

# Response to Ofgem Consultation on Proposed Changes to the Network Innovation Allowance and the Networks Innovation Competitions

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Damien Frame Keith Bell      Matthew Hannon  
*Dept. of Electronic and      Hunter Centre for*  
*Electrical Engineering      Entrepreneurship*  
University of Strathclyde

February 2017

## **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?**

Ofgem's Network Innovation Competition (NIC) guidance indicates that key objectives of the fund are that projects:

- accelerate the development of a low carbon energy sector and/or delivers environmental benefits whilst having the potential to deliver net financial benefits to future and/or existing customers;
- provide value for money to electricity customers;
- are innovative (i.e. not business as usual) and have an unproven business case where the innovation risk warrants a limited Development and/or Demonstration Project to demonstrate its effectiveness.
- generate knowledge that can be shared amongst all relevant Network Licensees;
- include collaboration between Network Licensees and third parties.

Given that these objectives focus on benefits that the industry, as a whole, should deliver to all customers, and that they articulate a desire for collaboration and the necessity of knowledge sharing, we believe that an industry wide innovation strategy is appropriate.

In a recent review for the UK Energy Research Centre (UKERC) and HubNet of the Low Carbon Networks Fund (LCNF)<sup>2</sup>, the precursor to NIC/the Network Innovation Allowance (NIA), it was commented that despite strong requirements to undertake knowledge capture and dissemination, it was often difficult for observers to identify clear messages with respect to the innovations investigated under the programme. Moreover, there was a variation in the quality of evidence reported.

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<sup>1</sup> <https://www.ofgem.gov.uk/ofgem-publications/53526/spnic.pdf>

<sup>2</sup> <http://www.ukerc.ac.uk/publications/a-review-and-synthesis-of-the-outcomes-from-low-carbon-networks-fund-projects.html>

In the portfolio of LCNF projects undertaken, the UKERC/HubNet review found multiple DNOs testing similar technology and/or business models. Whilst this is not fundamentally a problem if a strategic approach is taken across the portfolio of projects, a collaborative approach to identifying key uncertainties and generating appropriate new evidence was not apparent from the project reporting. For several innovations, the evidence produced across the project portfolio was inconclusive. For others, it was contradictory which suggests some value in multiple tests provided the reasons for different conclusions are made clear. For these innovations, the UKERC/HubNet report included a set of recommendations for collaborative work to review contrasting evidence and undertake collaborative work to address remaining uncertainties regarding the innovation.

To date, it has depended on the network licensees to identify areas of work for which they seek innovation funding support. The UKERC/HubNet review observed that the majority of LCNF projects focussed on methods to: increase visibility of the networks, improve understanding of network conditions, and locally control power flow and voltage. However, many projects also included prototype development and academic modelling of advanced, coordinated control systems that would underpin Distribution System Operator functionality. In some cases for these lower TRL innovations, strong conclusions, next steps and relevance to future work were not apparent, begging the question why the innovation had been tested in the first place. We do not see the investigation of lower TRL innovations as a negative per se. Indeed, we believe that it is important for the network licensees to engage in this rather than to leave it to, for example, academics funded through the research councils or European research funds such as Horizon 2020 doing it on their own<sup>3</sup>. Industry engagement in research council funded work will be very important in testing the subsequent applicability of the technologies or methods being developed, providing realistic case studies and data and maximising the chances of positive impact. However, in order for the network licensees to commit resources to such projects when beneficial outcomes for them are not certain, they should have access to at least some funding. It seems to us that the NIA would be suitable for investigations starting at medium TRLs. One purpose of these can be preliminary work that can lead to a good case for subsequent NIC funded demonstration.

Many LCNF projects focussed on equipment that was, to date, unfamiliar to DNOs in Britain. Knowledge has been gained on commissioning and operational performance, but, in our view, more now needs to be done on system level methodologies and business processes such as optimal operation, support for investment decision making, and commercial and regulatory frameworks.

We welcome the broadened scope of NIC projects suggested by Ofgem; however, in order to ensure good value for customers' money, the relevance of funded work to strategic objectives and the quality of evidence that can be expected must be ensured.

The existence of uncertainty is a fundamental requirement for allowing the use of customers' money; the aim of innovation funding support should be to reduce uncertainty through the generation of

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<sup>3</sup> It may be noted in passing that the public funding to which academics have access in respect of work relevant to power systems will significantly decline following the UK's exit from the European Union. It may also be noted that, in our experience, many of the reviewers engaged by the research councils to assess project proposals show little regard for work starting at medium TRLs. In other words, projects at such TRLs are less likely to be funded than those that are more 'novel' and 'ambitious', which many research council reviewers interpret as meaning "more blue sky" or concerning more fundamental, less immediately applied knowledge. This suggests a need for other sources of funding for medium TRL projects.

knowledge. In our opinion, the development of a low carbon energy sector is creating industry wide uncertainties and it is in the interests of customers for the network licensees to address these in an efficient and effective manner that provides scope for the coordination of different network licensees' efforts. An innovation strategy should identify the key uncertainties and provide a framework for collaborative R&D with clear guidance and methodologies for knowledge capture and sharing. However, it should also recognise the diversity of conditions that can be found in different regions of the power system and not be limited to methods or technologies that have universal applicability. At the same time, the network licensees could and should do more to learn from international experiences. The network licensees have the potential to build on learning from previous innovation activities, draw on their own improved R&D capability and work with the wider research community (including professional researchers such as academics). Although a useful push to innovation can come from some degree of competition between network licensees, we believe that network licensees collaborating on an industry-wide innovation strategy would significantly enhance the value for money of future innovation funding. However, we would also urge that the development of such a strategy is not left exclusively to the network licensees. We believe that significant value could come from the contributions of others, e.g. suitably qualified academics or consultants who can challenge the status quo, bring expert knowledge to bear and share learning on international experiences.

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

From our analysis of LCNF projects we observed that DNOs primarily turned to universities and large power systems specialists or consultancies as their main project partners. However, the role of local government and local community group partners has been limited, as shown in Figure 1.

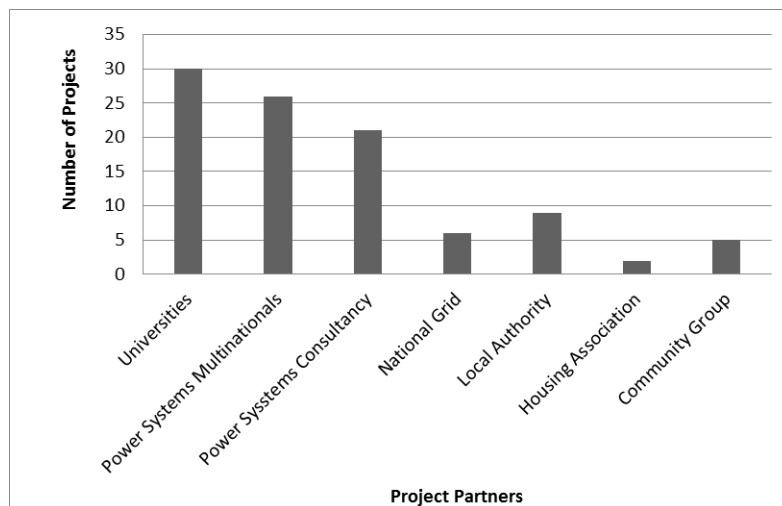


Figure 1: partners in LCNF projects

Local energy systems are a policy focus of the Scottish Government with innovation funding support coming from the Local Energy Scotland (LES) Infrastructure and Innovation Fund and the Local Energy Challenge Fund<sup>4</sup>. These funding mechanisms have been exclusively accessed by local authorities and

<sup>4</sup> <http://www.localenergyscotland.org/funding-resources/funding/local-energy-challenge-fund/>

community groups as the lead applicant. A thematic review of successful funding applications to these funds is underway for 63 funded projects and provides a point of comparison with LCNF innovation activity.

LES projects led by local stakeholders have, in large part, aimed to allow control of net power flows between a local area and the wider network. This may be driven by a desire to connect generation to a constrained network and/or a desire to find commercial benefits from technically and commercially linking local generation and demand. As shown in Figure 2, innovation challenges addressed included: local area balancing; 3<sup>rd</sup> party control of local generation and demand; matching local electricity generation to heat or hydrogen demand vectors; and matching local electricity generation to low carbon technology (LCT) demand. Although the majority of projects have implications for electricity networks and require DNO involvement, DNOs are rarely involved at the bid stage.

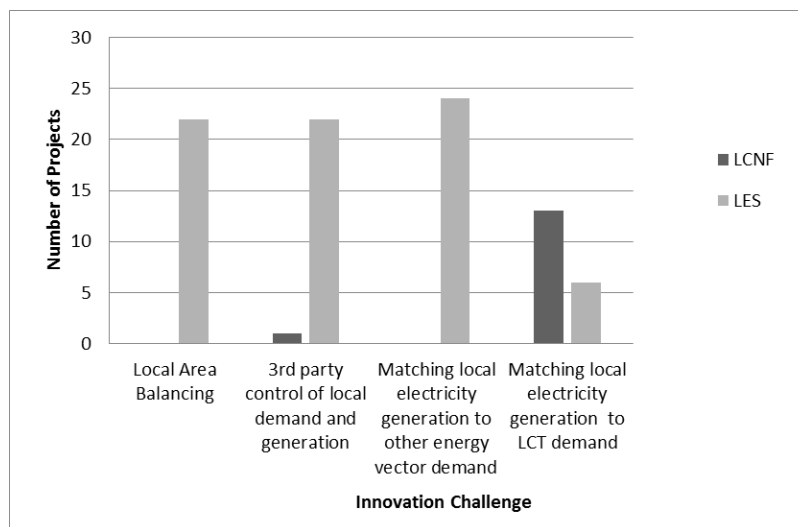


Figure 2: objectives in LCNF and Local Energy System projects

In our opinion, LES innovation activity to date represents a disconnect between the perceived needs of certain customer groups and the focus of the DNOs. Increasing the diversity of third parties involved in both NIA-funded projects and the NIC is necessary to ensure the ambition and objectives of network innovation projects are cognisant of the full range of activities customers expect networks to facilitate. Other parties that could be usefully involved in NIA or NIC projects<sup>6</sup> include generation licensees, equipment manufacturers, software developers, landowners such as Crown Estate or the various energy-related Catapults as well as professional researchers who can help to ensure the proper positioning, testing and reporting of work.

<sup>5</sup> Review being undertaken by authors in collaboration with UoS CXC Fellowship - Energy System Implications of a Shift to a more Localised Energy Production.

<sup>6</sup> Note that consideration should be given to which collaborators should be entailed to recover their project costs from NIA or NIC. In some cases, they may expect to gain commercial advantage from participation and so should not receive funding. In other cases, e.g. for academics, there will be no way for their costs to be recovered other than through the network innovation funding.

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

We offer no particular contribution in response to this question.

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

We agree that the previous innovation support mechanisms have helped DNOs, in particular, grow their capability to undertake and successfully deliver innovation projects. Where the network licensee itself stands to benefit from an innovation, it would be appropriate for them to make a non-refundable contribution to project costs. However, in cases where customer money is used, we also believe that it would be of value to continue a formal assessment of project success, with an appropriate incentive if necessary. We would argue that the original emphasis of the Successful Delivery Reward (SDR), *to incentivise efficient delivery and good project management by network companies*, may have been, in some ways, counterproductive to delivering high quality learning and evidence which should be, in our view, the true measure of innovation project success.

The UKERC/HubNet review of LCNF learning outputs found that although very large amounts of useful learning had been generated and most projects met Ofgem's requirements to support learning and dissemination, robust evidence regarding the innovations explored was sometimes lacking. While this can be due to unanticipated problems that should be addressed before any firm conclusion can be drawn on the utilisation and benefits of the innovation being explored, in a number of cases this would appear to have been due to poor initial design of experiments where there was a failure to clearly state what information is sought and to define robust methods to obtain it. In some projects, we also observed a failure to position a project relative to current levels of knowledge (or TRL), the expected evidence that should be generated by the trial, and finally, what level of knowledge is to be obtained by the end of the project. Such a lack of clarity risks a failure to deliver useful learning. It is our impression that DNOs have shown some reticence to report innovations that have not performed as expected and that the publication of sufficient data and information to allow others to try to reproduce the results and test the conclusions has been highly variable. We speculate that this could be due to: inexperience of some DNO personnel with management of R&D and scientific reporting; a focus in some cases on 'success' as meaning that what was being investigated in a project turns out to be something that can and should be adopted; or the nature of the competition between DNOs that has been fostered by Ofgem.

We view the most successful learning as that which enables sufficient evidence-based understanding to make a robust business case for adopting the innovation as 'business as usual' or, equally as important, making a robust case against adopting the innovation. We believe that the success of an innovation project, once funded, should be judged on the quality of evidence generated. The evidence may actually indicate the rejection of the innovation, or the need for further work. For high TRL innovations, the evidence should allow robust decisions to be made regarding the commercial viability and cost-effectiveness of the innovation and the conditions under which its deployment is justified. Similarly, projects that provide robust, credible evidence that a lower TRL innovation remains promising and requires further work, or should be dropped, should also be regarded as successes.

The UKERC/HubNet LCNF review proposed a framework for assessing the published evidence that reflects the reviewers' assessment of project success. This framework was subsequently adopted and applied to 'BAU Scoring' in the independent evaluation of the LCNF commissioned by Ofgem. In our view, this framework could provide a useful component of ongoing formal evaluation of the 'success' of innovation projects. We suggest there would be significant value in requiring project close down reports to include formal self-assessment of an innovation's 'BAU Readiness Score' and TRL progression, accompanied by an in-depth discussion of the supporting evidence produced by the project and, for projects with a positive BAU score, description of the expected pathway towards deployment. This could then be subject to independent expert scrutiny and would support ongoing knowledge capture, strategy development, and appropriate design of future innovation projects.