chargepoints at work.

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ENERGISING THE PERFORMANCE OF EV INFRASTRUCTURE

According to our latest research, investment in electric vehicles (EVs) by UK businesses is set to increase by almost 50% over the next two years, exceeding £12 billion. 27% of the 200 large businesses we surveyed expected at least a fifth of their vehicle fleets to be electric by 2022. Over the next two years, business leaders said that average spend on EV adoption is expected to amount to 4.5% of annual turnover.

COST PRESSURES

Despite the strong momentum towards EV, the survey showed that cost of adoption is the biggest drawback. Vehicle costs was a chief concern for 44% of all business polled, and of greater concern than range anxiety (42%) or the increased energy costs from charging vehicles on company premises (37%). Businesses emphasised the importance of grant funding and tax incentives to encourage widespread fleet electrification. Inevitably, organisations will significantly increase their total power consumption through EV charging, but it is possible to minimise the financial impact and further increase environmental performance by transforming their energy strategy.

Organisations can reduce the financial impact of electric vehicle adoption by rethinking their sustainable energy strategy says John Hartley of Centrica Business Solutions.

EV adoption requires a new approach to strategic energy planning for businesses and public bodies. To avoid spiralling costs, it is essential to maintain visibility and control over increasing electricity usage.

EXTRA SECURE POWER DEMAND

The need for more electricity to fulfil additional demand from charge points may require investment in new on-site infrastructure to increase electrical supply. This could include upgrades to the grid supply infrastructure, such as an enhanced connection, or the implementation of new on-site generation and storage solutions.

It is essential that the uninterrupted operation of the EV infrastructure is protected. Downtime will have a direct impact on business continuity. The risk, costs and business impacts of a power outage need to be fully assessed and appropriate actions taken to ensure resilience.

ON-SITE ENERGY SOLUTIONS

Installing on-site generation solutions, such as renewables or combined heat and power (CHP), is a proven strategy for increasing on-site power availability, improving sustainability, lowering energy costs and reducing grid dependency. By combining these on-site generation assets with battery storage, resilience and flexibility is further improved. Organisations can ensure a constant power supply in the face of an increasingly volatile grid, rising energy demand and intermittent renewable generation.

Local energy generation and storage also provides an opportunity to earn revenue from power flexibility via lucrative supply optimisation programmes. The potential of using energy stored within EVs to generate income from Vehicle-to-Grid (V2G) initiatives is even more exciting. As such, EV owners and fleet operators can charge their cars during off-peak demand periods, then sell any excess stored power when demand is high and financial incentives are most generous. This is a particularly attractive option for back-to-base fleets, where vehicles may be plugged in for longer periods.

TIME FOR DETAILED PREPARATION

Despite the potential benefits of moving to a distributed energy strategy to support the roll-out of EV charging infrastructure, our survey showed that organisations are under prepared. Although almost half of the businesses surveyed said they planned to install on-site charging points in the next two years, a significant majority hadn’t invested in energy technology capable of generating the electricity needed for vehicle charging. Just 28% were using on-site energy production, such as solar panels.

There is an urgent need for organisations to develop a plan to meet the additional power requirements of providing on-site EV charging. Planning and implementing the complex EV infrastructure for at-work charging or back-to-base fleets requires specialist technical and regulatory expertise.

Without the right experience and resources available in-house, it’s likely that organisations will need to seek expert support to guide them through the complexity of EV enablement. This involves integrating the many disparate elements of the project, including software, hardware and energy provision; planning control; regulation; installation; operation and maintenance, etc.

It is advisable to find a technology partner who has experience across the entire value chain and can take a joined-up approach to project delivery.

The adoption of electric vehicles (EVs) is no longer a question for tomorrow. For many businesses and public sector organisations, the transition to electric vehicles is now a big opportunity to become cleaner, more sustainable and more efficient.

Further information: www.centricabusinesssolutions.com

CASE STUDY

DRIVING OUT FLEET EMISSIONS

Electrification of transport is a key part of Centrica’s commitment to reducing its internal carbon footprint by 35% by 2025 and developing a path to net zero by 2050. As the owner of the third largest commercial fleet in the UK, the company has committed to electrify its 12,589-strong fleet of vehicles by 2030, having already racked up over one million electric miles over the last five years.

Employees are being encouraged to use low emission company cars and by the end of 2018, nearly 500 employees were driving electric and hybrid options. As a lead EV charge-point installer in the UK, Centrica has installed over 75 charge-points across its sites to support employees that choose low carbon transport for their commute. These combined actions led to an 11% reduction in global fleet emissions and company cars in 2018, saving 4,763tCO2e.

Further information: www.centricabusinesssolutions.com

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Alex Hilton HMRC reports:

W ith a workforce of more than 61,000 people in all four nations of the UK, travel plays a big part in the day-to-day work of HMRC. Many of our colleagues are responsible for meeting with our customers, wherever they may be, and with that, comes the responsibility of choosing the most sustainable way to travel.

DRIVING THE CHANGE

For HMRC, road travel has historically had the single biggest environmental impact of all transport options. Back in 2010, HMRC colleagues travelled more than 36 million miles by road alone – equivalent to travelling around the Earth 1,450 times.

This is divided between colleagues using their own cars for business purposes, hire cars and our dedicated fleet of cars, used by colleagues who engage with customers on a daily basis.

The good news is that the last decade has seen us make significant progress in reducing the environmental impact of our road travel. In 2018-19, we reduced our total road miles by more than 39% compared with 2010-11. We also saw emissions from our fleet drop by more than 10% compared with 2010-11. We also saw an 11.3% reduction in HMRC’s travel emissions – a saving of 2,285 tonnes of CO2e.

CHECKING IN ON DOMESTIC FLIGHTS

One area where there is work to do immediately is domestic flights, which account for 13% of our global travel emissions. We have targets to reduce our domestic flights and we are on track to achieve these targets.

COP26 AND BEYOND

Despite this progress, we know there is more to do to be a truly responsible organisation. As well as maintaining the steps that have led to reductions so far, we are exploring further changes to make a difference.

We are investing in IT conferencing improvements and in the first half of 2019-20 colleagues held over half a million meetings on our conferencing platforms. Over 56% of our rail bookings and 51% of domestic flights in 2018-19 were for colleagues travelling to internal meetings, so we have an opportunity through our technology to change our behaviour and switch as many of these face-to-face meetings to video calls.

Early indications from our move to newly-located regional centres show positive signs of staff changing their commuting habits and we hope to be able to confirm a reduction in commuter carbon emissions accordingly.

We already have six electric cars in our fleet, a small first step, and we plan to order more to achieve our ambition of electrifying the entire fleet by 2030.

But the work will not stop there. As our customers change their habits, so will we. As businesses innovate to find environmentally-friendly solutions, we will be alongside them. We will be bold and ambitious in the face of the climate emergency to truly drive change for the better of the communities in which we, and our customers, live. www hmrc gov uk
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