

THE EMA MAGAZINE

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**LIGHTS, SIRENS,
SUSTAINABILITY:
THE RACE TO
DECARBONISE
EMERGENCY
SERVICES VEHICLES**

**THERE IS A LOT
TO PLAY FOR: MY
CAREER IN ENERGY
MANAGEMENT**

**SCOPE 3 EMISSIONS
REPORTING
EXPERIENCE**

**GUEST EDITED BY THE EMERGENCY SERVICES
ENVIRONMENT AND SUSTAINABILITY GROUP**



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CALCULATING ENERGY USE IN IT



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by Michael Johnson, Chair of the Emergency Services Environment and Sustainability Group, and Environment and Sustainability Lead at Cheshire Constabulary & Cheshire Fire and Rescue Service



Dear Reader,

Welcome to the latest edition of The EMA Magazine, with a focus on colleagues from within the emergency services. We have been pleased to contribute to this edition as several members of our group are also members and contributors to the EMA.

The Emergency Services Environment and Sustainability Group (EESG) consists of professionals in the field of environment and sustainability, as well as other key stakeholders within the UK emergency services. With their collective expertise, the EESG is uniquely positioned to offer informed advice and innovative solutions tailored to the specific environmental sustainability challenges faced by the sector.

Reporting to the National Police Estates Group (NPEG), the EESG serves as the primary forum for discussing the environment and sustainability issues within the emergency services. The group actively collaborates with external stakeholders such as the National Police Chiefs Council (NPCC), National Fire Chiefs Council (NFCC), industry partners, and government bodies to ensure a comprehensive approach to sustainability.

The core mission of the EESG is to support the strategic plans and operational objectives of the emergency services by providing expert guidance on sustainable practices. This includes identifying and promoting best practices in environmental sustainability within the sector, as well as enhancing support networks for professionals at all levels of experience. Whether sustainability is a primary focus or a secondary responsibility, the EESG is committed to fostering a culture of efficient, effective, and compliant environmental management within the emergency services.

This edition will look at celebrating some of the people and outlining major challenges that the emergency services currently have on the journey to Net Zero.

I hope you find this edition enjoyable and informative.

Yours,

Michael Johnson



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

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ABOUT EMA

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

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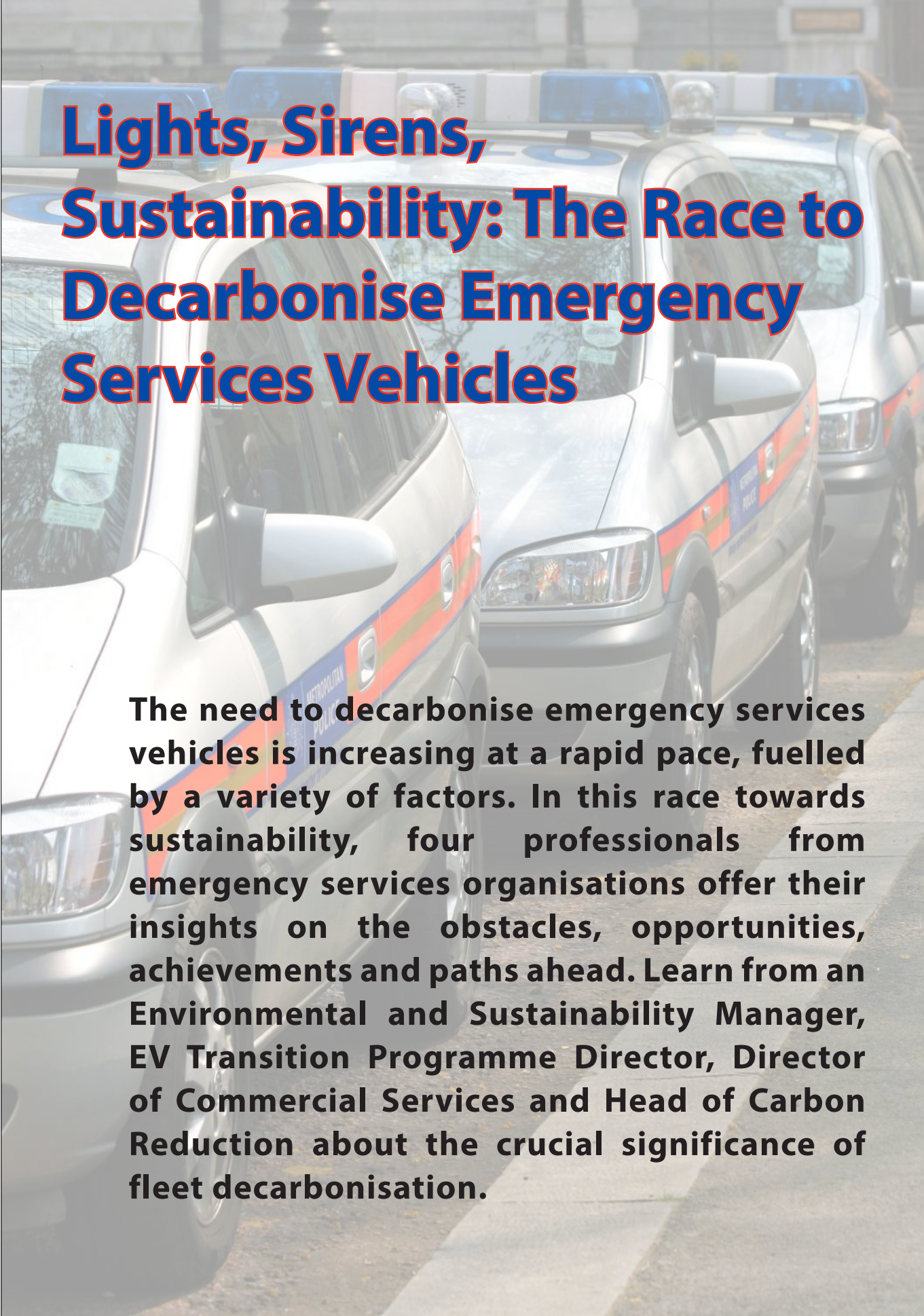
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Lights, Sirens, Sustainability: The Race to Decarbonise Emergency Services Vehicles

The need to decarbonise emergency services vehicles is increasing at a rapid pace, fuelled by a variety of factors. In this race towards sustainability, four professionals from emergency services organisations offer their insights on the obstacles, opportunities, achievements and paths ahead. Learn from an Environmental and Sustainability Manager, EV Transition Programme Director, Director of Commercial Services and Head of Carbon Reduction about the crucial significance of fleet decarbonisation.

O Brave New World



As an environmental and sustainability manager within a police force, your role involves driving change, to create a greener and brighter future for all. However, police forces are typically slow at changing. Especially when you consider any police force's primary function is to maintain public order, enforce laws, and prevent and investigate crimes - not specifically to protect the environment or promote sustainability. Furthermore, the daily activities of any police force have a negative environmental impact.

Therefore, it should become our responsibility to minimise our environmental footprint, protect the environment, and respond to the threats of climate change with the same urgency as we respond to criminal activities. Climate change, environmental degradation, and resource competition have been identified by the [College of Policing](#) as major threats that will significantly alter the operating environment of policing by 2040. The frequency of severe weather events such as droughts, heatwaves, floods, strong winds, rain and snowfall is expected to rise, alongside increases in temperature and sea levels. These will all increase the impact of policing and stretch the resources even further.

However, this argument becomes challenging to convey when funding is limited, and every initiative aimed at reducing carbon emissions or promoting sustainable practices competes with funding for core policing improvements.

Is this an EV, I see before me?

Modern police fleets are a major contributor to carbon emissions. The environmental benefits of fleet decarbonisation are clear. The market and the government are mandating that we embrace new technology too. Therefore, the argument isn't to be more sustainable, it is to ensure that our police force is suitable for the future and this incoming new technology. However, this is the first time the market is dictating how a police force will operate in years to come, and it is not as simple as replacing like for like.

To EV, or not to EV? That is the question.

It doesn't matter if you are a police officer, an environmental manager, a chef or a builder, it seems everyone has an opinion on Electric Vehicles (EVs) and a potential transition away from ICE (Internal Combustion Engine) vehicles. Everyone has a right to their opinion or personal preference.

It is true, EVs face several challenges, including limited charging infrastructure, longer charging times compared to refuelling, and available electrical capacity. Telematics, resources and data are needed to monitor performance. Battery life and range are concerns, along with potential environmental impacts of battery production and disposal. Furthermore, you need buy-in, and you need widespread adoption and alignment across a large organisation to adopt this new technology.

This doesn't take into account the substantial capital costs involved in a potential transition. Will the central government assist us, or will a new emerging technology come to the rescue? These are complex questions to answer, especially since the immediate priority for any police force is to continue serving the public. Therefore, the easiest response might be to say, "I don't know" and delay making a decision. Waiting for a silver bullet solution or additional funds might seem like a prudent choice to ensure the continued service of a police force. However, this can lead to missed opportunities in reducing emissions, consumer adaptation and can result in higher future costs.

You need to see climate change both as an existential threat and as an opportunity. There are issues, from a financial, infrastructure and mindset viewpoint. However, we need to also see the climate crisis as an opportunity to do things better, to improve policing as well as reducing our carbon emissions for the communities we serve.

Author's profile:

Patrick is the Environmental and Sustainability Manager for the Surrey and the Sussex Police. With a masters in environmental management, a strong background in environmentalism and a deep commitment to sustainability, Pat brings a unique perspective to law enforcement focused on reducing the force's carbon footprint and minimising its impact on the environment.

By George Symes, EV Transition Programme Director at Metropolitan Police Service

Service Continuity First



Police fleet decarbonisation is now about service continuity first and environment second. The Zero Emissions Vehicle (ZEV) mandate requires vehicle manufacturers to meet escalating sales quotas for ZEVs, starting at 22% in 2024 and reaching 100% by 2035. Despite the recent delay to the ban on internal combustion engine (ICE) vehicle sales from 2030 to 2035, these quotas remain unchanged, forcing a rapid shift in production focus from ICE to EV.

By 2027/2028, it is anticipated that all manufacturers will have ceased production of ICE models of advanced vehicles in favour of EV versions. Advanced vehicles perform the most demanding roles such as armed response, pursuit and roads policing, and are often parked for as little as 10% of the time at the police station. So on a typical day, not only are these vehicles using more energy by driving further and faster; they also have a shorter “charging window” at the station.

In short, police forces will be obliged to take on EVs to fulfil the most complex duties in as little as 3 years from now.

Can we buy ourselves time?

As the EV industry matures, batteries get cheaper and denser, chargers become more versatile and reliable, and for both, the supply chains adapt to reduce the cost of service, maintenance and repair. But adopting a “wait and see” approach entails significant risk: the impacts of extending ICE vehicle life should be explored. Pre-purchasing ICE vehicles could also offer a temporary solution - even though some forces

are already stockpiling vehicles, this seems akin to purchasing toilet roll during lockdown. We require a strategic approach to fleet decarbonisation that prioritises operational effectiveness and reliability.

When will the central government help us?

There are various initiatives involving police, fire and ambulance services, at a national and local level, to lobby for funding. While sufficient funds, skills and expertise are all crucial for a successful transition, there is much that each emergency service can do now at a relatively low cost.

First, rolling out telematics across the existing fleet can provide valuable data on vehicle usage patterns, helping to identify which vehicles are best suited for early EV replacement, and the charging requirements of the energy-hungry vehicles that rarely stay still. Beyond the time and location data necessary to facilitate the EV transition, telematics has further potential to optimise fleet management through fleet rationalisation, monitoring real-time performance and - in an EV fleet - monitoring battery state of charge and state of health.

Second, conducting an energy audit of your estate is essential. Understanding the current peak demand, and any additional unused power capacity, can help police and other emergency services create an estate baseline to complement the vehicle baseline. This can facilitate engagement with your Distribution Network Operator (DNO) on immediate and long term power capacity needs.

Third, with a data-rich picture of both the vehicle energy demand and the estate energy supply, the foundation is laid to run a small “proof of concept” pilot for services to learn how to integrate EVs into their operations, without going through the additional time and expense of a grid upgrade. This can help validate the degree to which the technology meets the current operational processes and test the flexibility of those operational processes at small scale in order to safeguard operational performance at large scale.

While the environmental benefits of fleet decarbonisation remain a significant driver, the immediate priority for police forces and other emergency services is service continuity. The rapid shift towards EVs as vehicle manufacturers respond to the ZEV mandate requires a balanced approach that safeguards operational effectiveness. By focusing on phased integration, leveraging telematics, and conducting thorough energy audits, police services' operators can successfully navigate this transition, ensuring that their critical services remain reliable while contributing to a more sustainable future.

Author's profile:

George leads the EV transition at the Met Police, where the team are rolling out a series of ultra-rapid EV charging pilots. He set up EV Evaluate Strategy to help complex fleets decarbonise by bringing together the fleet, charging infrastructure and behavioural change elements to make the EV transition happen.



Balancing the Budgets



Eighteen months ago I was asked to take on the Chair of the snappily titled 'Transport and Charging Infrastructure Working Group'. This group of fleet managers, estate managers and police officers reports to the Sustainability Board of the National Police Chiefs Council (NPCC). At that time, fleet decarbonisation was just one of a very long list of financial risks and issues in my in-tray. Policing is an acronym rich environment and after nearly 40 years in policing, I think I am well versed in all the acronyms and abbreviations. However, since taking on this role, I have had to learn a whole new language of TLAs (three letter acronyms!). BEV, PHEV, DNO, IDNO, KERS - to name but a few. Having almost got to grips with the language, I have realised that fleet decarbonisation isn't just another thing in the in-tray for Chief Finance Officers (CFOs) and it isn't just a risk, it's an opportunity. Why? You might ask.

For anyone who has even the slightest involvement in fleet decarbonisation it is immediately apparent that this is (a) far more than a fleet issue, arguably the biggest challenges are ones for our estates managers, (b) this is not a 2030 or 2035 issue, and (c) it has major financial implications. As the Chair of the Working Group, all of the above are issues we need to address. However, I am also the CFO for West Mercia Police and it is very apparent to me that how these three issues come together should be a major consideration for

me. This is true for CFOs / Finance Directors not just across policing, but for any organisation that uses cars, vans, trucks, coaches, buses, etc. However, I am not convinced we are all sufficiently alive to this.

I could write a massive and probably very boring tome on why Battery Electric Vehicles (BEVs) are not just a straight replacement for Internal Combustion Engine (ICE) vehicles but that's not the purpose of this article, and I will limit myself to the financial aspects whilst also explaining why the three points above all come together.

BEVs run on electricity – you knew that already! They run on DC and they need charging up, which takes time and requires a charging infrastructure. For every use case of a vehicle there is a decision to be made, and probably a compromise,

"Whilst the capital costs are significant, two critical issues are being missed."

between time to charge and cost. Slower AC chargers are relatively cheap but require many hours to charge a vehicle. Rapid and ultra rapid chargers are a greater cost but allow vehicles to be on the road longer with quicker turnarounds. However, in many cases rapid charger installation will require works from your Distribution

Network Operator (DNO) or Independent Distribution Network Operator (IDNO), which can come at a considerable cost and may take years to deliver.

As a CFO, I need to understand the use cases for the wide variety of vehicles we operate and what level of charging infrastructure we require. I am skirting over the option of public charging as in most cases these will not be where our officers and staff need to be, and the cost per kW can be expected to exceed the cost of petrol and diesel. For West Mercia Police, a very rough order of magnitude (ROM) cost is £5m-£10m for the infrastructure, this excludes any vehicles. The vehicles are also more expensive and qualifying working experience (QWE) can expect a significant increase in the cost of an average vehicle. Public finances are heavily constrained and these are increases in capital expenditure that are superficially unaffordable.

The key word here is superficially, but sadly I fear it's where many organisations stop. It's unaffordable, let's wait it out and hope it goes away, or at best let's dip a toe in, claim to be green and we will look at it later. But we can't ignore it. Whilst the capital costs are significant, two critical issues are being missed.

First, the lead in times for some site infrastructure could be 4 years or more. If we wait we could be left without the capability to operate our vehicles. As the vehicle manufacturers are also held to

targets to sell Zero Emission Vehicles (ZEVs), it will become increasingly difficult to source ICE vehicles. I don't believe it will be acceptable for us to be reliant on the second-hand market or to run vehicles long beyond their serviceable life. To delay is to risk your business and in our case, the service we provide to the public.

The second issue is where CFOs really need to step up. Yes, the capital costs are significant but the running costs are much reduced, and when the Whole Life Cost (WLC) or Total Cost of Ownership (TCO) – choose your acronym – is considered, the difference is far less apparent. Indeed, if the infrastructure costs in your location are not considerable, the BEV option can offer a significant saving. If fleet decarbonisation in the medium term is inevitable and if you believe the future is BEV, either alongside hydrogen or on its own, then the case for early adoption is a strong one.

As a public sector CFO it is my

duty to champion value for money and that means looking at whole life costs, and my assessment is that this means pushing forward with BEVs as quickly as the infrastructure allows. So, my journey through this new land of acronyms and abbreviations continues. The route clearly has some bear traps for the unwary, but with the right planning and foresight it can be a financial, operational and environmental opportunity. I firmly believe it is part of the role of the CFO to make sure the plans are in place and the opportunities seized.

Author's profile:

Richard is the Director of Commercial Services for West Mercia Police. He is the lead for the transition to zero emission vehicles working under the NPCC Sustainability Board. He has previously worked in senior roles in North Wales Police, Cheshire Police, Cumbria Constabulary and the Parliamentary and Health Service Ombudsman.



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Zero Emission Pumping Appliance



As part of the London Fire Brigade (LFB)'s decarbonisation journey, the Brigade is developing its own comprehensive carbon net zero strategy. But some significant steps have been achieved already when in 2022, we unveiled our first ever carbon net zero fire station in Walthamstow. This was achieved by removing the use of gas, with new electric heat pumps providing the source for heating and hot water. Solar panels have been installed on the roof, helping to produce electricity, and energy efficient lighting helps reduce energy by as much as 60 per cent. By the end of 2024, a further five fire stations are due to be carbon net zero and funding has been secured to decarbonise a further 12 stations by the end of 2026.



Alongside all this work, the Brigade is also currently developing its first ever Zero Emission Pumping Appliance (ZEP). This further supports our commitment to becoming a more sustainable organisation. The Brigade is currently working with Emergency One, the UK's leading manufacturer of specialist fire and rescue service appliances, to build a Zero Emission

Capable Pumping Appliance.

The Brigade is a leading voice in calls for innovation to help fire and rescue services and other organisations decarbonise their heavy fleets and it is hoped the project will help grow the market for zero emission specialist vehicles in the UK's emergency services.

Developing zero emission solutions for fire engines is particularly

challenging as they have demanding performance requirements – not only do these heavy vehicles have to attend to incidents as soon as possible, but they also have to be able to pump water for long periods of time, and transport equipment and machinery to deal with fires, flooding and other incidents.

Our fleet of emergency cars that respond to incidents are all electric

and the development of the first zero emission pumping appliance is in progress. Hydrogenated vegetable oil (HVO) is also being introduced to help fuel some appliances, such as fire engines. Sometimes known as Renewable Diesel, HVO is created by collecting vegetable fats and oils and putting them through a hydrogenation and isomerisation process which removes impurities. HVO reduces carbon emissions from vehicles by about 90 per cent.

We recognise that a lot of work is still required in order for us to realise our net zero ambitions. However, decarbonising the estate requires significant investment that will allow us to make the necessary improvements across

our operation that supports our strategy.

Author's profile:

Paul has been working in carbon reduction for 12 years. He started as a project manager delivering renewables and low carbon technologies. With a background in Electronics Engineering, Paul has become a subject matter expert in the field, but still considers every day to be a school day.

There is a Lot to Play for: My Career in Energy Management



What inspired you to pursue a career in energy management?

Growing up, I always had an interest in the outdoors and became fascinated by environmental issues. I took this interest through college and into university where I studied Geography at Lancaster University and then took a Masters in Environmental Management. It was during my Masters that I started to really consider what I could do career wise, and I really wanted to find a job where I could use my knowledge and skills in a practical way.

Following university, I took my first role as an Energy Consultant which involved managing energy procurement arrangements for a wide range of clients from a variety of sectors. At the time, it was a huge learning curve, not only as it was my first real full time role, but also dealing with real life energy issues for clients was a bit of a shock to the system. Looking back though, the practical experience and industry knowledge has been invaluable throughout my career.

My next role moved into a wider sustainability focused role for a social housing provider. I supported the Asset and Environmental Manager in improving sustainability of the housing stock through capital projects, mainly focused on insulation but also through

initiatives aimed at tackling fuel poverty, whilst also driving performance against the Social Housing Index for Tomorrow (SHIFT) metric, a system aimed at improving sustainability within the sector.

My next role was in the manufacturing sector where I took on the role of Environmental Officer. The role focused heavily on legal compliance and my time in the role was short lived. On reflection, I think a big driver for the short time in the role was that it felt solely focused on compliance and the lack of variety in the role didn't really excite me!

I was lucky to be able to move on quickly into the NHS where I was appointed as Environmental Manager for my local NHS Trust responsible for delivering mental health services. The role was extremely varied and the scale of opportunities was significant. It also gave me my first chance of developing a sustainability strategy as well as delivering a suite of energy efficiency projects, including LED lighting, building management system upgrades and solar PV projects. As well as these large projects, I was also able to work with service users in developing biodiversity projects that contributed to positive mental health and recovery, which was incredibly rewarding.

I gained valuable experience in the role and I then moved into my current role as a Sustainability Manager for Greater Manchester Fire and Rescue Service.

What does your current role entail?

My role focuses on delivering the sustainability strategy for the organisation. The role is wide ranging and has developed beyond energy alone into other areas such as resource efficiency, environmental protection, supply chain sustainability and sustainability leadership. However, a key driver still remains, and that is the need to reduce the carbon footprint of the organisation, so a large part of my role focuses on energy management, delivering energy efficiency and carbon reduction projects.

What is the most exciting part of your job?

The role is so broad ranging and diverse that it never feels like any day is the same. The nature of sustainability means that engaging with people, be it colleagues, contractors or peers, is a key requisite and this is something that I really enjoy.

The organisation is also hugely supportive of sustainability which helps to keep me challenged and motivated in equal measures!

What is your biggest achievement to date?

I was really lucky and honoured to be asked to attend COP28 as part of a National Fire Chiefs Council delegation. A specific event was held focused on reducing emissions from fire, so I was able to network and collaborate with peers from across the world, where I learnt an incredible amount in a short space of time. We also managed to get some time at the Green Zone at COP28 which was fascinating. It is definitely something that I look back on with great pride.

What was the most exciting project that you worked on?

Although challenging at times, it was great to work on the first phase of the Public Sector Decarbonisation Scheme. Grant funding hadn't come around for a long time, so to be able to acquire a large chunk of grant funding for widescale decarbonisation of the estate was exciting. The daunting part then came in trying to find appropriate supply chains and contractors who could deliver before the funding deadline, but I guess that is what made it exciting, if a little stressful! In total, my team managed to deliver two large solar PV systems and full LED retrofit at 18 fire stations, which was a phenomenal achievement given the time constraints and other challenges involved.

What is the most frustrating part of your job?

It can be frustrating working to long-term net zero targets as people can tend to think they are very distant, which can take the focus away from them. I find this frustrating at times as we require widescale, transformative change to achieve net zero, which will involve

a whole range of various actions along the way. The longer we leave this, the tougher this becomes!

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

It often feels like a constant cycle of upskilling people and creating a base level of knowledge around key areas such as energy. If we could somehow create a standard level of knowledge for everybody, a lot of time would be saved and we would definitely be able to progress at greater speed!

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

Finding ways of embedding sustainability into existing activity



within an organisation can often have greater results than running standalone projects. I often find this approach leads to actions being embedded better too!

Understanding context and using this to develop a clear strategic approach is something I have found to be very useful. Sustainability is such a vast topic and not having a clear strategy as to how our organisation intends to tackle it would leave us facing a huge challenge with no clear idea as

to where we intend to put our resources.

It probably comes across a bit simple, but I always think having a curious mind and openness to talk with people is vital. Data can tell you one thing, but past data and performance information, understanding how processes work and how people work will open many doors. People will often open up about issues, challenges and even frustrations but by engaging with people, I often find a willingness to support rectifying issues and coming up with solutions that will have a long lasting effect.

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

The profession is always changing. We continue to learn more about why we need to reduce energy consumption and our carbon footprint, and technologies continue to advance to meet this challenge. It often feels like a constant evolution of the role and profession, so being open and willing to learn, sometimes from mistakes, is a key attribute that I have carried with me through my career.

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

There are too many to mention throughout my career, but I often think they come from good places – there is a lot of misinformation and sustainability is complex!

What are your long-term motivations?

The overall goals within sustainability are huge so there is a lot to play for. My long-term motivation in my career is that I am playing a part alongside amazing and inspiring peers in making a difference for future generations.

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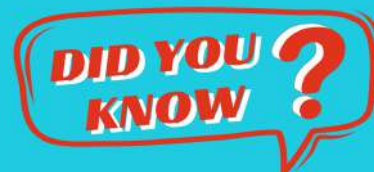
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Navigating the Path to a Sustainable Future: My Career Journey



What inspired you to pursue a career in sustainability?

I chose to study environmental science because of its interdisciplinarity. It was difficult to select one subject I would like to pursue as I had a keen interest in both natural and social sciences, but especially biology, politics and languages. Reflecting on it now, I have (quite miraculously!) been able to combine them all in my career. At school, I was also actively involved with student councils and went on to lead a local student council at my university, which helped me develop many of the invaluable 'soft' skills I use today.

After my BSc, I sought and secured a placement at the Ministry of Environment and Regional Development in Latvia, and it eventually led me to apply for my first role as a civil servant. I worked within the Climate Change Technology and Finance Department whilst also studying for a MSc in Biology. Though I do not recommend a full-time job alongside a research-intensive Master's, I thoroughly enjoyed both. At the time, I had developed a keen interest in environmental economics as I wanted to see policymaking processes that consider environmental impacts alongside economic impacts, forming holistic cost-benefit

analysis. I decided to pursue a formal training in this at the University of York. After that, I spent just over a year working as a research assistant at Stockholm Environment Institute in York.

I soon got to fully apply my most recent degree in full as I took on a role within an energy and environmental consultancy. This offered me an opportunity to work on many exciting projects – from developing business cases for different energy efficiency solutions to modelling the economic impacts of a 'latte levy,' generating building decarbonisation insights for trade associations, and engaging with government officials.

From there, I joined a policy team at one of the electricity Distribution Network Operators, where I spent five years leading on decarbonisation of heating and transport, local energy, net zero policy – undertaking stakeholder and policy engagement, and managing a capacity-building programme for community energy groups whilst witnessing the energy transition in real-time. Seeking fact-based and stakeholder-led policy changes on behalf of the electricity customers made it very clear that I was passionate about working in the public interest. Therefore, after many years working in the private

sector, I decided to seek a role in the public sector and applied for a newly created Sustainability Manager role at West Yorkshire Police.

Alongside my demanding role, I am also contributing to the North East and Yorkshire Net Zero Hub's work to accelerate decarbonisation and clean growth within the region, as an advisory board member.

What does your current role entail?

This is a new role for my organisation and the primary objective of it is to develop a 'corporate' approach to sustainability. I often tell my colleagues that a Sustainability Manager's job is to ensure their organisation eventually does not need a Sustainability Manager. Having recently developed and published the organisation's first Sustainability Strategy, I am now progressing it to implementation by equipping colleagues across the organisation with tools and training to support the strategic aims.

My weeks are quite varied, but always contain a good proportion of meetings and desk-based work – I could be running an internal workshop, meeting a new colleague or attending an external meeting, drafting materials for internal sustainability

workstreams, or taking a deep-dive into our greenhouse gas emission calculations.

What is the most exciting part of your job?

The most satisfying aspect of my job is the opportunity to add value both to my organisation and to the wider emergency services sector. I also thrive on the complexity of the subject and the complexity of the organisation.

What is your biggest achievement to date?

One of my career highlights was providing evidence to a UK Parliamentary Committee in 2021. While I had other successes working in energy and climate policy for more than ten years, this felt special as opportunities to speak directly to decision makers are rare and often reserved for the more senior colleagues.

What was the most exciting project that you worked on?

I have had the pleasure of being involved in many very different projects and initiatives. One of the more complex and therefore rewarding one has been working on the electricity network's approach to accommodate more electric vehicles, from scoping and project-managing the installation of inaugural electric vehicle charging infrastructure across own depots, to developing a 'readiness strategy' to accommodate more vehicles across the network, and engaging with the policy makers and fleet operators across the region to ensure inputs

into policy and decision making processes, coupled with practical support and information to customers.

Fast forwarding to today, the transition of emergency service fleets to zero emission vehicles is an area I feel most passionately about. To ensure service continuity, emergency services need to be ready to take on more zero emission vehicles into their fleets within the next couple of years, so they can keep up with the vehicle supply chain rapidly phasing out petrol and diesel vehicles. However, the



planning for this transition is at the early stages, and the funding constraints, the critical nature of these fleets, and the number of stakeholders, all add layers of complexity. There are more than 40 police forces, more than 100 emergency services organisations, and six electricity Distribution Network Operators. I firmly believe we can achieve better results if we work together, so I have been championing greater collaboration within the emergency services sector and with the energy sector to ensure this can happen as smoothly as possible.

What is the most frustrating part of your job?

The pace of climate action. We have known about the fundamental risks of climate breakdown to our society and economies for more than a century, but despite announcing a 'climate emergency,' many decisionmakers and organisations treat it as a distant and low risk. That, coupled with the realisation that all one person can professionally do to accelerate climate action could be offset within minutes by a decision made in another organisation.

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

The one thing that would make my job significantly easier would be science-led international and national policies, particularly ones that ensure environmental and social externalities are reflected in the economy.

If you could recommend three things to have success as a sustainability manager, what would you recommend?

One, if not the most important thing, is to relentlessly prioritise tackling the most material issues first.

Most recently, the thing I can see coming in handy for me and my peers is developing a network of professionals working on similar topics – as specialists, we often work on our own, but having peers provides an all-important sense-check as well as an appreciation that it is a team effort with shared goals.

Related to this, fostering partnerships and collaboration, in my view, is essential to ensure learning from best practice, not duplicating, and ultimately improving the quality of everyone's work. We absolutely cannot reach net zero targets if we work in silos!

What advice would you give to someone looking to become a sustainability manager?

Whether you have just completed your education or are seeking a career change, finding the first environmental job will always be the most difficult hurdle, and persistence will be key. At the same time, the demand for professionals

in this area has never been so high, and there is a real opportunity to apply different skills whilst working in environment/energy fields. Some of the more exciting opportunities, in my view, are open to those with formal training or background in other subjects, like law or engineering.

If I were giving advice to my younger self, I would suggest reading job ads before beginning the search to find and define the areas you are most passionate about, and honing numeracy, communication and collaboration skills.

What are your long-term motivations?

I care that the provision of emergency services can be sustained in increasingly challenging conditions with increasing demand, particularly recognising the climate impact on the frontline services and those more vulnerable in our society these services often seek to protect. Climate change really is the biggest challenge to ensure a liveable future for every one of us, and while we cannot avoid it, I am motivated to do as much as I can, as a professional and as an individual, to avoid the worst-case future scenarios.



18 SEP
11:00-12:00
ZOOM

CALCULATING CARBON FOOTPRINT – SCOPES 1, 2 & 3

This workshop will be delivered as a step-by-step guidance to calculating greenhouse gas emissions. The workshop will begin with an overview of the Scope 1, 2 and 3 emissions and conversion factors which are used to report greenhouse gas emissions. The session will then take you through examples of how to calculate energy use, including home working and transport, and demonstrate how to use the conversion spreadsheet to calculate different emission scopes.

30 OCT
11:00-12:00
ZOOM

THE ROUTE TO NET ZERO: DECARBONISING THE UNIVERSITY OF GREENWICH ESTATE

This workshop will provide an overview of the University of Greenwich estate and outline the necessary steps to achieve net zero emissions by 2030. The focus will be on the mechanical, electrical, fabric and renewable elements associated with the decarbonisation of the estate. One of the key decarbonisation projects recently completed at the University involved the removal of 1.2MW of gas-fired central boilers from five buildings. The boilers were replaced with central air-to-water source heat pumps that supply an ambient loop to the buildings, along with water-to-water heat pumps. During this session, the University's Building Services Manager Noel Mc Sweeney will be sharing the project's journey and the valuable lessons learned throughout the process.

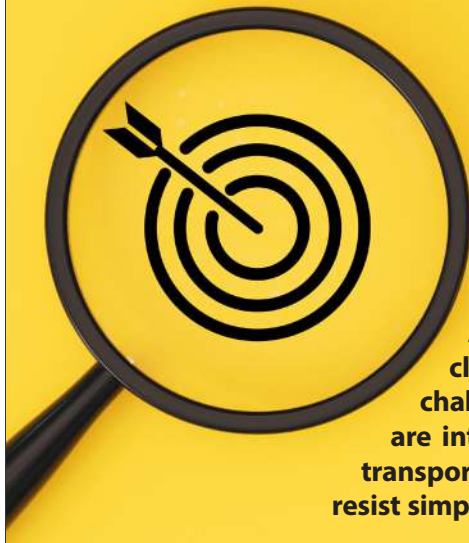
4 DEC
11:00-12:00
ZOOM

DECARBONISING AND CONSERVING UTILITIES AT DUBLIN CITY UNIVERSITY

Dublin City University (DCU) has made significant strides towards achieving its decarbonisation targets, currently reaching nearly 40% of its goal. Over the next five years, DCU has set ambitious objectives to achieve over 60% decarbonisation by 2030. In an upcoming workshop, Richard Kelly, DCU's Estates Manager, will share insights gained from DCU's decarbonisation journey thus far. These insights can be applied to any large energy-consuming organisation seeking to reduce carbon emissions. Additionally, Richard will outline DCU's new five-year strategic energy plan aimed at meeting the 2030 targets. DCU plans to achieve these targets by expanding its renewable power installations, integrating renewable heat sources (heat pumps), effective energy management, conservation efforts, retrofits, infrastructure upgrades, equipment replacements, and control system enhancements.



Register at: <https://www.theema.org.uk/ema-online-workshops/>



Scope 3 Carbon Emissions in Focus

Amidst urgent calls to address carbon emissions and combat climate change, industries are confronted with the intricate challenge of Scope 3 emissions. These indirect environmental impacts are interlaced throughout supply chains, ranging from procurement to transportation, waste disposal to employee commuting. Such emissions resist simple categorisation, necessitating innovative strategies for reduction.

But why are Scope 3 emissions so elusive? Unlike Scope 1 and Scope 2 emissions, which stem from onsite fuel combustion and purchased energy, Scope 3 emissions sprawl across countless activities and stakeholders, defying easy measurement and regulation.

This article delves into the complexities of Scope 3 emissions, exploring their measurement, challenges, reporting practices, and strategies for reduction. Finally, it provides guidance on where and how to begin addressing them.

Measuring Scope 3 Emissions – Challenges and Solutions

Measuring Scope 3 emissions is crucial for any organisation striving to comprehensively understand and mitigate its environmental impact. Unlike Scope 1 and 2 emissions, which are direct and indirect from owned or controlled sources, Scope 3 emissions encompass a broader spectrum, including all indirect emissions that occur in the reporting company's value chain from sources such as purchased goods and services, transportation, and even employee commuting.

Measuring Scope 3 emissions is more than just a theoretical exercise.

It requires a thorough examination of an organisation's supply chain intricacies. This entails collecting data from diverse sources such as suppliers, distributors and other stakeholders to evaluate the carbon footprint associated with the entire lifecycle of products or services.

For instance, consider an airport's efforts to assess its Scope 3 emissions. Beyond its operational activities, the airport must account for emissions stemming from various sources, including the manufacturing of construction materials for infrastructure, transportation of passengers and goods, and even the disposal of waste generated within its premises. This comprehensive analysis is essential for understanding the full extent of environmental impact and devising effective strategies for emission reduction.

One effective approach to measuring Scope 3 emissions is for companies to identify the 15 categories within Scope 3 and determine which are most relevant to their operations. Once identified, companies can prioritise these categories based on where they can have the most significant impact.

Expanding on the airport example, an airport may find that reducing emissions from waste management or ground transportation services have a more immediate and substantial impact than other categories within Scope 3. The airport can effectively reduce its overall environmental footprint by prioritising efforts in these areas while aligning with its sustainability goals and operational constraints. This targeted approach allows the airport to address the most impactful emission sources within its control and drive meaningful progress toward sustainability.

However, measuring Scope 3 emissions presents several challenges. One significant obstacle is the availability and reliability of data, as companies often struggle to obtain accurate information from suppliers and stakeholders along the entire value chain. Moreover, defining and quantifying indirect environmental impacts can be difficult due to the unclear boundaries of Scope 3 emissions. Furthermore, the dynamic nature of supply chains necessitates ongoing adjustments to measurement methodologies to keep pace with evolving operations.

To overcome these complexities, organisations can employ several strategies to facilitate effective measurement of Scope 3 emissions. Implementing robust data management systems enables organisations to streamline data collection, validation, and analysis processes.

Additionally, fostering collaboration and engagement with suppliers and stakeholders improves data quality and completeness. Clear communication channels and incentives encourage suppliers to provide accurate emission data, enabling more informed decision-making. Finally, adopting industry standards and best practices for Scope 3 emission measurement enhances comparability and consistency across organisations, facilitating benchmarking and peer learning.

Calculating Scope 3 Emissions

Calculating Scope 3 emissions is a multifaceted process that builds upon the foundation of measuring these indirect environmental impacts. Once organisations have gathered comprehensive data on their value chain activities, they can proceed to quantify the carbon footprint associated with each category within Scope 3. This involves converting various activities, such as procurement, transportation and waste management into equivalent

greenhouse gas emissions, typically measured in metric tons of carbon dioxide equivalent (CO₂e).

The calculation methodology for Scope 3 emissions varies depending on the specific category and industry standards. For instance, emissions from purchased goods

distance, mode of transportation and fuel efficiency data.

To ensure accuracy and reliability in calculating Scope 3 emissions, organisations often employ emission factors provided by recognised sources such as government agencies, industry associations, or academic research. These factors help convert activity data into emission estimates by accounting for factors such as fuel types, energy consumption and waste generation rates. Advancements in carbon accounting software and tools are constantly evolving, offering new opportunities for improvement and innovation. These tools not only improve efficiency but also enhance the transparency and traceability of emission calculations, enabling organisations to communicate their environmental performance more effectively to stakeholders.

Despite the complexity involved, calculating Scope 3 emissions is essential for developing informed sustainability strategies and tracking progress

over time. By accurately quantifying indirect environmental impacts, organisations can identify hotspots, set emission reduction targets and prioritise initiatives that yield the most significant environmental benefits across their value chain.

Reporting Scope 3 Emissions –



and services may be assessed using life cycle assessment (LCA) methodologies, which consider the environmental impacts associated with product production, transportation and disposal. Similarly, emissions from business travel and employee commuting can be estimated based on travel

Common Pitfalls and Best Practice

After diligently measuring and calculating Scope 3 emissions, the next critical step for organisations is effectively reporting this data.

Despite its importance, reporting Scope 3 emissions presents its own set of challenges and opportunities for improvement.

One common pitfall in reporting Scope 3 emissions is the lack of transparency and consistency in methodologies and data sources. Organisations may struggle to provide stakeholders with clear insights into how Scope 3 emissions are measured and calculated, leading to scepticism regarding the accuracy and reliability of reported figures. Comparability across organisations becomes difficult without standardised reporting frameworks and guidelines, hindering meaningful benchmarking and peer learning.

Another challenge arises from the dynamic nature of supply chains and evolving emission factors. As supply chain dynamics shift and new data become available, previously reported Scope 3 emissions may become outdated or inaccurate. This inconsistency undermines the credibility of sustainability reporting efforts and diminishes stakeholders' trust in organisations' environmental performance.

To address these pitfalls and uphold best practices in reporting Scope 3 emissions, organisations can implement several strategies. Firstly, transparency and disclosure are paramount. Organisations should explain their measurement methodologies, data sources and any assumptions or limitations associated with reported emissions.

This transparency fosters trust and allows stakeholders to better understand and contextualise reported figures.

Additionally, adopting standardised reporting frameworks such as the Greenhouse Gas Protocol or the Task Force on Climate-related Financial Disclosures (TCFD) recommendations promotes consistency and comparability in Scope 3 emission reporting. By aligning with recognised frameworks, organisations demonstrate their commitment to

“Organisations should explain their measurement methodologies, data sources, and any assumptions or limitations associated with reported emissions.”

robust environmental reporting practices and facilitate meaningful dialogue with stakeholders. Furthermore, regular updates and revisions to emission factors and calculation methodologies are essential to ensuring the accuracy and relevance of the reported Scope 3 emissions. Organisations should remain informed of advancements in carbon accounting practices and incorporate updated data and methodologies into their reporting processes accordingly.

Utilising technology can

significantly enhance the accuracy, efficiency and transparency of Scope 3 emissions reporting. For example, advanced data management systems and carbon accounting software can streamline reporting processes, reducing the risk of human error and ensuring data integrity.

Reducing Scope 3 Emissions

Reducing Scope 3 emissions necessitates a multifaceted approach that acknowledges the interconnectedness of various aspects within the value chain. One effective strategy involves close collaboration with suppliers and stakeholders to identify emission hotspots and implement targeted mitigation measures. By fostering transparent communication and partnerships throughout the supply chain, organisations can leverage collective expertise and resources to develop innovative solutions for emission reduction. While measuring, calculating and reporting provide critical insights into the extent of emissions, reducing Scope 3 emissions is where tangible environmental benefits are realised.

Setting ambitious emission reduction targets aligned with science-based methodologies provides a clear roadmap for action and signals a commitment to addressing climate change. These targets serve as guiding principles, encouraging organisations to prioritise emission reduction efforts and allocate resources accordingly. Integrating Scope 3 reduction targets into broader sustainability goals ensures alignment with long-term environmental objectives and enhances accountability across the organisation.

Additionally, investing in technology and innovation can unlock opportunities for emission reduction across different stages of the value chain. Implementing energy-efficient production processes, optimising transportation logistics and adopting renewable energy sources are just a few examples of how technology can drive significant reductions in Scope 3 emissions, while enhancing operational efficiency and competitiveness.

Engaging employees at all levels of the organisation is also crucial for successful Scope 3 emission reduction. Employees play a vital role in driving change and implementing sustainable practices within their respective roles. By fostering a culture of sustainability and providing training and resources, organisations can empower employees to identify opportunities for emission reduction and integrate sustainability considerations into their day-to-day activities.

Where and How to Begin?

To embark on the journey of addressing Scope 3 emissions comprehensively, organisations must first navigate the intricate landscape of measuring, calculating, reporting, and ultimately reducing these indirect environmental impacts.

Beginning with measurement, organisations delve into the

complexities of their supply chains, collecting data from diverse sources to evaluate the carbon footprint associated with their entire value chain. Challenges such as data availability and reliability, along with the dynamic nature of supply chains, require robust strategies for data management and collaboration with stakeholders to ensure accuracy and completeness.

Moving to calculation, organisations utilise this comprehensive data to quantify the carbon footprint associated with each category within Scope 3. By employing emission factors and industry standards, organisations convert



various activities into equivalent greenhouse gas emissions, laying the foundation for informed sustainability strategies and progress tracking.

Effective reporting follows, where organisations transparently communicate their Scope 3 emissions data, methodologies, and any assumptions or limitations to stakeholders. By adopting standardised frameworks and leveraging technology, organisations enhance the credibility and comparability of

their reports, fostering trust and facilitating meaningful dialogue with stakeholders.

Finally, reducing Scope 3 emissions requires a comprehensive approach that integrates insights gained from measurement, calculation, and reporting phases. Organisations collaborate with suppliers and stakeholders, set ambitious emission reduction targets, and utilise technology and innovation to drive meaningful progress towards sustainability goals. Engaging employees at all levels fosters a culture of sustainability, empowering individuals to identify opportunities for emission

reduction and integrate sustainability considerations into their daily activities.

By embracing this holistic approach, organisations can navigate the complexities of Scope 3 emissions, mitigate their environmental

impact, and contribute to a more sustainable future for all.

References:

[Scope 3 Inventory Guidance | US EPA](#)
[What Are Scope 3 Emissions? | IBM](#)
[Scope-3-emissions-guide.pdf \(windows.net\)](#)

Author's profile:

Noof Ahmed Al Kindi, a recent graduate with a Bachelor of Science in Environmental Sciences and Sustainability, started her career as a Sustainability Officer at Abu Dhabi Airports, working towards promoting and implementing sustainable practices.

By Lois Betts, Sustainability Manager & Sally Biddlecombe, Sustainability and Energy Analyst at Bournemouth University



Scope 3 Emissions Reporting Experience

Bournemouth University (BU) were keen to include scope 3 emissions into the 2019 - 2030/31 Carbon Management Plan. Previous versions had focused on scopes 1 and 2, and for the BU's Climate and Ecological Crisis Action Plan we included elements of scope 3 to align with the Greenhouse Gas Protocol's Accounting and Reporting Standard. Scope 3 areas present opportunities for staff and students to make decisions and impact the carbon footprint of the university and give us a wider view of the true environmental impact of BU. Having a full picture of all three scopes helps to show the scale of the problem and most importantly enables us to prioritise and plan what we can do to reduce emissions.

Baseline year 2018/19

The data available to us in 2019 was limited, but we were able to calculate several important scope 3 emission areas we felt represented a large part of our indirect emissions including business travel, water, waste and elements of daily commuting.

This included transport emissions associated with our bus contract known as the UNIBUS. By recording the litres of fuel used, we were able to use this data along with the DEFRA carbon factors for the fuel type to calculate emissions associated with students, staff and the public travelling on our bus network, mainly to get to or between our campuses.

Since 2019, we have reported emissions associated with business travel by air and rail. Business travel bookings go through a central travel management company who supply data such as number of trips booked, miles travelled, and emissions associated with each booking. We have

also published guidance for staff on making more sustainable choices with their travel to help reduce emissions in this area.

Operational and construction waste data is included in our reported scope 3 emissions using the actual tonnage collected from our sector-

leading 'pay-by-weight' waste contract as part of a framework with several other South Coast universities. Reducing overall waste produced and ensuring waste goes in the right bin is an important area where we can engage the students and staff, so that everyone can feel as though they are doing their part.

In order to reduce overall volumes of waste we have introduced schemes to reduce disposable coffee cups and encourage students to refill their water bottles on campus through our status as a 'Refill Campus' with City to Sea.

Emissions associated with water and wastewater are also reported, calculated using manual meter reads and DEFRA carbon factors.

Since our 2018/19 baseline, we have included these scope 3 elements in our emissions reporting annually and seen big changes, mainly due to factors outside of our control. Particularly, the impact of the Covid-19 pandemic on commuting and business travel, and this

BU Bournemouth University

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12 MONTHS GUARANTEE

can be seen on the graph below from our 2022-2023 annual report.

The graph shows our progress to our 50% reduction target and the big changes we have seen in reported scope 3 emissions between 2018/19 and 2022/23. You can read more about our reported emissions in our 22-23 [Annual Progress Report](#).

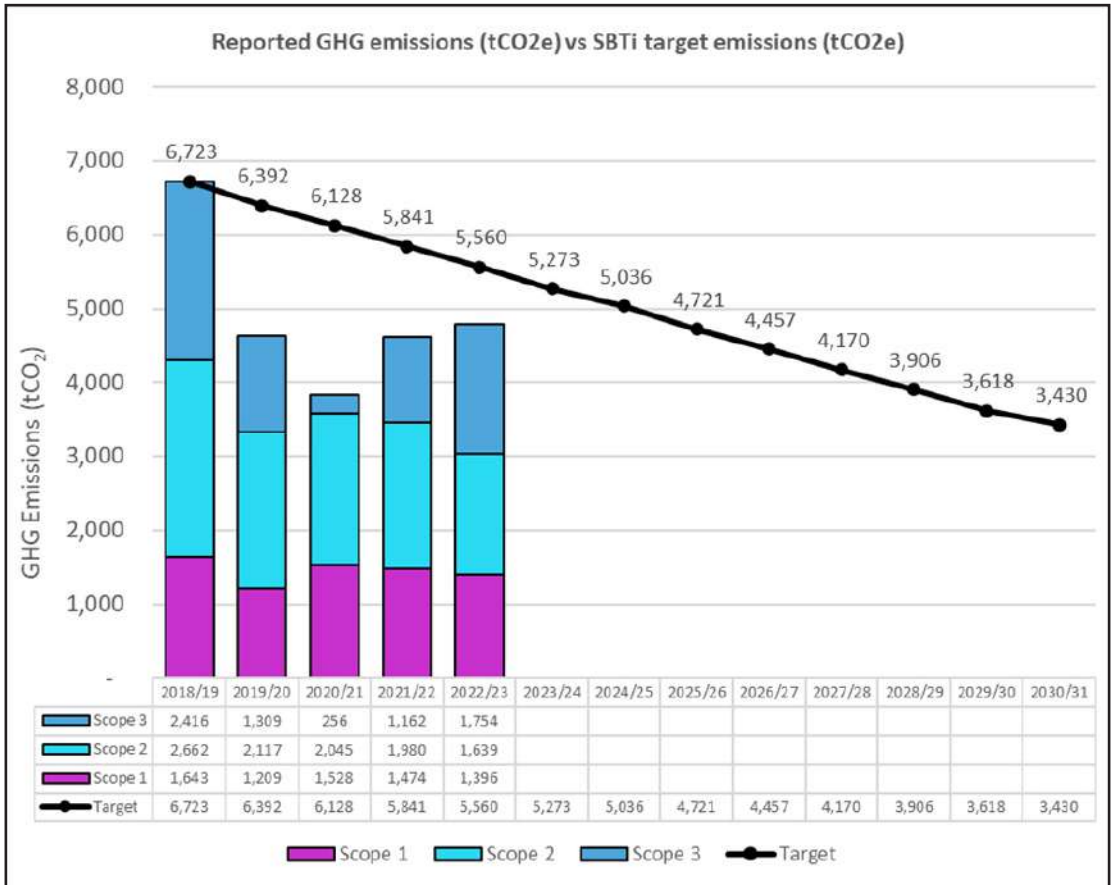
Continuous review

It was always our intention to keep scope 3 under review and in the reporting year 2021-22 we were able to make some improvements to our data by adding in emissions from travel associated with BU open days. This was calculated by collecting postcode data and transport methods from open day participants so that we could multiply the distance travelled by the correct DEFRA carbon factor. We also moved the emissions associated with electricity transmission and distribution into our scope 3 reporting. In order to add these into our reporting, we had to collect the data from every year back to our baseline year of 2018/19 so that our carbon footprint is comparable over time.

In January 2023, new guidance was published for Universities by the EAUC called the [Standardised](#)

[Carbon Emissions Framework \(SCEF\)](#). This identifies three levels of data accuracy for reporting categories of emissions; advanced, intermediate and basic. To ensure continuous improvement of our reporting and to align ourselves with best practice for our sector, we reviewed our data

methods. As the survey collects responses from just a sample of staff and students, the results can then be extrapolated to give estimated emissions for all staff and students across the university. To address commuter emissions, we have made significant progress



collection methods against the new framework and found that our existing reported scope 3 areas met the advanced level.

As a result of the SCEF we are looking to include additional areas in our reporting which currently meet the basic level of data accuracy, which we hadn't been comfortable including before. An example of this is staff and student daily commuting; emissions are based on survey responses from our annual travel surveys which collect data on commuter distances and travel

as part of the university's travel plan, which includes investment in active travel facilities such as showers and changing rooms to support cycling and walking, as well as providing secure cycle facilities and campaigning with local government for improved cycle lanes.

We are also looking to expand the scope of our reported business travel emissions to include those from hire cars and coaches. This would incorporate the road travel of our university sports teams as they travel to fixtures, as well as business travel by staff. Initial

calculations in 2022/23 suggest this accounted for twice the emissions of business travel by rail. We can include this by requesting the annual mileage data from the hire car companies.

Specific to universities is student home travel, which accounts for the trips that students make between their homes and the university over the course of the academic year. This can be split into two sub-groups, international student travel and domestic student travel. Initial calculations estimate that these figures may be almost a quarter of our entire carbon footprint for the 2022/23 year. For these calculations, BU have used the [Domestic and International Student Relocation Travel Emissions Calculator Tool](#) developed by the University of Aberdeen in collaboration with EAUC Scotland. The input for the tool is student home country data, which is collected from our student enrolment

team. Domestic student travel emissions are estimated using the postcodes of UK based students and an assumed number of trips they make between their home and the university each year. This is estimated using the responses collected in the annual student travel survey.

Challenges

The big area we are grappling with is emissions from our supply chain, including purchased goods and services, transport for delivery and capital construction projects. This category represents the largest proportion of our scope

3 emissions by far. This has been calculated for us by our purchasing consortium using standard industry codes and spend data. However, this is a fairly blunt measurement which doesn't account for actual improvements we might make to improve sustainability of our supply chain (for example using a local supplier or encouraging our security contractor to use electric vehicles). If we don't reduce £ spend the carbon footprint won't change unless the whole sector code factor changes. This is an area of research by universities who are working together with external parties to



explore other methods to gather supply chain emissions data.

Finally, there are other areas we are investigating, where we are in the process of gathering data. This includes financial investments and pensions, student accommodation (as most BU accommodation is run by third parties from whom we have requested data), staff homeworking, staff expenses claimed from driving, leased buildings and sold products.

Conclusion

Scope 3 indirect emissions are a large and important part of BU's carbon footprint, where the choices of our students and staff can make

a difference. Travel choices both for business and commuting do make a difference and when scaled together will help reduce fossil fuel emissions. For our supply chain emissions, staff choices can make a big impact but often choosing not to buy or not to travel can be difficult. Working with our suppliers at all stages, from procurement into contract management, represents a big opportunity to reduce emissions from our supply chain, but current reporting methods don't show the results of collaborative efforts just yet. We will continue working with the sector to determine better ways

to collect and report our emissions data and hope to impact all the decision makers across the university to reduce our overall footprint.

Authors' profiles:

Lois leads the Sustainability Team at Bournemouth University where she oversees the delivery of BU's Climate and Ecological Crisis Action Plan to reduce emissions by

50% by 2030/31. Focus for Lois is heat decarbonisation and BU's most recent project is removal of gas in our Business School and replacement with air source heat pumps.

Sally is the Sustainability and Energy Analyst within the Sustainability Team at Bournemouth University. With a background in Mechanical Engineering, Sally is able to address data queries with a logical and technical approach, and works with various stakeholders across the university to bring together multiple aspects of the university's carbon footprint.

The EMA Energy Management Awards celebrate those at the forefront of the energy management and wider sustainability industry and inspire other professionals to follow in the same footsteps



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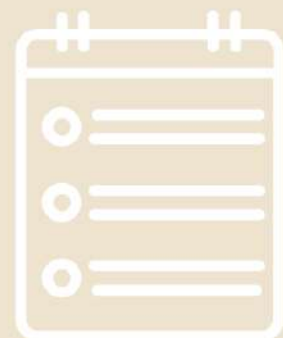
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The 2024 Awards' Categories:

Energy Manager of the Year - Private and Public Sector

We are seeking applications from professionals who have been working in energy management for several years. The entry should reflect the entrant's industry knowledge and experience, their achievements and initiatives to promote energy efficiency, and include overall savings and energy reduction achieved for their organisation. Nominate yourself or a colleague and demonstrate expertise, celebrate wins, and boost visibility in the industry and organisation.

Energy Management Team of the Year - Private and Public Sector

We are seeking applications from teams of two or more people who engage in daily energy management activities for their organisation or clients. The teams should be able to demonstrate clearly defined roles, collaboration between the roles that is beneficial to the performance of the team, development of individuals within the team and successful performance outcomes. Nominate a team to recognise the contributions to the organisation, and celebrate successes and achievements.

Sustainability Manager of the Year - Private and Public Sector

We are seeking applications from professionals who have been working in sustainability for several years. The entry should reflect the entrant's industry knowledge and experience in developing, implementing and monitoring company or organisation's sustainability strategies. Nominate yourself or a colleague and demonstrate expertise, celebrate wins, and raise profile in the industry and within organisations.

Young Energy Management Professional of the Year

We are seeking applications from professionals who have been working in the energy management industry for no longer than three years. The entrants should be able to demonstrate their impact on energy and carbon reduction, and achieved savings at their organisation. Nominate yourself or a colleague and highlight new talent, and showcase the energy management/sustainability industry as a rewarding career option for new and upcoming entrants.

VIEW THE REQUIRED CRITERIA BY REQUESTING A PDF COPY



Net Zero Strategy of the Year

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

Decarbonisation Project of the Year

We are seeking applications on energy, sustainability and/or engineering projects that have been successfully implemented and where achieved savings can be demonstrated. All projects, including but not limited to optimisation, upgrading, replacing or behaviour change, that have been implemented and resulted in a reduction of carbon emissions for the organisation will be accepted. Nominate a decarbonisation project and highlight the organisational effort that is needed for leading a decarbonisation project of any size.

Energy Efficiency Project of the Year

We are seeking applications on energy, sustainability and/or engineering projects that have been successfully implemented and where any achieved energy reduction can be demonstrated. All projects, including but not limited to optimisation, upgrading, replacing or behaviour change, that have been implemented and resulted in an energy reduction for the organisation will be accepted. Nominate an energy efficiency project and celebrate successful implementation and achieved energy reduction and savings.

Organisation of the Year

We are seeking applications from organisations that can demonstrate their commitment to energy and carbon emission reduction through an organisation wide approach and application of core areas of energy management. This category is open to end-user organisations of any size. Nominate your organisation and showcase your organisation's approach to energy management with robust policies, strategies and results in each area.

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ESOS Assessment of the Year - NEW CATEGORY

We are seeking applications on ESOS assessments that were completed in the Phase 3 compliance period, and where tailored information on cost-effective ways to reduce energy use were prepared and provided to comply with ESOS. Nominate your organisation and partners and celebrate a delivery of a complex work that supports an organisation in regulatory compliance and in adopting measures to save energy.

Energy Management Consultancy Partnership of the Year

We are seeking applications from in-house teams and service providers about collaborative partnerships of two or more parties that can demonstrate the benefits of delivering energy management in a partnership. Nominate your organisation and partners and highlight your joint achievements which would not be possible without the partnership in place.



SUBMIT BY
26 SEPTEMBER
(extended deadline)

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Motivating Stakeholders to Support Energy Management Practices

Motivating stakeholders to support energy management practices is crucial in achieving set goals and efficient energy usage within organisations. The importance of keeping stakeholders engaged and informed about energy-efficient practices, setting clear goals, regular updates on progress, and offering incentives for participation is not lost on any energy management professional. This article offers perspectives from two energy management professionals on how they engage with stakeholders to promote the adoption of these practices for long-term success and positive impact.

**Kevin Grant,
Director at
encompass
safety
solutions
Ltd and
Global
HS&E &
ESG Lead at Process Sensing
Technologies Ltd**



Energy management is crucial for organisations striving to minimise their environmental footprint, reduce costs and enhance their reputation. In my experience, by fostering a shared understanding of the benefits and opportunities associated with energy efficiency, organisations can garner widespread support and participation.

Picture the scene; you've worked on your energy management strategy for weeks, maybe even months. You've completed the initial research, the engagement with potential suppliers and contractors, gathered the costings, the facts, the data, assessed the timelines and, of course, reviewed the project proposals. You've negotiated hard, been ruthless, and your shortlist is ready. Now all you need to do is

present to the Board and convince them that your million-pound plans are the best plans, and the ones needed to guarantee future sustainability and take the business into its next phase of stratospheric growth.

Of course, this isn't always the case. Energy management plans and practices needn't cost a million pounds, and often they don't. But, whether it's the proverbial acorns or the oak trees, there is always a group of people who will need convincing – stakeholders.

Before implementing energy management practices, it's essential to understand the various stakeholders within the organisation and their motivations. Stakeholders perform roles at all levels throughout an organisation and they can be internal or external to your organisation. It can be a Boardroom full of C-suite executives whose support you need to spend millions on a huge new solar park project, it could be shop-floor staff whose support you need to make correct use of the new recycling bins you've bought, so that the

volumes of general waste decrease. It could even be the local planning department whose support you need to realise the benefits of erecting that new wind turbine on your land in the face of the NIMBY (Not In My Back Yard) crowd who just don't like the look of it. Whoever the stakeholders are, understanding the diversity of their interests, concerns and motivations so that their vision becomes aligned with yours, is critically important. Let's look at these stakeholders in a little more detail, together with a summary of their responsibilities and level of involvement in energy management practices:

1. Investors, Boards and C-suite

Arguably, they are ultimately responsible for determining whether energy plans and practices are given the green light to be signed-off and implemented. Historically, this is where energy plans meet their doom, but as more and more evidence is available to back up energy plans in terms of the clear ROI linked to any initial investment, these stakeholders are becoming wiser to the positive impacts energy investment can have.

2. Senior Management

Responsible for strategic decision-making and resource allocation. Convincing these stakeholders can be assured by having thorough business cases in place, with no stones left unturned and clear, evidence-based details on why your plan is the right plan to invest in. Consider yourself in front of a panel on Energy Dragons Den! You'll need to convince them all to invest in you and your strategies! Your plans can then be summarised by Senior Management and escalated to the Board.

3. Department Heads and Managers

More than likely, the people who are writing the energy strategy, plans and practices will sit in this group, unless they are senior managers. Nevertheless, assistance will be needed to implement energy policies, procedures and practices within the various other departments across an organisation. The full buy-in will be needed from these stakeholders

who, in turn, will be cascading the information to their teams. If energy plans are not accepted and received well at this level of stakeholders, you can guarantee that these same behaviours will be displayed at a subordinate level.

4. Employees

Frontline workers often have a direct impact on energy consumption through their actions, and it is often these stakeholders who increasingly demand improved energy

practices from their employers. As information becomes freely available, employees want to see investment in energy and witness the associated improvements across an organisation. The tangible effects of satisfying this stakeholder group is that talent stays longer, meaning less money is spent on recruitment, and improved talent is attracted to fill vacant roles, therefore increasing the performance of the organisation.

5. Customers and Clients

External stakeholder groups, such as customers and clients, can often drive change within an organisation – for reasons both good and bad.



I've experienced organisations that have had a client for over thirty years suddenly be told that unless they successfully implemented a formal EMS (it was ISO14001:2015 in this instance), all ties will be severed, and the client will look elsewhere for an alternative supplier. I have also experienced clients working with organisations to implement improvements to energy performance, as it will be mutually beneficial to both parties – not just ticks in boxes.

6. Suppliers and Partners

Stakeholders at this level can play a vital role in the supply chain and may even collaborate on energy-saving initiatives. As the regulatory landscape for reporting data, ESOS and SECR for example, matures; supply chain and other partners can assist in the provision of valuable data – scope 3 emissions. For example, so that this data can be added to energy plans to reinforce them, answer any questions that may be raised and, ideally, get them signed off at the first attempt. Going forward, initial data used to benchmark an organisation can be scrutinised, year-on-year, to evidence that improvements have been achieved.

7. Regulatory Bodies

Industry regulatory bodies set the standards and regulations related to energy usage and sustainability. These standards are usually unequivocal and can help drive energy plans and investments through at board-level. For example, if the energy performance of an organisation shows

that it will not meet regulatory requirements unless investments in infrastructure are implemented. Additionally, bodies such as local planning departments may play an active role in recommending elements of energy plans. Only recently, I have been involved in a planning application that included increases in the number of EV charge points at a location in East Cambridgeshire, whereby the local planning department recommended doubling the

existing number of EV charge points from 6 to 12 (they also recommended doubling the cycle racks from 20 to 40!). Whilst there is a legislative requirement to do so, satisfying stakeholders such as the local council/planning department may see energy plans that involve planning applications successfully expedited.

Once all of the various stakeholders potentially involved in energy plans are thoroughly understood, a robust approach that considers some, or all of the following points can help to get them onside and supportive of your plans.

Raise awareness through education:

Begin by educating stakeholders about the importance of energy management practices. Be careful not to lecture them but highlight the numerous and diverse benefits to the organisation, the environment and the societal benefits too. It's important to use verifiable data and case studies to illustrate any potential cost savings, reduced environmental impacts and improved corporate reputation associated with effective energy management.

Set clear targets and objectives:

Establishing specific, measurable, achievable, relevant and time-bound (SMART) energy management targets & objectives, and ensuring that they clearly align with the organisation's overall strategic objectives and priorities is critical. Specifically when looking to establish support from the

higher echelons of an organisation, including investors.

Offer training and resources:

Formal training courses and other resources, such as e-learning and workshops can help to equip employees with the knowledge and skills necessary to implement energy-saving practices, and perhaps more importantly understand why the practices have been implemented. Providing additional resources such as best practice toolkits, guidelines, industry benchmarking data to support stakeholders in adopting energy-efficient behaviours and technologies.



Provide incentives and recognition:

Implement incentive programs to reward individuals or departments that achieve energy savings or contribute innovative ideas for energy conservation. Incentives don't always need to be financial. The recognition and celebration of achievements of individuals or teams through certificates, awards or internal communications is often more impactful than money.

Empower employees through engagement:

Empowering employees, at all levels,

to take ownership of energy-saving initiatives within their respective areas of responsibility can be hugely productive in engaging them to offer their input, ideas, feedback and managing the improvements in energy efficiency. Encourage active participation and involvement from employees at all levels by soliciting their input, feedback, and ideas for improving energy efficiency.

Leadership by example:

Ensure visible, demonstrable leadership and commitment from senior management by integrating energy management into the organisation's strategic vision and goals. Lead by example by demonstrating energy-saving

behaviours and championing sustainability initiatives.

Collaborate and communicate:

Facilitate cross-functional collaboration and communication among departments, teams and stakeholders to

share knowledge, best practices and lessons learned. Establish regular channels for feedback and dialogue to address concerns, overcome challenges and drive continuous improvement in energy management.

Track progress and report results:

Implement a robust monitoring and reporting system to track energy consumption, savings and performance against targets. Share progress updates and results with stakeholders regularly to maintain transparency and accountability.

Tailor the messages to different

stakeholder groups:

This doesn't mean to fabricate any truths! It simply means that different elements of your energy plans and processes may mean different things to different people. The installation cost of a 30-meter wind turbine is irrelevant to someone who simply doesn't want to see it from their back window! Recognising that different stakeholder groups will have varying priorities and motivations will allow for messaging to be fine-tuned. This tailoring of communication and messages should resonate with the specific interests and concerns of each group.

Make continual improvements and adaptations:

Solicit feedback from stakeholders on the effectiveness of energy management practices and initiatives. Continuously evaluate and refine strategies based on lessons learned and changing organisational dynamics.

By implementing these strategies, organisations can effectively motivate stakeholders at all levels to support energy management plans and practices, and foster a culture of sustainability and efficiency.

Author's profile:

Kevin is a high performing and results-orientated H&S, ESG & Sustainability Management professional with a passion for the industry and a hands-on, pragmatic approach to problem solving to provide stakeholder-focused results. A skilled man-manager with an entrepreneurial attitude, always determined to succeed and be a driver of success in others.

Austin Langan AMEI, Energy Manager at VIVID



This year marks my fifth working in the social housing sector, four of those within energy management, and 2024 sees energy management and the greater sustainability piece, riding upon the crest of a wave.

Many councils in England have declared a climate emergency, the Government has set targets for the

action was being taken to reduce consumption and lower bills. With the Russia-Ukraine conflict driving prices even higher the need to reduce consumption became more evident and the need greater. However, the inflation we have endured has blown budget forecasts out of the water, leading businesses to seek savings across the board. This, coupled with the stabilisation of energy prices, means the case for investment becomes harder.

So, how do you motivate and engage with stakeholders?

Case study: Replacement of landlord meters

VIVID is a leading provider of social housing in the south of England with 35,000 homes. We currently have around 1,500 landlord electricity meters. As part of the Government's drive to smart metering, our electricity supplier is required to replace our older, analogue meters.

Initially, they were treating these supplies as they would a domestic setting, sending letters to "The Landlord meter", which led to multiple letters to our customers directly and a flurry of calls to our customer experience team worried whether these were genuine.

Contacting the supplier to halt this proved challenging, our priority was getting meters installed and minimise the disruption to our customers, and save them any confusion. Eventually, with the help of our account manager at our energy broker, we were able to get in touch with the commercial meter



housing and transport sectors to achieve net zero carbon, backed by grants, and social housing providers have responded positively to this.

So, with this, plus rising energy costs, greater scrutiny from customers and the obligations of the Energy Act looming large, it should be easy to sign off on any change you want to make, right? Post Covid demand saw rises in energy prices, while several energy suppliers, such as Bulb, went out of business. This in turn led to more scrutiny from stakeholders, both internal and external, about how we procure and use energy and what

team. Learning we had nearly 1,000 meters earmarked for replacement, and they were keen to commence with a programme to install en mass.

On the face of it, this was a win for us. It was completely free and would give us better monitoring of our homes' energy usage. However, the age and diversity of our housing stock, coupled with the detailed information required by the energy supplier prior to installations being booked, meant that time and resource from across the business would be needed to ensure things went smoothly and effectively.

There is never going to be a good time to add more work to your colleagues, but approaching year end was always going to be a challenge, but one of our company values is 'work as one team', something I am pleased to say embodies my colleagues across the business. To deliver this project required assistance from our customer service team, neighbourhoods team, estates team, independent living team, and finally, our energy and sustainability team.

Task 1 – Identify the stakeholders

We identified the key stakeholders in each team and spoke to them on an informal basis, to sound them out and understand any objections they may have or issues that this project make cause for them. Having a quick, 5 minute face to face chat over a coffee was incredibly effective and reduced the need for more formal online meetings.

Task 2 – Short term pain = long term gain

In these conversations, it was vital to listen - really listen - to the concerns raised by each team to understand the impact this project would have upon them. It was also vital to

demonstrate to them how it would benefit their teams personally in the long term, e.g., not having to send neighbourhood officers out to read meters each month, fewer complaints about higher bills based on estimates, etc.

Task 3 – Link back to the business' ambitions

By showing how this project would support the ambitions of the business, it strengthened the case for the project to go ahead. This project helped to improve the accuracy of billing, thereby eliminating the high estimated bills we were receiving, in turn reducing cost to customers, and therefore higher satisfaction levels and lower incoming customer calls.

Task 4 – Think big but start small

We were pleasantly surprised by the scale of ambition of our supplier's plan to replace hundreds of meters a week. However, committing to such large numbers came with risk, so we started with a small pilot of just 10, leading to another pilot of 50 installs in a week. By taking small, incremental steps, we were able to see what worked well and what didn't. We made subtle changes and used the feedback to make improvements to the next pilot.

Task 5 – Monitoring, listening, improving

As we now move out of the pilot phase and into larger scale delivery, it is important to keep checking in with each stakeholder to ensure things are still on track and note anything that has changed, e.g., is the estate operative who gives access to certain blocks on holiday? Is communication between the contractors and on-site staff still good? Have these activities resulted in more calls

into the customer service team? By continually checking in with all our stakeholders, we avoided small issues becoming larger ones and were able to make small 'course adjustments' rather than drastic changes. This project has been a great opportunity to communicate with our customers, informing them of what we were doing and highlighting how it would positively impact on them by improving our service charge accuracy.

Task 6 – Show your appreciation

Lastly, it's a simple and effortless thing to say thank you, but always important and appreciated. A little goes a long way. Passing on your thanks to everyone involved and making sure they understand how their involvement has positively impacted on the project and the wider ambitions of the business.

In summary :

1. Know your audience;
2. Make sure you understand the impact of your projects on your stakeholders;
3. Make sure they understand the benefits to them and the business as a whole;
4. Prove the concept with pilots;
5. Use regular communication with stakeholders to affect small course adjustments;
6. Show your appreciation for everyone's efforts.

Author's profile:

Austin has worked within housing over the course of 30 years, starting in the private new build and second-hand residential sale sector. Within his role at VIVID, the key focus is about improving how the business operates their heat networks, overseeing commercial energy procurement, consistently looking at ways to improve heat network efficiency to reduce CO₂ emissions and reduce customers' energy costs.

By Parthena (Nopi) Exizidou, Head of Net Zero Transition at the British Antarctic Survey



Retrofitting vs Building New in a Net Zero World

The buildings sector represents 40% of Europe's energy demand. Positively the sector's intensity in carbon emissions per metre squared has dropped, and investments in building energy efficiency have gone up; however, growth is outpacing efforts (UNEP, 2022). In the UK, construction, demolition and excavation account for 60% of material use and waste generation. This calls for urgent action and a fundamental shift in the way we are designing and delivering building projects, challenging current construction practices and the extensive use of natural resources.

To get to net zero, radical reductions in carbon emissions from the building sector need to be achieved; we simply cannot afford to continue the pace of demolishing and building new. A circular economy system, where materials never become waste and nature is regenerated, offers huge opportunities to minimise impact and protect our natural resources.

The decision between retrofitting or building new is not always an easy one and can be quite challenging to reach. Building owners and professionals in the building sector will need to consider several different parameters to help them in the decision-making process:

1. Structural integrity

First and foremost, the structural integrity of the existing building needs to be reviewed. To ensure a retrofit is feasible, confidence needs to be gained that the structure of the building is sound and will support a deep retrofit and an extension of the building's lifespan. However, even in cases

when the structural integrity has been compromised, there may be solutions to consider, such as underpinning to strengthen foundations and other remedial actions; and therefore, retrofit shouldn't be discarded too soon.

2. Operational energy

Questions like, "How low is low energy demand for a retrofitted building?", "How does this compare to a new build?" and "What does best practice look like?" will need to be addressed.

There are building standards and guidelines such as [EnerPhit](#) for deep retrofitting and [LETI/RIBA 2030](#) to support climate emergency design and ensure very low energy demands and high thermal comfort levels for building occupants. For example, a new building built under the Passivhaus standard can achieve 15 kWh/(m²a) for heating while a retrofitted building under the EnerPhit standard can achieve 20 kWh/(m²a).

The reason for this difference is because some building elements

such as the orientation of the building, structural characteristics and thermal bridges cannot be changed in a retrofit project. However, energy demands can still be minimised and performance levels can be very close for both options.

Thermal performance of the building envelope is only one element affecting operational energy. Heat decarbonisation is high on the agenda for many building owners. The strategic approach would be to tackle both thermal performance and heat decarbonisation together. Significantly reducing energy demands will ensure a smooth transition from traditional fossil fuel-based heating systems to electrified low carbon/renewable systems. This is also an opportunity to think long-term regarding the adaptation of buildings to a changing climate and the continuously increasing cooling energy demands in the UK.

3. Carbon

Carbon emissions resulting from

the operational energy use is only one part that needs to be considered. When addressing the carbon impact as part of the decision-making process, it is important to look at the whole life carbon of the different options. That will include “cradle to gate” embodied carbon which refers to the emissions associated with the production of building materials, from raw material extraction to the manufacturing, transportation and end of life emissions. A whole life carbon (WLC) assessment such as the one under RICS Professional Standard should be followed.

4. Lifespan and adaptation

In most cases, building owners need to take a decision regarding the future of a building when the building is close to the end of its life or when there is considerable investment needed to rectify issues. The extended lifespan is another important decision-making criterion to be considered when compared to the lifespan of a newbuild. In addition, adaptation to climate change needs to be considered for both options.

5. Internal layouts and size

Since its construction, the way the building is used has likely dramatically changed. The reasons vary from a growing business that needs more space for staff and collaborators, to the reduced space demand because of hybrid and remote working, to new ways of collaborative working requiring more open plan than cellular offices. Both options of retrofitting and building new need to be fit for purpose and fit for the future.

For retrofitted options, changing internal layouts can be challenging and some compromises might need to be made. This can also impact the new standards regarding floor to ceiling height that might need some creative thinking to improve internal space conditions. Exposing services on the ceiling is one way of addressing this, when floor to ceiling height is lower than aspired, which will give a more industrial look to the space. Great example of a retrofitted building that adopted such an approach is the Entopia building of the Cambridge Institute for Sustainability Leadership.



6. Maintenance

Maintenance requirements both day-to-day and longer term is another parameter to consider for both options when choosing materials and building systems. With an ever-growing demand on new skills and the market adapting at a slower pace, the skills gap is growing fast. A durable design will therefore lead to improved resilience and a longer lasting asset.

7. Circular economy

Adopting circular economy principles, irrespective of the decision, will ensure responsible

sourcing of materials, minimising waste that can lead to reduced long-term costs, designing for adaptation and disassembly; while retaining the materials' value to allow them to be reused.

More and more tools are now being developed to help designers integrate circularity in projects; from measuring the circularity of your design, working out the percentage of recycled content in materials and products, testing various material options to identify where savings can be made as well as different scenarios for reducing the end-of-life impact.

Another area to apply circular economy principles is when choosing furniture for your space; from the use of repurposed furniture giving them another life, to incorporating modular elements and designing for disassembly and life extension.

For newbuild options, a survey to identify opportunities for

materials to be recovered and reused in the new structure needs to be planned early on.

Gaining traction in this space, platforms for circular management, reuse of building materials, fixtures and furniture, refurbishing and renting office furniture as well as software and tools to help incorporate circular economy and wider sustainability into the design process can be found under the UK Green Building Council Solutions.

8. Decanting and disruption

Decanting and minimising disruption is another parameter

to review for both options. Strategies for alternative temporary accommodation and phasing of the project, while construction activities are taking place, can minimise disruption and impact to operations but they could also have a significant impact on the overall cost of the project.

9. Cost

No doubt cost is an important factor when the two options are being considered. Whole life carbon needs to be assessed along with whole life costs to support decision making.

The weighted factors against the above criteria may vary between different decision-makers. However, it's important that any decision is backed by a thorough feasibility analysis that has considered all the above.

In both cases, a sustainability strategy needs to be developed with strong ambitious targets very early on to guide decision-makers and ensure sustainability is embedded into all work stages of the project.

For inspiration, **best practice and award-winning examples of retrofit projects** include the 1930's telephone exchange [Entopia building](#) that now hosts Cambridge Institute for Sustainability Leadership. Entopia has achieved BREEAM Outstanding, the Passivhaus 'EnerPHit' standard, and WELL (Gold) and is expected to reduce whole life carbon emissions by 80% across the building's assumed 100-year lifespan, compared to a standard office refurbishment. [Park Hill Phase 2](#), a refurbishment with increased fabric efficiency of an iconic Grade II Listed estate in Sheffield

is designed to deliver an 87% reduction in operational emissions and a 55% improvement in whole life embodied carbon compared to a good practice new build.

For **best practice new build**, the [Forge](#) is the first commercial building designed in line with the UK Green Building Council's definition of net zero and the first office to be built using the highly sustainable platform approach to design for manufacture and assembly (P-DfMA). The [Enterprise Centre](#) at the University of East Anglia achieved Passivhaus and BREEAM Outstanding and reduced embodied carbon by 65% compared to a conventional higher education building at the time by



using reclaimed/recycled and local materials.

Author's profile:

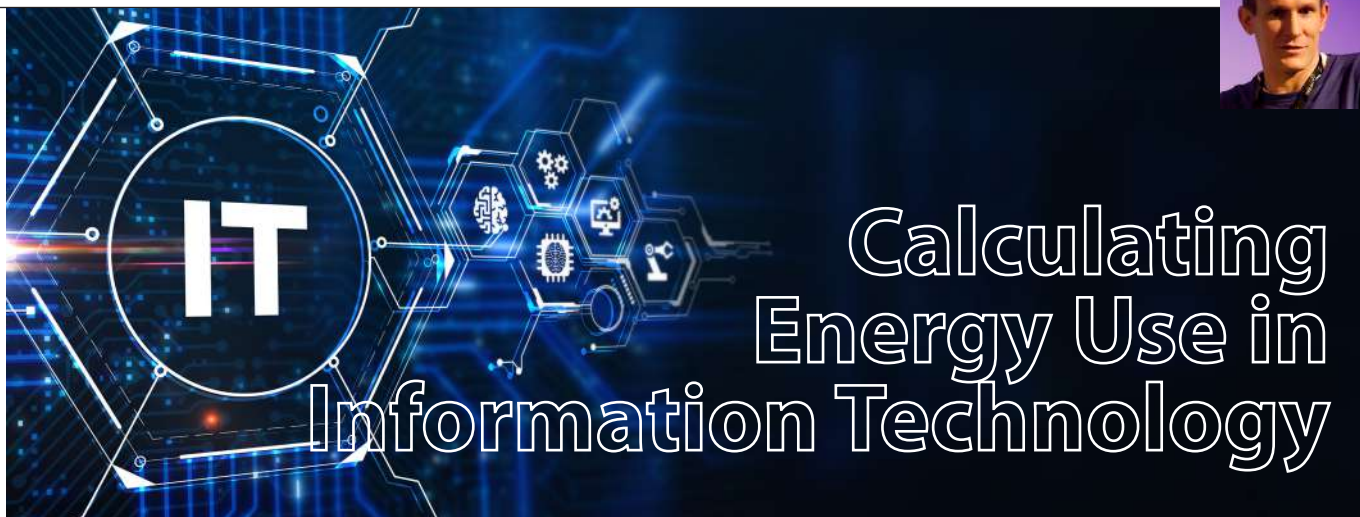
Nopi is an engineer by background with more than 15 years of experience in sustainability. At BAS, she is responsible for the strategic delivery of the net zero programme and leads the Net Zero Team. Her special focus is decarbonising the BAS infrastructure, transport and logistics, and supply chain activities in Cambridge and Antarctica. Nopi is a member of the EMA Steering Group.

The **Enterprise Centre** is an innovative dual purpose teaching building and business hub. At the time of completion, it was the largest Passivhaus building in the UK and its design has gone on to confirm other Passivhaus major scale buildings. Constructed from materials such as timber, local thatch and reclaimed materials, it was completed in 2015. The average energy consumption in the first three years was lower than initially predicted and has remained consistent over the nine years since completion. This is evidenced by consistently achieving an energy certificate rating of DEC A annually.

A full life-cycle analysis study was completed during construction of the building, with an annual prediction of

446 kgCO₂e/m² emissions over the 100-year cycle, for which the building was designed. That figure is approximately 20% of a conventional university building. In 2021, the embodied carbon methodology and modelling were revisited to incorporate advancements in the field and ensure accuracy of the figures. Although the building was designed in 2012-2013 and completed in 2015, it does meet the 2030 RIBA and LETI targets, including biogenic storage.

In terms of practical and demonstrable achievements, the building's primary energy demand is less than 47 kWh/m annually and airtightness is under 0.21 ach/h @50 Pa. Annual energy consumption figures compare positively even against the University's next most sustainable building, which has an energy demand of 102 kWh/m annually. The excellent energy efficiency of the building means that utility bills are 90% less than a comparable building, with photovoltaic roof tiles providing 23% of the building's energy demand.



Calculating Energy Use in Information Technology

Changes within Information Technology

The past 50 years have seen significant changes in Information Technology (IT). Mainframe computers of the 1970s were typically large enough to fill a room, but by the 1980s, we had entered the age of personal computing. Computers had come down in both the size and cost, and were starting to appear in people's homes as well as their businesses. Through the 90s, computers continued to get smaller and more affordable, with internet connected laptops becoming common place. Since the turn of the millennium, the speed at which IT has developed has been unprecedented. Today's devices no longer need to be plugged into computers to connect to the internet, with technologies like GPRS, Wi-Fi and Bluetooth, making IT ubiquitous in every walk of life, whether it's the offices we work in, the cars we drive, phones in our hands, the shopping we have delivered and even the waste we dispose of. Tech is everywhere.

IT and the Global Demand for Energy

It has been estimated that IT accounted for between 4 and 6 percent of all electricity use in 2020.

As far back as 1965, Gordon Moore (co-founder of Intel) predicted that the number of transistors that could

fit on an integrated circuit board would double every two years. This rule of thumb, known as Moore's Law still holds true today, computers have become capable of processing twice as quickly every 18-24 months.

Despite computers becoming more efficient, global demand for energy from the IT sector has been growing steadily over the past few decades. This may be due to another rule, known as Jevons Paradox, which states that the more efficient technology becomes, the more affordable it will be, and the more demand there will be for it. Somewhat surprisingly, English economist William Stanley Jevons came up with his paradox in 1865, exactly 100 years before Moore came up with his Law.

Energy Use within IT

Studies suggest that user devices consume more energy than networks and data centres combined, with one study attributing 60% of electrical consumption to user devices.

Communication networks used to connect devices and transfer data, including wired, wireless and mobile networks are thought to account for 20-25% of the energy used within the IT sector.

The remaining portion of the energy usage in the IT sector is attributable to data centres. Research by the International Energy Agency (IEA)

report that data centre energy use accounted for about 1% of global electricity demand in 2020. Cooling in particular accounts for a large proportion of this use. A typical data centre can consume up to 100 times more energy than a standard office building of the same size.

The Challenges of Calculating the Energy Used by IT

Challenge 1 – Definition

Possibly the greatest challenge faced when attempting to calculate the energy used by our IT systems is defining exactly what we mean by our IT systems. We could think of IT as simply our computers, servers, desktops and laptops. However, then we have mobile devices, tablets and mobiles, and what about - printers, copiers, scanners, cameras, projectors, disk drives, and the vast array of sensors we use to collect data.

Challenge 2 – Performance data inconsistency

The next problem is that in much the same way that our mobile phone batteries run down more quickly the more we use them, other IT devices also use more power the more processing they are performing. So, we can't simply take a figure for how much power a device uses per hour and multiply it by the number of hours the device is likely to be used. We also need to factor in how heavily the device will be used or work out

some way to estimate the average.

Challenge 3 - Data storage location and management

Another problem comes from the use of hosted services like online data storage, back-ups or social media. The energy use will not only vary with the volume of use, but it will also vary depending on where these services are located and how they are operated, which is beyond our control.

Challenge 4 - Users

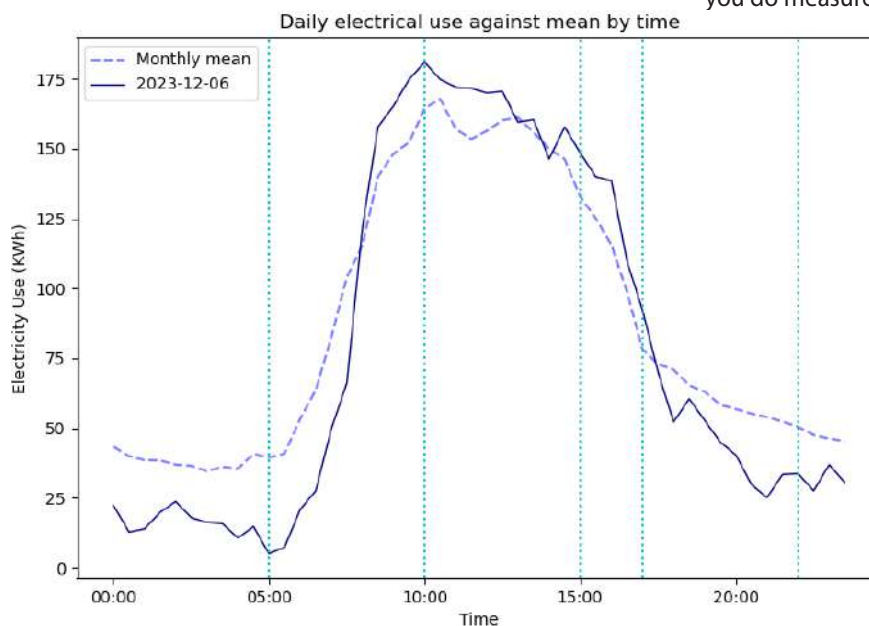
The final problem that I'd like to consider is that of flexible working. These days it's becoming increasingly common for staff to want to choose where and how they work. Some will want to work from the office, some will want to work from home, some staff will prefer to work on a company desktop computer, others will want to use a laptop, tablet or even a mobile phone, while others still will want to use their own devices. This adds additional levels of complexity to trying to calculate energy use as you will have to come up with a way of understanding this mix of different use patterns before you begin.

Ways of Measuring Energy Use within your IT Environment

The amount of power used by IT devices will vary based, not only on the type of device, but also on factors such as the efficiency of that particular make and model of the device, whether the device is running or in standby, or whether any form of power saving mode is enabled. It will

also vary depending on the level and type of activity. For example, whether a computer is accessing data from a disk drive or processing calculations, and whether a printer is an ink jet or a laser printer, printing 70 pages a minute or 1 an hour. The best way to understand the energy use of your own organisation is to measure it, this will give you real data relating to your actual usage.

There are a number of ways with which you can physically measure the electricity use by IT equipment using meters. If you have your own data centre, with its own electric supply, then you could use half hourly data from an Automated Meter Reading (AMR) meter. If you have an on-premise server room with a dedicated electrical circuit, then you could use a sub-meter in the Distribution Board (DB) to monitor power usage.



The diagram above shows a typical usage profile based on ½ hourly AMR readings. This gives a good indication of how much energy your devices are using and how that varies during the day. In this diagram, I have compared a single day with the mean values at each time, demonstrating how typical usage in the day shown.

Portable Data Loggers are another

great way to capture power use. Data loggers typically clip to the outside of a mains cable and use very accurate sensors to record electricity used, which can then be downloaded and analysed. One of the key advantages of this type of metering is that it's cheap and easy to install. Over a period of time you could move the data loggers around, capturing use across your whole site to identify areas of the highest use.

On a more granular level, if you want to understand how much electricity a device is using, for example a server, a copier or a network switch, then installing something like a simple in-line socket meter may be a viable option. This would allow you to measure how much energy the device uses per hour, day or week.

It's important to remember that if you do measure your data using a

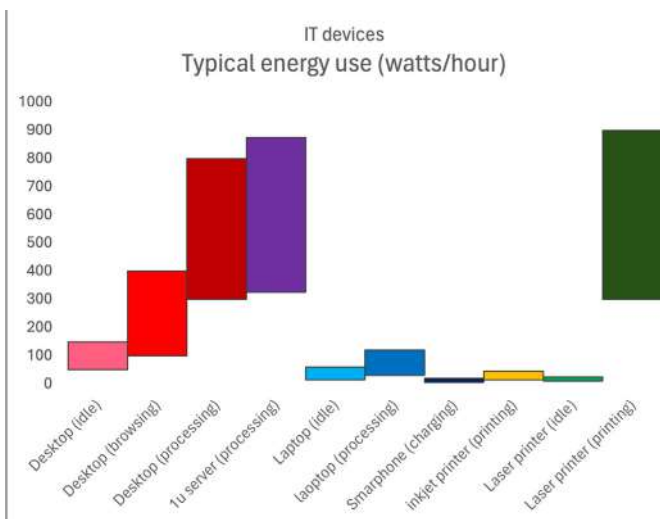
meter, this data will only give you a snapshot of the power used at the time you measured it. If you want a deeper understanding of your energy use relating to IT equipment, continually measuring your use and monitoring those readings is essential.

Ways of Estimating the Use of Energy within your IT Environment

It may not always be possible or practical to measure the energy used by devices, in which case you may need to estimate usage. Based for example on the number of users or devices you have, the average hours the devices are used for and the average energy used by the device. If

you are calculating the overall energy used by your organisation, one way to do this is to create a spreadsheet, listing all of the possible uses of energy in the rows and listing the number of devices, the average hours the devices are used and the average hourly energy used by each device in the columns to calculate the total energy use.

You can usually find data about the power used by a device included in the technical specifications, listed on manufacturers website. There are also a number of websites that publish the results of standard power usage tests, so that you can compare power use across a range of devices.



If you are producing a business case for investing in new technologies, it's good practice to estimate the different power usages for each proposed IT solution when calculating Return on Investment and payback periods.

Carbon Emissions Relating to IT

Because the renewable energy component of the energy mix is increasing, and the vast majority of the energy used within IT is electrical energy, carbon emission relating to IT are generally falling.

When we think about the total carbon emissions associated with IT, we also need to consider the embodied

energy, that is to say, the carbon emissions that go into manufacturing, transportation, maintenance and disposal of the IT assets we are using.

Studies estimated that embedded emissions make up around 20%-30% of the IT sector's total carbon emissions. For user devices, the embodied emissions account for an even larger proportion of overall emissions, estimated at around 50%. This is partly due to the comparatively short lifetimes of hardware use.

Reducing Energy Use within your IT Environment

To a large extent changing the behaviour of the user sitting in front of the keyboard will have a higher

impact on energy used than any changes you make to the device itself. Ensuring that staff get the right training and fostering a culture of good practice is essential to reducing energy use.

If we are looking at overall energy use, including embedded energy, then extending the working life of user devices by installing additional RAM, larger disk drives or faster processors may be a viable option.

If the life of assets can't be extended then we need to ensure that whenever we purchase new IT equipment, whether that's servers, laptops or monitors we consider the energy rating of that equipment. If we consider overall energy saving for the whole organisation, even if we are able only to replace a device with a new device that is one energy rating higher, the savings may be significant over the lifetime of those assets.

Finally, looking at power profiles, scheduling devices to go into a standby mode after a period of inactivity wherever possible may be another easy win.

Drawing Some Conclusions

When it comes to quantifying energy used by our IT systems, in the majority of cases, it's going to be a best estimate, based on a large number of complex variables.

While there are a variety of ways in which we can reduce operating energy, these choices are far from simple as reductions in operating energy may well be at the cost of embedded energy. IT managers may also be faced with a difficult choice between energy savings and performance decreases.

Even if we could accurately estimate the energy used by our IT assets, these estimates are likely to very quickly become unrepresentative, due to the rate of change in technology.

It's likely that over the next decade, the majority of growth in demand for energy will come from the growing processing requirements of the machine learning and artificial intelligence. But it's also entirely possible that the level of energy used within the sector will decrease, due to advancements in electrical efficiency created by these new technologies.

Author's profile:

David is passionate about Energy, Decarbonisation and Sustainability. Although relatively new to his role in Energy Management within the NHS, he has 20 years of experience working in IT, having headed up the IT Team at Baltic Centre for Contemporary Art in Gateshead. Working closely with the facilities team at Baltic, David used data analysis to support system optimisation, leading to a 50% reduction in energy consumption and associated carbon emissions over 5 years.



The Future is Here... with UrbanChain

UrbanChain are now scaling at pace and preparing for European and international expansion.

Who are UrbanChain?

Put simply, they help people who generate renewable energy sell it directly to people who want it. A company behind the leading peer-to-peer (P2P) energy exchange in the UK.

Backed by leading European investment group Eurazeo, managing €35.4bn in diversified assets, UrbanChain work with all kinds of organisations, local government, generators of renewable energy, universities, data centres, office buildings, industrial sites, energy suppliers, housing associations and more. All trade within a regulated platform, which is blockchain backed and powered by AI.

Cutting out volatile wholesale markets and big energy suppliers

UrbanChain's energy exchange cuts out the big energy suppliers and volatile wholesale markets, and connects buyers and sellers directly. Clean energy flows from where it's produced to where it's needed.

UrbanChain's peer-to-peer technology keeps things running smoothly. Energy users get traceable renewable power, not brown power with a green certificate. Producers sell at a fair price directly to people who use it. Ultimately, buying energy through the peer-to-peer system is clean, traceable and predictable.

Social responsibility

CEO Somayeh Taheri's mission, founding UrbanChain in 2017, was to

'alleviate fuel poverty and fix a broken inefficient energy market model', and the social responsibility values haven't wavered. "During my PhD research, I realised that the wholesale energy market fails to serve so many people and businesses, especially the disadvantaged," she said. "It's actually contributing to fuel poverty across the country, and I want to do something about that."

Energy supply licence granted

Having disrupted the market, the company reached a major milestone just a few months ago. Ofgem granted UrbanChain an electricity supply licence. This means they can offer customers better products while giving renewable generators more control.



UrbanChain are poised to launch new products and new methods - it's a new era. More importantly, this next step will help secure an even stronger service for energy demand customers. It'll enable granular ESG tracking alongside real traceable renewable energy. As a regulated energy supplier, UrbanChain now have full control of the peer-to-

"The energy exchange that cuts out the big energy suppliers and volatile wholesale markets, and connects buyers and sellers directly."

peer matching process. That means renewable generators have much more choice, control and security over the customers they supply. And with more transparent data flows, the company can roll out new products, ensuring generators have true choice in where their generation goes.

Major moves

In September 2024, UrbanChain moved across Manchester Science Park to BASE, a 91,000 sq ft new home for businesses working in the Industry 4.0 sectors. The company, also

backed by the Department for Energy Security & Net Zero and Innovate UK, is now gearing up for a Series B funding round, to support their UK and international growth strategy. With a team rapidly growing beyond 50 people, the new headquarters will help UrbanChain recruit the talent they need to match their ambitions. By 2030, the global energy management systems market is expected to grow at a compound annual

growth rate of 13.3% to reach USD 111.86 billion. Coupled with the increased use of renewables, energy consumption efficiency measures are coming to the fore faster than ever.

The future of energy management is bright. With UrbanChain, the future is already here.

Contact us on our website at <https://www.urbanchain.co.uk/>

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