Energy Systems Catapult Response to the Ofgem Consultation on The Network Innovation Review

Introduction

1. This response is submitted on behalf of the Energy Systems Catapult (ESC). The ESC is an independent company whose remit is to create innovation in UK energy markets and also create business opportunities. The ESC is looking at a "whole systems approach" and is responsible for the delivery of the **Smart Systems and Heat (SSH) Programme** on behalf of the Energy Technologies Institute (ETI).

2. The ESC is working with the UK government and local authorities to deliver the SSH Programme**,** determining the most effective means of decarbonising the UK's 27 million homes and contributing to the target of an 80% reduction in the UK's Greenhouse Gas emissions by 2050. The SSH Programme is developing a cost-effective area-by-area deployment approach. A modelling framework ("*EnergyPath*TM *Networks*") has been developed that allows the design of the most cost-effective energy system in a local area, including energy efficiency interventions for the homes in that area. We have worked with Newcastle City Council to develop a Local Energy Plan that seeks to reduce carbon emissions by 90% by 2050. We are also working with Bridgend County Borough Council and the Greater Manchester Authority to develop similar local energy plans. We believe that this approach can lead to a significant reduction in carbon emissions from heat in buildings.

3. Another key element of the SSH programme is the development of a Home Energy Management System (HEMS) which will allow the smart operation of domestic heating and other applications. HEMS will enable innovative new business models and allow the householder to automatically control energy usage and potentially help to balance the energy system. To realise the benefits from HEMS, new energy supply licence arrangements and consumer protection will need to be developed to allow energy service providers to offer levels of comfort rather than merely supplying kWh of energy. Digitalisation may also have a key role, with ICT enabling integration and sophisticated customer interaction through the acquisition and use of data and information. There is a need for the development of standard data protocols so that customers are not tied in to single service suppliers and the switching costs do not put up barriers to competition.

4. The ESC is also leading the Future Power System Architecture (FPSA) project in collaboration with the Institution of Engineering and Technology (IET). This project seeks to determine the functions that will be required to enable a future, low carbon, power system to operate in the face of transformative change, and hence to enable recommendations to be made that will inform policy and regulatory considerations.

5. If you wish to discuss the contents of this submission, please contact Tony Dicicco at tony.dicicco@es.catapult.org.uk.

Summary

6. Achieving the changes that are needed to decarbonise the energy system on the scale required to meet the 2050 climate change targets will be a massive task over the coming decades. If the decarbonisation programme starts in 2025, around 100,000 dwellings per year to 2050 would need to be retrofitted with low carbon measures – this is a considerable logistical challenge and is likely to cost over £300 billion (in 2015 money)[1].

7. We believe that there are significant structural issues with the electricity market; this market has been developed for a centralised, unidirectional system. A better solution might be a holistic review of the structure of the market and the roles and responsibilities of market participants in order to meet the needs of modern-day customers. A good starting point would be the outputs from the joint Energy Systems Catapult and IET Future Power Systems Architecture (FPSA) project. This project has identified 35 key functions that the future electricity system needs to implement, recognising customers as an integral part of the system.

8. To meet the strategic changes that are required to move to a smart world, an innovation strategy will need to be implemented. The ESC believes that this strategy should be developed by network companies working closely with industry stakeholders, including the ESC and IET. The outputs from the FPSA Project Phase 1 and Phase 2 (due to be completed in summer 2017) can be used to inform this strategy.

9. More innovation is likely to be required in electricity distribution networks as we move to a smart world than in any other energy sector. The expected rapid electrification of heating and transport over the next 25 years will place considerable strains on electricity distribution networks. Innovative technologies could significantly reduce the amount of future network upgrades required, and so any reduction in Network Innovation Competition (NIC) funding could actually lead to increased costs in the long-term

10. Third party involvement in the (NIC) is valuable as non-network companies bring different skills, new technologies and ideas, helping to increase the variety and quality of potential bids. Third-parties are more likely to propose radical innovations than network operators as the latter are less likely to develop options that challenge their current business models. We support increasing third-party involvement in the NIC as we believe that it will stimulate greater innovation and have a positive knock-on effect for both consumers and network companies. We believe that priority should be given to equipment manufacturers and innovators rather than merely to provide additional funding for academic research.

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[1] ESMe Forecast – Energy Technologies Institute (2015)

Detailed Response to Questions

__Chapter 3: Proposals for delivering greater value for money__

__Question 1: What are your views on our proposals to introduce a requirement for the network companies to jointly develop an industry-wide innovation strategy?__

- *__If you agree, should companies retain their own strategies, and in addition should there be a single system strategy, or one for gas and another for electricity?__*
- *__How often should the strategy be updated?__*

11. We agree with Ofgem that there are significant benefits arising from network innovation initiatives and that these benefits should be passed down to consumers. The energy supply industry faces a number of significant challenges as we move unto a "smart" world – the ESC dthese were discussed in the recent BEIS/Ofgem Call for Evidence: *A Smart, Flexible Energy System*. Fundamental changes will be required to the energy market structures, trading arrangements and the associated codes and agreements – a major re-design may be the most appropriate course of action.

12. We believe that there are significant structural issues with the electricity market; this market has been developed for a centralised, unidirectional system. A better solution might be a holistic review of the structure of the market and the roles and responsibilities of market participants in order to meet the needs of modern-day customers. A good starting point would be the outputs from the joint Energy Systems Catapult and IET Future Power Systems Architecture (FPSA) project. This project has identified 35 key functions that the future electricity system needs to implement, recognising customers as an integral part of the system. Implementing a legal and market framework allied to the 35 key functions could be a better long term strategy than continually working on the barriers inherent in the current market framework.

13. To meet the strategic changes that are required to move to a smart world, an innovation strategy will need to be implemented. The ESC believes that this strategy should be developed by network companies working closely with industry stakeholders, including the ESC and IET. The outputs from the FPSA Project Phase 1 and Phase 2 (due to be completed in summer 2017) can be used to inform this strategy. There should also be coordination with the development of the strategic direction as proposed in the recent Ofgem consultation: "*Industry Code Governance: Initial consultation on implementing the Competition and Markets Authority's recommendations*".

14. The decarbonisation of electricity generation and transmission, heating and transport will require more cross-vector coordination; this would suggest that a single system strategy might be more appropriate. However, in practice, given the complexities of the electricity system in particular, it is probably more appropriate to have separate gas and electricity innovation strategies. In due course, it might be necessary to consider an innovation strategy for heat, as heat networks and new forms of heating are developed.

15. We agree that strategies are generally a plan of action for the mid-to-long term but that given the period of rapid change in energy sector, the focus of network innovation may need to have a shorter time horizon than this. Therefore, we agree that network companies and industry stakeholders should review and update an innovation strategy every two years, but the strategies themselves will need to be set in the context of a longer-term view on meeting the 2050 climate change targets.

Question 2: What are your views on our proposals to help facilitate increased involvement of third parties in the NIC via the network companies?

16. We agree that third-party involvement in the Network Innovation Competition (NIC) is valuable as *"..non-network companies bring different skills, new technologies and ideas, helping to increase the variety and quality of potential bids"*. We also agree that third-parties are more likely to propose radical innovations than network operators as the latter are less likely to develop options that challenge their current business models. There is a lot of innovation taking place in the technical/data science sector and we believe that players in this sector should be allowed access to NIC funding, along with equipment manufacturers/innovators who are looking to develop products for eventual use in the energy networks. We therefore support increasing third-party involvement in the NIC as we believe that it will stimulate greater innovation and have positive knock-on effect for consumers. It can also be positive for the network companies as it could spread the costs of innovating to meet the significant technological changes that are required to move to a smart world, and improve future operating efficiency.

Question 3: What are you views on providing direct access for third parties to the NIC?

17. The ESC does not have any objection to third-parties participating directly in the NIC. This would increase competition for NIC funds and could help to ensure that the best projects are given funding.

Question 4: What are your views on our proposals to remove the Successful Delivery Reward and the provision to recover Bid Preparation Costs?

18. In principle, we support Ofgem's proposals to remove the Successful Delivery Reward (SDR) and the provision to recover Bid Preparation Costs as we agree that this would provide better value for money for consumers from the NIC. However, we would not like to see the removal of this funding acting as a barrier to third-parties submitting projects to the NIC. If the SDR and Bid Preparation Costs provision are removed, any negative effect on the number of projects submitted to the NIC should be assessed.

Chapter 4: Proposal for future funding level of the electricity NIC

Question 1: What are your views on the rationale for reducing the level of electricity NIC funding pot?

19. We agree that there is a seemingly strong case for reducing the current level of funding from £90 million to £70 million due to the undersubscription of the NIC in recent years and the desire to increase competition for funds. However, there is a danger that this reduction could mean that some potentially valuable projects could be prevented from being developed, especially if the NIC is opened up to third-parties and the number of innovation projects increases accordingly. In summary, if the NIC is not opened up to third-parties then the reduction from £90 million to £70 million is probably the right approach, but if the scheme is widened then this reduction may not be appropriate.

Question 2: What are your views on the proposed funding level of the electricity NIC?

20. More innovation is likely to be required in electricity distribution as we move to a smart world than in any other energy sector. The expected rapid electrification of heating and transport over the next 25 years will place considerable strains on electricity distribution networks. Innovative control, energy storage and demand-side technologies could significantly reduce the amount of future network upgrades required, and so any short-term saving in NIC funding could actually lead to increased costs in the long-term.

Chapter 5: Other proposals for governance arrangements

Question 1: Do you agree with our proposals to clarify the circumstances we do and do not expect change requests are submitted to us?

If you agree, do you think our proposed draft explanation of material changes is clear?
If you think alternative drafting would achieve this more effectively please provide this drafting.

21. The ESC supports Ofgem's proposals to reduce the burden of processing change requests and make it less onerous for companies to change aspects of NIC projects. We think that the proposed draft explanation of material changes is clear and we do not propose any alternative drafting.

Question 2: Do you have any feedback on our proposal to publish a plain English guide to our default intellectual property (IP) requirements?

22. We support Ofgem's proposal to publish a plain English guide to its default intellectual property (IP) requirements so as to allay concerns about different interpretations of the default IP arrangements across the network companies. One issue that we would raise is that some third-parties may wish to benefit directly from any IP and/or royalties generated from NIC projects, rather than this being solely for the benefit of consumers.

Question 3: Do you have any views on our proposals to improve the visibility of the NIA projects? What are your suggestions for a proportionate way to get assurance that the NIA is being used by network companies in an appropriate way?

23. We support Ofgem's proposals to improve the visibility of the Network Innovation Allowance (NIA) projects. We do not have any specific views on suggestions for a proportionate way to get assurance that the NIA is being used by network companies in an appropriate way.

Question 4: Do you have any comments on any of our other proposals?

24. No further comments.