

THE EMA MAGAZINE

www.theema.org.uk | ISSUE OCTOBER-DECEMBER 2021



**WINNERS AND HIGHLY
COMMENDED ANNOUNCED**



Energy Management Awards 2021



Trends 2022

**JOURNEY TO
NET ZERO
IN THE NHS**



Planning for Net Zero



**SHAPING THE FUTURE OF
ENERGY MANAGEMENT**

ENERGY MANAGEMENT TRAINING COURSES

**PUBLIC TRAINING - IN-HOUSE TRAINING - ONE TO ONE
TRAINING - VIRTUAL TRAINING - TAILORED TRAINING**

2022 TRAINING CATALOGUE OUT NOW

IN 2021...

56

**TRAINING
SESSIONS DELIVERED**

1422

PARTICIPANTS

47

**ENERGY MANAGEMENT
TOPICS COVERED**



04 FOREWORD

By the Energy Managers Association

FEATURES

06 ENERGY MANAGEMENT TRENDS 2022

By Haydn Collingwood, Roger Low, Vilnis Vesma and Haydn Young

10 PLANNING FOR NET ZERO IN THE NHS

By Paul Graham and Clare Jones

CAREER & TRAINING

13 CAREER IN ENERGY MANAGEMENT

With Laura Howlette

16 EMA MEMBERSHIP SURVEY 2021

By the Energy Managers Association

18 MY ROLE IN TACKLING CLIMATE CHANGE

With Sara Emmett

INDUSTRY FOCUS

21 SAVING THE HOSPITALITY SECTOR 1KWH AT A TIME

By Dr Samantha Mudie

26 EMA ENERGY MANAGEMENT AWARDS

By the Energy Managers Association

31 A WHOLE UNIVERSITY APPROACH TO ACHIEVE ENERGY TARGETS

By Gavin Hodgson

32 NET ZERO GUIDE

By the Energy Managers Association

35 HAS THE COP26 DELIVERED FOR ME AS AN ENERGY MANAGER?

By Astley Fenwick



Dear Reader,

Across this year, as our world continued changing, the energy management world has been turning towards a set of responsibilities and concerns with respect to the climate crisis, consulting on the strengthened ESOS, digesting heaps of government's strategies and facing unprecedented energy price increases sifting through energy suppliers.

It remains debatable whether the last few months have brought a tangible progress leading to actions rather than just words when it comes to the climate emergency at a national level, but we don't know a single energy management professional who isn't considering their organisation's climate impact right now, working tirelessly on a net zero plan and putting steps into actions.

We reflect on these plans, actions and roles that our community plays in addressing the climate change nearly across the entire issue. We also honour the immense accomplishments over the last 12 months and share with you the profiles of the EMA Energy Management Awards 2021 winners. These are the leaders who are injecting enthusiasm and best practices into energy management. However, starting on page 6, we look forward to 2022 and the expected trends that could transform energy management processes and profession next year.

This is an exciting time for energy management and within the pages of the magazine you will find plenty of great and inspiring work that is valued, respected and raises the profile of energy management. So please enjoy and as you look through feel proud of making a difference and being part of this rewarding industry.

We wish all our readers a Merry Christmas, take care and stay safe so we can all look forward to a happy and healthy New Year.

Yours,
The EMA Team

PUBLISHER

The EMA Magazine is published quarterly by the Energy Managers Association (EMA).

EDITORIAL

The Energy Managers Association
www.theema.org.uk
Tel: 0203 916 5516

CONTACT

Edita Krupova; Editorial Enquiries & EMA Membership Services Manager
edita.krupova@theema.org.uk

CONTRIBUTORS:

Haydn Collingwood, Roger Low, Vilnis Vesma, Haydn Young, Paul Graham, Clare Jones, Laura Howlette, Sara Emmett, Samantha Mudie, Astley Fenwick and Gavin Hodgson

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.

ADVERTISING SALES

The EMA Team
Tel: 0203 916 5516
enquiries@theema.org.uk

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.

@2021 Energy Managers Association, Registered in England and Wales, Company No 7943728, VAT No 151339624, Registered Address: Suite 77, 95 Mortimer Street, London, W1W 7GB.

No part of this publication may be reproduced, stored in, or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without prior written permission. Any information or material sent by advertisers and contributors, including advice, opinions, drawings and photographs, is the view and the responsibility of those advertisers and contributors, and does not necessarily represent the view of the EMA.

ENERGY MANAGEMENT ONLINE TRAINING SCHEDULE

Energy Management Theory Combined with Real-World Applications

JANUARY

20th	SECR Compliance
21st	Net Zero Fundamentals and Strategies
27th	Essential HVAC Control and Optimisation

FEBRUARY

3rd-4th	Energy Management in Building Services
11th	Reaching Net Zero

MARCH

3rd	Understanding and Delivering Behavioural Change Programme (in-person)
4th	On-site Electricity Generation
10th	Become an ESOS Lead Assessor
11th	Waste Management
18th	Energy Monitoring, Targeting and Validation

APRIL

1st	BMS Essentials
8th	Energy Auditing Techniques
28th	Turning Data into Energy Savings (in-person)
29th	Energy Procurement

MAY

5th-6th	Fundamentals of Energy Management
13th	Battery Storage for Business
20th	Lighting – Basic Understanding

JUNE

17th	Water Management
------	------------------

REDUCED PRICES

Group Training

The majority of the 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 feedback 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



Energy Management Trends 2022

As we say goodbye to 2021, we have asked four energy management professionals to look forward to energy management in 2022. Here are their views on the most important trends that will transform energy management processes and profession next year.

Haydn Collingwood, Technical & Innovation Manager at Vertex Services Group Ltd



Decarbonisation and electrification of buildings

I remember a time just a few years ago in 2017 when it was deemed a good idea to have co-generation on site in the form of CHP generators which operated on gas. Fast forward to 2021 and this ideal has been completely flipped on its head. Gas CHP may now be perceived as the energy friend turned villain due to the CO2 emissions it produces. There will hopefully be scope for hydrogen powered CHP in the future, but hydrogen is not

yet economical without subsidies although the costs are falling.

A move away from gas fired boiler heating and carbon emitting plant to electric heating seems to be the new way forward. The UK has set a legally binding target to achieve net zero greenhouse gas emissions by 2050. Achieving this will require almost all heat within buildings to be decarbonised and heat in industry needs to be reduced to close to zero carbon emissions.

So how can we move away from gas to electric heating? It is possible by using current technologies such as heat reclaim chillers, air source heat pumps and industrial heat pumps, although admittedly it's much easier said than done due to funding.

The following recent CIBSE publications give an indication of the shift and the pace at which electrification in buildings is moving:

- AM16 CIBSE guide for heat pump installations in domestic buildings

(published Sept 2021)

- TM 67 Electrification of buildings for net zero (published Nov 2021)
- AM17 CIBSE guide for heat pump installations in non-domestic properties (to be published in early 2022).

Digital transformation to drive sustainability

I am a huge advocate for reducing building energy wastage by utilising building energy management systems (BeMS). I have been fortunate to work with some great BMS engineers in the industry by implementing energy efficiency strategies across multiple buildings, some which have little to zero initial cost with swift payback periods.

The issue however with some of these continuous improvements and efficiency strategies is that they are near impossible to quantify in terms of kWh savings and cost savings without solid data to back them up.

I welcome the widespread adoption of digital solutions and platforms for monitoring energy performance and the broader sustainability scope such as environmental monitoring of spaces which has become more prevalent during the pandemic. Within the current phase of 'the return to the office', occupiers depend upon safe and healthy environments with accompanying indoor air quality information for peace of mind.

Access to data, data analytics, AI, and IoT are now all trending and gathering momentum. The industry needs data and digital dashboards to be able to visualise these savings but also pinpoint the exact areas where energy wastage is occurring. Based on experience and some statistics it is estimated that 15-20% of energy consumed in buildings annually is due to wastage.

“**BASED ON EXPERIENCE AND SOME STATISTICS IT IS ESTIMATED THAT 15-20% OF ENERGY CONSUMED IN BUILDINGS ANNUALLY IS DUE TO WASTAGE.**

Once we identify these specific areas via digital means to the decision makers then this will no doubt drive sustainability initiatives.

Companies are implementing digital platforms to operate across their entire portfolio and this is accelerating data sharing which will assist in achieving the end goal of smart connected buildings and cities.

Environmental Social Governance

The importance of environmental, social and governance (ESG) matters

have escalated in the wake of the pandemic, gaining increasing urgency amid rising energy costs across the UK and Europe. One of the main social-political issues forecast for 2022 and the next three to five years is centred around environmental issues (e.g., air quality/climate change).

In terms of sustainable property investment, the focus now seems to be turning a corner towards repurposing and refurbishment projects as these are a better fit for the values which ESG represent.

Companies are currently developing ESG management roles in order to realise their ESG strategies and commitments which are being closely monitored by investors and local communities alike.

Upskilling people with the relevant knowledge in the various branches of ESG will be key to success in this relatively new domain.

**Roger Low FEMA MEI,
Consultant Energy Manager
at Speedwell Energy Services**



Commodity prices

The increased and increasing commodity prices for fuel will continue to drive the smaller power suppliers out of the market, and with this reduce

competition. However, I believe that one of the 'Big Six' will eventually consider the domestic market untenable for their shareholders, and withdraw from supplying domestic users, and concentrate on the commercial/industrial markets.

Energy industry

The Chinese banking system, which is heavily based on ownership of debt from building development in mainland China, will eventually burst in the same way as the US sub-prime market.

This will have a devastating effect on the energy industry, especially nuclear in the UK, as it is almost entirely reliant on Chinese funding for the new fleet; the UK government has already been persuaded to give EdF profit payments on the proposed Sizewell C plant during construction, to try and insulate the UK from the risk of Chinese financial collapse.

Self-generation

The high cost of energy supplied via the electric and gas grids, will persuade an increasing number of domestic users to opt for self-generation (via renewables mainly); along with the Government's change to the uniform business rates, reducing impact on development of renewables for business users, will initiate the 'Energy Death Spiral'.

This means running costs of the grids, with inflation and increased maintenance costs, will be shouldered by an ever decreasing number of grid users; again, making these users slowly drift towards self-generation.

Vilnis Vesma, Energy Consultant, Author and Trainer



I foresee growth in bogus energy-saving products and a shortage of energy-management expertise. But I hope that the trend for ever-fancier but functionally underwhelming software tools will be reversed.

Growth in bogus energy-saving products

The environmental imperative is motivating ever more organisations to look for energy saving. This creates fertile territory for unscrupulous merchants using pseudo-science and misdirection to peddle worthless products. It is not a new phenomenon: I can remember someone trying to sell me magnetic fuel conditioning when I was an energy manager in the 1980s and there are plenty of organisations today that have been inveigled into putting snake-oil products into their heating systems or fitting voltage reduction kit, just to give two examples. New scams in 2021 include a 'programmed' magnetic tape that you put on heating system pipework to 'structure' the water. It's profitable business for the masterminds, who make their money from selling licences and franchises to gullible but ignorant sales agents.

Why do I think the problem is likely to get worse in 2022? Partly because the hype around Net Zero is boosting

demand. Partly because customers' representatives lack the scientific knowledge or engineering training to recognise and challenge nonsensical marketing claims, and even go so far as to propagate them with ill-considered testimonials. Sadly, also it is because even reputable agencies have recklessly endorsed useless products.

Can we reverse the trend? Only, I think, by developing basic scientific and engineering knowledge in the customer community.

“NEW SCAMS IN 2021 INCLUDE A 'PROGRAMMED' MAGNETIC TAPE THAT YOU PUT ON HEATING SYSTEM PIPEWORK TO 'STRUCTURE' THE WATER.

Shortage of energy-management expertise

Talking to friends in the energy consulting business it has been clear for a while that there is already a shortage of well-qualified individuals who can undertake energy surveys and audits even for walk-round exercises, let alone for detailed or investment-grade studies. This is likely to get worse for two reasons. One is the demand for building assessments connected with organisations' net-zero planning.

The second reason is the impending surge of work under the Energy Savings Opportunity Scheme. Some ESOS assessors have already withdrawn from the pool because of the stressful circumstances and unsustainable workload, and it's hard to see why anyone would want to step into that particular breach. Meanwhile the Environment Agency are known to be contemplating tighter standards for ESOS work. Depending how they go about it, this could push some 2023 survey work forward to 2022, to escape

being covered by any new rules, or it might even persuade more assessors to bow out.

We need a national campaign of capacity-building and my prediction for 2022 is that there won't be one.

Fancier but less useful software tools

In the early days of applying personal computers to energy management, we had limited consumption data to work with, and software was quite limited in what it could do. But that software was also simple enough for 'amateurs' to deploy. That meant that people who were domain experts in energy could also be their own developers and sell software applications that did useful things.

As time went by, hardware speeded up, storage became virtually free, software tools of all sorts became more powerful and complex, and the professional software developer emerged as a class. This changed the rules of engagement because an energy business employing developers needs sales volume, so it needs salesmen, and salesmen need jazzy stuff to impress customers (think garish animated three-dimensional dashboards). At the same time automatic meter reading, and the growth of submetering (both good things in themselves) have created a tsunami of data which, in most cases, software developers are just passively rendering as pretty pictures.

My fear for 2022 is that there will be yet more hype about blockchain, the Internet of Things, and other frippery. My hope is that we see customers starting to demand that the results of large-scale energy data analysis are intelligently filtered, focussed and flagged as actionable information.

**Haydn Young, Chair of
Retail, Tech-Telecom &
Media, Logistics & Finance
- Sustainability & Energy
Forums**



I am excited about 2022. After two years of pandemic interruption the momentum is resurging as we push forward towards decarbonising our economy. Whilst COP26 may have stumbled, with nation states protecting their own interests, market forces have taken on the message to act on climate change.

Now it is businesses and organisations who are doing the pushing, recognising their obligations alongside the opportunities that decarbonising will bring.

Having worked in the energy field for over 15 years, previously as an Energy Manager for a retailer, now leading collaboration forums of Energy & Sustainability practitioners, I have never been so enthusiastic about the UK's progression towards Net Zero than now. Public support is high, the financial backing is available and the Net Zero 2050 & 1.5°C target is still in reach.

So, what do I think will be the trends of 2022?

Race for renewables

Global demand growth for renewable energy is set to soar alongside an inevitable, and hopefully only short term, rise in material costs. The UK is a small buyer in a huge market and panel costs have already risen by 20% over the last 12 months alongside the rise in labour costs in the UK. The impact could be felt on self-generation capex projects pushing back the ROI by a year or more. For those looking for longer term renewable energy deals via Power Purchase Agreements the impact will be milder with the increased costs spread over the contract duration.



For those buying renewable power contracts from suppliers, increased demand is now raising the cost of REGOs which have been historically low. You should also anticipate increased scrutiny of the generation sources used by your suppliers. Buyers should question suppliers on their renewable energy procurement sources and whether they are buying the energy and certificates collectively from named generation sources.

Focusing on our fleets

With whole business decarbonising the 'end game', the focus for Energy & Sustainability Managers should be

on areas whereby emissions remain stubbornly high, one being the transport fleet. Whilst cars, vans and LGVs are likely to be electrified during their natural fleet replacements, the challenge remains for the heavier forty-four tonne HGV fleet. Large fleet electrification is, possibly, two vehicle replacement cycles away and your immediate focus should be using renewable fuels such as Hydrotreated Vegetable Oil or Biomethane.

Looking forward, the UK Gov has commissioned consortia of businesses and academics looking at HGV Electric Road Systems and Hydrogen trials.

Where possible, large fleet operators should get involved in these studies. Sustainability is a team sport, so get involved.

Electrification of heat

Except for a cluster of industrial businesses in the East of England; hydrogen

seems too distant a possibility for many businesses to decarbonise their properties in the medium term. The emphasis then shifts to looking for sources to remove natural gas from our properties.

Whilst green gas will play a part, the drive towards electrification of heat seems inevitable through heat pumps. The only concern is how your local electricity network can cope with this increased demand and whether your property has the space available. This energy capacity challenge is clearly exacerbated by the need to electrify your vehicle fleet too. Start looking at your heat decarbonising options now.



Planning for Net Zero in the NHS

Paul Graham, Utilities, Waste & Sustainability Manager at Kingston Hospital NHS Foundation Trust



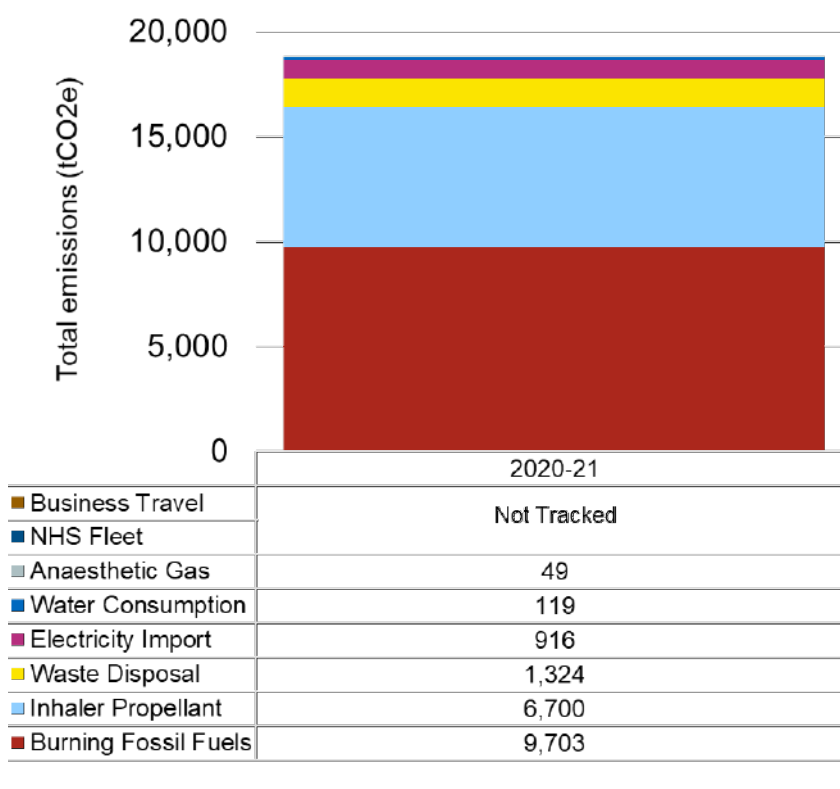
Kingston Hospital is a medium acute site in south-west London, providing emergency, planned and specialist services to a local population of approximately 1m people. We do this from a varied group of 30 buildings aged between 1 and 150 years old, with a team of 3,000 staff and contractors. We generate heat and power on site by burning 46GWh of natural gas per year and we import 3GWh of electricity, the total cost of energy services is approximately £3m per year. We have one energy manager who splits his time between energy, waste, sustainability compliance and reporting as well as miscellaneous data services for the Estates & Facilities Department.

Our starting point for considering sustainability was the 2018 Sustainable Development Management Plan (SDMP) which showed an initial

intention to reduce our environmental impact but had no firm carbon targets. We used this to launch annual action plans to inspire and track positive action. While much of this work didn't have a measurable carbon impact, it was worthwhile and we are proud of our progress to date. We have been tracking carbon emissions for most of our scope 1 and 2 sources for many years. We average around 20,000 tonnes of CO₂e per year from our core activities.

Data for energy, waste and water consumption is mostly captured from billing which is then validated

against a mixture of automated and manual meter readings. We already had to report these values as part of the annual Estates Return Information Collection (ERIC) anyway so there are well established processes in place. This year, for the first time, our Pharmacy department has started to track the quantity of anaesthetic gas used and inhalers dispensed. Our 'fleet' of 3 pool vehicles is not currently tracked and we are working with finance to capture more granular information from recharges made to staff for using their own and public transport. The figures for the 2020-21 financial year are provided in the chart.



The NHS has set some ambitious targets and timelines in their document “Delivering a ‘Net Zero’ National Health Service” which was published in October 2020. Accordingly, we will reduce the emissions we control directly (scope 1, 2 and selected parts of scope 3) by 80% by 2032 and to net zero by 2040.

“ **ACCORDINGLY, WE WILL REDUCE THE EMISSIONS WE CONTROL DIRECTLY (SCOPE 1, 2 AND SELECTED PARTS OF SCOPE 3) BY 80% BY 2032 AND TO NET ZERO BY 2040.**

There is also a target for the rest of scope 3 and some other sources, much of this is beyond our realm of control but will happen as society and larger organisations like NHS Supply Chain adapt to a net zero world. Honestly, unless specific opportunities arise, we do not plan to exceed these target timescales. However, we are cheering from behind for those Trusts who have already set net zero goals for 2030.

We are currently formulating our journey towards these lofty and far away sounding 10 to 20 year goals. Our executive management team requested an update recently which was well received and signalled their interest in this area. We have appointed the Director of Finance as the board-level lead for net zero. NHS England requires all Trusts to produce a board-approved 3-year Green Plan by January 2022 which is helping to focus our senior management attention. We expect this plan to include details of our plans to progress towards electric vehicles, policies on expenses and smart working, building improvements, replacement inhaler and anaesthetic gas products etc.

We are also working on an energy strategy to bring us up to the 2032 deadline which, while it may well continue to be gas fuelled for now, should set us up to apply low-carbon solutions thereafter by moving to low temperature heating distribution systems and applying solar and battery technology.

Our next actions to facilitate carbon reduction include working with our integrated care system partners across south-west London to work out what we can do together to comply and excel in this area. While our approach to net zero at this time is unlikely to be highly technical (for example by setting science-based targets for our organisation etc.), we think that by following the lead of NHS England, all Trusts should be capable of taking appropriate action in the short-term. The inclusion of multiple actions within the NHS Standard Contract Service Conditions is a welcome direction for our efforts.

The longer-term solutions to get us to net zero by 2040 will require heavy investment to renew buildings and services to net zero standards. This has proved difficult to obtain to date and we look forward to finding out how this will be managed at a national level.

Author's Profile:

Paul has been an energy manager for 5 years and has been employed by Kingston Hospital NHS Foundation Trust for 13 years within the Estates & Facilities Department. He leads the energy, waste and sustainability agenda for the Trust as they serve the local population in South West London. He was awarded Member of the year by the Energy Managers Association in 2020.

Clare Jones, Energy, Sustainability & Compliance Officer at Northern Devon Healthcare NHS Trust



In my current role at Northern Devon Healthcare NHS Trust (which includes North Devon District Hospital, the most remote acute hospital in mainland England), I'm responsible for monitoring our Energy Performance Contract (EPC) which covers a Combined Heat and Power plant (CHP) which provides heat and hot water for North Devon District Hospital, three biomass boilers at our community hospitals at South Molton, Bideford and Holsworthy and solar panels at some sites.

The total cost of EPC was £4.6M which included £2.8M Salix Funding with a payback period of seven years. The EPC has achieved savings of £600,000 plus and reduced 2,108 t/CO2 per year so far. We have also purchased 100% clean REGO backed electricity since April 2021, installed LED light fittings, additional insulation, replaced the main chiller, replaced pumps, made improvements to the BMS (Building Management system), restructured and recruited within the facilities department to recognise the importance of sustainability (me!), added water free urinals and actively promote Warp-it (which reuses and recycles surplus redundant resources such as furniture, equipment, fixtures

and fittings). I'm also responsible for monitoring all our energy and water consumption across all sites and implementing energy/water saving devices.

However, one of the Trust's biggest challenges over the next five years is finding a replacement for the CHP as it currently runs on natural gas and how we're going to fund it.

“ **HOWEVER, ONE OF THE TRUST'S BIGGEST CHALLENGES OVER THE NEXT FIVE YEARS IS FINDING A REPLACEMENT FOR THE CHP AS IT CURRENTLY RUNS ON NATURAL GAS AND HOW WE'RE GOING TO FUND IT.**

So, what's next for Northern Devon Healthcare NHS Trust? We are planning to integrate with Royal Devon and Exeter NHS Foundation Trust next year and already have joint Sustainability and Travel group meetings. We want to develop a Sustainability Policy and Green Plan, establish a method to accurately assess the Trust's carbon footprint, bring together all carbon savings so that they can all be accounted for, set achievable carbon targets, establish working groups to progress small projects and ensure that sustainability is a key consideration for all that the Trust does.

We have a draft joint Green Plan which will go to Board this year for approval and we have a Board Level Sustainability Lead in Chris Tidman, our deputy CEO. Our Green Plan covers nine areas of action, Workforce and System Leadership, Sustainable models of care, Digital Transformation, Travel and Transport, Estates and Facilities, Medicines, Supply Chain and Procurement, Food and Nutrition and



Adaptation, following the Greener NHS updated Green Plan Guidance (2021) and we have linked these areas of action to the United Nations Sustainable Development Goals. Each of these areas of action has a: What do we want to achieve? How can we achieve it? And a How we will measure it section? These will all be developed over the next 12 months with our stakeholder engagement workshops both internally and externally as we plan to play an active role as an Anchor Institution in Devon.

I'm going to be completely honest and say the carbon benchmarking data isn't where we would like it to be and the stakeholder engagement hasn't been thorough due to the time constraints of developing our Green Plan and delivering it to the ICS by January 2022. The Green Plan will be reviewed annually and our first consideration on our road map for 2022 is staff engagement. We are waiting on Greener NHS to provide us with our Carbon footprint baseline and a digital tool for continuous improvement to replace the SDAT (Sustainable Data Assessment Tool) to measure it. I know other Trusts are using consultants or have a greater

capacity to calculate the carbon footprint themselves.

In October 2020, the NHS became the world's first health service to commit to reaching net zero carbon. When I started this role, we didn't have a Board level Sustainability Lead or a Green Plan. Now I'm hearing about internal and external sustainability projects, networking on the Greener NHS forums, attending webinars and meetings almost every day. There is a real feeling of movement and awareness now, alongside COP26 and **in recognition of the unequivocal threat to health presented by climate change.**

Author's Profile:

Clare has been working at the Trust for just over 12 months. She has a MSc in Environmental Issues which she completed in 2000. Her experience includes supporting the implementation of ISO14001 at a packaging company, reducing clinical waste disposal at a local authority and becoming an internal auditor for ISO 9001:2015 while developing an integrated management system for a company specialising in maintaining critical network power equipment.

Career in Energy Management

The Energy Managers Association aims to encourage and enable more professionals to enter the world of energy management and environmental roles. Being an environment and energy manager may not seem like the most obvious career for many. The EMA has taken on a challenge of changing the perception of energy management and associated fields, by raising the sectors' profile and sharing insights into the career progress and achievements of leading energy management professionals.



In this issue, we have asked Laura Howlette, Environment Team Manager at Rushcliffe Borough Council about her career in energy management.

What made you to choose environment and energy management as a career?

I started my career working in a customer service call centre for an energy company, I didn't have a degree, or even A-levels and I was particularly useless with computers – the only thing I could remember from school IT lessons was how to save onto a floppy disk – a skill that was no longer in demand!

The company I worked for had an online training academy with lots of free courses, I really wanted to learn more but didn't have a computer at home, so I started staying behind for an hour a day to do the online courses and taught myself excel, PowerPoint – stuff that seems so simple to me all these years later, but back then it was a real challenge.

A manager from an entirely different department saw me, asked what I was doing, when I explained, her response was "there's a role on my team, I want to see your application by the end of the week". I got the job and started working for a department that covered projects and data analysis, the

opportunity was a turning point for me. I developed skills in project research, how to analyse basic data trends and put together business proposals – looking back, all skills that you need in an Environment Managers role. I joined the 'Environmental Champions' – an internal volunteer group whose focus was promoting recycling and energy efficiency in the office.

A year or so later a role for a Sustainability Coordinator became available – under 'requirements' was the line 'must have relevant degree or equivalent', but I didn't let that put me off, as a Champion I'd already done a lot of work with the members of the team who knew my capabilities. I gave a good interview and was hired for the role. Over the next 4 years I was involved in a wide variety of sustainability projects – water saving initiatives, energy, and waste reduction, I spent a lot of time collecting environment data and finding new and interesting ways to communicate it to staff. I was pushed out of my comfort zone doing roadshows and public speaking – something that used to scare me so much it made me feel sick! But I did well, and the company

“A YEAR OR SO LATER A ROLE FOR A SUSTAINABILITY COORDINATOR BECAME AVAILABLE – UNDER 'REQUIREMENTS' WAS THE LINE 'MUST HAVE RELEVANT DEGREE OR EQUIVALENT', BUT I DIDN'T LET THAT PUT ME OFF.

paid for training and additional environment qualifications. I even won an award for the company for one of my water saving campaigns.

I then applied for a secondment at a Power Station, it meant moving nearly 100 miles away but it was one of the best decisions I've made, I learnt about energy generation and was able to do external training to become a qualified waste manager. After the secondment ended, I moved back to my previous office, but not before taking time off after having my first child. While still on maternity leave, I applied for a role as an Environment advisor. I remember writing my interview prep and the presentation they'd requested with my baby asleep in one arm – not the easiest of things to juggle, but worth

it, as I was offered the role. My career at the energy company lasted a total of 13 years, at which point I was ready to move on, so when voluntary redundancy became an option, I said my goodbyes. Shortly after, the pandemic hit and the whole country was in lockdown.

I was lucky, I was contacted by a recruiter for a temporary maternity cover contract for Environment Manager at Ferrero Thornton's Chocolate Factory. At first, I was intimidated by the role; I'd never been an Environment Manager in my own right before and it was a lot of responsibility, but I quickly fell into the work and the variety of experiences from my previous roles really helped. There was a lot to do, the site had just been issued with a new Environment Permit and their environmental management system needed reviewing and updating, they had also just started on the course of installing their own CHP heating system. The challenges taught me a lot about leadership and the kind of manager I wanted to be, I found real confidence in myself and my abilities for the first time – it was definitely a case of learning to swim by jumping in at the deep end!

Shortly before my contract came to an end, I applied for my current role as Environment Team Manager for Rushcliffe Borough Council. My colleagues at Ferrero were so happy for me when I told them I'd been offered the job, it was sad to say goodbye, but I was excited by my new challenge of working in local authority.

What does your role at your organisation entail?

My role at Rushcliffe Borough Council is exciting and varied, I have a small team of direct reports and the key thing that falls under my remit is the council's commitment to being

Carbon Neutral for our own operations by 2030. I was really impressed at just how much focus is given to environment initiatives in Rushcliffe, under their overarching 'Carbon Clever' campaign there are activities such as LED lighting in buildings, looking into greener options for refuse vehicles, how to make events more sustainable or installing EV charging in council owned carparks – every department in the council operates with sustainability in mind.

In my own department I oversee an ecologist who's developed a robust Biodiversity action plan and 'tree-planting' plans, as well as a Country Park Manager whose park is about to undergo an ambitious re-development to become more sustainable, including the installation of solar PV and sustainable heating solutions to provide the energy needs of the site as well as adopting electric tools and vehicles to replace the petrol ones.

I'm currently leading on the government funded 'LAD2' project, with an aim to install energy saving options such as external wall insulations, loft insulation and solar panels in qualifying houses within the borough to improve the energy efficiency of those buildings for the residents. We've also partnered with other Local Authorities within Nottinghamshire to develop a 'Green Rewards' scheme to get local residents taking action to reduce their carbon footprint and win prizes.

What is the most exciting part of your job?

For me it's all about the people I get to meet. Environment roles are unique in that they touch onto almost every other department – procurement, fleet, buildings, communications. You end up getting to know almost everyone internally as well as engaging with the public, local businesses and MPs. I really enjoy

getting to know people and learning about their jobs, their life, what they're passionate about – almost everyone has an opinion when it comes to environmental issues and it's always interesting to hear from other people's experiences and points of view.

“ ENVIRONMENT ROLES ARE
UNIQUE IN THAT THEY
TOUCH ONTO ALMOST
EVERY OTHER DEPARTMENT
– PROCUREMENT,
FLEET, BUILDINGS,
COMMUNICATIONS.

What is your biggest achievement to date?

During my time at Ferrero Thorntons, I made a commitment to qualify the factory for ISO 14001 – something Ferrero group were keen to have for all their sites. It meant I had a year to take a factory from the bare bones of a management system to compliance with the ISO Standard, the whole time during a global pandemic, with all the associated stress and people shortages. It was a hard year, I had to make a lot of changes to processes and policies, and I had to bring the whole factory on that journey with me through huge amounts of training and communications.

Due to timing and covid relating issues our pre-audit got cancelled, so, six weeks before my contract came to an end, we went straight into the certification audit, with no pre-audit – a decision that was labelled 'brave' in that 'it's your funeral' kind of way at the time! I'm pleased to say we were certified with zero non-conformities. I will always be so grateful to every person in the company; all who worked so hard, especially the maintenance and facilities teams. The day we passed the audit was

such a great day, so much relief and pride. They really did deserve that certification and I'm honoured that I had the opportunity to lead such a complex but ultimately rewarding project.

What was the most exciting project that you worked on and why?

Possibly the most exciting project is one I'm currently working on; we're refurbishing buildings at one of our country parks to supply a hot food café, improve the education centre and make the park more sustainable and accessible. As a result, I've been getting involved in work around solar PV, air source heat pumps and how to provide a sustainable café – things like biodegradable takeaway consumables, but then I've also been involved in things that don't traditionally fall under 'environment'. Such as how do we provide healthy food options and applying for funding to install a 'Changing Places' toilet to make the park more accessible.

Looking into these aspects starts to give you a clearer understanding of the everyday challenges for those with mobility issues and you realise that we need to take responsibility, not just to provide a more sustainable future, but a more accessible one.

What is the most frustrating part of your job?

I'm sure every role feels this way; budgets! Though I have to admit in recent years investment in environment initiatives has become so much better, but there's still always so much more that could be done if finances were there.

If you had the opportunity to change one thing that would make your job easier, what would you change?

Climate change deniers: I think most

people now are aware of the climate crisis facing us all, but you still get the odd pocket of people who either don't 'believe' it's a thing or simply think it's someone else's problem.

The truth is everyone needs to play their part in reducing emissions; government, corporations, councils, individuals at home - we all need to be working together.

If you could recommend three things to have success as an environment and energy manager, what would you recommend?

People skills - this is not a job that can be done in isolation, you'll need to train, encourage, communicate, and challenge in a way that makes progress and not enemies!

Analytical mindset – you'll need to make decisions on what will provide the most benefit with the resources you have.

Enthusiasm – if you don't believe in what you're doing, then how can anyone else.

What advice would you give to someone looking to become an environment and energy manager?

If you already work for a company that has an environment manager or team have a chat with them, find out what the day to day looks like and get on their radar, you'd be surprised how many skills are transferable – data analysis, project management, financial management. You may find, if a vacancy comes up, that you have skills they need and they might be willing to provide training in other areas.

If you don't have an environment person then go to your leadership and ask why. Offer to become an environment representative, you may find the company eager to reward you with the training courses you'll need to progress further.

“THE BOTTOM LINE IS THAT YOU SHOULD NOT BE PUT OFF IF YOU DON'T HAVE AN ENVIRONMENTAL BACKGROUND ALREADY, IT'S A JOB THAT TAKES A LOT OF DIFFERENT SKILLS AND QUALITIES, MANY OF WHICH YOU MAY ALREADY HAVE.

The bottom line is that you should not be put off if you don't have an environmental background already, it's a job that takes a lot of different skills and qualities, many of which you may already have.

What is the most absurd statement that you have heard in your job?

"If it were up to me, you wouldn't be on the (environment) team; you don't have a degree in environmental sciences" – unfortunately said to me by a manager. The joke's on them, a short time later I was an Environment Manager in my own right.

Don't ever let someone else's opinions put you off something you're passionate about.

What are your long-term motivations in the company or the position?

I enjoy working in Local Authority because it gives me the chance to have a direct impact within a community. I'd perhaps like to expand the work we do into 'Green' education in schools as this is a subject that will affect the next generation even more.

Long term I just want to be able to look back and know that I have made a positive difference, to know that my actions have helped in some way to reduce carbon emissions or to improve someone's life in some small way, I can be proud of who I am and what I've achieved.

ema

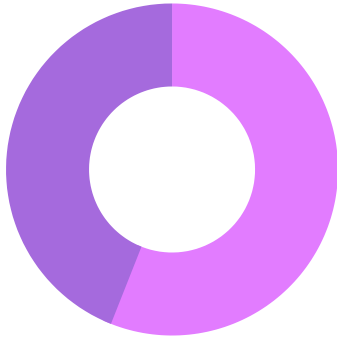
MEMBERSHIP SURVEY 2021



Introduction

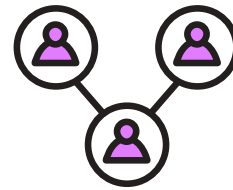
The EMA sounded out its membership on the impact of the pandemic on their salaries, energy consumption, energy efficiency projects and their barriers to approval. Here are the survey results.

RESPONDENTS

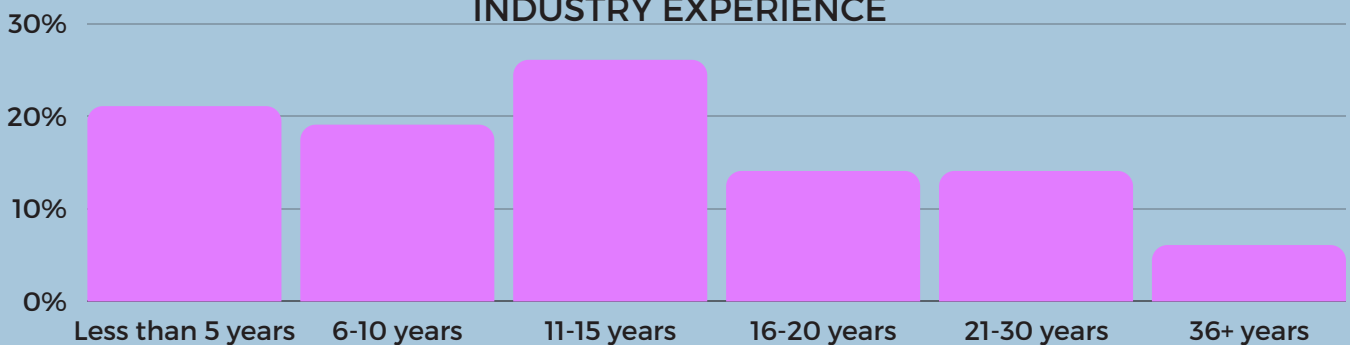


37% In-house energy managers
33% In-house facilities/sustainability managers
21% Energy service providers
9% Other

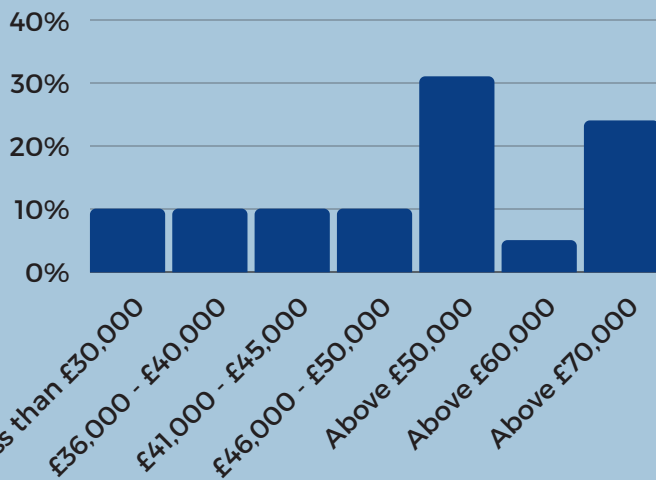
56% Private sector
44% Public sector



INDUSTRY EXPERIENCE



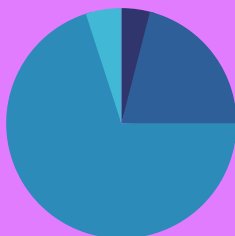
ANNUAL SALARIES - PRIVATE SECTOR



ANNUAL SALARIES - PUBLIC SECTOR



PANDEMIC EFFECT ON SALARIES

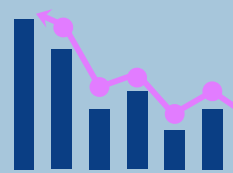
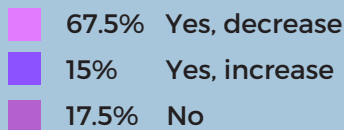
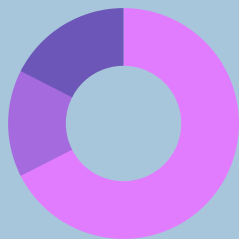


4% Yes, salary increase
21% Yes, salary cut
70% No
5% Other

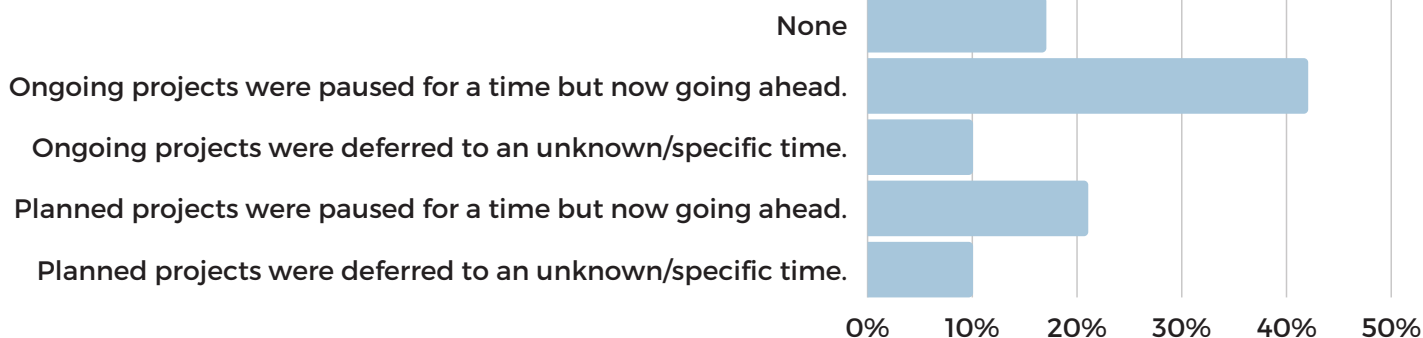


PROJECTS

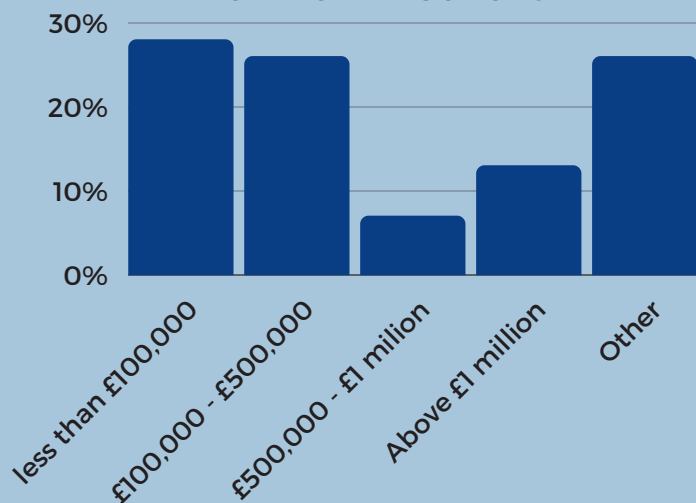
PANDEMIC EFFECT ON THE ORGANISATION'S ENERGY CONSUMPTION



PANDEMIC EFFECT ON ENERGY EFFICIENCY / CARBON REDUCTION PROJECTS



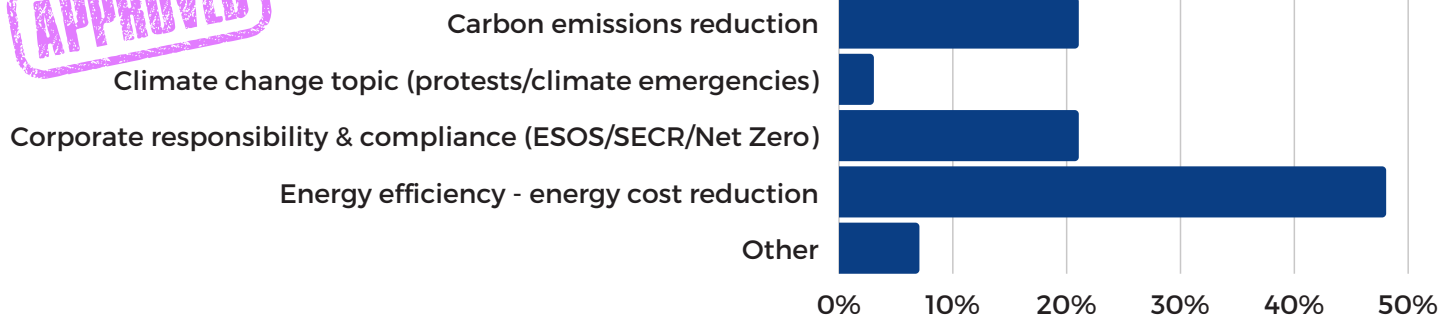
ANNUAL BUDGET FOR ENERGY EFFICIENCY PROJECTS



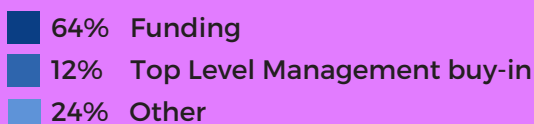
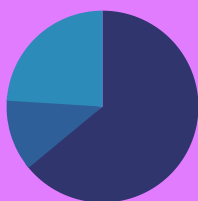
SAVINGS ACHIEVED IN THE PAST 12 MONTHS



CURRENT DRIVERS FOR PROJECT APPROVAL



CURRENT BARRIERS FOR PROJECT APPROVAL

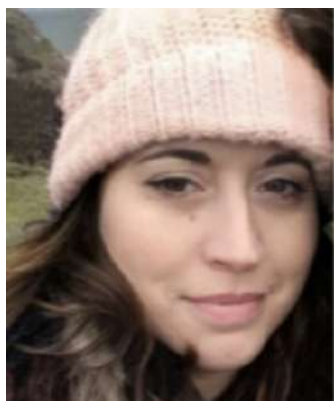




My Role in Tackling Climate Change

The professionals in energy management, sustainability and environmental roles play a key part in their organisational delivery of energy efficiency and Net Zero targets. By performing their everyday roles, investing in professional development and exchanging of ideas and experiences with others, they are contributing to tackling the risks of climate change on organisational as well as national level.

With all the varied roles and tasks, we are keen to showcase our members' skills and day-to-day tasks. In this issue, we have asked Sara Emmett about her role of Assistant Diocesan Environment Officer at Diocese of Bath and Wells in tackling climate change.



What attracted you into the industry?

I have been a naturalist since I was about 7 years old, first taking an interest in hedgehogs and then birds. By my teenage years I was studying seabirds and waders and as an adult authored my undergraduate thesis on breeding failure in Little Terns in Dorset. I am currently studying mycology in South Somerset and Dorset. As I am immersed in the natural world, I am very aware of the danger that climate change poses to creation and dedicated myself to work towards raising awareness to the problem and

finding novel solutions to the (often complicated) webs we have woven that trap us into patterns of behaviour.

How have you started and progressed through the industry?

After being a dedicated homemaker for my family and carer for my disabled son for 10 years, I decided to return to study to update my skills and improve my impact in climate change awareness and mitigation. I studied MSc Green Economy at Bournemouth University and as part of this undertook a year-long placement with the Environment Team at the Diocese of Bath and Wells, initially undertaking a project introducing a pilot energy audit scheme to churches and church buildings across the Diocese. The aim of this work is to provide bespoke assistance to our churches in reaching net zero carbon but also to assist in planning by the Diocese. This project is ongoing and contributed to the formulation of the Diocese Environment Policy and Net Zero 2030 Action Plan.

I also worked for the National Church of England analysing 180 energy audits from 3 different companies to extract learnings that would contribute to the CofE Practical Pathway to Net Zero for Churches.

I am now doing some follow up work on this project for the Diocese of Oxford and I am part of the National Diocesan Environment Network and sit on the Church of England Energy Working Group. I am also studying my PhD in Change Management at Bournemouth University with a focus on transitions toward net zero carbon and the contribution of worldviews to achieving this goal in complex organisations which is so necessary to minimising climate change and its detrimental impacts.

I was very delighted to become Assistant Environment Officer- it is the most rewarding job. I am lucky to be daily working with dedicated and inspirational people within the Diocese and with partner organisations and the wider community.

What does your current role entail?

In early 2020, the Diocese declared a climate emergency and responded by making a commitment to achieve net zero carbon emissions across in-scope activities by 2030. During the pandemic, we were engaged in planning for this achievement and produced an updated 10-Year Environment Action Plan and Environment Policy.

These have been formulated with collaboration stakeholders and experts from across the Diocese, including both lay and ordained professionals and working cross-departmentally especially with our school's team as schools play a significant role in our emissions scope.

Our key priorities are to establish a more accurate baseline carbon emissions figure, engage, educate, and support communities, schools, and parishes to reach net zero and encourage a faith-based commitment to change across the Diocese.

My main roles on a day-to-day basis are to continue the Green

Journey audit process and support and guide churches and communities to plan and take action to reach net zero. I work closely with the school's team and am supporting churches to achieve Ecochurch status through Christian charity A Rocha.

I am also deeply engaged with a partnership project working with Somerset Wildlife Trust called 'Wilder Churches' which is currently supporting over 100 of our churches to rewild their church land in community-sensitive and collaborative ways to form a network of biodiversity across the lands which we are blessed to steward.

In your opinion, what role do you play in tackling climate change?

I am blessed to be at the forefront of both practical action and education (in my Diocesan role) but also innovative solutions through my PhD researcher role with both roles mutually benefiting the other. I am committed to using these two opportunities to

“ **IN EARLY 2020, THE DIOCESE DECLARED A CLIMATE EMERGENCY AND RESPONDED BY MAKING A COMMITMENT TO ACHIEVE NET ZERO CARBON EMISSIONS ACROSS IN-SCOPE ACTIVITIES BY 2030.**

support real change across the Diocese and the wider world.

What are the main challenges in tackling climate change/ delivering Net Zero targets at your organisation?

The Church of England and its constituent parts have a historic complexity and distributed governance that means that climate solutions need to be adaptable to meet the varying needs of communities and the restrictions that adaptation of historic buildings often encounter.

As in many large organisations, there are also competing priorities whose needs must be balanced carefully with the urgency of climate change. Finance for adaptation is also a significant concern in many parishes.



In your opinion, what is the order of importance for the three key aspects of tackling climate change – finance, skills, technologies?

I believe that in tackling climate change, we must begin with finding relevance in people's lives and work. Whilst climate change issues are becoming higher on both individual and organisations agendas, there is still a great amount of work to do in finding significance in our lives that supports effective change. For many this will be a moral, ethical or faith-based commitment but there is a significant research gap concerning how to translate commitment to sustained change which I am trying to bridge with my work. Technology also has advances to make that will enable affordable and effective long-term solutions to work across complex situations like historic buildings.

“IT WILL BE VITAL FOR ANY GROUP OR ORGANISATION TO ESTABLISH PATHWAYS OF RELEVANCE TO CLIMATE ACTION, PARTICULAR TO ITS COMPONENT PARTS.

What is your biggest achievement to date that has contributed to tackling climate change?

I'm so proud to be part of the Environment Team at Bath and Wells and a part of the Diocese. So much work has gone into the Net Zero target in the last few years. There is a real sense of joint commitment towards this goal, and it is so encouraging.

What particular knowledge and skills do you see vital in reaching the national and organisational climate change targets?

Through my experiences in different roles, I have come to acknowledge



that both social and organisation complexity are major barriers to change. It will be vital for any group or organisation to establish pathways of relevance to climate action, particular to its component parts. This will require leaders and stakeholders to collaborate more, giving support and providing bespoke assistance for a range of unique journeys towards these urgent shared goals. Flexibility and a creative solutions-based approach will be key for leaders.

Thinking about current Government policies and incentives in delivering on the UK's climate change promises and Net Zero target where would you like to see more developments and guidance?

Whilst I accept that change takes time, it will be very hard to create urgent and sustainable change unless the priorities of our country move away from (financial) progress at any cost and embrace the solidity of a resilient, diverse and community-centred approach that favours wellbeing and equality above traditional economic models and that by design, ensures a circular, green economy.

This shift in thinking must centre

around how we raise our young people so that it becomes an engrained way of living and thinking. Much is already being done for the youngest in our schools, but older children must be encouraged to continue to nurture and value the connection with the wider world they are introduced to in early school life.

Technological advances can be our friend in this matter but must not come at a detrimental cost to our planet and our neighbours both near and far. Policy that realigns us with valuing our roots in nature and community will be vital to this shift.

Where do you see your future within the industry?

My future is very much aligned and guided by my faith. I am dedicated to serving others and climate action is very much a part of this service. I hope my PhD work will provide some novel pathways for tackling socio-organisational complexities barriers to change and I have no doubt it will expose other lines of enquiry as I progress through it. My role in the Diocese continues to be a blessing and I will continue to serve there as long as I am needed.



Saving the Hospitality Sector 1 kWh at a Time

Catering businesses feature in every town and city in the world and are vital buildings to be considered in any low-carbon plan. Commercial kitchens are some of the most profligate users of gas, water and electricity in the UK. As a result, they leave a large carbon footprint, with relevant benchmarks (in kWh/m²) exceeding ten times the energy intensity of the majority of commercial premises (i.e., supermarkets, offices, retail premises, etc.)^{1&2}.

The catering sector has been severely affected by the coronavirus pandemic, as well as Brexit. Consumer spending on hospitality remains at less than 70% of pre-pandemic (2019) levels³, and 72% of hospitality sector businesses were expected to close in 2021⁴.

In a world where income is dropping and expenses are growing, the traditional measures of success (turnover, market share and like-for-like sales increase) are not as important as profitability, and reducing utilities spend is an obvious way to increase resilience in these trying times. Energy is frequently the third largest overhead after labour, food and drink in a food service operation, amounting to an average yearly spend of £27,000 (250,000 kWh) for an average sized

pub. There has never been a more urgent need to manage this cost.

Establishing the Pathway

'Energy Reduction in Commercial Food Preparation', is an award-winning engineering doctorate, sponsored by one of the largest pub and restaurant operators in the UK, in conjunction with the University of Reading. The organisation spent around £70M on utilities per year, in around 2,000 sites with over 40,000 employees.

When we set out on this 6-year project, there was very little innovation and research available on how to meaningfully reduce energy consumption over the long term in the sector, from academia or industry. Headed up by Richard Felgate (founding board member of the EMA), the Energy, Environment and Sustainability Team had already made great strides before the project commenced. AMR, LED lighting, voltage optimisation and minimum energy standards across several aspects of the front and back of house operations had already been rolled out.

However, the industry as a whole lacked a robust method to assess the

minimum consumption required to deliver diverse and evolving menus. A strategy for reducing energy use specifically from cooking operations just didn't exist. Knowing where to start, where to stop, and what to include within the scope of the project was an ongoing challenge. We ambitiously selected four key-focus areas for priority:

1. State of the art review

Despite comparatively low emissions compared with other areas of the food chain, the energy use attributed to catering activities is equivalent to both agriculture and food retail combined (24 TWh per year) and is responsible

“ IN A WORLD WHERE INCOME IS DROPPING AND EXPENSES ARE GROWING, THE TRADITIONAL MEASURES OF SUCCESS (TURNOVER, MARKET SHARE AND LIKE-FOR-LIKE SALES INCREASE) ARE NOT AS IMPORTANT AS PROFITABILITY, AND REDUCING UTILITIES SPEND IS AN OBVIOUS WAY TO INCREASE RESILIENCE IN THESE TRYING TIMES.

¹ CIBSE. Guide F Energy Efficiency in Buildings. The Chartered Institution of Building Services Engineers (CIBSE) 222 Balham High Road, London SW12 9BS, 2012.

² Mudie S, Essah EA, Grandison A, et al. Benchmarking Energy Use in Licensed Restaurants and Pubs. Chartered Institute of Building Service Engineering (CIBSE) Technical Symposium 2013. Liverpool John Moores University, UK, 2013.

³ ONS Coronavirus and its impact on UK hospitality: January 2020 to June 2021, available at <https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/articles/coronavirusanditsimpactonukhospitality/january2020tojune2021>.

⁴ "72% of hospitality and pub businesses face closure in 2021, says new research". Stefan Chomka, 19th November 2020, Big Hospitality. Available at (<https://www.bighospitality.co.uk/Article/2020/11/19/72-of-hospitality-and-pub-businesses-face-closure-in-2021-restaurants-Coronavirus-lockdown>).

for 11% of UK service sector energy consumption⁵. Yet, beyond the procurement of 'more energy efficient cooking appliances', very little innovation has been achieved within these operations. Indeed, the design of cooking technologies has remained virtually stagnant since their creation!

2. Energy monitoring and analysis

Before the project commenced there was very little in the way of energy consumption data from whole buildings, kitchen operations or specific sub-metered appliances. Neither operators nor appliance manufacturers were previously

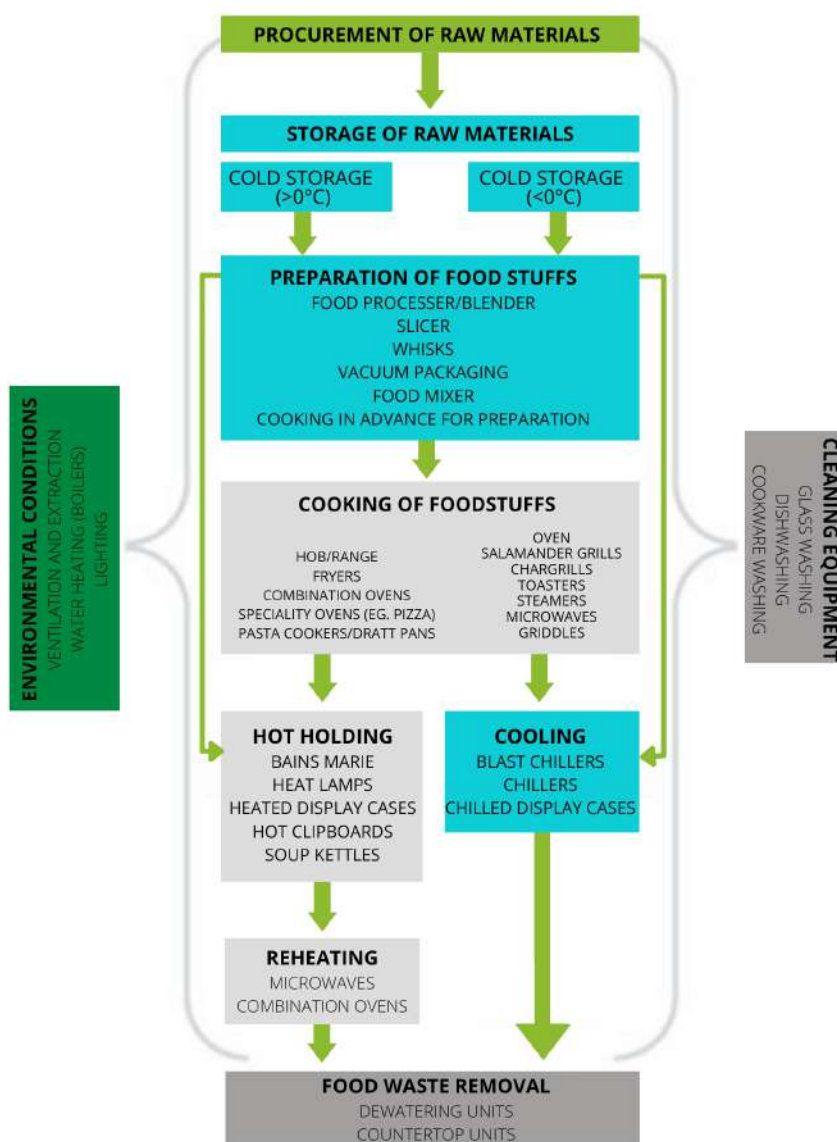
forthcoming with sharing their private data. To fill this gap, extensive energy monitoring and comprehensive analysis would need to be published to enable the sector to predict and understand their consumption. This work really sets the scene and shapes priorities and strategy for the future.

3. Energy benchmarking

Current published benchmarks reported in CIBSE's TM50, TM22 and Guide F: Energy Efficiency in Buildings, originated from work conducted in the 1980s with no substantial review or updated data set in four decades. Pubs especially have evolved

dramatically, expanding towards food-led businesses in response to increased duty on alcohol sales. Reviewing and, if necessary, updating the benchmarks is key to moving the sector onto realistic carbon reduction targets. Numerous energy intensity metrics existed including kWh/m², kWh/£ turnover, and kWh/meal; and operators needed clarity regarding the optimum benchmark to use for their operations both internally, and between the sector.

4. Relating menus and food throughput to energy consumption of appliances



⁵Energy Reduction in Commercial Food Preparation". S. Mudie Engineering Doctorate Thesis, University of Reading, 2017.

Anyone can buy a more efficient appliance, but it is a more radical and interesting question to ask if the appliance is needed at all. There are hundreds of methods one can use to cook each menu item, and the cooking appliances selected need to be flexible in order to adapt to future menu changes.

Energy consumption must be related to food throughput and numerous other operational factors such as food palatability, cooking times, space and training requirements etc. to be of any value to a specific hospitality business. Tying these factors into what, when and how an operator delivers a menu was the greatest challenge. Minimising energy consumption without compromising on diversity, quality, timings and volume of product served was the major aim of this project.

Approach:

For the benchmarking study, half hourly AMR data were gathered for one year from over 1,500 sites and 14 brands. Data concerning the estimated drinking/dining area, number of covers, financial turnover, and food and drink sales were obtained from the operators. Correlations between energy usage and the above metrics were analysed via linear regression and compared with the current published benchmark figures. When the most suitable metric was established, it was applied to a much larger dataset of over 11,000 managed pubs and restaurants (65% of the UK's total managed pub and restaurant estate at the time).

From this sample, 14 sites were selected and over 400 individual appliances within them were monitored, resulting in a published academic journal article. Using a bottom-up approach and the principles of life-cycle analysis, we then set about developing a holistic, sophisticated and award-winning method to model the entire food

preparation operation. Number, type and timings of food served were directly downloaded via till records, and the operators' standard procedures were assessed in order to map catering activity on an ingredient level, encompassing all energy-using processes required to deliver each menu item.

Findings:

Consumption within the sector was found to be significantly greater than previously reported; 19.57 TWh for managed pubs alone, compared with previous CIBSE estimates of 21.6 TWh for the entire catering sector. The energy use of the new dataset was found to be over 80% more than expected when compared to the kWh/m² published benchmarks at the time (and 66% in terms of kWh/meal). Updated electricity and gas benchmarks were published and submitted to CIBSE (0.20 kWh/£ turnover for electric and 0.16 kWh/£ turnover for gas).

This part of the project won several awards at international conferences. This initial work also revealed large opportunities in the area of behaviour change, with 71% savings found

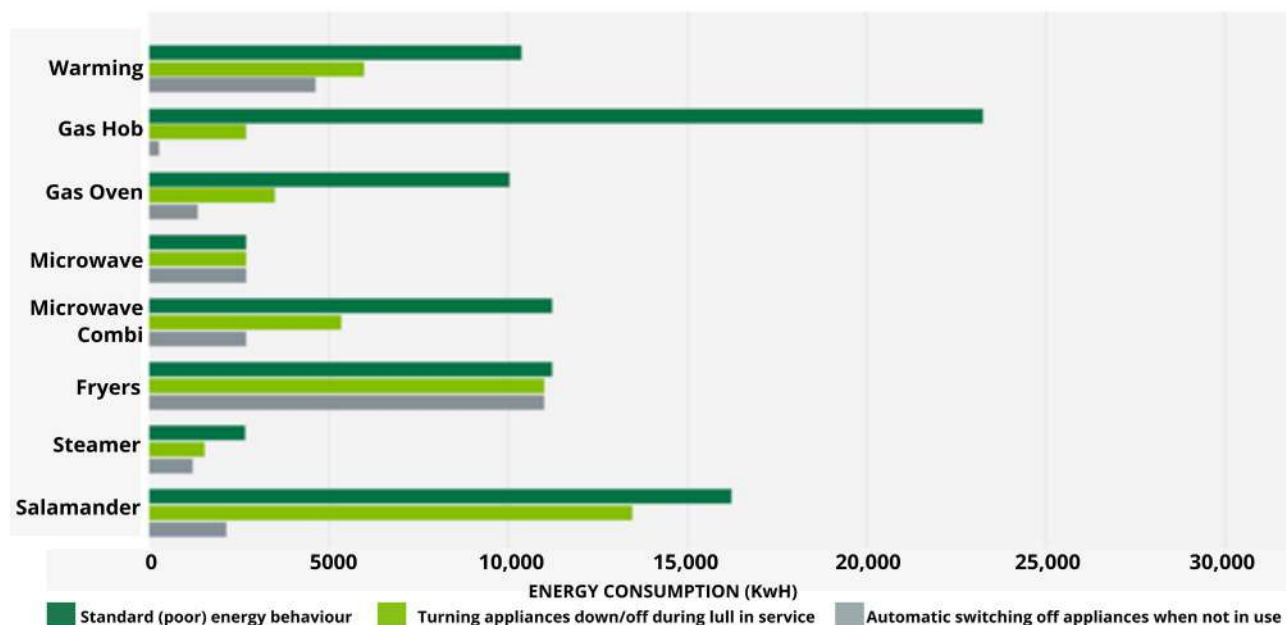
from one study of over-fired grills. Other immediate opportunities included appliance specification and maintenance strategies.

The subsequent model development allowed, for the first time, several energy and carbon reduction strategies to be run without disruption and cost to catering operations from physical trials.

The brief specified looking in detail at the cooking methodology and appliances, food throughput, equipment features and specifications, operational planning and management decisions, and providing a return-on-investment of less than two years. The following scenarios were selected for input into the menu-model after extensive consultation with the broad range of stakeholders:

- Replace chargrill with low-carbon cooking alternative
- Replace fryers with low-carbon cooking alternative
- Replace microwaves with low-carbon cooking alternative
- Reduce freezer demand
- Elimination of hot-holding
- Replace gas hob with induction hobs

Inputs	Outputs
<ul style="list-style-type: none"> • Menu - All ingredients, cooking methods and variations • Number and timings of meals sold from sales data • Kitchen use profile - opening hours, hot holding and batch cooking preferences, cover, behavioural factors and more • Equipment specifications - makes, models and numbers • Extraction and ventilation information • Refrigerant data • Bills of materials and embodied carbon of kitchen appliances • A range of energy reduction scenarios and equipment replacements 	<ul style="list-style-type: none"> • Hourly cooking distribution from analysis of meals served and their timings • Hot finishing and preparation demand considering batch cooking and hot holding strategies • Capacity and maximum throughput for each appliance category • Appliance utilisation per hour and capacity checks • Total energy consumption per appliance category (kWh) per day, week, and yearly • Total running cost per appliance category (£) per day, week, yearly • Total emissions (kg CO₂e) per day, week, & yearly • Return on investment • Embodied, use phase, and end of life carbon and cost



Operational feasibility

Wasteful energy use is often a symptom of inefficient processes in general; the range of calculations encompasses several operational impacts to assess the true benefit of the energy saving outside of just carbon emissions and cost. For example, any effect on cooking times, spatial footprint of appliances, seasonal menu changes, consistency of product and any staff training requirements are also assessed and presented for consideration.

Actual meal demand per hour was mapped through till-sales data. Three behavioural scenarios (above) were built into the model based on the results of our prior study; poor energy

performance (business as usual), some energy demand reduction (turning things down or off during mid-morning and/or late afternoon lull in dining), and energy minimisation (reflects very thrifty behaviour and automatic switching off appliances when not in use).

Appliance utilisation analysis provides an indication of the priority for energy reduction in relation to demand. It also provides insight into their operations outside of energy consumption, such as the crowded chargrill on specials weekends and the barely used steamers and gas ovens.

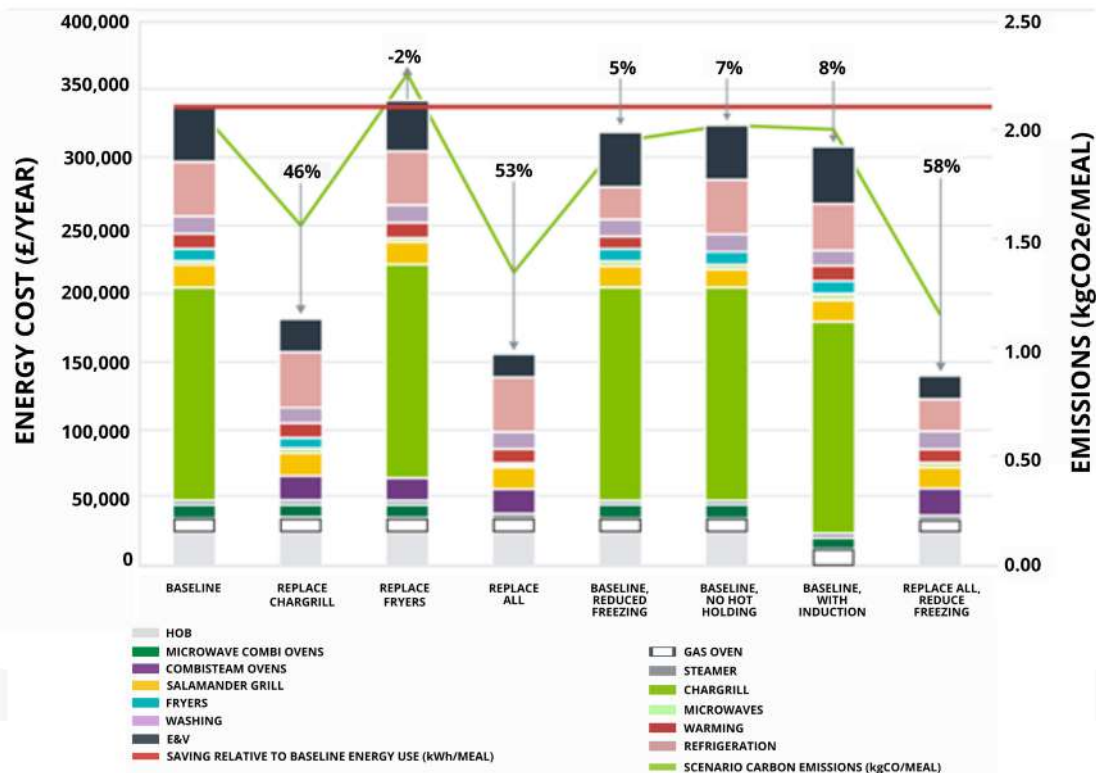
The results were really quite staggering (below). The most favourable energy reduction scenario saw a 58% reduction in energy use,

which equates to 37.77 million kWh, 10.71 million kgCO₂e and £2 million saved per year across the chain of restaurants. A simple payback of <6 months was calculated.

Interestingly, the cost of not acting was an astonishing £38,500 for every week that went by as 'business as usual'. These savings were achievable without further staff training to minimise wastage through behaviour.

On top of the carbon credentials, there were many other co-benefits identified such as space savings in the kitchen, uniformity and consistency of product could be improved by utilising new cooking features, and training needs could also be minimised. Peak appliance utilisation was never over maximum capacity which also streamlined operations. Average cooking times per meal were increased by 50%. However, considering that the operator stood to gain £18.3 million per year savings if the template was rolled out to all restaurant brands, and more importantly, customers are crying out for more sustainable businesses and products, this may be more than acceptable to operators and consumers alike!

APPLIANCE CATEGORY	MAXIMUM CAPACITY UTILISATION (%)		
	TYPICAL WEEK	PEAK WEEK	SPECIAL WEEKEND
FOOD STORAGE	29		
CHARGRILL	91	114	122
SALAMANDER	11	14	15
STEAMER	<1	<1	<1
FRYERS	7	8	9
MICROWAVE COMBI OVEN	2	3	2
MICROWAVE	27	33	35
GAS OVEN	<1	<1	<1
GAS HOB	20	25	26



Future plans:

While Covid has taken a huge toll on the industry, it has shown how quickly the sector can adapt, and this is very encouraging. Reluctance to modify cooking practices and shying away from radical improvements required for energy efficiency is not something that these businesses can continue with any longer.

There are huge financial savings to be made and opportunities are everywhere. With the recent buzz surrounding COP26 and the publication of the Net Zero Guide for the Hospitality Sector, many larger firms are beginning to make more ambitious commitments towards carbon neutrality. Scope 3 emissions reduction will form a large part of this. Our research also identified significant opportunity in the area of behaviour change; over 70% energy savings could be realised purely through staff training and engagement in some cases. The government has recently acknowledged this will be a major focus in reaching our Net Zero targets.

I sincerely hope that the pandemic gives operators the chance to reflect on how investing in energy saving measures could (and should!) be the key to unlock the profits desperately required to see them through the coming season.

Author's Profile:

Dr Samantha Mudie has published 8 peer-reviewed academic journal papers and has a doctorate in the field of commercial catering energy reduction, winning both national and international awards for her work in hospitality carbon saving. She has developed and led sustainability strategies for a wide range of businesses for over ten years and chaired various energy focused groups in industry. An avid EV owner, she is also actively involved in local renewable energy and carbon reduction initiatives in the Reading area.

References:

[1] - CIBSE. Guide F Energy Efficiency in Buildings. The Chartered Institution of Building Services Engineers (CIBSE) 222

Ballham High Road, London SW12 9BS, 2012.

[2] Mudie S, Essah EA, Grandison A, et al. Benchmarking Energy Use in Licensed Restaurants and Pubs. Chartered Institute of Building Service Engineering (CIBSE) Technical Symposium 2013. Liverpool John Moores University, UK, 2013

[3] ONS Coronavirus and its impact on UK hospitality: January 2020 to June 2021, available at <https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/articles/coronavirusanditsimpactonukhospitality/january2020tojune2021>

[4] "72% of hospitality and pub businesses face closure in 2021, says new research". Stefan Chomka, 19th November 2020, Big Hospitality. Available at (<https://www.bighospitality.co.uk/Article/2020/11/19/72-of-hospitality-and-pub-businesses-face-closure-in-2021-restaurants-Coronavirus-lockdown>)

[5] "Energy Reduction in Commercial Food Preparation". S. Mudie Engineering Doctorate Thesis, University of Reading, 2017



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

We are pleased to introduce our 2021 winners and highly commended:

ENERGY MANAGER 2021 - PRIVATE SECTOR

Foon Tse - Technical Services Manager - BNP PRE Real Estate

Foon has more than 30 years of experience in the management of technical and energy delivery in corporate real estate. He was a National Energy Manager for Land Securities Plc and was responsible for the delivery of an integrated sustainability strategy for Land Securities Property Portfolio. He worked with variety of investment fund representatives, and occupier clients to manage compliance, optimise sustainability performance and promote initiatives. His work was built upon wider business strategy and harnessed key opportunities that identified, developed, and promoted additional value-add.

Major Building asset for BNP Paribas thrives its success in consistently delivering unprecedented level of service to its primary stakeholders, whilst welcoming the relentless encouragement to seek new opportunities to create add value aspect – and one such building is Cannon Bridge Properties. Situated at a heart of City of London, it caters for prominent prime occupiers who required a right intervention for an enabler who could make an impact in Energy Management. Foon with his long-standing experience and technical ability created an Energy Strategy for the building in 2017. The underlining principle of the strategy was 'collaboration' and 'simplicity' with dividend returns on reducing usage of 1,9MWH in service charge electricity saving £212K.

ENERGY MANAGER 2021 - PUBLIC SECTOR

Andrew Waggott – Energy Services Team Manager - Portsmouth City Council

Andrew has over 9 years' experience of working in the energy management industry within a public sector organisation. Since 2016, he manages the Energy Services Team at Portsmouth City Council responsible for all energy services, which include energy efficiency and micro-generation capital projects, procurement and management of utilities and fuel poverty mitigation programmes across the Council's extensive and varied housing and corporate property portfolio. Under Andrew's management, the team has grown four-fold; expanding the scope and scale of their services and creating a graduate programme with the aim of training the next generation of energy management professionals.

SUSTAINABILITY MANAGER 2021

Danielle Taylor - Sustainability Manager - South Yorkshire Police

Danielle has worked in the field of sustainability for 17 years and has been in post as the Sustainability Manager at South Yorkshire Police since 2010. Her experience, networks and qualifications, coupled with her desire to achieve positive outcomes have enabled her to engage and inspire colleagues and partners to commit to targets, take action and make lasting changes. Danielle is passionate about empowering people to understand sustainability, make changes, embrace innovation and celebrate successes. She developed and launched South Yorkshire Police's current sustainability strategy, which is aligned to the UN Sustainable Development Goals, and is both prestigious and well known throughout the police force. The strategy's overarching ambition is to embed sustainability "in all that we do" and Danielle and her team are always working to ensure sustainability considerations permeate all areas of force activity. Danielle enjoys working nationally with other police and emergency service organisations, sharing best practice and working together to develop and deliver programmes to affect positive change.

Previously, Danielle worked as a senior environmental consultant leading a department within a multidisciplinary consultancy. She specialised in sustainable construction, developing and delivering training courses for the Construction Industry Training Board.



UTILITIES MANAGER 2021

Lowell Lewis - Safety, Health, Environment and Quality Manager - Coventry City Council

Dr. Lowell Lewis is a Sustainability and Energy Management professional with a background in Chemical Engineering and wide-ranging experience coming from roles in brownfield regeneration, sustainability research and energy management over the past 15 years.

Having previously worked for central government and university clients, he has been the energy management lead for Coventry City Council since 2018. He is responsible for managing the utilities for corporate property and Council operations. This includes all aspects from advising on procurement, day-to-day management of the utility contracts including validation and dispute resolution, as well as budgeting and reporting on consumption and spend. Key achievements include the roll out of AMR across the estate, automation and streamlining of payment processes to improve team productivity and recovery of significant incorrect charges.

This work has provided greater insight into the Council's utility use and solid foundations needed for successful bids to ERDF and PSDS, securing over £9m of funding in 2021 to deliver energy efficiency projects on the Council's estate. This success has led to Lowell now leading a newly created Energy Services team, to deliver energy efficiency and renewable generation projects for the Council and to support others with their energy management and decarbonisation challenges.

YOUNG ENERGY MANAGEMENT PROFESSIONAL 2021

Jack Beckwith - Environmental Officer - believe housing



ENERGY MANAGEMENT TEAM 2021 - PRIVATE SECTOR

Networks Energy Team - Vodafone

The Networks Energy Team at Vodafone led by John Teasdale is responsible for energy and carbon management for Vodafone's UK Network. The versatile and experienced team is made of the Energy Management team led by Suki Gilliland comprising of Beatriz Valdes, Ollie Cramer, Gabriele Gessani and James Butterworth, and Energy Technical Innovation provided by James Feeney.

Vodafone's network estate ranges from large data centres, fixed transmission sites, to over 11,000 radio base stations which provide vital connectivity to its customers.

The networks energy team ensure energy management best practice is implemented across the network. Since the team was formed three years ago, it has grown and made significant changes in the way Vodafone manages its energy and carbon as business. Key achievements have been certifying Vodafone's core technical sites to ISO 50001 standard with the remainder of the technical estate planned in the coming years. In July 2021, the team ensured Vodafone achieved 100% renewable electricity supply for its UK network, an important part of its net zero journey. Other key projects include site rationalisation that removed over 15,000 tonnes of CO2 from the network, as well as innovative on-site renewables installations.



ENERGY MANAGEMENT TEAM 2021 - PUBLIC SECTOR

Energy Management Team - 29 Regiment, Royal Logistic Corps



29 Regiment, Royal Logistic Corps is based at Duke of Gloucester Barracks, South Cerney, Gloucestershire. The unit's primary role is to provide movement control and postal and courier capabilities for the UK Armed Forces around the world. The site has been occupied by the military since 1937 and comprises an estate

of older and newer buildings. With such a mixed estate and diverse portfolio of stakeholders' teamwork, awareness and getting core parties consistently involved in the site's strategic energy saving projects has been key since 2010, engendered in our ethos of "One Station, One Team and One Family." The Energy Management Team comprises all stakeholders, including Service Personnel, Defence Infrastructure Organisation (DIO), Defence Government Services and the Army Basing & Infrastructure, as well as industry Partners.

For the team to be recognised by the Energy Managers Association Board of Directors as the Team of the Year (Public) is a wonderful recognition of everyone's hard work. We remain at the forefront of embracing new opportunities, seeking innovative solutions to prepare ourselves for the future. We hope that our sustainability and energy management story will inspire others throughout Defence.



EMA MEMBER 2021

Kirsty Rice - Environmental Lead Manager - JTI UK

Kirsty is the Environmental Lead for JTI UK and is responsible for helping the business develop and deliver against its Environmental Plan 2030 which looks at five focus areas of emissions, energy, waste, water and stakeholder engagement. Kirsty has significant experience in the field of sustainability and was previously the principal energy adviser for the UK's largest conservation charity and property owner, the National Trust. In addition to being a full EMA member, she is an accredited CIBSE Low Carbon Assessor, CIBSE ESOS Assessor, IEMA Internal Auditor and PRINCE2 Project Manager.



NET ZERO STRATEGY 2021

University of Reading - Net Zero Carbon Plan

University of Reading has set an ambitious target to reach Net Zero Carbon emissions by 2030. This covers a broad scope of emissions, including all scope 1 and 2 as well as business travel, waste, water and electricity transmission and distribution, and has committed to explore and target reductions in its wider carbon footprint too. Its Net Zero Strategy sets out a clear delivery pathway, including 3-year interim targets to be able to assess progress and ensure it remains on track.

The University has a long track record of delivering on its sustainability targets, meeting its 35% and 45% carbon reduction targets for 2016 and 2021 respectively, as well as recently meeting its 60% recycling target. Reading's teaching and research strengths include Agriculture, Construction Management and Meteorology and its current Strategic Plan identifies sustainability as one of its 4 key principles, aspiring to be recognised as a leader in sustainability at a global level. The University had the most lead authors of any institution worldwide in the most recent IPCC 6th Assessment Report and is home of the Climate Stripes, developed by Professor Ed Hawkins, which have captured global imaginations for their striking representation of rising local and global temperatures.

ENERGY MANAGEMENT CONSULTANCY PARTNERSHIP 2021

Leisure Energy Limited - Ashford Borough Council - Freedom Leisure

Leisure Energy is a unique Energy Consultancy in that we only work in the leisure sector. We work with leisure operators, charitable trusts and local authorities to decrease the energy cost and carbon footprint of the Leisure Centres. For local authorities, these will be some of the most carbon intensive buildings in their portfolio. As the centres have been built, extended and modified over the last several decades, it means that no 2 leisure centres are alike and subsequently a fully bespoke energy audit is always completed. Unusually, for an energy consultancy, we then project manage the installation of the recommendations as both Principal Designer and Principal Contractor. This means the clients receive a one stop shop for all of their energy projects.

Freedom Leisure is a not-for-profit leisure trust which manages 110 leisure and cultural facilities on behalf of 26 local authorities across the UK to realise their vision of "improving lives through



leisure". They are proud to be delivering high quality, locally-focussed services and are committed to their ongoing development. As a not-for-profit organisation all surpluses are reinvested in support of the objectives that they share with their partners.

Ashford Borough Council is a local government borough in the county of Kent. They provide services to Ashford, Tenterden and surrounding villages. Stour Leisure Centre is located in Ashford and managed on their behalf by Freedom Leisure.

DECARBONISATION PROJECT 2021

London Borough of Islington - Bunhill 2 Project

The Bunhill Phase 2 project is an extension of the existing Bunhill Heat and Power Network which has been providing heat to surrounding homes since 2012. Construction of a second Energy Centre was completed in 2019 under Phase 2 of the project. Built on the site of a disused Tube station and London Underground ventilation shaft, the new Bunhill 2 Energy Centre was designed to capture waste heat from the Tube tunnels below, to supply cheaper, greener heat to 550 additional homes and a nearby school. It is expected to reduce carbon emissions by approximately 1200 tonnes per year.

The first phase of the Bunhill network was a bespoke Energy Centre, supplying heat and hot water to more than 800 local homes and two community leisure centres. The success of this initial phase encouraged the council to expand the network to supply 550 more homes and a local school, as well as to create spare capacity for more connections to be added. The first project of its kind in the world, Bunhill Phase 2 was conceived in partnership with TfL to extend the network to help reduce fuel poverty in the borough, and provide cleaner, greener energy to the local community.



YOUNG ENERGY MANAGEMENT PROFESSIONAL 2021 - HIGHLY COMMENDED:
Faye Hargreaves - Sustainability Coordinator - Oracle

ENERGY MANAGEMENT TEAM 2021 - HIGHLY COMMENDED - PRIVATE SECTOR:
Energy Management Team - Muntons

ENERGY MANAGEMENT TEAM 2021 - HIGHLY COMMENDED - PUBLIC SECTOR:
Energy Services Team - Portsmouth City Council

NET ZERO STRATEGY 2021 - HIGHLY COMMENDED:
Blenheim - Roadmap to Net Zero

DECARBONISATION PROJECT 2021 - HIGHLY COMMENDED:
University of West London - Decarbonisation Project



**CONGRATULATIONS TO ALL OUR
2021 WINNERS AND HIGHLY COMMENDED.**



A Whole University Approach to Achieve Energy Targets

With new targets and challenges for carbon and energy reduction both locally and nationally, Oxford Brookes University recently committed to increasing the intensity of its work in this area.

Focusing on creating a resilient future for the University, our latest strategy and action plan brings Oxford Brookes in line with science based targets to support both the UK Government's target of a 68% reduction in emissions by 2030, and the City of Oxford's ambitions to be net-zero by 2040.

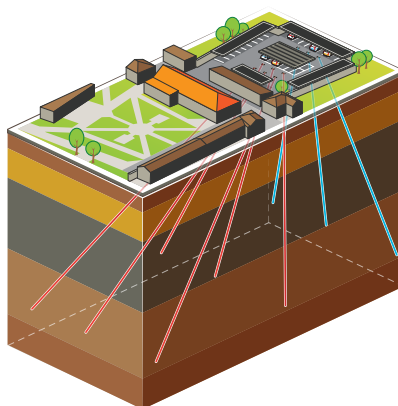
We've already cut carbon emissions by 35% since 2005, some 5,000 tonnes, however the University has a deep commitment to doing more - recently declaring a climate emergency to recognise the impact of climate change as one of the biggest challenges facing the world.

Our new carbon reduction strategy continues to set the bar high. In the past year the University invested heavily in low carbon technologies. We doubled our installation of solar panels on campus and continue to optimise the energy performance of our campus buildings. We are reviewing all our indirect emissions, and driving the organisation towards net-zero by 2040 as part of our commitment to the Zero Carbon Oxford partnership.

A core part of supporting this is through optimising the performance of our buildings, decarbonising heating and hot water and cooling systems, removing f-gases from our estate by 2030 and moving to ultra-low emission vehicles.

We're aiming for a 68% reduction of Scope 1 and 2 emissions from 2010 levels, by 2030. And since over 75% of our energy use is for space heating, hot water and lighting, we're focusing our energy efficiency projects in those key areas. Every year, over £250,000 is

invested into new carbon reduction projects such as LED lighting, controls and better heating controls.



We're just about to get underway with a really exciting new development, installing a Geo-Exchange Heating and Cooling system on our Headington campus in Oxford that will deliver 1.2GW of low carbon heating per year. We're the first UK University that will have this technology up and running - and we're estimating it will reduce carbon emissions from the campus site by

around 20%. It's a huge step forward for the University.

Fourteen boreholes, drilled to a depth of 220m, will be connected to heat pumps in our energy centre via a series of flowlines, trenched underground to the Headington Campus' Energy Centre. The system displaces the use of fossil fuels and reduces energy consumption across both cooling and heating processes. Requiring significantly less space than traditional ground source heating it can be retrofitted to existing sites, such as the Energy Centre in the University's John Henry Brookes Building.W

But as we learned from COP26, it's not just about looking at emission reductions to our buildings and infrastructure, we are moving towards a whole institution approach - where research, learning, teaching, procurement, operations and investments are all delivered with a focus on carbon reduction and sustainability. A significant piece of work coming up is assessing Scope 3 emissions across the whole University based on a whole life approach.



Practical Guide for Energy Management Professionals

NET ZERO



***“Putting Energy
Management at the
Heart of British
Business”***



Last month saw the launch of the EMA's newest addition to the series of [Practical Guides for Energy Management Professionals](#), the Guide to Net Zero.

The Guide was prepared by Members of the EMA Steering Group and is intended to provide a pathway for any organisation looking to deliver a Net Zero target.

Introduction

Carbon emissions have a damaging effect on the Earth's atmosphere and have been identified as the main cause of global warming and climate change. They can come from a large range of sources and activities, but most are based around the combustion of fossil fuels or the release of gases which are considered to be greenhouse gases (GHGs). The combustion and release of these gases into the atmosphere needs to be minimised to avoid the potential for catastrophic temperature changes.

The main focus is on the 6 gases identified in the Kyoto protocol which are deemed to create the greatest problem. These are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆). While CO₂ is used as the baseline and considered to have a global warming potential (GWP) of 1, other gases can have a much higher GWP and be far more damaging. For instance, methane is considered to have a GWP of between 28 and 36 while Nitrous Oxide has a GWP between 268 and 295.

In theory, an organisation could create no emissions (absolute zero) by generating all its own energy demand from on-site renewable sources and not using any fossil fuel for transport but in practice, this is unlikely to be achievable for the vast majority. This means that at the present time, for most organisations, their aim will be to achieve Net Zero carbon emissions or to be carbon neutral. In basic terms, for an organisation to become Net Zero, it must be removing as much in emissions terms from the atmosphere as it is creating through its use of fossil fuels and any releases of dangerous gases.

In real terms, this means reducing energy consumption as far as practically and economically possible, changing to using self-generated forms of renewable energy and for those emissions that are left and currently difficult to decarbonise, removing an equivalent amount somewhere else on the earth, known as offsetting.

Net Zero Drivers

Given that the UK has now enshrined the target for the whole of the country to achieve Net Zero carbon emissions by 2050, any organisation operating within the UK will need to decide longer term how they can help towards this target, and it is likely that legislation will ultimately be introduced to mandate actions for those who do not do so voluntarily.

Some pieces of legislation already exist that have started this process, so far targeted at larger entities. The Energy Savings Opportunities Scheme (ESOS) requires all larger entities and their associated group companies to calculate their total energy consumption and undertake mandatory energy audits every 4 years. The opportunities identified through the audits should give organisations a good route to reducing energy consumption.

The Streamlined Energy and Carbon Reporting (SECR) scheme requires large entities to report annually on their energy consumption, related emissions and any energy efficiency actions undertaken or planned. While neither scheme currently forces any organisation to make changes





in the way they consume energy, the pressure of these laws and the reputational damage possible from either not complying or not being seen to take any action should in theory drive organisations to consider reducing their energy consumption.

It is also very likely that over time, organisations will start to require those they deal with, either as suppliers or customers to be proving their environmental credentials, such as having a Net Zero plan. This is likely to be particularly true for those tendering for public sector contracts where we are already seeing at least some of the assessment judged on sustainability criteria.

Setting Net Zero carbon targets, and delivering genuine action in pursuit of those targets, can set organisations apart in terms of their sustainability and corporate social responsibility commitments. Often, carbon reduction also goes hand in hand with achieving financial sustainability, whether through re-occurring energy savings, increased energy price certainty, or through competitive advantage.

Carbon Emissions

Organisations are required to define the scope of their Net Zero carbon commitments, key GHG emission indicators fall within 3 core scope categories. Scope 1 and 2 emissions are conventionally reported by organisations. However, most carbon emissions from organisations are from Scope 3 activities, representing significant opportunities for improvement.

As stated in the introduction, the main focus for carbon accounting, and associated Net Zero Carbon commitments, is on the 6 main gases identified in the Kyoto protocol. Whilst CO2 is the most common of the key gases, others are more damaging per unit of mass, as presented in the Table on the right so even a small use or release of these can have huge impacts on an organisation’s carbon impact.

Greenhouse Gas	Global Warming Potential, 100-year time horizon	Atmospheric Lifetime (years)
Carbon Dioxide (CO ₂)	1	100
Methane (CH ₄)	28	12
Nitrous Oxide (N ₂ O)	265	121
Chlorofluorocarbon-12 (CFC-12)	10,200	100
Hydrofluorocarbon-23 (HFC-23)	12,400	222
Sulfur Hexafluoride (SF ₆)	23,500	3,200

Calculating Carbon Emissions

It is key to follow a consistent calculation process once key emission indicators have been identified as part of the Net Zero Carbon strategy. To calculate, the total carbon emissions of an organisation, the total volume of fuel consumed of each type must first be calculated. This can then be converted into Tonnes of carbon dioxide equivalent (CO2e) using the UK Government’s conversion factors spreadsheets. Examples of this are presented in the Guide.

The full version of the [Guide to NET ZERO](#) which is available on the EMA website in the Resources section, includes sections outlined below.

- CHAPTER 1: INTRODUCTION TO NET ZERO
- CHAPTER 2: CARBON EMISSIONS
- CHAPTER 3: POLICY – FORMULATION AND CREATION
- CHAPTER 4: STAKEHOLDER ENGAGEMENT
- CHAPTER 5: MAKING A BUSINESS CASE AND SECURING FUNDING
- CHAPTER 6: NET ZERO STRATEGY
- CHAPTER 7: NET ZERO ENERGY PROCUREMENT
- CHAPTER 8: NET ZERO STRATEGY IN PRACTICE
- CHAPTER 9: DATA COLLECTION AND ANALYSIS
- CHAPTER 10: MONITORING & REPORTING PROGRESS
- CHAPTER 11: DECARBONISATION OF HEAT
- CHAPTER 12: RENEWABLE ELECTRICITY GENERATION
- CHAPTER 13: DECARBONISATION OF TRANSPORT
- CHAPTER 14: BEHAVIOUR CHANGE
- CHAPTER 15: CARBON OFFSETTING





Has the COP26 Delivered for me as an Energy Manager?

The majority of people on Earth, our world, who have knowledge of all its vast natural resources, believe that all of this has been provided by a creator called God who has entrusted us to use them wisely. However, there are millions of people on this planet who readily accept and consume these resources without any thought or respect of where they come from. Or worse, they forget or ignore that it is a finite resource which won't last forever and appear to have no regard for the future prospects for our planet.

Why say that as my opening statement? Well as you may know, I'm an energy management consultant but I'm also a Lay Minister in the Church of England, and during a recent sermon I spoke about COP26 and its importance in tackling the issue of Climate Change. I also mentioned that Russia and China chose not to attend, and yet China exceeds all other nations in producing greenhouse gas emissions, some 27%. Nearly a third of the whole world of greenhouse gases is emitted by China!!

After the service, and over a cup of coffee, a lady approached me and said, "I have a bone to pick with you." Don't you just love it when someone says that to you? She said, "You didn't mention that the UK also contributes to China's carbon footprint because of all the goods we import from them." Initially I was knocked back but when you think about it, she has a point. Just try to buy any domestic electrical equipment or household tools and how often do you see the 'Made in China' label?! I'm quite saddened by this fact, and some manufacturers try to disguise this by placing 'Designed in the UK' labels

on their boxes. This got me thinking about how our own industry is struggling to compete with less expensive imports from the likes of China who is now also facing huge cost increases for their gas and electricity requirements, as well as being pressured to look at Carbon Neutral and Net Zero targets.

COP26 has finished and pledges and promises were made with regard to reducing the amount of greenhouse gases emitted into the atmosphere. However, what I didn't hear about was how energy management and the reduction of consumption of energy is an important issue, or that it should be considered an important detail within the Net Zero proposal.

Yes, they talked about emissions associated with transport and the increase in use of electric vehicles, but unless the electricity used for charging is from 100% renewables, then it doesn't help with the problem. Similarly, the production of hydrogen through the electrolysis process needs to be from renewables.

It appears to me that with regard to energy management there is loads of advice available but no firm support from the government, that is unless you are controlled by a local authority, in which case fully funded schemes are available! By reducing demand, the user is obviously gaining savings in cost and becoming more competitive, whilst the government can enjoy the savings in emissions and go forward to reach their targets. It would be great if there was some financial assistance available, similar to the old Carbon Trust scheme

where free energy audits to identify savings for large consumers, plus interest free loans for energy efficient projects could also be re-introduced. This would significantly help the government in achieving their reduction targets rather than increasing 'green' tariffs and further burdening industry and commerce. A carrot rather than a stick approach, I think, would work better.

It is common knowledge that within the energy management industry a saving of at least 5 to 10% can be achieved when good energy management principles are put in place. That could lead to a saving of at least 5% of emissions of greenhouse gases associated with industry, or indeed any other type of significant energy consumer.

My question, aimed at our government, is twofold. Why was there no mention of energy management and the associated benefits in the reduction of greenhouse gases discussed at COP26; and when will they offer financial assistance to all major energy consumers, not just local authorities, to help industry to be more competitive and energy efficient?

Author's Profile

Astley has almost 45 years' experience within the building services sector and 30 years' experience with industrial power and process control systems. His specialities include power distribution, lighting, motor drives, HVAC controls, compressed air systems, building services design and maintenance as well as running stakeholders' engagement campaigns in his previous role as energy manager at GSK.



- CPD awarded

- Practical advice

- Q&A sessions

TOPICAL WORKSHOPS

12 January 2022

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.

19 January 2022

ENERGY MARKET UPDATE

The prices of gas and electricity have soared over recent months resulting in multiple energy suppliers ceasing their trading and consumers' costs increasing. This workshop will focus on reviewing the recent and current market prices for wholesale gas and electricity, what drives these prices and how they have been impacted by the recent gas shortage outbreak. The session will also examine what the continued impact may be over the next year and what it will mean for organisations and energy management.

26 January 2022

ENERGY EFFICIENCY AND NET ZERO OPPORTUNITIES AND CHALLENGES AT UNIVERSITY HOSPITALS BIRMINGHAM NHS FOUNDATION TRUST

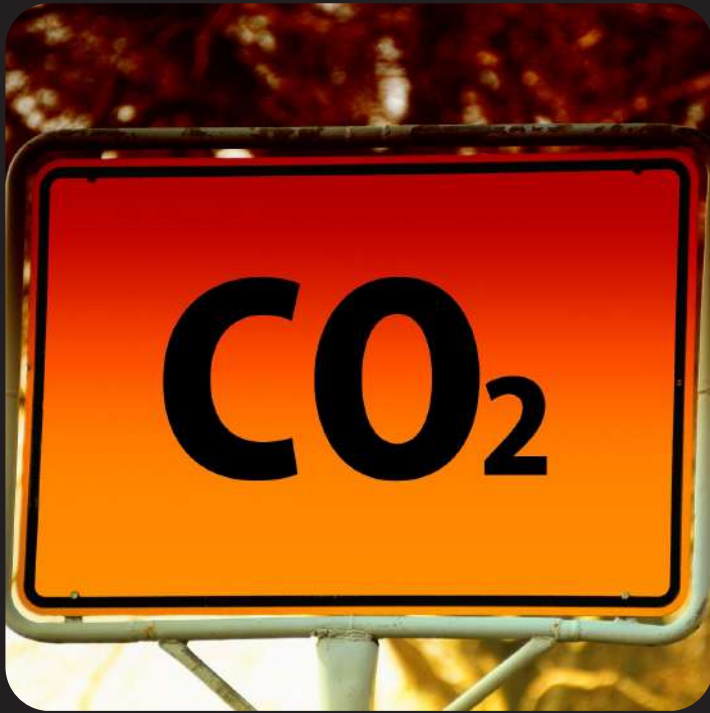
This workshop will define what energy efficiency means for the University Hospitals Birmingham NHS Foundation Trust as well as the opportunities and challenges the Trust faces in meeting their Net Zero targets.

Leon Korner, the Trust's Energy & Sustainability Manager, will focus on the challenge of improving energy efficiency and decarbonising heat at one of the largest NHS trusts in the country. He will explain where they started and the journey so far, as well as how they propose to get to the NHS' Net Zero 2040 target whilst also identifying some of the challenges along the way and how they may be overcome.

16 February 2022

DECARBONISING AND CONSERVING OUR UTILITIES AT DUBLIN CITY UNIVERSITY

This workshop will set out the Dublin City University's (DCU) achievements to date and their ten-year planning strategy for the decarbonisation and conservation of their energy systems through to 2030. The plan is to establish pillars and enablers to create a clear and well-defined roadmap, set ambitious aggressive targets, begin a transition progress routing plan, completely eliminate fossil fuels from all new developments, begin the process of electrification of the existing building stock, and to continue with the successful conservation initiatives that have been carried out over the past 15 years.



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.

[REGISTER HERE >>](#)

NAVIGATE THE SHIFT TO NET ZERO



REACHING NET ZERO COURSE

The course offers a guide on how to prepare for and reach your targets. It outlines a typical road map to achieving the desired targets and practical measures to achieve them. It highlights where the carbon impact can come from, how to create a strategy for reduction of emissions, identification of the practical measures needed as well as auditing and verifying progress.

[REGISTER HERE >>](#)

**FOR THE LATEST DATES VISIT
WWW.THEEMA.ORG.UK**