



Strategic Innovation Fund (SIF)

Cycle 2 Innovation Challenges – Discovery Phase

Funding Decision and Summary of Recommendations from Expert Assessors

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OFFICIAL





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# Introduction

Innovation will prepare the regulated energy network companies to deliver Net Zero greenhouse gas emissions at the lowest cost to consumers, while maintaining world-class levels of system reliability and customer service.

The SIF was introduced as a part of the RIIO-2 price control by Ofgem, the Office of the Gas and Electricity Markets Authority, to support network innovations that contribute to reaching Net Zero while delivering real benefits to network consumers. The SIF is delivered in partnership with Innovate UK (part of UKRI), which administers the SIF and works to coordinate innovation activities funded by network consumers with other innovation funded programmes.

New Innovation Challenges are launched annually which focus on strategic issues currently facing gas and electricity networks.

The SIF adopts a three Phase Project approach within each Round to mitigate the risk associated with innovation: Discovery Phase, Alpha Phase and Beta Phase. The Discovery Phase focuses on feasibility, the Alpha Phase on experimental development, and the Beta Phase on deployment and demonstration.

As set out in the SIF Governance Document<sup>1</sup>, the SIF is open to the Electricity System Operator, Electricity Transmission and Distribution, Gas Transmission and Distribution licensees.

Applicants can apply for Discovery, Alpha, and Beta funding three times a year.

The Application process has been designed to allow for flexibility depending on Project needs. The Application window open every four months, for around four weeks at a time – opening at the end of January, end of May, and end of September. Applicants are able to apply across all three Phases of the SIF (Discovery, Alpha, and Beta) during each Application cycle, where eligible.

This report is for the Cycle 2 Discovery Phase Project Applications. It sets out the Funding Decisions from Ofgem alongside the recommendations from independent

<sup>&</sup>lt;sup>1</sup> The SIF Governance Document can be found here: <u>https://www.ofgem.gov.uk/publications/updated-sif-governance-document</u>

Expert Assessors. Each Project Application was scored in accordance with eight Eligibility Criteria in accordance with the relevant Innovation Challenges and the SIF Governance Document.

The eligibility Innovation Challenges for this Cycle are as follows.

Round 4<sup>2</sup> of the SIF was launched in March 2024 and focuses on four Innovation Challenges:

- 1. Faster network development
- 2. Greater heat flexibility
- 3. Embedding resilience
- 4. Accelerating towards Net Zero energy networks

These Innovation Challenges were developed through extensive collaboration and consultation with a wide range of stakeholders and interested bodies, including energy network companies, other innovators and entrepreneurs, government and academia.

In prioritising these challenges, the key underlying principles established are that they should be:

- Strategic innovations are required to meet national and devolved Net Zero targets effectively.
- Network relevant they involve innovation needs and solutions that can be taken forward or materially supported by energy networks.
- Timely the challenge should focus on problem areas where solutions can be scaled up to meet the requisite Net Zero targets and commitments. 2035 was used as a target year for identifying challenges.

<sup>&</sup>lt;sup>2</sup> Find the four Innovation Challenges launched for Round 4 here: <u>https://www.ofgem.gov.uk/decision/strategic-innovation-fund-round-four-innovation-challenges</u>

• Appropriate in scope - the scope of the Innovation Challenge complements and does not duplicate other UK innovation programmes (including other network innovation funding mechanisms).

# 1 Cycle 2 Summary

Within each of the Innovation Challenges are specific requirements on scope and Project Partner requirements. Projects submitted to the SIF must meet these specific requirements and must follow the SIF Governance Document. For this Discovery Phase, Applications were received by 26 February 2025 and must start no earlier than 1 May 2025. They must last up to 5 months, and must not request funding of more than £150,000, exclusive of VAT.

Applications submitted to the Cycle 2 Discovery Phase by the 26 February 2025 deadline, and which met the Innovation Challenge-specific requirements, were assessed by Expert Assessors. The Expert Assessors are independent external appointees whose recommendations inform Ofgem's decision-making on the selection of Projects for SIF Funding. The Expert Assessors have relevant expertise and knowledge on the respective Innovation Challenges and/or the energy sector, including for example policy, regulatory, commercial, financial and technical areas. Consistent with the requirements of the SIF Governance Document, the Expert Assessors have assessed each Application with reference to (a) its compatibility with the Eligibility Criteria in chapter 2, and (b) taking into consideration any additional and relevant information available to the Expert Assessors.

As part of each Application assessment, the Expert Assessors also considered whether Projects should receive all the SIF Funding requested for the Discovery Phase, or no funding at all.

The overall funding recommendation summarised in this report is based upon a balance of considerations taking into account whether a Project has met each of the SIF Eligibility Criteria, suitability of the Project for SIF funding, any Project-specific conditions recommended by Expert Assessors, and wider concerns or opportunities identified by the Expert Assessors. For more information on how Projects are assessed by the Expert Assessors, please see Section 2, Assessment Process, below.

This report is a consolidation of the Applications assessed by the Expert Assessors and sets out recommendations from the Expert Assessors to Ofgem on which Projects have met the Eligibility Criteria and should be considered for SIF Funding in the Cycle 2 Discovery Phase of the SIF. Ofgem, taking into the account the Expert Assessors' assessment and recommendations, performs its own internal review of each Project to reach a decision. Ofgem is the sole decision-maker for the SIF.

# 2 Assessment Process

For the Discovery Phase there is a maximum of 5 stages in assessing eligible submitted Applications:

- Initial sift completed by Innovate UK to confirm whether an Application complies with the Innovation Challenge-specific requirements.
- Expert Assessor evaluation An Expert Assessor assesses and provides a score for each Application and its accompanying appendices, against the questions stipulated in the SIF Governance. These questions tie directly to the Eligibility Criteria outlined in chapter 2 of the SIF Governance Document. Each Expert Assessor includes their assessment of how and why an Application has met or not met each Eligibility Criteria and an overall comment for each Application assessed.
- Expert Assessors' overall recommendations As part of their assessment, each Expert Assessor provides an overall recommendation on whether the Project should be considered for SIF Funding in the Discovery Phase. This decision is made based on an assessment of whether the majority of Expert Assessors consider that each of the Eligibility Criteria has been met, and a consideration of any serious risk or opportunity in respect of an Application. A Project will be recommended for SIF Funding if it has a majority of Expert Assessors recommending it (two of the three Expert Assessors who assessed the Application), if no significant risks are identified which could prevent the Project from progressing, and if the majority of Expert Assessors on each Project consider it to have met each of the Eligibility Criteria outlined in chapter 2 of the SIF Governance Document.
- Recommended Project-specific conditions Should an Expert Assessor identify an area for additional consideration or clarity for a Project recommended for SIF Funding during the Discovery Phase, the Expert Assessor may recommend a Project-specific condition be included. In many cases these have been offered as ways of strengthening the Project outcomes and their inclusion does not necessarily reflect a weakness in the Application. The recommended Projectspecific conditions are then considered by Ofgem and finalised with any modifications in the Project Direction for each of the successful Projects.
- Final decision The consolidated recommendations report is provided to Ofgem for consideration on which of the Projects for which Applications have been

made should be considered for SIF Funding. Having taken into account the Expert Assessors' report, the Authority decides which Projects should receive SIF Funding and provide brief commentary on its reasoning for each decision.

## 2.1 Meeting the SIF Eligibility Criteria

Projects submitted must meet all the Eligibility Criteria outlined in chapter 2 of the SIF Governance Document in order to be considered for SIF Funding. There are eight Eligibility Criteria which must be evidenced within an Application. The following table outlines how the scored questions tie with the Eligibility Criteria outlined in the SIF Governance Document.

Question number	Application question	Eligibility Criteria (chapter 2 of the SIF Governance Document)
2	Problem statement	Eligibility Criterion 1: Projects must address the Innovation Challenge set by Ofgem.
3	Innovation justification	Eligibility Criterion 3: Projects must involve network innovation.
		Eligibility Criterion 5: Projects must be innovative, novel or risky.
4	Benefits Part 1	Eligibility Criterion 2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers (whomever is paying for the innovation).
5	Benefits Part 2	Eligibility Criterion 2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers (whomever is paying for the innovation).
6	Team and resource	Eligibility Criterion 6: Projects must include participation from a range of stakeholders.
7	Project Plan and milestones	Eligibility Criterion 8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.

8	Key outputs and dissemination	Eligibility Criterion 8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.
9	Route to market	Eligibility Criterion 4: Projects must not undermine the development of competitive markets.
10	Value for Money	Eligibility Criterion 7: Projects must provide value for money and be costed competitively.

# 3 Faster network development Innovation Challenge: summary of Projects

This section covers the assessment of Cycle 2 Discovery Phase Applications received into the 'Faster network development' Innovation Challenge.

In order to protect intellectual property rights (IPR), unsuccessful Projects have been redacted from the final published version.

Project reference number	Project name	Funding licensee	Total Project costs (£)	Total Project contribution (£)	Total SIF Funding requested (£)	Recommended by Expert Assessors for funding (Yes/No)	Decision by Ofgem for funding (Yes/No)
10157248	RAPID - Automated Routing Infrastructure	Scottish Hydro Electric Transmission plc	167,343	27,680	139,663	Yes	Yes
10157280	Super DuPPR (Dual Purpose Power Reserves)	UK Power Networks (Operations) Ltd	131,942	12,932	119,010	Yes	Yes
10157635	WAVE - Weather Adaptive Vessel Efficiency	National Grid Electricity Transmission plc	166,426	16,642	149,784	No	No
10158424	Autoflex	Northern Powergrid (Northeast) plc	142,900	15,379	127,521	No	No
10158433	Project VOLT	Northern Powergrid (Northeast) plc	171,499	24,299	147,200	Yes	Yes
10158670	Conductor	UK Power Networks (Operations) Ltd	153,894	15,559	139,335	Yes	Yes

## 4 Faster network development Innovation Challenge: Expert Assessors' recommendations on Projects

## 4.1 Project 10157248 - RAPID - Automated Routing Infrastructure

#### **Submitted Project description**

The Winser report makes recommendations concerning faster delivery of new transmission infrastructure including standardisation and automation of route design for new transmission lines. This Project, in direct alignment with the Winser report, will examine the problems that need to be solved to address the recommendations concerning the process of route design and the automation of route design, accelerating the pace of network development to meet net zero goals. The Discovery Phase of this Project will identify and prioritise innovations for route design. Then, the Alpha Phase will develop a statement of requirements and plan for implementing innovative ideas as business-as-usual.

Eligibility Criteria met or not met – Expert Assessors' evaluation				
1. Projects must address the Innovation Challenge set by Ofgem.	Met			
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met			
3. Projects must involve network innovation.	Met			
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met			
5. Projects must be innovative, novel and/or risky.	Met			
<ol> <li>Projects must include participation from a range of stakeholders.</li> </ol>	Met			
7. Projects must provide value for money and be costed competitively.	Met			

8. Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) FUND

Overall, the Expert Assessors agreed that this Project has met <u>all of</u> the Eligibility Criteria and recommend this Application for funding.

Overall, the Expert Assessors agree the Project addresses the Innovation Challenge by aiming to improve the efficiency of routing design of transmission infrastructure, aligning with the goal of faster network development. It involves all Transmission Owners and National Energy System Operator (NESO), aiming to identify and explore efficiency improvements that will benefit from a standardised framework, reduce route planning time and delays, and enhance consumer and stakeholder confidence. One Expert Assessor had concerns on meeting Eligibility Criterion 1 as, in their opinion, route planning is dictated by a range of Project specific issues, including land use, amenity and stakeholder concerns. In addition, this same Expert Assessor did not think the Application was clear on why a standardised framework will solve this problem, or why it is an improvement on current route planning practices.

The Project has identified a clear benefit for electricity consumers through efficiency improvements in the route design and planning process, potentially reducing the cost and time for developing network improvements. It also aims to deliver environmental sustainability by reducing carbon emissions and potential cost savings on consumer energy bills.

The Project addresses the Innovation Challenge by developing a coordinated and efficient means of transmission route planning and designing that can be consistently applied across the three transmission regions. This will accelerate network development targets and reduce the delivery time for strategic transmission lines. The Project does not undermine the development of competitive markets as it includes all three transmission owners and NESO. The output, a report addressing the Winser report recommendations, will be disseminated widely and transparently within the GB energy businesses.

The Project is considered innovative and risky due to the introduction of a route planning and design framework that can be applied across all three transmission regions. The use of advanced computational methods such as AI and machine learning techniques adds to the innovation and risk.

The Project includes participation from a sufficient range of stakeholders, including all Transmission Owners, NESO, Arup, and VoltQuant, which specialises in geospatial planning and AI. This diverse consortium is well-placed to carry out the Project and exploit the results.

The Project is delivering value for money as the balance of costs between Project Partners seems reasonable, and labour rates are consistent with previous SIF Projects.

The Project has a robust methodology with a well-thought Project plan, milestones, and associated resources. The work packages and milestones are clearly identified, and the Risk Register complements the Project plan, giving confidence in timely delivery.

## Decision from the Office of Gas and Electricity Markets (Ofgem)

#### FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

#### **Recommended Project-specific conditions**

Prior to the end of the Discovery Phase, the Funding Party must provide to the Monitoring Officer justification as to why a standardised framework would offer an improvement over the current route planning practices and why a standardised approach will support the problem statement of the Project.

## 4.2 Project 10157280 - Super DuPPR (Dual Purpose Power Reserves)

#### **Submitted Project description**

Traditional reserve power systems that support critical infrastructure, such as telecoms equipment, use fossil fuels, such as diesel generators, which will be replaced by batteries as they are decarbonised. This will in turn increase demand on the local electricity network. Research from the University of Reading estimates there is over 2GWh of backup power in the UK that, during winter when required cooling load is low, could be used for other purposes such as regional balancing or flex.

Unlocking this potential capacity could accelerate the decarbonisation of reserve power systems and reduce the net load increase on the electricity network.

Eligibility Criteria met or not met – Expert Assessors' evaluation				
1. Projects must address the Innovation Challenge set by Ofgem.	Met			
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met			
3. Projects must involve network innovation.	Met			
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met			
5. Projects must be innovative, novel and/or risky.	Met			
<ol> <li>Projects must include participation from a range of stakeholders.</li> </ol>	Met			

7.	Projects must provide value for money and be costed competitively.	Met
8.	Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) FUND

The Expert Assessors agree that this Project has met the Eligibility Criteria and recommend this Application for funding.

The Project addresses the Innovation Challenge by exploring novel methods to increase electricity capacity from existing assets, such as backup power systems, during peak times. Better aligning network services with the risk profile of asset owners like BT could create significant capacity to help manage these peaks.

The Project has identified a clear benefit to electricity consumers by opening capacity from backup power systems to reduce network peaks, thereby deferring or avoiding the need for reinforcement investment. Additional benefits may include national balancing, managing network outages, and enabling faster roll-out of low carbon technologies.

The Project involves network innovation by optimising the capacity that backup resources which can provide to the electricity system. Bringing risk-based weather modelling to this problem is innovative and could open significant capacity from these assets.

The Project clearly articulates that its outputs will be made openly available to all networks and will source data from many stakeholders, aiming to create new services and revenues for external users. Thus, it does not undermine the development of competitive markets.

The Project is considered innovative, novel, and risky because applying risk-based weather modelling to these assets brings an innovative perspective to opening up

their capacity for network and balancing services. Identifying suitable commercial models for these assets is complex and risky, balancing the needs of asset owners, network operators, and network users.

The Project includes participation from a sufficient range of stakeholders, bringing together expertise from UKPN, Met Office, and academia.

The Project is delivering value for money with overall costs appropriate to the scale of the opportunity and the nature of the problem. The balance of costs between Project Partners is reasonable, with justified use of subcontractors' costs.

The Project has a robust methodology defined in accordance with UKPN's established Project management approach. The breakdown of work packages and deliverables is sensible, enabling reasonable Project control. The risk register provides a good view of key risks to delivery.

## Decision from the Office of Gas and Electricity Markets (Ofgem)

#### FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

#### **Recommended Project-specific conditions**

Prior to the end of the Discovery Phase, the Funding Party must evidence to the Monitoring Officer on how the Project has engaged with NESO, DNOs and flexibility market providers to clarify how reserve power assets will integrate into existing markets.

Prior to the start of the Discovery Phase, the Funding Party must evidence to the Monitoring Officer on how the Project will engage with additional critical infrastructure outside of BT to ensure findings can be applied broadly.

## 4.3 Project 10157635 - WAVE – Weather Adaptive Vessel Efficiency

#### Submitted Project description

Transmission Owners are increasingly facing weather-related challenges in offshore operations, complicating vessel scheduling and increasing costs. The Weather Adaptive Vessel Efficiency (WAVE) Project aims to optimise marine vessel routes and schedules, increasing operational efficiency and reducing weather-related delays through an innovative tool. By providing networks and other marine vessels user with a robust understanding of the variation and trends of sea states, WAVE will enable dynamic route adjustments and identify optimal sheltering zones, ensuring safer and more cost-effective offshore operations. This Project supports faster network development and enhances resilience, ultimately contributing to a more reliable and sustainable energy system.

Eligibility Criteria met or not met – Expert Assessors' evaluation			
1. Projects must address the Innovation Challenge set by Ofgem.	Met		
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met		
3. Projects must involve network innovation.	Not Met		
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Not Met		
5. Projects must be innovative, novel and/or risky.	Not Met		
<ol> <li>Projects must include participation from a range of stakeholders.</li> </ol>	Met		
7. Projects must provide value for money and be costed competitively.	Met		
8. Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met		

Recommendation to the Office of Gas and Electricity Markets (Ofgem)

## **DO NOT FUND**

Overall, the Expert Assessors did not recommend this Project for funding as it did not meet Eligibility Criteria 3, 4 and 5.

The Project meets the Innovation Challenge, focusing on operational efficiency and productivity in delivering and maintaining assets. It recognises inefficiencies in current vessel productivity and aims to determine the feasibility of tool to improve this by the end of Discovery. Expert Assessors considered the problem of poor forecasting of ship operability windows as material and it could impact network capacity, particularly for fault repairs.

The Project has identified potential consumer benefits through cost savings in the operation of vessels supporting offshore power transmission networks by reducing vessel wait times.

The majority of Expert Assessors consider the Project does not offer sufficient innovation over and above the service offered by other met-ocean and vessel route planning service providers. The Project has not sufficiently explained what is innovative about their approach that would produce more accurate forecasts.

The Expert Assessors determined that the Project risks undermining competitive markets as NeuWave, a commercial company, retains Intellectual Property Rights for the Project. Other companies could use a similar approach without public funding. However, the Project risks linking NGET to a single provider of met-ocean services, potentially distorting competition.

While the Project is offering to fund a new entrant into met ocean services, overall the Expert Assessors did not consider the Project to be innovative, novel and/or risky as the technology differentiation from existing providers is not sufficiently clear.

The Project is delivering value for money with clearly defined objectives, reasonable potential for exploitation, and a team with wide expertise and experience. The costs

are reasonably transparent, except for DNV, and there is sufficient activity and resource requirements to justify the costs.

The Project has a robust methodology with a clearly defined work plan, milestones, and deliverables. The team comprises complementary skills and experience, with no critical external inputs that could significantly affect the timescale or costs. Credible mitigation for risks is in place.

#### Decision from the Office of Gas and Electricity Markets (Ofgem)

#### **DO NOT FUND**

Ofgem agrees with the Expert Assessors that this Project should not be funded because it does not meet Eligibility Criteria 3, 4 and 5. The Project is not demonstrably innovative as it has not clearly outlined how the service will provide innovation to the network which is not already provided by existing services in the market. The Project risks undermining competitive markets due to the risks of linking NGET to a single provider of met-ocean services.

#### **Recommended Project-specific conditions**

N/A

## 4.4 Project 10158424 - Autoflex

#### **Submitted Project description**

AutoFlex will explore the feasibility of fully automated, collectively optimised demand response from low carbon technologies (LCTs) across an entire community. Each customer will have its own optimised microgrid as part of a larger, localised virtual power plant. Novel funding frameworks will be designed to support LCT uptake among low-income households in the community. AutoFlex will reduce energy bills and improve flexibility procurement for networks. The benefits from LCTs will become accessible for fuel-poor households, and their uptake optimised across a community. AutoFlex's AI-powered automation will enable DNOs to make better use of capacity headroom, supporting faster and efficient connections.

E	ligibility Criteria met or not met – Expert Assessors' evaluation	
1.	Projects must address the Innovation Challenge set by Ofgem.	Met
2.	Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met
3.	Projects must involve network innovation.	Met
4.	Projects must not undermine the development of competitive markets.	Met
5.	Projects must be innovative, novel and/or risky.	Not Met
6.	Projects must include participation from a range of stakeholders.	Met
7.	Projects must provide value for money and be costed competitively.	Met
8.	Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) DO NOT FUND

Overall, the Expert Assessors determined that this Project did not meet the Eligibility Criterion 5 and therefore do not recommend this Application for funding.

The Project meets the Innovation Challenge theme by investigating the use of a novel energy management platform to enable demand-side response from domestic low carbon technologies. By increasing the flexibility of these technologies, the Project aims to lower reinforcement costs and create new revenue streams to offset investment costs for consumers. The Project is considered to have clearly identified potential to deliver a net benefit to electricity consumers because it could deliver increased uptake of low carbon technologies which are expected by the Project to be a net benefit.

The Project is considered innovative in some sense in terms of developing a software platform to enable the coordinated response of low carbon technologies at the community level, providing flexible services to the distribution network. It has the potential to demonstrate increased use of machine learning in this area and advance the use of a TRL9 level platform linked to DSO control. However, the Project does not provide a sufficient explanation of why the approach is novel or different from other existing Projects which have investigated the benefits of demand-side response from domestic low carbon technologies. The Project cannot therefore be considered risky and/or novel and thus does not meet Eligibility Criterion 5.

The Project does not undermine the development of competitive markets as it does not favour any specific provider of low carbon technologies. It is agnostic of the technologies and suppliers that could provide the solution to consumers.

The Project includes participation from a sufficient range of stakeholders, including Energy Networks, technology providers, and management consultancy with expertise in benefit analysis, stakeholder engagement, market, policy, and regulation. The mix of stakeholders is appropriate for the Project's desk-based research.

The Project is considered to be costed competitively, in line with other SIF funded Projects. However, the main budget request is for non-network Project Partners with flat rates for employee costs regardless of seniority. Guidehouse's consultant rate is notably high, and more details on internal employee costs should be requested if the Project were to be funded.

The Project has a robust methodology with a professional Project plan and risk register, giving confidence that it will progress in a timely manner. The length of the Project is adequate for the scope, though it could benefit from an extended timeline to better mitigate risks. The experience of the lead Project Partner in managing innovation Projects further supports timely progression.

## Decision from the Office of Gas and Electricity Markets (Ofgem) DO NOT FUND

Ofgem agrees with the Expert Assessors that this Project should not be funded because it does not meet Eligibility Criteria 5. The Project failed to explain how the approach it intends to take is novel and/or risky, when there are other examples of Projects which have also undertaken demand-side response from domestic low carbon technologies.

#### **Recommended Project-specific conditions**

N/A

## 4.5 Project 10158433 - Project VOLT

#### **Submitted Project description**

Project VOLT (Vector-Optimised Microgrid Operations for Industrial Low carbon Transition) explores the potential of multi-vector microgrids to support industrial and commercial (I&C) sites in decarbonisation, resilience and flexibility, integrated into an energy system in the most optimal way. With Newcastle Airport, Port of Tyne and Nissan signed up as customers, VOLT focuses on high-emission zones like ports, airports, and manufacturing hubs, integrating renewable energy, storage, hydrogen, and smart technologies to optimise flexibility and reliability. Backed by NESO it will ensure alignment with Regional Energy Strategic Plan and assess energy demand, infrastructure synergies, and regulatory challenges, developing scalable, cost-effective microgrid solutions.

#### Eligibility Criteria met or not met – Expert Assessors' evaluation

1. Projects must address the Innovation Challenge set by Ofgem.	Met
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met
3. Projects must involve network innovation.	Met
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met
5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeholders.	Met
<ol> <li>Projects must provide value for money and be costed competitively.</li> </ol>	Met
8. Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) FUND

Overall, the Expert Assessors determined that this Project has met all the Eligibility Criteria and recommend this Application for funding.

The Project addresses the Innovation Challenge because it explores the deployment of multi-vector microgrids to decarbonise industrial and commercial sites, integrating renewable energy, energy storage, and hydrogen with existing network infrastructure. This aligns with the aim of ensuring microgrids enhance whole system resilience and flexibility.

The majority of Expert Assessors consider the Project to have identified potential to deliver a net benefit to electricity consumers by proposing the monetisation of flexibility services, providing demand response and grid-balancing capabilities. The benefits extend through potential participation in ancillary services and flexibility markets, generating new revenue streams for industrial and commercial users. Though the Project could have done more to define the consumer benefits.

The Project is considered to be innovative by developing a multi-vector energy model that dynamically balances energy flows across electricity, gas, and hydrogen, enabling improved load balancing, peak shaving, and network efficiency. This ensures optimal integration with distribution and transmission networks.

The Project does not undermine the development of competitive markets because it explores the potential of multi-vector microgrids to support industrial and commercial sites in decarbonisation, resilience, and flexibility. It aims to integrate renewable energy, storage, hydrogen, and smart technologies to optimise flexibility and reliability, ensuring alignment with the Regional Energy Strategic Plan.

The Project is considered innovative and risky because it examines existing microgrid Projects that do not offer a structured framework for industrial multi-vector integration. It aims to develop a replicable model for industrial sites, capable of dynamically switching between vectors to improve efficiency, security, and cost-effectiveness. The Project leverages real-world industrial demand profiles to quantify the benefits of multi-vector microgrids in terms of carbon reduction, cost savings, and system flexibility.

The Project Partners are sufficient, including Northern Powergrid, Northern Gas Networks, LCP Delta, and Newcastle University. With Newcastle Airport, Port of Tyne, and Nissan signed up as customers, the Project focuses on high emission zones, integrating renewable energy, storage, hydrogen, and smart technologies to optimise flexibility and reliability.

The Project is costed competitively with balanced costs between Project Partners, appropriate for successful completion and delivery. The balance of costs and workload between Project Partners and the proposed assets needed to deliver the Project seem reasonable. There are no subcontractors involved, and the Project represents good value for money compared to alternative approaches. The Project has a robust methodology with a clear Project management approach, plan, and stated Project management tools. Work package leads, key milestones, and the risk register are presented in a clear and structured methodology. The identification and mitigation of risks are stated, and the team has the necessary skills, experience, and resources to deliver the Project.

## Decision from the Office of Gas and Electricity Markets (Ofgem)

#### FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

#### **Recommended Project-specific conditions**

None

## 4.6 Project 10158670 - Conductor

#### Submitted Project description

Traction bulk supply points (BSPs) are large-capacity grid connections designed to support peak demand on the rail traction system. Because traction power is typically very peaky in nature this capacity is not optimally utilised. Installing battery storage facilities at traction BSPs and unlocking connection agreements to enable two-way dynamic flow could shift rail energy demand away from peak periods, unlocking capacity for other customers; support regional balancing of supply and demand; fulfil unmet demands for flexibility services in areas with network constraints; and increase the commercial scope for new traction-connected generation capacity, replacing curtailment with load shifting and export capability.

Eligibility Criteria met or not met – Expert Assessors' evaluation	
1. Projects must address the Innovation Challenge set by Ofgem.	Met

<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met
3. Projects must involve network innovation.	Met
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met
5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeholders.	Met
<ol><li>Projects must provide value for money and be costed competitively.</li></ol>	Met
<ol> <li>Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.</li> </ol>	Met

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) FUND

The Expert Assessors agree that this Project has met the Eligibility Criteria and recommend this Application for funding.

This Project addresses the Innovation Challenge by increasing the capacity of energy networks to host Net Zero aligned supply and demand assets by using novel methods to increase electrical capacity from existing assets or support faster and more efficient connection methods, including digital innovations.

The Project could deliver a net benefit to electricity consumers through reducing the cost of infrastructure reinforcement as well as offsetting additional usage costs by enhancing flexibility opportunities.

The Project offers direct network improvement by utilising redundancy, particularly off-peak rail operations, to assist in the operation of the main electricity grid. Battery storage innovation is proposed to maximise load flexibility opportunities. The Project is not deemed to undermine competitive markets as it assesses the potential to introduce innovation to support demand growth in a specific region, without precluding market entrants at a future stage from delivering site-specific innovative technology solutions.

The Project is considered innovative and risky because there is clear evidence that the demand profile for traction can be more efficiently supplied with the additional benefits of network reinforcement cost avoidance. However, the legal and regulatory frameworks do not currently support this change, and any solution and future benefits will be dependent on achieving compliance with these frameworks.

The consortium breadth and depth are extremely strong, and the networking potential is very positive. Engagement with stakeholders is recognised as a work package within the Project plan. The timescale and resource requirement for engagement with Network Rail, Department for Transport, local authorities, and community stakeholders is considered optimistic. The Application could have been enhanced by having Network Rail as a Project Partner which could significantly mitigate Project risks attributable to insufficient engagement.

Previous work leading to this Project shows good value and lays the background well. The Project costs set out are reasonable for the resources identified and thus assessed as costed competitively. The solution proposed has the opportunity to be a significant cost avoidance factor in future network planning and thus would deliver value for money.

There was a coherent and robust methodology presented, which, combined with the strong team formed, suggests a successful Project outcome in a timely manner.

## Decision from the Office of Gas and Electricity Markets (Ofgem) FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

**Recommended Project-specific conditions** 

Prior to the end of the Discovery Phase, the Funding Party will evidence to the Monitoring Officer engagement with the SIF Project, Flexible Railway Hubs, and incorporated learnings from the Project.

# 5 Greater heat flexibility Innovation Challenge: summary of Projects

This section covers the assessment of Cycle 2 Discovery Phase Applications received into the 'Greater heat flexibility' Innovation Challenge.

In order to protect intellectual property rights (IPR), unsuccessful Projects have been redacted from the final published version.

Project reference number	Project name	Funding licensee	Total Project costs (£)	Total Project contributio n (£)	Total SIF Funding requested (£)	Recommended by Expert Assessors for funding (Yes/No)	Decision by Ofgem for funding (Yes/No)
10157199	FORTRESS (Flexibility and Optimisation for Resilience in Energy Systems)	Scottish Hydro Electric Power Distribution plc	163,905	146,524	7,381	Yes	Yes
10158067	Hot Chips	UK Power Networks (Operations) Ltd	149,207	133,079	16,128	Yes	Yes
10158431	Warmsure	Northern Powergrid (Northeast) Ltd	166,163	17,747	148,416	No	No

## 6 Greater heat flexibility Innovation Challenge: Expert Assessors' recommendations on Projects

6.1 Project 10157199 - FORTRESS (Flexibility and Optimisation for Resilience in Energy Systems)

#### Submitted Project description

It is essential that Protected Sites (PSs), e.g. hospitals and military sites, have a resilient energy supply to meet critical requirements. Most protected sites currently use fossil-fuels for heat and backup solutions. For Distribution Network Operators (DNOs), supporting protected sites' transition to electrified heating will require providing additional capacity whilst maintaining the requisite level of resilience, involving major infrastructure investment. Utilising a coordinated, flexible approach to heat demand offers the opportunity to offset some of these costs. FORTRESS's hospitals use case demonstrates these diverse resilience needs, from critical care to administrative buildings, analysing innovative heat flexibility strategies for DNOs.

Eligibility Criteria met or not met – Expert Assessors' evaluation	
1. Projects must address the Innovation Challenge set by Ofgem.	Met
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met
3. Projects must involve network innovation.	Met
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met
5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeholders.	Met
<ol><li>Projects must provide value for money and be costed competitively.</li></ol>	Met
<ol> <li>Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.</li> </ol>	Met

## Recommendation to the Office of Gas and Electricity Markets (Ofgem)

#### FUND

The Expert Assessors agree that this Project has met all the Eligibility Criteria and recommend this Application for funding.

The Project addresses the Innovation Challenge by seeking to streamline the electrification of heat through flexibility options for a significant future electricity demand from the NHS.

The Project does not undermine the development of competitive markets by knowledge sharing and free dissemination of findings/outputs to DNOs, Protected Sites and industry stakeholders. This will prevent monopolisation of the knowledge gathered, ensuring broad access to insights on flexibility solutions.

The Project is considered innovative, novel, and risky because it seeks to establish models and future energy scenarios at a significant scale due to the size of heat capacity which may need to transition to electricity.

The Project includes participation from a sufficient range of stakeholders, including an NHS trust that owns multiple sites, but it should take care not to overgeneralise the outcomes to sites that may be very different.

The allocation of costs is reasonable, delivering value for money because the benefits likely to accrue to GB customers could be significant. Notable effort has gone toward establishing a team and corresponding Project plan (with milestones) with resourcing which can be delivered within the tight timescales.

The Project has a robust methodology which gives confidence that it will be capable of progressing in a timely manner because, as reviewed in the assessment, the PM Book has been completed to a very high level, with clear deliverables, robust breakdown of work packages and milestones. The Project has demonstrated a robust approach to Project management.

## Decision from the Office of Gas and Electricity Markets (Ofgem)

## FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

#### **Recommended Project-specific conditions**

None

## 6.2 Project 10158067 - Hot Chips

#### **Submitted Project description**

Electricity demand from heating could quadruple by 2050 to over 100TWh per year, almost a third of GB's current annual electricity demand.

Hot Chips will demonstrate how data centre surplus heat could reduce the energy demand of district heat (DH) networks and explore how DNOs and data centres can work collaboratively to decarbonise DH networks.

Using water-sourced heat pumps in an ambient loop array, this Project will reduce electrical demand and increase system efficiency. Coupled thermal storage will provide thermal flexibility for homes as well as electrical demand flexibility for DNOs.

Eligibility Criteria met or not met – Expert Assessors' evaluation	
1. Projects must address the Innovation Challenge set by Ofgem.	Met
2. Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met
3. Projects must involve network innovation.	Met
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met
5. Projects must be innovative, novel and/or risky.	Met

6.	Projects must include participation from a range of stakeholders.	Met
7.	Projects must provide value for money and be costed competitively.	Met
8.	Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) FUND

The Expert Assessors agree that this Project has met the Eligibility Criteria and recommend this Application for funding.

The Project addresses the Innovation Challenge by aiming to reduce heat-led peak electricity demand through flexibility services, developing low carbon, lowtemperature heat networks operating with waste heat from data centres and long duration thermal storage. The outputs from this Project will identify the potential to reduce peak heat demand through utilisation of an alternative heat source.

The Project has a clearly identified potential to deliver a net benefit to heat and electricity consumers by focusing on whole system efficiencies. Using waste heat from data centres for ambient loop district heating should benefit consumers by saving on electricity bills through reduced need for costly network infrastructure and power generation. Heat consumers should also benefit from affordable heat using ambient loop heat networks with thermal storage.

The Project is considered innovative by opening new technical and commercial opportunities for more resilient distribution networks and more efficient whole system operation. It aims to develop coordinated action between DNOs, heat network and thermal storage developers, and data centre operators, providing routes for innovation in decarbonising heat.

The Project does not undermine the development of competitive markets as it is agnostic of the technologies and suppliers that could provide the solution to

consumers. It aims to develop new market opportunities for data centre owners, heat network and thermal storage developers, and DSO flexibility services.

The Project is considered innovative, novel, and risky because it explores the opportunity to link waste heat sources with heat demand sources to support an overall reduction in network electricity demand at peak periods. It seeks commercial and technical solutions to repurpose waste heat from data centres into a resource for heat networks with long duration thermal storage. It is risky because there is currently no incentive for data centre owners to capture waste heat for ambient loop heat networks, and no ready-made developers or domestic customers for such heat services.

Project Partners are sufficient for the Project, incorporating the necessary skills and expertise to conduct the planned work.

The Project is delivering value for money by addressing the under-exploited resource of residual heat from data centres and potential whole system efficiencies from ambient loop district heating with thermal storage. It is costed competitively, with no subcontractors, making funding allocation straightforward.

The Project has a robust methodology for the work packages detailed in the plan, giving confidence that it will progress in a timely manner. There is a comprehensible, well-structured plan, timetable, and clear division of labour between Project Partners. The risk register details activities for adequate mitigation of main risks.

## Decision from the Office of Gas and Electricity Markets (Ofgem)

#### FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

#### **Recommended Project-specific conditions**

Prior to the end of the Discovery Phase, the Funding Party will evidence to the Monitoring Officer engagement with other district heating Projects, such as SHIELD and GreenSCIES (Green Smart Community Integrated Energy Systems) from the Prospering from the Energy Revolution (PFER) portfolio, to ensure alignment with prior waste heat utilisation Projects and avoid duplication.

Prior to the end of Discovery Phase, the Funding Party will evidence to the Monitoring Officer how it will assess the viability of large-scale deployment beyond a single pilot site.

## 6.3 Project 10158431 - Warmsure

#### **Submitted Project description**

The Project addresses challenges posed by the large-scale deployment of clustered electrified heating in social housing, accounting for 16% of UK housing stock. Increased heat pump uptake can lead to voltage instability, asset overloading, and delays in decarbonisation. Traditional system planning demand models fail to capture modern consumption patterns, leading to inefficient planning. This Project develops a heat decarbonisation platform and coordinated flexibility strategies to optimise network planning, reduce connection delays, and enhance resilience. Integrating advanced demand modelling, socio-technical analysis, and flexibility solutions, enables efficient, scalable electrification of heat while supporting cost-effective network investment and equitable low carbon heating access.

Eligibility Criteria met or not met – Expert Assessors' evaluation	
1. Projects must address the Innovation Challenge set by Ofgem.	Met
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met
3. Projects must involve network innovation.	Met
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met

5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeho	lders. Met
7. Projects must provide value for money and be costed competitively.	Not Met
8. Projects must be well thought through and have a robust methodology so that they are capable of progressing in a time manner.	Not Met mely

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) DO NOT FUND

The Expert Assessors agree that this Project has not met all the Eligibility Criteria and therefore cannot recommend this Application for funding.

The Project addresses the Innovation Challenge, because it examines an aspect of reducing heat-led peak demand through flexibility, as heating systems in social housing are decarbonised at neighbourhood scale. It aims to achieve this by developing new forms of coordination between social housing providers switching stock to electric heating, DNOs and possibly flexibility/demand side response aggregators.

The Project is considered to have met this Eligibility Criterion because it has demonstrated a number of areas in which savings could be made, which would be a net benefit to electricity consumers. However, the quantification and justification of potential benefits are comparatively weak, even given the limited expectation for a Discovery proposal. Although, the Project has identified a clear benefit for a subset of electricity consumers through aggregation of flexibility, and a wider set of electrical customers via reduced bills.

The Project addresses the Innovation Challenge because it has potential to provide innovative solutions for improving network planning processes. The Project involves innovation due to the focus on social housing providers. The Project is not considered to undermine the development of competitive markets because it is planned to be technology neutral and open up new possibilities for flexibility providers.

The Project is considered innovative and novel because of the challenge of deploying the envisaged technologies on scale with a business such as NPG and other DNOs. There is a caveat on this statement arising from the very high-level description of the technologies to be developed. The focus area and consumer segment add to the innovation.

The Project includes participation from a sufficient range of stakeholders because the Project team includes universities, subcontractors, the local council, and a demonstrator site.

The Project is not considered to be delivering value for money as day rates for private contractors are high compared to industry standard and are not sufficiently justified. There is a disconnect between costs from some of the Project Partners compared to other Project Partners.

The Project's methodology is not sufficiently robust and does not give confidence that it will be capable of progressing in a timely manner. The stated outputs are not clearly targeted. The risk register has only two risks, which is insufficient for a complex Project with many elements that must synchronise.

## Decision from the Office of Gas and Electricity Markets (Ofgem) DO NOT FUND

Ofgem agrees with the Expert Assessors that this Project should not be funded because it does not meet Eligibility Criteria 7 and 8. The Project does not provide value for money as the costs of subcontractors are higher than what is expected of industry standard while the involved universities are on a zero-profit rate, resulting in a disconnect between Project Partners' costs. The Project does not provide a robust methodology as only a high level of detail is provided in the described approaches, there is also a lack of clear targets for the outputs.

## **Recommended Project-specific conditions**

N/A

# 7 Embedding resilience Innovation Challenge: summary of Projects

This section covers the assessment of Cycle 2 Discovery Phase Applications received into the 'Embedding resilience' Innovation Challenge.

In order to protect intellectual property rights (IPR), unsuccessful Projects have been redacted from the final published version.

Project reference number	Project name	Funding licensee	Total Project costs (£)	Total Project contributio n (£)	Total SIF Funding requested (£)	Recommended by Expert Assessors for funding (Yes/No)	Decision by Ofgem for funding (Yes/No)
10157227	Future Agriculture Resilience Mapping (FARM)	Scottish Hydro Electric Power Distribution plc	147,880	133,092	14,788	Yes	Yes
10157410	Gas transmission asset resilience through network transitions	National Gas Transmission plc	108,501	97,650	10,851	Yes	Yes
10157434	Multi-modal Transport Decarbonisation	National Gas Transmission plc	162,104	145,883	16,221	Yes	No

10158623	SHARED (Smart Hydrogen and Resilient Energy Decarbonisation)	UK Power Networks (Operations) Ltd	169,939	20,879	149,060	Yes	Yes
	Decarbonisation)						

# 8 Embedding resilience Innovation Challenge: Expert Assessors' recommendations on Projects

## 8.1 Project 10157227 - Future Agriculture Resilience Mapping (FARM)

#### Submitted Project description

To achieve clean power by 2030 and Net Zero by 2050, UK food production must move away from fossil fuels. With approximately 209,000 farm holdings in 2023, energy networks must be prepared to meet different future rural energy demands driven by greenhouse gas reductions and climate change adaptation. The Future Agriculture Resilience Mapping (FARM) Project will:

1. Support UK food production and security by understanding future energy requirements, transition pathways, and the associated network requirements.

2. Identify clear commercial, policy and planning actions for DNOs, the agricultural sector, and policy makers.

Eligibility Criteria met or not met – Expert Assessors' evaluation	
1. Projects must address the Innovation Challenge set by Ofgem.	Met
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met
3. Projects must involve network innovation.	Met
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met
5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeholders.	Met
<ol><li>Projects must provide value for money and be costed competitively.</li></ol>	Met

8. Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.

### Recommendation to the Office of Gas and Electricity Markets (Ofgem) FUND

The Expert Assessors agree that this Project has met all the Eligibility Criteria and recommend this Application for funding.

The Project addresses the Innovation Challenge by developing novel and replicable approaches for rural decarbonisation. The proposal demonstrates replicable approaches for rural decarbonisation.

The Project is considered to deliver net benefits to electricity consumers by creating savings through developing future energy scenarios and profiles for the food production sector. Generating these for the agricultural food production sector is needed to decarbonise the whole system.

The Project provides cross-vector approaches to decarbonising rural communities in a resilient manner, complementing other Project activities such as Rural Energy and Community Heat (REACH), Hydrogen Farm of the Future, and electrification of rural industries. It also aims to facilitate wider use of energy storage assets. The Project does not undermine the development of competitive markets as there is no existing comparable product on the market.

The Project is considered innovative and risky due to uncertainty in generating data from food production sites. Without this data, the consortium cannot develop solutions or forecasted energy models.

The Project includes a sufficient range of stakeholders with expertise and experience from industry, complemented by representation from community associations and farming unions.

Overall, the Project is delivering reasonable value for money, though one Expert Assessor did note some Project Partners' daily rates <u>are could be</u> considered high and the value delivered throughout the Project will be monitored.

The Project has a robust methodology with clearly defined work packages and appointed lead partners for each deliverable. The stages and timeframes for delivery are realistic, and all risks have been identified with mitigation strategies in place.

#### Decision from the Office of Gas and Electricity Markets (Ofgem)

#### FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

#### **Recommended Project-specific conditions**

Prior to the end of the Discovery Phase, the Funding Party must evidence to the Monitoring Officer how the Project has included farming bodies, such as the National Farmers Union, in its engagement and learnings, to ensure their views and feedback are included within the Project.

# 8.2 Project 10157410 - Gas transmission asset resilience through network transitions

## Submitted Project description

As the energy system transitions away from unabated natural gas and parts of the gas network are either decommissioned or repurposed to support the UK's net zero goals, there is an increased risk of unintentional third-party damage to the network. Any supply interruptions to the transmission network would directly impact security of supply across the country and have a significant cost to customers including power generators, industry and domestic users. This Project will investigate the benefits of moving from expensive, low frequency, manual network inspections to innovative AI assisted surveillance technologies in combination with satellite imagery and drones.

Eligibility Criteria met or not met – Expert Assessors' evaluation	
1. Projects must address the Innovation Challenge set by Ofgem.	Met
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met
3. Projects must involve network innovation.	Met
4. Projects must not undermine the development of competitive markets.	Met
5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeholders.	Met
7. Projects must provide value for money and be costed competitively.	Met
8. Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) FUND

Overall, the Expert Assessors determined that this Project has met the Eligibility Criteria and recommend this Application for funding. One assessor had some concerns on the justification for the claim of reducing gas demands and it increasing the risk of unintentional third-party damage and recommended that this be kept under review if the Project is funded.

The majority of Expert Assessors agreed the Project is aligned with Innovation Challenge 3 to embed resilience in an energy system with reducing natural gas demand by reducing the future cost of maintaining a decommissioned and/or repurposed gas network. By moving to condition or risk-based maintenance, there is significant potential to improve future cost estimates by being more data-driven. Exploring how new technologies can reduce the burden of maintaining the network is a great use of innovative problem-solving.

The Project has identified a clear benefit to gas consumers through opening up capacity from backup power systems to reduce network peaks and thereby defer or avoid the need for reinforcement investment. Additional benefits may include national balancing, managing network outages, and enabling faster roll-out of low carbon systems.

The Project is innovative by exploring how new technologies and combinations of technologies can be applied to the network challenge of miles of underground pipeline, currently only monitored periodically. The proposed technologies, including quantum sensing, autonomous drones, and AI visual analysis, have not previously been used to assess pipeline integrity on such a widespread scale.

The Project does not undermine the development of competitive markets as a wide range of technologies will be considered, and the current thinking is to integrate different technologies via Application Programming Interface, thus avoiding a single provider approach. The outputs will be made available to all stakeholders, creating opportunities for new revenues for external users.

The Project is considered innovative and novel because the proposed technologies may not work or may not be deployable at an acceptable cost, making the innovation risky. The support of SIF funding is crucial to investigate the viability of these technologies before further investment. The risk register has identified risks such as low shareholder availability and participation in data sharing.

The Project includes sufficient stakeholders for a Discovery Phase, bringing together the transmission network with technologists and experts in satellite technologies. Many related Projects, such as digital twin, have been identified, indicating that the Project team understands the wider ecosystem around this innovation.

The Project is delivering value for money, given the reports proposed to be produced and the wide range of technologies to be explored. The overall costs appear appropriate to the scale of the opportunity and the nature of the problem. The balance of costs between Project Partners is reasonable, and each Project Partner's costs are based on reasonable day rates.

The Project has a robust methodology with meticulously detailed deliverables and sensible workstreams, giving confidence that it will progress in a timely manner. Roles and responsibilities between partners are clear, making Project management straightforward. The risk register provides a good view of key risks to delivery.

## Decision from the Office of Gas and Electricity Markets (Ofgem)

#### FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

#### **Recommended Project-specific conditions**

Prior to the end of the Discovery Phase, the Funding Party must evidence to the Monitoring Officer, how the Project has engaged with previous SIF and NIA Projects, such as Eye in the Sky, Visual Inspection and Condition Assessment Platform for OHL Steelwork 2 (VICAP 2) and Beyond Visual Line of Sight (BVLOS), which have used drones for Electricity Transmission and what learnings the Project has taken from these.

## 8.3 Project 10157434 - Multi-modal Transport Decarbonisation

#### Submitted Project description

Dispersed industrial and power generation CO<sub>2</sub> emitters face challenges in costeffective decarbonisation, requiring innovative CO<sub>2</sub> transport solutions. With gas demand Projected to decline by 40-60% by 2035, pipeline owners must plan asset reuse and/or decommissioning to support system-wide decarbonisation. The proposed platform enables optimal route analysis for CO<sub>2</sub> transport, including repurposed gas pipelines, new pipelines, and rail and road options. This aids network operators in pipeline planning decisions and facilitates gas-fired power plant decarbonisation. The platform addresses the needs of dispersed industrial sites and CCS clusters and offers more cost-effective CO<sub>2</sub> abatement methods, potentially lowering energy bills for GB consumers.

Eligibility Criteria met or not met – Expert Assessors' evaluation	
1. Projects must address the Innovation Challenge set by Ofgem.	Met
<ol> <li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li> </ol>	Met
3. Projects must involve network innovation.	Met
4. Projects must not undermine the development of competitive markets.	Met
5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeholders.	Met
7. Projects must provide value for money and be costed competitively.	Met
8. Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met

## Recommendation to the Office of Gas and Electricity Markets (Ofgem)

#### FUND

The Expert Assessors agree that this Project has met the Eligibility Criteria and recommend this Application for funding.

The Project directly targets the challenge of transitioning to a decarbonised energy system with reducing natural gas demand, while maximising benefits of existing infrastructure and limiting consumer costs. There is clear potential to deliver consumer benefits via decarbonised energy and extended revenue streams from existing infrastructure. Additional benefits include strategic investment planning and cost avoidance, as well as potential reduced costs due to re-purposing the existing gas grid.

By considering multi-modal options, new potential network futures can be explored, creating innovative solutions. The Project demonstrates clear network innovation by re-purposing the gas pipeline for Carbon Dioxide distribution for storage or utilisation.

The Project does not undermine competition and instead actively opens new possible markets for multi-modal carbon transportation. It does not negatively affect other markets and offers opportunities for transport services to coordinate Carbon Dioxide supply.

The Project is innovative in embracing multimodal transport options and optimising transportation via AI to multiple emitters and users/storage options. This novel approach provides valuable information for planning Carbon Capture Storage and reduces overall transportation costs.

The Project Partners are appropriate for the Discovery Phase and specifically recognise and address wider stakeholder engagement needs for future success. There are clear indications for stakeholder engagement and dissemination of findings.

Costs appear competitive and appropriate to deliver high value for money in the Discovery Phase. The costs submitted are reasonable and adequate for the work envisaged, with strong commercial potential and cost savings for consumers.

The Project plan is clear and well-structured, giving confidence in delivery. Timing is considered ambitious, but contingency exists to mitigate unforeseen challenges. The methodology is valid and robust, with detailed deliverables and sensible workstreams.

#### Decision from the Office of Gas and Electricity Markets (Ofgem)

## DO NOT FUND

Ofgem does not agree with the Expert Assessors and does not approve this Project for funding because it does not meet Eligibility Criterion 2; the Project does not provide a net benefit to gas or electricity consumers. Within the Application, benefits were considered indirect and primarily served industry, rather than delivering a clear net benefit to gas consumers. Currently, CO2 infrastructure is not included within the regulatory asset base – whilst Ofgem is considering the policy stance on this it was deemed not have any direct benefits for consumers.

## **Recommended Project-specific conditions**

N/A

# 8.4 Project 10158623 - SHARED (Smart Hydrogen and Resilient Energy Decarbonisation)

#### Submitted Project description

Rural communities face challenges in decarbonising heating systems, are more vulnerable to climate change impacts and are more likely to be 'worst served customers' (WSCs). Decarbonising these areas could increase electricity demand, exacerbating resilience issues, especially for WSCs. Strengthening the electricity network in these areas would be expensive and take time, so alternative solutions are needed.

SHARED will explore the potential of low-cost hydrogen production and storage as a solution to improve the resilience of these communities. The Project will assess how effective this approach could be and identify the specific needs of rural communities.

Eligibility Criteria met or not met – Expert Assessors' evaluation		
1. Projects must address the Innovation Challenge set by Ofgem.	Met	

2. Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met
3. Projects must involve network innovation.	Met
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met
5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeholders	;. Met
7. Projects must provide value for money and be costed competitiv	vely. Met
<ol> <li>Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.</li> </ol>	, ,

## Decision from the Office of Gas and Electricity Markets (Ofgem)

#### FUND

The Expert Assessors agree that this Project has met the Eligibility Criteria and recommend this Application for funding.

This Project addresses the Innovation Challenge by providing alternatives to current methods of energy resilience for worst served customers.

The Project is considered to meet Eligibility Criterion 2, because it could deliver more reliable, clean, and potentially lower cost, services for customers in rural areas, compared to use of diesel generation as back up during power outages, and compared to higher cost, likely slow, network reinforcement.

The Project is considered to be innovative, because it is incorporating a small hydrogen 'stand by' facility; visibility of low voltage network power flows through more accurate data; reduced carbon emissions and capacity to defer or avoid reinforcement.

The Project does not undermine competitive market development and could instead encourage new markets in community-scale electrolyser and hydrogen storage technology, benefiting rural areas and potentially for export.

The Project is innovative and risky, aiming to develop distributed hydrogen generation and storage for rural networks, though it is largely untested and requires coordination of multiple stakeholders and technology components.

The Project involves a sufficient range of stakeholders, with plans to engage customers and other key stakeholders to support cleaner, more resilient rural network operation.

The Project delivers value for money by testing a viable route to affordable, clean hydrogen solutions for rural network decarbonisation and resilience, with competitive costing and transparent costings.

The Project has a robust methodology, with clear plans, milestones, and deliverables, providing confidence in timely progression.

# Recommendation to the Office of Gas and Electricity Markets (Ofgem)

#### FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

#### **Recommended Project-specific conditions**

Prior to the end of the Discovery Phase, the Funding Party must evidence to the Monitoring Officer how the proposed solution produces low-cost hydrogen.

Prior to the end of the Discovery Phase, the Funding Party must evidence to the Monitoring Officer how the proposed solution aligns with the current GB policy direction on hydrogen.

# 9 Accelerating towards net zero energy networks Innovation Challenge: summary of Projects

This section covers the assessment of Cycle 2 Discovery Phase Applications received into the 'Accelerating towards net zero energy network' Innovation Challenge.

In order to protect intellectual property rights (IPR), unsuccessful Projects have been redacted from the final published version.

Project reference number	Project name	Funding licensee	Total Project costs (£)	Total Project contributio n (£)	Total SIF Funding requested (£)	Recommende d by Expert Assessor for funding (Yes/No)	Decision by Ofgem for funding (Yes/No)
10157201	InstantFlex	Southern Electric Power Distribution plc	165,749	149,175	16,574	Yes	No
10157253	ODIN - Optimisation and Diagnostics for Innovative Networks	Scottish Hydro Electric Transmission plc	168,447	149,612	18,835	Yes	Yes
10158435	Gridsight	Northern Powergrid (Northeast) Ltd	157,238	15,724	141,514	No	No

10 Accelerating towards net zero energy networks Innovation Challenge: Expert Assessors' recommendations on Projects

## 10.1 Project 10157201 - InstantFlex

#### **Submitted Project description**

DESNZ's Smart Secure Electricity Systems Programme (SSES) aims to establish broad criteria for a flexibility-management framework that meets the needs of NESO, the Market Facilitator and DSRSPs. However, SSES does not anticipate offering real-time, granular flexibility visibility for DSOs; arguably the most critical aspect of largescale ESA deployment for the next two decades. InstantFlex supplements SSES, leveraging existing datasets from ESAs to develop a secure, scalable, standards-based, real-time data exchange framework. This innovation is fully synergistic with SSES, optimising the core programme whilst transforming domestic flexibility visibility, baselining and forecasting, helping DSOs optimise network performance and minimise reinforcement costs.

Eligibility Criteria met or not met – Expert Assessors' evaluation	
1. Projects must address the Innovation Challenge set by Ofgem.	Met
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Met
3. Projects must involve network innovation.	Met
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met
5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeholders.	Met
<ol><li>Projects must provide value for money and be costed competitively.</li></ol>	Met

8. Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) FUND

The majority of Expert Assessors agree that this Project has met the Eligibility Criteria and recommend this Application for funding.

The Project aligns with the Innovation Challenge. One Expert Assessor queried the Project's choice of theme (efficiency) and felt that another theme would be better suited (flexibility) though the Expert Assessor still considered the Eligibility Criterion met. The scope is appropriate, potentially delivering additional flexibility services and benefits to electrical consumers. The Project aims to increase network efficiency through flexibility, aligning with the Innovation Challenge.

It supports competitive markets by facilitating wider use of energy smart appliances. The Project is innovative and novel, focusing on an open, standardised framework of protocols and datasets. The Project Partners are sufficient, though engagement with more DNOs would strengthen the bid. The Project costs are generally in line with other Projects, though some costs appear generous and should be reviewed. SSEN's experience in delivering similar Projects gives confidence in successful delivery. The Project addresses network efficiency through detailed forecasting of flexibility impacts on LV networks. It aims to provide better investment planning tools, though its added value over previous Projects is uncertain. The Project improves DSO visibility of flexible asset behaviour, with significant market value. There is no evidence it would undermine market development. While the aim is innovative, the Project builds on prior work, raising questions about the need for SIF funding. The involvement of SSE, EDF, and GEO is limited, and wider DSO involvement would be beneficial for the Project.

The Expert Assessors overall viewed the Project as value for money; however they did note that some costings appeared high for the length of time of the Project.

The Project plan is well-conceived with a robust methodology. The summary statement clearly explains how it meets the innovation challenge and benefits users. The benefits for stakeholders are well considered, with appropriate metrics. The proposal addresses the problem of outdated demand forecasting methods, proposing an innovative framework using digital twins and AI. The Project should help develop competitive flexibility markets. It is innovative and risky, involving three relevant stakeholders. The Project costings and management approaches appear appropriate.

## Decision from the Office of Gas and Electricity Markets (Ofgem) DO NOT FUND

Ofgem does not agree with the Expert Assessors and does not approve this Project for funding because it does not meet Eligibility Criterion 2. The Project failed to explain how there are net benefits for electricity or gas consumers as there is no immediate cost reduction, and any potential savings would only be realised in the long-term and would require system-wide uptake. The Application benefits are mostly system-level operational improvements (DSO visibility, forecasting, datasharing), rather than direct cost savings or service improvements for consumers.

Additionally, the Project did not demonstrate what further benefits it would bring compared to what already exists within this space. For example, DSO-led flexibility market coordination may not be the right approach, as flexibility aggregators and market players already operate in this space.

## **Recommended Project-specific conditions**

N/A

## 10.2 Project 10157253 - ODIN - Optimisation and Diagnostics for Innovative Networks

#### **Submitted Project description**

The ODIN Project aims to develop automated methods for interpreting and diagnosing data collected from continuous monitoring of robots operating in high-voltage direct current halls. By leveraging modern advanced analytics, including machine learning and artificial intelligence, the Project will transition from the current labour-intensive process of manual data assessment, which lacks trend analysis for comparing against normal operating conditions. Through the Application of artificial intelligence and machine learning, ODIN will uncover novel insights into high-voltage direct current asset behaviour, thereby improving operational efficiency, reliability and resilience to support the transition to a net-zero energy network.

Eligibility Criteria met or not met – Expert Assessors' evaluation		
1. Projects must address the Innovation Challenge set by Ofgem.	Met	
2. Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	
3. Projects must involve network innovation.	Met	
<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met	
5. Projects must be innovative, novel and/or risky.	Met	
6. Projects must include participation from a range of stakeholders.	Met	
7. Projects must provide value for money and be costed competitively.	Met	
<ol> <li>Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.</li> </ol>	Met	

Recommendation to the Office of Gas and Electricity Markets (Ofgem)

### FUND

The Expert Assessors agree that this Project has met the Eligibility Criteria and recommend this Application for funding.

The Project addresses the Innovation Challenge by increasing the hosting capacity of existing networks through reduction of unscheduled outages due to faults, reducing the reinforcement required for alternative transmission connections.

It has a clearly identified potential to deliver a net benefit to consumers as it could reduce network operating costs and enhance system availability by reducing planned maintenance.

The Project involves network innovation. It does not undermine the development of competitive markets as the learnings from the Project are planned to be shared across a broad range of public platforms.

The Expert Assessors agreed the Project is innovative and risky because the solution is unproven, requiring development and validation before it can be introduced. There are also risks associated with implementation, including the effectiveness of the proposed technology and techniques.

The Project includes participation from a range of stakeholders as the Project Partners include a transmission network, providing access to the HVDC hall for trials, and a third party with capabilities in robotics and AI.

It provides value for money and is costed competitively as the balance of costs between Project Partners is justified and the total costs requested are appropriate.

The Project is well thought through and capable of progressing in a timely manner as there is a detailed Project plan and risk register, with the Project deploying robust Project management techniques that have been successful in previous SIF and innovative Projects.

Decision from the Office of Gas and Electricity Markets (Ofgem)

#### FUND

Ofgem agrees with the Expert Assessors and approves this Project for funding.

#### **Recommended Project-specific conditions**

Prior to the end of the Discovery Phase, the Funding Party must evidence to the Monitoring Officer on how the Project will define Application of AI and what the advantages the Project's solution has over other predictive AI solutions.

## 10.3 Project 10158435 - Gridsight

#### **Submitted Project description**

GridSight addresses the lack of real-time visibility in Low Voltage (LV) networks necessary to support the increasing deployment of domestic energy smart appliances (ESAs). By repurposing real-time data from energy smart appliances, GridSight provides Distribution System Operators (DSOs) with critical operational insights, enabling proactive network management and efficient grid support. Leveraging existing communication standards, the Project aims to create a standards-based, scalable, interoperable data exchange framework. Building on previous Projects, GridSight enhances asset registry systems for real-time monitoring, aligning with UK government objectives for an integrated electricity grid and supporting Net Zero energy networks.

Eligibility Criteria met or not met – Expert Assessors' evaluation	
1. Projects must address the Innovation Challenge set by Ofgem.	Met
<ol><li>Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers</li></ol>	Not Met
3. Projects must involve network innovation.	Met

<ol> <li>Projects must not undermine the development of competitive markets.</li> </ol>	Met
5. Projects must be innovative, novel and/or risky.	Met
6. Projects must include participation from a range of stakeholders.	Not Met
7. Projects must provide value for money and be costed competitively.	Not Met
8. Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met

## Recommendation to the Office of Gas and Electricity Markets (Ofgem) DO NOT FUND

The majority of Expert Assessors did not agree that this Project has met the Eligibility Criteria 2, 6 and 7 and do not recommend this Application for funding.

The Project identifies a reasonable issue with the increasing numbers of grid-edge smart energy technologies that are invisible to the DNO. Standardising access to these devices and their data will improve visibility, benefiting network planning and flex market participation.

The Project has the potential to reduce reinforcement costs and the cost of procuring needed flexibility, or reduce system costs by enabling better, more granular data to become available to system planners and operators. However, the Project provides no quantification of the counterfactual or upside from the innovation, making it difficult to determine clear benefits.

The Project is innovative because greater visibility of energy storage assets could lead to planning and operation decisions that improve the efficiency of the distribution network. It involves network innovation by focusing on providing data to the DSO, although the Application could be more specific about the network value generated. In principle, the Project could enhance competitive markets by providing greater visibility and flexibility market access to ESAs. There is no evidence that the Project would undermine competitive market development.

The Project is innovative in addressing a reasonable problem and potentially leading to greater innovation in network planning and operation, as well as greater flexibility market participation by ESA. There is risk involved in the anonymisation and processing of data to make the effects of individual device data available in a form usable by the DSO.

The Project does not meet Eligibility Criterion 6 because it does not stipulate how owners of energy storage assets will be engaged, which is critical to the Project's success. The involvement of NPG, EDF, and GEO is relatively limited in scope to assess the need for all DSOs. Wider involvement by other DSOs would have been valuable.

The Project costs do not appear to be excessive. However, there is a question as to whether the Project adds sufficient value as it mainly seeks to carry out a review of previous work and develop a business case for further work.

The methodology and competence of EDF as Project manager give confidence that the Project would be delivered on time. The Project Partners and methodology provide confidence that the Project would be taken forward and delivered in a timely manner.

#### Decision from the Office of Gas and Electricity Markets (Ofgem)

#### **DO NOT FUND**

Ofgem agrees with the Expert Assessors that this Project should not be funded because it does not meet Eligibility Criteria 2, 6 and 7. The Project does not demonstrably provide a net benefit to gas or electricity consumers as there is a lack of quantification of the counterfactual or the upside of the innovation. The Project does not have a good breadth of stakeholder engagement as it does not detail how owners of energy storage assets will be engaged. Additionally, further involvement from DSOs would be deemed essential for this Project. The Project does not provide value for money as it seeks to review previous work carried out to build a business case for further work rather than creating new work.

**Recommended Project-specific conditions** 

N/A