

REPORT: FM PROFESSIONALS' EXPECTATIONS AND EXPERIENCES OF IMPROVING THE USE OF ENERGY

2014

The Facilities Management professionals' "experiences and expectations of improving the use of energy" online survey was conducted during October 2013 by the National Energy Foundation (NEF) in partnership with the British Institute of Facilities Management (BIFM) Sustainability Special Interest Group. The survey aimed to establish where energy use falls on the FM agenda and identify how FM professionals are tackling the gap between actual and predicted energy performance in buildings. Online responses were supplemented by mini-interviews held at the Sustainability SIG AGM on 25 October 2013.

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Foreword

LUCY BLACK
CHAIR, SUSTAINABILITY SPECIAL INTEREST GROUP,
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“Energy use is a critical element of organisations’ overall sustainability strategies, playing as it does a key role in their environmental and financial impacts. Whilst energy use has received a lot of attention over the last decade, the survey has shown that there is still considerable scope for improvements. While many respondents believe that technologies will help reduce energy consumption, very few are using existing technologies to that end. Alongside this, there remains the ongoing holy grail of how to achieve behaviour change. Technologies and behaviour change need to be progressed together to deliver the maximum impact. With only a small number of organisations sharing their data publicly, there may also be a lack of good comparison information to help facilities managers improve performance in their buildings. Bridging the landlord-tenant responsibility is an ongoing barrier for many and unsurprisingly, cash is king when it comes to investing further in these cash-strapped times.

Facilities managers’ estimates that they could save 10% of energy use sits worryingly against the national reduction targets, and indeed the international needs in relation to climate change. It is to be hoped that this report will add to the debate on how to deliver further reductions in future.”

DR KERRY MASHFORD
CHIEF EXECUTIVE, NATIONAL ENERGY FOUNDATION



“Facilities Management professionals are uniquely placed to influence the extent and type of energy consumed when buildings are in use, often having to navigate through the less than perfect circumstances they have inherited.

The survey has highlighted that the twin drivers – finance and environment – are pushing closer investigation into the use of energy in buildings, regardless of sector or type of organisation. Long term trends in managing energy use, by nearly all organisations, means we are closer to understanding where, when and how energy is used. With energy security increasingly a concern, this is essential. Many FM professionals were working around constraints such as inadequate or non-existent sub-metering. Equally, the survey highlighted that information about how buildings are actually performing in use could be more widely shared. In many ways, this could be our greatest responsibility and gift to our peers.”

Key findings

The FM profession is clearly fully committed to improving the use of energy– with energy efficiency remaining a high priority. The survey highlighted a sophisticated understanding of the interplay of technology, behaviour and process factors in realising potential savings.

However, the survey findings suggest that the metering and monitoring tools to help improve the use of energy are still not widely used, evidenced by a lack of confidence in baseline measurements, limited access to real time data and the prevalence of a manual meter reading system for monitoring and tracking purposes.

Worryingly, over 30% of respondents stated that they do not compare the building(s) energy performance over time or externally, and nearly half do not know how the actual performance compares with how it was designed to perform (regardless of the accuracy of the design assumptions).

There is not a culture, yet, of sharing energy performance data externally. Benchmarking was most commonly used to compare energy performance more closely within their own stock, and as a starting point for investigations into changes in building occupancy or projects deployed.

The survey uncovered a sense of caution – or lack of optimism - on what further energy efficiency improvements could be made. More than two in five respondents estimated that, even if the most important energy improvement factors they identified were implemented, there is still a relatively small prize on offer of up to a 10% improvement in the use of energy without significant investment.

There is a sense that it is getting harder to make significant year on year reductions due to improvements so far. This runs counter to research that suggests measures such as energy surveys can still typically identify no/low and medium cost savings opportunities of up to 20%.

Leadership was highlighted as an important driver for empowering action. As one respondent succinctly put it;

“I firmly believe that buy-in from CEO's, COO's & MD's is imperative to the success of any initiative. This has been achieved by emphasising the current spend and projected spend over the next 5-10 years. This puts into perspective the realisation of the impact of energy consumption when it is related directly to the P&L”

75%

said improving the use of energy is a 'top 5' organisational priority

30%

do not compare buildings' performance over time

1 in 7

have shared energy performance data publicly

90%

know their buildings' annual 'energy' spend

2 in 5

did not know how energy performance compared to design

1. Who shared their views?

ABOUT THE RESPONDENTS

The 62 respondents were predominantly at manager level or above (93%), and nearly a fifth of these are senior executives or equivalent. There was an equal split of public and private sector respondents (43% each). One in four respondents worked in large organisations with over 5000 employees, while nearly half of respondents worked in SMEs (22% in organisations with 50-249 employees, 20% in 250-499 employees).

Nearly 90% of respondents had responsibility for office buildings within their roles, with the education sector also represented in a quarter of respondents' remits. Most were responsible for more than one building; over half of respondents were involved with less than 10 buildings, while one in four were concerned with a portfolio of 50+ buildings. In terms of the age of the building stock, three quarters of respondents were dealing with buildings 20 years or older within their range of responsibilities.



Fig 1: Organisations' annual turnover

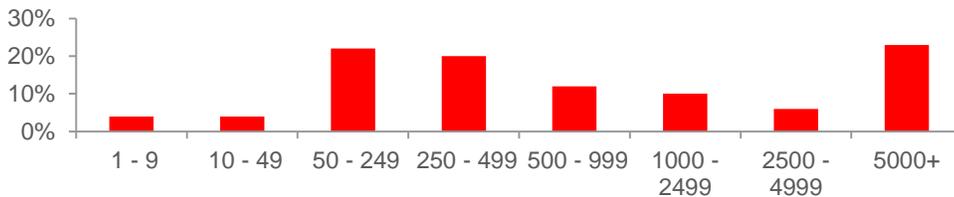


Fig 2: Number of employees

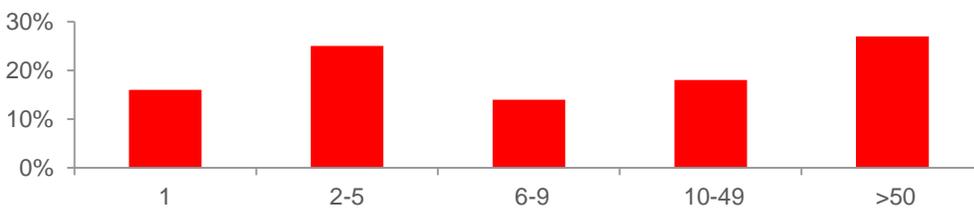


Fig 3: Number of buildings for which responsible

2. Improving energy use is firmly on, and rising up, the corporate agenda

The good news is that improving the use of energy is firmly fixed near the top of the corporate agenda. When asked where improving the use of energy came on their own priority list, **86%** of respondents put it in the top ten, of which **75%** had it as a top five or the number one priority. This is clearly not surprising for the sustainability/energy manager respondents, but there is some evidence that it is either firmly fixed or rising up the corporate agenda too: The focus on improving the use of energy is either a rising priority (for **31%** of respondents) or a continuation of strategy, with the majority (**61%**) of respondents saying that this is about the same priority level as last year.

Several respondents working in a multi-tenanted building setting emphasised the boundaries of their ability to influence energy consumption. Although one respondent shared: “We have agreed with Contractors - Owners of Leased Premises, to include it in the contract management plan, as [an] obligation”.

Interestingly, **15%** of respondents stated it wasn't a priority this year. Comments suggest that this is, in some cases, because all the “low hanging fruit/quick win” projects and energy savings had been made. Significant investment (e.g. new plant) would be required for another step-change – and the funds just aren't available.

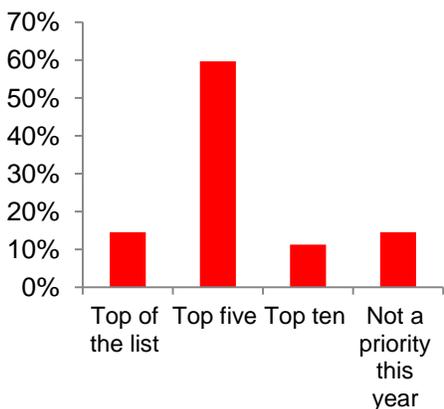


Fig 4: Where does improving the use of energy or energy efficiency feature in your priorities?

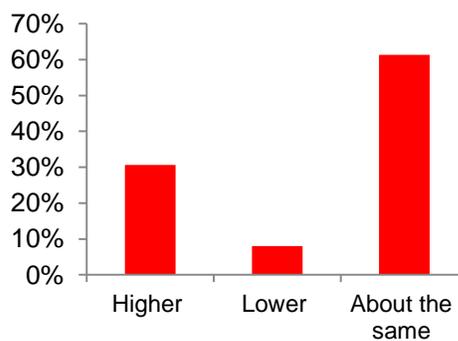


Fig 5: Compared to last year, is this higher, lower or about the same?

“Top of list for sustainability team, top 5 for organisation”

“Clients do not want to incur investment cost they cannot recover from a landlord building”

“As a tenant in a multi-tenanted building there is limited scope for energy efficiency”

3. Targets: Relative reduction is top of the list

Nearly a third (**30%**) of respondents did not have an energy use or efficiency improvement target, and comments suggest that lack of baseline data is one cause of this, rather than an issue about its relative importance. Targets are being set 'top down', often coming from an organisational target to reduce energy consumption, or CO2 emissions.

There were cases of success to celebrate, emphasizing a long-term, on-going commitment to improving the use of energy. The vast majority of organisations (**74%**) are working towards a percentage reduction in energy usage, while **26%** were focused directly on the cost reduction. A couple of respondents cited their CO2 reduction targets too.

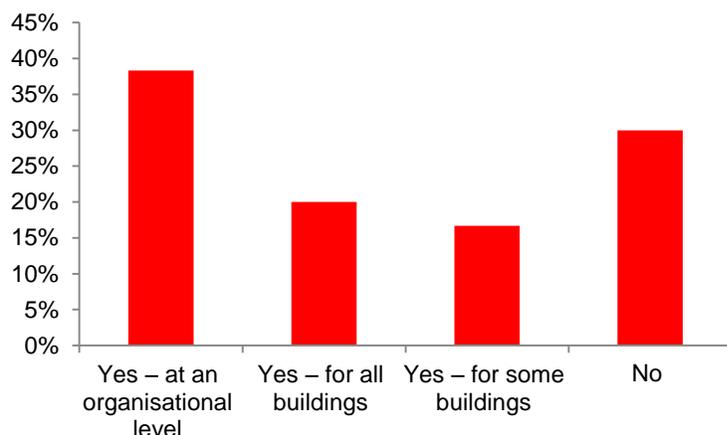


Fig 6: Do you have an energy efficiency or energy use improvement target?

One respondent pointed out that long-running reduction targets were increasingly difficult to achieve due to past successes. Another respondent highlighted the challenges of ongoing comparison when the baseline data wasn't as robust as they would have wished. When asked how realistic they thought the targets were, respondents showed mixed levels of confidence: **40%** felt they were unrealistic or gave a neutral response, while **45%** thought they were quite realistic and **14%** were confident they were very realistic.

“Target is to achieve a 15% reduction by 2015 my building has achieved 22% reduction by 2012/13 ... so we are setting new challenges”

“We have a national target to reduce carbon emissions by 5% [across] all FM managed buildings. We have already achieved a 38% reduction from a baseline year of 2006/07, so such reductions are getting harder”

“[we’re] not very accurate in measuring a baseline against which target is set”

FM PROFESSIONALS' EXPERIENCES AND EXPECTATIONS OF IMPROVING THE USE OF ENERGY

Renewables had a low profile across all respondents, none of whom had a renewables usage target. It is recognised that there can be issues associated with longer term investment in renewables, particularly where the landlord would need to be responsible. The new financial incentives are in place to support the development and adoption of new renewable energy projects, including the Renewable Heat Incentive and Feed in Tariffs, provide government funded payments for each kWh of renewable energy generated. In some cases, such an income stream might make implementing renewables a more viable option, if payback periods are tolerable.

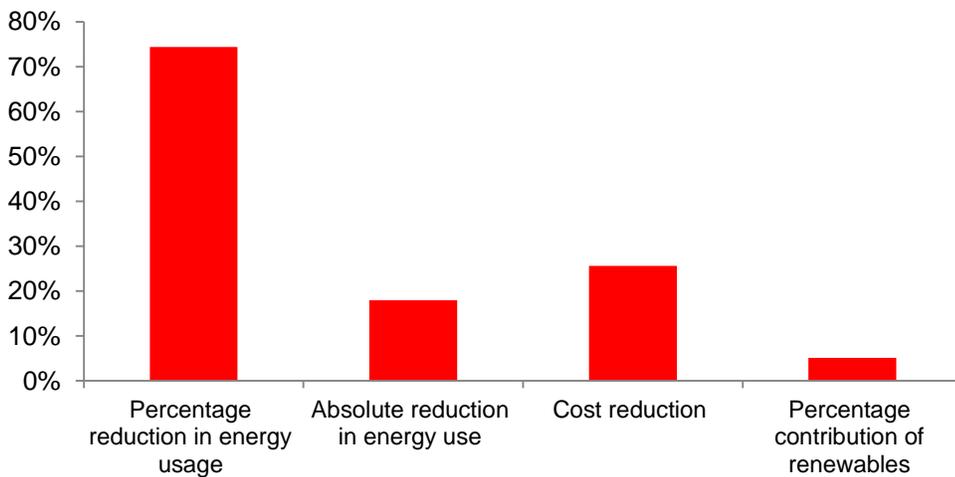


Fig 7: Types of energy target being used

4. Cost is in the driving seat

While cost is clearly in the driving seat when it comes to investing in improving the use of energy, it is still not a completely clear picture of how much energy usage is actually affecting the balance sheet.

The good news is that **90%** of respondents knew the annual energy spend for at least some of the buildings they were involved with, while over three quarters (**76%**) of respondents had energy consumption data available. Many respondents shared that this information is available mostly on a monthly or quarterly basis, with monthly breakdown.

This still leaves the FM or energy specialist using retrospective information, or “driving forwards using the rearview mirror”.

A couple of respondents highlighted that information was not readily available, making tracking energy usage costs extremely difficult. This is likely to have a detrimental effect on changing behaviour or processes to achieve reduction targets - or even setting targets at all.

“We receive billed data quarterly (but with monthly breakdown”

“[Access is] only when requested. Information is not freely available”

“There is a monthly budget review”

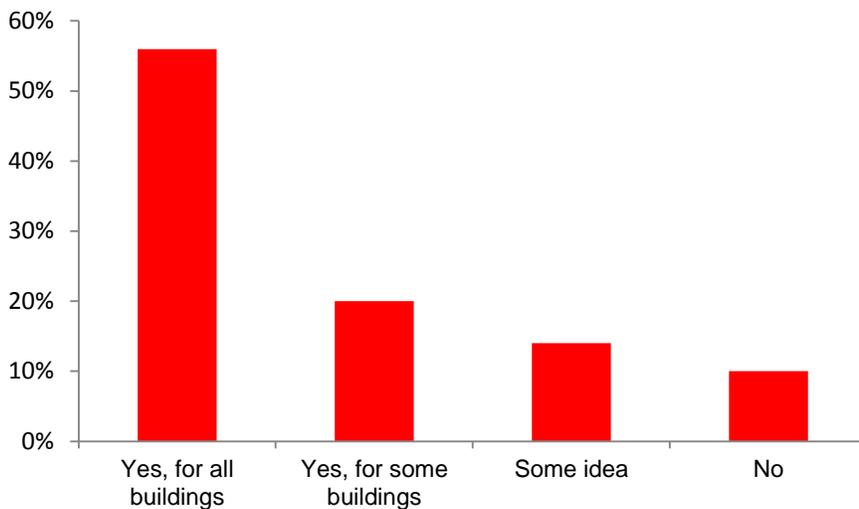


Fig 8: Do you know what the current annual spend on energy is for your building(s)?

5. Access to budget

While nearly **a third** of respondents had a dedicated budget for energy improvement measures to draw on, most respondents (**44%**) used a case by case approach, e.g. business case or funding applications, to access capital expenditure for energy use improvement initiatives. One in five respondents did not have, or were not likely to have, a budget for energy use improvement measures. Again, for those responsible for leased office buildings, opportunities can be more limited, as it is the landlord's responsibility.

Longer term the aim should be to develop a coherent programme of quantified and prioritised improvements, which can be developed into a compelling business case for investment and a dedicated budget. This enables improvement projects to be phased and coordinated which can bring extra benefits. A robust programme of projects will also provide a better opportunity for internal engagement at senior level and across the organisation. An energy management programme, a programme of projects over short, medium and long term to deliver savings to target, needs to be part of a wider business case for investing in energy efficiency.

As one respondent commented *"the budget comes once the opportunities have been identified and costed, the business case can then be made, including savings, costs, wider benefits etc"*.

"Small to medium companies/ organisations don't have either the funds, or expertise to implement radical energy saving solutions"

6. Monitoring is hindered by data quality and frequency

One in five respondents had a daily (or more frequent) view through dashboards of how the building(s) performed. Monthly consumption data is still the primary data tool available with which to navigate the complexities of energy management. The most commonly available forms of energy usage data are dashboards and exception reporting – on a monthly basis. Even exception reporting is primarily a monthly report, and not received at all by **42%** of respondents. Many buildings are poorly served by sub meters, either they are not present or those that are, are not functioning correctly. FM and energy professionals are constrained by not having access to the scope and quality of data they need. This lack of data also translates to difficulties in developing a baseline, as noted in the earlier section.

Respondents clearly aim to use the most 'current data' available. This enables site knowledge and insights to be engaged at the same time as the data emerges. It also enables action to be taken quickly, to minimise waste or take opportunities as soon as they arise. However, it needs to be recognised that there are limiting factors associated with resources available to review and interpret data and to act upon it.

	Don't receive	Daily	Weekly	Monthly	Quarterly	Annually
Dashboards/comparison	40%	19%	4%	21%	15%	0%
Exception reporting	44%	10%	12%	20%	12%	2%
Process management	56%	2%	10%	17%	7%	7%
Volume consumption	14%	14%	9%	41%	16%	5%

Table 1: Types and frequency of energy usage data received

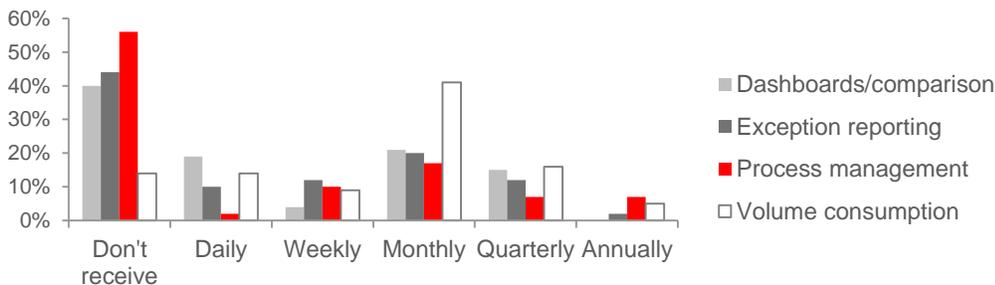


Fig 9: Frequency with which different types of data is available

“Real-time energy reporting and monitoring varies across buildings”

“It has been extremely difficult to gain accurate information”.

“Frustrating that a fit-out only 5 years ago did not adequately establish sub-meters by function”

“Most of our buildings are fitted with half hourly data recorders for both electric and gas which are accessible through a monitoring and targeting website. Billed data is linked to AMR readings”

7. Methodologies used for measuring consumption

All respondents understood that only real and regular data will provide real insights, yet many did not have as much access to this as they would have liked.

Whilst not an energy consumption measure, EPCs are used by more than one in five respondents (**23%**) as part of their “energy performance” toolkit and decision-making processes. Over a third of respondents are using Building Management Systems (**40%**), while a simple process of manual meter readings, captured monthly in an excel spreadsheet, was cited as the preferred methodology by many respondents (cross referenced with annual supplier statements).

As mentioned in the previous section, there are a range of routes to carrying out the evaluation - from in-house simple data collection and review on site, to employing third party bureaus.

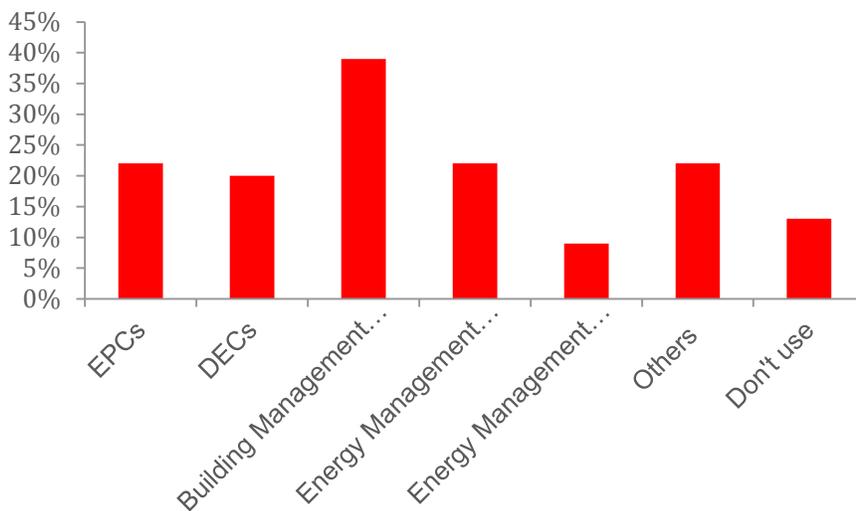


Fig 10: Do you have an energy efficiency or energy use improvement target?

“Issuing half yearly bills does not help - it is summer by the time they realise they had a problem the previous winter”

“Data quality is the key and although we have AMR we are a little blind on specifically what end uses are responsible for energy use within our buildings. Sub metering costs are prohibitive, so we have to estimate the impacts of lighting, cooling and IT infrastructure”

8. Benchmarking is an internal affair

Three quarters of respondents have been measuring the building(s)' energy consumption for over two years, and nearly **two out of five** respondents have been doing so for more than six years.

Benchmarks undoubtedly have a use in giving a 'ball park' from which to compare more closely within their own stock, and as a starting point for investigations into changes in building occupancy or projects deployed. The most popular form of benchmarking used by respondents is to compare year on year performance of the building. Worryingly, over **30%** of respondents stated that there isn't any comparison.

Some respondents questioned if all benchmarks are still relevant, with updates needed in many sectors and in some cases, new benchmarks too. Online benchmarking tools, such as CarbonBuzz and SMeasure, enable buildings to compare their performance, however these are based on small populations.

It was widely recognised that comparing the same building (with itself) over time can also highlight areas for improvement. A building which improves 2% year on year against itself, but which starts from a very low base, still has poor performance.

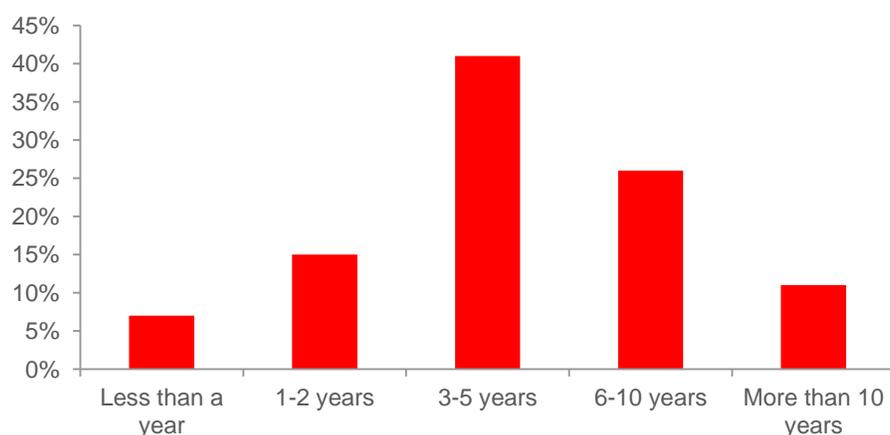


Fig 11: Length of time energy consumption has been measured

“Experience in use of benchmarks has proved quite misleading - so many variables involved”.

“Shared on own website and DECC website”

“We have shared all our DEC properties on Carbon Buzz”

FM PROFESSIONALS' EXPERIENCES AND EXPECTATIONS OF IMPROVING THE USE OF ENERGY

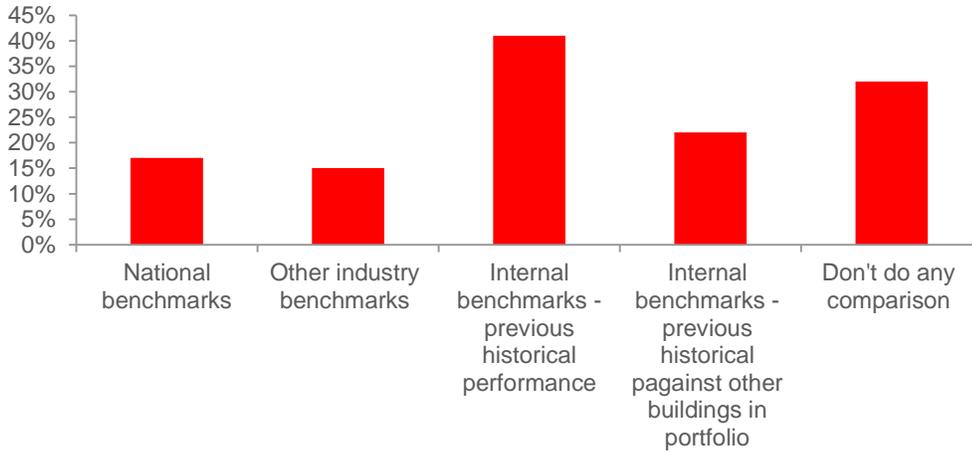


Fig 12: Comparing the performance of your buildings

This 'internal focus' was further highlighted by only one in seven of respondents having shared energy performance data on any of the publicly accessible building performance databases. Nearly three quarters (**73%**) of respondents had not shared the energy performance data of their building(s). This represents a missed opportunity to move forwards shared knowledge of comparative real-life performance in use.

Worryingly, nearly half of respondents did not know how their building(s) energy usage compared to how it was designed to perform - although this is only relevant for buildings of a certain age.

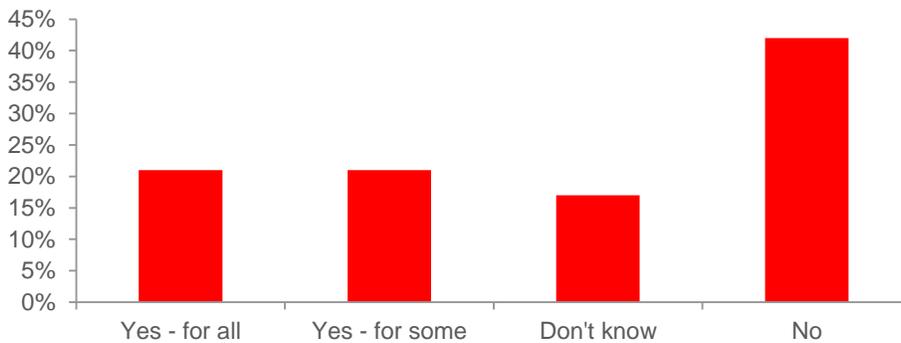


Fig 13: Knowledge of building(s)' energy usage compared to design

9. The size of the prize

“Technology” was identified as the most important factor that would most improve the use of energy in buildings by nearly half (48%) of respondents, who were referring to large scale capex projects, such as new plant. However, it is not technology alone – as just over two in five respondents cited “behaviour” as the most important factor. Either respondents were accepting that large-scale improved infrastructure projects were going to be few and far between or outside of their control – or more likely, there is a widely recognised interplay of these two factors – it is how it is used rather than technology alone that will achieve the outcome sought.

“We tend to follow a hierarchy: behaviours / management, then investment in efficient kit / plant before looking at micro generation (renewables)”

	1st	2nd	3rd	4th
Technologies (e.g. new plant or new/additional controls)	45%	28%	14%	5%
Behaviours (e.g. FMs, organisation's leaders or occupants)	42%	23%	23%	12%
Processes	4%	35%	40%	17%
Offsetting/certification	2%	12%	15%	54%

“Leadership”

Table 2: Rankings of the “top three measures which would most change / improve the use of energy in buildings”

“Initial design for new build projects is critical”

The graph below highlights how respondents weighted the interplay of the three factors – technologies, behaviours and in a supporting role, processes – in improving the use of energy in their buildings. In fact, it was only offsetting and certification which was seen as having a limited impact by most respondents, and falling firmly into last position in the rankings.

“Quick Wins and Just Do Its”

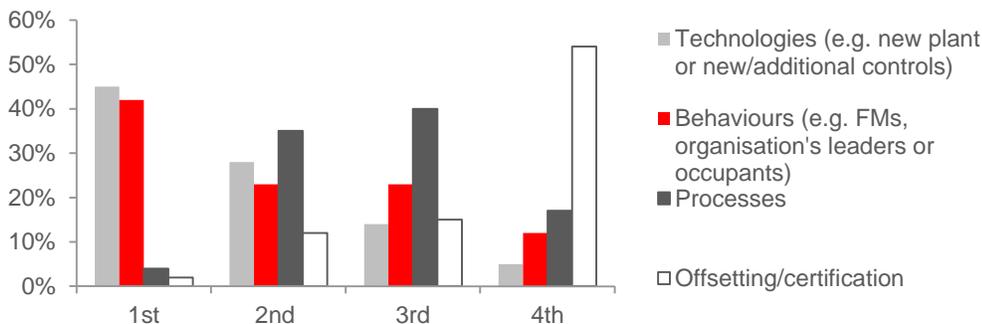


Fig 14: Rankings of importance where 1 = most important

10. Realistic expectations – or substantial investment

More than two in five respondents estimated that, even if the most important factors were implemented, there is still a relatively small prize on offer of up to a **10%** improvement in the use of energy.

There is a sense of “It is what it is” without significant investment and depending on the building in question, and also a recognition that it is getting harder to make significant year on year reductions over time.

Short payback requirements, lack of accurate sub-metered data, and a silo approach to projects are all limitations. Yet several respondents stressed the importance of a whole building approach, and the benefits this brings. **“To get the most benefit one must consider each stage if the life cycle of a building from design, build, commissioning and use, and take into account user needs and behaviour in the design phase as well as ongoing monitoring in the operation phase to ensure planned meets operational targets”**

Yet 10% is considerably less than the savings found by the best energy improvement projects. There is evidence to indicate that many buildings offer significant opportunities to save. Basic good management practices underpinned by monitoring can achieve savings of up to 15%. Energy surveys can typically identify no/low and medium cost savings opportunities of up to 20%. Investment and medium to longer term opportunities can offer savings of over 30% in many buildings.

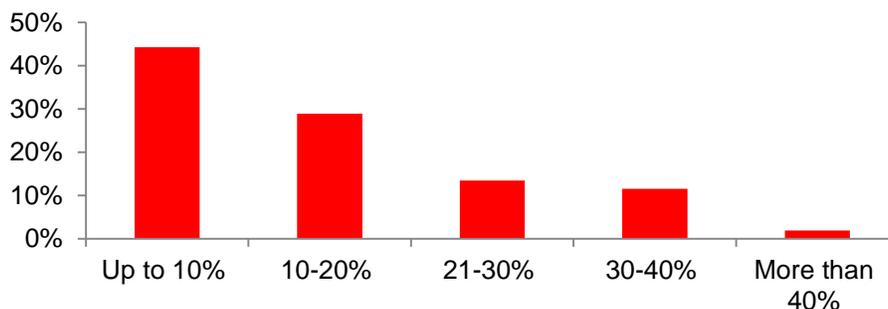


Fig 15: Estimated “realistic” energy saving across your building(s) if the main areas of saving referred to above were implemented

“We are at a point where substantial investment would be needed to get larger savings”

“All buildings have been renovated within the past 4 years so the key to further savings lies in our processes”

“We have chipped away at the smaller projects and have educated staff ... We now need to look at the bigger projects”

“From absolute position in 2008 we have saved well over 40% in consumption terms”

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