Energy Institute response to the Department for Business, Energy and Industrial Strategy – Call for Evidence following the Helm Review

1. About the Energy Institute

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.

2. Response

The EI welcomes the opportunity to make the following submission to the Department for Business, Energy and Industrial Strategy (BEIS) to support the Call for Evidence following the Helm Review. This response is based on ongoing consultation and engagement with industry specialists and subject matter experts, including energy professionals' responses from the Energy Barometer[1], an annual survey of a representative group of EI professional and pre-professional members.

3. Introduction and Summary

3.1. The Helm Review's analysis is sound; the current system is unlikely to deliver the needed carbon reductions through to 2050 at least cost. Too many interventions, layered one atop another, have resulted in a complicated system with regulation that still picks winners in a manner that is not as transparent or effective as it could be.

3.2. The Review presents a compelling vision of possibilities for the future energy system, one that pulls through low carbon technologies at lowest cost. Its recommendations have the potential to allow for a simpler and more stable regulatory and policy environment, which has been consistently called for by energy professionals via the Energy Barometer. These recommendations could unlock business and technological innovation and competition, leverage the benefits of Brexit, and enable new and different solutions to decarbonising energy.

3.3. However, the Review's proposed solution does not account for various practical issues likely to arise from its implementation. These issues arise due to social, commercial, or political concerns, rather than technology limitations. These aspects

[1] Energy Institute annual *Energy Barometer* report, available at https://knowledge.energyinst.org/barometer

are explored in more detail in the joint engineering institution response to this consultation submitted by the Royal Academy of Engineering, so will not be repeated here.

3.4. In evaluating the aims laid out in the Review, knowledge from industry experts should be a primary source of information for Government. Further detailed studies will be needed to work through the practicalities, opportunities and risks of achieving energy system change on this scale. Energy professionals are among the best resource for identifying effective ways of achieving a simplified, lower-cost energy system; they will also be the ones to implement those changes. The EI regularly consults with its professional members regarding industry developments, and energy professionals are keen to contribute their knowledge and experience to improve the system.

3.5. Despite using "energy system" terminology, the focus of the Review was almost exclusively on electricity, rather than the wider energy system. It is particularly important that the energy system as a whole be considered when making decisions affecting a significant part of that system (such as electricity), as all parts of the system are becoming increasingly interdependent.

3.6. Similarly it is disappointing that the terms of reference for the Review focused exclusively on the unit cost of supplying energy and not on the full picture including the demand side, which would also factor in the impact of progress made in energy efficient buildings and appliances.

3.7. In our responses below we have endeavoured to provide constructive feedback and suggestions on this systems approach. Answers to consultation questions recurred across areas, so responses from generation, transmission and distribution, supply, and “cross-cutting” have been collated into single categories. Several main themes recurred through the responses:

- Taking a whole-system view
- The role of energy professionals in identifying and implementing solutions
- Potential industrial strategy benefits

4. Responses to consultation questions

What are the longer-term challenges?

4.1. *Balancing the grid given new patterns of supply and demand*. Renewable deployment continues at a rapid pace. As renewables make up an increased portion of UK supply, the challenge of balancing intermittency will become greater and necessitate different system capabilities. Likewise, new patterns of demand may emerge, from developments such as increased take-up of electric vehicles, an increased role for electricity as a heat vector, and an increase in summer demand for air conditioning due to urbanisation, global warming, affordability and rising comfort expectations. To enable these potential developments, an effective market structure will need to account for the costs of necessary grid reinforcement, electricity storage, and flexible generation.

4.2. *Need for breakthroughs in carbon reduction if long-term carbon targets are to be met*. Energy professionals have consistently indicated that given the current policy landscape, the UK is unlikely to meet its 5th carbon budget and 2050 emissions target.

4.3. *Connected devices and a smarter grid.* Opportunities exist for connected devices, i.e. the internet of things (IoT), to deliver more cost-effective and timely demand management with near real-time price signals, which could be transformational for the longer-term market. Data from this more connected system can be used to drive down costs and increase access to energy transactions (e.g. blockchain). However, inherent to more connected devices are increased cyber security and privacy risks; these risks must be managed in order to gain consumer buy-in.

4.4. *Building a skilled workforce*. Actively promoting skills in engineering and STEM generally – inspiring young people to become the professionals needed to design and maintain the complex energy system. This goes beyond the "usual message;" there is an increasing urgency for Government and industry to together make a step change in UK strengthening high-level STEM skills, which is especially true given the likely impacts of Brexit.

4.5. *Policy stability and Brexit.* Energy professionals cite uncertainty around energy policy and Brexit as challenges that could discourage the investment needed to meet the above challenges. Setting up a clear framework and system direction will encourage investment and help avoid unnecessary system costs.

What matters should the Government take into account in considering the policy and market frameworks?

4.6. *A whole-systems view.* Heat and transport decarbonisation options, with varying extents of electrification, should be factored into future network and market structure requirements. The implications of different decarbonised heat provision options are potentially much more significant than direct use of electricity. Transport demand could also significantly alter electricity demand patterns and amounts. What combination of electricity, heat, and transport delivery, and market structures will result in the most effective, lowest-cost system?

4.7. *Industrial strategy*. It is important for economic competitiveness that UK industrial and commercial power prices are cost-competitive with other large markets, particularly the EU and US.

We should also be realistic as to where the UK can credibly compete in international markets and more proactively factor these considerations into our energy policy development.

For example, it is unlikely the UK can compete on large-scale energy equipment manufacture, with the exception of hard-to-transport items like wind turbine blades. This is currently due to limitations such as labour and energy costs, the relative lack of established competitive manufacturing capability, and domestic scale/demand that is relatively modest by international standards.

Instead the focus should be on building on areas of existing and credible UK competitive strength, which can support the UK economy and contribute to the transition to a low carbon world, such as:

- Technology R&D, design, project management in areas such as smart grid evolution, regulation and management
- Innovative renewables business models, and technology for energy access in developing world markets, for example in aspects such as integrated renewables and gas fired power grid management
- LNG projects, shipping, trading, etc.
- Financing and legal services
- Skills and expertise accumulated in UK energy and engineering institutions, that could be used internationally to build UK influence and involvement in international regulation and trade
- High remaining potential of the UK continental shelf for attracting investment and providing economic benefit to the UK

4.8. *Access to energy*. Power and heat should be affordable for the fuel poor, ensuring they are not left behind but rather benefit from future market structure and competitiveness. This point is also valid for technological advances in how consumers interact with the energy system, including the 'smart' transition; these benefits should be accessible to all consumers but especially those most in need. Affordability is particularly important to consider during the transition to a low-carbon energy system, where costs of change are often borne disproportionately by those least able to pay. This can lead to political pressure to alter policies in the short term, which is counterproductive to keeping energy policy consistent and can impede investment.

4.9. *Technology and scale mean costs of renewables and storage are reducing at faster pace than expected*. The rate and magnitude of these cost reductions were not foreseen, and emphasise that developments are sometimes unpredictable. This also highlights the need for caution when making particularly long-term capital-intensive decisions, and illustrates the value of shorter lead-time, less capital-intensive, more flexible solutions.

4.10. *Security and cost of fuel supply, particularly natural gas.* Increasing diversity and hence security and competitiveness of global supplies of LNG – especially from North America – are leading to structurally sustainable lower costs.

4.11. *Regularly reassessing large infrastructure projects*. In light of the rapid developments in other low-carbon forms of generation, the large-scale nuclear plant at Hinkley Point C appears increasingly expensive, even acknowledging the benefit of its baseload, very low carbon power. This and other large capital projects should always be open to a balanced reassessment on a look-forward basis; with all long-term energy system changes, we should always be open to asking "how does it look now given what we know?"

What additional evidence should the Government consider to reduce costs in the longer term?

4.12. More insight into credible technological and mass manufacturing learning curves for renewables and energy storage

4.13. More insight into the role of energy efficiency, particularly a cost comparison of efficiency measures with low carbon generation capacity. Professionals surveyed for the 2017 Energy Barometer cited energy efficiency as the best way to reach emission targets at lowest cost, over all forms of low-carbon generation. It is disappointing that the terms of reference for the Review focused exclusively on the unit cost of energy. This is just one side of the equation and fails to give a full picture of the amount paid by consumers on the basis of the amount consumed. While the unit cost is important, so too is the significant progress that has been made – and needs to continue to be made – to improve energy efficiency and reduce overall consumption. Analysis produced by the IEA[2] and the Committee on Climate Change[34] has repeatedly shown this. As Claire Perry told the Conservative Party conference "…for household consumers energy bills have actually gone down, mostly because we are more energy efficient and use more efficient appliances."

[2] http://www.iea.org/publications/freepublications/publication/Captur_the_MultiplBenef_ofEnergyEficiency.pdf

[3] https://www.theccc.org.uk/publication/energy-prices-and-bills-report-2017/

[4] https://www.theccc.org.uk/tackling-climate-change/reducing-carbon-emissions/what-can-be-done/using-energy-more-efficiently/