Innovate UK

Innovate UK response to Ofgem Consultation:

Reviewing the benefits of the Low Carbon Networks Fund and the governance of the Network Innovation Competition and the Network Innovation Allowance

5th February 2016

Overview

Innovate UK is the UK's innovation agency, a non-departmental public body sponsored by BIS. It is the prime channel through which the Government incentivizes innovation in business. Innovate UK is business-led. Our governing board and executive team is comprised of experienced business innovators and experts. We work with people, companies and partner organizations to find and drive the science and technology innovations that will increase productivity and exports and grow the UK economy.

We are working to:

- accelerate UK economic growth by nurturing small high-growth potential firms in key market sectors, helping them to become high-growth mid-sized companies with strong productivity and export success;

- build on innovation excellence throughout the UK, investing locally in areas of strength;

- develop Catapult centres within a national innovation network, to provide access to cutting edge technologies, encourage inward investment and enable technical advances in existing businesses;

- turn scientific excellence into economic impact and deliver results through innovation, in collaboration with the Research Community and Government; and,

- evolve our funding models to explore ways to help public funding go further and work harder, while continuing to deliver impact from innovation.

In line with our [strategy](#) we operate across Government and advise on policies which relate to technology, innovation and knowledge transfer. We also support Government departments to become more efficient by supporting them in developing innovative solutions through harnessing the creativity that businesses can offer.

Innovate UK was established in July 2007 (as the Technology Strategy Board). We have committed more than £1.5 billion to date and independent evaluations have established that overall Innovate UK has created over £6 of GVA for every £1 it has invested and 7 jobs for every business it has invested in. Over the last 8 years this has added up to delivering a total of £7.5Bn and 35,000 jobs. The private sector more than matches that investment, doubling the power of public sector money, and we have directly supported over 6,500 companies. We work with nearly every University in the UK to stimulate the commercialization of leading-edge academic research and innovation.

The energy sector has grown into one of Innovate UK's key priorities. Our aim is to help innovative UK businesses to take advantage of the opportunities that a rapidly changing energy system will present, both in the UK and in overseas markets. Over the last parliament we have invested up to £60m per year in support of hundreds of innovative businesses developing new products across the energy sector, from new supply technologies, through to new network-based products and energy use efficiency services. Our 2012 – 2015 energy strategy articulates our objectives in this sector.

Innovate UK supports businesses in two main ways. Firstly, we provide funding to allow development of high potential, ground-breaking new technologies and products that are too early and too risky for the private sector to fund alone. Secondly we help businesses connect to the right partners, expertise, test facilities, financiers and influencers that can accelerate their route to market. Examples of this support are the Catapult centres, launched by Innovate UK to provide critical expertise and test facilities to businesses in developing new products. Two of these are in the energy sector; Offshore Renewable Energy Catapult in Glasgow and Blyth, and Energy Systems in Birmingham.

A growing part of our energy portfolio is in 'energy systems' (by which we mean the development of an optimized, flexible, reliable and cost-effective system of energy supply across electricity, heat and gases). The experience gained in funding projects in this field, alongside setting up the Energy Systems Catapult has provided a great wealth of knowledge about the possibilities that will be provided by new technologies, products and services in optimizing and enhancing flexibility of the energy system in the near future, the opportunities for network operators and implications for them.

When deciding its investment priority areas and funding interventions Innovate UK has to consider:

- Where most economic impact can be achieved, which is usually synergistic with having the most impact in addressing the UK energy goals

- Timeliness of the investment

- Value for money for taxpayer

This submission is written through this lens, intending to ensure awareness of the art of the possible in enabling network flexibility. The feedback in this document is also written predominantly around the electricity, and the associated experiences and observations, though we anticipate learning and knowledge from gas NIC projects will also be important to our role in the future.

Observations and comments – Learning and Knowledge

To inform the above process, Innovate UK gathers evidence from a wide range of sources. We have found the data, knowledge and learning from LCNF projects in particular an invaluable input and reference for evaluation of funding priorities. Without the breadth and quality of these projects hard data and good context based opinion we would have very few sources of quality input, and would have to base our decision making processes on expert opinion or analysis, modelling and simulation activities in academia. Projects such as My Electric Avenue, Electric Boulevard, Low Carbon London and Customer Led Network Revolution have given us a much clearer perspective on areas such as:

- The potential for plugin vehicles for grid support, the attitudes of EV owners to managed charging, the likely timing of network impacts. This has directly contributed to our confidence in treating this as a high value intervention area and subsequent representation we have provided to DECC and OLEV that this ought to be treated as a significant opportunity high priority area

- Customer attitudes such as to time of use tariffs and DSR – this is valuable data and learning for both Innovate UK in informing priorities and our innovator community. Many of the innovation projects Innovate UK has funded (see here for examples) are trialing new ways of interacting with end users of energy. But, there is a limit to scale of project trials that Innovate UK is able to fund, limiting the ability for innovators to gain confidence in a commercial model in some cases. The body of evidence from LCNF projects that involve energy users greatly augments Innovate UK project trials. Put another way, LCNF projects trialling something "technical" affecting end users augments Innovate UK projects that are seeking to trial a "business model" that might be provided to end users

- Heat pumps, attitudes to use, technical opportunities and barriers, which will inform our thinking on innovation needs and opportunities for thermal storage, demand response and system performance improvement

- We would also like to specifically point out that the breadth of LCNF trials of electricity storage has provided us with a much clearer view of how we can support efforts to support and communicate the commercial viability of electricity storage. In particular, one of the questions frequently posed regarding electricity storage over the years has been "where is the best scale and location to put electricity storage". We see enough evidence now from LCNF trials to support the view that given the complexity and diversity of our networks, that in time storage will have commercial viability and network value at all scales to suit local needs and circumstances, a view echoed by network operators we have spoken to, confidence that can only be attributed to LCNF trials. This confidence of view removes one of the decision blockers for innovators and investors in the sector, i.e. there are unlikely to be dead end areas

Observations and comments – future direction

There are three converging need areas in the energy systems area that suggest that there is a significant emerging opportunity for more closely aligning NIC funding (or some NIC funded projects) with funding or projects from Innovate UK to meet the needs of the sector and accelerate the agenda. Converging needs:

Converging need area 1

An observation of many of the dissemination presentations for LCNF projects (good examples being the ones highlighted earlier in this response) is the need for additional work and creativity in business models in order to reap the full network benefits of a new technology or approach. Benefits of a Method are often fragmented across different and sometimes quite remote stakeholders.

- A simple well known example across many project conclusions is "network located" electricity storage, where the economics are not viable for business as usual if considered purely with the domain of the network operator

- A further example is time shifting charging of plug in vehicles where a) the benefit to a DNO is cited in My Electric Avenue at circa £20/property in terms of network deferral avoidance, which is felt not to be enough on its own to solicit engagement from plug-in

users, and b) network operators are not in a good position in terms of their experience/knowledge to develop commercial relationships with plug-in owners.

To summarize the above need area, network operators need external engagement and creativity of business model approach to facilitate viable sustainable solutions to provide them with new flexibility resources, particularly those that engage the fragmented end user base.

Converging need area 2

As commented on previously, Innovate UK has funded a number projects that seek to generate new business models engaging end users (and also communities), typically working in an environment that is either behind the customer or working in conjunction with existing service providers such as aggregators.

Existing projects will typically finish early/mid 2017 bringing valuable learning on the technical contribution their innovations could make to network goals, and on commercial viability. As these innovations typically engage end users in new ways, the behavior of those users in response to those new systems will be a key objective of those projects and to build confidence in business model and commercial success.

It is quite conceivable that these projects will benefit from further project demonstrators with much deeper relationships with network operators to connect much more strongly into the network operator operational practices and provide much more real world of the energy user behaviors and reactions.

We also anticipate growth of projects and innovations that will seek to test the real behaviors of statistically useful populations of end users in scenarios that will be of significant interest to network operators. Good examples of this would be anticipated future projects featuring business models that might focus on active management of plug-in vehicle charging, vehicle to grid, domestic hot water control, domestic storage heater control etc. This is not limited to the domestic scenario as small business/light commercial customers also have potential for flexibility orientated projects

To summarize the second converging need, we see a growth in projects that will need to credibly test the real world behaviors of a statistically useful population of end user responses to new business models that will benefit and engage network operators.

The consequent needs/opportunities from the above

Resultant need/opportunity 1

To protect energy customers, LCNF/NIC projects that engage end users in testing behaviors (e.g. Low Carbon London and time of use tariffs) such projects guarantee to those customers involved that they will not be disadvantaged financially by the projects. Such customers are therefore compensated at the end of the trial. As customers are informed at the beginning of the project that they will be compensated, this framework is therefore not a fully representative real world behavioral trial, and therefore providing uncertainty and risk in any conclusions that are drawn from observed behavior.   This in turn significantly weakens the confidence building that we would hope projects centered around energy user behavior that our innovator community would greatly benefit from.

NIC innovation projects engaging end users therefore have a significant potential in the future to enable viable business models to springboard into commercial swiftly after NIC project completion if they can provide demonstrably "real" behavior and user engagement.

Recommendation - To release the above value we would propose that a mechanism is provided within NIC governance to enable energy customers to partake in projects where the customer agrees to take a degree of financial risk on the project such that they might actually be disadvantaged by the project.

Resultant need/opportunity 2

As the need for new business models and value aggregation mechanisms is a commonly identified barrier in network operator lead projects, and given that this is anticipated as a growth area of contribution from the external innovator community, we believe there is a significant opportunity for Innovate UK funding and NIC funding to be brought together in a collaborative funding competition. The two "sides" meet AT the customer as it were and so the two separate innovation funding mechanisms could work together to achieve much fuller customer engagement and learning than is achieved today, simultaneously providing very real learning of network benefits, but also very real business model experience for the innovators concerned.

An example of one proposed structure for funding from both environments working together could be for a joint two stage competition such as

- o Innovate UK fund the first stage (perhaps feasibility studies) in response to a network operator formulated challenge. This might back several projects to explore competitor approaches looking at both the technical and commercial potential for ideas

- o Stage 2 would be funded by NIC, choosing the best approaches from the feasibility studies in stage 1

Recommendation 2 - Innovate UK would like to formally explore opportunities in this area with Ofgem, bringing the infrastructure focused network innovation agenda with the business proposition focused agenda of external innovators.

Working together in a manner of this sort would provide a focus that could accelerate business model orientated innovations and demonstrate a very joined up approach to stakeholders.

Observations and comments – dissemination of information

The quality and value of dissemination through the LCNI event is excellent, as is the standard, depth and breadth of project closure information documents for LCNF/NIC projects. The dedicated web sites for these projects area also very welcome and well thought through and very conducive to external engagement and dissemination. The only request for improvement we would request for the above is a small onen, namely that the LCNI conference brochure contains more information on the content of the sessions listed. At the 2015 event, brochure information on each talk was very high level and it was very hard to judge (for someone who already has good awareness of all the projects) which sessions might be of interest.

On a contrary note, as a specific dissemination tool in its own right, the Smarter Network Portal is extremely poor, hard to navigate, and not at all conducive for a third party from outside the sector to browse such as innovators from outside the sector. We will be more than happily provide more specifics on this on request.

Other

Whilst they may not not strictly within the scope of this consultation, we have the following comments on the following areas that are part of the overall process around NIC.

Innovation Working Group

- o Innovate UK feels the IWG meetings extremely valuable both in terms of understandings Ofgem interests and ideas in the development of NIC funding

- o We would highly recommend encouraging a wider participation of non-DNO partners from existing/previous NIC/LCNF projects in the meeting. There were three SMEs in the previous meeting, two of whom we know have engaged with the DNOs on NIA projects but only one who had participated in an LCNF project who made a very useful contribution. Encouraging more participants of the latter would have great value, as they have a particularly interesting perspective on the process, especially if they are an SME

- o Finally in this section, a question. Given the expected future creativity and diversity in business models for energy systems, particularly one that engage energy customers, might there be value in inviting a representative from the energy supply sector (Energy UK?) and also someone representing the energy supply area from Ofgem?

Creating opportunities for SMEs in NIC and NIA projects at LCNI

The LCNI event provides an invaluable occasion to absorb disseminated information from NIC projects and network with network operators. Innovate UK does encourage innovators in its community to participate in the event. While there is interest in doing this, the feedback from smaller companies in particular is that hiring an exhibition stand of their own is far too costly and far to speculative. This is often in the context that the companies we support are not usually in the current network operator supply chain, and wish to explore the newtwork opportunities with ideas which may be at a very early stage, or where the network need may be several years away.

At the last event Innovate UK did host a small number of companies on its own stand but this had to be done in a low key way and for free in order to avoid breaching the contractual obligations upon "formal" exhibitors that they are prohibited from sub-letting the space. Despite this low key approach the positive leads that the companies secured while on the Innovate UK far exceeded their expectations and in one case it has given them the confidence to commit to an exhibition presence of their own this year.

There therefore exists a significant opportunity to develop a low cost "innovation zone" for companies at the event, for innovators with more creative, more speculative innovations using small display pods in order to catalyze creative connections at the event, and explore ideas for new products, services and business models. This would need to be done in an ultra low cost way, keeping the hurdle as low as possible, to encourage as many innovators as possible to do this. Innovate UK has discussed this idea with BEAMA who are very supportive and see an

opportunity for their members to put themselves on the radar with network operators in an efficient and creative new way. We believe the Energy Innovation Centre would also support an initiative of this kind, and based on our experience of running similar innovation zone formats in other industry events, that between the three organisations an innovation zone of this sort could easily provide an opportunity for 30-40 new innovator participants in the event.

A particular example of where this sought of approach would be in EV/plugin vehicle charging management systems, load shifting, vehicle-to-grid. The supply chain in this sector is still in its infancy, but the future opportunity and value for the network agenda is significant. A low cost innovation zone approach such as this would be an ideal forum to solicit many of these early market players and other interested parties such as from the digital sector to engage with multiple network operators, to build relationships and build understanding.

This would represent a break from the ethos of the event to date, from being predominantly one of "dissemination", to one where there is additionally a strong event ambition to catalyze fresh new thinking around business models, facilitate really creative new opportunity connections, and would provide a very easy new way for innovators from smaller companies and outside the supply chain to engage. It is the only sector event of its kind in the calendar, and one where we believe more value can be generated for both network operators and innovators.

Mark Thompson
Mark.thompson@innvoateuk.gov.uk
07867 462690