

# THE EMA MAGAZINE

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with Joel Kirby, EMA Recognised  
Energy Manager

## REDUCTION IN EMISSIONS

at Surrey Police

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an overview



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Analyst at Manchester  
University NHS  
Foundation Trust



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By Lord Rupert Redesdale,  
Chief Executive at  
The Energy Managers  
Association



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Chief Executive at The Energy Managers Association



## THE EMA MAGAZINE

# Welcome

Forewords are often never read, so in theory, I could say anything I like, be as controversial as possible, without any fear of any comeback.

So here it goes... by the time you read this there will be feverish preparations over a new referendum, campaigning for a general election or financial meltdown, but with optimism for a bright future following a hard Brexit. I would say a referendum is most likely, but we are in for a roller-coaster ride whichever happens.

Whatever happens there could be a recession on the way as two years of market uncertainty and lack of investment will catch up with us. A recession would lead companies to look at cutting expenditure. This could be a problem for energy managers but also an opportunity. Proactively putting forward energy saving measures now as a way of cutting costs could be quite popular with Boards when they are desperately looking at cutting costs.

The good news for 2019 is that the whole energy efficiency landscape is about to finally become a recurring Board item by law. The new Simplified Energy and Carbon Reporting (SECR) regime will be starting in April and it has statutory requirements to measure and understand all principal energy efficiency measures as a duty of Boards and LLPs. The EMA is working on defining what principal measures means, and if you have not heard of SECR it would be well worth reading the article on Five Energy Management Trends for 2019.

I believe that by the time you read this we will be in a referendum mode and we will stay in the EU. If you are a leave supporter and are wailing and gnashing your teeth I can at least thank you for reading this far.

Have a great 2019!



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# Five Energy Management Trends for 2019

**2019 promises to be an interesting year for energy managers, with continuing technological progress and some important policy changes. Here are the top trends to watch.**

## Streamlined Energy & Carbon Reporting

The final guidance for SECR will be published in January with the scheme coming into effect in April. Although the final guidance is still to be tweaked<sup>1</sup>, it is really only setting out the obligations placed on organisations.

If you are a large company listed as such by meeting two of the following three criteria: 250 employees, £36 million turnover and an £18 million balance sheet, you will need to comply. The public sector is not covered unless they own entities that undertake commercial activities and there is a no need to file a report if you use less than 40,000 kWh during the reporting period.

So here are the main actions your company will legally need to undertake:

- Collect and publish greenhouse gas emissions, energy consumption which includes transport fuel, and energy efficiency actions taken.
- Present the data on emissions to be signed off by auditors.
- Compile an energy efficiency narrative for the Director's Report, this will need to state all principal energy efficiency actions undertaken during the reporting period.
- Present to the Board for sign off, for an LLP this needs to be presented by a named member.
- Include in the company report or lodge as a separate report with Companies House.

As per usual, the SECR reporting requirements are based on taxation. This will come in the form of increased Climate Change Levy (CCL) rates beginning in April of 2019. The rates have been set out, and are charged based on the amount of electricity, gas, and fuels consumed within your organisation. The rates are charged by the energy providers and are shown on your bill.

This all sounds quite a lot of work but we at the EMA aim to help you create the report with the least stress possible. The upside in this process is that the Board will finally have to take energy use and efficiency seriously by law and that should mean that the importance of energy managers will be a lot higher in 2019 than 2018.

## ESOS Phase 2

We are now in Phase 2 of the ESOS compliance scheme so let's recap some facts. The ESOS Regulations 2014<sup>2</sup> is a reiteration of the Article 8 of the EU Energy Efficiency Directive and mandate that large organisations in the UK undertake comprehensive assessments of energy use and energy efficiency opportunities at least once every four years.

In broad terms, ESOS applies to any large undertaking that carries out a trade or a business (a Company), and any corporate group where at least one member of the UK group meets the ESOS criteria.

A large undertaking is one that:

- employs at least 250 people;
- or employs less than 250 people but has an annual turnover in excess of 50 million euros (£38,937,777), and an annual balance sheet total in excess of 43 million euros (£33,486,489).

Most public sector bodies do not fall under ESOS, however organisations that receive some public funding, such as universities, may have to comply with ESOS.

If you are unsure if you qualify for ESOS, refer to full ESOS guidance<sup>3</sup>, which includes additional information on how to assess if your organisation qualifies.

In order to comply with ESOS, the large UK organisations are required to take 5 important steps before the compliance deadline of 5 December 2019:

- Appoint an ESOS Lead Assessor.
- Calculate your total energy consumption to determine which 90% (minimum) of the energy consumption requires an energy audit.
- Carry out a comprehensive energy audit.
- Review and sign off.
- Report your compliance and keep records.

ESOS is part of British law so even a hard Brexit will not change the requirement to report.

## Electric vehicles

Electric Vehicle (EV) technology is improving and for those who own one the driving is great. Against the backdrop of improving technology and accelerating climate change, the UK Government has published its Road to Zero Strategy<sup>4</sup>, which foresees that a third of the UK's fleet on



the road in 2030 will be electric. The government has also vowed to end sales of internal combustion vehicles in the UK by 2040.

This is an optimistic prediction considering 2030 is only eleven years away. Furthermore there is a problem with zero emissions at the tail pipe, as the energy must be provided by the grid and the resulting load will not be inconsiderable.

A privately owned EV can roughly double the electricity use of the average UK home. As a result, one third of the current UK fleet, or 10 million vehicles equates to the power needed for approximately up to 10 million new homes.

National Grid forecasts<sup>5</sup> that EVs will create an additional 18GW of demand by 2050, which is one-third higher than today's peak demand.

The scale of generation needed is not in the pipeline and it is an open question whether they could be built in time.

All our present wind assets together have 20GW of capacity, enough to power 14 million homes, with 30GW forecasted by 2030<sup>6</sup>.

Don't get me wrong, there will be a huge increase in the number of electric vehicles on the road, but the charging infrastructure needed and local power constraints<sup>7</sup> that will kick in with mass ownership will be a real headache.

These increases in EV charging demand will have to be managed by better consumer engagement, smart-charging technology, and other innovative vehicle-to-grid solutions at scale.

### The energy uncertainty of Brexit

With European energy interconnections forecasted<sup>8</sup> to account for one-fifth of UK consumption by 2025, the implications of Brexit on energy prices will be important. Given that energy suppliers purchase energy months or years ahead, the uncertainty will give rise to significant risk premiums on energy prices. The increasing risk will lead to higher consumer prices, a major problem for long-term business planning.

<sup>1</sup><http://www.theema.org.uk/streamlined-energy-carbon-reporting-secr-request-for-comments-on-guidance/>

<sup>2</sup><http://www.legislation.gov.uk/ukxi/2014/1643/contents/made>

<sup>3</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/509835/LIT\\_10094.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/509835/LIT_10094.pdf)

<sup>4</sup><https://www.gov.uk/government/publications/reducing-emissions-from-road-transport-road-to-zero-strategy>

<sup>5</sup><https://www.nationalgrid.com/group/case-studies/electric-dreams-future-evs>

<sup>6</sup><https://www.bbc.co.uk/news/business-44926442>

<sup>7</sup><https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-potential-impact-of-electric-vehicles-on-global-energy-systems>

<sup>8</sup><https://www.theguardian.com/business/2018/aug/18/brexit-looming-energy-sector-builds-new-links-europe>

Additionally, regulatory uncertainty extends to the European Union's carbon pricing, leaving the UK's companies unclear on whether the same rules will apply post-Brexit.

Despite a foggy future, maintaining the energy status quo serves to benefit incumbent suppliers and consumers on both sides of the English Channel. Any major disruption will be a negative for all market participants, and therefore issues relating to trade friction and disruptions are the highest risks.

Whilst it is unlikely that the lights will go out without strong agreements in place, it is going to be a less efficient market in the event of a disruptive Brexit. In any uncertain scenario resulting from Brexit, the UK's security of power supply has to become top priority, rather than being considered a minor problem.

### Battery storage

This is one area that could become really exciting in 2019 because you could benefit from hosting batteries. Work is being undertaken to allow DNOs to source contracts for battery services in the area of Demand Side Response.

Simply put, the DNO could work out the cost of upgrading, reinforcing or building in resilience and instead of building new substations, they could meet their requirements by contracting out demand reduction services through contracts with independent

aggregators.

The aggregators would install batteries at large sites that use power at peak. Energy stored off peak would be used to reduce power. The demand reduction would not require the site to reduce energy use but use the stored power thereby reducing demand from the grid. Such contracts could help sites, through load shifting, turn peak time use into a profit centre.

If this sounds a little confusing, it is because it will be a slightly complicated process but for energy managers the result will be someone else paying for the batteries, installing them, managing them and rewarding you for the privilege.

### UK electricity interconnectors





# Areas of Importance and Growth in 2019

**The EMA Board of Directors identified areas of energy management that will be of importance and growing further in their industries this year.**



**Paul Eggleton, Commercial Director, Mitie Sustainability**

**Asset financing and asset as a service:** With the age old limitations on internal capital availability, organisations continuing to seek to reduce fixed costs, and growing numbers of finance providers willing to invest in energy related assets I expect to see more solution providers moving to an asset as a service model. However, not just based around a simple lease model but one that allows the provider to leverage the asset for other revenue streams – this has the potential to reduce the fixed price, whilst providing some risk rebalancing which is offset by a share of any upside.

**Flexibility services combining price, volume & action:** This will continue to grow and become BAU. I expect to see more and more new market entrants challenge the established players and provide Over the Top services that devalues the existing Customer/Supplier relationship. I think this will provide some good opportunities for end users IF they are prepared to shift from established players. I think we'll also see established players looking to acquire/partner to bring new

capability into their service portfolio. Specifically on the flexibility front I see organisations accelerating their adoption of EVs and this in itself will cause organisations to think about how they manage site loads, available capacity, charging regimes etc.

**Delivery, delivery, delivery:** With many large end users facing fully delivered bill increases of up to 70% in the coming years and more FDs and CFOs waking up to this fact I anticipate we'll see greater action in organisations putting in place bolder strategies and projects to mitigate these as much as possible. I would like to think this would lead to a greater uptake in Energy Performance Contracting and integration of the two, aforementioned topics, into a company's strategy.

**Wendi Wheeler, Energy & Carbon Strategy Manager, Network Rail**



**Outside-the-box thinking:** Following the IPCC special report on reaching the 1.5°C global warming threshold which was released in October, there is a renewed conviction that we simply are not doing enough. With the increasing focus on accelerated decarbonisation industries, organisations are challenged with what they can do next. Whilst there is still so much to do in terms of general energy

efficiency it is clear that even if all of those avenues are exhausted, more will need to be done. In order to achieve greater carbon reduction businesses simply can't continue to operate in the same way as they have done previously. Getting rid of carbon-intensive fuels and moving to low-zero carbon operation is a massive challenge for the rail industry, but one which the industry is embracing as it sets out plans for a cleaner railway – and those plans will require us to change our modus operandi. It's challenging and exciting, and I'm so pleased to be a part of the revolution!

**A new way of managing our energy demand:** As District Network Operators also prepare to change their methods and transition to District System Operators there is a fantastic opportunity to ride with them on their journey and take advantage of the benefits that this change can bring. By working together with the electricity industry and using energy storage and demand management techniques, organisations can help to balance the grid whilst generating cash benefits. Increased focus on demand management will also highlight areas of energy waste that can be addressed – if done right, this is a win-win-win scenario.

**Partnerships and shared learning:** Moving into 2019, I see that we will not only need to learn from each other more and more – as successful energy managers we should be doing that already – but working in new ways to apply that shared learning better. Organisations need to be less insular and reach out to those that can help them achieve their aims by operating in partnership with others. Rather than traditional client-contractor relationships I see service partnerships coming to the fore, sharing the benefits of joint goals and getting on with the bigger job in hand rather than getting tied up in arranging individual contracts for piecemeal works.



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**Scott Armstrong, Head of Sustainability and Energy,**



**Bourne Leisure**  
**Making utility efficiency the responsibility of all:** Moving away from a central top down approach to energy efficiency within companies and engaging with all team members to make it a moral responsibility on all to operate/work in a manner that delivers efficiency across all utilities will deliver greater results and mean teams are better engaged with the overall sustainability message. We have a saying within Bourne Leisure that 'if everyone does a little, then no one will have to do a lot'; this tells our team that everyone can, and is expected to, make an impact.

Also, moving away from a financial savings message around utility efficiency to a softer environmental message is starting to deliver greater impact with our youthful team. This links in nicely with the October IPCC report urging people to make lifestyle changes to avoid future 'climate catastrophe'.

**Granularity of data:** If you can measure it you can manage it! Data is everything in the drive to manage utilities. Whilst the use of metering and data is not new in itself, the falling cost of sub-meters recording interval data to measure zonal energy consumption and loggers and flow meters to measure water consumption will give businesses a greater level of visibility to become even more focussed on efficiencies. Cheap to install and linked to an energy management platform, this will enable businesses and department heads to take corrective actions when identifying consumption spikes and as data is built up, compare against performance metrics to drive best practice and create some competitive spirit.

**Make ESOS your friend:** 2019 Phase 2 of ESOS should be welcomed by all business energy management/sustainability teams. It gives us all the ability to engage directly with Leadership teams, re-focus on operational practices through audit work and gain legislative commitments from the Board. Take the opportunity to build your internal expertise and train an internal team member to Lead Assessor level, after all you know your business better than any external consultant, no matter how good, will ever know it. 2019 will be a year of discovery and focus linked to ESOS, make ESOS your friend!

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**Dr Mike Pedley, Independent Consultant**



**Look ahead:** Given current UK politics, these are uncertain times for UK business. So in 2019 take a check on one of the energy basics: buying or sourcing energy for your future business needs. Uncertainty leads to price volatility. Having some future power secured can reduce financial risk.

If not already doing so, look at whether you can buy flexibly so you can secure power gradually as opportunities arise. Remember before buying to ask yourself:

- What can I save through energy efficiency?
- What can I generate cost effectively on (or-near) site?
- How important is green (low-carbon) power for my organisation?
- How flexible can I be in when I use power?

**Review (or write!) your energy buying/hedging strategy... and**

ensure it is signed up to by the key stakeholders in your organisation. Set out what your plans and contingencies are and ensure those holding the purse strings sign up to it. Understand what your financial risk limits are (i.e. how much of your requirements can be left unbought until later).

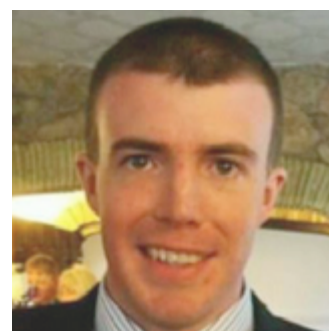
- When do you buy as the price rises and when is it not worth holding out as the price falls?
- How far ahead do you (and can you) buy?
- Do financial products (e.g. future swaps) and long term PPAs have a role?

**Secure a green future:** Despite the uncertainties there are some great opportunities out there to green your business through the way you source energy.

- Can you generate on site? If not on-site, is there a local generator (e.g. solar array or wind turbine) you can connect to with a direct wire? That could be a 'win' for both.
- Can your supplier provide certified renewable energy (at low or no premium)? Consider if a long-term grid PPA from a new renewable development would fit your strategy?

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**Charlie Cox, Energy Manager, University Hospitals of North Midlands NHS Trust**



**Collaboration:** I work for an NHS Trust which is currently in financial special measures, so we have extremely tight controls on capital and revenue spending. This makes it very challenging to fund any significant energy saving measures.

We intend to work more closely with partner organisations to find ways of delivering savings, within the framework of these challenges. Key

partners for this will be local NHS organisations, other public sector organisations, and our PFI Project Company. The key here is to select a small number of work streams that will bring real benefits to all parties through collaboration, and not to get bogged down by trying to work together on everything. By working together we can improve overall public sector more efficiently and offer better value to the tax-payer.

**Keep banging the drum:** It's easy to assume that just because you have told someone something, they have heard it! In reality, people are busy at work, and are bombarded with so much information all the time, that messages often get missed. This applies both to general energy saving messages sent to all 11,000 members of staff, and to specific requests directed at individuals and small groups.

In these challenging times, we need to keep energy efficiency on everyone's radar, and keep reinforcing the point that there are savings to be made that don't impact on patient experience.

**Innovative working:** We need to reach out to our clinical colleagues to help reshape the way healthcare is delivered. There is only so much that can be achieved by making what we already do more efficient, we need to question whether we needed to do it in the first place.

By embracing technology such as smartphone apps that help patients with long-term conditions to manage their symptoms, we can help them to avoid unnecessary and stressful visits to our energy-intensive hospitals. Obviously energy is only one small part of a complex jigsaw here, but this is an example of how energy managers can help to steer their organisations towards improved social, financial and environmental sustainability.

**Dr Vassia Paloumbi, Sustainability and Energy Management Expert**

There is a lot of talk these days and aspirations for organisations becoming zero carbon. Even the Mayor of London has committed



to London becoming a zero carbon city by 2050. But in the world of energy management this is often more like a dream and it does require comprehensive monitoring of energy demand and carbon emissions which I certainly hope the new Streamlined Energy and Carbon Reporting and ESOS Phase 2 have the opportunity to achieve, if done well. So for me, energy managers' world should:

**Be lean – use less energy and manage demand:** Priority should be given to minimising energy demand both at new built but for existing buildings as well. It is much easier of course to do this for new builds when designing a new building, but for existing ones Energy Performance contracts (like RE:FIT) for public buildings can help and can deliver significant carbon reductions against targets.

**Be clean – supply energy efficiently and cleanly:** Demand for natural gas in London has been decreasing over the last few years, with a 25 per cent reduction since 2000. This trend is expected to continue due to improved efficiency and a move away from individual gas boilers. CHP is no longer the answer and alternative technologies that don't use fossil fuel should be explored. On the other hand electricity demand will increase and will impact an already overstretched grid. This is where we need to think creatively and consider, demand-side response minimising peak energy demand and promoting short-term energy storage. Technologies like battery storage can be a great and clean asset to an organisation

for energy storage and demand management where you can help balance the grid but also generate income.

**Be green – use of renewable generation:** Where possible looking at onsite generation direct or PPA through private wire or alternatively PPA agreements with large generators. Renewable generation in the UK has increased (almost a quarter of energy generation now comes from renewables) and this is set to continue. There has been a lot of debate around green tariffs and these should not be considered for energy efficiency and you should always do whatever you reasonably can to reduce your current use of electricity and other fuels before considering these.



**And one more:** Plastic pollution was the hot topic of 2018 mainly due to Sir David Attenborough. We have seen many changes on this and great campaigns and initiatives from a lot of large and well-known companies worldwide. Plastic straws are now hard to find these days and if you go around with a paper cup (like the environment secretary recently) you may get strange looks – well Michael Gove was certainly spotted. How can we as energy managers jump on this? How can we make energy efficiency a hot topic and on the top of the agenda?

Reducing plastic or eliminating it will not combat Climate Change (or deliver zero carbon – as I have talked above) but reducing our energy use and associated emissions will! So, how do we do it? One for the New Year I think! Happy 2019.





# ESOS Phase Two

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# EMA Recognised Energy Manager

**The Energy Managers Association is pleased to announce that Joel Kirby, the Energy and Environmental Manager at Celtic Manor Collection, has joined the ranks of the EMA Recognised Energy Managers after successfully demonstrating the knowledge and skills in energy management through the Knowledge and Skills Gap Analysis Interview.**

The EMA runs the Knowledge and Skills Gap Analysis Interview to help energy management professionals to not only pinpoint areas that may need expanding, but also to show that often energy managers know far more than they think they know.

The Interview is a professional discussion with other energy management professionals touching upon your current areas of professional knowledge, whilst at the same time identifying any potential gaps, and suggesting ways to fill those gaps either through learning or mentoring. If interviewees demonstrate all the necessary knowledge in the core energy management competencies

during the interview they will be awarded the official EMA endorsement of the Recognised Energy Manager.

The core competencies are:

- Technical and Operational Competency
- Energy Assessments, Measurements and Verification Competency
- Behavioural Change and Motivation Competency
- Regulatory & Legal Compliance, and Carbon Management Competency
- Energy Management Strategy and Plan Competency
- Waste Management Competency
- Energy Procurement Competency
- Energy Efficient Transport Competency
- Water Management Competency
- Information Technology Competency

For more information regarding the EMA Recognised Energy Manager status and the interview process, please contact [jana.skodlova@theema.org.uk](mailto:jana.skodlova@theema.org.uk) or call 0203 176 2834.

## LOOKING FOR A ROUTE TO COMPLY WITH ESOS? ISO 50001 HITS THE MARK.

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## NEXT SUBMISSION DEADLINE (PHASE 2 OF ESOS) - 5<sup>TH</sup> DECEMBER 2019

Tony Summers,  
Lucideon Auditor

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LUCIDEON



# An Interview with an EMA Recognised Energy Manager

## How did you become interested in energy management?

I have always had an interest in the environment and our climate from an early age which pushed me towards geography as an undergraduate and then more specifically climate change science as a postgraduate. My specific interest in energy management came more by luck when I was invited to interview as an account manager to encourage energy efficiency for The Restaurant Group. From here my interest has only grown, as there is a satisfaction in knowing that what you do day-in, day-out has an impact on the wider environment.

## What does your role at The Celtic Manor Collection entail?

My basic role at The Celtic Manor Collection is to improve efficiencies to reduce the resort's utilities spend and to coordinate the reduction of our overall effect on the environment and ensure environmental compliance. Although that is a very basic description, in reality my role is far more wide-ranging, touching every area of the 2,000-acre operation consisting of 4 hotels, 10 lodges, a conference centre, 3 championship golf courses and 2 golf clubhouses. The portfolio varies in age from the 17th Century Manor House to the 2008 Twenty Ten Ryder Cup Clubhouse and currently

under construction a 5,000 delegate International Convention Centre Wales. Electricity and gas are, like in most businesses, the most expensive elements of our utility spend and therefore require the most attention. As you can imagine in the older buildings there are always areas of maintenance that need attention. I work closely with our maintenance and operations teams day to day to ensure that equipment is running



as efficiently as possible, whether that be at the correct times, to the correct temperatures or just a case of only switching equipment on in areas that are absolutely required at the time. I also look after waste disposal in all of the buildings, which is a constant and evolving battle. Not only with the day to day operations, but also the large events that as a resort we host annually, such as the Celebrity Cup and the annual Christmas event which runs



throughout December. Furthermore, packaging and plastic waste features prominently in the media and the public is aware of what needs to be done, and this means it needs a much larger focus from myself to manage these impacts. Apart from all of the above, there are also the more recent developments currently under construction and in planning on the grounds and a few upcoming acquisitions to The Celtic Manor Collection, which require attention.

## What is the most exciting part of your job?

I would have to say there are quite a few, but the most exciting would be my involvement with the International Convention Centre Wales. Obviously, looking after older buildings and being able to make drastic changes to the efficiency and running costs is particularly interesting for an

energy manager, but the opportunity to help develop a world-class conference and events venue from day one is great. As an energy manager your ability to implement change is limited to those around you and the belief they share in what you are trying to achieve is crucial. I am very lucky to have an excellent maintenance team and senior managers who really buy into the importance of what I am trying to achieve across the Collection.





This is exemplified by the new build Convention Centre, and to witness the 2019 opening has to be the most exciting part of my job right now.

### What is the most frustrating part of your job?

My main frustration is that I cannot make all of the changes that I would like at once. As I have already mentioned, I have great support from senior managers who understand what I am trying to achieve and recognise the importance of sustainability and energy efficiency. I do get the opportunity to develop new energy projects every year, but obviously there is a limited budget and not everything can be implemented all at once.

Some of the larger projects implemented over the past year consist of 3 CHP engines, variable speed drive installations to control ventilation in our kitchens and underground car parks on air quality, BMS optimisation and upgrades, and we continue to roll out LED lighting across the estate, something which is now almost complete. We have made solid reductions to all of our utilities since I started the role in 2016, most notably electricity, reducing like-for-like consumption by 10.5% year to date against 2016 baseline and scope 1 and 2 CO2 emissions by 28%, so I cannot complain too much.

### Can you describe your typical day?

It is very difficult to pin down a typical day, but there are various things that I do on daily basis to manage the estate's utilities. Every morning, I check our sub-metering for any issues overnight or pick out any trends or anomalies from the previous day that could impact on overall consumption. This can be from a number of things, improper shutdowns in any of the outbuildings and golf clubs, equipment being switched or left on in areas that should not be, and to ensure that

certain key equipment like CHPs are running. The other thing I do every day is check and set up the multiple BMS platforms that we have across the Collection. This involves setting up AHU schedules for upcoming business, checking building temperatures and generally ensuring equipment is running correctly.

Following this, I make sure key items are in stock, such as LED lighting, something which I have taken control of to ensure that we are only ordering high efficiency equipment across all of our older buildings.

Waste management will also take a main role in any typical day. From managing contamination reports to chasing missed collections, this is probably the most time consuming part of my typical day.

The rest of my time can vary, from dealing with project installations, developing new projects and dealing with other requests and problems from across the business.

### What drives you?

My main interest has always been in the environment and so I would have to say that my main drive is to have an impact on reducing our global emissions. As an energy manager, I am in a privileged position to have a direct responsibility and the resources to

reduce the emissions and enhance the sustainability of The Celtic Manor Collection. To see the improvements that are being made on a day to day basis encourages me to continue to seek further areas of improvement and persuade others to do the same.

### What qualities should a good energy manager possess?

Due to the nature of an energy manager's role, and the need to engage with so many different stakeholders within a business to

“AS AN ENERGY MANAGER YOUR ABILITY TO IMPLEMENT CHANGE IS LIMITED TO THOSE AROUND YOU AND THE BELIEF THEY SHARE IN WHAT YOU ARE TRYING TO ACHIEVE IS CRUCIAL.”

encourage change, I think there are many qualities that an energy manager needs to be successful. That being said, I believe that there are maybe two main qualities that are vital for a good energy manager. The first being the patience to keep persevering and the second to have the ability to seek help and advice from others. I do not think there are any energy managers who have not been told 'no' by key decision makers over certain projects, and I have spent a lot of time on certain projects which have been dropped at the last minute, but this should only encourage you to move onto the next thing.

Not everything always works and there are many ways to reduce a business's impact on the environment without getting hung-up on one decision. In addition, no single person has all the answers and I have heard stories about people rejecting the help of others over the fear of looking bad themselves. I have certainly required the advice and guidance of others, and without this I definitely would not be in the position I am now.

#### **Which energy efficient innovation can revolutionise the global economy?**

There are so many energy efficient innovations now that it is hard to pick one. The biggest impact in my experience, in large buildings, is the proper utilisation of equipment already installed. For example, a few changes to the building management system at the main Celtic Manor Resort reduced our annual consumption by over 5%. There is a lot of mis-use of these systems and a lack of knowledge by managers in charge that a few small changes could have a significant impact on global energy demand.

#### **What prompted you to undertake the Knowledge and Skills' Gap Analysis Interview with the EMA?**

I have been in energy management for a few years, however apart from my experience I had nothing to demonstrate the skills I had learnt and the level of my competency. The EMA Knowledge and Skills' Gap Analysis Interview not only allowed me to gain some recognition

but also highlighted areas where I needed improvement. In turn, this can only help to improve my ability to make a bigger impact on the industry in my career.

#### **Do you think that the EMA Recognised Energy Manager status will allow you to highlight your credentials as an energy manager?**

Absolutely, and this is one of the main reasons I wanted to become a Recognised Energy Manager. I would like to think that this also helps me to demonstrate competency to key members of staff within my workplace.

It has not been long since I got the status, but it has helped from a confidence point of view if nothing else, knowing that your knowledge has been validated and that you do know what you are talking about.

#### **What does next year hold for you?**

The next year promises to be very busy for The Celtic Manor Resort Collection, and myself, with the opening of the International Convention Centre Wales in July 2019, not to mention the continuing

progression of efficiency projects for the rest of the estate in the meantime.

We have focused heavily on efficiency throughout the build, ensuring that ventilation systems are controlled by occupancy, air quality and temperature, LED lighting is installed throughout, low flush urinals and low flow taps are used in all WCs, and natural ventilation is used where possible, to name a few.

As a result, I am hoping that there will not be too much involvement required to run the building, however I am sure there will be efficiencies that can be built-in as we learn more about the way the building runs. It is certainly an interesting time for the business and very exciting from a sustainability point of view!

“ I BELIEVE THAT THERE ARE MAYBE TWO MAIN QUALITIES THAT ARE VITAL FOR A GOOD ENERGY MANAGER. THE FIRST BEING THE PATIENCE TO KEEP PERSEVERING AND THE SECOND TO HAVE THE ABILITY TO SEEK HELP AND ADVICE FROM OTHERS. ”

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# Energy Management Team Interview



**In 2019, we will devote one regular feature to energy management teams and their work. To start the series, we have asked Viridor's energy management team about their approaches to energy management and achievements.**

## What does energy management mean at Viridor?

Our approach to energy management is shaped by Viridor's wider sustainability ambitions. Viridor is committed to being a responsible business – our purpose

The energy team's remit is wide and complex but sometimes even simple changes can have a significant effect. For example, we have appointed energy champions for each site and business function to ensure we can get everyone behind energy efficiency measures. The energy champions will be invaluable in disseminating information across site teams and making sure engagement levels are high. We are also asking our individual site teams to pay particular attention to their energy use during the peak periods of 4-7pm, Monday to Friday, November to February through our '4 to 7' campaign. The price of energy is up to six times higher during these 258 peak demand winter hours.

Our campaign presents us with a real opportunity to lower Viridor's energy costs, to create revenue by increasing the amount of energy we export to the grid during those times and – importantly – to help balance the grid through our flexibility. The UK's energy infrastructure is changing, and we believe that



is to give the world's resources new life – so lowering carbon emissions and reducing energy consumption is a primary concern of the energy management team. Better energy management also ensures we can keep pushing operating costs down, manage risk and build better business resilience.

It all begins with an in-depth understanding of the way we use energy right across our site portfolio. Viridor operates over 320 facilities across the UK; through comprehensive analysis of how much energy is being used, at what time and where, we can pinpoint areas to reduce consumption and start to plan how this can be achieved most effectively. Full ISO50001 compliance is a high priority for us in 2019 and this activity will help ensure our organisation can secure that.

all businesses have an important part to play in ensuring the nation has a safe, stable and cost-efficient energy system for the future.

## What is the return-on-investment that the Energy Management team brings to the organisation?

Our organisation's annual utility expenditure is more than £10m. We have recently reset our target to reduce our energy consumption by 10% against 2017/18 baseline to save £1m cost over the next 5 years. We are proud to have been able to reduce our carbon emissions from electricity consumptions by 20% between 2016/17 and 2017/18. However, our business is growing in size and this has caused us to revisit our baselines for the next 5 years.



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	13 <sup>TH</sup>	Understanding and Delivering Behavioural Change Programme
	14 <sup>TH</sup>	Essential HVAC Control and Optimisation
	19 <sup>TH</sup>	Battery Storage for Business
	21 <sup>ST</sup>	On-site Electricity Generation
APRIL	3 <sup>RD</sup>	Energy Monitoring, Targeting and Validation
	4-5 <sup>TH</sup>	Fundamentals of Energy Management
	24 <sup>H</sup>	Turning Data into Energy Savings
	25 <sup>TH</sup>	Lighting – Basic Understanding (Bristol)
	30 <sup>TH</sup>	Water Management
MAY	9-10 <sup>TH</sup>	Energy Management in Building Services <sup>*NEW</sup>
JUNE	4 <sup>TH</sup>	Energy Management Strategy and Plan
	5 <sup>TH</sup>	Waste Management
	11 <sup>TH</sup>	Essential HVAC Control and Optimisation (Bristol)
	13 <sup>TH</sup>	Energy Procurement (Manchester)
OCTOBER	1 <sup>ST</sup>	Energy Procurement
	3-4 <sup>TH</sup>	Fundamentals of Energy Management
	8 <sup>TH</sup>	Energy Monitoring, Targeting and Validation
	9 <sup>TH</sup>	Essential HVAC Control and Optimisation
	29 <sup>TH</sup>	On-site Electricity Generation
	30 <sup>TH</sup>	Lighting – Basic Understanding
NOVEMBER	5 <sup>TH</sup>	Battery Storage for Business
	6 <sup>TH</sup>	Water Management
	6 <sup>TH</sup>	Understanding and Delivering Behavioural Change Programme
	13 <sup>TH</sup>	Energy Auditing Techniques
	13 <sup>TH</sup>	Turning Data into Energy Savings
	28-29 <sup>TH</sup>	Energy Management in Building Services

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### How are responsibilities shared in the team?



Our energy management team is led by Mark Knights in the role of Power Portfolio Director. The team works across a broad remit with the overarching aim of continually improving energy management practice across Viridor. We're responsible for trading energy and managing accreditations as well as various commercial schemes related to energy supply and generation.

Our team members include Sheriff Akande, an Energy Management Consultant whose core responsibilities are developing and reporting on energy budgets for each of Viridor's consuming sites, leading the '4 to 7' campaign, and also leading on natural gas contracts and hedging activities and procurement of energy management systems and tools.



We also have Energy Manager Justina Grey, whose core responsibilities are related to ISO 50001 compliance and the delivery of Viridor's Carbon Reduction Commitment, as well as managing the Energy Champion programme at Viridor.

Donovan Kwaramba, our Graduate Energy Projects Analyst, is a valued member of the energy management team. He contributes to the demand side management of our Viridor import portfolio by working with both internal and external stakeholders, as well as assisting across a wide range of activities, including our energy campaigns, the development of import budgets and the improvement of import approaches. He is also tasked with evaluation of our own energy management platforms and providers.



### How is information regarding energy management and the work that the team undertakes communicated to various stakeholders in the organisation?

Awareness and communication are key to better energy management across an organisation like ours. Our team aims to ensure that each of Viridor's sites are behind our energy initiatives and projects by providing regular webinars and on-site presentations, 'meet the energy expert' sessions, energy updates, toolbox talks and monthly newsletters. Our '4 to 7' campaign has been one of our biggest successes in this regard, during both winter 2017/18 and this winter. Campaign materials including desk drops and posters kept the campaign front of mind and we also introduced a competitive element to the campaign with a leader-board for top performing sites. The hard work has already paid off: high engagement levels saw an additional £6million added to Viridor's bottom line last winter. This winter we are already 7% ahead of our average power export (and reduced power demand) target.

We share knowledge with our senior leadership team and directors by attending the Leadership Management Meetings and various other leadership meetings within the business. This helps to support and propagate their commitment to effective energy management and energy efficiency improvements throughout the business.

### Does your organisation offer energy management training/professional development to the energy management team and/or the wider staff?

Viridor recognises the importance of ongoing personal and professional development and believes that investment in its people will better equip the organisation for the future. To this end, the company provides apprenticeships, graduate recruitment and management training schemes to nurture the skills of both the energy management team and the wider staff.

The organisation also calls upon the help of external consultants to provide energy management training. During February and March of this year, all Energy Champions will undergo bespoke ISO 50001 and energy management training, to help better prepare them for the new role. Viridor Directors and other Senior members of staff will also undertake a bespoke energy management course. This will enable them to fully understand the benefits that ISO 50001 and Energy Management can bring to the organisation.

Within the energy management team, training is definitely considered a priority – each member of the team is provided with a budget for training and professional memberships every year. Our team members regularly attend industry specific webinars, seminars and short courses to enhance their knowledge and keep them up to date – crucial in an industry that is changing so rapidly! We are also consistently supported in our longer-term professional ambitions. For example, two of our team members are currently enrolled on a Chartered Management Degree apprenticeship programme.

### Are the team's achievements celebrated/acknowledged by the organisation?

During 2018, Viridor nominated our team member Justina Grey for the Junior Energy Manager of the Year award at the Energy Managers Association (EMA) Awards. We're proud to report that she was selected as a finalist.

Team member Steven Sepp, our Energy Accreditations Manager, was also recognised with a nomination for the Association of Decentralised Energy (ADE) Young Professional of the Year award, for which he was shortlisted and received second place.

Our Viridor Winter Energy (4 to 7) Campaign was also shortlisted for an EMA award during 2017. We hope to be able to achieve even more in the year ahead.



### What are the plans for this year?

Energy Management is a top priority within Viridor. We're committed to making changes that will ensure a more energy efficient way of working and reduce energy

consumption, which in turn will reduce our energy costs and maximise our revenue streams – especially from onsite renewable generation. The important wider benefit of this will be a reduction in our carbon footprint and environmental impact.

The energy champions we have recently put in place will assist us in ensuring we can achieve these ambitions. They will be indispensable in driving and supporting the changes that all colleagues will need to make in order to achieve our 2019 energy goals.

These include: to be fully compliant with ISO 50001, to achieve our target of 10% reduction in energy usage - which can save us £1m over the next 5 years, to improve energy efficiency and performance of our assets, to enhance our business sustainability, to reduce our carbon footprint and environmental impact and, of course, to maintain our commitment to good management practice.

In the immediate future, our focus will be on collecting, tracking and analysing data, detailed monitoring of energy intensive processes, establishing baselines and targets, and identifying savings opportunities.

We will also be working to increase our reliance on renewable and alternative energy sources and on increasing our energy flexibility, so that we can play our part in a more sustainable energy future.

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# Data Analysis of Meter Readings to Spot Wastage or Anomalies

**A study completed in 2016 stated that buildings are responsible for 40% of global energy usage, thus accounting for 30% of total carbon emissions. This is an area we can all target to cut down on our usage and help in this global crisis. First though, how do you begin? Well, imagine it is post-Christmas; you look at yourself in the mirror and think there is a bit more on the hips than there was a few weeks ago, so you would go to step on the scales. This is pretty much where we are; you cannot manage what you do not measure, if you cannot measure you cannot improve.**

Metering is the first and most important part of energy management and is the backbone to an effective energy management campaign. The Carbon Trust states that for many organisations, energy is the second largest expenditure following salaries. I work in an NHS Trust with an energy spend of £14 million per year and despite ongoing efficiency programmes this is only increasing due to the price of energy, government legislation

and the growing intensity of activity required in a hospital. In the past, organisations would have a basic level of metering just so utility companies would get a vague idea of what to bill. Now, however, large organisations are investing more in complex metering systems as the 'money men' are noticing this financial benefit more and more. Getting a good metering system in place is essential, however where to begin once you start receiving the data?

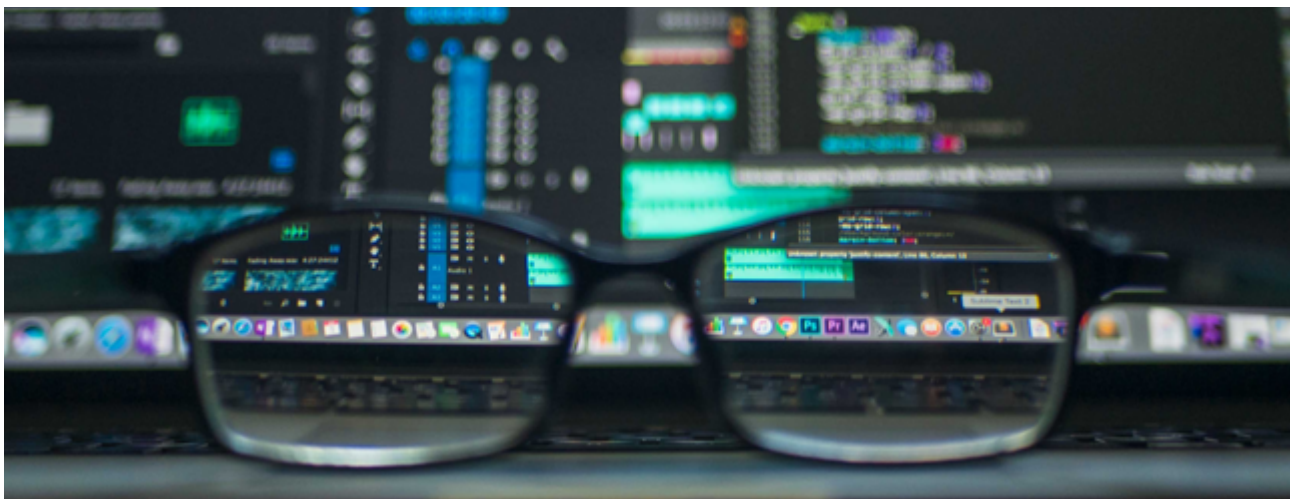
## Bill validation

The first form of analysis to be done on meter readings would be bill validation. Many organisations are paying too much for utilities due to inaccurate estimates and errors. Simple analysis of monthly meter readings ensures that companies and organisations will only pay for what they use. This is a fairly simple piece of analysis that can be done using Microsoft Excel. Setting up a simple spreadsheet with columns on various cost data will allow you to see what you are using per month

and what it costs, compared with your bills. It is important to include columns for: your meter reads, suppliers reads, rates, charges (daily charge, standing etc.), suppliers bill and your estimated bill. Having this system in place will allow you to update monthly with reads and data and apply a quick comparison when the bills come in. At the Trust we have someone monitoring this data and have included rolling bar charts plotting consumption over time to make it easy to see any anomalies or wastage. This is also a useful way to begin benchmarking.

## Benchmarking

At the heart of it, benchmarking is just a comparison. Think about it, your laundrette business is going well, you have good custom but your utility bills are costing a fortune. You cannot afford to close early one day, you cannot afford the marketing. How is it that somebody with the same business across town is doing similarly well business wise, same size building, the same number of machines but his profits are much



more? After a little comparison of your meter reads you notice he is using 2/3 the amount of electricity. This simple bit of benchmarking has shown a weakness in your business and an area you can improve on, it shows somewhere you are wasting energy and thus losing money. Being able to compare a building's energy use against similar buildings allows you to see if wastage is high allowing you to formulate a plan on how to alter this.

### Normalisation

Benchmarking also needs to be done in a form of normalisation. Taking the meter read and consumption alone is irrelevant without adding extra information such as floor area, number of visitors, weather. One of the most prominent methods I use is normalising gas usage against temperature in the form of heated degree days (HDD).

Plotting gas consumption against the number of HDDs as a piece of regression analysis predicts how much gas should have been used based on the number of HDDs if there is a strong correlation. If I experience a correlation of  $R^2 = 0.95$  for the largest hospital building when used in a ' $y=mx+c$ ' formula, this shows me whether consumption is at a normal level or an anomaly and is essential in providing depth to the data.

Our intensity of activity and size also changes over time so it is important to analyse the effect of this. The Trust has increased in size by 22% and 10% in terms of occupied floor space and number of patient contacts respectively between 2013 and 2018, and electricity rates have increased by 13% between April 17 and April 18. It would be impossible to reduce energy and costs with these external conditions; however, our normalised data of largely gas and electricity usage (Scope 1 + 2 carbon emissions) shows a 13% reduction in tCO<sub>2</sub>- per patient contact.

Being able to analyse and report this data with context allows us to explain how we are improving but also identify any areas that need improving.



### Half-hourly data

Benchmarking analysis and bill validation have been useful tools in saving organisations money and looking towards energy savings, however new technology allows for much more in depth analysis of meter readings. Metering technology has improved greatly, particularly since the emergence of half-hourly and smart meters. By law any organisation with a max demand of over 100kW should have half hourly data, however it would be useful to have it in any case.

Analysis of Half Hourly data allows for energy profiles to be built up and anomalies and wastage to be spotted more easily. These profiles will stay constant, however spotting unexpected peaks will point to anomalies and wastage. Largely, your energy profile will follow an occupancy profile of a building in that the people inside will be using lights, heating and computers etc. A large amount of energy wastage and anomalies can be spotted just by doing this comparison.

For example, one of the hospitals is just a 9-5 weekday hospital. A quick analysis of the data showed that we were still using a reasonable amount of extra electricity on the weekend. Whilst it would be expected that some electricity usage would be required for essentials, it was clear from the profile that the HVAC system was operating for the same hours as through the week. A simple

change through the BMS has resulted in reduced wastage across 2 days out of 7 (104 days per year!) providing substantial savings.

This wastage is spotted just through simple analysis and by looking at time profiles, however should you have the resources to do more thorough analysis you can also look to see whether the overall usage fits with the type of area. For example, knowing that at a certain time the only equipment being used in an area would be computers, TVs, small power equipment, etc. you would expect relatively low usage. Knowing there is some wastage or incorrect values allows for further investigation. This is where sub metering and perhaps device level monitoring would be useful.

### Sub-metering

Having an extensive sub-metering system allows for much more analysis and more wastage to be spotted. Sub-metering smaller areas off the fiscal meter and building up a 'tree' as such will show the areas consuming large amounts and the areas benchmarked well or poorly to allow for an energy management campaign which targets areas of higher consumption. The ability to monitor and analyse meter readings for smaller areas will show outliers, improve on billing with any recharges and even highlight maintenance issues. Should the electricity bill be unusually high, analysis of the sub metered data will allow you to

pinpoint the value of the anomaly and where it is arising from.

It is not only the building data that can be analysed through sub-metering but also equipment level metering which is available through new technology which utilises CTs to measure consumption at device level. This intrinsic level of analysis allows for a holistic view on how everything is running. Monitoring the efficiencies of your high consuming kit can instantly show you where energy is being wasted (through time left on the power it is being run at), equipment that needs repairing or just equipment not being used! Monitoring the consumption of pieces of equipment allows you to strive towards the holy grail of no wastage and thus reduced energy bills.

This sub-metering is more likely to be automatic and provide automatic targeting and reporting. The automated reports allow for easier analysis of your data against targets and show any progress. Showing progress is vital as a key driver in driving energy efficiency behaviour change. It is estimated that in our NHS Trust we can save a further 10% of energy through staff behaviour. Reporting this data as a monetary value back to staff is an important piece of analysis as it allows staff to see progress and understand the importance of what they are doing,

therefore minimising any wastage. We have numerous programmes running through the Trust targeting behaviour change with feedback stating the importance of seeing the data to inspire staff improvement.

This technology is also fantastic for any measurement and verification (M&V) purposes. To be able to implement more and more efficiency projects, a good level of M&V has to be done. Data analysis of meter

efficiency projects where it is now possible to see how much exactly the Trust has saved, giving accurate ROIs and the assurance to push for more projects.

To summarise, substantial analysis of meter readings is imperative to an effective energy management campaign. To be able to manage, you need to measure. Knowing what you use as a whole is great, however the ability to dig deep and analyse at building or equipment level allows you to identify wastage and inefficiencies in your operation. The rise of new technology and the prevalence of half hourly data make it simple to compare energy profiles and expected usage thus minimising wastage. It is also important to measure how much energy you have saved; analysis for M&V purposes is imperative to keep getting projects approved and keep up the good work!

“IT IS ESTIMATED THAT IN OUR NHS TRUST WE CAN SAVE A FURTHER 10% OF ENERGY THROUGH STAFF BEHAVIOUR. REPORTING THIS DATA AS A MONETARY VALUE BACK TO STAFF IS AN IMPORTANT PIECE OF ANALYSIS AS IT ALLOWS STAFF TO SEE PROGRESS AND UNDERSTAND THE IMPORTANCE OF WHAT THEY ARE DOING, THEREFORE MINIMISING ANY WASTAGE.”

readings allows for effective M&V showing stakeholders how well an efficiency project has worked. Analysing the data before and after can show a step down in consumption (if the project worked!) and thus money off the energy bill. Being able to analyse these projects through sub-metering is more effective, however if the equipment is individually monitored it is possible to put an exact number on it. I have completed a number of lighting

#### Author's profile:

Bobby is a Physics graduate who has worked as a data analyst in the Energy & Sustainability team at Manchester University NHS Foundation Trust since 2016. He hopes to develop a strong career in energy management with aspirations to specialise in renewable energy.





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# Heat Network Regulations – what you should know

**Heat generation is a major part of our economy and accounts for around a third of UK carbon emissions. To meet the UK's carbon reduction targets, we must significantly cut our emissions from heat. This requires us to move to cleaner and more efficient ways of heating our homes, buildings and industry. Heat networks are an important part of this transition to clean growth and will allow us to make progress on reducing emissions from heating.**

Heat networks are shared heating systems which provide a more energy efficient alternative to

domestic boiler heating systems. They incorporate systems where water is heated or chilled at a central source (such as a boiler or plant room) and then channelled to customers through a pipe network for heating, cooling or hot water use. There are two types of heat network. Communal networks serve a single building containing multiple customers, such as a block of flats or offices. District networks serve multiple buildings, such as a housing estate or university campus.

Heat networks are very popular in northern Europe but currently supply only around 2% of the UK's heat demand. However, the government is promoting this technology as

an important contributor towards its carbon-cutting targets. The sector was largely unregulated until the introduction of the Heat Network (Metering and Billing) Regulations 2014, which seek to establish some uniformity among operators in the way they bill customers (i.e. according to their actual consumption of heat) while also giving customers an incentive to reduce their consumption. The Regulations are also being used to create the first detailed register of heat networks in operation throughout the UK.

The Regulations are enforced by the Office for Product Safety & Standards (OPSS), part of the Department for

Business, Energy & Industrial Strategy. They place duties on heat suppliers, defined as anyone who supplies and charges for the supply of heating, cooling and/or hot water to customers through a heat network.

For the purposes of domestic heat supply, a user is considered a final customer where they occupy a partitioned private space intended to be used as a domestic dwelling where it meets all of the following criteria:

Office for Product Safety & Standards

## Heat Networks

**Communal network:**

- A single building
- More than one final customer
- Connected to a shared boiler or plant room

Central plant/boiler room

### What is a communal heat network?

*Communal heat network means the distribution of heat, hot water and cooling from a central source in a building which is occupied by more than one final customer. It is not necessary for the heat supply to be within the building, only that a single building is making use of the heat. For example, this includes supplying heat to a number of apartments within a single block of flats or private, enclosed offices in a building*

### What is a district heat network?

*District heat network means the distribution of heat, hot water or cooling from a central source. A district heat network is defined as two buildings or more being supplied with heat and at least one final customer. For example, this includes supplying heat to two office buildings with one (or more) legal entities inside.*

Central plant/boiler room

**District network**

- More than one building
- At least one final customer
- Connected to a shared central boiler or plant room



- It has a living and sleeping space.
- It has sanitary facilities (including washing and toilet).
- It has cooking and food preparation facilities.

Spaces that do not meet all of these criteria such as shared houses with a domestic boiler, houses of multiple occupancy or university halls of residence where some services, such as cooking, are shared are therefore not considered within the scope of the regulations. In a non-domestic setting, customers are those with the exclusive use of a partitioned space.

Heat suppliers must inform OPSS of the details of their networks, install heat meters to measure customers' consumption (where it is cost-effective and technically feasible to do so), and use those meters to bill customers by actual consumption.

The first deadline for this was December 2015, but any outstanding notifications should be submitted as soon as possible.

Heat suppliers should inform OPSS of their existing networks as soon as possible, using the official 'notification template'. This asks for information such as the number of buildings and customers on those networks as well as, for metered networks, the amount of heat generated and supplied. New heat networks should be identified on or before the date they become active.

A fresh notification form must be completed within every 4-year period thereafter. Heat suppliers will in future be required to use a cost-effectiveness tool to determine whether or not they should install heat meters.

The cost-effectiveness tool will be released following a planned consultation.

- Where the tool gives a positive response, heat suppliers will be expected to install meters and begin billing customers by actual consumption as soon as the meters have been installed.

- Where the tool gives a negative response, heat suppliers will be required to re-use the tool every 4 years thereafter.

The Regulations apply across the UK and are enforced by OPSS on behalf of the devolved governments. The enforcement approach taken by OPSS is always to help heat suppliers achieve compliance, although non-compliance can result in financial penalties. The primary enforcement approach of OPSS is to work with the regulated entity to achieve compliance before considering sanctions.

The 'notification template' is available at [www.gov.uk/heat-networks](http://www.gov.uk/heat-networks). This webpage contains guidance on the types of heat networks considered to be inside and outside the scope of the Regulations. It also contains a list of frequently asked questions.

The email address to which completed notification forms should be sent is [heatnotifications@beis.gov.uk](mailto:heatnotifications@beis.gov.uk).

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# Making the Difference: The EMA Energy Management Awards –Winners and Highly Commended

The winners and highly commended of the 4th annual EMA Energy Management Awards were revealed at a ceremony in November. The Awards celebrate excellence, innovation and creativity in the energy management sector, showcasing inspiring talents amongst energy management professionals and examples of outstanding work delivered across organisations.

**The 2018 Awards winners are:**

## Energy Manager

Martin Bilton – Gatwick Airport Limited



Martin is a Chartered Engineer, member of the Energy Institute and has over 25 years' experience in airport engineering roles covering mechanical services design, asset maintenance, contract and cost management.

As Gatwick Airport's Utilities Manager since 2009, Martin is closely involved in scoping business cases for energy projects including lighting projects, HVAC & boiler replacement and exploring options for site generation technology.

His role also covers utilities budgeting and financial control including bill validation and energy risk management; combustion permit and energy legislation compliance; utilities contract management & procurement; water asset management and environmental action planning/reporting.



## Junior Energy Management Professional Roederer Rose Lyne – University of Aberdeen

Roederer has been a member of the University of Aberdeen's Energy Management Team since the summer of 2016 when she started as an intern. She joined the team full time as a Graduate Energy Engineer in June 2017, following the completion of her Mechanical Engineering MEng (Hons) degree.

Roederer is responsible for keeping track of the savings made as part of the University's 5 year Carbon Management Plan, in addition to researching potential energy saving projects that can be added to the plan's project register.

Another key part of her role is the maintenance of the University's energy performance indicators, degree day analysis, and Monitoring & Targeting software, as well as managing the team's student and staff engagement materials and events.

## EMA Member

### Kirollus Tamer – Keltbray Group

Kiro studied an Energy Engineering and Sustainability degree and joined the industry in 2012 as a placement student. Due to the industry demand and opportunities, he was given a group role as soon as he graduated.

Kiro joined the EMA in 2014 and became an EMA ESOS Lead Assessor. Since then, he has supported the EMA by contributing to The EMA Magazine, presenting at EMEX and also hosted a members' meeting at one of his old sites.

Currently, Kiro is working as an Energy and Environmental Advisor at Keltbray Group where his role involves assessing and managing the Group's energy performance through energy procurement strategy, use of new technologies and employee engagement.



## Energy Management Team

### Marston's Plc

With streamlined efficiency, Andy, Chris and Jon's astute awareness not only help Marston's PLC operate above industry standards but placed it as a thought-leading company. In an over-saturated news period, they have remained focussed, ensuring their real long-term sustainability work speaks for itself.



The broader environmental agenda is brought to life by the team for everyone from Directors to Pubs; meaning the team's engagement with the wider business ensures they remain realistic about the impact of their ideas/trials.

No small task, but sheer enthusiasm to create a more sustainable business is only outweighed by business mind-set and dedication to create a future-proof Marston's.

## Energy Reduction Project through Organisational Behaviour Change

### Parkwood Leisure

Last winter (17/18), Parkwood Leisure ran an employee engagement campaign "The Triad Challenge". The objective of the campaign was to educate and motivate staff in 42 leisure centres across England and Wales to focus on reducing Triad transmission charges without impacting upon customer experience.



Engagement and success were continually monitored throughout the campaign and appropriately communicated back to a cost driven audience through use of league tables.

The campaign aimed to be both informative and positive to sustain momentum and continuous improvement over the 4 month Triad season. Overall the actions taken by the leisure centre teams achieved a 20% reduction in peak electricity demand, reduced carbon emissions from electricity generation as well as alleviating pressure on the National Grid during national peak periods.

### Energy Management Consultancy Service

Energy and Technical Services Ltd (ETS)

Celebrating our 20th year in business, Energy and Technical Services Ltd (ETS) is an award winning, multi-disciplinary consultancy practice, specialising in energy management, technical engineering and compliance.

We work with clients across the UK and Ireland on a variety of energy and engineering projects ranging in value from small scale refurbishments to multi-million-pound upgrades.

We are a national network of experts working with clients to develop and implement innovative solutions to the complex challenges associated with energy management. Our extensive resource of Senior Consulting Engineers allows us to connect expertise across services, sectors and geographies.



### Energy Reduction Product

Seeley International – Breezair TBSI 580

The Breezair TBSI 580 is the world's first high performance, inverter motor, axial fan, evaporative air-conditioner. With outstanding cooling performance and energy efficiency, savings up to 90% in running costs compared to reverse cycle DX.

For this award, we presented the product together with a case study of an installation at NIFCO UK Ltd, a manufacturer of components for a vast network of automotive manufacturers.



28 Breezair TBSI580 and 10 extract fans were installed in the factory to improve thermal comfort and air quality. The factory is now cooled to a more comfortable 24°C, with Breezair units achieving COPs 12.5.

### Amongst the Highly Commended are:

#### Energy Manager of the Year

Luke Olly – Co-op

#### Energy Management Team of the Year

The Energy Management Team at Bedford Borough Council  
The Energy Management Team at Rolls Royce plc  
The Energy Management Team at University of Aberdeen



### Congratulations to all of our winners and Highly Commended.

The CEO of the EMA and Awards' Chair, Lord Redesdale said: *"This year's entries were of an incredibly high standard. All winners and highly commended can truly celebrate and be proud of their achievements."*

The entries for the EMA Energy Management Awards 2019 will open in May.

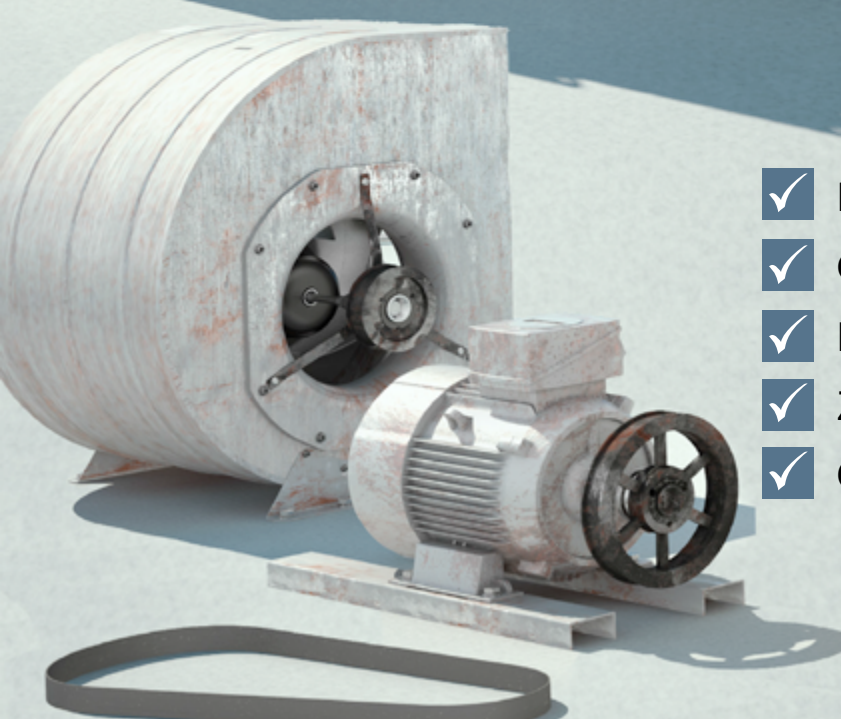


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by **JASON FRANKS**  
Managing Director at HEELEC Ltd



# EMEX Post-Show Report

**We've been so proud of the positive feedback from attendees, exhibitors and speakers. The comments come from a range of product suppliers and experts and reflect a broad cross-section of business sectors which suggests that we are providing a good depth of knowledge in the right areas.**

EMEX is very much the EMA's show; it is a way that we can get the members together and build our community. Through the seminars, we hope we offered you a wide range of topics on which experts gave up to date presentations; one of the most interesting was on climate change.

At EMEX, we're rather fortunate that we are able to separate seminars from sales presentations. The content of the theatres is uniquely programmed by Lord Rupert Redesdale, the EMA, its board and surveys of the membership. There is a real desire by senior Energy Managers to ensure that the seminars are appealing and instructive to attendees, many of whom no longer attend other events. Not only do our attendees come to hear informative presentations but they are delighted to spend the rest of their time visiting the exhibitors, playing with new technology and hearing their pitches on how they can reduce their energy bills.

EMEX exhibitors and visitors tend to use a genuine face-to-face opportunity to prod and poke innovative products and have meaningful conversations with the common aim to reduce energy consumption. This means that they are only too happy to share contact information and pursue collaborations and deals during the weeks and months after the show.

Here is a snapshot of EMEX in facts and figures:

- 4,423 attendees graced the show over two days. EMEX is UK's only stand-alone energy efficiency event, and its audience continue to represent the lion's share of UK Energy Managers.
- 112 speakers, over 130 exhibitors





and 80 seminar sessions, 8 hours of CPD credits and 1,000 attendees sit in each of the 5 seminar theatres.

Our post-show survey reveals that:

- Visitors have given an average score of 8 out of 10.
- 80% of our attendees are likely to recommend EMEX to their colleagues.
- 78% of our attendees have confirmed their intention to return in 2019.
- Our attendees spend a combined £9–12bn on energy every year, which is more than half of the UK's total non-domestic energy consumption! And over 53% will spend six or seven figures on energy efficiency.

The chart below shows the primary job functions of attendees.

Here's what some of you have said about EMEX:



Paul Noble,  
Principal Consultant  
DNV GL

*"It was great to attend EMEX to share ideas and experiences and catch up with the latest interpretation of what is next by way of regulations, technologies and opportunities. Energy management certainly is a dynamic and diverse subject at the moment for example, energy efficiency, storage, renewables, DSR and EVs..."*



Andrew Simms, author, analyst  
and co-director of the New  
Weather Institute.

*"In a bustling energy exhibition EMEXLONDON with @iemanet @PhilCHike @nickblythe & @theCCCuk we've been sparking with a fantastic, lively audience over how to deliver @RapidTransition to hit the 1.5 degree climate target"*



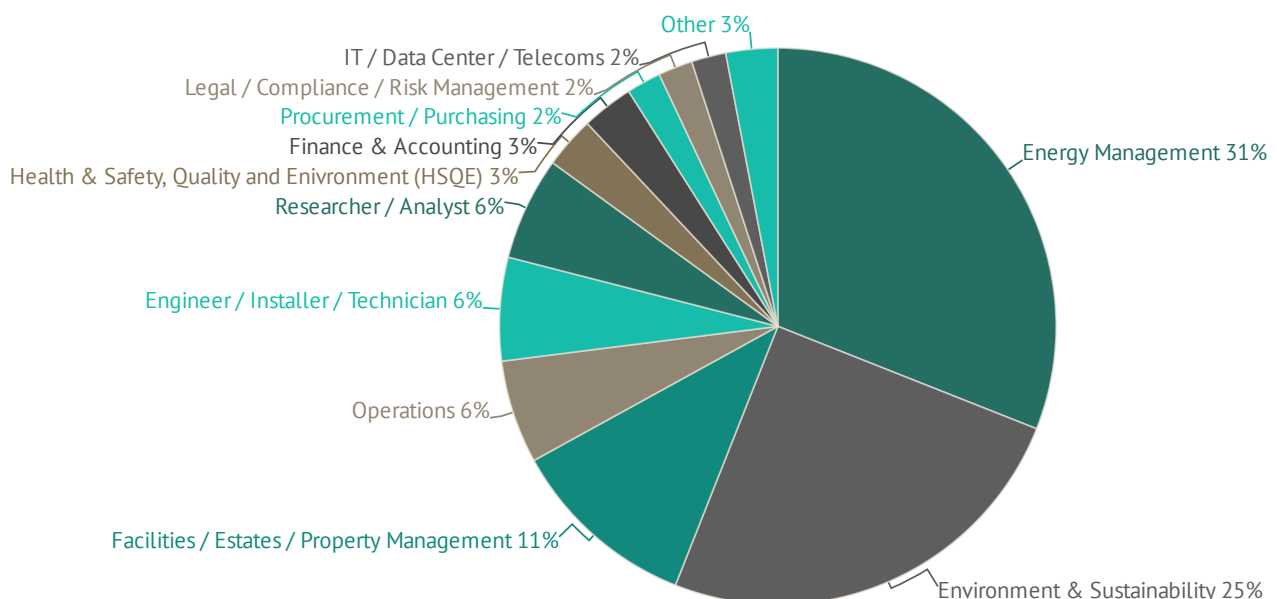
John Armstrong  
Head of Operations - City  
Energy Solutions at E.ON

*"Fantastic day at EMEX. Not only did I get to meet some fascinating people from across energy but I also got to present on the future of heat. I loved the engagement from the audience and the challenging questions."*

When it comes to important areas to watch over the coming months and year, here are the topics covered in the most attended sessions:

- Guidance on the Streamlined Energy and Carbon Reporting
- How to Develop and Successfully Present Business Cases
- Empowering Women in Energy Management
- Embracing Battery Storage as a Key Source Of Flexibility
- Road to Zero
- Energy Performance Contracts: Successes and pitfalls

- How to succeed in implementing an Energy Management Strategy
- ESOS: Reflect, summarise and prepare for Phase 2
- The Grete Policy Smog and how to navigate it
- Driving Sustainable Business: Why Generation Z is the key
- Turning Opportunities into a Sustainable Energy Strategy
- Environmental Management Systems & Auditing for Climate Change Action
- Battery Storage as a Solution
- Foundations of Energy Auditing
- On-Site Renewables in a Post-Subsidy Landscape
- Safe, Smart and Sustainable Cities
- Lighting up the dark side
- Appraising the Opportunities for Sustainable Business Travel
- Keynote Presentation by the Committee on Climate Change
- New Guidance & Standards for Climate Change Adaptation
- How to Achieve Significant Energy Savings in Legacy HVAC Equipment
- Water and Energy Auditing Techniques – Practical examples
- Sustainability as a Point of Competitive Advantage
- A Tale of Two Energy Futures
- Opportunities and Challenges of Delivering Electric Vehicle Charging Points
- Practical Approach to Waste Management





Our vision at EMEX would not have become reality without the huge commitment and active contribution from our exhibitors, sponsors, contributors and partners including:



Many of the seminar presentations are available on the EMEX website, [www.emexlondon.com/2018-seminar-presentations/](http://www.emexlondon.com/2018-seminar-presentations/)

I'd like to quote some other participants whom we thank for their on-going support – they make it easy to confirm our return in 2019 doing even more for your energy management community:



Caroline Holman, Senior Manager, Utilities Strategy & Provision, Jaguar Land Rover

*"I'd recommend EMEX to all my colleagues. It is targeted, focused and embraces the excellence of our profession while challenging perceptions and striving for greater knowledge and understanding."*



Wendi Wheeler  
Energy & Carbon Strategy  
Manager, Network Rail

*"I always find EMEX helpful for my job. Good networking platform where we also can get update on latest technologies!"* Mohammad Rafique, Energy & Environment Officer, Surrey Police

*"EMEX is a fantastic event which gets better and better each year. The seminar programme, product information and networking opportunities are second to none and are invaluable to an Energy Manager in progressing energy and carbon reduction strategies."*

*"EMEX provides both a showcase for suppliers and useful insight to Energy Managers through the*

*seminar programme. I always find it worthwhile."* Utilities, Waste & Sustainability Manager, Kingston Hospital NHS Foundation Trust

We're enormously grateful to everyone who helps make EMEX the number one event in this market place. If you want to be more involved in 2019, please see our contact details on page 4 and join a very impressive line-up.

Our energy management community plan to spend over £1bn on energy efficiency measures next year – that's an impressive figure and a great reason to continue sharing ideas and exhibiting the best products and services.

**See you on 27–28 November 2019, at ExCeL London.**

# SAVE THE DATE

# EMEX

## EXCEL LONDON

## 27<sup>th</sup>–28<sup>th</sup> NOVEMBER 2019

[www.emexlondon.com](http://www.emexlondon.com)



# Reduction in Emissions at Surrey Police

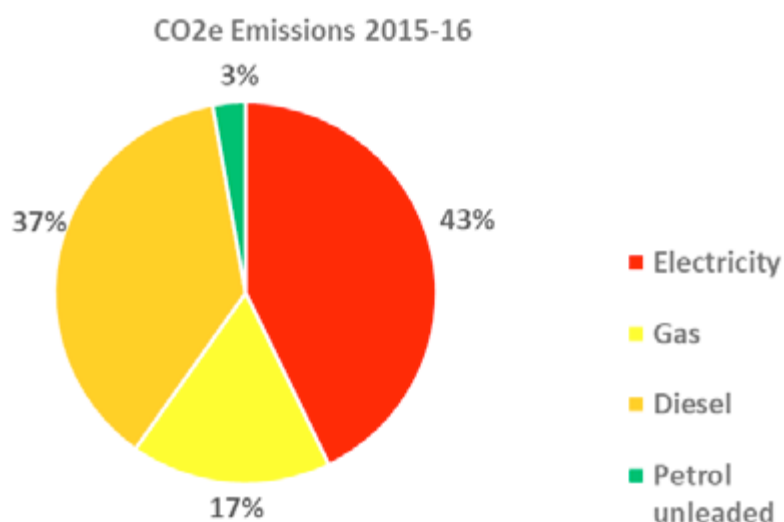
**Surrey Police is the territorial police force responsible for policing the county of Surrey in South East England. Over 3,700 employees operate from 69 different buildings, and the Surrey and Sussex Police have a combined fleet of over 2,200 vehicles. Our core activities have significant impacts on the environment, and we are fully committed to improving our environmental performance in order to reduce these impacts.**

Surrey and Sussex Police recently signed up to a joint environmental policy to deliver the forces' environmental objective to promote efficient use of energy in all of our sites and implement energy efficiency measures through an effective management system where practical. We are developing an energy and environmental management system to manage our impacts.

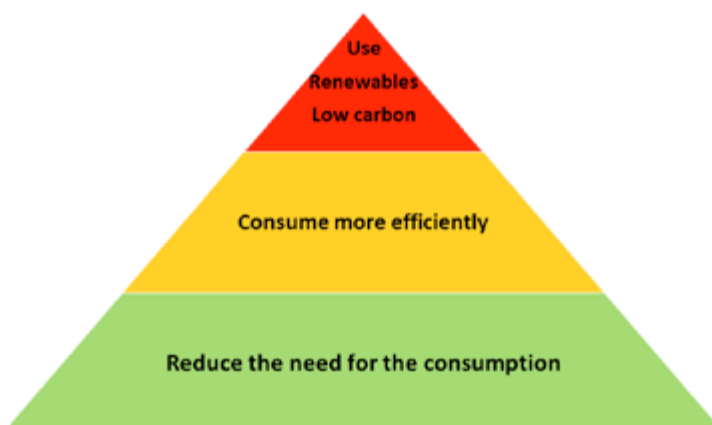
We set up baseline emissions in 2015-16 to monitor the next 5 years target performance. The Surrey Police environmental KPIs are added into the force's overall performance KPIs and performances will be reported on a monthly basis.

- % CO<sub>2</sub>e reduction from building related emission
- % CO<sub>2</sub>e reduction from transport related emission

In 2015-16, the Surrey policing operations resulted in over 9,500 tonnes of CO<sub>2</sub>e emissions. Our target is to reduce 15% of building and transport related carbon emissions by 2021-22 from the 2015-16 baseline.



The Surrey Police adopted the below hierarchy to achieve the emission reduction target.



Over 30 projects have been delivered to reduce building and transport related emissions so far and we have a number of projects in progress to establish robust energy monitoring, controls and efficiency:

- Building Energy Management systems upgrade to control heating, cooling and ventilation efficiently;
- Energy sub-metering at electrical distribution board level to avoid unnecessary usage;
- Low energy LED lightings and control;
- Automatic air-conditioning control with timer and occupancy, window/door open sensor;
  - Hot water demand sensor installation;
  - Efficient burner replacement and control management;
  - Dynamic burner management;
  - Efficient chiller replacement;
  - Solar PV installation.

The Police Fleet Review highlighted the potential opportunities to reduce carbon emissions of the owned fleet, whilst at the same time reducing the total costs of transport across the force.

To support the aims and objectives of the Environmental and Carbon Reduction Strategy and the Local Policing Plan, the force seeks to minimise the use of vehicles with high



CO<sub>2</sub> emissions. Purchases of new vehicles with a level of CO<sub>2</sub> emissions over 226 g/km will only be made where there is a compelling operational requirement approved by the Deputy Chief Constable and Director of Finance or their nominated representatives, prior to submission to the Joint Transport Board (JTB).

The ongoing level of fleet emissions is measured against target of 0.375 g/km set by the Local Policing Plan. A revised plan for a 10% reduction in this target has been agreed and will form part of the KPIs of the Joint Transport Service (JTS), which is currently being implemented.

The Head of Transport who is leading the Joint Transport Service (JTS) seeks to incorporate environmental best practice in all forms of transportation used by both forces. To this end, extensive evaluations of electric and hydrogen fuelled low emission vehicles are being carried out across both forces in conjunction with the Office for Low Emission Vehicles (OLEV) to introduce Ultra-Low Emission Vehicles (ULEV) vehicles where it is cost-effective and operationally prudent to do so.

As part of the Environmental and Carbon Reduction Strategy, 60 unmarked fully electric vehicles are deployed across the force, replacing existing diesel fuelled vehicles, which had already been identified for replacement during the 2018/19 financial year. The new vehicles will be used for non-response purposes on division and in departmental roles. Furthermore, as response purpose, the Surrey and Sussex Police will be trialling 2 hydrogen vehicles in early February 2019, one at East Surrey and one at Gatwick.

Taking this innovative step towards cutting our carbon footprint, by introducing a more energy-efficient fleet of vehicles, will not only help to save money, but will also be better for our environment, reducing our CO<sub>2</sub> emissions by an estimated 470 tonnes over the next five years. It is estimated that this change alone will initially save up to £120,000 for each force over five years, just from the reduced fuel, servicing, maintenance and repair costs.

Key to the procurement of the BMW i3s was the fact that they can be driven for over 100 miles between charges, which means they could be used on day-to-day front-line policing activities, such as being used by officers visiting victims or witnesses to take statements as part of door-to-door inquiries or by crews on short patrols. The ability to use the on board "range extending" facility to charge the battery means that this range can be extended by a further 100 miles, thus enabling them to be multi-tasked when required.

Both Surrey and Sussex Police are using the initial investment in i3s to establish ULEVs in the fleet, whilst looking for opportunities to increase the numbers over the coming years.

A charging infrastructure partner installed 70 charge points at 19 police sites across Surrey and Sussex under the Central Southern Regional Framework. This framework, run by Hampshire County Council, gives local authorities and other public bodies in the South of England the ability to procure and install charge points rapidly, without running their own tendering exercises. It also ensures a uniform public charging network across the region, both in terms of products used and





interoperability. The installed charge points use standard fast charging units capable of charging up to 22kW (approx. 3 hours for a full charge).

The two police schemes in Sussex and Surrey operate as a closed charging network – meaning only police can use these, with access controlled by Radio Frequency

Identification (RFID) cards. The monitoring portal allows the police full visibility of charge point usage and running costs. The running cost, if charged overnight, can be as low as 2p/mile, compared to 11-19p/mile for petrol or diesel vehicles, giving the police substantially reduced running costs from the purchase of their new electric vehicle fleet.



Our fleet Enterprise Resource Planning (ERP) software solution and the incoming Telematics solution will, for the first time, provide dynamic and accurate information to the driver, and monthly statistics on fuel consumption, mileage and CO<sub>2</sub> emissions to fleet management. Therefore, the end users will now have direct access to this information and can monitor their progress toward their own target of a 10% reduction in annual emissions, for a given level of mileage operated.

In an attempt to reduce our CO<sub>2</sub> emissions further, without affecting the front-line services, we also trialled a 5% bio-diesel fuel mix at one of our sites. Whilst the trial proved successful, it has been decided not to roll out the initiative, due to the conflicting guidance given from vehicle manufacturers and the current levels of bio fuel already in diesel. When a clear position emerges on whether to roll out the product across the force, it will be considered by the Joint Transport Board.

The emerging electric vehicle technology remains an option for police forces, however despite the reduced capital cost, fully electric powered cars rely heavily on infrastructure investment. ULEVs are becoming increasingly available, but still suffer from the following disadvantages:



- Lower power output compared to conventional engines;
- Poor handling, due to weight distribution - hybrids tend to be front wheel drive, with batteries at the rear;
- Higher capital cost;
- Higher and more specialist maintenance costs due to design;
- Heavier than conventional cars, therefore tyre and brake wear rates are higher;
- Challenging to multi task.

Our JTS management keeps a watchful eye on this ever-changing area of clean air zones, potential reductions in cost and emissions, and will take advantage of grants etc. to introduce such technology when cost effective and importantly sustainable. The outcome of these evaluations is helping to formulate an evolving vehicle strategy that could see:

- At least 10% (approx. 200 vehicles) of the operational fleet being low or zero emission vehicles by 2020;
- Introduction of hydrogen fuel cell vehicles by 2020;
- New response vehicles being low emission vehicles from 2025;
- The phasing out of diesel by 2030;
- Entire fleet being zero emission by 2050.

#### Author's profile:

Mohammad has been working for Surrey Police since July 2016. He is responsible for energy efficiency and emissions reduction strategy for the force. He is leading on the development of Energy and Environmental Management System following ISO guidelines and has a previous 3 years of experience on ISO certified Environmental Management System in the Royal Mail.



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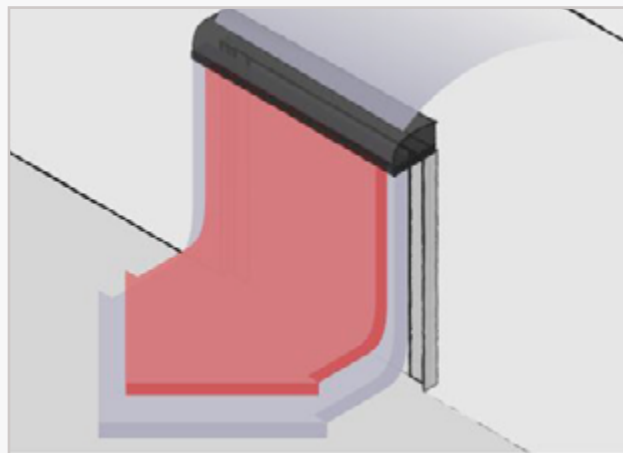
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