10 November 2017

Ofgem
9 Millbank
London
SW1P 3GE

Dear Sir/Madam,

The IET’s response to the call for engagement on Ofgem’s Research Hub

We fully support Ofgem’s development of a new research hub and welcome the chance to respond to this call for engagement. It is as an excellent opportunity for Ofgem to engage with the research community and we hope the following comments can assist in ensuring the best results for the hub in the future.

The Institution of Engineering and Technology is Europe’s largest professional engineering and technology organisation. The members represent a wide range of expertise, from technical experts to business leaders, encompassing a wealth of professional experience and knowledge.

The response has been compiled on behalf of the IET Board of Trustees by the IET’s Energy Policy Panel. The policy panel includes a diverse range of experts that provide unbiased impartial advice for government and parliamentary stakeholders.

If the IET can be of any further assistance please do not hesitate to contact me.

Yours faithfully,

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IET response: call for engagement on Ofgem’s Research Hub

We welcome Ofgem’s intention to establish a research hub that will hopefully provide an effective interface between Ofgem and the research community. The UK’s energy research landscape is complex with many institutions playing different roles. We consider there to be an urgent need for this landscape to be ‘mapped’ so that all parties who wish to engage with it can do so more effectively. If Ofgem is of the same view it would be helpful if its new hub could work with government and the research community to address this need.

The following are our concise thoughts on the four issues you have requested views on.

1. **Priority Research Areas**

We have no issue with the research areas identified and understand Ofgem’s interest in them. However, the way that they are presented gives the impression that they can be dealt with individually and incrementally. We would encourage Ofgem to think more holistically about the research challenges and to work harder at joining up the activities across Ofgem in networks, systems, code governance and innovation. We have included an appendix to this letter providing some detailed points on each of the four proposed research areas.

We do believe that one very important area for research has been omitted. This relates to creating an agile regulatory response to rapid emergent change across the whole electricity system and we discuss this below.

2. **Existing Published Research**

Over the past four years, the IET has been exploring the challenges that the electricity system is facing. The foundations for this work were, as you would expect from the IET, largely technical. The first report\(^1\) described the challenges and made initial proposals as to how they might be addressed. The second report\(^2\), commissioned by government, was delivered jointly with the Energy Systems Catapult. It explored in more detail the enhanced functionality that the electricity system would need to offer in order to efficiently facilitate the low carbon transition. This work, the Future Power System Architecture (FPSA) project, clearly demonstrated that the delivery of the required functionality had technical, commercial and regulatory impacts.

The second phase of the FPSA project focused attention on, amongst other things, the way that the transformational changes identified could actually be delivered. It concluded that a new governance model was required to recognise the complexity of the changes needed, the need to better engage stakeholders in the change process and to make it more flexible and agile. This work was published in July this year\(^3\).

We are aware that Ofgem is already working to develop the sector’s code governance processes but we think the scale of this is such that further research is required. We are therefore surprised that this was not more visible in the research areas proposed for the new hub.

Ofgem has been engaged as an observer throughout the FPSA work. We have also presented the FPSA findings to Ofgem and have enjoyed strong engagement from a number of senior people, but

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\(^1\) [http://www.theiet.org/factfiles/energy/elec-shock-page.cfm](http://www.theiet.org/factfiles/energy/elec-shock-page.cfm)

\(^2\) [http://www.theiet.org/sectors/energy/resources/fpsa/fpsa-project-phase-one.cfm](http://www.theiet.org/sectors/energy/resources/fpsa/fpsa-project-phase-one.cfm)

\(^3\) [http://www.theiet.org/sectors/energy/resources/fpsa/fpsa-future-system-challenges.cfm](http://www.theiet.org/sectors/energy/resources/fpsa/fpsa-future-system-challenges.cfm)
we are concerned that the key messages may not have been promulgated through all relevant parts of the organisation. We would be very pleased to meet with Ofgem again to help make this happen.

Looking more broadly at the existing research position, there is a massive amount of information available. First of all, there are the outputs from the LCNF and NIC projects and the work of the Smart Grid Forum. We suspect that more value could be extracted from this work if appropriate resources were made available.

In addition, there is a significant body of work generated by European projects under the FP7 and Horizon 2020 programmes.

Finally, we believe that better contacts with the Electric Power Research Institute (EPRI) in the USA would be beneficial. EPRI is a long established not-for-profit research organisation that was established to meet the needs of the power industry in the USA. Some additional information is provided in the Appendix.

3. **Planned research**

Here we turn back to the FPSA project. Further phases of this work are planned and the preliminary work for Phase 3 is already underway. Phase 3 will apply as a ‘use case’ the governance model proposed in Phase 2 to the challenges presented by the growth of electric transportation. This is planned to commence in the New Year. We would welcome more active engagement with Ofgem on this work.

We believe this would be mutually beneficial. Ofgem’s wider involvement could provide vital inputs that would add a ‘real world’ dimension to the work and assist in the consideration of practical transition paths from current practice to a future more dynamic and agile world.

4. **How Ofgem can help to support the IET’s research**

As already stated, whilst we enjoy excellent engagement with some parts of Ofgem we believe that the scale and urgency of the issue of rapid emergent change and the whole electricity system is such that better engagement between the IET and all relevant parts of Ofgem would be mutually beneficial. We believe the foundations for this are in place and we would welcome the opportunity to build on them in the immediate future.
Appendix

1. Comments on Ofgem’s Priority Research Areas

Cross-sectoral policy interactions

- Efficient ‘whole system’ interactions between the energy and transport sectors are an important area for research. Understanding and quantifying the roles of regulation and competition (the mix and interactions between the two) in promoting the timely development of required infrastructure for EV recharging is key to ensuring the envisaged transition from ICE to battery powered vehicles. A perceived lack of infrastructure will act as a barrier to EV uptake, whilst uncertainties in EV uptake will act as a barrier to privately financed infrastructure provision.

- Benefits for and against regulated monopoly and privately financed EV infrastructure provision (or the optimum mix between the two) in ensuring that infrastructure is provided in a cost-efficient and timely manner will need to be carefully analysed. The role of DNOs in supporting EV infrastructure could be restricted to providing connections for recharging points, or it could involve provision and operation of infrastructure itself.

- Similarly, the provision of heat networks will require considerable investment ahead of revenue streams and hence returns on investment. Uncertainty in levels of consumer uptake in heat services, and hence the risk of stranded investment, might act as a barrier to investment. Hence, the extent to which investor certainty (and/or an acceptable cost of capital) might require a ‘regulatory asset base’ approach to achieve critical mass will need to be understood.

- A further important area will be exploring any regulatory or market barriers to exploiting arbitrage opportunities between gas and electricity in both the supply and utilisation of energy (in which heat networks and storage may play an important role).

Facilitating the low-carbon energy transition

- The current market framework for electricity generation and system products is complex; this leads to uncertainty for investors and is a barrier to wider, more distributed energy resources and stakeholder involvement. National Grid’s System Needs and Products Strategy is looking to simplify system service products but this is unlikely to be sufficient to unlock potential flexibility inherent in domestic and SME scale ‘behind the meter’ opportunities – in particular EV charging points.

- Energy storage has a vital role to play in supporting low carbon energy transition, but whilst some market and regulatory barriers (or anomalies) are being addressed, questions over ownership and operation still divide opinion; further exploration of the role of energy storage in optimising the whole energy system (i.e. not only electricity, and not only batteries) and barriers to maximising opportunities should be explored.

- The evolution of DNOs to DSOs is commonly accepted as a desirable development. However, there is uncertainty over the legitimate scope of the future DSO, as evidenced by the ENA Open Networks Project and by recent consultations by Western Power Distribution and UK Power Networks. It will be important to ensure that any regulatory (licence) barriers that prevent DSOs from undertaking a full range activities that would demonstrably benefit the whole system (and hence customers) are addressed – even if this requires a rethink of the
current DNO business model, and thinking beyond simply ‘regulatory asset value’ as the mechanism for collating DSO investments.

The Future Consumer

- At the domestic and small business level, intuition suggests that bundled services (not only – or even explicitly – energy services) will become increasingly attractive to customers in future. Non-traditional business model companies (and/or existing Suppliers and Aggregators adapting their business models) are likely to usurp the conventional ‘Supplier Hub’ principle. It will be important to consider these options and ensure there are no market or regulatory barriers to the development of such models whilst also ensuring appropriate protection for customers.

- Ofgem’s Targeted Charging Review is addressing emerging issues over residual network charging. However, this is a complex and increasingly urgent area for examination. Key issues requiring resolution include: bases of equitable sharing between customers of costs in respect of sunk network investments; the extent to which locational use of system charging is practicable without creating a post-code lottery; the basis on which network charges should be levied in respect of inter or intra energy community trading (i.e. over virtual private networks) and how charges for standby and top-up, or wheeled units, should be determined; and the appropriateness of charging on an energy as opposed to capacity basis.

Global Trends

- In examining global trends it will be important to understand differences in power system challenges arising from reliability, decarbonisation, cost pressures, power system design, generation mix, system topology and demand characteristics – and hence the extent to which learning is ‘transferable’.

- Notwithstanding the above, comparisons with different approaches to regulation, ownership and market frameworks should be informative.

2. Electric Power Research Institute (EPRI)

EPRI engages extensively with NARUC (the National Association of Regulatory Utility Commissioners) to share its research findings, recommendations and sector developments. NARUC also has a research lab (https://www.naruc.org/naruc-research-lab/). EPRI views NARUC as a primary audience for its research work, largely as they see it being used constructively and helping to shape the energy sector.

In a similar vein, NARUC looks to EPRI for independent fact based research outputs (EPRI is a not-for-profit research institute rather than a trade body). The Research lab takes in input from a number of sources, while Ofgem clearly does so through open consultations, the research lab is more focused on technical enablers that can be translated into regulatory policy. In some ways it’s the step before a policy consultation to better inform the questions to be asked.

EPRI (and others) do advise the research lab on deeper technical areas where utilities should focus their research.
Having the research lab allows them to have staff dedicated to questions of a technical nature, this allows them to attract and retain technical expertise.

NARUC has an extensive international section on its website, but interestingly the UK is not listed. Ofgem could consider initiating a dialogue with NARUC on the grounds that it could be mutually beneficial.