THE EMA MAGAZINE

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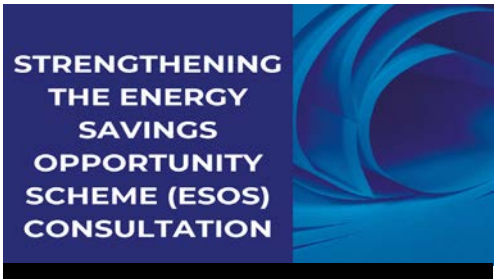
Heat Decarbonisation at UHBW



Stronger ESOS, better ESOS?

Industry Interview with SFRS

NET ZERO FUNDAMENTALS AND STRATEGIES COURSE

As more and more organisations make their commitments to achieve Net Zero targets, this course explains what Net Zero can mean, how different interpretations can be applied and the possible routes to achieving it. It also explains the basics of what would be included in an organisation's carbon footprint, and how it can be measured using standard emission factors.

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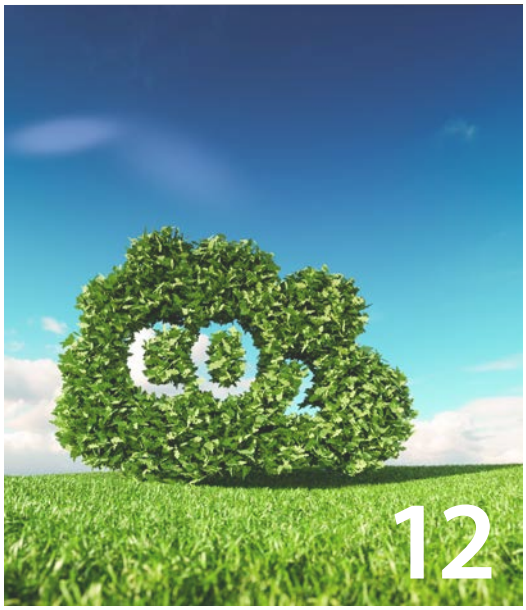

FEATURES

CAREER & TRAINING

INDUSTRY FOCUS

Dear Reader,

Welcome to the latest issue of The EMA Magazine. With the summer months behind us, we can now turn our attention to the autumn/winter season with all that it will offer. We are expecting further announcements on the Government's Strategy for Net Zero and we all hope for detail on the steps the UK will take in the coming years to get on track to reach Net Zero emissions by 2050. The delayed COP26 will take place in November and as with the Government's plans, there is a need to move past rhetoric and deliver on agreed plans and targets.

Of course, for some organisations the Net Zero target looms closer than in 2050 and it will be the skills and knowledge of those delivering these early targets that will become even more valuable and sought after in the future. It is for this reason that our main focus remains in the skills' development through our practical training courses, creating awareness and keeping you informed through regular workshops and raising your profiles and celebrating your achievements through The EMA Magazine and the EMA Energy Management Awards.

This issue marks the beginning of quarterly publishing of The EMA Magazine and going forward we will continue to bring you ideas, tips and experiences of other energy management professionals. As always, this issue offers a variety of contributions from inspiring energy management professionals which all have the same aim – to share, help and inspire.

We hope you will enjoy it.

The EMA Team

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The EMA would like to thank to the above contributors for their time and effort in providing the content and making this issue possible. Their willingness to share experience and knowledge is exemplary and inspiring, and we hope it will encourage others to come forward and contribute in the future.

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ABOUT EMA
The Energy Managers Association (EMA) was set up in February 2012 and represents Energy Managers across all industries. Our priority is to improve the position of energy management experts and their profession and act as their united voice. We aim to develop the skills, knowledge and experience of professionals through our training, high-quality peer to peer guidance and best practice exchange.

TOPICAL WORKSHOPS

- **CPD awarded**
- **Practical advice**
- **Q&A sessions**

29 September 2021
ENERGY AUDITING MASTERCLASS

It is relatively easy to undertake an energy audit, but doing it in a way that makes a lasting impact on the energy consumption performance of an organisation, is a much bigger challenge. In this "masterclass", the EMA Board Director and Head of Energy Optimisation for Welsh Water, Ben Burggraaf will share his 15+ years' expertise of undertaking energy audits and how they fit into the wider energy management practice within an organisation. The lessons learned from Ben's successes & failures over the years covered in the workshop will enable you to make a lasting impact on your future audits.

Booking: MEMBERS/NON-MEMBERS

6 October 2021
CARBON OFFSETTING

While ideally businesses would not produce any carbon through their activities, in reality this is unrealistic for most. Carbon emissions should be reduced to a realistic minimum through energy efficiency and self-generation, however when these options have been exhausted, any remaining emissions will need to be offset to achieve net zero status.

This workshop will examine what offsetting is, how it works, the various types of schemes available, certification and sustainability as well as look at some of the pitfalls.

Booking: MEMBERS/NON-MEMBERS

20 October 2021
THE PATH TO NET ZERO: FROM COMMITMENT TO IMPLEMENTATION IN THE PRIVATE SECTOR

Organisations in the public and private sector have been working to align their carbon reduction targets to the UK commitment of Net Zero by 2050. This workshop will help Energy and Sustainability Managers to identify what elements need to be considered while supporting their organisations in defining the Net Zero carbon pledges and developing the most suitable implementation strategies.

The workshop will also provide food for thought about the role of internal and external communication, colleague engagement, energy procurement, heating & cooling, energy efficiency, building optimisation and carbon offsetting in the path to Net Zero.

Booking: MEMBERS/NON-MEMBERS

by Mark Taylor, Stuart Jackson, Adam Fairman and Neil Fright

Stronger ESOS, better ESOS?

The Energy Savings Opportunity Scheme (ESOS) consultation proposes to strengthen the scheme by improving the quality of audits through increased standardisation of reporting, ensuring that ESOS Lead Assessors have the right skills and knowledge, inclusion of a net zero element to audits, and requiring public disclosure of high-level recommendations by participants in Phase 3.

The consultation also looks for views on additional options, possibly implemented in Phase 4, such as mandating implementation of ESOS recommendations and extension of ESOS to medium sized enterprises. We have asked four EMA ESOS Lead Assessors to share their views on the proposed changes.

Mark Taylor – Owner, Taylor Made Energy Solutions Ltd

I think a review of ESOS is probably overdue after 2 phases without change and welcome this consultation. There are some good proposals in the consultation, recognising some of the problems that have been seen in phases 1 and 2, although some of the ideas put forward would radically change ESOS with the potential for making it very much more expensive for participants.

The proposals to try to improve the quality of audits and assessments are particularly welcome given the variable and quite often poor quality seen in the first 2 phases. The removal of repeatedly poor assessors from registers and ensuring that properly skilled staff undertake audits is, I think, a priority to give ESOS more credibility and to convert opportunities into real energy reductions rather than just a compliance activity.

However, I do think many of the proposals are trying to create a more rigid framework for assessors to work within in the hope of improving their performance rather than addressing the issue that many audits are undertaken by unqualified staff using "tick sheet" methods. The existing guidance is already quite clear on many of the proposal areas so I am not sure any more notice will be taken of a stricter framework as the current rules are quite obviously being ignored now to produce the volume of poor audits.

The proposed aligning of ESOS with net zero is also good news as up to now, they did almost clash in some ways, and using ESOS as an additional driver can only be a good thing and create extra engagement. It will however create quite a lot of additional work and ultimately cost for participants, whichever way it is included.

Many of the proposals should be relatively easy to implement such as including emissions as well as energy consumption and creating benchmarks. For some proposals, such as making analysis of half hourly data mandatory where it is available, it seems unacceptable that there are currently lead assessors who do not do this as a matter of course anyway. But there are some proposals that could perhaps require a step up in knowledge and expertise for some lead assessors. Expanding audits to include forms of on-site generation and the assessment of low carbon technologies could create some issues, especially when carbon savings do not always guarantee the energy cost savings on which ESOS is predicated.

It does appear that for many auditors and lead assessors, some upskilling may be required to maintain their competence and their accrediting bodies are also likely to have to improve their accrediting and monitoring procedures.

Another proposal that may cause many issues is on sampling. The possible requirement to sample far more sites (potentially having to audit every site within a given number of ESOS phases) could hugely increase the time and cost requirements for many multi-site participants but provide little benefit in the way of more opportunities identified.

> IT DOES APPEAR THAT FOR MANY AUDITORS AND LEAD ASSESSORS, SOME UPSKILLING MAY BE REQUIRED TO MAINTAIN THEIR COMPETENCE AND THEIR ACCREDITING BODIES ARE ALSO LIKELY TO HAVE TO IMPROVE THEIR ACCREDITING AND MONITORING PROCEDURES.

The proposed reduction of any de-minimis exemption from 10% to 5% will definitely have an impact on large energy users who will now have to audit far more assets but it does prevent large areas going unaudited. However, it could also cause large increases in time spent on audits of relatively small energy uses such as gas bottles and static equipment like standby generators where again, the benefit could be very small.

One element likely to be welcomed by participants and lead assessors is the discussion on extending the qualification date to remove the heavy workload on assessors in the last year of each phase and stagger assessments more. This should in theory also reduce costs if much of the last minute rush can be avoided.

There is of course an issue with some of the proposals in that they are likely to be included in phase 3 which has already started. Site audits which have already been completed may now not conform to any revised ESOS regulations, especially given the net zero proposals. Either some dispensation will have to be given for early starters or some repeat audits may be needed.

While the proposals do address a number of issues and areas that needed review, the one conclusion that seems inescapable is that the requirements of ESOS are going to be much wider in future which will inevitably increase the costs of any assessment to participants. Hopefully, the increased cost will be rewarded with better opportunities found and delivered by better qualified and trained lead assessors.

Stuart Jackson – Director, Stuart Jackson Associates Limited

Strengthening the Energy Savings Opportunity Scheme (ESOS) Consultation:

- Concentrates on 3 main areas: improving the quality of audits, the inclusion of a net zero element to audits and public disclosure of high-level recommendations, these being for immediate action.
- Seeks opinion on extending the scope of the scheme to include medium sized businesses and mandating action on audit recommendations, these being possibilities for future action.

I think it is accepted that the range of participant acceptance for ESOS is wide and there was at times a shortage of Assessors, and these issues need addressing.

Suggestions of standardised reports and common sampling methodologies in Chapter 1 of the consultation are sensible.

The consultation also refers to inclusion of Energy Intensity Ratios (EIR) and Behavioural Change audits, both of which I would suggest are important.

It is also important to address Assessors in relation to quality of reports. The consultation discusses ESOS Lead Assessor Registers and Assessors' skill sets. As a member of the EMA ESOS Lead Assessor register, I am aware that these are available on line. I believe there is merit in selection of Assessors on their skill sets. However, this may well reduce Assessor availability. Training and updating Assessors seems to be the key.

The consultation discusses options for staggering the phases or qualification dates. It also highlights possible coordination with other schemes, particularly Streamlined Energy and Carbon Reporting (SECR). This could enable Lead Assessors to manage more audits, and I would strongly support a change, especially if the scheme is expanded to include Medium Enterprise Undertakings, as is mentioned. The proposed link with SECR is supported by the suggestion that eligibility for each scheme is the same. Again, a laudable thought. However, I feel it could go further and utilise the SECR requirement as a means of ESOS follow-up. Especially so, if some of the suggestions for ESOS follow the pattern of SECR, Intensity Ratios or suggested reporting formats for example.

One important suggestion for inclusion is a net zero element to audits. This is probably the area which could cause the biggest effect in terms of analysis of the opportunities. It is vital that we take a long-term view on carbon reduction but analysis of the opportunities needs much detailed work. Some companies are already evaluating their opportunities for net zero carbon, whilst reporting within ESOS and SECR, with a view to support their aims within Environment, Social and Governance (ESG) Corporate Reporting. Some schemes can be complex and very long term.

“ ONE IMPORTANT SUGGESTION FOR INCLUSION IS A NET ZERO ELEMENT TO AUDITS. THIS IS PROBABLY THE AREA WHICH COULD CAUSE THE BIGGEST EFFECT IN TERMS OF ANALYSIS OF THE OPPORTUNITIES. IT IS VITAL THAT WE TAKE A LONG-TERM VIEW ON CARBON REDUCTION BUT ANALYSIS OF THE OPPORTUNITIES NEEDS MUCH DETAILED WORK.

To include net zero element in an ESOS report would increase costs of audits and it is likely to be initially in a very generic format. I see the value and would be broadly supportive but would caution more thought on its implementation. Should we move to net zero inclusion in audits, there will be a need for clarification training for all, participants and assessors.

I have some concerns regarding the practicality of encouraging take-up of the recommendations. At present there is no mandatory requirement to adopt any suggestions. I can see the value in preparing an action plan. At present, it is included but with a light touch. The consultation discusses possible added requirements, such as mandatory follow up reporting, although with initially no penalties. It suggests annual progress reports and extra information on a central portal for public access. However, yet another set of reports will be a further burden on companies and I feel it will reveal very little. We should not forget that many companies already report carbon emissions through UKETS (formerly EUETS), CCA and energy performance through SECR. These can fall for submission at various times of the year and, I would argue, directly or indirectly contain the same data for evaluation. I doubt further reporting would be welcome, and I am of the opinion it would really prove ineffective in overcoming the lethargy of the passive Undertakings.

Assisting participants with their ESOS compliance, I have identified various projects and energy savings but these are prioritised over a number of years. Annual or interim reporting will simply be a further report with little information.

Timescales for implementation of proposed measures are discussed within the consultation document, too. We are approximately half way through phase 3 of ESOS. Responses to this consultation close 28 September 2021 and I assume it will be 2022 before we have chance to digest any changes. I will be encouraging my clients to start assessment next year and would think it prudent to activate any changes for phase 4 of ESOS.

If we are to adopt some of the suggestions in the consultation, there will be a requirement for clarification of the new reporting and updating skills.

There is much more detail in the Consultation Document and I commend you to read in full and offer your opinions.

Adam Fairman – Senior Energy Analyst, Welsh Water*

When it comes to energy management, there are three types of companies:

- Those who pay others to do it.
- Those who do it themselves.
- Those who do not do it at all.

Reading between the lines, ESOS seems to be aimed at the 3rd group. The thinking was, if only the directors of those companies knew how much money they were wasting, they would take action. If you made them spend a little money on energy management, they would save lots of money and help the environment. ESOS phase 1 and 2 was fairly light touch, presumably because the Government did not want to create an undue burden of regulation and thought that the businesses themselves were best placed to decide how to audit their energy use.

However, now the Government have decided that ESOS needs strengthening because the pesky 3rd group has been finding ways of 'complying', and still not doing energy management.

My perspective is from the middle group, working in the energy team of a large energy user in a highly regulated industry. We already report annually to our regulator on our energy consumption and carbon emissions in detail and are externally audited on this every year. We have supportive management who are happy to invest in energy efficiency measures. So, when it comes to ESOS, it is not really changing anything, it is just more reporting when we would rather be doing more energy management.

Despite that, I do not want ESOS to be scrapped, but I do have some ideas as to how ESOS can get the recalcitrant 3rd group to step up to the plate whilst minimising the burden on the rest of us. How can we go from energy saving opportunity to energy saving reality?

One concern is the quality of audits not being sufficient to identify savings because people are abusing the sampling approach and only auditing a few sites within a portfolio. There is concern that this flexibility is being abused and so minimum standards need to be set. There is a danger though that in spreading resources more thinly you reduce the quality of individual audits. This is a challenge for multi-site organisation like ourselves with over 4,000 electricity supplies. Pareto analysis applies though, so we can cover 80% of our energy use by auditing 20% of our sites. I think a fair approach would be to set a site level de minimis requirement rather than a fixed % of Total Energy Consumption as this better reflects the inefficiency of visiting lots of small sites.

And while we are on that subject, as we have all learnt to work remotely, do we still need the requirement for a physical site visit to count as an audit? I gain very little from visiting a remote pumping station when all the asset data, flows, pressures, power etc. are available from my desk. Let's make energy auditing energy efficient!

Having set the scope appropriately, I think we also need to have other routes to compliance. If the goal is energy savings, then why not make that a route to compliance rather than just audits.

So, for example if you can evidence a monitoring and targeting system for a site that goes beyond comparing annual numbers to budget, then that should count as compliant. After all, we all know that this is better than a once every 4-year review of the data and a walk-through survey. It goes part of the way to ISO 50001 and could be a stepping stone there for organisations.

Similarly, if there has been financial spend on energy efficiency within the compliance period that should count as compliant, which would answer the question of how to encourage companies to implement measures. If companies are faced with a choice of spending time and money doing an audit to get the same results, or to actually save energy, hopefully they will choose the latter! This offers a cost-free

carrot (or at least a promise to withdraw the stick!) to implement measures without the legal minefield of mandating them.

> FOR MOST BUSINESSES, THE BEST THING THEY CAN DO TO HELP THE UK REACH NET ZERO IS TO BRING DOWN THEIR ENERGY CONSUMPTION. DO WE REALLY NEED 100S OF REPORTS WEIGHING UP THE PROS AND CONS OF A NEW BOILER VS A HEAT PUMP WHEN IT SHOULD BE THE GOVERNMENT LEADING ON THE STRATEGY OF DECARBONISING HEAT AND SETTING THE INCENTIVES ACCORDINGLY?

One final word on carbon, which BEIS want to bring into ESOS. For most businesses, the best thing they can do to help the UK reach net zero is to bring down their energy consumption. Do we really need 100s of reports weighing up the pros and cons of a new boiler vs a heat pump when it should be the Government leading on the strategy of decarbonising heat and setting the incentives accordingly? Let's keep the focus on energy efficiency and tackle strategic questions about carbon reduction at a sector level where Scope 3 emissions can also be considered.

You might disagree but hopefully this has given you some ideas as to how you can respond to the consultation.

**The opinions expressed within the content of this feature are solely the author's and do not reflect the opinions of Welsh Water.*

Neil Fright – CEO, Carbon Numbers Group

In my view, the initial scheme achieved broad compliance, but as more businesses actively work towards gross and net zero, the timing is right to take ESOS from what can be largely a box-ticking exercise to a step-change in the way businesses proactively measure, monitor and disclose energy consumption.

In my opinion, the overall theme of the consultation is that we need to see significant changes in the whole ESOS process to get anywhere near the outcomes we want to achieve.

This is evidenced in chapter one, page 24 outlining 'Improved information on energy management practices,' where it is disappointing to read that only 50% of all ESOS reports audited by the Environment Agency contained energy management recommendations. In addition, BEIS analysis found the majority of those recommendations were generic with no guidance on implementation or benefits. Many of these businesses haven't even been introduced to building management and monitoring systems, because their ESOS assessor isn't qualified or experienced enough to make recommendations.

Some of the BEIS' proposals in chapters one and four on improving the scope and standardising the audit schedule to align ESOS with SECR will lead to greater transparency and consistency with findings, because businesses will be providing information in a format that is uniform and verified, with metrics they are able to benchmark and understand. In chapter one particularly, the consultation talks about the importance of proactively changing behaviours within an organisation.

I believe this is the missing link, where we have the ability to influence these step-changes in the behaviour of stakeholders across the organisation that will lead to real change. With the right guidance and measures that are easy to understand and implement, wider management can be involved to ensure the level of quality, insight and organisational change we want to achieve.

Of course, every sector is different, and it's positive that the consultation considers the different nature of companies. To add value and present ESOS as a positive scheme, we need to go in with an understanding of the diverse challenges businesses face as well as the practical reality of adopting recommendations. For instance, is it right to recommend a business with a short lease make a large capital investment in energy efficient lighting?

Looking beyond the numbers to present not just change, but the reasons for the change will help the scheme drive best practice and go a long way in enabling a generation of Energy Conscious Organisations (ECOs).

I wholly agree that a clear, fair set of recommendation and measures that looks at the wider organisation will pay long-term dividends. This is

especially pertinent when we look at chapter four of the consultation and the proposal for public disclosure of high level information from their ESOS report. I am reassured to see that the recommendation is not to go for a league table format and that metrics will be focused around progress on energy management proficiency and actions rather than performance.

Subsequently, these proposals will then go a long way towards helping businesses see the value of ESOS and have a better understanding of the broad range of opportunities available to them.

A key factor that stood out to me throughout the consultation was the references to behavioural research. In addition to recommending radical changes in the way businesses measure and report, it is clear that ESOS Lead Assessors have a critical role to play in using their experience and resources to influence positive change. To make that happen we again need to look beyond reporting and work with businesses to give them roadmaps and outcomes that are meaningful and achievable.

In 'Routes to compliance,' the consultation looks at three alternative routes to be ESOS compliant; Display Energy Certificates (DECs), Green Deal Assessments (GDAs) and ISO:50001, with ISO being the favoured approach. I wholly agree with recommendations to remove DECs and GDAs and would go further, to say that the long-term approach of ISO accreditation is the only route that cultivates the ongoing responsibility and engagement in making sustainable, measured changes across a business.

> "IT IS CLEAR THAT ESOS LEAD ASSESSORS HAVE A CRITICAL ROLE TO PLAY IN USING THEIR EXPERIENCE AND RESOURCES TO INFLUENCE POSITIVE CHANGE. TO MAKE THAT HAPPEN WE AGAIN NEED TO LOOK BEYOND REPORTING AND WORK WITH BUSINESSES TO GIVE THEM ROADMAPS AND OUTCOMES THAT ARE MEANINGFUL AND ACHIEVABLE.

If Lead Assessors can move away from the four-year compliance cycle and work with companies in line with ISO standards, there is an opportunity to look beyond reports, cost savings and carbon offsetting, to embedding ongoing improvements to the way they power their businesses and the environment they create as ECOs.

This proposal has a timely opportunity to present ESOS as an energy efficiency policy rather than remaining focused on auditing. The changes could lead to businesses concentrating on an achievable long-term roadmap that the whole organisation buys into.

Finally, there is no doubt that mandating actions and disclosure, as proposed in chapter six of the consultation will drive change. However, to embed a meaningful transformation, the policy needs to create value and build trust to lead a broader conversation around what energy efficiency means and how every touchpoint can contribute to better working environments as well as gross/net zero targets and cost savings.

The consultation talks about being 'ambitious,' and as well as guiding better practice, I believe it presents a strong case for the cultural change that will lead to ESOS being a core contributor to Corporate Social Responsibility.

by Joel Kirby and Ned Maynard

Heat Decarbonisation at University Hospitals Bristol and Weston (UHBW)

Joel Kirby – Energy and Sustainability Manager at UHBW NHS Foundation Trust

Ned Maynard – Senior Energy and Sustainability Manager at UHBW NHS Foundation Trust

Introduction

Bristol City Council is arguably the UK leader at a local authority level in their response to the Climate Emergency. They were the first council to declare a Climate Emergency in November 2018, the first to embed leadership of the New Green Deal in their Cabinet structure, the first to review their progress against the United Nations' Sustainable Development Goals, and the driver of a motion to the Local Government Association which saw 435 additional councils declare a Climate Emergency.

Since then, the council has expanded the vision in their "One City Climate Strategy", released on 26th Feb 2020, outlining ambitious targets for carbon neutrality by 2030, significantly faster than national 2050 legislation. A key emphasis of this plan is that it is a "shared vision for Bristol in 2030" that "will need the collaboration of multiple partners across the city to reach our goals". University Hospitals Bristol and Weston NHS Foundation Trust (UHBW) is one such partner. With a workforce of over 13,000 staff, the Trust delivers over 100 different clinical services across 10 different sites, serving a core population of more than 500,000 people. The trust has two main campuses in Bristol city centre and in Uphill, Weston-Super-Mare.

The strong push from the Council was a key enabler to help write the internal business case for the Trust's own Climate Emergency declaration in October 2019, and development of our Sustainable Development Strategy. Despite the challenges of the pandemic, we have appointed a new Head of Sustainability and recruited both of the authors' roles, dedicated to the delivery of our ambitious target for carbon neutrality by 2030.

Current Set-Up

When starting at the Trust in the summer of 2020 we were shown the energy centre for the Bristol city centre campus, containing duel-fuel steam boilers in combination with a 3.6MW gas-fired CHP unit. These heat sources feed a lower temperature hot water (LTHW) district heating system (85C/75C) to four buildings on the northern half of the campus closest to the energy centre.

The rest of the southern half of the site is fed via a steam-based district heating system that serves the majority of the total annual site thermal demand of 36,800 MWh. There are also a number of stand-alone gas supplies feeding local boilers in areas difficult to reach with district heating. All of this is controlled via a building management system (BMS).

Weston General has previously had the existing steam system removed, replaced with LTHW fed by a 550kW gas-fired CHP and condensing boilers which supply the main hospital building with an annual thermal demand of 4,600MWh. There are also various other smaller buildings with

their own gas-fired boilers. The majority of the site is controlled by a central BMS, however some of the smaller outbuildings have local controls.

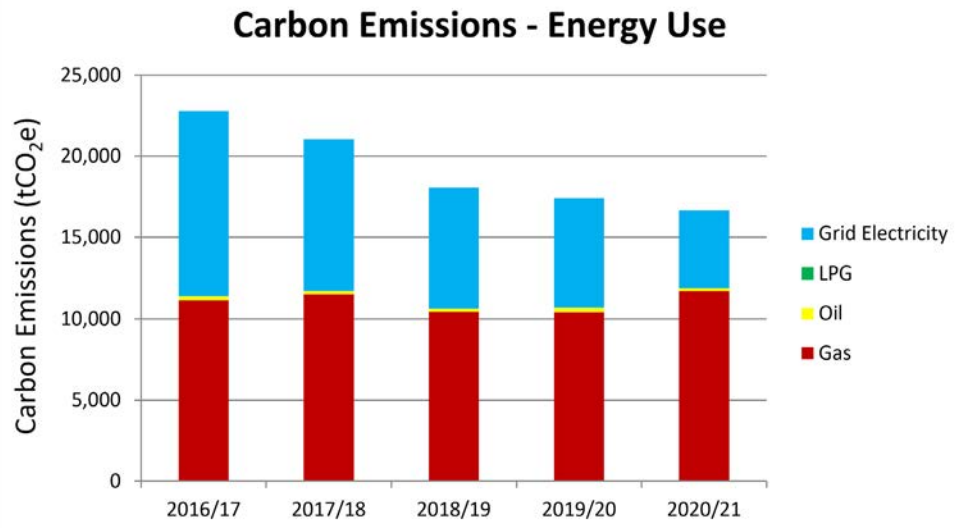
Historic Emissions

You can see from the graph on the right that emissions from energy use have been decreasing slightly over the past five years, primarily driven by the wider decarbonisation of the national electricity grid. This shows the key challenge for any heat decarbonisation project. The national grid future scenarios place full decarbonisation of electricity somewhere around 2034, but unlike electricity, the national gas network is not on a decarbonisation trajectory, meaning the only way to reduce emissions is to reduce or generate locally on-site.

Over the past five years heat-based emissions (gas and LPG) have actually increased, due to the introduction of a new CHP at Bristol, and the merger with Weston in 2020/21. Gas-fired CHP technology is financially lucrative due to the comparatively cheap price of gas yet does not offer a pathway to decarbonisation.

The Plan

To achieve net zero emissions across our scope 1 and 2 carbon emissions, there are many elements we will need to tackle as a Trust - the main one being around our heat and how we supply this around the various hospital buildings in the Trust. This relates to number of elements, from technology selection, building controls and improved efficiency within the buildings.



Both CHPs are 'hydrogen-ready', meaning we could switch the fuel source from natural gas to emissions free hydrogen. This is the optimal solution as it would mean we could keep the existing engines and continue to generate electricity on-site. Unfortunately, it does not look likely that hydrogen will be a technologically or economically viable fuel source in time. The UK government recently released a paper on plans to accelerate hydrogen fuel generation, starting with industrial clusters in the North of England, but the same paper estimates we will not see nationwide adoption until approximately 2050.

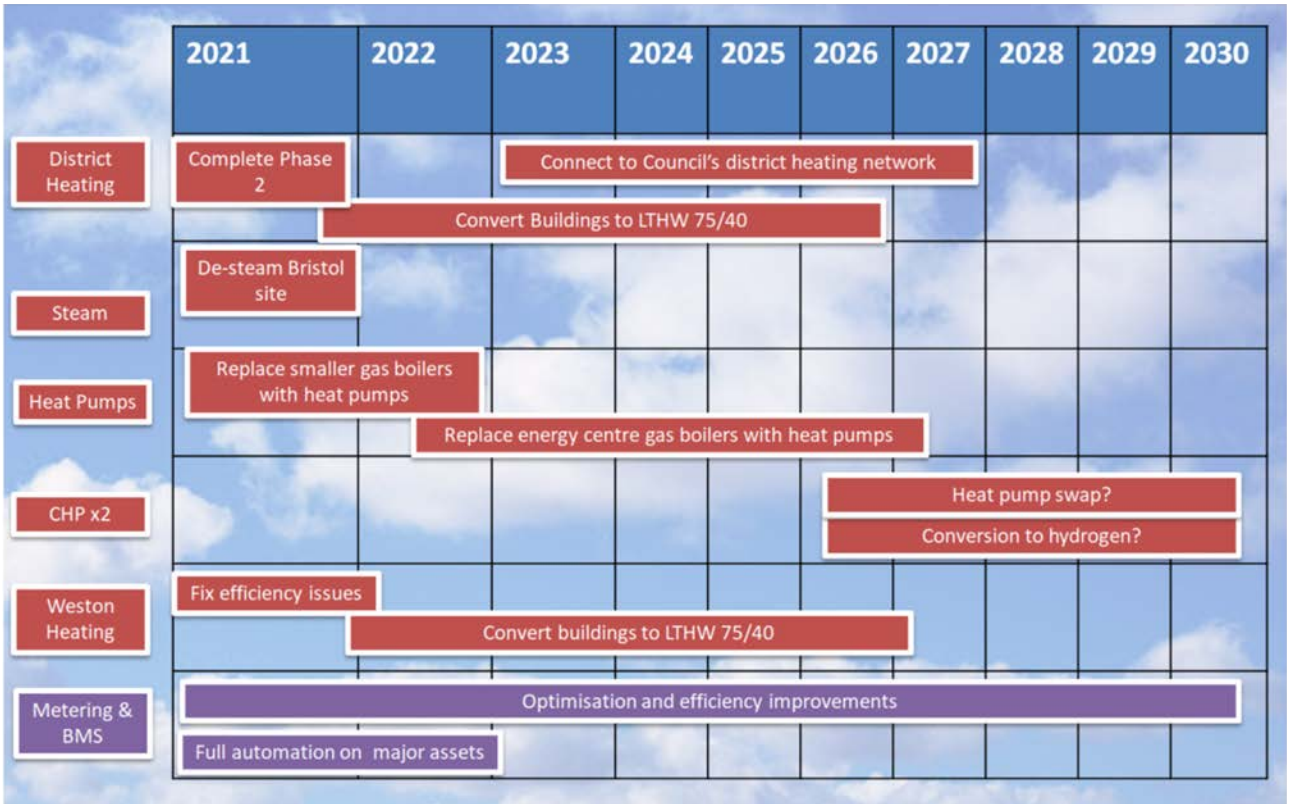
Really, this only leaves one technologically viable option, removing both CHPs and replacing them with heat pump technology. Initial assessments using the British Geological Survey's "Open-loop GSHP screening tool" showed that both sites sit on a low productivity aquifer and may not achieve the required borehole flowrate to make ground source viable, meaning we are most likely looking at the introduction of air source heat pumps (ASHPs) to replace the CHPs and gas boilers.

With ASHPs in mind, we worked backwards to establish a road map for heat decarbonisation. The technology could come from two sources, either we install them ourselves, or we connect to Bristol City Council's (BCC) network and take advantage of the fact that they are working to achieve the same decarbonisation timescales as us. We could also see a hybrid situation where we connect with BCC and also have our own heat pumps on site to feed into the wider city network ourselves.

With any heat pump option there are however technological limitations. In order to get an efficient and cost viable system, the coefficient of performance (CoP) of the system needs to be over 3.0. This dictates specific lower flow and return temperatures and a major blockade to achieving this at the Bristol Precinct is the steam system which remains across a large section of the portfolio, as well as large sections of older obsolete Sigma BMS controllers. These will all need to be considered in the Trust's plan to decarbonise heat in the future.

Recent Progress – Salix

In November of 2020, we made a successful bid to the Public Sector Decarbonisation Scheme (PSDS) via Salix Finance and were awarded £17m



for a range of works centred on our heat decarbonisation road map.

Bristol Salix Projects

At Bristol, the bulk of the funding is going towards converting the remaining steam district heating on the southern half of the site to a LTHW system to match the existing four buildings near the energy centre. The remaining steam boilers will also be replaced with duel-fuel gas boilers for LTHW. This is estimated to result in an emissions reduction of 2,122 tCO2e per year.

Removing the steam supply does however result in the need to maintain hospital services that use steam. The chief consideration on this project is the Central Sterile Services Department or CSSD, which operates near 24/7 critical sterilisation services for the Trust. The initial design to electrify CSSD used electrode boilers to generate steam, but we realised we could pre-heat the feed water intake of the washers via the new LTHW district heating and generate steam within the washers themselves, removing the need for external steam boilers. There is a significant power draw to electrify the steam generation, requiring a new 1.7MVA transformer to supply the building, but the LTHW system should be able to provide about 63KW of pre-heat.

Some of the smaller external buildings were not feasible to connect onto the newly expanded district heating network. For these, funding has been secured to convert the supplies to standalone ASHPs, achieving around 6.97 tonnes of CO2e in its first year of operation and permanently removing the gas supplies from the buildings.

Weston Salix Projects

Weston General Hospital comprises of a main hospital building with smaller external buildings delivering clinical care and admin/training space. Where the main hospital building has already undergone the process of de-steaming, funding was focused on improving efficiency across the site and to connect external buildings to the existing LTHW system to utilise a higher proportion of the available CHP heat.

The current set up at the hospital comprises of a main CHP and 4 boilers providing hot water for DHW and LTHW across the main hospital. This is split into 4 circuits within the boiler room:

- Domestic hot water supplying heat plate exchangers at both ends of the hospital;
- LTHW circuit to a small private ward on the premises;
- LTHW circuit to estates and facilities and several other smaller support offices;
- A main LTHW header in the roof space providing heating for Constant Temperature (CT) and Variable Temperature (VT) systems across the main hospital.

Existing flow testing and low differential temperature (dT) flow and returns have highlighted on many occasions that there are existing

issues with hydraulic separation between the various secondary circuits in the roof space, owing to heat losses and poor heat utilisation from the CHP and boilers during the early and latter stages of winter and fringe months. The funding granted from Salix is being used to rectify these existing issues, as well as to replace existing fixed speed pump sets to re-balance the system and improve the heating control strategy around the hospital. In addition to this, the new heating has been designed to incorporate new secondary circuits to supply LTHW to the external buildings, thereby removing additional gas assets and utilising additional CHP heat when available. The net carbon savings annually are expected to be in the region of 129 tonnes CO2e.

In addition to the new heating system, the Salix funding also allowed for the installation of an air source heat pump in the Academy building, which was deemed too far away to be connected to the new LTHW heating system; a new BMS to resolve any remaining site-wide control issues; and lagging remedials across the entire site to reduce overall heat demands. The projects together will save in excess of 250 tonnes CO2e and align Weston General to the Trust's overall heat decarbonisation road map.

Challenges for Continuing Heat Decarbonisation

Once the Salix projects have been completed, we will have successfully prepared the distribution systems for both sites to switch the heat source from CHP to a lower/net zero carbon alternative. The next stage will be to reduce the temperatures of the network. We are currently looking into how this will be achieved, but in its simplest form will involve reducing the heat demand of our buildings and lowering building-side temperatures.

The current plan is to survey each building to identify the most cost-effective schemes to reduce energy consumption. This might include things like double glazing, insulation, changes to building fabric, or other 'deep-retro fit' measures. The surveys will also look at the possibility of increasing the size of local heat emitters such as radiators or coils.

Another looming challenge will be the increasing demands for electrification from the heat pumps and other sustainability initiatives such as electric vehicle charging. Both Bristol and Weston have very little spare capacity, so we have established an 'Increasing Electrification Working Group' to gather key stakeholders around the Trust to forecast future electricity demand and begin making bids for infrastructure capital to start upgrading the capacity now, in preparation for the expected increasing demands.

Authors' Profiles:

Joel Kirby has worked in the industry since 2015, working with The Restaurant Group, The Celtic Collection and International Convention Centre Wales before his current role as Energy and Sustainability Manager at University Hospitals Bristol and Weston NHS Foundation Trust, working towards the Trusts' Net Zero Carbon targets.

Ned Maynard has worked as a directly employed sustainability professional in a number of industries including records management, construction, and most recently in healthcare. As Senior Energy and Sustainability Manager at University Hospitals Bristol and Weston NHS Foundation Trust, his main focus is on driving progress towards their carbon neutral objectives.

Women in Leadership Interview

While it is perceived that there are many structural and other barriers that limit women's progress through the ranks in energy management, we would like to explore a different question: how have the women who have made it to the very top in energy management overcome those barriers?

Paulina Bohdanowicz-Godfrey, Senior Director Energy & Environment EMEA at Hilton takes us through the journey of pushing her career boundaries and finding the balance to rise to the prominence in energy management.

Paulina Bohdanowicz-Godfrey – Senior Director Energy & Environment EMEA at Hilton

What is your personal story?

Being born into a family of academics, my first focus was on pursuing a university career with a Bachelor's degree in Environmental Protection and Management from the Technical University of Gdansk in Poland, followed by a Masters in Sustainable Energy Engineering at the Royal Institute of Technology in Stockholm. It was however my PhD work that defined my future career.

Whilst doing academic research into responsible resource management in hotels, I connected with Scandic and Hilton and realised hospitality is an industry that provides great opportunities to make a positive change to global environmental wellbeing. Whilst I was studying for my PhD degree, I was offered an opportunity to manage, develop and control HER – Hilton Environmental Reporting digital platform (the predecessor to Hilton's LightStay). The tool was designed to monitor, measure and track reductions in energy and water use as well as carbon and waste output of the hotels. This gave me a real taste for the difference I could make in this industry, so following some teaching commitments in Sweden and Poland, I returned to Hilton to look after sustainability for the EMEA region, based in the UK.

Whilst being at university allowed me to learn about various environmental and engineering challenges and help to educate future generations, I found that by embarking upon a career in engineering, I had the potential to be part of the change. At Hilton, I was given the opportunity to transform from an academic wanting to understand a challenge, into a decision maker who is focused on providing a solution.

My role and position with Hilton have continued to evolve ever since. I now cover environmental governance and reporting, learning and personal development programmes in engineering and sustainability, team member engagement programmes and ESG advisory for the EMEA region. With time, my role has expanded to cover efficiency projects and energy procurement. I started as an environmental engineer, then evolved into a sustainability specialist and energy manager. I currently occupy a niche in between the three 'E' worlds of environment, energy and engineering. I have a small, diverse and very capable team to support 250+ hotels across the region. Ashley, Georgina, Harry, Simon and I continue to evolve and expand our horizons and push for change, as sustainability and efficiency goalposts are never still.

Both the company and my team have been recognised for our contribution to better environmental and energy

management internationally and nationally. The team was recognized as Highly Commended EMA Energy Management Team of the year 2017, and in 2016 I was included in the inaugural 'Top 50 Women in Engineering' list by Women's Engineering Society and The Daily Telegraph.

What does your role entail?

My current role is to help the company become more environmentally and socially responsible and efficient whilst providing value to all stakeholders. There are multiple aspects and pathways that need consideration to achieve the goal.

My team and I are responsible for the strategy, management, planning and directing of the energy and environmental activities for hotels across EMEA. This includes awareness, engagement and recognition campaigns to ensure hotels are aware of the latest opportunities to reduce their footprint, improve service levels and control costs. We also lead on efficiency and conservation projects and compliance with company and local environmental legislation and certification.

Collaboration is key, and we provide organisational support to other departments and individual hotels with environmental and engineering initiatives. We are involved in sustainability reporting and the continuous development of Hilton's ESG management platform, LightStay to ensure we continue to accurately track, report and analyse our environmental footprint, helping us to see the progress of various initiatives, and where changes and improvements to our operations need to be made. A key element of the role is also related to the contract management and procurement process for all centrally managed utilities, such as electricity, gas and water across the region.

Within my role I enjoy the continuous opportunity to learn, discover, inspire and engage others, and second only to my passion for the environment is my passion for people and providing them with development opportunities. This led me to create the Women at Hilton Engineering EMEA network, which I continue to support alongside co-developing learning and leadership programmes for our engineering teams.

Did you always know where you wanted to be professionally at this stage?

My parents enjoyed spending time in nature, whether at the seaside, countryside or in the forest. As such I was exposed to the natural environment and knew quite early that I wanted to do something to help protect and preserve it for the next generation to enjoy. I have always loved travelling and working with people, so the current role is the combination of my passions.
My other professional career option of choice would be to work within the education system to empower and inspire the next generation to make a difference.

What is your leadership style, and how did you develop your leadership confidence and voice?

My parents have always encouraged me to speak up and voice opinions but were careful that I was capable to rationally explain and justify these. I think I was a natural leader from my early youth, but most frequently worked independently. In my professional formative years my managers were very flexible and allowed me a lot of independence to learn, make mistakes, improve and evolve. They however always expected a high degree of collaboration within and across teams.

I'd like to think that I have taken their leadership style on board, and work collaboratively with my team. I encourage them to discover, voice their opinions, make and own their independent decisions, take responsibility, manage their time and workload. At the same time, I make sure that I'm there to support, make decisions, inspire and encourage, but also take ownership and coach when required.

Throughout my career my proudest moments have always been related to my team and seeing them inspired and inspiring others as they develop personally and professionally, take on challenges and responsibilities, build their careers at Hilton and deliver fantastic business results, including the annual energy and water reductions across our hotels or an increase in the share of properties supplied by certified renewable electricity, to name a few.

What are, from your perspective, the biggest challenges for women in energy management leadership roles?

I believe that the roles should always go to the best person for the job and women are absolutely capable of doing everything they set their minds to. However, I think sometimes we may be our own worst enemies. The concept of imposter syndrome, whilst not always referred to as such, is probably familiar to most of us, and might have prevented many of us from taking a step upwards or sideways in our careers and challenging ourselves to take on a new role. The fear of not being able to properly manage the work-life balance is most likely contributing to the situation as well. However, there are numerous role models of women who expertly balance executive job roles with family life and thrive in their environments, such as those annually recognised by Women's Engineering Society in the UK.

Diversity and Inclusion are becoming increasingly important considerations on the business agenda, and people expect to see tangible action and results to help drive inclusivity in the workplace across every sector. I hope that this increased focus on creating workplaces that empower everyone to thrive will encourage more women to see that they can take on a leadership role in this sector. The Women in Hilton Engineering EMEA network has been a critical internal support tool during the last 18 months, and is one of a number of Hilton initiatives which led to the company being recognised as the #3 best place to work for women in the UK by Great Place to Work.

What can women do to overcome these challenges or to change these situations?

We should not be afraid to step

outside of our comfort zones, choose to challenge (as the leading theme of the 2021 International Women Day campaign) and take on the challenges presented to us. Every challenge can be turned into opportunity. We should be influencing our own career path and motivating other women to join the sector to build diverse, effective and harmonious teams. We can be the source of a positive change for those around us and the next generation.

Many people struggle with finding a mentor or support to help them in their career journey. Did you ever receive any form of support or mentoring as you moved along?

I was very lucky in that regard, as I have been directly exposed to very inspiring individuals and fantastic mentors, including Ivo Martinac at the Royal Institute of Technology in Stockholm, JP Bergkvist at Scandic/Hilton, Andrew Forte and Darren Cook at Hilton. They have supported and challenged me in my roles, allowing me to get out of my comfort zone, develop, make mistakes and learn from them – all in a very supportive environment. The teams I have been part of have always been extremely collaborative – which makes for a great learning environment. I have learned so much from my team – not just managers and mentors, but also younger generations who approach things in a different way and have different life experience to bring to the table.

As well as those personal experiences, everyone at Hilton has access to a very comprehensive set of resources and tools to support individual development through Thrive@Hilton and Hilton University, including online self-study modules, reflection materials, as well as coaching and mentoring opportunities.

What about training? For those who want to be leaders, do you advise that they get any formal training on how to lead?

I think this really is an individual choice. Some formal training on leadership styles and people management can be useful, but I believe in order to develop an authentic leadership style, it is also important to let your leadership skills develop organically through experience – something which my career at Hilton has allowed me to do. That way, we are more likely to remain true to ourselves, which ultimately helps to be an authentic leader and build trust with our teams and partners.

Looking back, what three pieces of advice do you have for your younger self?

- Don't wait for opportunities – create them, challenge yourself and define your own career path.
- Always strive to learn and improve yourself. Learn from interaction with other individuals and cultures.
- Inspire and be inspired. Even the smallest of positive changes, when taken up by all those we influence, can result in a massive positive ripple effect globally.

What are your long-term plans professionally?

I want to continue contributing to the improvement of environmental and social conditions in which we live, as the negative effects of what we have already done to the environment are more obvious than ever. Hilton's Travel with Purpose ESG strategy is one of the strongest in the sector and we are working to achieve our 2030 goals "to cut our environmental footprint in half and double our investment in social impact", however sustainability does not stand still and we need to remain engaged and committed to make a long lasting positive impact.

Secondly, I am passionate about developing people and seeing them grow. I have so much faith in the abilities of my team, so I would like to see them progress in their professional and personal lives.

ENERGY MANAGEMENT ONLINE TRAINING SCHEDULE

Energy Management Theory Combined with Real-World Applications

SEPTEMBER

23rd	Energy Auditing Techniques
24th	Energy Monitoring, Targeting and Validation

OCTOBER

8th	Become an ESOS Lead Assessor
15th	On-site Electricity Generation
21st	BMS Essentials, Controls and Optimisation

REDUCED PRICES

NOVEMBER

4th	Turning Data into Energy Savings
5th	Lighting – Basic Understanding
10th	Net Zero Fundamentals
11th	Understanding and Delivering Behavioural Change Programme
12th	Essential HVAC Control and Optimisation
15th	SECR Compliance
19th	Waste Management
22nd	Reaching Net Zero
25th - 26th	Energy Management in Building Services

DECEMBER

3rd	Energy Procurement

Group Training

All courses can be delivered virtually to teams or groups of stakeholders from the same organisation or industry in a standard format, or as tailored sessions (minimum 5 candidates). For a quote email **jana.skodlova@theema.org.uk** with your chosen course title and approximate number of staff. We can also develop new, bespoke material to fit your specific needs.

Knowledge and Skills Gap Analysis Interview

Understanding of a range of energy management competencies is required for professionals to effectively manage organisation's energy cost and consumption, monitoring and reporting energy use, as well as meeting energy efficiency requirements. The EMA can assess your knowledge and skills through the Knowledge and Skills Gap Analysis Interview. The Interview is an informal 60-minute conversation that concludes with afeedback on how to progress your professional development and advance your career.

For an up-to-date list of all our courses visit our website at www.theema.org.uk

"The course gave me some great ideas that I will apply at the start of the next financial year as part of my energy efficiency programme."
Central Operations Manager – Azzurri Restaurants

"It was informative, useful and given confidence to challenge quotes and suppliers."
Energy Efficiency Manager – Parkwood Leisure

The EMA Energy Management Awards give prominence to those leading the energy management industry and inspire other professionals to follow in the same footsteps.

- Energy Manager of the Year - Private Sector
- Energy Manager of the Year - Public Sector
- Energy Management Team of the Year - Private Sector
- Energy Management Team of the Year - Public Sector
- Sustainability Manager of the Year - Private Sector
- Sustainability Manager of the Year - Public Sector
- Utilities Manager of the Year - Private Sector
- Utilities Manager of the Year - Public Sector
- EMA Member of the Year - nominated by the EMA
- Young Energy Management Professional of the Year
- Net Zero Strategy of the Year
- Decarbonisation Project of the Year
- Energy Management Consultancy Partnership of the Year

Energy Manager of the Year - Private and Public Sector

Nominees

We are seeking applications from professionals who have been working in energy management for several years. The entry should reflect the entrant's industry knowledge and experience, their achievements and initiatives to promote energy efficiency, and include overall savings and energy reduction achieved for their organisation. We are seeking entries from professionals who believe they meet these criteria and those who wish to nominate their colleagues and peers. Entrants will be expected to evidence their impact and achievements with examples and results.

Energy Management Team of the Year - Private and Public Sector

Nominees

We are seeking applications from teams of two or more people who are engaged in daily energy management activities for their organisation or clients. The teams should be able to demonstrate clearly defined roles, collaboration between the roles that is beneficial to the performance of the team, development of individuals within the team and successful performance outcomes. We are seeking entries from teams who believe they meet these criteria and those who wish to nominate their colleagues and peers. Entrants will be expected to evidence their impact and achievements with examples and results.

Recognising and Rewarding Excellence in the Energy Management Industry

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CELEBRATE YOUR SUCCESSES AND ACHIEVEMENTS THIS YEAR WITH A SUBMISSION TO THE

ema ENERGY MANAGEMENT AWARDS

Sustainability Manager of the Year - Private and Public Sector

Nominees

We are seeking applications from professionals who have been working in sustainability for several years. The entry should reflect the entrant's industry knowledge and experience in developing, implementing and monitoring company or organisation's sustainability strategies. We are seeking entries from professionals who believe they meet these criteria and those who wish to nominate their colleagues and peers. Entrants will be expected to evidence their impact and achievements with examples and results.

Utilities Manager of the Year - Private and Public Sector

Nominees

We are seeking applications from professionals who have been working as utilities managers for several years. The entry should reflect the entrant's industry knowledge and experience, their achievements in the areas of energy, water and other supplies to sites. We are seeking entries from end-users who manage utilities for their employer and believe they meet these criteria and those who wish to nominate their colleagues and peers. Entrants will be expected to evidence their impact and achievements with examples and results.

EMA Member of the Year

Nominee

This special category is nominated by the EMA team. This Award seeks to reward a member of the EMA for their support throughout the year.

Young Energy Management Professional of the Year

Nominees

We are seeking applications from professionals who have been working in the energy management industry for no more than three years. The entrants should be able to demonstrate their impact on energy reduction and achieved savings at their organisation. We are seeking entries from professionals who believe they meet these criteria and those who wish to nominate their colleagues and peers. Entrants will be expected to evidence their impact and achievements with examples, showcasing their role in the achieved results/savings.

Net Zero Strategy of the Year

Nominees

We are seeking applications from organisations with clearly defined Net Zero strategy and targets. The entry should include the organisation's short- and long-term plans for achieving the set goals, expected timelines, progress to date and any achievements so far. We are seeking entries that offer a clear pathway and consider all scopes of carbon emissions that occur directly or indirectly from the organisation's activities. Entrants will be expected to share their strategy documents as part of the submission.

Decarbonisation Project of the Year

Nominees

We are seeking applications on energy, sustainability and/or engineering projects that have been successfully implemented and savings achieved can be demonstrated. All projects, including but not limited to, optimisation, upgrading, replacing or behaviour change that have been implemented and resulted in a reduction of carbon emissions for the organisation will be accepted. The project results should be able to demonstrate successful implementation, reduction and savings achieved.

Energy Management Consultancy Partnership of the Year

Nominees

We are seeking applications from in-house teams and service providers about collaborative partnerships of two or more parties that can demonstrate the benefits of delivering energy management in a partnership. We are seeking entries from partnerships that have been in place for a period of time that allows for the evidence to be presented. Entrants will be expected to evidence their impact and achievements with examples and results.

ENTRIES

Entries are free of charge and can be submitted on the EMA website until 13 October 2021.

WINNERS AND HIGHLY COMMENDED

The winners and highly commended in each category will be announced during a virtual awards' ceremony on 16 November 2021 and will be entitled to the following benefits and opportunities:

- The use of the EMA Energy Management Awards 2021 logo;
- Have their profiles published in The EMA Magazine and the EMA website;
- Highlight their achievements with published case studies and/or articles (The EMA Magazine and website).

by Wendi Wheeler and John Mulholland

Getting Top Level Commitment

Wendi Wheeler – Sustainability Strategy Manager at Scotland's Railway

Treading the path of an Energy Manager can often be quite lonely – a lot of the time you are working really hard, digging around in data, walking sites observing with a clipboard or rummaging in boiler rooms, and others in your organisation are never quite sure what it is that you actually do! Then, when you have found efficiency solutions, persuading the powers-that-be to release the funds and give you the backing that you need to put them into action can be mighty difficult. It often feels like you are wading through treacle.

You and I know that this work is interesting, rewarding and very worthwhile, but just how do you get the people that matter to see it in the same way? And who are 'the people that matter'?

For me, one of the paradoxes of this career is a love/hate relationship with finance. Cost efficiency is not the reason I am in this job – there are much bigger drivers for me (and I suspect for many of you) like doing my small bit to try and slow the Earth's demise. But, as they say, money makes the world go round, so that is where we need to start. Persuasion tactics to loosen purse strings gain more traction, in my experience, than pulling on heartstrings – more is the pity. **Target No.1 = Finance Director.**

Bundling efficiency opportunities into a cohesive programme of work is a good way to start. Why? Because it makes the numbers bigger, and therefore makes your Finance Director sit up and listen. Pushing forward individual schemes as they become mature is a decent enough way to do things, but it does not set up that light-bulb moment (pardon the pun) that you need to get good backing. Instead, present your full set of ideas in one big bang. This will, of course, mean more work at the outset to quantify all of your opportunities, but it is well worth the up-front effort. As well as cost savings, do not forget to consider future cost avoidance for energy, taxation and maintenance costs; and work those into your business case.

> "FOR ME, ONE OF THE PARADOXES OF THIS CAREER IS A LOVE/HATE RELATIONSHIP WITH FINANCE. COST EFFICIENCY IS NOT THE REASON I AM IN THIS JOB – THERE ARE MUCH BIGGER DRIVERS FOR ME (AND I SUSPECT FOR MANY OF YOU) LIKE DOING MY SMALL BIT TO TRY AND SLOW THE EARTH'S DEMISE. BUT, AS THEY SAY, MONEY MAKES THE WORLD GO ROUND, SO THAT IS WHERE WE NEED TO START.

Whilst you are preparing for that, you will need some allies on side. Who they are will depend on your organisation and where you are placed within it; but wherever you sit, you will need the resolute support of your own Director. **Target No.2 = Departmental Head.**

Talk to your direct line manager about your plans and the support that you need. They should do the work to open up some doors for you. If not, ask for a meeting with your Departmental Head directly. Present the plans that you are working on, explain the business case and ask for their sponsorship.

If your business case is robust, you should get it. Your Departmental Head will be your ally as you try to gain that top-level commitment that you need. Foster that relationship, maintain regular updates and mentoring sessions, and gain their trust that you can deliver what you are presenting. Enthuse. Explain. Persist. Persuade.

Ok, so you have your Departmental Head on board, and they will do some of the legwork with your Finance Director to gain you an audience. Know your figures inside out, be honest about any bits you do not have the answer to (but make sure you fill those gaps quickly) and have confidence in your work. Enthuse. Explain. Persist. Persuade.

My top tip is to find a way to clearly show your business case with simple imagery that is easy for a non-energy professional to understand. They do not need the detail (although it needs to be available to back up your case) – they want quick facts and figures that do not confuse and are easy to say 'yes' to. And spend the time making them look good. If you are not a whizz on Excel or PowerPoint, call in a favour from somebody who is – it will reap massive rewards. Enthuse. Explain. Persist. Persuade.

So hopefully you will now have the backing of your Departmental Head and your Finance Director. But top-level commitment means more than just a slap on the back from your big boss and a budget (although believe me, these are always much-needed and well-received). What you need is real, firm commitment from your Executive Leadership Team and a rippling communication of it through your organisation, right? **Target No.3 = Executive Team.**

By now you have tested your pitch on your direct line manager, your Head of Department and your Finance Director and, if you are smart, you have honed your messaging as you have gone along. You will also have backing and support in the Boardroom from the latter two. The last thing to do is to sell your concept to the entire Executive Leadership Team. Sounds daunting, but in reality, all that you have got to do is to find a hook for each of those around the table – what will pique their differing interests? A part of your pitch should play to each of them – for your Finance Director, it is money; for your HR Director, it may be the fact that it is proven that staff are happier (and therefore more productive) in a sustainably-aware organisation; for your Chief Marketing or Communications Officer it is likely to be the opportunity to shout about the company's green credentials; and for your CEO and Chairman it will be the carrot of being a leader in the sustainability field. There are many other examples, but you get the idea. Enthuse. Explain. Persist. Persuade.

Throughout, use the golden rule of 'present a case that cannot be argued with'. Test your theories and pitches on willing subjects who are not part of the energy management world and will not really know what it is that you are banging on about. If you sell it to them, and they understand, you are on to a winner. Enthuse. Explain. Persist. Persuade.

Once you have that commitment, your job is not done. You need to maintain momentum. Regularly update your Executive Team, feedback your progress, celebrate your successes and escalate your barriers. Enthuse. Explain. Persist. Persuade.

> "ONCE YOU HAVE THAT COMMITMENT, YOUR JOB IS NOT DONE. YOU NEED TO MAINTAIN MOMENTUM. REGULARLY UPDATE YOUR EXECUTIVE TEAM, FEEDBACK YOUR PROGRESS, CELEBRATE YOUR SUCCESSES AND ESCALATE YOUR BARRIERS.

Finally, remember – nobody ever went into energy management to win a popularity contest. You need to be prepared to make a nuisance of yourself, and maybe take a knock-back or two. It is no mistake that one of the words I have repeated throughout my musings here is 'persist'.

It is my belief that one of the most important key skills for a successful energy manager is stakeholder engagement. Tenacity is a must and persuasion tactics need to be on top form. Enthuse. Explain. Persist. Persuade.

And succeed.

Author's Profile:

Wendi Wheeler is Sustainability Strategy Manager at Scotland's Railway, focussing on decarbonisation and the low-emissions agenda. She has worked in energy management for 30 years and has won numerous awards for her work. Previously Chair of the Energy Managers Association, she remains a Fellow of the EMA and a stalwart supporter of its work.

Eur Ing John Mulholland BScTech (Hons) CEng CSci MIChemE FEI – Director at Mulholland Energy

To make things happen in organisations we all know the importance of top management commitment. But in the realm of energy management and behaviour change projects, how do you secure this commitment? How does it work if you are an external consultant?

Who exactly is 'top management'?

This might seem such an obvious question that it is not worth asking. Top management are those at the top of the organisational tree. While that is true, we need to consider how different sized organisations work in practice. For example, some large multi-nationals have board members spread around the world and they operate at a strategic level and have relatively little involvement in day-to-day operational activities which are delegated to others. Generally, energy management rests under environmental/sustainability and tends to be related to on-the-ground activities. In these sort of organisations people at senior operational level might be the people you need to influence.

How do you access top management?

This can be challenging but you could simply ask to see them. It may be for 15 minutes to explain the initiative and seek their support. Some people do not get in front of top management because they do not ask. They assume the answer will be 'No'. In hierarchical organisations the expectation is to go via the management tiers. I remember once asking an Energy Manager to introduce me to his CEO. The Energy Manager said he had never met the CEO; it was not possible for me to see him. He was wrong. When we got before the CEO I said: "Thanks for seeing us. I would like to introduce you to your Energy Manager, as I understood you have not met".

One advantage of being a consultant is that you are from the outside and not in the hierarchy, so you do not have norms to adapt to. In fact, you are an agent of change and part of your role is to challenge cultural norms. You can take risks that internal staff cannot. You can ask big. They can only say no. They might say yes. Napoleon said: "You honour me with the size of your request".

> "ONE ADVANTAGE OF BEING A CONSULTANT IS THAT YOU ARE FROM THE OUTSIDE AND NOT IN THE HIERARCHY, SO YOU DO NOT HAVE NORMS TO ADAPT TO. IN FACT, YOU ARE AN AGENT OF CHANGE AND PART OF YOUR ROLE IS TO CHALLENGE CULTURAL NORMS. YOU CAN TAKE RISKS THAT INTERNAL STAFF CANNOT. YOU CAN ASK BIG. THEY CAN ONLY SAY NO. THEY MIGHT SAY YES. NAPOLEON SAID: "YOU HONOUR ME WITH THE SIZE OF YOUR REQUEST".

Also, as an outsider your views are likely to be taken more seriously than those of an insider, even though the insider might be making exactly the same points. "A prophet is not without honour, except in his own country". This provides you with a lever and opportunity and as a consultant it is important to take hold of this function and not shrink back from opportunity.

How do you get their commitment?

It is important to fully understand top managements' goals and priorities. These will include reducing costs, compliance, health and safety, net zero and sustainability. So, any energy management initiative should be framed within their business objectives and priorities. Then it becomes their priority. It is vital for you as a consultant to link your initiative to their agenda.

Once you have accessed senior management, it is important to ask for their commitment. This means explaining specifically what you want them to do and why.

Around 30 years ago when I was embarking on behaviour change programmes, I was designing an energy awareness initiative. I asked to see the CEO and Board and was given a 15-minute slot. The CEO introduced me to those present and asked: "What specifically are you asking of us as a Board?" At that point I froze. I did not have an answer. I knew we needed top level commitment, but I had no idea what it actually was. I had no specific requests to make. I was unprepared.

So, it is important to define what top level commitment means and specifically what you want people to do. Because senior management are busy people, your requests of them should be framed by:

- Actions with a high visibility and impact.
- Actions which take little time.
- Actions which tie into business goals/priorities.

What to do if commitment is lacking?

The first question is whether commitment is lacking or they are simply busy with urgent priorities to address? It may not be lack of commitment but a timing issue. Therefore, it is important to be patient and seize opportunities when they arise.

Sometimes commitment is actually lacking by some senior people. In this case it is helpful to analyse why. It could be a lack of awareness which you could address. But if it is a lack of interest or engagement then it is worth asking:

- What will get their attention?
- Is there anyone at a senior level who is interested?
- What is the minimum commitment we need to get the initiative going?

Sometimes commitment grows as initiatives succeed and senior people then want to be associated with success. In other words, they can have a change of attitude.

At the other end of the spectrum if top level commitment is not forthcoming and their support is needed there is the option to walk away and to do anything at all. I have done so several times and focused my efforts on clients who want to engage. Time is now running out on the climate emergency and if senior management are sleep walking, it is time to go to those who are awake.

If the commitment is there, how do you sustain it?

The important thing is feedback, communication and maintaining a personal relationship. This can be done by a variety of ways. For example, in one organisation the Board had monthly meetings and I gave a 15-minute update once a quarter. It was sufficient to brief them on successes and challenges. Often senior level people will volunteer to help: "If there is an issue, let me know." These senior people can unblock problems and also contribute useful ideas.

Author's Profile:

Eur Ing John Mulholland is a chartered energy consultant with over 40 years' experience in energy management and behaviour change. John is qualified ESOS Lead Assessor and is experienced in energy auditing and ISO 50001. He founded Mulholland Energy Solutions in 2012 and specialises in behaviour change, employee engagement, ISO 50001 and energy and carbon management and strategy.

by The Energy Managers Association

INDUSTRY INTERVIEW

Energy Management at the Scottish Fire and Rescue Service

In this feature, we focus on how organisations across different industries approach energy management. In this issue, we asked Brian Troddyn, Carbon & Energy Officer at the Scottish Fire and Rescue Service (SFRS) about energy management at one of the largest fire and rescue services in the world.

Brian Troddyn – Carbon & Energy Officer at SFRS

Background

The Scottish Fire and Rescue Service is the fourth largest fire and rescue service in the world with more than 7,900 employees. SFRS is a national organisation delivering frontline services from three strategically positioned hubs based in the East, North and West of the country. The Service responds to many different emergency incidents including fires, road traffic collisions, rope rescue, water rescue, hazardous materials and flooding as well as assisting partner agencies to keep Scotland's communities safe.

Across Scotland, there are 356 fire stations, comprised of: 74 Wholetime fire stations which operate 24hrs day, 240 Retained fire stations and 42 Volunteer stations. Retained and volunteer stations are usually unoccupied most of time except during call outs and training exercises. The organisation's fleet is made up of over 800 fire appliances and almost 800 light fleet (cars/vans).

What does energy management mean at SFRS?

Energy is used in a number of ways within our operations. Fire stations are very energy intensive buildings, particularly our Wholetime sites, which require heating, lighting and hot water 24hrs a day, seven days a week. This poses a challenge when trying to run the building as efficiently as possible. There is not a lot of dynamic loads within the building and so the energy baseline of these buildings can be quite high.

Our smaller Retained stations, where firefighters respond to emergencies via a pager-system when required, are very different in their use patterns. They are not always operational and when they are not being used for emergency call outs, they are used for training nights. Heating and hot water systems still need to operate but we are retrofitting smart heating controls to ensure that the heating is not running at full comfort temperatures for long periods when unoccupied. Drying rooms for firefighter PPE are vital for stations. Items not completely dry would pose a health and safety risk. This means that this is also the most energy intense process within the building. The rooms need to run at over 28°C for long periods to dry wet PPE. Managing the energy of hundreds

of sites across the whole country poses its own challenges. Many of our smaller sites are in very rural, hard to reach areas and communities. However, one major advantage to our operations in terms of energy management is that all fire stations generally have the same operational needs, systems and use patterns. Any solution we develop can then be easily repeated and deployed across all other stations and this is an approach we are having a lot of success with.

Have the organisation's strategies been adapted to include focus on Net Zero policy?

SFRS is very much focused on becoming a Net Zero organisation. In 2019, we published our Climate Emergency Response Plan which is a statement of how we will respond to climate change, support communities across Scotland and reduce our own organisation's impacts on climate change. As an emergency service, we are very much at the frontline of many impacts from climate change and so our focus is not just on how we can serve and support our communities but also on reducing our own organisational impact.

We then published our first 10-year Energy and Carbon Management Strategy 2020-2030 which maps out the challenges, drivers and opportunities for better energy management within the organisation long term. We have set ourselves an ambitious target of 6% carbon emissions reduction from our 2015/16 baseline each year to 2030. We have also developed our first of 5-year rolling Carbon Management Plans and are in the second year of our Carbon Management Plan 2020-2025. Through this plan, we are currently running a number of different energy and carbon reduction programmes across our building estate and fleet. We have a dedicated Environmental and Carbon Management Board with representatives from across all heads of functions.

How does SFRS deal with energy management?

Energy security and resilience is very important to us and so onsite generation of power is a major part of our strategy and we are deploying roof mounted solar panels across all our Wholetime and corporate buildings. We have so far deployed over 3286 solar panels on our roofs which generates just over 1MWH of electricity each year which represents about 4.8% of our total electricity use. We plan to continue this trend to generate as much onsite power as possible across our estate.

Smart asset management is a key strategy for us going forward. We are currently upgrading all our existing BMS systems to smarter BEMS systems and integrating them onto a central BEMS platform for remote management. Part of this was to develop a bespoke fire station controls strategy. We are also retrofitting smart heating controls to all 240 Retained stations by 2025 with about 50 completed so far.

We are trialling new direct electric boilers to replace all our smaller gas heating systems on our rural sites. Biomass is playing a smaller part with our national headquarters recently switching over to a biomass boiler and we plan to replace our existing oil boilers with biomass at other key sites.

Building fabric is important too and we have begun to roll our cavity and loft insulation at many of our rural Retained stations. For our bigger Wholetime and corporate sites we are looking to develop a suitable external cladding system to retrofit to these sites to improve their U-Values.

The greening of our light fleet is well underway and we are

developing a national Blue Light EV charging network in conjunction with emergency service partners. Currently, we have transitioned about 20% of our light fleet to low/zero emission vehicles with a target to fully transition over next 5-6 years.

Staff engagement is key. Enabling staff to make a positive impact on their working environments is a major challenge and one we are looking to tackle head on. We plan to launch a nationwide energy campaign over this coming winter. We are developing a suite of tools and information to allow station level users to assess and implement their own energy action plans within their local station. The plan is to launch this as part of an energy competition this winter. This will be the launch pad for more sustained and wider environmental and carbon related behaviour changes programmes going forward.

What areas of everyday business are most challenging in terms of energy management?

Resilience is paramount when it comes to our day to day operations. As a front-line emergency service, the ability to maintain the same level of response and service delivery takes precedence over all other considerations when we are looking at how our buildings and fleet operate. Downtime of key energy systems such as heating and hot water need to be minimal with a Plan B in place for any possible incidents of failure. This is especially true for hot water for showers as firefighters need to clean themselves after coming back from incident grounds and hot water for our BA (Breathing Apparatus) systems is critical to firefighter safety.

> “WE ARE DEVELOPING A SUITE OF TOOLS AND INFORMATION TO ALLOW STATION LEVEL USERS TO ASSESS AND IMPLEMENT THEIR OWN ENERGY ACTION PLANS WITHIN THEIR LOCAL STATION. THE PLAN IS TO LAUNCH THIS AS PART OF AN ENERGY COMPETITION THIS WINTER. THIS WILL BE THE LAUNCH PAD FOR MORE SUSTAINED AND WIDER ENVIRONMENTAL AND CARBON RELATED BEHAVIOUR CHANGES PROGRAMMES GOING FORWARD.

Can you describe an energy management project that reflects the organisation's principles when it comes to energy management and environment?

We recently decommissioned many of our large underground fuel bunker stores. Energy security is key for us particularly around our fleet. The ability to continue to mobilise our fleet during a fuel shortage is critical in ensuring we can continue to respond to incidents as required. We had a number of legacy fuel stores around the country, some in poor condition and overall, we were over capacity. Upon review, we decommissioned a number of these and only kept strategically placed fuel stores which drastically reduced the amount

MACALPINE Road Fire Station Solar PV

of fossil fuel we keep on our sites. Ultimately, we are aiming to transition our heavy fleet over to an alternative low carbon fuel solution, but this will take time.

How has Covid-19 affected the energy management at SFRS?

Fire stations' energy needs remained largely the same during the pandemic. However, like many other organisations a lot of our staff have been home working. Currently, about 80% of our support staff still work from home and this is set to continue as we are now moving to a more flexible working policy. This will no doubt lead us to assessing the use patterns of our buildings and how best to manage them in terms of energy.

home working. As employees are now home working we will have to report on home working emissions in the near future. The Scottish Public Sector is currently working on a tool for this.

The biggest risk and challenge is now the reliability of our supply chains as many components are both becoming more expensive and in short supply. Forward planning is key to mitigating this risk where we can.

What is in the pipeline for the future?

Emissions from our heavy fleet represents about one third of our carbon footprint and also presents the biggest challenge for decarbonising. Fire appliances do not only need to travel to their destination but also the engine needs to work hard to power the water pump at an incident potentially for long periods and so transitioning to a low/zero carbon alternative fuel source that can deliver the same level of operational need is a major challenge but one SFRS is keen to explore.

We will continue to develop projects to decarbonise our built estate. Currently, we are developing a suitable low/zero carbon heating solution to replace our gas heating systems within our large Wholetime fire station and corporate buildings. This is another major challenge that we are focused on.

> "THE BIGGEST RISK AND CHALLENGE IS NOW THE RELIABILITY OF OUR SUPPLY CHAINS AS MANY COMPONENTS ARE BOTH BECOMING MORE EXPENSIVE AND IN SHORT SUPPLY. FORWARD PLANNING IS KEY TO MITIGATING THIS RISK WHERE WE CAN.

We have seen a sustained drop of about 20% in energy use at our office buildings where most staff have been

Author's profile:

Brian Troddyn is SFRS's Carbon & Energy Officer and works within their Environmental & Carbon Management team. He has responsibility for all energy management activities across SFRS, including developing and delivering energy projects, monitoring and reporting, developing behaviour change programmes and advising on energy and carbon aspects of capital programmes. He holds a MSc in Energy Management and a BSc in Environmental Science.

by Wilson Power Solutions

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The Bad, The Ugly and The Controversial in Energy Management

We are all used to hearing about best practice, successes and achievements but one could argue that there are lessons to be learned from bad practice and failures as well. We have all heard some horror stories about projects, partnerships and technologies that did not work out as planned. We have asked our members to share some of these with us in addition to their opinions in other areas. Here are some of the responses in the areas of:

Area 1: PROJECTS/CONTRACTS/ OTHER

Area 2: GREENWASHING EFFECT ON AN ORGANISATION

Area 3: OFFSETTING

Area 4: COP26 - YOUR MESSAGES

AREA 4: Show us the money - and not money you have already promised but real new money.

AREA 1: The project was a new build library for a local authority involving a ground source heat pump system for heating and a gas fired micro-CHP for domestic hot water. The main contactor appointed an M+E contractor, the M+E contractor issued a specification to the subcontractors who designed and installed the relevant items.

The project was completed in 2017. The ground source heat pump (GSHP) was installed without suitable metering as required by RHI and none of the various parties accepted this was an issue because they had all met their individual specifications. The GSHP operates with a Coefficient of Performance of around 1.1, one of the main reasons being the BMS strategy being 'a mess', again because a BMS has been provided all parties have argued they have fully met their requirements.

The CHP for domestic hot water was connected directly to a domestic hot water tank (no buffer from the CHP) and no heat pump installed. The CHP produced far more heat than was required for hot water and was turned off after commissioning to avoid damaging it because it can't run for long periods. The justification for the CHP was the designers' assumption regarding hot water needs which massively overestimated the requirements.

At the time the project took place the Local Authority did not employ an energy manager and no one in the Facilities / Maintenance department had any experience of heat pumps/CHP so no one was able to evaluate and challenge the designers/contractors. Performance of systems and monitoring after installation was not included as part of the contract.

AREA 2: Greenwashing makes it more difficult for energy managers and staff who understand where the main emissions come from to focus work on projects that will result in significant carbon savings. We spend 80% of our time discussing 10-20% of our emissions (largely related to land use, food, and similar issues).

AREA 4: High profile event but policies need to come from it.

AREA 3: Offsetting should be the last resort not the first. It also moves resources from reducing emissions and allows bad practices to continue. We are developing an emissions pathway to try and meet our Net Zero by 2038 target. Right now, it says we can only reduce emissions by 80% so we may need to do something but at the moment we do not know.

AREA 1: Our biggest source of frustration is a supplier who will not respond to email requests and are not issuing bills to our billing team addresses. We are then served with late payment fees and debtor visits because their online portal does not work for most of our accounts either. They force us to either phone and be on hold for ages or use a web chat which half of the time the operator does not appear to do the thing you have requested but you do not find out for another 7 to 21 days. Yet, they think it is OK to bombard me with emails from their energy contracts team! I am not going to do any business with them ever again.

I feel more comfortable with suppliers where there is a named account manager I can liaise with and keeping these relationships going is my tip to other energy managers. Physical meetings have not been possible, but emails, calls and virtual meetings have helped. I have tried to request an account manager with the current supplier, but they won't allow this.

AREA 3: Offsetting is unavoidable in the short term, especially as we cannot remove gas entirely from what we do, but a lot of schemes out there are suspect. Trees are only good if they survive - try to keep it local.

AREA 2: Net zero targets set with no plan to get there and no increase in resources to achieve it. The finance won't be there to match the publicised target. This applies to both capital projects and the necessary current account to pay for more salaries.

AREA 4: Set some real targets and give the message that fossil fuel extraction must start to be reduced asap.

AREA 1: All meter installations can be a complete nightmare. For heat meters it is hard to even find competent companies who can install and correctly commission the meters. For electricity it is virtually guaranteed there will be inverted CTs, incorrect CT ratios, inverted voltages, some phases counting up, the others down, sub-meter totals exceeding master meters. Water meters also seem to fail regularly and gas meter half hourly data from suppliers regularly fails too.

Tip
Find a specialist meter company, certainly not electrical installers who will lie to your face, and get them to double check any installations you suspect are wrong. Check sub-meter totals against master meter readings after at least a month. Always be suspicious of all new meter installations.

AREA 4: Whilst there is need for a high-level event of this magnitude, I feel that with past failures to meet objectives, it is becoming more of a PR stunt for the representatives than anything else. Enough of excuses, support the talks with results to set examples for others to take climate change seriously.

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