ROUNDTABLE REPORT

The role of FM and building services in achieving net zero and energy efficiency

In partnership with

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Institute of Workplace and Facilities Management

Contents

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Energy efficiency and the road to net zero

Net zero has been described as the new industrial revolution. As such, it presents the single biggest challenge anyone currently working in the built environment has ever faced.

It's also been described as a destination without a road map, so reaching that destination efficiently demands new ways of thinking and behaving in the FM sector.

The challenge is magnified by uncertainty over which technologies to adopt, the potentially high transformation costs of adopting them and lack of clarity in government policy, now and potentially in the future, which clouds investment decision making. Time pressures are mounting too: by 2030, emissions need to be reduced by 50%, and by 2050, net zero needs to be achieved. In London, the Mayor wants net zero carbon to be reached by 2030. And by 2035, the UK is targeted to be powered entirely by clean electricity.

To start to pick away at this mighty challenge and find some early nuggets on how best to tackle it, the IWFM invited some leading thinkers from the FM world to a roundtable discussion in London in March. The event was in partnership with HVAC manufacturer and service and maintenance provider, Mitsubishi Electric, and the combination of FM practitioners and key manufacturer proved to be very valuable, demonstrating the merits of joined-up thinking in addressing this multi-faceted challenge.

In this write-up we share some of the insights and learnings from this fascinating discussion. Among the ideas that emerged were challenging traditional thinking about investments and costs, developing an internal carbon cost to prompt progress, and encouraging suppliers to be more forthcoming with solutions. The discussion focused mainly on the engineering side of energy efficiency, but it is important to note that progress can be made with little associated costs by ensuring systems are aligned to operations and commissioned effectively. Importantly, there was a common recognition that more collaboration was needed in this field and encouragingly, Stephanie Welch of Arup commented that she had noticed more companies exchanging notes on the net zero issue in the past year.

> "There's an acceptance we're all in the same boat together, and we've all got the same problems to solve."
>
> **Chris Newman**

Collaboration is also at the heart of Mitsubishi Electric's response to net zero, as Head of Sustainability, Martin Fahey explained: "We are no longer just a manufacturer that purely supplies the product. We now offer a far more collaborative approach, with far earlier engagement in the decisions as to what product is installed and how it is installed, and we are staying involved with it throughout its lifecycle."

His colleague Chris Newman added: "What's also changing is that there's now much more transparency in the business world. There's an acceptance we're all in the same boat together, and we've all got the same problems to solve. At Mitsubishi Electric, for example, we don't necessarily need to talk about the brand but more about what the customer is trying to achieve, and whether there is technology that will help them achieve it. And we share data so that people can make better decisions."

Challenging traditional thinking about investment costs and returns

Stuart Wright of Aviva described the problem of finding the right route to net zero, saying: "There's so much uncertainty over fuel systems and technology and we've already seen so many changes of approach – be it CHP, biomass, or hydrogen.

Historically, we used to buy chillers and boilers for a 25-year investment period, but we now wonder if that should be a five-year investment. And we're being asked to commit to doing something that potentially in a few years' time will be obsolete or superseded by something else. There are lots of equipment options available, but we're all worried about buying Betamax."

Oliver Morris of CBRE agreed, saying: "with Minimum Energy Efficiency Standards (MEES) still not adopted policy, we're careful about giving advice on upgrades because in six months time the picture may have changed."

Another difficult issue is return on investment. Chris Newman commented: "This is the biggest problem that we encounter – people saying, 'What's my return on investment on this?'

"The reality is that when you're trying to decarbonise your estate, the operational cost of a building will increase in nine times out of 10 because gas is cheap. So, hypothetically, if we tell a client who wants to sign up to net zero by 2030 and wants to get off gas, we would say we've got a solution for you but it's going to cost a significant amount to install, and your operational cost is likely to increase, they're saying to us, 'What?'.

"People have to realise that low carbon is not low cost, but they also need to understand that if they do not decarbonise, then their asset might not be worth what they think it is in future."

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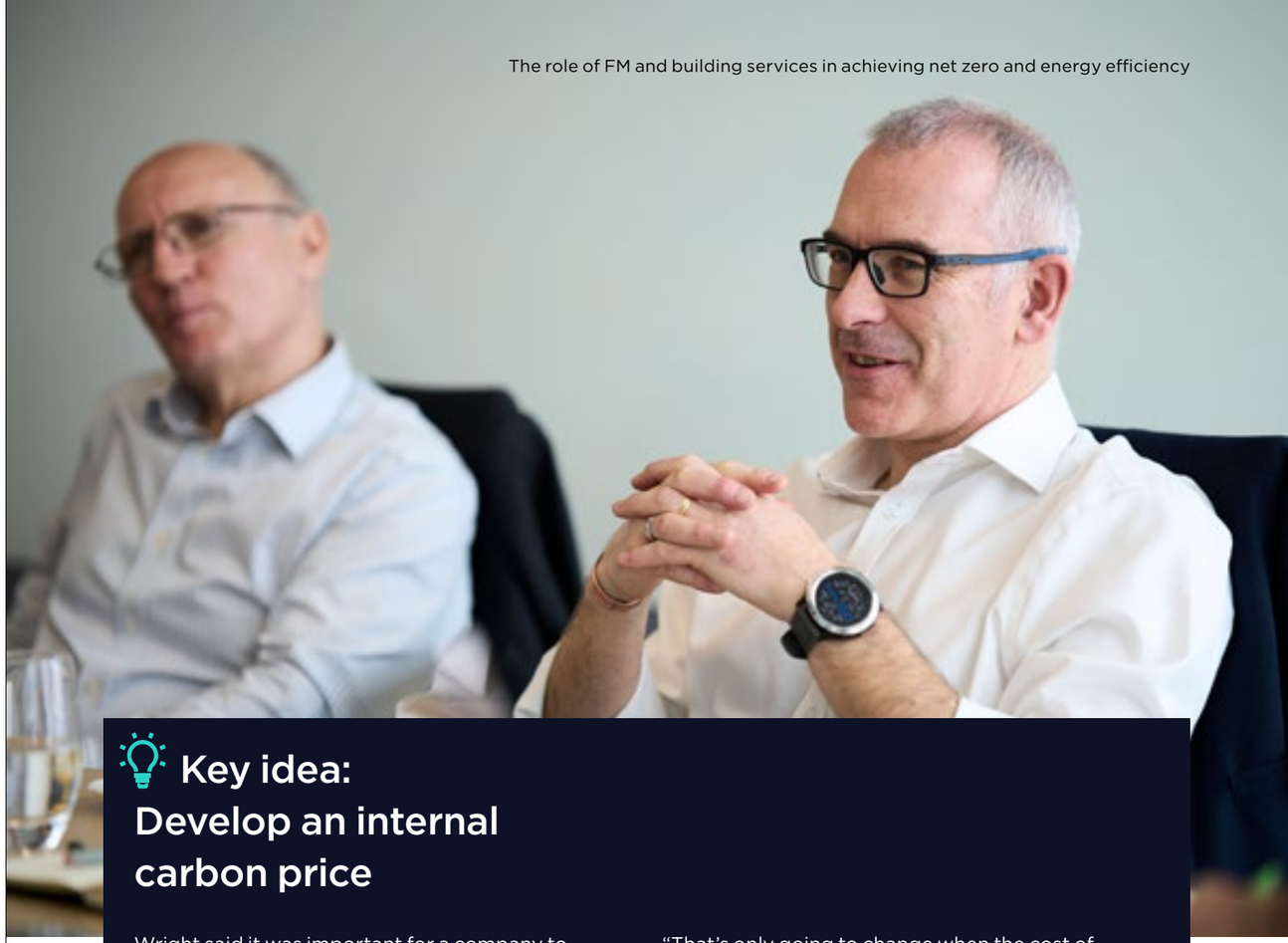
> **Chris Newman**

Stuart Wright commented: "We're currently building a wind turbine, which has a seven year payback compared against our usual much shorter in-house return on investment requirements. But we have to accept there's a balance to be struck in meeting the requirements of both net zero and our financial targets, because the reputation of the group will be based on meeting these requirements in the same way as it is with hitting our insurance numbers or investment profits. The Financial Conduct Authority is asking more questions about corporate sustainability. My business case for net zero states there's no specific return on investment, so it's not all about money now, it's about reputation too."



Key idea: Develop an internal carbon price

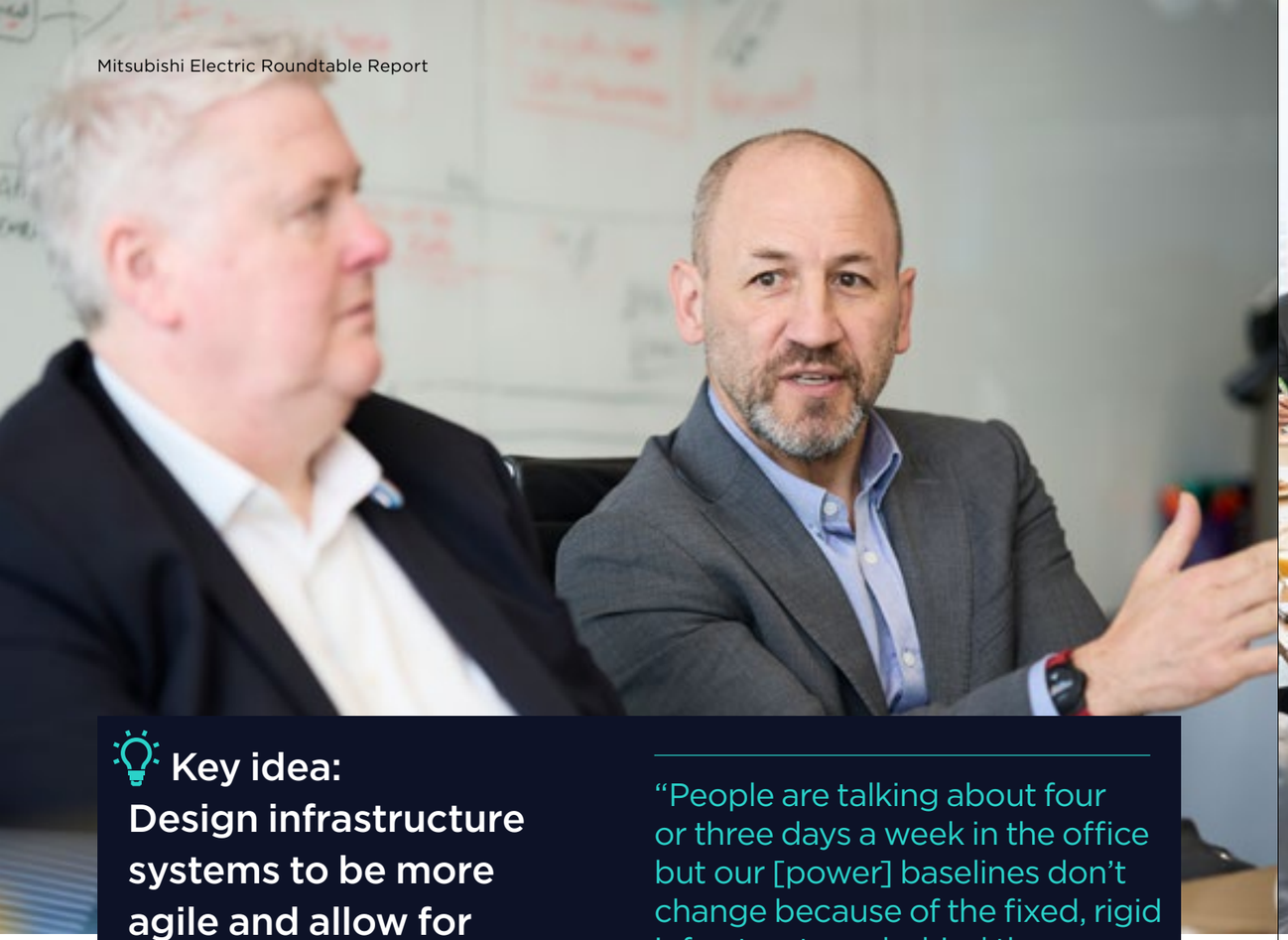
Wright said it was important for a company to develop an internal carbon price in order to make a strong business case for implementing a larger decarbonisation investment programme, and extend its payback over 20 rather than the current seven years. IWFM's Sustainability Special Interest Group (SIG), which kindly reviewed this write-up, notes that the benefits here should not be limited to carbon reduction but extend to improvements for employees.

Martin Fahey agreed: "At Mitsubishi Electric, we certainly see an internal carbon pricing mechanism as a way of holding ourselves to account – it's very much part of what we all need to do moving forward."

Chris Newman added: "Bear in mind that at the moment, it's actually cheaper to offset than it is to reduce emissions. So some companies are saying, 'We'll carry on as we are, and we'll just offset our carbon – it's only 24 pounds a ton, and we can save money off the bottom line, and can claim we're carbon neutral'.

"That's only going to change when the cost of offsetting is more than the cost of reduction, and then you'll see a major shift in the approach of companies. But first, you have to know how much carbon you're producing." The IWFM must also stress here that offsetting should only be used as a last resort after direct greenhouse gas emissions are reduced.

> "At Mitsubishi Electric, we certainly see an internal carbon pricing mechanism as a way of holding ourselves to account – it's very much part of what we all need to do moving forward."
>
> **Martin Fahey**



Key idea: Design infrastructure systems to be more agile and allow for more flexibility

For FMs trying to improve a building's energy-efficient operation, Jason Clark of UBS suggested the decarbonisation journey can be helped by "compartmentalising the infrastructure systems that support our space". He explained: "Our spaces are becoming more agile, we're using our space differently. People are talking about four or three days a week in the office but our [power] baselines don't change because of the fixed, rigid infrastructures behind them. We need to design infrastructure systems that are more agile and responsive to the way we use space now."

Office employees may need to adjust to different ambient temperatures, it was suggested. Chris Newman commented: "Historically, we all have this concept of unlimited comfort. We expect to be able to walk into any building at any time on any day, day or night, middle of the summer, middle of winter, and have the exact perfect environment that we're all looking for. And yet, at the same time, we're all desperately trying to reduce energy consumption and limit carbon emissions. There

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>
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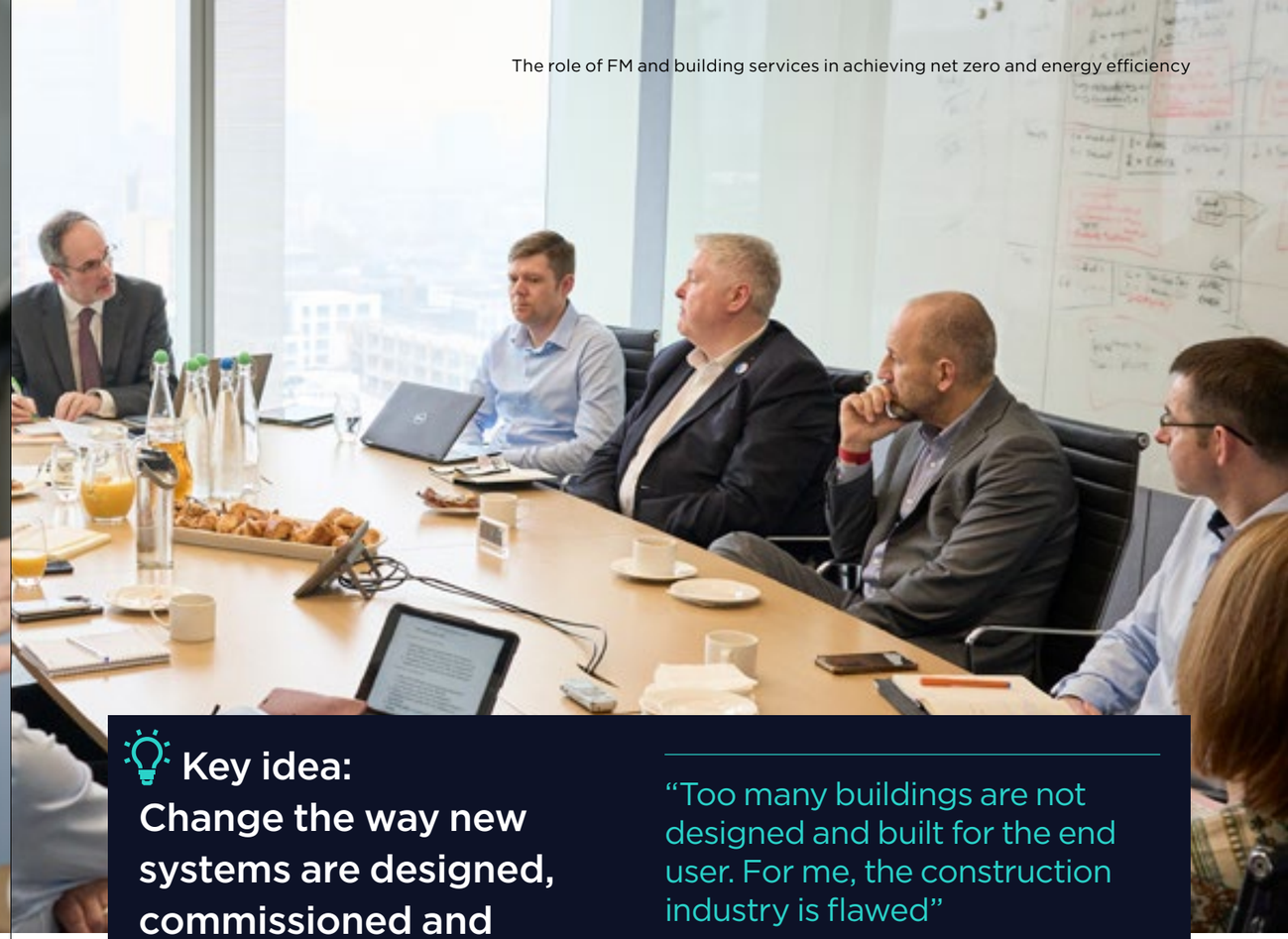
has to be a realisation that you don't really need to achieve 21 degrees in an office on a day when it's 35 degrees outside. We need to accept that the internal environment needs to be more flexible so we can save energy."

Jason Clark agreed, and added: "We're looking at zoning our buildings. We're looking at having hot places and cold places in the same building, and people can work where it suits them best."

The problem of how to 'modulate down' from a big power system to one that can serve just a few people working in an office is solvable, said Martin Fahey. "It's all about explaining that to the architect and the people doing the value engineering."



Key idea: Change the way new systems are designed, commissioned and tested

It would also help, it was agreed, if a different approach is taken to the way that newly installed systems are commissioned and tested. "Quite often in the construction process, commissioning gets squeezed and engineers aren't given enough time to properly set up and commission the systems, which is vital to ensuring the right performance from day one," explained Geoff Turton, Mitsubishi Electric's Director of the Commercial Life Cycle Group.

"Engineers often do a full load test of the cooling system in the middle of winter when there's no load on the building. But it's not a realistic test. You need to optimise the system, at part load or 50% load, in the summer, which calls for a more seasonal approach to commissioning.

"In addition, regular service and maintenance must be scheduled to ensure the optimal conditions are maintained throughout the product's lifecycle."

In Jason Clark's opinion, "too many buildings are not designed and built for the end user. For me, the construction industry is flawed. There's poor

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> **Jason Clark**

quality throughout the whole process, including the commissioning process. And we, as an industry, don't look at how that building has performed, so we don't have a way to stop making the same mistakes in the future." The importance of this point and proper communication back to the business at each of the new building stages is further reinforced by IWFM's Sustainability SIG.

It was agreed that the performance gap is a major issue for the sustainability drive. "The gap is absolutely massive", said Chris Newman. "And it's the client that pays the difference, and the occupier of the building who suffers as a result, and the lifespan of the equipment is reduced. How you solve that problem is all about front loading the project design, so you actually put more effort in at the start of the project."

Newman recommended using the NABERS UK system, which offers a rating system that helps office owners to understand their building's energy performance and provides a benchmark against other office users' performance.

Key idea: Bolster collaboration between the various external parties

A further complicating factor is that equipment suppliers are not responsible for installing a building's entire M&E system – they are only responsible for a part of it. A range of installers are involved, including for example, a hydraulics specialist, a mechanical contractor, a controls contractor, etc. – so responsibility for the system is very compartmentalised.

"What needs to happen to get to net zero" said Newman, "is collaboration. The controls engineer needs to be on site when the manufacturer is commissioning the chiller, and so do the heat pump engineer and the mechanical contractor so that they actually collaborate to get all of those things optimized and working together, rather than them all being commissioned separately."

Another problem – which many traced to the influence of Design and Build contracting – is also apparent in the way the equipment manufacturer is not involved in the early stages of the design process. For example, space allocated for plant may be totally inadequate. As a result, the manufacturer's ability to influence a building system's efficiency is severely limited and the client's desire for an energy-efficient building is unfulfilled.

> "What needs to happen to get to net zero is collaboration. The controls engineer needs to be on site when the manufacturer is commissioning the chiller, and so do the heat pump engineer and the mechanical contractor so that they actually collaborate to get all of those things optimized and working together, rather than them all being commissioned separately."
>
> **Chris Newman**

Key idea: Encourage supply chains to be more pro-active with solutions

There was a feeling amongst FMs and consultants that the supply chain should be more pro-active and come up with systems solutions that could help drive sustainability.

Stuart Wright commented: "I think some suppliers may have a perception that the client isn't interested in innovation or change. Therefore, they don't make any suggestions, when in fact the client is sitting there thinking, 'I wish they would suggest something.' But it's something we encourage and we often get good ideas from our supply chain which we can incorporate into designs.

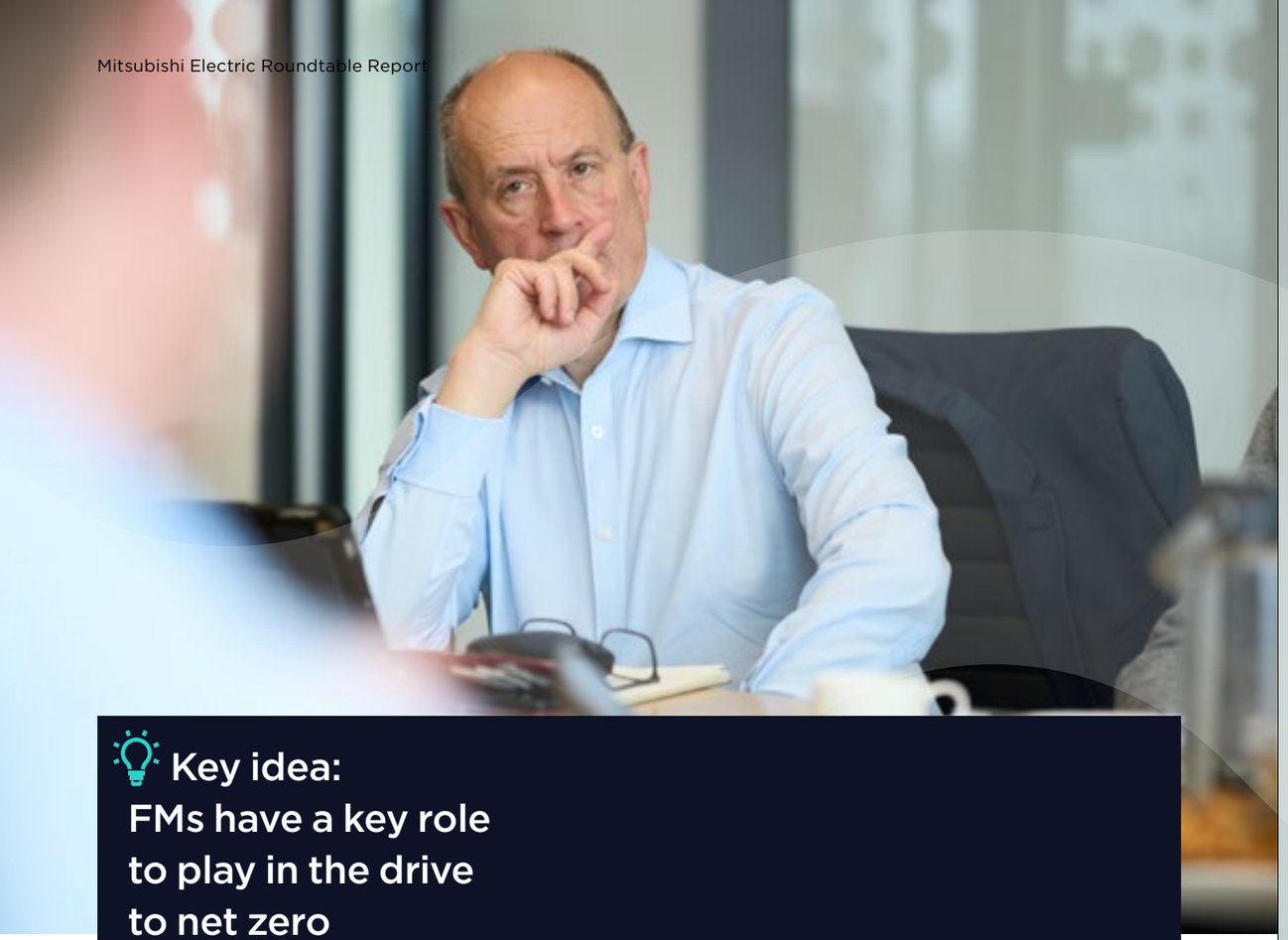
"So when a pump is at the end of its life or has failed, we don't do a straight replacement but see it as an opportunity to discuss other options. We want to have proper discussions and find out what people are working on and find out what other people's challenges are. And actually maybe just get some ideas."

Mark Griffiths was also in favour of more and better discussions with the supply chain: "Most suppliers now are, I think, quite competent at their core activity. So you can move on from the hygiene aspects to more value-added discussions. And I think people generally could be more risk aware, rather than risk averse."

Stephanie Welch suggested suppliers might consider offering two styles of approach to their clients: the traditional, 'stay in your lane' approach, which focuses on making sure the lights work etc; and a second broader, more informative approach for clients who are keen to implement more innovative solutions that will help on the road to net zero."

Chris Newman agreed that suppliers can offer clients a better solution to issues than the client may have first envisaged – as long as they have operational data to work from. "One of our clients was looking to replace an existing gas boiler with heat pumps. They had two and a half megawatts of gas boiler and therefore, wanted a two and a half megawatt heat pump replacement. But when we examined the historical data, we saw they'd never used more than a megawatt of capacity. So we suggested they install a smaller system to better match the actual load which could halve the cost of the plant replacement." This point is very relevant to retrofit projects and workplaces undergoing changing use or occupancy patterns and is a key opportunity for facilities managers to add value using real data.

One view of future technologies is that there will be a suite of technologies within the same building. For example, a PV on the roof, an air source heat pump, a ground or water source heat pump, and even a CHP. FMs would have to understand the various systems and learn how to integrate them.



Key idea: FMs have a key role to play in the drive to net zero

The problem of co-ordinating the commissioning process, it was agreed, presents an opportunity for FM to influence the building's design in the earliest stages of the project brief.

> "If you're an FM, you need to be contributing to the debate because you have the right skills set."
>
> **Mark Griffith**

Mark Griffith, of WMA Consultancy, saw FMs playing a major role in the transition to net zero: "If you're an FM, you need to be contributing to the debate because you have the right skills set."

Stephanie Welch agreed, and said that at Arup, there's been a "step change" in recognising it is important to involve FMs in the net zero debate.

"You want FM's input into the design process because they're going to be the ones that need to manage and maintain the spaces and buildings afterwards."

Jason Clark said the job of FM might usefully be separated into two distinct roles: one person who does the traditional FM duties and another who works as an interface in helping net zero developments. "You need someone on board who can work with the supply chain and look at the building's lifecycle, the way it interacts with its users and the systems technology."

He cited the IWFM's Operational Readiness Good Practice Guide, which advocates for FMs to be involved in creating a building as they understand the needs of the end-users and are responsible for day to day operation of the building. "This approach is fundamental to the way we create our buildings."

"You want FM's input into the design process because they're going to be the ones that need to manage the spaces and buildings afterwards."

Stephanie Welch

Many clients are still not measuring embodied carbon

Increasing numbers of clients are eager to know how much embodied carbon exists across their estate. Some local authorities, such as the GLA, are also asking for whole-life carbon assessments on proposed new developments. The GLA's planning authority is driving for zero carbon emissions on every new development and to impose charges on developers for any carbon emissions they create.

Martin Fahey described how Mitsubishi Electric has invested considerable effort into the complex task of measuring embodied carbon, and has gained useful insights into how it's best done.

It is fully committed to this expensive exercise, but is disappointed to find many clients are still ignoring the need to measure their embodied carbon. Until government legislates to compel companies to make carbon calculations, there's a widespread feeling amongst manufacturers that the investment they're making to measure embodied carbon is not valued by sufficient numbers of companies, and therefore progress towards net zero is being hindered.

CIBSE's TM65 embodied carbon calculation methodology provides a valuable framework to work with, but there is still confusion about how to standardise the data that individual companies are measuring. More transparency is required so that all companies are calculating their embodied carbon in the same way. The UK Green Building Council is looking to resolve the issue and create guidance for the built environment sector.

KEY TAKEAWAYS

- Participants were encouraged that end-users and manufacturers are talking to each other about innovation and the best way forward.
- There was a clear recognition that traditional thinking around investment and costs had to change for net zero.
- Organisations were encouraged to develop an internal carbon cost to hold themselves to account.
- There were calls for infrastructure systems to be more agile and for there to be more flexibility around internal environments.
- Collaboration was recognised as being key at commissioning stage, handover stage and very much through the maintenance life in order to deliver sustainability outcomes.
- Suppliers and supply chains were encouraged to be more pro-active in coming up with solutions to support the drive to net zero.
- A common call was for FMs to step up and recognise that they have central role to play in this area.
- Data needs to be measured consistently, standardised, and available from one source – to provide a data dashboard that's used across the sector.

Participants

Stephanie Welch
Arup

Stuart Wright
Aviva

Oliver Morris
CBRE

Richard Latchford
IPUT Dublin

Martin Read
Editor, Redactive

Martin Fahey
Mitsubishi Electric

Chris Newman
Mitsubishi Electric

Geoff Turton
Mitsubishi Electric

Jason Clark
UBS

Mark Griffiths
WMA Consultancy

Guidance checklist

- Challenge traditional thinking about investments and costs
- Progress no/low-cost options like ensuring systems are aligned to operations and commissioned effectively
- Develop an internal carbon cost/carbon pricing to prompt progress
- Encourage suppliers to be more forthcoming with solutions
- Collaboration with other companies could be a useful shared resource
- Stakeholder collaboration and earlier engagement in decision making in relation to what/how equipment is installed
- Make sure to use and share data in an optimal manner, to ensure better decision making
- Understand that low carbon does not mean low cost
- You must know how much carbon your organisation is producing
- Carbon offsetting should only be a last resort to mitigate any remaining carbon emissions, after exhausting all other approaches in the energy hierarchy. When using carbon offsetting, great care must be taken to use only reputable schemes so as to avoid greenwashing. Carbon offsetting costs can vary widely
- Think about designing infrastructure systems that are more agile and responsive to how space is used now
- Look for flexibility regarding internal temperatures in order to save energy
- Think about a different approach to commissioning of newly installed systems
- Look for external and auditable benchmarking systems that provide a benchmark against other users
- Collaboration between specialists is required during the commissioning phase
- Influence of Design and Build contracting – (the equipment manufacturer is not involved in the early stages of the design process, so space allocated for plant may be inadequate)
- Be more risk aware rather than risk averse
- Ensure operational data is available when looking to replace systems, and consider replacing with smaller systems rather than like for like
- As an FM, not only do you have the skills required, you play a critical role in the net zero debate. After all, FMs play a unique role in bringing together the needs of the landlord, end user and supply chain
- Work with the supply chain and look at the building's lifecycle, the way it interacts with its users and the systems technology
- Measure and report Scope 3 emissions associated with FM services and building operations
- Know how much embodied carbon exists across your estate.

Appendix:
Useful reference material

Guidance Notes and Toolkits

IWFM Net Zero Toolkit with Inenco
www.iwfm.org.uk/resource/what-to-consider-when-developing-a-holistic-net-zero-strategy.html?parentId=D63EF145-2B71-4271-8BB9698C2C886CDB

Roundtable Reports

Navigating a changing energy landscape in the transition to net zero
www.iwfm.org.uk/resource/navigating-a-changing-energy-landscape-in-the-transition-to-net-zero.html?parentId=4450579B-41B1-452B-98851409E1AA7B2C

Report

Sustainability Survey 2022
www.iwfm.org.uk/resource/sustainability-survey-2022.html?parentId=4450579B-41B1-452B-98851409E1AA7B2C

Webinars

‘Scope 3 Building a Greenhouse Gas Inventory’ with the IWFM Sustainability SIG
www.iwfm.org.uk/resource/scope-3-building-a-greenhouse-gas-inventory-with-the-iwfm-sustainability-sig.html?parentId=6EEB6BF6-4FCF-41AB-B122A99218E277B3

‘Sustainability trends in FM: carbon and net zero, circular economy, and wellbeing’
www.iwfm.org.uk/resource/sustainability-trends-in-fm-carbon-and-net-zero-circular-economy-and-wellbeing.html

‘Agents of change: from net zero promises to genuine progress’ with Inenco
www.iwfm.org.uk/resource/agents-of-change-from-net-zero-promises-to-genuine-progress-with-inenco.html

‘ESG – Who cares wins’ in conversation with EMCOR UK
www.iwfm.org.uk/resource/esg-who-cares-wins-in-conversation-with-emcor-uk.html

‘Raising FM’s value through accurate emissions measurements’
www.iwfm.org.uk/resource/raising-fm-s-value-through-accurate-emissions-measurements.html

‘Beyond operational carbon: the importance of embodied carbon’
www.iwfm.org.uk/resource/beyond-operational-carbon-the-importance-of-embodied-carbon.html

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We exist because workplace and facilities management transforms organisations and enhances experience. We empower and enable workplace and facilities professionals to expand their potential and have rewarding, impactful careers. We are a business enabler. Together, we optimise the profession's impact. Our vision: where every workplace delivers.

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