Electricity Network Innovation Strategy

Second Stakeholder Consultation - Responses to feedback

29th March 2018

Energy Networks Association

Restriction: None

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Purpose and Objective

The purpose of this consultation was to seek the views, inputs and suggestions for improvement of wider industry stakeholders on a joint Electricity Network Innovation Strategy for the six electricity Distribution Network Operators (DNO), three electricity Transmission Network Operators (TNO) and the electricity System Operator (SO).

The Electricity Network Innovation Strategy will help the licensees to identify gaps and opportunities in the challenges they face, enabling them to efficiently manage their innovation project portfolios. The outcomes will include improved customer value from innovation and a coordinated approach to using innovation to address the challenges that the licensees will face in the coming decades.

The requirement by Ofgem is that the Electricity Network Innovation Strategy must include:

a) A description of the challenges faced by the network licensees;
b) A description of the current and future innovation projects planned to meet (a);
c) A description of the challenges faced by the network licensees that are not being addressed by innovation projects, i.e. the innovation challenge gaps;
d) A description of innovation projects planned to meet the gaps identified in (c), or reasons why they should not be addressed;
e) A description of how licensee activities will be coordinated to avoid duplication;
f) A description of how learning gained from the innovation projects will be shared.

Stakeholder Engagement & Consultation

The importance of stakeholder consultation for the Electricity Network Innovation Strategy was highlighted not only by Ofgem, but also by the Electricity Networks and the ENA. In order to identify and address all of the challenges and uncertainty, it is essential that a wider viewpoint of the industry is registered. With input from our stakeholders, the Electricity Network Innovation Strategy will be better informed and more successful in addressing the challenges and uncertainties. Therefore, the decision was made to include two stakeholder consultations in the plan; one on the challenges faced by the network licensees and the other on the overall strategy.

First Consultation
An initial consultation was run from 22nd September until 6th October 2017 to gather stakeholder views on challenges and uncertainties facing electricity transmission and distribution licensees. The feedback from this has been considered and a summary of this consultation can be found here along with our response to specific feedback.

Second Consultation
This consultation was structured as an online questionnaire, with a set of questions aiming to capture the views of stakeholders on the key sections and conclusions from the strategy document. This consultation was open from 17th November until 15th December 2017.

Stakeholder Engagement Events
As part of the second phase of consultation, the ENA and its members hosted two free stakeholder workshops to facilitate more open and in-depth conversation on the draft strategy.

The draft Electricity Network Innovation Strategy was also presented alongside the draft Gas Network Innovation Strategy at ENA's Low Carbon Networks & Innovation Conference in Telford from 5th – 7th December 2017.

Consideration of Feedback

Electricity industry innovation context

Question(s)

- Which technology or trend do you think will have the most profound impact on the network operators?

Feedback	Response
We are seeing linkages between smart homes, renewables and storage and their ultimate relationship with the wider energy system as a major innovation opportunity and challenge. This needs to be considered from both a technical, including comms and data, and social aspect, as energy consumption is a socially complex phenomenon. These technologies working together have the potential for major shifts in consumption patterns and resilience of the system.	We strongly agree, and we have highlighted the transition towards a whole energy system across each of the innovation themes.
It was stated many times by the respondents that the current provision of telecommunications infrastructure in the UK energy sector will not accommodate this increasing requirement for digital connectivity. **Issues include**: The legacy technology used is often proprietary and non-IP-based thus risking vendor lock-in, vendor polarisation, is unclear that there is co-ordination in terms of design and ultimately learning across projects that have a communications component **Suggestions include**: NIC/NIA should focus on communications technologies, transform from TDM to IP-based communications, a joint "Task Force" be set up by the ENA to focus on this area	Following the consultation, we have included "leveraging communications infrastructure of the future" as a key medium-term outcome under the "Network improvements and system operability" Innovation Theme. ENA in general is also looking to setup a Strategic Telecoms Working Group in collaboration with JRC.
The electrification of heat and transport is a key challenge for the industry, but this needs to be considered in the context of the use of flexibility services and as a bare minimum, the next step should be a "scale" trial to test interoperability of the whole market through trials of different models.	We strongly agree, and we have highlighted the transition towards a whole energy system across each of the innovation themes. We placed specific focus on flexibility in Themes 2 (Transition to a low-carbon future) and 3 (New technologies and commercial evolution) and also have a section on how we intend to deliver benefits from innovation.

Feedback	Response
The most important technological changes for network operators will be development and uptake of smart IT systems to enable effective whole system optimisation and coordination between transmission and distribution systems. The transition of DNOs to DSOs and the interaction between these, the ESO and the TO, if managed correctly, will have a large impact.	DNO to DSO transition is captured as a priority area in category 2.3 of Theme 2 (Transition to low-carbon future). In addition, category 3.4 and 3.7 of Theme 3 (New technologies and commercial evolution) highlight the opportunity of smart IT and cross sector collaboration.
The technology that will have the most profound impact on network operators is the development of flexible decentralised energy resources, such as energy storage; and the need for operators to manage and optimise such flexibility while still guaranteeing a reliable and secure network.	We agree, flexibility and energy storage are acknowledged in Themes 2 and 3 as having the highest future innovation opportunity. Energy security is one of the critical elements of the energy trilemma and will continue to be considered across all of the innovation themes in this Strategy.
Several respondents highlighted the important of smart IT systems. These could be used to manage the system, coordinate between Transmission and Distribution Networks. Technology from other sectors was also highlighted as an important consideration for innovation projects. Areas include AI, DLTs, materials science, and meteorology.	Category 3.4 and 3.7 of Theme 3 (New technologies and commercial evolution) highlight the opportunity for smart IT, new technology and cross sector collaboration.

Introduction to network innovation

Question(s)

- Do you think this section highlights the purpose and objectives of the funding initiatives described?
- Do you think there are any additional innovation funding initiatives which should be captured?

Feedback	Response
This section details the criteria used to identify the NIC and NIA funding requirements. It does not highlight how activities add customer benefits or are sufficiently distinguished from business as usual activities.	Providing value to customers is a critical driver for all network innovation. Ofgem's requirement regarding this strategy focused on particular funding mechanisms, hence the heavy focus on NIA/NIC and LCNF. Chapter 6 on delivering benefits from innovation discusses BAU activities.

Feedback	Response
We hold additional concerns around the purposeful inclusion of innovation areas outside of the eligibility criteria set out by Ofgem. Inclusion of these areas in the strategy serves no purpose given that none of these sit within network innovation, and none would be under the remit of networks under licensing conditions.	While the strategy primarily looks at innovation activities which are eligible for innovation funding, it is important to recognise the wider challenges faced by the industry and ensure that these are considered and addressed as we move forward.
The consultation notes that innovation in industry codes and governance is also outside the NIA/NIC criteria. However, learning from NIA/NIC projects does have the potential to highlight opportunities for new business models and also deficiencies in existing industry code governance arrangements. The latter is an area of challenge that has generally been ignored or overlooked by NIA/NIC projects.	We evaluate innovation project outputs when closing out innovation projects to ensure that any recommendation for updating codes and standards are implemented. This is explained in Chapter 6 (delivering benefits from innovation).
Several respondents recommend that some additional focus be placed on the area of network communications and IT, since these will be the fundamental platform upon which most, if not all innovation strategies will be supported. In addition, several respondents stated that smart meter data should be integrated into wider energy system management, and the capability of information handling and network monitoring should be improved as part of the transition to a DSO. These specific ICTs were mentioned: Virtual data centre/Mobile edge compute technology, Field area networking, Interoperable system platform.	IT systems are addressed within the scope of network innovation. Under "Transition to a low-carbon-future" and "New technologies and commercial evolution" we have included outcomes addressing: smart meter data integration, big data, artificial intelligence, innovation in ICT and cyber security.
The text is limited to an overview of the status quo, without addressing a range of issues stemming from such funding incentives. It is sufficient for the Innovation Strategy to capture the Network Innovation Competition (NIC) and Network Innovation Allowance (NIA) funding incentives. We do not support the inclusion of the last four bullet points that currently sit outside the eligibility criteria.	While the strategy primarily looks at innovation activities which are eligible for innovation funding, it is important to recognise the wider challenges faced by the industry and ensure that these are considered and addressed as we move forward. However, we agree that the way these points were conveyed was not suitable, and hence they have been removed.

Feedback	Response
The current text is not clear on which of the various innovation incentives and funding platforms are included in the strategy and how. There is a lack of clarity on whether or not the strategy would go outside of these projects in suggesting coordination of other sources of funding into that which is already available for network innovation projects.	We have focused on the current NIA/NIC and previous LCNF mechanisms. However, innovation is not limited to solely Ofgem funding mechanisms – as discussed it is important to align our work with other industry initiatives. We have now aimed to make this distinction clearer in the published version of the strategy.

Analysis of innovation projects conducted to date

Question(s)

- Do you think we have adequately captured the innovation activity which has been delivered to date?
- Do you think this analysis is reflective of the volume/value of innovation activity within each category to date?
- If not – which innovation activity do you believe has not been captured/is not represented and why?
- Do you agree with the high-level analysis of the gaps?
- Do you see any major gaps in addition to the ones identified, or conversely, do you feel these gaps are being address elsewhere?

Feedback	Response
I'm concerned that not all innovation outcomes are shared - I recognise Ofgem has taken steps to improve	Sharing of innovation outputs is covered in Chapter 7 (Collaborative Innovation). However, we continue to welcome suggestions on how to improve this moving forward.
Whilst the innovation activity has been captured well, we note that improving network visibility and controllability has been categorised as requiring medium / high effort, related activities to date is low. Given the underpinning nature of these functions, this gap needs to be tackled.	We agree - this category has been assigned a higher priority.
There should be more promotion of projects on customer/ stakeholder focus and technology innovation as these should deliver the most benefits	We agree and this theme has been assigned a higher priority.

Feedback	Response
The analysis is limited to, the volume/funding of innovation activity within each category to date. There is no analysis of the benefits delivered by the projects to consumer's / network users. It is not clear that the projects are significantly different from BAU activities Also, it's important to provide information on the projects that weren't successful and why this was the case.	Detailed analysis of benefits delivered from past innovation projects is outside the scope of this strategy. For more details on specific project learnings see ENA's Smarter Networks Portal. Ofgem has also commissioned various reports on the benefits of their innovation funding mechanisms.
Value in this context appears to describe the funding of projects, not the actual value to consumers from the investment. There is no identification of costs avoided or subsequent reductions in customer's charges.	Detailed analysis of benefits delivered from past innovation projects is outside the scope of this strategy. For more details on specific project learnings see ENA's Smarter Networks Portal. Ofgem has also commissioned various reports on the benefits of their innovation funding mechanisms.
There is not enough weight given throughout as to how this will be rolled out into Business as Usual and benefit customers. A lot of customer money has been spent on innovation and this doesn't seem to focus on what has been achieved to date and how that then translates to real change in the future.	We agree and have included a chapter on 'Delivering benefits from innovation' in the revised strategy, which looks at the transition to BAU.
We believe that it is important that the electricity and gas network innovation strategies are linked and aligned. There will be efficiencies realised in understanding how the two vectors can interact in the future which are clearly not being addressed considering the stark differences between the two strategy consultation documents.	As a result of this feedback we have further improved coordination with the Gas Network Innovation Strategy.
We note that IFI projects have not been included in the analysis which therefore ignores a major element of the innovation project portfolio (we believe over 780 projects). It is misleading not to highlight the IFI projects and to draw out some of the key learning they have created.	The scope of this project was LCNF onwards (since about 2010) – i.e. new innovation.
Improve network visibility and controllability; are both seen as requiring medium/high effort, the actual effort to date on these areas is low. Why is this and what can be done to improve this? Is it due to a lack of understanding, technical knowledge or a belief that if everything remains the same, everything will be ok?	The category refers specifically to LV networks, which is a new need, given the connection of increasing numbers of LCTs and DER at LV.

Feedback	Response
What is missing is perhaps the value chain of components, devices and services which make up the project.	That would be an interesting analysis; however, it is out of scope of this strategy.
Government have a major responsibility to stimulate the market – we do not see enough responsibility pushed back to government for the innovation momentum and regulation needed e.g. What is BEIS, OFGEM, OFCOM doing for smart grid enablement?	We have passed this comment onto Ofgem & BEIS.
We do not perceive any added value in this chapter and the high-level information captured in does not seem to be materially relevant. The DNO-DSO transition is the one topic that should be included in a joint electricity network innovation strategy – whereby all DNOs, the NETSO and industry stakeholder work in a coordinated manner. Smart meters should not fall into the scope of network innovation funding because they are not part of the distribution network remit; and both electrification of heat and transport are already addressed within existing innovation projects.	This chapter was required in the scope of the strategy. The DNO-DSO transition is one of the key categories in the strategy, and links to the work being undertaken by ENA's Open Networks Project. We are not referring to the deployment of Smart Meters in terms of hardware, rather the innovative use of data that will or may become available from them.
We understand the difficulty of factoring in the uptake of electric heat and transport, but would point out that this is an issue with the RIIO framework and long-term nature of network funding, rather than an issue with access to innovation funding.	We will pass this comment onto Ofgem.
There is one clear gap outside of those identified, in the form of the connection of Gas and Electricity networks for a whole system view.	Over £70m has been spent on projects around whole-system planning, but we agree there is significant innovation opportunity here and we have assigned a high priority to this category accordingly.

Observations

Question(s)

- Do you think that there are additional areas for further innovation that should be highlighted?

Feedback	Response
Not specifically innovation project in traditional sense, however improvements around transitioning projects into normal business processes, addressing bottlenecks, business barriers and facilitating replication of innovation value across DNOs if proven to save customer money and improve service and offerings.	Transitioning of projects into BAU has been addressed in our chapter on 'Delivering benefits from innovation.'
We feel that in terms of the observations, there should be more focus on the end consumer and delivering a market based solution centred around consumer's interests. It is not clear if "value" from innovation projects benefits the network owner or end consumer. There also needs to be clearer delineation between funding provided for innovation projects and activities that should be Business as Usual. For instance, employee skills and resources or appropriate forecasting tools should be normal business improvement activities and should not attract innovation funding.	We agree, customer focus is one of our key themes. We will pass your comment that the guidance could be clearer on the definition of innovation projects to Ofgem.
Whilst it is not in the remit of networks, supplier engagement with customers on behind the meter energy solutions will likely have an impact on areas highlighted for further innovation. It is increasingly important to understand what changes may be required to the grid to accommodate for this innovation.	We agree and believe that the issue has been addressed in Themes 1 (Network Improvements and System Operability) and 4 (Customer and Stakeholder Focus).
We would also like the ENA to share with us the bodies that responded to the previous consultation to enable us to gain a better understanding of how these observations were developed.	The types of respondents who participated in the consultations are shown in the documents on the Stakeholder Engagement section on the Electricity Network innovation Strategy page on our website: http://www.energynetworks.org/electricity/futures/network-innovation/electricity-networks-innovation-strategy.html
Data Analytics and Customer Innovation on Future Services could be additional areas of focus.	We appreciate this comment and believe these areas are reflected in the revised innovation categories.

Feedback	Response
We would point out that throughout these themes are areas which would be classified as BAU. Without going into more granular detail of the responses recovered in the first consultation, it is difficult to see how the feedback has responded to each of the sections for each theme, and hard to see the justification for their inclusion. There is a particular need to explain what is meant by cross-sectoral application of network maintenance.	Cross-sectoral application of network maintenance refers particularly to outage planning efficiencies. The issue of innovation vs. BAU is addressed in the chapter on 'Delivering benefits from innovation' in the latest iteration of the strategy.

Our strategy for each innovation theme

Question(s)

- Please rate the future innovation opportunities by importance
  - Are there any missing?
- Do you agree with the assessment of the level of innovation activity across the listed categories?
  - If not - how would you assess the level of innovation activity across the listed categories?
- Do you agree with the assessment of the future innovation opportunity across the listed categories?
  - If not - how would you assess the future innovation opportunity across the listed categories?
- Do you agree with the required innovation effort across the listed categories?
  - If not - how would you assess required innovation effort across the listed categories?
- Do you have any comments on the timeline of innovation activities?
- Do you foresee any external influence or policy changes that would change the timeline of when the challenges will need to be addressed?

Feedback	Response
Theme #1: Network improvements and system operability	
Demand and generation forecasting require substantial effort to make meaningful breakthroughs, not only in creating the models, but also in ensuring that practitioners can effectively make use of the outputs from these forecasts.	We agree and included this in the latest iteration of the strategy – see Themes 1 and 2.
A comment made by several people during the innovation workshops is that the priority timeline question doesn't necessarily frame the issue fairly. Many innovations require attention in the short term but are likely to require continued attention through to the long term. There was confusion as to what timeline should be selected in those cases.	We agree and have amended the timelines in the latest iteration of the strategy.

Feedback	Response
These appear to be BAU activities. Innovation funding should be driven by the associated benefit to customers.	Innovation in these areas has and continues to deliver significant benefits to customers; hence this is still an important theme in our innovation strategy.
Timelines should remain under continuous review as priorities will be affected by the speed and direction of power sector evolution.	We agree with this. As a minimum, the strategy is to be updated every 2 years, as outlined in the guidance document by Ofgem.
As the gathering of data volumes increase, the need to perform predictive analysis and trending will follow. We recommend that one topic should be "Maximising the value of Data Capture"	We have included this aspect in Themes 1 and 3 in the final version of the report
How can every DNO adopt new systems / assets if they are not sanctioned by government through regulation or other means to enforce adoption? Something in the Industry needs "teeth" to move the UK dial for future SO and the supply resilience.	We will pass this comment onto Ofgem.
The paragraph simply outlines the current projects, without outlining any of the criteria that would determine whether the current level of innovation and the future innovation opportunities should be ranked low, medium or high.	Thank you for the comment, we have now added in a methodology section in the final version of the strategy, to explain the criteria associated with the different rankings.
1.5 – is this for the network operator or for the users of the networks? If this increase in visibility and controllability is for the DNO, this should be factored into BAU expenditure. If this innovation is meant to increase consumer visibility of network constraints and their own effect on this, then that is part of the work set out in the Smart Systems and Flexibility workstream and should be taken forward by Ofgem and BEIS.	We believe that there is scope to develop and further improve monitoring and control techniques for the electricity networks via new innovation, particularly at a low voltage level.
Theme #2: Transition to a low-carbon future	
There seems a presumption in the electrification of heat but a hybrid future that has a combination of electrified heat alongside clean gas as a balanced, cost effective and environmentally friendly outcome.	We agree and hence we are taking a whole systems approach with consideration for the specific challenges related to the electricity networks.

Feedback	Response
The recent Statement by Dermot Nolan on regulation needing to be ready for revolution should seek to help bring about the benefits of innovation earlier. We must future enable our systems and markets to unlock the benefits and to do that we must bring about change in a more flexible and responsive manner. We must be able to design, assess and implement change quicker	Thank you for the comment, we agree. We have included it in industry trends.
Adoption of the Active Buildings measurement as part of the Energy Efficiency and Performance of Buildings European Directive. This would act as a key indicator in helping to commercialise energy efficiency products, boost the potential of smart meters and DSR services.	We agree. Energy efficiency, smart meters and DSR are included in our strategy.
The Network Companies should be a facilitator of the transition to a low-carbon future, enabling customers to benefit from the transition. Network Companies should be impartial to the type of generation technology and should not distort the market. Any innovation should represent a substantial improvement or change, simply facilitating the change should be considered BAU.	We agree and we have updated the roadmap in the latest iteration of the strategy accordingly. This also very much aligns with our definition of the future DSO as a Neutral Market Facilitator under the ENA Open Networks Project. The Open Networks Project is taking a technology neutral approach. Ofgem is the body reviewing BAU criteria, but we are explicitly focussing on innovation in this strategy.
Most of the areas identified should not be in the remit of DNOs. The only area which could justify stronger innovation is the DSO transition. Yet, such innovation efforts should complement the Open Networks Project outputs.	The areas identified have been identified by our stakeholders. We agree that many of these categories fall under the scope of the Open Networks Project. As such, the Open Networks Project will be running a series of innovation trials in these areas, which will be coordinated under the ENA. The principle of the DSO is to act as a Neutral Market Facilitator which will allow a range of new and low carbon technologies to connect to the networks and participate in new markets. The Open Networks Project is taking a technology neutral approach.
Theme #3: New technologies and commercial evolution	
In some respects, there is much work to be done at the boundaries, particularly at the building level, where multiple innovation priorities will be in play at a single instance - i.e. electrical heating, storage, electric vehicles and smart and connected homes. There is an issue about unpicking these issues too much and creating a little more of an obvious space for this kind of cross issue working.	We agree and hence we are taking a whole systems approach with consideration for the specific challenges related to the electricity networks. We are working with other relevant industry bodies to further enhance this cross-vector collaboration.

Feedback	Response
This theme is of utmost importance. More inflexible, distributed and micro-generative sources, electric vehicles and localised storage will exert greater pressures on the networks, and also opportunities. Although each important area for innovation in themselves, it is the management and optimisation of these factors on a whole system level (whether community, municipality or national scale) which requires greatest innovation in the areas. It is the digital technologies that will be the glue that holds this together and where there is need for significant innovation.	We agree and hence we are taking a whole systems approach with consideration for the specific challenges related to the electricity networks. We are working with other relevant industry bodies to further enhance this cross-vector collaboration.
Industrial Strategy Challenge Fund programmes including the Faraday Challenge, Prospering from the Energy Revolution and Buildings Construction challenges.	The different types of funding considered are mentioned in the chapters on 'Delivering benefits from innovation' and 'Collaborative innovation'
There is scope for innovation within this theme but it should be customer focused with the potential benefits clearly presented. However, we believe the Network Companies should facilitate new technologies coming onto the system as BAU. To ensure the maximum benefit is provided to end consumers, Network Companies should be technologically unbiased, this will ensure they do not distort the market. Network Companies should not be able to own assets that can provide them with a service which they currently procure from market participants, in addition to this, Distribution Networks should not be an aggregator of services for the SO.	We agree, and again much of the concern raised in this comment is being dealt with under ENA's Open Networks Project, which this strategy has been aligned to.
The timeline appears to be too long, when a significant amount of work has already been done to date. We suggest that the roadmap is broken down to show when "quick wins" and learnings from early projects can be implemented.	We indicate the current level of innovation as well as future innovation opportunity in the latest iteration of the strategy. The criteria for assessing these has been described in the methodology section.
Theme #4: Customer and stakeholder focus	
There is a major issue about access of consumers to their energy information and hope this can link with the wider smart home. We raised this at the recent Smart Meter Bill reading - consumers are generating valuable information yet they have no way to fully access and flexibly use this - this is an important issue if we want to transform the energy market and consumer experience.	We agree and category 2.4 aims to create value from the introduction of smart meters and work collectively to deliver the wider public policy and public interest benefits from data. In addition, the focus of category 4.7 is to maximise the transparency of information and the quality of accessible data for customers.

Feedback	Response
I think more innovation effort could be put into improving employee skills and resources, since this is vital to enable all the other changes and innovations.	We believe that relative to other categories, this category should be assigned moderate future innovation opportunity.
I'm surprised that involvement of customers in the delivery of innovation work has not been scored as requiring a higher level of effort. I think this is not something that the industry currently carries out terribly well (although there are some good examples) and it is one of the greatest reasons for failure of innovation projects. I refer you to a European report in to the failure of smart city projects which listed lack of involvement of customers and community groups (particularly in the early stage) as the foremost cause of project failure.	We believe that having more of a customer focus is critical to the networks going forward which is reflected in the higher average scores for this theme. However, this category on its own has been assigned moderate innovation opportunity. This priority resulted from weighted results and opinions gauged through previous consultations and workshops.
Improving employee skills does not fall into the category of innovation and we do not believe extra funding should be available for this, this process should be part of BAU and necessary in order for the Network Companies to efficiently carry out their statutory duties. We believe that customers and stakeholders should always be at the forefront of any innovative activities carried out by the networks and therefore this theme should be the overarching driver of any innovation.	The narrative in the latest iteration of the strategy clarifies that category 4.3 is aimed at the identification of skills needed in the future.
We would like clarification on (4.2). If by 'customers', the strategy is referring to the energy system participants in general, the we agree with the initiative and it should be absolutely included. If it refers to domestic customers then they are very unlikely to be engaged, and those that are will likely not be representative of the customer base giving skewed, unhelpful results.	The reference in category 4.2 is made to electricity network customers, i.e. the 'energy system participants' that you refer to.
The selected innovation categories are, again, not detailed enough to be classified as network innovation. Seeking collaboration with stakeholders and partners should be a focus of all innovation projects across all themes, and should not be classed as innovation in and of itself.	We agree that there are strong links between the customer and stakeholder focus theme and others in the innovation strategy. However, to recognise the importance of these areas we have kept them as innovation categories to ensure the associated challenges are explicitly addressed.

Feedback	Response
Theme #5: Safety, health and environment	
Several respondents questioned whether innovation projects that improve SHE would benefit customers, and therefore should not qualify for innovation funding. It was also suggested that continuous SHE improvements should be part of the networks continuous improvement processes and is therefore BAU. One respondent however stated that a specific approach to safety measures that would create a step change in future should count as innovation.	We disagree with this opinion that SHE is solely a BAU activity, as step-change innovation in this area accelerates developments and results in new and improved technologies and processes. For example, innovative use of drones for inspection has a direct impact on staff and can deliver benefits to customers through lower inspection cost. However, this would not be considered BAU.
Protecting the environment from pollution and developing efficient end-of-life disposal strategies is an important area given environmental risks arising from new technologies (e.g. battery storage systems). New technologies might introduce new risks that require more immediate attention.	We agree with this comment and believe that this is covered under the SHE Theme categories.

Areas of focus for future innovation projects

Question(s)

- What are your views on our forward-looking innovation themes?

Feedback	Response
I would encourage an emphasis on establishing the role of communications networks in facilitating the 'smart grid' future.	Following the consultation, we have included "leveraging communications infrastructure of the future" as a key medium-term outcome under the "Network improvements and system operability" Innovation Theme. ENA in general is also looking to setup a Strategic Telecoms Working Group in collaboration with JRC.
There isn't a specific mention of cross-sector interaction in the forward-looking themes, in spite of this being identified in as an innovation category in the previous section.	We agree; this section has now been removed and combined into the previous sections, which highlight the need for cross-vector interaction.

Feedback	Response
Customer/stakeholder focus – we are unsure as to why energy efficiency should appear on a DNO innovation strategy as this is not a DNO led activity. We echo these thoughts for "vulnerable customers".	While the networks do not lead on energy efficiency in the home, this is a crucial area for energy policy which we can help promote. Furthermore there is still plenty of scope to make the networks more efficient. In terms of vulnerable customers, this is a key focus area for Ofgem and the networks will do as much as they can to help in this area.
Key focus areas should also include 'beyond the meter' technology and interoperability: smart appliances; HEMS/BEMS; home energy storage; ICT/IoT enabled applications; AI / machine learning; etc. These technologies have the potential to profoundly impact customer behaviour and the extent to which flexibility can be leveraged to both benefit the operation of the power system and enhance customer satisfaction.	While we need to understand the impacts of what is happening behind the meter, this goes beyond the current scope of the networks.

Delivering benefits from innovation

Question(s)

- Are there ways in which we can improve the delivery of benefits from innovation?

Feedback	Response
Far greater openness and communication of outcomes – e.g. via the Energy Systems Catapult Energy Knowledge Exchange and the UKERC EDC.	This is reflected in our chapter on collaborative innovation.
The specifics will vary from project to project, but the main shortcoming of the existing approach is viewing customers only as end users, when many new innovations require customers to be engaged and on board to succeed (the roll out of smart meters being an example of customers not being engaged or on board). More processes could be brought in to get customers to engage with new methods and technology as they are transitioned into business as usual (for example, customers who were involved in an innovation project acting as ambassadors for the new technology as it is deployed as standard).	We agree with this comment. We want to significantly improve customer and 3rd party involvement in network innovation – hence we have addressed this in Theme 4 and the chapter on collaboration.

Feedback	Response
Increased transparency around the costs of innovation and the benefits that they provide to network users and ultimately end consumers. It's should be clear how the list of stakeholder benefits corresponds to the list of future innovation projects in the previous section. It's important to learn from projects that weren't successful to avoid making the same mistakes in the future, information should be provided regarding unsuccessful projects of the past.	As discussed in our chapter on 'Delivering benefits from innovation', the ENA Smarter Networks Portal aims to disseminate this type of information to the general public. We will also pass this comment onto Ofgem.
Where the benefits are clear from a piece of innovation, it should be clearly mandated that it is rolled out across all DNO's. We do not see a lot of evidence of such practice so far and the innovation strategy should contain a clear procedure for UK wide roll out for successful innovation (by this we do not mean Flexible Connections we mean any solution which changes the way the grid can be managed to release capacity, provide better service or better manage the network).	There are different problems across various networks, therefore mandating specific innovation is not considered practical. Procedures on collaboration and knowledge sharing are covered under 'Delivering benefits from innovation'. We are also improving the transition to BAU under the ENA's processes. While it may not be visible that this is occurring (and we can certainly improve this) networks have 'fast followed' each other and rolled out a number of innovations as BAU.
All innovation results and learnings should be open source and transparent. It should also be communicated to industry in a constructive and easy to understand way that allows other stakeholders to benefit from the innovation work completed. This innovation does not belong to networks, but to all network participants.	All innovation outputs and learning is published publically on the Smarter Networks Portal to ensure the wider industry benefits from our innovation.
Media, Traditional and Social is not embraced enough. ENA should consider new ways of marketing communication beyond the initial stakeholders.	We strive to be continuously more customer focused, and hence we are looking to improve methods of communication under ENA.
Enhancing methods used to share information across a broad range of stakeholders should be a significant part of the delivery of benefits from innovation. Whilst posting innovation projects on the ENA website is a useful start, broader sharing of the detailed results from innovation projects would enable greater development based on these findings.	Collaboration and implementation are highlighted in the strategy as a strategic focus moving forwards we will aim to significantly improve these.

Collaborative innovation

Question(s)

- In an ideal world, what do you think the best arrangement for enabling collaboration would look like?
- Are there any other ways in which Network Companies could collaborate with each other more effectively?
- Are there any other ways in which Network Companies could collaborate with third parties more effectively?
- Do you believe there are additional barriers to network collaboration or have suggestions for how these could be overcome?
- Are there any other ways in which Network Companies could encourage Cross Energy Vector or Cross Sector collaboration?
- How can we improve the level to which third parties are informed about, and involved with, innovation projects?
- How would you like to be involved in innovation with the Network Operators in the future?

Feedback	Response
Seek to establish an innovation workstream and governance arrangement to support the development of the communications needs of the operators as part of the DNO to DSO transition.	Although this is not part of strategy, ENA is taking an active role to facilitate this. ENA will be setting up a Strategic Telecoms Working Group in collaboration with JRC.
Innovation can arise from either a problem or an opportunity, and in some cases both. Therefore, it would be good to have a platform which lists the problems that have been identified by network operators, and the skills they expect to need to address them. This would have to be combined with an open opportunity for collaboration around ideas which have not been identified by the network company, but could still deliver value.	Existing platforms (e.g. ENA Smarter Networks Portal and the NI Collaboration Portal described in the strategy) are available for academia as well as other users.
NIA and NIC projects facilitate this, but some network companies are more open to collaboration than others. Large academic projects and research hubs have the potential to facilitate this, for example identifying the most appropriate expertise or sharing network innovation challenges within the research community.	We welcome more academic involvement in this area, and would welcome a discussion to further facilitate this.

Feedback	Response
Along with Ofgem, Elexon and BEIS I am exploring the opportunity of setting up an industry wide sandbox (similar to Ofgem's existing sandbox). This would enable innovators to have a one stop shop for regulatory and technical advice on how to implement their technology, and in exceptional cases give derogations to regulation to trial new technologies. This would enable innovators to navigate the complex environment of the energy industry quicker and also identify opportunities for innovation funding or collaborations.	We agree and ENA is happy to collaborate on such an initiative.
Publish frequent updates online for the projects, demonstrating the value for customers. Hold workshops/consultations to discuss future projects with customers, this will ensure that projects are built around the customer's interests.	We agree, this is currently being done via a variety of initiatives under ENA and the networks, and we aim to increase this engagement going forward.
The competitive structure of recent network innovation funding needs to be replaced with collaboration as a default approach.	We agree and will pass this comment onto Ofgem.
The key is to consider how collaboration can be managed holistically so that innovation moves seamlessly through the TRLs and doesn't become delayed or stranded due to transitions between TRLs that require different sources of innovation funding.	We agree and would welcome input from others on how this could be improved.
Collaborative effort in conducting research projects needs to be followed-through with effective action. We have noted, for example, that whilst the Smart Grid Forum DS2030 project drew many informative conclusions, there is little evidence to date of effective follow-up in taking forward the recommendations.	SGF actions have been taken forward under the Open Networks Project and by others (inc. the new Smart Systems Forum). As discussed, BAU processes have also been implemented for successful innovation projects previously.
Actively seeking collaboration with (for example) Local and/or Public Transport Authorities, Smart Cities, Energy Communities, and BEV manufacturers, might enable a stronger case to be made to secure the new sources of funding.	We agree. Cross-sector collaboration is a key priority going forward.
Collaboration could be enhanced by a consortium-type approach whereby a group of DNOs and other interested stakeholders would work in close cooperation for continuous exchange of experiences between network operators and their customers.	This activity is undertaken by the ENA who represent all of GB's electricity and gas networks.