

Decision

Decision on the 2019 Gas and Electricity Network Innovation Competitions

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The Network Innovation Competitions (NICs) are designed to stimulate innovation in the energy networks. This document explains which projects have been selected for funding in 2019.

We have decided to award £21.2 million across one gas and two electricity projects. Our decision is informed by the recommendations of independent Expert Panels.¹ Licensees awarded NIC funding must make at least a ten per cent contribution to the total costs of projects. This year successful licensees and their partners will contribute £2.4 million to projects.

The successful projects were selected because they performed well against all NIC Evaluation Criteria.² We expect the outcomes of these NIC projects will help network licensees and industry to better address customers' changing requirements as Great Britain moves towards a smarter, more flexible, low carbon energy system.

¹ The Expert Panels are referred to interchangeably throughout this document as 'the Expert Panels', 'the Panels', and, in sector specific chapters, 'the Expert Panel' or 'the Panel'

² The Evaluation Criteria are set out in the NIC Governance Documents [which are accessible here: https://www.ofgem.gov.uk/publications-and-updates/version-30-network-innovation-competition-governance-documents](https://www.ofgem.gov.uk/publications-and-updates/version-30-network-innovation-competition-governance-documents).

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Executive summary

The Network Innovation Competitions (NICs) encourage network companies to innovate in the design, development and operation of their networks and, in doing so, to engage with one another and third parties in and beyond the industry.

Up to £20 million of funding is available through the gas NIC and up to £70 million of funding is available through the electricity NIC for large-scale innovation projects that move the GB energy networks towards a low carbon future each year. This was the seventh year of the NICs.

This year, we received one Full Submission to the gas NIC and four Full Submissions to the electricity NIC. These five submissions requested a total of £42.02 million of the £90 million available funding. The five submissions were as follows:

- H21 Phase 2 from Northern Gas Networks requesting £6.8m of gas NIC funding
- Constellation from UK Power Networks requesting £7.5m of electricity NIC funding
- DC Share from Western Power Distribution requesting £4.72m of electricity NIC funding
- FreeVE from Western Power Distribution requesting £13.3m of electricity NIC funding
- Resilience as a Service from Scottish and Southern Energy Networks requesting £9.7m of electricity NIC funding.

Of the five Full Submissions, we have decided to award funding to one gas project and two electricity projects. The tables below summarise the aims of the successful projects and the maximum amount of NIC funding available for each project.

2019 Gas NIC Projects	NIC Funding Awarded
<p>H21 Phase 2</p> <p>The proposed project aims to provide the next stage of quantified safety evidence to confirm the existing gas distribution network is suitable to transport 100% hydrogen. The evidence produced will be used to support the case for a GB hydrogen conversion by trialling the injection of hydrogen into untested parts of network and exploring public perceptions.</p>	<p>£6.8m</p>

<i>Proposed by Northern Gas Networks (NGN)</i>	
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2019 Electricity NIC Projects	NIC Funding Awarded
<p>DC Share</p> <p>The proposed project will develop and trial the use of a DC ring to share load across constrained secondary substations and to power rapid charge points for electric vehicles in more convenient locations for users.</p> <p><i>Proposed by Western Power Distribution (WPD)</i></p>	£4.72m
<p>Resilience as a Service (RaaS)</p> <p>The proposed project intends to trial an alternative to standby diesel generation for remote parts of the SHEPD distribution network. The project will test a system through which low carbon technologies on the distribution network could provide resilience services, and will also examine how to facilitate the market for these services.</p> <p><i>Proposed by Scottish and Southern Electricity Networks (SSEN)</i></p>	£9.7m

1. Introduction

Context and related publications

1.1. Our energy system is undergoing a radical transformation as the process of decarbonisation, digitisation and decentralisation accelerates. The energy networks sit at the heart of the energy system and the network companies have a fundamental role in supporting decarbonisation at lowest cost to consumers. Innovation is crucial to increasing the pace of change, and protecting consumers in the transition to a smarter, more flexible and low carbon energy system.

1.2. Network companies will need to innovate in the way they design, plan, and operate their networks, while delivering the services that customers want. The NICs are designed to help stimulate this innovation. They provide up to £90 million of funding to encourage network licensees to run trials of new technology and different commercial and network operating arrangements.

1.3. Network customers fund NIC projects. Therefore, a key feature of the NIC is the requirement that project learning is disseminated, in order for customers to gain a significant return on their funding through the broad rollout of successful projects, and the subsequent delivery of network savings and/or carbon and environmental benefits. Even where projects are implemented and deemed unsuccessful, network licensees will gain valuable knowledge that could result in future savings in network costs.

1.4. NIC Governance Documents: <https://www.ofgem.gov.uk/publications-and-updates/version-30-network-innovation-competition-governance-documents>

Purpose of this document

1.5. This document sets out our decisions on the applications we received in the 2019 NICs.

1.6. We have published other documents to accompany this decision. These are:

- the Full Submissions for each project, produced by the network companies, and with commercially sensitive information redacted or removed
- the recommendation reports from both the independent gas and electricity Expert Panels

- the network companies' answers to supplementary questions raised during the evaluation process by Ofgem, the independent technical consultants (who evaluated parts of the projects) and the Expert Panels.

How the Network Innovation Competition works

1.7. The NICs encourage network companies to innovate in the way they design, develop and operate their networks. They provide funding for a small number of large-scale innovation projects. We run two annual competitions which provide up to £20 million of funding for gas projects and up to £70 million of funding for electricity projects.

1.8. The NIC Governance Documents set out the scheme's governance and administration.

Initial Screening Process

1.9. The annual Competitions start when network companies submit project proposals to the Initial Screening Process (ISP). The gas NIC is open to applications from gas distribution networks (GDNs), the gas transmission licensee – National Grid Gas Plc (National Transmission System) (NGG NTS), and independent gas transporters. The electricity NIC is open to applications from the fourteen electricity distribution licensees (DNOs), the onshore electricity transmission licensees (TOs/SO), the offshore transmission owners (OFTOs), and independent distribution network operators (iDNOs).

1.10. During the ISP, we consider whether proposals are eligible to be considered for funding based on the eligibility requirements, comprising the specific requirements and each of the four ISP criteria, set out in the NIC Governance Documents. Only projects considered eligible may progress to the Full Submission stage.

Full Submission stage

1.11. At the Full Submission stage, we appoint an independent Expert Panel to each Competition, to consider the relevant submissions and provide us with an independent recommendation on whether in their view we ought to provide NIC funding. The Panels consist of persons independent of both Ofgem and the companies with specific expertise in the energy networks, environmental policy, technical and engineering issues, economics

and finance, and consumer issues.³ Ofgem considers the independent Expert Panels' view in reaching its decisions.

1.12. The Panels assess each project against the Evaluation Criteria set out in the NIC Governance Documents. These are summarised below.⁴

- a) accelerates 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.
- b) provides value for money to electricity/gas customers.
- c) generates knowledge that can be shared among all relevant Network Licensees.
- d) is innovative (ie not business as usual) and has an unproven business case where the innovation risk warrants a limited Development and/or Demonstration Project to demonstrate its effectiveness.
- e) involvement of other Project Partners and External Funding.
- f) relevance and timing.
- g) demonstration of a robust methodology and that the Project is ready to implement.

1.13. After it has completed its evaluation, each Expert Panel produces a report (published alongside this decision) on which projects it recommends for funding. Ofgem considers these reports in reaching its decisions along with consideration of the impact of the project with regards to the wider network innovation portfolio. The final funding decision is taken by the Authority and, where appropriate, may differ from the Expert Panels' recommendations.

The 2019 competitions

1.14. This year's Competitions began with the ISP in April 2019. We received eight submissions across both Competitions at the ISP stage, two for the gas NIC and six for the electricity NIC. All of these ISP submissions can be found on our website.⁵

³ Details of the Gas NIC Expert Panel are available here: <https://www.ofgem.gov.uk/network-regulation-riio-model/network-innovation/gas-network-innovation-competition/gas-nic-expert-panel>
Electricity NIC Expert Panel: <https://www.ofgem.gov.uk/network-regulation-riio-model/current-network-price-controls-riio-1/network-innovation/electricity-network-innovation-competition/electricity-nic-expert-panel>

⁴ The full Evaluation Criteria are set out in paras 5.41-5.62 of Governance Documents

⁵ The Gas ISP submissions can be found here:

<https://www.ofgem.gov.uk/network-regulation-riio-model/current-network-price-controls-riio-1/network-innovation/gas-network-innovation-competition>

1.15. We rejected two submissions to the electricity NIC at the ISP stage:

- UK Power Network’s project, DESTINY⁶
- National Grid Electricity Transmission’s project, H-Awel.⁷

1.16. We rejected one submission to the gas NIC at the ISP stage:

- National Grid Gas Transmission’s project, Captivate.⁸

1.17. At the Full Submission stage, the Expert Panels met the bidding project teams twice. Where aspects of the submissions required clarification, the network companies had an opportunity to provide such clarification via a written Supplementary Question process, in meetings and by resubmission. As part of this, the network companies were provided with Supplementary Question Answer Forms outlining various questions posed by Ofgem, the independent technical consultants and the Expert Panel. The network companies were asked as many questions as were considered necessary in order to clarify aspects of the Full Submissions provided by the network companies.

1.18. The Expert Panels made their recommendations based on the final submissions, taking into account any clarifications provided, and submitted their recommendations to us in late October 2019. The network companies’ written responses to the Supplementary Questions have been published alongside this decision and have been considered by Ofgem in full before arriving at this decision.

1.19. In line with NIC Governance, Ofgem’s engineers provided assistance to the Expert Panels. We appointed AECOM as technical consultants to provide additional support within this year’s electricity competition. The Panel directed the consultants to advise it on technical issues and challenge the companies on specific technical aspects of each project.

The Electricity ISP submissions can be found here:

<https://www.ofgem.gov.uk/network-regulation-riio-model/current-network-price-controls-riio-1/network-innovation/electricity-network-innovation-competition>

⁶ DESTINY ISP submission can be found here: <https://www.ofgem.gov.uk/publications-and-updates/electricity-nic-initial-screening-submission-2019-destiny-ukpn>

⁷ H-Awel ISP submission can be found here: <https://www.ofgem.gov.uk/publications-and-updates/electricity-nic-initial-screening-submission-2019-h-awel-nget>

⁸ Captivate ISP submission can be found here: <https://www.ofgem.gov.uk/publications-and-updates/gas-nic-initial-screening-submission-2019-captivate-nggt>

1.20. We assessed the projects, taking into account the NIC Evaluation Criteria and the Expert Panels' recommendations, to decide which projects should receive funding. Our decision on which projects to fund through the gas NIC is contained in Chapter 2. Our decision on the electricity NIC is contained in Chapter 3.

2. Decision on the Gas Network Innovation Competition

Section summary

We have decided to offer funding to one project for which we received a Full Submission. The project that will be funded will be H21 Phase 2 (Northern Gas Networks, awarded £6.8m), subject to conditions.

Projects selected for funding

H21 Phase 2 – Northern Gas Networks, NIC funding awarded £6.8 million, compulsory contribution 761k

Overview

2.1. H21 aims to build on the work of the 2016 H21 Leeds City Gate (LCG)⁹ and the 2018 North of England (NoE) project¹⁰ which established hydrogen conversion is technically possible and economically viable. The H21 programme will provide essential evidence to support the Government's £25 million 'Downstream of the ECV' hydrogen programme (Hy4Heat), which examines using hydrogen as a potential heat source in the home. This next phase of the H21 programme continues to be a collaborative bid involving all the GB GDNs and now National Grid Gas Transmission.

2.2. The aim of this project is to demonstrate that the gas distribution network can safely transport 100% hydrogen.

Summary of Expert Panel's recommendation¹¹

⁹ <https://www.northerngasnetworks.co.uk/wp-content/uploads/2017/04/H21-Report-Interactive-PDF-July-2016.compressed.pdf>

¹⁰ <https://www.northerngasnetworks.co.uk/event/h21-launches-national/>

¹¹ We have not copied the Expert Panel's full consideration of the proposed H21 Phase 2 project within this document. The Panel's full consideration is available in their report published alongside this document.

2.3. The Expert Panel were pleased to learn the project would build on the foundation work of H21 Phase 1 and contribute to the evidence base on hydrogen as a replacement for natural gas in the network. Additionally, the Panel welcomed the collaboration between all gas Transmission and Distribution networks for the first time in a NIC bid.

2.4. The Expert Panel believed the project is timely, well thought through, and represents a significant step towards decarbonising heat within the GB network.

2.5. There was some concern that a suitable site for the trial on an existing unoccupied section of the network had not yet been identified and secured, which led to questions for the bid team to explain the impact on the project if a site is not identified. The information and responses provided by the bid team updated the Panel on progress in locating a suitable site. This included work collaborating with other licences to identify a suitable site elsewhere in the country.

2.6. The Panel's original concerns were mitigated by the responses provided by the bid team. The Expert Panel were convinced of the benefits of this phase and necessity within the overall project, as well as the alternative ways suggested in the event an appropriate site not being identified. The Panel therefore believed the risk could be mitigated and managed with the addition of a stage gate.

2.7. The Expert Panel accordingly recommended the project be subject to a stage gate¹² with respect to the identification of the site required for the unoccupied network trial, which would mean that NGN would need to seek permission from Ofgem to proceed with the project if they had to use a backup site for phase 2b.

2.8. Whilst there was also some initial concern over the lack of detail regarding the social science research in the initial submission, this concern was mitigated by the bid team's response to questions regarding the scope and purpose of this phase in follow up meetings. In such meetings, the outcomes and benefits of this phase were presented to the Panel in detail. The Panel welcomed the inclusion of this additional detail in the re-submission of the final bid and were satisfied by the bid team's proposals to capture consumer perceptions within the project.

¹² A stage gate is a common project management technique which makes progression from one stage of a project to the next dependent on a decision point.

2.9. The Expert Panel considered that the project satisfies the Evaluation Criteria, and recommended that we provide the full amount of funding requested for this project.

Ofgem's assessment and decision

2.10. We agree with the Expert Panel's recommendation and consider that H21 Phase 2 performs well across the Evaluation Criteria. Our assessment of the project against each of the Evaluation Criteria is set out below.

a) accelerates 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

2.11. The bid team were able to demonstrate the potential environmental and financial benefits of the project well. NGN estimates that, if rolled out across the whole of GB, the use of hydrogen as an alternative to natural gas may be able to save an estimated 242 million tonnes of CO₂ by 2050. If successful, the project could provide a clear alternative to the installation and use of heat pumps or an all-electric decarbonisation scenario.

b) provides value for money to electricity/gas customers

2.12. The bid team were able to demonstrate the value for money the project provides to consumers. They have estimated that a transition to hydrogen could lead to a saving for consumers of £46 billion cumulatively to 2050, when compared to the installation and network reinforcement required to move forward with electric solutions. There is also a clear benefit in utilising the existing network and appliances currently on the network as opposed to reinforcement assets that could potentially be stranded. It represents good value for money for consumers.

c) generates knowledge that can be shared among all relevant Network Licensees

2.13. Knowledge sharing is a key component of this project. In its submission, NGN has demonstrated the involvement of all GDNs and National Grid Gas Transmission. This thereby ensures the dissemination of knowledge gained from this project. In addition, stakeholders involved in the production, delivery and utilisation of hydrogen will benefit. We

believe H21 will generate the knowledge necessary in order to support networks in transporting hydrogen within the existing network infrastructure.

d) is innovative (ie not business as usual) and has an unproven business case where the innovation risk warrants a limited Development and/or Demonstration Project to demonstrate its effectiveness

2.14. The H21 Phase 2 project is innovative. It aims to provide the evidence required to support the injection of hydrogen on to the gas network and is co-ordinating with other teams working in this area globally to ensure there are no obvious overlaps. Accordingly, we are satisfied that the project would not be carried out as part of the licensee's business as usual activities.

e) involvement of other Project Partners and External Funding

2.15. NGN has decided to utilise the project team that delivered the first phase of the H21 Phase 2 project. This is a logical step, ensuring that learning from Phase 1 is captured and brought into Phase 2. We believe NGN's choice of Project Partners is sensible and brings a clear benefit to the project as a whole.

f) relevance and timing

2.16. Based on the potential benefits described above, we consider that this project is both relevant and timely considering the UK's commitment to a net zero carbon emissions by 2050. The project will provide a knowledge base for a decarbonisation option that will utilise an existing asset and if successful, could have minimal effects on consumers.

g) demonstration of a robust methodology and that the Project is ready to implement.

2.17. We consider that the project deliverables are appropriate to achieve the overall aims of the project and that these can be delivered within the suggested timescales. We recognise the efforts made by the bid team to consider the learning from H21 Phase 1, their ability to progress this further in Phase 2 and the importance of understanding consumer acceptance in designing the project's methodology. We consider the phases of the project to be robust in gathering the required evidence to take this work further in the future and are ready to implement.

2.18. We additionally note the Panel’s recommendation that a stage gate should be used in relation to the identification of the unoccupied trial site. We are confident that, as a result of their collaborative efforts with all other GB network companies to identify a site for Phase 2b, NGN should be able to notify us of its identification of a site in due course. We recognise the practicality of allowing the project to go ahead as planned and believe it is possible to mitigate any risk of not identifying a site for Phase 2b.

2.19. Accordingly, we believe that provision of funding is on condition that, in the event a site is not identified or materially differs from that set out in the final bid submission, NGN will be required to submit a project change request to Ofgem.

2.20. For the above reasons, we have decided to award the project the full £6.8 million funding and impose a stage gate within the project related to the identification of an appropriate unoccupied trial site.

Summary of feedback from this year's Gas NIC

2.21. The Panel can see clear evidence that NGN has drawn on previous knowledge and feedback provided on previous bids. In particular, NGN used feedback on the 2017 Gas NIC submission for H21 Phase 1 and provided clear and full responses to questions put to them by the Panel and used realistic evidence to support arguments. The Panel believe the bid team is developing a more innovative culture.

2.22. The Panel were encouraged by NGN and the bid team's constructive, engaging manner and willingness to respond to questions throughout the process.

2.23. The Panel recommended that future submissions on hydrogen should clearly set out why gas consumers should pay to deliver what is considered Government policy.¹³

2.24. We agree with the views of the Panel, and would encourage the network companies to continue to engage with the NIC process and work collaboratively when presenting projects for funding.

¹³ See section 3.3 of Expert Panel Report.

3. Decision on the Electricity Network Innovation Competition

Section summary

We have decided to offer funding to two of the four projects for which we received Full Submissions. The projects that will be funded will be DC Share (Western Power Distribution, awarded £4.72m) and Resilience as a Service (Scottish and Southern Electricity Networks, awarded 9.7m). In total, subject to fulfilment conditions, we are approving £14.42 million towards electricity NIC projects.

We have decided not to fund two projects: FreeVE (Western Power Distribution) and Constellation (UK Power Networks) for the reasons set out below.

3.1. We received four Full Submissions to this year's electricity NIC requesting a total of £35.22 million in NIC funding:

- Western Power Distribution (WPD) requested £4.72 million to develop and trial the use of a DC ring to share load across constrained secondary substations and to power rapid charge points for electric vehicles in more convenient locations for users (DC Share)
- Scottish and Southern Electricity Networks (SSEN) requested £9.7 million to develop a solution that would allow low carbon and more cost-effective back up generation for remote and isolated parts of the network (Resilience as a Service)
- UK Power Networks (UKPN) requested £7.5 million to develop and demonstrate substation technology that would permit localised decision-making in pre-defined circumstances and optimisation of operational arrangements (Constellation)
- WPD requested £7.5 million to develop and trial flexible connections using differing control modes and combinations of low carbon technologies (FreeVE).

3.2. Based on the evidence provided by the network companies and the Expert Panel's recommendations, we have decided to fund two projects (DC Share and Resilience as a Service) and not to fund two projects (Constellation and FreeVE). We provide the reasons underpinning our decisions below.

Projects selected for funding

DC Share from Western Power Distribution, NIC funding awarded £4.72 million, compulsory contribution £0.53 million, other funding £0.34 million

Overview

3.3. DC Share intends to trial a DC ring on a part of the low voltage (LV) network experiencing constraints to deliver two key outcomes. Firstly, it intends to power fifteen electric vehicle (EV) rapid charge points in a location better suited to customer needs than the current rapid charge offering, and secondly, enable load sharing between secondary substations connected to the ring.

Summary of Expert Panel's recommendation¹⁴

3.4. The Panel consider this project has the potential to offer a low cost solution for rapid charge point deployment. While recognising that there have been other projects, such as FUN-LV and LV Engine,¹⁵ which exploit latent substation capacity, the Panel were satisfied that the project was sufficiently innovative in that it is a fully DC alternative for a specific purpose and place, which could deliver efficiencies over existing approaches.

3.5. While the Panel had some initial concerns regarding the competitiveness of the Project Partners' costs and contributions, these concerns were set in context by the Panel's confidence that the project will begin to deliver value for money after only a small number of deployments.

3.6. The Panel were interested in the opportunity of extending this trial to include the connection of distributed resources, but were convinced by the bid team's case for

¹⁴ We have not copied the Expert Panel's full consideration of the proposed DC Share project within this document. The Panel's full consideration is available in their report published alongside this document.

¹⁵ FUN-LV: <https://www.ofgem.gov.uk/publications-and-updates/low-carbon-networks-fund-submission-uk-power-networks-%E2%80%93-flexible-urban-networks-low-voltage>
LV Engine: <https://www.ofgem.gov.uk/publications-and-updates/electricity-nic-submission-sp-energy-networks-lv-engine>

maintaining the existing project scope due to the likely trial location being unlikely to fulfil this and rapid charging criteria.

3.7. The Panel sees the project as timely given the net zero carbon targets and increasing uptake of plug-in vehicles, and expects that a variety of solutions should be developed to meet the accompanying infrastructure requirements of electrified transport. The potential for GB rollout is improved by the formal involvement of another DNO (Electricity North West Limited), which the Panel welcomed.

Ofgem's assessment and decision

3.8. We agree with the Expert Panel's recommendation and consider that DC Share performs well across the Evaluation Criteria. Our assessment of the project against each of the Evaluation Criteria is set out below.

a) accelerates 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

3.9. We are satisfied that the project intends to develop and demonstrate a low carbon solution for load sharing on the LV network combined with rapid charging for electric vehicles, which has the potential to deliver value for money for network customers.

b) provides value for money to electricity/gas customers

3.10. We agree with the Panel's assessment of the project's overall value for money for network customers. This is because the project has the potential to deliver value for money for network customers relative to its costs, and it likely to be replicable by other network companies.

c) generates knowledge that can be shared among all relevant Network Licensees

3.11. We are satisfied that the project generates new knowledge in the use of power electronics and DC solutions to address network constraint issues and anticipates the requirements of the growing demographic of EV owners.

d) is innovative (ie not business as usual) and has an unproven business case where the innovation risk warrants a limited Development and/or Demonstration Project to demonstrate its effectiveness

3.12. We recognise the project's similarities to existing projects which explore load-sharing solutions using meshed and DC networks. However, we are satisfied that the project is sufficiently innovative in its focus on clustered rapid charging as a key outcome of its approach to qualify for NIC funding.

3.13. Likewise, we are satisfied that the project trials an innovative arrangement of mostly pre-existing technologies, which falls within the definition of innovation provided within the NIC Governance.

e) involvement of other Project Partners and External Funding

3.14. We recognise the Panel's concerns regarding the rates of third parties locked in as Project Partners and the loss of opportunity to competitively tender for services. However, it is our view that projects such as these would not arise without third party involvement from an early stage. This project will conform to the default Information Property Rights as detailed in the NIC Governance, and therefore it is expected that sufficient project learning will be shared to permit other market entrants should the solution prove to be successful and widely replicable.

3.15. Furthermore, the involvement of another DNO (Electricity North West Limited) gives us confidence that the project has the potential for rollout following completion and will be developed with replicability in mind.

f) relevance and timing

3.16. We agree with the Panel's view that the project's focus of network constraints and EV enablement is relevant and timely.

g) demonstration of a robust methodology and that the Project is ready to implement.

3.17. Given the importance of securing an appropriate site, our funding will be offered on the condition that a stage gate is introduced which limits project expenditure prior to the acquisition of a trial location. Based on the Full Submission, we are confident that the project that the project will be able to secure an appropriate site, within this specified

timeframe. We are also satisfied that the project scope is appropriate and achievable, having clearly established through the Full Submission process that this is a technical trial, rather than intended to examine consumer behaviour through charge point usage.

3.18. For the above reasons, we have decided to award the project the full reward of £4.72 million subject to the stage gate conditions being met.

Resilience as a Service, Scottish and Southern Energy Networks, NIC funding awarded £9.67 million, compulsory contribution £1.09 million

Overview

3.19. Resilience as a Service (RaaS) intends to trial an alternative to standby diesel generation for remote parts of the network. The project will test a system through which low carbon technologies on the distribution network could provide resilience services, and will also examine how to facilitate the market for these services.

Summary of Expert Panel's recommendation¹⁶

3.20. The Panel believe that the project delivers financial benefits, noting that the project claimed it would break even on its costs after seven deployments. The Panel find that the project addresses the development of low carbon networks through its intended move from reliance on diesel to batteries, demand side response and renewable generation.

3.21. The Panel was satisfied that overall the proposal would accelerate the development of the low carbon energy sector would achieve carbon benefits, including potential indirect benefits of demonstrating a further revenue stream for low carbon generation with storage capacity. The Panel also saw further potential benefit in extended use cases of the solution.

3.22. The project was viewed by the Panel as representing value for money for network customers in the learning it develops and costs. In particular, the Panel were satisfied by SSEN's benchmarking of day rates, despite the fact that the project suppliers were not competitively tendered. They also noted that Costain's contribution in designing contracts that would be attractive in a competitive market. As a result, the Panel has confidence that E.ON is not unduly benefitting from its involvement.

3.23. The Panel sees new knowledge in the identification and commercialisation of resilience services that third parties can provide to DNOs. The Panel also noted that the issues being addressed are complementary to the NIC project funded last year "Distributed

¹⁶ We have not copied the Expert Panel's full consideration of the proposed Resilience as a Service project within this document. The Panel's full consideration is available in their report published alongside this document.

ReStart” (formerly “Black Start from DER”) by NGESO¹⁷ and are pleased that efforts have been made by SSEN to share the learnings between these two projects.

3.24. The Panel are confident that the project partners together have the necessary expertise to deliver the intended outcomes of the project.

Ofgem’s assessment and decision

3.25. We agree with the Expert Panel’s recommendation and consider that RaaS performs well across the Evaluation Criteria. Our assessment of the project against each of the Evaluation Criteria is set out below.

a) accelerates 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

3.26. We agree with the Panel’s assessment of the project’s potential to deliver net financial benefits to network customers and its development of the low carbon energy sector through procuring further services from low carbon technologies.

b) provides value for money to electricity/gas customers

3.27. Given the project expects to break even on its costs after only seven deployments and the number of potential sites identified, we consider the project to represent good value for money. We agree with the panel’s assessment of the project partners’ costs and consider it appropriate that a stage gate is in place prior to deployment of the technical trial.

c) generates knowledge that can be shared among all relevant Network Licensees

3.28. The technical part of this project is a GB demonstration of a successful deployment in Sweden by project partner E.ON, which is permissible under the NIC Governance. We are

¹⁷ <https://www.ofgem.gov.uk/publications-and-updates/electricity-nic-2018-national-grid-electricity-system-operator-eso-black-start-distributed-energy-resources>

satisfied that the technical issues which arise from delivering the project in GB can justify innovation funding.

3.29. Secondly, we are pleased that the project intends to collaborate with the project 'Distributed ReStart' following questions from the Panel. This ensures there is the potential for mutually beneficial learning with other innovation projects.

d) is innovative (ie not business as usual) and has an unproven business case where the innovation risk warrants a limited Development and/or Demonstration Project to demonstrate its effectiveness

3.30. The key innovation in this project is in developing a market for resilience services. We agree with the Panel's assessment that the project partners, in particular Costain, are appropriate for achieving the project's potential in this area.

e) involvement of other Project Partners and External Funding

3.31. E.ON and Costain are appropriate partners for delivering the technical and commercial elements of the proposed project. We agree with the Panel's assessment of the partners' benchmarking of costs.

f) relevance and timing

3.32. We are satisfied that the project is relevant and timely, with the potential to address other current network issues than resilience. We agree with the Panel that the project is a timely project in response to the rapid growth of distributed generation.

g) demonstration of a robust methodology and that the Project is ready to implement.

3.33. We share the Panel's confidence that the project is likely to secure suitable trial locations, and believe that the project methodology is sound and provides adequate support for the achievement of its proposed outcomes.

3.34. For the above reasons, we have decided to award RaaS the full £9.67 million requested.

Projects not selected for funding

3.35. We have decided not to fund two electricity projects that were assessed at the Full Submission stage. We agree with the Panel that these two projects did not perform sufficiently well against the Evaluation Criteria set out in the NIC Governance. We describe the projects and the reasons for our decisions below.

Constellation – UK Power Networks, NIC Funding requested, £7.5 million, compulsory contribution £0.85 million, other contribution £0.87 million.

Overview

3.36. Constellation proposed to design, develop and demonstrate localised control and decision-making at substation level as an alternative to the current centralised control systems. The solution involves a core application that would be tested for five use cases, adaptive protection, fault level management, distributed voltage stability control, reverse powerflow management and operability and system resilience, seeking to facilitate the connection of low carbon technologies and improve localised management as LCT density on the network increases.

Summary of Expert Panel's recommendation¹⁸

3.37. In the Panel's assessment the project met a number of the Evaluation Criteria. The Panel considered that the Constellation concept could deliver financial benefits and was considered to be innovative, timely and have the potential to generate new knowledge.

3.38. However, the Panel had significant concerns regarding the robustness of the project methodology and implementation plan, in part because the project underwent significant change during the assessment process. The original use case of the core application was adaptive protection, which was later revised to five use cases after meeting with the Panel. The Panel believed that UKPN only understood what the project needed to deliver over the

¹⁸ We have not copied the Expert Panel's full consideration of the proposed Constellation project within this document. The Panel's full consideration is available in their report published alongside this document.

course of the assessment process, and therefore concluded it be too speculative for the scale of project proposed and level of NIC funding requested.

3.39. The Panel were of the view that the risks presented by the broad project scope had not been sufficiently well considered, in particular the data challenges at distributed level and the implications of the five new use cases that were introduced following UKPN's resubmission.

Ofgem's assessment and decision

3.40. We agree with the Expert Panel's assessment of Constellation and believe that the project does not perform well against the Evaluation Criteria. Our assessment of the project against each of the Evaluation Criteria is set out below.

a) accelerates 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

3.41. We agree with the Panel's assessment that the proposed project has the potential to deliver financial benefits and to release capacity, with the potential that this additional capacity could be taken up by low carbon generation or technologies.

b) provides value for money to electricity/gas customers

3.42. Given the small number of deployments required to break even on costs, contributions of partners Cisco, and the intention to competitively tender for other parts of the project, we view the proposed project to be representative of value for money.

c) generates knowledge that can be shared among all relevant Network Licensees

3.43. We agree with the Panel's view that the development of localised control of distribution networks could generate valuable new knowledge for GB.

d) is innovative (ie not business as usual) and has an unproven business case where the innovation risk warrants a limited Development and/or Demonstration Project to demonstrate its effectiveness

3.44. We consider the proposed project to be innovative in its novel arrangement of pre-existing technologies and the development of its applications.

e) involvement of other Project Partners and External Funding

3.45. We agree with the Panel's assessment. It is disappointing that the involvement of project partners, such as WPD, has not resulted in greater leverage of experience from previous projects on similar issues. Constellation is quite a departure from current arrangements and therefore would have benefited from wider expertise, such as from academia, who could have contributed to work on specifications and testing of hypotheses.

f) relevance and timing

3.46. We agree with the Panel that a project exploring an alternative architecture would be complementary to current efforts being channelled into the improvement of network control and visibility at the distribution level.

g) demonstration of a robust methodology and that the Project is ready to implement.

3.47. While we see merit in the project's aspirations to develop decentralised control, UKPN were unable to provide a sufficiently robust evidence case to support its proposal for a large scale demonstration at this time.

3.48. We share the Panel's concerns around methodology, in particular given the considerable change the project underwent during the assessment process. We are not convinced that the use cases of the core application, which were latterly presented as a key deliverable of the project, were present during the design of the project methodology, and therefore cannot have confidence in the sufficiency or appropriateness of the project design for its intended outcomes.

3.49. The uncertainty around practical use cases over the course of the NIC process indicates that the project as a whole has a lower technology readiness level (TRL) than TRL 5, as is stated in the Full Submission.¹⁹ The Full Submission indicates that Constellation

¹⁹ We note that paragraph 1.18 of NIC Governance specifies that projects must be TRL 4-8 to be eligible for NIC funding.

would reach TRL 8 at project completion. We disagree that the project is currently at TRL 5, which casts doubt over the robustness of its methodology and consideration of risk. We believe further investigation and development is required before the project would be ready for the level of NIC funding requested.

3.50. Additionally, we do not think the concerns around the project methodology could be mitigated through the addition of a stage gate or other project deliverables. This is because the stage gate would not be able to mitigate the concerns about the project's underlying methodology.

3.51. Therefore, for reasons outlined above, we have decided not to fund Constellation.

FreeVE – Western Power Distribution, NIC funding requested, £13.3 million, compulsory contribution £1.5 million, other contribution £1.13 million.

Overview

3.52. The project intends to run a trial involving 640 homes with a combination of low carbon technologies (LCTs) in order to understand their impact on the network when these technologies are controlled, and to gather load profiles to improve network planning in anticipation of demand flexibility.

Summary of Expert Panel's recommendation²⁰

3.53. The Panel were unconvinced by the project's enduring benefit to GB network customers. The Panel requested evidence of how this project would deliver benefits for all GB electricity customers. This evidence was not provided and it therefore remained unclear to the Panel as to who would benefit from the Project and the potential for uneven distribution of the benefits and costs. There were also doubts cast on the usefulness of the project's findings given the limited future scenarios the trial would prepare for, and the multitude of possible directions for the LCTs and markets.

3.54. The Panel did not believe that the project represented value for money, given the sizeable amount allocated to PassivSystems' costs. Insufficient evidence was provided to give the Panel confidence that the proposed day rates were competitive. The Panel also had concerns that the project did not include mitigations against the undue advantage that PassivSystems would gain in a competitive market for flexibility management services.

3.55. The Panel also questioned the timing of the project, which relies on the findings of the currently ongoing Network Innovation Allowance project 'MADE',²¹ and the learnings from which the Panel would expect to clarify the requirements for a follow-on project.

3.56. Regarding the network-relevant project learnings, the bid team were unable to convince the Panel of the statistical robustness of the project methodology and chosen

²⁰ We have not copied the Expert Panel's full consideration of the proposed FreeVE project within this document. The Panel's full consideration is available in their report published alongside this document.

²¹ <https://www.westernpower.co.uk/projects/multi-asset-demand-execution-made>

sample size, nor its utility to other network licensees and regions. This is despite having two other DNOs as Project Partners, as the Panel were unable to find any evidence of meaningful input from Northern Powergrid and SSEN in the project design and implementation phases.

3.57. The Panel viewed the recruitment of 640 households to the trial prior to winter 2020 as a substantial risk to the project's ability to deliver statistically significant load profiles, and questioned the use of households involved in previous trials as representative of the typical GB household.

Ofgem's assessment and decision

3.58. We share the Expert Panel's concerns regarding the FreeVE project and do not consider that the project performs well across the Evaluation Criteria. Our assessment of the project against each of the Evaluation Criteria is set out below.

a) accelerates 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

3.59. We agree with the Panel that the project would deliver limited benefits to network customers. We view the project's network benefits as secondary to those benefits arising beyond the network, in the potential development of the flexibility services space. While we recognise the merit of work in this area, the NIC is a network innovation fund which needs to demonstrate clear benefits to network customers.

b) provides value for money to electricity/gas customers

3.60. We consider the project to be costly and likely to produce limited enduring benefits, primarily to the 640 households which would be engaged in the trial.

c) generates knowledge that can be shared among all relevant Network Licensees

3.61. Given the uncertainties around the future of flexibility services highlighted by the Panel, it is unlikely that the project's specific findings will be capable of being replicated or capable of delivering significant wider benefits to GB network customers.

d) is innovative (ie not business as usual) and has an unproven business case where the innovation risk warrants a limited Development and/or Demonstration Project to demonstrate its effectiveness

3.62. The project's proposed innovation is the learning to be gained from the load profiles of households' multiple low carbon technologies, however the method proposed to acquire this learning does not appear to be robust, and therefore we cannot accept its associated risk. We are unconvinced that this limited innovation warrants the £13.3 million investment by network customers.

e) involvement of other Project Partners and External Funding

3.63. We agree with the Panel's concerns regarding the significant competitive advantage PassivSystems would gain from participating in the project. We emphasise the importance of enabling competition and cost-effective replicability through robust project methodology. Therefore, appropriate arrangements with project partners are needed to ensure value for money with network customers' funding.

f) relevance and timing

3.64. We consider a project focused on the development of flexibility services to be relevant and timely, given the accelerating growth of low carbon technologies in GB homes.

g) demonstration of a robust methodology and that the Project is ready to implement.

3.65. We agree with the Panel's opinion on the limited ability of this project to deliver its proposed benefits. This is firstly because there is considerable risk presented by the project methodology because it requires the recruitment, retention and fit out of a 640 homes. Secondly, the project has developed its plan unsupported by the findings of project 'MADE', which is still to be concluded.

3.66. We do not believe these concerns with project design could be mitigated with a stage gate or additional project deliverable.

3.67. Therefore, for reasons outlined above, we have decided not to fund FreeVE.

Summary of feedback from this year’s electricity NIC

3.68. We encourage future applicants to consider the expected value for the network customers in their submissions. Additionally, future applications should ensure that project methodology and plans are sufficiently robust and underpinned by robust evidence. We encourage future applicants to consider the SQ logs published alongside each submission in order to anticipate the information required by the Panel and Ofgem in their assessment.

3.69. We encourage licensees to continue to build upon the innovative work taking place across the GB network and beyond, to work with third parties in identifying innovative new solutions to key network challenges, and to increase the delivery of benefits to network customers through innovation in business as usual.

4. Next steps

Funding of selected projects

4.1. Before funding a NIC project, we issue a Project Direction explaining the terms that the funded network company has to comply with as a condition of receiving NIC funding. If the network company agrees to comply with its Project Direction, we will issue a Funding Direction to specify the amount of money to be recovered from network customers next year, through their network charges, to fund the successful NIC Projects. We will issue both the Project Direction and the Funding Direction shortly.

4.2. We expect the funded Projects to start as soon as possible, each according to the terms in its Project Direction and the applicable NIC Governance Document. Projects will be able to access funding from April 2020.

Monitoring of projects and dissemination of learning

4.3. We will monitor each project to ensure it is implemented in line with its Project Direction. Each project will have to provide regular progress reports, in line with the requirements of the NIC Governance document. These reports will be published on the companies' websites to make project learning available to all interested parties. Learning from the projects should also be made readily available and shared according to the projects' plans.

4.4. The Energy Networks Association (ENA) has a portal which holds information and learning from innovation projects, including those funded under the Low Carbon Networks Fund (LCNF) and the Gas and Electricity NICs.²² We expect learning from this year's projects to be made available through this portal.

4.5. Network companies have a licence obligation to ensure dissemination of the knowledge generated from their projects (including previously funded NIC projects). These requirements are set out within the NIC governance documents.

²² <http://www.energynetworks.org/electricity/futures/innovation-portals.html>

Future Network Innovation Competitions

4.6. We will publish dates for next year’s NIC in early 2020.

4.7. Please note that the next round of the RIIO price controls (RIIO-2) will begin in 2021 for Gas Distribution, Gas Transmission and Electricity Transmission and the Electricity System Operator. As set out in our Sector Specific Methodology Decision in May, the NIC will be replaced with a new innovation funding pot for RIIO-2.²³ Accordingly, 2020 will be the final year of the RIIO-1 Gas NIC in its current form. We encourage network licensees to consider opportunities for innovation funding under the NIC in its final year.

4.8. Whilst the arrangements for electricity transmission will also change from 2021, the electricity distribution companies will continue to be able to use existing RIIO-ED1 innovation funding mechanisms until 31 March 2023.

²³ Please see Chapter 10 of our [Sector Specific Methodology Decision – Core Document](#).