

The Energy Institute Energy Management Panel welcomes the opportunity to make the following submission to the Department for Business, Energy and Industrial Strategy in response to the inquiry on **Helping businesses to improve the way they use energy**.

1. About the Energy Institute Energy Management Panel

The Energy Institute (EI) is the chartered professional membership body bringing global energy expertise together.

We're a unique network with insight spanning the world of energy, from conventional oil and gas to the most innovative renewable and energy efficient technologies.

The global energy industry, the people working in it and wider society all benefit from the EI's work. We gather and share essential knowledge about energy, provide the skills that are helping us all use it more wisely, and develop the good practice needed to keep it safe and secure.

We articulate the voice of energy experts, taking the know-how of around 20,000 members and 250 companies from 120 countries to the heart of the public debate.

And we're an independent, not-for-profit, safe space for evidence-based collaboration, an honest broker between industry, academia and policy makers.

The Energy Management Panel (EMP) is an advisory panel composed of EI members with extensive experience in energy management, working in energy companies, energy intensive sectors, the public sector, academia and other areas. The EMP members contribute their expertise to support the Energy Institute in its efforts to promote knowledge, skills and good practice in energy management and reducing carbon emissions. These are professionals with practical knowledge about the energy management challenges faced in the UK and globally, and as such are well qualified to understand the complexities of the ways in which energy is used by businesses and individuals.

2. EI EMP response

2.1. This response is based on:

- Views expressed by members of the EI Energy Management Panel
- The [Energy Barometer 2018](#), an annual survey of the EI College, a group of EI professional and pre-professional members. A total of 406 members (a sample size

representative of EI professional and pre-professional members) completed the survey online in February 2018.

- A previous edition of the Energy Barometer survey conducted in 2017.

2.2. Out of 32 consultation question, EI EMP members responded to 13 selected questions. The number of each consultation question is indicated in brackets.

3. (Question 1) What do you see as the key developments and trends that will impact on the energy efficiency market over next 10 years?

Energy has been a main driver of global progress and has provided for vastly improved living conditions over the last century. There are still very large populations without access to energy, and whose lives could be improved immeasurably by its provision. Equally there are opportunities in the developed world to use energy to increase wealth and improve lifestyles. The key priority is to use energy more efficiently and to do so in a way that minimises its impact on the planet. For example, the use of gas to displace coal fired power stations or to provide power to people who have none is a way forward. Indeed, reducing energy demand has to be viewed in the wider context of the quality of life on the planet. Thus, adequate capacity should be ensured, and increased access to energy should be prioritised.

The last ten years have seen a notable reduction in UK greenhouse gas emissions and a reduction in energy consumption per unit of GDP. On both of these measures the UK is doing well when compared to other major economies. The UK's performance in successfully reducing emissions provides an admirable example of how government policies, linked to skilful implementation, can be effective in addressing the global challenge of climate change. The combination of improved energy efficiency of consumers, off-shoring of industrial activity, and the shift from coal to gas in power generation have been the main causes, helped at the fringes by increased renewables generation and other efficiency improvements. The post-2008 economic slowdown also has had an impact on emission reduction.¹

1

https://www.mckinsey.com/~media/McKinsey/dotcom/client_service/Sustainability/cost%20curve%20PDFs/Imp

However, further reductions in GHG emissions in the UK are likely to be more challenging over the next ten years.

Although improving energy efficiency is perceived by EI members as one of the areas most positively affected by energy policy and also as a sector of comparatively low investment risk due to policy uncertainty, there are persistent calls for more progress to be made in efficiency. EI members believe that efficiency must be energy system's first port of call in the effort to reduce emissions. They not only believe that the Government strategies, including the Industrial and Clean Growth Strategies, should to a large extent be built around improving energy efficiency, but they also identify efficiency as the highest priority measure for the Government to meet the 5th carbon budget. Furthermore, EI members firmly acknowledge efficiency's role in reducing transport emissions, including shipping and aviation sectors.

When it comes to the heating sector, EI members strongly agree that proven technologies related to efficiency should be prioritised as the best measures to reduce emissions in the next decades. They emphasise the importance of retrofitting buildings and ensuring high energy efficiency in new buildings through proper wall and loft insulation. Upgrading equipment such as boilers to more efficient technologies is also among the measures believed to enable the greatest emission reductions. These top three technological priorities for emissions reduction in heat are emphasised, along with control and smart systems, heat pumps, and CHP and heat networks, all of which improve heating system efficiency.

When it comes to trends which would enable a flexible UK electricity system that will increase the efficiency of the whole energy system, EI members show a clear preference for updating the electricity grid and making it smarter, rolling out energy storage and ensuring a sufficient amount of flexible electricity generation capacity is available. They also believe that wider societal changes will be needed, such as greater engagement of energy consumers in the system, adopting new technologies and shifting demand through behavioural change.

[actFinancialCrisisCarbonEconomicsGHGcostcurveV21.ashx; https://www.cccep.ac.uk/wp-content/uploads/2015/10/PPBowenetc-economic-slowdown-emissions.pdf](https://www.cccep.ac.uk/wp-content/uploads/2015/10/PPBowenetc-economic-slowdown-emissions.pdf)

Finally, there is also a case to consider putting greater emphasis on helping other nations reduce their emissions, rather than to focus solely on UK emission reductions, as other larger economies could have larger global impact. The UK has the expertise, experience and connections to enable, motivate and encourage other countries to replicate what has been achieved here. If these were applied successfully, the impact on GHG emissions reductions globally could vastly outweigh the gains likely to be achieved from emissions reductions in the UK. Exporting this expertise should be one of a major planks of Government policy going forward, delivered for example through the FCO.

4. (Question 2) What are your views on the level of ambition and how we could measure our progress?

The statistical information gathered by the UK Government provides an opportunity to track progress on emissions and energy use. These data could be analysed further to develop policy by identifying what actions work and how much impact they have: for example, the impact of CRC and ESOS in improving efficiency. These data could also be used to identify particular areas of UK energy use where improvements would be most usefully targeted. It is encouraging to see ambitious goals such as gas grid decarbonisation, zero-carbon transport, hydrogen fuel cell rollout, expanded district heating, and smart grids, but their progress will be judged by how the ideas are implemented and how they deliver for consumers and businesses.

We believe that technological developments should be complemented by implementation of simple, conventional energy efficiency improvements. There is ample evidence to show that businesses will implement energy saving measures with a two-year payback, but less financially attractive investments are rarely taken up. Companies and individuals need only modest nudges towards accelerating investment. Various schemes have been devised to provide the finance or to encourage uptake but with little effect, due to complexity or other factors. In addition to a simpler financing scheme, one possibility is for the Government to identify various industry leaders who could act as influencers within their sectors, encouraging uptake of efficiency initiatives.

It's worth re-stating that climate change is a global threat, therefore ambition must be global. Measures should be directed to levelling the playing field and achieving the easy gains available internationally, and as discussed above, the UK has the potential for significant influence and sharing of learning in this

area. Promoting awareness of various countries' progress could be helpful, for instance via league tables on decarbonisation progress like to the New Climate Institute / Climate Action Network International / Germanwatch initiative 'Climate Change Performance Index':

https://www.climate-change-performance-index.org/sites/default/files/documents/the_climate_change_performance_index_2018.pdf.

5. (Question 3) What other measures and energy efficiency potential might be available to businesses to reduce energy demand?

The Energy Institute has developed the "Understanding your energy culture" tool, a part of the EI's Hearts and Minds toolkit, to improve businesses' energy management performance. Much like safety management, improving energy management has focused on improving technology to be more energy efficient and on implementing an energy management system that provides policies, rules, and systems for measuring and reducing energy use, but there is now an increasing awareness that, whilst having an energy management system in place is a good start, this can only be effective if it is accepted, used and improved by the workforce. A key challenge to improving energy management, efficiency and reducing greenhouse gasses is therefore to change the behaviour of the organisation and those who work in it.

Unlike traditional behavioural interventions, which focus on changing the individual (such as through training), Hearts and Minds targets the culture of the organisation. This approach acknowledges that company processes (i.e. the energy management system) and people's behaviour are not independent – both must work together. Only then will the full benefits be realised.

6. (Questions 4 & 9) What evidence do you have on how increasing building standards could drive improved energy efficiency, or how energy efficiency improvements in buildings have resulted in wider benefits? Is there any evidence that increasing building standards would not drive improved energy efficiency? What evidence is there to support the effective use of voluntary standards within the UK? What opportunities exist for expanding voluntary standards?

The majority (63%)² of Energy Institute (EI) members surveyed by the 2017 Energy Barometer survey conducted by the Energy Institute see that mandatory standards for buildings as the most effective policy measures to decarbonise heat through to 2030. Other measures prioritised by EI members are financial incentives, like tax credits or capital grant schemes (63%) or engaging communities via new ownership models (39%).

In contrast, relatively small share (17%) of EI members see voluntary standards for buildings as the most effective policy measures for decarbonising heat through to 2030. Only private investment funds (13%) were chosen by a smaller proportion of the survey respondents.

7. (Question 10) How can government support more widespread voluntary standards and other mechanisms including green leases? What are the barriers to development of such standards and products?

One of the potential barriers to the implementation of low-carbon heating systems during the construction and renovation of buildings is the shifting of blame between stakeholders for not adopting efficient systems, e.g. occupiers blame landlords for a lack of efficient housing availability, contractors blame developers for not including efficient systems into plans, occupiers are blamed for insufficient demand for efficient housing, and so on. EI members believe that government intervention at the developer stage would have the greatest impact on stimulating demand and supply of low carbon heat in the housing sector. Other parts of the value chain, including landlords, contractors and occupiers also need to be incentivised to transform the approach to supply and demand of low carbon heat.

² The respondents were allowed to choose more than one option as an answer to the question: “Within the residential heating sector, which of the following policy and financial instruments will enable the greatest emissions reduction by 2030?”

EI members call for an integrated approach in policy and regulations, as currently the responsibility is easily shifted and not clearly defined. It is also believed that loopholes are currently more significant in old rather than new build, and that Government planning is required at both national and local levels.

8. (Question 11) How can the barriers to the development of the energy services market be overcome? Does this differ between sectors? Is there a role for government?

This really is an important question that would be worthy of significant levels of investment and research to answer. The Energy Services market is a developing industry; some of the primary barriers it faces are:

- ***The low cost of energy relative to the strategic value of 'business as usual' energy consumption for many potential ESCO customers:*** While increasing energy expenditure is often unwelcome, it is typically a low enough cost to represent less than around 5% of operating costs to the sorts of organisations that might typically engage an ESCO, for example the owners / occupiers of medium-sized commercial real estate. As such, energy savings do not typically represent a strategic concern to many potential ESCO customers, while concerns such as occupier comfort or sales environment are of key strategic importance. Although a well-run ESCO will enhance these strategic variables, while energy is still cheap enough to use relatively freely the ESCO is fighting an 'uphill sales pitch' to change the inefficient status quo. While the current model is relatively inconvenient, it is not often causing strategic pain to the occupier. For example, an office block may incur energy costs of a few hundred thousand pounds a year, while it may house a team of staff whose salary bill is many millions of pounds a year and upon whom the business's income depends. In this context, the sales pitch for an ESCO will have to dislodge an energy system that is acceptable to the end user, while providing reassurance that key strategic variables such as occupier comfort will not be adversely impacted, in order to deliver a saving that is relatively small in relation to other operational costs.
- ***The high levels of uncertainty surrounding ESCO delivery and savings validation:*** ESCOs often base their business case upon proposed savings that can risk being 'lost in the noise' of independent variables such as the weather, occupancy rates, and changes of use. Models such as the IPMVP (International performance measurement and verification protocol) help to

provide a standard methodology for verifying savings that can help to address this barrier, however this complicated modelling is often challenging to set up and difficult to explain to potential ESCO customers who are often not conversant in the energy knowledge required to fully interrogate the models.

- ***The gaps between the building's owner, landlord, and occupiers:*** In many cases, as mentioned above, there are gaps between the interests of the building owner, landlord and occupier that make it hard for the ESCO to please all three and to engage with them in a manner that gives the long-term certainty required for the ESCO to invest in capital equipment that will underpin the ESCO's business model.

Whilst the ESCO business model is challenging, given that a significant proportion of UK energy consumption and associated carbon emissions are from buildings that would benefit from the presence of an ESCO provider, and that the ESCO model is a suitable model for addressing the existing building stock (as opposed to new builds), which is responsible for much of the current and future energy and carbon emissions, ESCOs are an important potential part of the UK's energy and climate strategy. The following suggestions are for exploration:

- ***Set up an energy efficiency in existing buildings 'Grand Challenge' with a subgroup targeting ESCO barriers and business models:*** The UK government has identified a number of 'grand challenges', as outlined here: <https://www.gov.uk/government/publications/industrial-strategy-the-grand-challenges/missions#buildings>. The Clean Growth grand challenges include a mission to 'At least halve the energy use of **new** buildings by 2030'. It is suggested that the scope of this challenge is extended to cover existing buildings and that an ESCO sub-group is established.
- ***Set up a working group within BEIS' Better Regulations Executive to investigate the potential for the MEES regulation to be strengthened and accelerated:*** The Government has created the Minimum Energy Efficiency Standards (MEES) regulation to target EPC improvements through investment in the fabric of buildings. The regulation is relatively new and unproven, however it is a useful source of momentum for the ESCO business model, since the ESCO can provide a means to comply with MEES by funding investment in the building fabric. It is suggested that a

working group within BEIS' Better Regulations Executive is set up to investigate the potential for this regulation to be strengthened and accelerated. One particular area is the impact of the occupier's behaviour. Research commonly shows that, typically, end use does not meet the energy efficiency potential of a well-designed building. A particularly bold but potentially beneficial move would be to extend the MEES standards beyond the EPC / Building Fabric to also include a minimum standard on its end use / DEC rating.

9. (Question 12) What innovative business models for energy efficiency could be developed or are already operating in other countries? How are they are helping to overcome barriers to energy efficiency? What more needs to be done to accelerate their development?

A useful source for this information is the Odyssee-Mure project, a comprehensive monitoring of efficiency trends and policy evaluation in EU countries, Norway, Serbia and Switzerland:

<http://www.measures-odyssee-mure.eu/successful-measures-energy-efficiency-policy.asp>

10. (Question 13) What more needs to be done to improve standardisation to drive investment in energy efficiency? What role could government usefully have, if any?

Multiple existing energy management standards aim to improve energy efficiency. ISO 50001 has recently been through an updating process and the new version has been published. The energy audits standards, EN 16247 and ISO 50002, also have an important role to play. Energy management, including carrying out the audit process, has been practised for decades with varying success. One persistent problem has been in defining the details of the energy management process and effectively seeing them through. Over the decades there have been many gaps in the process and missed opportunities.

The introduction of energy management standards was a major step in addressing those failures, in spelling out the full processes which should be adopted. No more needs to be done by Government to improve standardisation, rather the Government's role should be to help raise the profile of these standards and encourage their uptake. For example, there are events planned after the ISO 50001 update publication, which the government could engage with, the first being at the EI on 18 September: https://energyinst.org/whats-on/search/events-and-training?meta_eventId=61809A. There will be on-going opportunities.

11. (Question 14) Are the costs of M&V a barrier to implementing projects? What could be done to overcome this?

Measurement and verification costs are typically small in relation to wider energy costs and capital expenditure during energy efficiency investments. These M&V costs are not seen as representing a barrier to implementing projects. Initial data is typically gathered as part of early business case generation, often for free by the sales team proposing a project, and the eventual measurement and verification costs are also not prohibitive and are easily justifiable via the standard management adage that ‘you can’t manage what you don’t measure’.

12. (Question 16) Would digitalisation and data analytics offer opportunities to improve the way businesses manage their energy use and make investment decisions? Please provide any evidence of whether this is already having an impact on the market for energy efficiency.

A primary challenge faced by the digitisation and data analytic activities in the energy sector is an ongoing lack of standardisation in energy meters and energy provider data. Improved methods of data analysis supported by digitalisation have great potential to recognise and address savings opportunities and perform ongoing monitoring. Perhaps one of the most important roles that the Government could play here would be in standardising data protocols and energy meter specifications to allow for better ‘plug and play’ offerings that can accept data from all meters and all providers/suppliers. It may also be worth considering mandating that all energy suppliers provide a minimum quality of data analytics in their standard online billing portals, to support better customer analysis of energy usage and savings opportunities.

One requirement for effective analysis of data is expert interpretation, involving knowledge of the particular business. However, for many buildings, the facilities are fairly standard, and performance can be expected to be within a reasonable range. In modern motor vehicles the energy performance is continuously monitored, and the driver’s style is characterised on the dashboard – similar displays could be easily built into building metering and management systems. Domestic smart meters already have a basic system incorporated. Data analytics can greatly extend the sophistication of measurement and

monitoring systems, whether through simple measures mentioned here or more sophisticated analysis, and should provide guidance on where problems and deviations exist and what to do about them.

13. (Question 31) What more can be done? What are the key barriers for industry (and how do they compare to those in wider businesses)?

Policies to date which impact on cost and reputation for businesses have had impact on raising awareness and driving efficiency. Despite this, energy is not always considered when businesses are seeking efficiencies, and there continues to be a lack of awareness of the potential for improvement and cost saving. Energy cost savings can be trivial compared to savings achieved in other areas across industry. Many funding models where businesses and departments have an annual allocation make it difficult to invest in energy efficiency due to payback periods being outside the funding period.

Investment in projects does not always take account of the lifetime costs involved and can result in new installations not always having the most efficient solutions available at the time.

In complex industrial sites, loans, partnerships and external consultants are not always easily adopted due to the lengthy process of gaining understanding of a particular business' requirements and issues.

A requirement to implement some of the recommendations from ESOS audits (or equivalent) or to set and achieve reduction targets across all industry as in CCAs would improve the UK's approach to energy efficiency. These could potentially be linked to tax savings, as in the CCA scheme. This would help large and complex industries, requiring them to capture where savings are being achieved for reporting (where this is not done the result is a lost opportunity to share successes).

Also, faster introduction of minimum standards would ensure new installations adopt proven technology available at the time of design/construction.

**14. (Question 32) What further energy efficiency potential is there in the diverse light industry sector?
Please provide specific evidence and examples.**

The publicising of available efficiency opportunities could be improved, so that non-energy specialists are aware of the potential to save and what technology is available.

For instance, lighting technology has become widely available and most people are aware of the benefit of using LEDs at home and in the workplace. A more difficult question is around what can be done to improve knowledge and awareness of other technology. For instance, ultrasonic surveys of compressed air ring mains, or payback times when investing in new motors versus rewinding. Consideration could be made of how to encourage a culture shift towards efficient choices, either through faster introduction of minimum standards or via helping new technology quickly becoming mainstream.