

Strategic Innovation Fund (SIF)
Round 3 Innovation Challenges – Discovery Phase
Funding Decision and Summary of Recommendations
from Expert Assessors
(unsuccessful Projects redacted)



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Introduction

Innovation will play a crucial role in delivering best value to energy consumers. Innovation will prepare the regulated energy network companies to deliver Net zero greenhouse gas emissions at lowest cost to consumers, while maintaining world-class levels of system reliability and customer service.

The SIF was introduced within the RII0-2 price control by Ofgem to support network innovations that contributes to the achievement of Net zero while delivering real benefits to network consumers. The SIF is being delivered in partnership with Innovate UK (part of UKRI), who are administering the SIF and are working to coordinate innovation activities funded by network consumers with other innovation funded programmes.

For each round of the SIF, new Innovation Challenges are launched focusing on strategic issues currently facing gas and electricity networks. Round 3¹ of the SIF, was launched in May 2023 and focuses on four Innovation Challenges:

1. Whole system network planning and utilisation to facilitate faster and cheaper network transformation and asset rollout
2. Novel technical, process and market approaches to deliver an equitable and secure Net zero power system
3. Unlocking energy system flexibility to accelerate electrification of heat
4. Enabling power-to-gas (P2G) to provide system flexibility and energy network optimisation

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.

¹ Find the four Innovation Challenges launched for round 3 here: <https://www.ofgem.gov.uk/publications/strategic-innovation-fund-round-three-innovation-challenges>

As set out in the SIF Governance Document², Round 3 of the SIF is open to the Electricity System Operator, Electricity Transmission, Electricity Distribution³, Gas Transmission and Gas Distribution licensees.

This report is for the Round 3 Discovery Phase. It sets out the Funding Decision and Summary of Recommendations from Expert Assessors for Ofgem's consideration for Projects which submitted an Application for the Round 3 Discovery Phase and met the Eligibility Criteria set out in the SIF Government Document and the Innovation Challenge-specific requirements outlined in the Round 3 Innovation Challenges.

² The SIF Governance Document can be found here: <https://www.ofgem.gov.uk/publications/updated-sif-governance-document>

1 Round 3 Summary

Four Innovation Challenges were launched in May 2023 for Round 3 of the SIF⁴. For Round 3, the Innovation Challenges focus on specified areas that are key to achieving key sectoral targets over the next decade, such as delivering a Net zero power system by 2035. The Round 3 Innovation Challenges are:

- Whole system network planning and utilisation to facilitate faster and cheaper network transformation and asset rollout
- Novel technical, process and market approaches to deliver an equitable and secure Net zero power system
- Unlocking energy system flexibility to accelerate electrification of heat
- Enabling power-to-gas (P2G) to provide system flexibility and energy network optimisation

The four 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.

The key underlying principles established to prioritise these challenges have been:

- Strategic: innovations are required to meet national and devolved Net zero targets effectively.
- Network relevant: 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 for Round 3.

⁴ Find the four Innovation Challenges launched for round 3 here: <https://www.ofgem.gov.uk/publications/strategic-innovation-fund-round-three-innovation-challenges>

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

Within each of the Innovation Challenges are specific requirements on scope and partner requirements. Projects submitted to the SIF must meet these specific requirements and must follow the SIF Governance Document⁵. For the Discovery Phase of Round 3, Projects must start no earlier than 1 March 2024, end by 31 May 2024 and must not request funding of more than £150,000, exclusive of VAT.

Applications submitted to the Round 3 Discovery Phase by the 22 November 2023 deadline and which met the Innovation Challenge-specific requirements were assessed by Expert Assessors. The Expert Assessors are external appointees whose recommendations inform Ofgem's decision-making on the selection of Project for SIF Funding. The Expert Assessors have relevant expertise and knowledge on the respective Innovation Challenges and/or the energy sector, including in areas such as policy and regulatory, commercial, financial and technical. Consistent with the requirements of the SIF Governance Document⁶, 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, partial funding, 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, the total mean Expert Assessor score achieved against the Application questions, any Project-specific conditions recommended by Expert Assessors, and wider concerns or opportunities identified by the Expert Assessors. For more information on how

⁵ The SIF Governance Document is available here: <https://www.ofgem.gov.uk/publications/updated-sif-governance-document>

Projects are assessed by the Expert Assessors, please see the 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 Round 3 Discovery Phase of the SIF. Ofgem, taking into the account the Expert Assessors' assessment and recommendations, is the sole decision-maker for the SIF.

2 Assessment Process

For the Round 3 Discovery Phase there is a maximum of 5 stages to assess eligible submitted Applications:

- Initial sift - completed by Innovate UK to confirm whether an Application complies with the Innovation Challenge-specific requirements⁷.
- Expert Assessor evaluation – Each Expert Assessor assesses and scores questions 3-8, and 10 of each Application and the accompanying appendices. 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 recommendation – As part of their assessment, each Expert Assessor provides an overall recommendation on whether the Application and Project should be considered for SIF Funding in the Discovery Phase. This decision is made based on an assessment on 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. Applications will be recommended for SIF Funding if they have a majority of Expert Assessors recommending it (two of the three Expert Assessors who assessed an Application), no significant risks are identified which could prevent the Project from progressing, and 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 Project-specific conditions are then considered by Ofgem and finalised with any modifications in each of the successful Projects' Project Direction.

⁷ For more information on the Innovation Challenge-specific requirements please see: <https://www.ofgem.gov.uk/publications/strategic-innovation-fund-round-three-innovation-challenges>

- Final decision – The consolidated recommendations report is provided to Ofgem for consideration on which of the Applications should be considered for SIF Funding in the Round 3 Discovery Phase. Having taken into account the Expert Assessors’ report, the Authority will decide which Projects should receive SIF Funding.

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 Criteria 1: Projects must address the Innovation Challenge set by Ofgem.
3	Innovation justification	Eligibility Criteria 3: Projects must involve network innovation. Eligibility Criteria 5: Projects must be innovative, novel or risky.
4	Benefits Part 1	Eligibility Criteria 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 Criteria 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 Criteria 6: Projects must include participation from a range of stakeholders.
7	Project Plan and milestones	Eligibility Criteria 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 Criteria 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 Criteria 4: Projects must not undermine the development of competitive markets.
10	Value for Money	Eligibility Criteria 7: Projects must provide value for money and be costed competitively.

3 SIF Discovery Phase – [Whole system planning for faster asset rollout]- Summary

This section covers the assessment of Round 3 Discovery Phase Applications received into the '[Innovation Challenge name]' Innovation Challenge⁸.

For the Discovery Phase, twenty-four Applications were submitted to Innovate UK through the Innovation Funding Service (IFS) portal by the closing deadline of 22 November 2023 and are listed below. In order to protect the intellectual property rights (IPR), unsuccessful Projects have been redacted from final published version.

Project reference number	Project name	Funding licensee	Total Project costs (£)	Total Project contribution (£)	Total SIF Funding requested (£)	Expert Assessors Recommended for funding (Yes/No)	Ofgem Recommended for funding (Yes/No)
[REDACTED]							
10102926	BluePrint – Building Industry Collaboration and Methodologies for Developing Offshore Wind Behind Constraint	SHET PLC	167,891	20,801	147,090	Yes	Yes
[REDACTED]							
10104062	Probabilistic Pathways for Energy System Planning	NG ESO LIMITED	168,640	19,096	149,544	Yes	Yes

⁸ <https://www.ofgem.gov.uk/publications/strategic-innovation-fund-round-three-innovation-challenges>

10105122	Nature4Networks (N4N)	SEPD PLC	164,719	16,472	148,247	Yes	Yes
10105126	SeaChange	SEPD PLC	166,035	16,604	149,431	Yes	Yes
1010617	Fractal Flow	NORTHERN POWERGRID (NORTHEAST) LIMITED	163,066	21,417	141,649	Yes	Yes
10106218	UN:LOCK – Unblocking Networks: Local Optimisation, Consumers and Knowledge	SEPD PLC	112,637	11,264	101,373	Yes	Yes
10106524	MaxFlex	SEPD PLC	157,334	20,232	137,102	Yes	Yes
10106669	SANND (Scenario Analysis for Non-Domestic Network Decarbonisation)	NORTHERN POWERGRID (NORTHEAST) LIMITED	167,602	22,771	144,831	Yes	Yes
10098730	Carbon and Hydrogen transportation to SAF production facilities	NGT PLC	131,907	13,200	118,707	Yes	Yes
10098733	HyNTS Maritime	NGT PLC	165,202	15,202	150,000	Yes	Yes
10102277	Road to Power	NGED PLC	157,127	15,898	141,229	Yes	Yes
[REDACTED]							

10103531	HIRE – Hybrid- Network Improvement & Reliability Enhancement	NGET PLC	151,059	15,977	135,082	Yes	Yes
10105057	KnowMyFlex	UKPN PLC	162,518	16,252	146,266	Yes	Yes
10105058	HeatNet	UKPN PLC	164,387	18,871	145,516	Yes	Yes
10105060	Data Mate	UKPN PLC	127,275	12,728	114,547	Yes	Yes
10105061	Wayl-ease	UKPN PLC	122,930	12,293	110,637	Yes	Yes
10105631	Rural Energy And Community Heat (REACH)	NGED (SOUTHWE ST) PLC	159,880	42,885	116,995	Yes	Yes
10106917	CLIP: Community Led Integrated Planning	UKPN PLC	136,919	14,086	122,833	Yes	Yes
10107024	Regional Energy Strategic Modelling (RESM)	NGN LIMITED	124,098	13,572	110,526	Yes	Yes
10107060	Cross Vector Energy Hub	NORTHERN POWERGRI D (NORTHEA ST) LIMITED	131,750	14,445	117,305	Yes	Yes
10107156	Electric Thames	UKPN PLC	144,500	14,450	130,050	Yes	Yes

4 Expert Assessors Recommendations [Whole system planning for faster asset rollout]

4.1.1 10102926, BluePrint - Building Industry Collaboration and Methodologies for Developing Offshore Wind Behind Constraint

Submitted Project description

The Blueprint Project is seeking to identify key risks and uncertainties for the connection of offshore wind farms into currently constrained areas of the GB network, and to devise innovative and collaborative solutions to mitigate those risks.

The solutions of interest include novel, collaborative connection methodologies and approaches to accelerate infrastructure development.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>The Expert Assessors agree that the Project has met all Eligibility Criteria, and that this application is recommended for funding.</p> <p>The application clearly demonstrates how the Project aims to improve the electricity transmission network by addressing a key bottleneck in transmission network constraints and seeking to accelerate the deployment of renewables to constrained network areas through innovative collaborative methods which aim to meet the requirements of the Innovation Challenge. The Project has a clear potential to deliver value to end consumers and the network.</p> <p>The Project has a well-defined delivery strategy with specific responsibilities assigned to consortium members and a well justified and clear Project plan. A concern was raised regarding the lack of sufficient commercial participation in the Project, and it was noted that the Project should engage with commercial stakeholders as well as local government planning stakeholders to support its findings.</p>

Decision from Gas & Electricity Markets Authority
<p>FUND</p> <p>Ofgem agree with the Expert Assessors and approve this Project for funding.</p>

Recommended Project specific conditions

Prior to the completion of the Discovery Phase, the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with Discovery Round 3 Projects HIRE – Hybrid-Network Improvement & Reliability Enhancement and LookNorH2 and considered how the Projects complement each other and provide knowledge sharing opportunities.

Prior to the completion of the Discovery Phase, the Funding Party must provide evidence to the Monitoring Officer of engagement with offshore wind developers and other commercial stakeholders and demonstrate how their requirements will be encompassed into the Project.

4.1.2 10104062, Probabilistic Pathways for Energy System Planning

Submitted Project description

The FSO will be responsible for future whole energy system planning required to achieve net zero at lowest cost to consumers. Planning for an inherently uncertain future is complex and time consuming, significantly benefiting from the ability to quantify risk within planning decisions and analyse more pathways.

This Project will develop an enhanced end-to-end network planning methodology for the whole energy system. We will explore applying advanced computational techniques, such as artificial intelligence and probabilistic modelling, to capture risk and uncertainty within future energy pathways, enable rapid iterative network needs analyses, risk-based network options assessments, and deliver optimised planning decisions.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The Expert Assessors agree that the Project has met all Eligibility Criteria and addresses the aims of the Innovation Challenge through novel and advanced approaches to whole-system modelling.

The Expert Assessors found that the Project addresses a significantly relevant issue for long-term planning of energy system transition, incorporating the enhancement of existing systems in line with the principles of the Innovation Challenge. The Project will aid network reliability, support increased network utilisation and thus support reliability and cost optimisation to consumers.

The Project is considered to have an appropriate group of Project Partners and represent value for money compared to alternative approaches outlined, although the balance of costs between Project Partners and assets could have been better justified. In addition, the focus on only one of

the three Transmission Operators could lead to additional work to consult and involve the other two companies to achieve the levels of confidence required to pursue the Project beyond Discovery Phase.

The Expert Assessors agree that the Project application demonstrates a solid methodology and that the proposed Project management suggests timely delivery, however one Expert Assessor notes that the distinction between milestones and deliverables in the Gantt chart is unclear and could be improved.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase, the Funding Party must provide evidence to the Monitoring Officer of engagement with the other Transmission Operators to understand how this innovation will interact with them to support wider scale up of the innovation into business as usual.

[4.1.3 10105122, Nature4Networks \(N4N\)](#)

Submitted Project description

Our electricity network is exposed to the increasingly unpredictable and severe impacts brought about by climate change, like flooding and extreme heat. Typically, hard engineering solutions have been used to protect assets from problems such as flood risk. Whilst these are undeniably effective for their primary purpose, they offer no additional benefits and the materials used in their construction is extremely carbon intensive.

However, nature provides us with other options and approaches which are effective, and provide climate, biodiversity, social, and well-being benefits. Nature4Networks with GHG, Frontier Economic and SSEN will explore using nature-based solutions to safeguard our electricity networks.

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The majority of Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Project is considered to meet the aims of the Innovation Challenge by using digital modelling techniques to identify nature-based solutions for improving delivery of network resilience, a core network responsibility.

The Expert Assessors agree that the Project will deliver environmental and social benefits, having the potential to address network and consumer costs, as well as the carbon impact of networks. In addition, the expected key outputs of the Project have been described and align with the objectives of the Innovation Challenge.

Overall, the Expert Assessors agreed that the Project has a robust methodology and clear Project plan which gives confidence that it can deliver the outcomes proposed. The Expert Assessors considered that more detailed information on dissemination and engagement with stakeholders involved in environmental protection would have improved the proposal.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the start of the Discovery Phase, the Funding Party must provide an updated Stakeholder Engagement and dissemination strategy to the Monitoring Officer identifying any stakeholders (for example, Sniffer Scotland who has expertise in Nature Based Solutions), who the Project may benefit. An updated plan must be provided to the Monitoring Officer detailing any potential benefits of a strategy e.g. engaging with local communities, local authorities and environmental organisations.

4.1.4 10105126, SeaChange

Submitted Project description

The UK's target of achieving zero-emissions shipping by 2050 is driving a substantial surge in national electrical demand. The maritime sector is notably complex with extreme diversity across ports and their users.

'SeaChange' is a Project with EMEC, PNDC, Ricardo and Scottish and Southern Electricity Networks Distribution which will develop a replicable, port-level investment model to explore transition scenarios.

This model will not only be used to help identify key network investment requirements, but also to inform and enable ports and their users to plot their most viable decarbonisation pathways.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

All Expert Assessors agree that the Project has met all Eligibility Criteria, and that this application is recommended for funding. The Expert Assessors agree that grid capacity is a significant issue for decarbonisation of shipping and the Project has identified an important gap in current net zero analysis.

The Project clearly addresses the Innovation Challenge because it is considering the zero-carbon transition of ports, which have not traditionally been considered by DNOs. It is deemed that the Project has the potential to influence key stakeholders in the development of infrastructure required to meet net zero for ports and harbours.

One Expert Assessor raised concerns about stakeholder engagement and methodology. It was noted that the consortium would be stronger if they had brought in a trade association or one of the larger multi-site owners/operators who could provide a richer dataset and perspectives from another part of the port sector. In addition, some work would be required to assure that the methodology can address the stated outcomes.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase, the Funding Party must provide evidence to the Monitoring Officer that it has considered the linkages with other Discovery Round 3 Projects (HyNTS Maritime and Electric Thames) and understands the duplication risk or knowledge sharing opportunities with this Project.

Prior to the start of the Discovery Phase, the Funding Party must provide an updated Stakeholder Engagement strategy to the Monitoring Officer identifying any stakeholders beyond the core areas (e.g. cargo sector, freeports).

4.1.5 10106177, Fractal Flow

Submitted Project description

DNOs require an innovative solution to accelerate net zero targets due to physical capacity constraints. A current solution to address this issue is via Active Network Management. However, information constraints and conflicting requirements can inhibit its adoption.

We will develop a tool which provides clear visibility of fractal network power flow, via a centralised vendor agnostic system to bind data-streams to a virtual network structure, while bridging various communication protocols.

This system will help unlock additional capacity by providing clearer status visibility and explore integration of powerful machine learning analysis and targeted data exchange across a Grid Supply Points (GSPs).

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>The majority of the Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Project is aligned with the Innovation Challenge because it proposes to leverage data, digital tools, and novel commercial arrangements to maximise existing network capacity.</p> <p>The Expert Assessors agree that the Project could provide net benefit saving in respect of the reinforcement of the electricity network and that the solution could provide easier access to flexibility services. However, one Expert Assessor notes that the net benefit to network customers should be quantified. The proposal would have been strengthened by stating why the data science approach taken by the Project differs from the similar tools cited.</p> <p>The Expert Assessors agree that the Project provides a robust methodology, and the plan is clearly presented. They also agree that the proposed team is appropriate for the Project as presented and the key individuals identified have the necessary skills and experience. However, there are some concerns on availability of required data, clarity on the methodology and lack of quantification around the level of innovation, which will be key for successful delivery of the Project. The Expert Assessors also considered that more explanation on future ownership and maintenance of the software was needed.</p> <p>One Expert Assessor noted that the Project would benefit from engagement with other DNOs to ensure that all 'boundary-flows' issues are identified, and not just those impacting on the current</p>

Project Team. Expert Assessors also noted that the application lacks analysis to demonstrate its value for money and competitive costing, particularly regarding the consultancy partner's rates.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

1. Prior to the start of the Discovery Phase, the Funding Party must provide the Monitoring Officer with an updated Stakeholder Engagement plan, identifying an approach to engage with other DNOs.
2. Prior to the end of the Discovery Phase, the Funding Party must provide the Monitoring Officer with an outline of how the data integration tools and machine learning have been used within the Project – this must include how the use is innovative.

4.1.6 10106218, UN:LOCK – Unblocking Networks: Local Optimisation, Consumers and Knowledge

Submitted Project description

In some areas of Great Britain, high penetration of distribution connected generation is causing network constraints that are blocking the connection of more renewable power. Traditional network reinforcement typically has a long lead time and these delays are slowing the decarbonisation of the country’s energy system.

Project UN:LOCK will explore novel market-based solutions to create capacity in constrained areas of network and allow the connection of additional generation, whilst the long-term network reinforcements are being delivered. This will create additional local economic benefit for both generators and consumers as well as accelerating progress to a net zero society.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>All Expert Assessors agree that the Project has met all Eligibility Criteria, and that this application is recommended for funding.</p> <p>The Expert Assessors agree that the Project addresses the Innovation Challenge and would provide a sensible approach to develop solutions to overcome network constraints in a specific area (Isle of Wight) that is potentially replicable across GB. However, it is noted that it could be beneficial to expand on the differences and innovations for this Project over other studies covering the same topic. The Project has identified potential to deliver a net benefit to electricity consumers through enabling more generation to connect to the grid in the Isle of Wight where there is relatively strong solar radiation. In addition, the proposed approach is sufficiently detailed and provides confidence that the Project could be delivered within the timeframes required.</p> <p>The Expert Assessors agree that the Project is well-presented, demonstrating potential network benefits, value for money and a strong team. However, the Expert Assessors note that a higher level of clarity on these aspects within the Discovery Phase will be beneficial.</p>

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Before the end of the Discovery Phase, the Funding Party must provide the Monitoring Officer with evidence of how the stakeholder and tool development processes combined, and how the learning from this environment will apply to the wider GB system.

4.1.7 10106524, MaxFlex

Submitted Project description

To maximise flexibility on electricity networks we need to know about two key facilitators: _

- Firstly, the potential for flexibility from properties
- Secondly, the potential for connection to electricity networks

Without these, operators will struggle with network planning and flexibility procurement. This could increase costs and lead to expensive demand balancing solutions; especially where local authority, industrial and commercial buildings are concerned.

MaxFlex proposes to complement existing work assessing domestic flexibility by creating Energy Flexibility Certificates; for industrial, commercial, and local authority buildings. Adding electricity network capabilities, connection arrangements, and market opportunities should reduce bills and create more efficient electricity networks.

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The Expert Assessors agree that the Project has met all Eligibility Criteria, and that this application is recommended for funding. The Project meets the aims of the Innovation Challenge by offering novel new information and facilitating whole system network planning and development through new energy flexibility certificate information. The Expert Assessors agree that the Project addresses the challenge of effectively accessing property level flexibility and that the use of energy flexibility certificates is a practical way to engage relevant customers.

The Expert Assessors agree that the Project has identified benefits to deliver net zero to consumers because of the focus on flexibility in the system, and that the benefits include cost and emission reduction potential.

The Project is well presented throughout the application, demonstrating alignment with the Innovation Challenge and wider SIF objectives, as well as having a strong team in place who possess both academic and practical skillsets. In addition, the Project plan is clear which gives confidence that it will be capable of progressing in a timely manner.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase, the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with relevant studies and Projects OptiHeat and understands the duplication risk or knowledge sharing opportunity of the scope of this Project.

Prior to the start of the Discovery Phase, the Funding Party must present to the Monitoring Officer an updated stakeholder engagement plan, showing key stakeholders and focussing on ensuring earlier engagement.

4.1.8 10106669, SANND (Scenario Analysis for Non-Domestic Network Decarbonisation)

Submitted Project description

Scenario Analysis for Non-domestic Network Decarbonisation (SANND) will be a software tool to visually display forecast scenarios of additional demand on electricity distribution networks at different time points based on bottom-up modelling. It will model the propensity for individual large energy users to take different decarbonisation routes and build into a whole network model.

This tool would facilitate network planners understanding of probable future network needs (how much demand, where and when) allowing network planners to pre-emptively plan network infrastructure upgrades / flexibility to ensure the network is ready to cost effectively support each customers decarbonisation journey.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>The majority of the Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Project is considered to have met the aims of the Innovation Challenge as it addresses digital simulation and advanced modelling techniques to facilitate whole systems planning and development. The Project approach is built on previous public and network innovation-funded Projects to deliver tangible benefits to the customers.</p> <p>The majority of the Expert Assessors agree that the Project addresses an area that is likely to be beneficial and the outputs would be useful for improved network planning. However, one Expert Assessor raised a concern that the Project did not present a clear view, or potential quantification through metrics, of the benefit that could arise.</p> <p>Overall, the Project has a robust methodology, a clear description of the delivery of the four Work Packages and a capable team that is relevant to the Project aims with knowledge from previous Projects. However, it was noted that the Project lacked some clarity on the range of stakeholders beyond the advisory group.</p>

Decision from Gas & Electricity Markets Authority
<p>FUND</p> <p>Ofgem agree with the majority of Expert Assessors and approve this Project for funding.</p>

Recommended Project specific conditions

Prior to the start of the Discovery Phase, the Funding Party must provide the Monitoring Officer with an updated Stakeholder Engagement strategy to demonstrate that the learnings of this work will be shared sufficiently and that the views of potential users of this tool are appropriately considered in its development.

End at the Discovery Phase meeting, the Funding Party must provide the Monitoring Officer with an outline on how the Project will draw out and articulate consumer benefits.

4.1.9 10098730, Carbon and Hydrogen transportation to SAF production facilities

Submitted Project description

The aviation industry is responsible for around 8% of the UK's carbon emissions. Sustainable Aviation Fuel (SAF) has the potential to reduce lifecycle CO2 emissions by 70% compared to conventional jet fuel.

National Gas are developing UK wide hydrogen and carbon dioxide backbones to enable wide-scale hydrogen uptake and carbon capture and storage. Hydrogen and carbon dioxide are both feedstocks for the Power-to-liquid (PtL) process for producing SAF and other sustainable liquid fuels.

This Project will explore how hydrogen and carbon networks could support UK Sustainable Aviation Fuel (SAF) production and accelerate the aviation industry in moving towards Net Zero injection. Using waste energy/gases from industry and excess renewable electricity, to produce chemical hydrides, helping deliver Britain's net zero commitments by 2050.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A

5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A
7: Projects must provide value for money and be costed competitively.	Met	N/A
8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met	N/A

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>The Expert Assessors agree that the Project has met the Eligibility Criteria and that this application is recommended for funding. The Project application is well thought through and well-presented across all aspects, addressing the aims of the Innovation Challenge as it will bring together key stakeholders from gas and aviation sectors to enable improved system planning and asset development towards SAF production.</p> <p>The Expert Assessors agree that the Project identifies a clear benefit to gas consumers as it has the potential to deliver CO2 emissions savings in the aviation sector and, ultimately, cost savings to gas consumers. One Expert Assessor noted that valuable information was expected to be obtained during the Discovery Phase. However, it was raised that there were some inconsistencies across units used for CO2 emissions and potential savings values.</p> <p>The Project is considered to have a robust methodology and a comprehensive team to deliver the Discovery Phase Project. The Expert Assessors agree that the Project demonstrates good value for money and provides justification of the need for the Project. It was also suggested there should be a higher funding contribution from the Project Partners in future rounds.</p>

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the start of the Discovery Phase, the Funding Party must provide the Monitoring Officer with an updated methodology outlining the unit calculations used in the quoted CO2 emissions and potential savings values.

Prior to the start of the Discovery Phase, the Funding Party must provide the Monitoring Officer with an updated Project plan to clarify the role of all team members and potential stakeholders. This should include more information on the allocation of Project team members to the various work packages.

Prior to the completion of the Discovery Phase, the Funding Party must provide the Monitoring Officer detailed understanding on negative impacts and alternative options of the Project.

4.1.10 10098733, HyNTS Maritime

Submitted Project description

This Project will determine how the National Transmission System (NTS) could support UK maritime ports in providing links to large scale hydrogen infrastructure across the UK. The Project will consider export and import of hydrogen through UK ports, in addition to potential maritime infrastructure decarbonisation.

We will be looking to consider the technical requirements for links between ammonia cracking facilities for imported hydrogen to enable access to users across the UK. Whilst also considering how hydrogen can be moved from UK production facilities to ports for use either directly, or for Export via hydrogen carriers such as ammonia/LOHCs.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The Expert Assessors agree that the Project has met the Eligibility Criteria and is recommended for funding. The Project is considered to address the Innovation Challenge because it has potential to inform improved system capability across networks, hence fast track and leverage existing assets and resources towards maritime H2 opportunities and needs.

The Expert Assessors agree that the Project could provide a net environmental and expected financial benefit to gas consumers because it has the potential to deliver a faster and defined transition to hydrogen adoption via UK ports and the maritime industry. The Project will provide a positive contribution to network knowledge as it has strong innovation elements and considers innovation in the field of hydrogen networks. One Expert Assessor suggested that more explicit engagement with UK and global ports, maritime transport companies and related technology developments might enhance the Project outcome and ensure greater efficiency of learning and benchmarking. It was unclear whether this would be included within the engagement described with the 'Advisory Council' in the proposal.

The Expert Assessors agree that the Project has a strong consortium and a robust methodology which is capable of being delivered in a timely manner, but a wider perspective of technology providers would benefit the Project.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase, the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with other Discovery Round 3 Projects (SeaChange and Electric Thames) and understands the duplication risk or knowledge sharing opportunity of the scope of this Project.

Prior to the start of the Discovery Phase, the Funding Party must provide an updated Stakeholder Engagement strategy to the Monitoring Officer, to identify stakeholders beyond the core areas (e.g. cargo sector, freeports).

4.1.11 10102277, Road to Power

Submitted Project description

The street and road works sector faces a pivotal transition to net zero by 2030, decarbonising 7.8TWh of energy demand across 700,000 major works, annually. The challenges presented by this transition are uncertain and unique; the energy demands are high, temporary, non-static and have inflexible charging times.

Road to Power will forecast future consumption and consider the infrastructural needs for this transformation. In Discovery, it will specify tools to facilitate obtaining temporary grid connections and predicting the infrastructural impact of works. Additionally, it will investigate alternative methods for providing temporary grid connections.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The Expert Assessors agree that the Project has met the Eligibility Criteria and is recommended for funding. The Project is considered to address the Innovation Challenge as it aims to model demand in street and road works to deliver overall cost reduction and support the decarbonisation of an important emitting sector.

The Expert Assessors agree that the Project clearly identifies potential to deliver a net benefit to gas or electricity consumers as it aims to provide cost-effective solutions and has the potential to impact on wider network development in a way which could reduce costs for the consumer base. However, one Expert Assessor noted that whilst the descriptions are understood, quantification of the cost and carbon would have been more beneficial than the statements provided in the application.

The Expert Assessors agree that the Project showcases a robust methodology with clear milestones and a phased development plan, a strong team and diverse stakeholder engagement.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the start of the Discovery Phase, the Funding Party must provide an updated Stakeholder Engagement strategy to the Monitoring Officer and provide a summary of suitable technical developers that should be engaged with.

Prior to the start of the Discovery Phase, the Funding Party must provide, to the Monitoring Officer, an updated risk register with additional detail on the specific risks and associated mitigation strategies.

Upon completion of the Discovery Phase, the Funding Party must identify quantifiable metrics for claimed benefits, such as end-user cost savings and present findings in the End of Phase monitoring meeting and provide to the Monitoring Officer.

4.1.12 10103531, HIRE – Hybrid-Network Improvement & Reliability
Enhancement

Submitted Project description

Offshore wind energy is pivotal for the UK’s net zero grid ambitions, increasingly, cable failures pose financial and reliability challenges for new and existing Projects.

New, innovative condition monitoring can improve the commissioning and operation of offshore cables to mitigate the risk of failure and overcome the limitations of existing techniques (e.g. maximum cable length).

In this Project, we will research state-of-the-art monitoring techniques, including for temperature, vibration and integrity of electrical insulation. The aim is to create an integrated monitoring system, aiding network operators in decision-making for a more flexible grid and robust commissioning practices.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>The majority of the Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Project objectives are clear and well aligned to the Innovation Challenge, looking to assess which DC cable monitoring is best for both assessing faults at deployment of the cable and for long-term condition monitoring.</p> <p>The Expert Assessors agreed that the potential benefits in relation to HVDC cables are clearly described and are supported by examples of previous cost impacts caused by cable unreliability. It was noted that these benefits would be significant and would apply to both operators and consumers. One Expert Assessor raised concerns that the methodology did not consider array cables in sufficient detail to show evidence of benefits in this area.</p> <p>The Project offers good value for money and strategic relevance through lowering the operational costs of network infrastructure for offshore wind farms. The Project also has a strong consortium and a robust methodology which gives confidence that it will be capable of progressing in a timely manner. However, it was noted that the specifics around how each of the Work Packages will be delivered was not described, and that it would have been helpful to have more granularity of the specific technical milestones of each Work Package, as well as how they inter-relate.</p>

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the start of the Discovery Phase the Funding Party must provide an updated Project plan to the Monitoring Officer to clearly define the Work Packages and key deliverables within the proposed timescales.

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with Discovery Round 3 Projects (BluePrint and LookNorthH2) and understands the duplication risk or knowledge sharing opportunity of the scope of this Project.

4.1.13 10105057, KnowMyFlex

Submitted Project description

Energy flexibility is essential to transforming to a Net zero energy system. For customers adopting low carbon technologies, smart management of these flexible assets will empower them to use less energy, reduce bills, and make the most of low carbon energy.

KnowMyFlex proposes to create Energy Flexibility Certificates, similar to EPC ratings, to provide a centralised view of the existing and future flexibility potential of homes and buildings, to help customers engage with flexibility to reduce their bills; support market participants in developing propositions; and enable system operators to better forecast, plan, and operate the energy system, reducing costs for all.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The Expert Assessors agree that the Project has met the Eligibility Criteria and that this application is recommended for funding. The Project is considered to address the aims of the Innovation Challenge as it seeks to improve coordination, modelling and planning capability across networks to support holistic and timely system development. The Expert Assessors agreed that the Project has a robust methodology and innovative concept aimed at helping build market visibility of flexibility capability and hence support whole system solutions.

The Expert Assessors agreed that the Project offers clear customer benefits in terms of cost saving and resilience. It was noted that the benefits to customers could be high if the Project is well communicated. The Expert Assessors agree that the Project is well-defined and scoped for a Discovery Phase Project. In addition, the key outputs for the Project align to the challenges set out in the SIF objectives.

The Expert Assessors also agree that the proposed approach reflects value for money, a highly experienced team and is capable of progressing in a timely manner. However, one Expert Assessor noted that the value for money arguments could have been stronger, especially around the high consultancy rates proposed.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the start of the Discovery Phase the Funding Party must provide an outline to the Monitoring Officer with detail on the proposed customer engagement to ensure that end users are able to understand the benefits of engaging in effective and safe operation of the future electricity grid.

4.1.14 10105058, HeatNet

Submitted Project description

Heat pumps are key technology for decarbonising the UK's building stock, but widespread deployment will have significant impacts on local electricity networks.

HeatNet aims to demonstrate how the coordination of heat pump operation using advanced optimisation algorithms can help address network operators' challenges. Our aim is to develop an independent service offering to networks to accelerate the electrification of heat through new strategies that improve voltage quality and network reliability.

The Project will develop novel machine learning tools to manage power loads from heat pumps and help regulate voltage-drops at the grid-edge while making sure our customers can keep warm.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The majority of the Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Expert Assessors agree that the Project addresses the Innovation Challenge as it would lead to a better understanding of voltage drops caused by the deployment of heat-pumps. The Expert Assessors considered the Project to take a novel approach to aggregating and moderating energy demands from heat pumps to maximise the use of the existing LV network.

The Project offers a net benefit to electricity consumers through clear potential cost savings from managing voltage reduction. However, one Expert Assessor noted that the evidence around this needs to be much better developed during the Discovery Phase.

The Expert Assessors agree that the Project has a robust methodology, an equipped team and a Project plan that is well thought through. However, the Expert Assessors noted that, although the Project is a lower TRL type Project, the application could have been clearer on the evidence of

potential benefits and on future commercial arrangements to ensure it does not undermine competitive markets.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the start of the Discovery Phase the Funding Party must provide to the Monitoring Officer an updated Stakeholder Engagement plan to consider the wider involvement of additional stakeholders (e.g. experts on long range weather forecasting).

Prior to the completion of the Discovery Phase, the Funding Party must outline how the control of heat-pumps would take place from standpoints such as behaviour change, governance, and incentives and present to the Monitoring Officer.

At the End of Phase monitoring meeting for the Discovery Phase, the Funding Party must present an outline, to the Monitoring Officer, of the scale of the potential benefits to network customers from this Project.

4.1.15 10105060, Data Mate

Submitted Project description

As more Low Carbon Technologies ('LCT') connect to the network, UKPN have seen a rise in voltage complaints from customers due to voltage limits of the LCT equipment being triggered.

Immediate data is not available to UKPN to sufficiently conduct a root-cause analysis, impacting the ability to provide conclusive and quick response to issues. However, this detailed data is available from customers' own LCTs.

DataMate aims to better understand LCTs voltage impact on the network by developing a partnership ecosystem and open data framework with LCT operators. Through crowdsourcing voltage data, DataMate will enable proactive response from electricity networks and improve customer experience.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
FUND
<p>The majority of the Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Expert Assessors agree that the Project addresses the aims of the Innovation Challenge and is a highly innovative possible solution to network problems arising from deployment of low carbon technologies.</p> <p>The Project is considered to offer a clearly identified potential to deliver a net benefit to electricity consumers because of greater efficiency in the management of consumer connections by the DNO.</p> <p>The Expert Assessors agree that the Project team has strong expertise and experience which should ensure the Project’s successful delivery. In addition, the Project application was considered well put together, although a greater quantification and clarification on predicted benefits at this stage would have strengthened the application. The Project plan was considered very detailed and clear, and the Projects partners were considered credible, although one Expert Assessor noted the proposed rates for Sia Partners were high.</p>

Decision from Gas & Electricity Markets Authority
FUND
Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

1. Prior to the start of the Discovery Phase the Funding Party must provide evidence and certainty to the Monitoring Officer that the use of Crowdsourc does not have any legal implications for sharing data.
3. Prior to the competition of the Discovery Phase the Funding Party must present, to the Monitoring Officer, a summary of the impact of harmonics arising from certain Low Carbon Technologies on the network operation.

4.1.16 10105061, Wayl-ease

Submitted Project description

Gaining consent from public and private landowners to dig up their ground and install network equipment presents a huge challenge to network operators. When a customer wants to connect to our network or operational works are required, delays in securing consent from landowners is a blocker, causing frustration to all.

Wayl-ease seeks to create a transparent, but secure, external-facing record of consents and link network operators and landowners via an online engagement and digital payment platform. By automating manual processes and giving customers visibility of the consent progress, Wayl-ease will facilitate improved planning, faster network transformation and more informed customers.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding.

The Expert Assessors agreed that the Project addresses the aims of the Innovation Challenge because it could facilitate faster and cheaper network transformation and asset rollout by innovating to a digital solution for wayleaves. However, there was some concern that this may focus on business-as-usual process improvements rather than potential innovations.

The Expert Assessors agree that the Project identifies and has quantifiable metrics to account for net benefits to electricity consumers, landowners (also consumers) and the networks. The benefits come through efficiencies and accelerated access to the necessary infrastructure upgrades to permit new or upgraded connections. The Project focuses on an area of significant relevance and impact to landowners, the networks and consumers. One Expert Assessor noted that it may be worth considering other utilities that face a similar wayleave issue.

The Expert Assessors noted some minor issues with the justifications in the proposal due to insufficient supporting evidence, however it was noted the Project is overall well-presented and deemed suitable for the Discovery Phase.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to completion of the Discovery Phase the Funding Party must clearly define and present, to the Monitoring Officer, the aspects of Wayleave Management that are innovative compared to existing practices and the aspects that can be dealt with under business-as-usual activities to demonstrate the additional benefits that are valued by customers and landowners.

4.1.17 10105631, Rural Energy And Community Heat (REACH)

Submitted Project description

Rural Energy and Community Heat (REACH) will work closely with rural community energy groups to learn what their decarbonisation priorities are and develop a modular rural energy centre that can accelerate their decarbonisation.

The solution can offer communities shared low carbon heating, rapid EV charging, and renewable generation in an area where commercial markets may not serve customers and where the electricity network has limited capacity.

Working closely with community energy groups, NGED connections, and innovative suppliers, the Project will evaluate the feasibility of a novel way to help customers make cost effective decarbonisation plans coordinated with wider development plans.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>The majority of the Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Expert Assessors agree that the Project clearly addresses the Innovation Challenge as it demonstrates ways to facilitate faster and cheaper network transformation and asset rollout to support rural electric heat and transport ambitions.</p> <p>The Expert Assessors agree that the Project has a clearly identified potential to deliver a net benefit to electricity consumers because it provides a comprehensive list of benefits and supports this by engaging with customers to validate these.</p> <p>The Expert Assessors agree that the Project team is well equipped, although one Expert Assessor noted that it was unclear whether the Project team will work well together, as insufficient evidence is presented of their previous joint undertakings.</p> <p>Overall, the Project is deemed well-presented throughout the application, with a thorough Project plan that includes Project Partners experienced in managing DNO Projects. However, the Expert Assessors note some gaps within the proposal, with the need for greater clarity around the commercial viability of the Project and transparency within the Project. One Expert Assessor also noted that the application lacked specificity in describing the outputs and the dissemination as well as unclear messaging for the community interest and capacity of ownership.</p>

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must present to the Monitoring Officer with recommendations for improvements or innovations in DNO products and solutions to facilitate faster rural connections as well as simple development of modular renewable solutions for rural communities.

4.1.18 10106917, CLIP: Community Led Integrated Planning

Submitted Project description

CLIP is pioneering a community-led Net Zero planning approach for multiple clusters of communities. By using an innovative circular digital planning process, it addresses existing gaps in local area energy planning, enabling collaboration between communities, DNOs, and local authorities to develop unique and tailored decarbonisation plans for communities.

CLIP includes a traffic light system, highlighting the alignment between community readiness and DNO asset planning, underpinned by credible and actionable plans. This forward-thinking approach empowers communities and optimises low carbon solutions to be deployed. It prioritises communities ready to go so networks can ensure capacity is available when needed.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>The Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Expert Assessors noted that the Project has met the aims of the Innovation Challenge by providing an innovative approach to community-led planning.</p> <p>The Project is considered to have the potential to contribute to the acceleration of deployment of distributed generation that communities will support and embrace.</p> <p>It was noted that although the innovation justification was clear, it is less clear where CLIP adds value compared to improving LEAP methodology or existing LEAP tools. One Expert Assessor noted that the Project should ensure it integrates thinking from other community energy planning programmes (e.g. 'CLEP' Community Local Energy Planning framework as developed in Oldham) as well as integrate plans for regional energy planners as part of the programme.</p> <p>The Expert Assessors agree that the Project has a robust set of Project Partners and additional contacts from a clearly experienced team. In addition, the Project management plan and process is considered robust and detailed, with a strong methodology and clear links to outputs.</p> <p>Overall, the Expert Assessors agree that Project is well-presented throughout the application and is deemed appropriate for the Discovery Phase, offering clear financial, network and environmental benefits.</p>

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the start of the Discovery Phase the Funding Party must undertake a mapping exercise to identify a stakeholder engagement plan for less engaged communities as well as outlining any planning process gaps for communities. This must be presented to the Monitoring Officer.

Prior to completion of the Discovery Phase the Funding Party must identify and present to the Monitoring Officer the extent to which CLIP adds value compared to LAEP process, and whether improving the LAEP methodology or existing LAEP tools would better target community need.

Prior to the completion of the Discovery Phase the Funding Party must present an outline to the Monitoring Officer of the scale of additionality that community owned assets and funds would provide above household and network savings as part of this work. It will also be important to highlight any potential inequality issues between communities viewed as "more ready" than others, and how the community approach might support a fairer net zero transition versus more individual LCT uptake approaches.

4.1.19 10107024, Regional Energy Strategic Modelling (RESM)

Submitted Project description

Regional Energy Strategic Modelling (RESM) aims to develop and test a system dynamics tool that could be used by a Regional Energy Strategic Planner (RESP) to deliver socio-economic development of regional decarbonisation pathways across Britain.

The RESM will place vulnerable consumers at the core of its decision-making, whilst establishing a top-down approach to deliver more coordinated local energy planning which is cognisant of the needs of a modern, flexible multi-vector national transmission system.

This first-of-its-kind Project aims to deliver the first regional energy plan for North East England, establishing joined-up thinking between gas, electricity and water distribution networks.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The majority of the Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Expert Assessors agree that the Project addresses an issue that is well aligned to the Innovation Challenge and highly topical with impending creation of the FSO and allocation of the RESP role.

The Project is considered to involve network innovation because it is examining digital simulation and advanced modelling techniques to facilitate whole system network planning and development. However, one Expert Assessor noted that the level of innovation is very minor as it will adopt two existing methods, and the modelling is not risky as RESP does not have to adopt the model recommendations, and consequently this Expert Assessor did not recommend the Project for funding. The Expert Assessors also noted that the description within the application was jargon-heavy and could be improved.

The Expert Assessors agree that the Project has assembled a strong consortium with a good whole system perspective across gas, electricity and water. The Project identifies potential to deliver a net benefit to both gas and electricity consumers through savings in investment in and operation of the networks. Further detail on the value for money of the Project was needed, particularly as One Expert assessor noted the proposed rates for DNV are more than double that of any other partner.

The Expert Assessors also agree that the Project has a robust methodology which gives confidence that the Project will be capable of progressing in a timely manner.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with Round 2 SIF funded Project PRIDE (Planning Regional Infrastructure in a Digital Environment) Planning Regional Infrastructure in a Digital Environment and understands the duplication risk or knowledge sharing opportunity of the scope of this Project.

Prior to the completion of the Discovery Phase the Funding Party must present to the Monitoring Officer an outline of how the Project has made considerations of vulnerable consumers for regional planning.

4.1.20 10107060, Cross Vector Energy Hub

Submitted Project description

This Project will design and implement a Multi-Vector (Gas + Electricity) Energy Hub that optimises devices across a truly whole system solution to increase network resilience, operating efficiency, and hosting capability by coordinating:

- renewable generation,
- battery storage,
- power to gas and gas to power, through a hydrogen electrolyser and peaking plant,
- gas storage,

This builds on the academic theory of Energy Hubs through detailed design and simulation, and when progressed to beta stage, will deliver a solution for holistic whole energy system planning & operation that has been calibrated and validated against a real-world demonstration.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>The majority of the Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Expert Assessors agree that the Project addresses the Innovation Challenge because it seeks to improve coordination, modelling and planning capability across networks. However, one Expert Assessor noted that more detail could be provided on how the Project distinguishes itself from the body of research and current practical trials on coupled power/gas grid dynamics, as this would make the Project’s use case more compelling.</p> <p>The Expert Assessors agree that the Project could deliver a net benefit to consumers from improved planning and flexibility rationalising the electricity and gas distribution systems. However, one Expert Assessor noted that application focuses on the benefits to networks and that the implied benefit to consumers is not quantified and lacks detail.</p> <p>The Expert Assessors agree that the organisations involved are credible, the team is strong, and the technical approach is well described. The Project is considered to demonstrate value for money, although one Expert Assessor noted that the value for money justification lacked clarity.</p> <p>Overall, the Project is considered to have a robust methodology which gives confidence that the Project will progress in a timely manner. In addition, it is considered well written and clear in its intent.</p>

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the start of the Discovery Phase the Funding Party must provide an updated dissemination plan to the Monitoring Officer, to provide more information and clarity on how benefits will be articulated to the consumer.

Prior to the start of the Discovery Phase the Funding Party must provide an updated methodology to the Monitoring Officer, to provide a stakeholder engagement plan for understanding of the coordination between gas and electricity networks as well as ensuring that the Project will engage with sufficient expertise from the gas and/or hydrogen industry.

4.1.21 10107156, Electric Thames

Submitted Project description

Today, the boats, docks, and ports operating on the Thames run mostly on fossil fuels, but this is changing as the river's economy decarbonises in response to climate change. There is limited understanding how this shift will affect the electricity network and that's why we've created the Electric Thames Project.

Working together with multiple stakeholders, we will map out the future of the electricity system around the Thames and explore new technologies such as Boat-to-Grid (B2G) services. The outcomes will shape a whole-system planning framework for our waterways, offering insights for decarbonisation and electrification that can be replicated across GB.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The Expert Assessors agree that the Project has met the Eligibility Criteria, and that this application is recommended for funding. The Expert Assessors agree that the Project is aligned with the Innovation Challenge because it aims to better understand the marine sector impacts on the energy networks from a whole systems basis. The Project is considered to have the potential to make significant contributions to development in the GB of an integrated energy system and maritime decarbonisation plan.

The Expert Assessors agree that the Project could deliver a net benefit to electricity consumers through potential reduction in overall network costs.

The Expert Assessors agree that the Project has a robust methodology and involves a strong consortium well placed to carry out the Project, though one Expert Assessor raised concerns around the risk of the developed plan not being fully implemented by 2030. In addition, although one Expert Assessor notes the level of detail from LCP Delta on the labour costs reflects poorly on the application, overall, the Project is deemed to offer value for money.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer show that it has considered linkages with other Discovery Round 3 in this area (SeaChange and HyNTS Maritime) and understands the duplication risk or knowledge sharing opportunity of the scope of this Project.

Prior to the completion of the Discovery Phase the Funding Party must provide to the Monitoring Officer a detailed assessment of how the potential reduction in overall network costs due to a more coordinated approach to decarbonising the marine sector would be a net benefit to electricity consumers.

5 SIF Discovery Phase – [Novel approaches to deliver a secure power system]- Summary

This section covers the assessment of Round 3 Discovery Phase Applications received into the '[Novel approaches to deliver a secure power system]' Innovation Challenge⁹.

For the Discovery Phase, twenty Applications were submitted to Innovate UK through the Innovation Funding Service (IFS) portal by the closing deadline of 22 November 2023 and are listed below. In order to protect the intellectual property rights (IPR), unsuccessful Projects have been redacted from final published version.

Project reference number	Project name	Funding licensee	Total Project costs (£)	Total Project contribution (£)	Total SIF Funding requested (£)	Expert Assessors Recommended for funding (Yes/No)	Ofgem Recommended for funding (Yes/No)
10101698	REVISE - Revisiting and Evaluating Environmental Inputs on Line Ratings	SHET PLC	£171,297.00	£21,446.00	£149,854.00	Yes	Yes
10102960	SYSMET - SYstem Strength Measurement and EvaluaTion	SHET PLC	£110,914.00	£11,181.00	£99,733.00	Yes	Yes
10102735	Hydrogen Storage in Aquifers	WWU LIMITED	£123,985.00	£12,405.00	£111,580.00	Yes	Yes

⁹ <https://www.ofgem.gov.uk/publications/strategic-innovation-fund-round-three-innovation-challenges>

10103996	Network Security in a Quantum Future	NGET Ltd	£169,857.00	£20,236.00	£149,621.00	Yes	Yes
10105895	LDES NODE	ENW Ltd	£165,968.00	£20,015.00	£145,953.00	Yes	Yes
[REDACTED]							
[REDACTED]							
[REDACTED]							
10104053	Look NorthH2	NGT PLC	£133,329.00	£15,000.00	£118,329.00	Yes	Yes
10104876	EquiFlex	SPEN Ltd	£148,567.00	£14,863.00	£133,704.00	Yes	Yes
[REDACTED]							
10105062	SizeWise	UKPN Ltd	£171,890.00	£25,953.00	£145,937.00	Yes	Yes
10105063	Balancer	UKPN Ltd	£166,175.00	£16,618.00	£149,557.00	Yes	Yes
10105065	CarbonFlex	UKPN Ltd	£152,645.00	£22,918.00	£129,727.00	Yes	Yes
10105067	Flex Direct	UKPN Ltd	£159,135.00	£19,473.00	£139,662.00	No	Yes
10106183	GridLink	NPG Ltd	£149,625.00	£17,700.00	£131,925.00	Yes	Yes
10106405	LV Optimiser - LVOE	SP MANWEB PLC	£162,094.00	£19,958.00	£142,136.00	Yes	Yes
10106474	Fuel Cell Renewable Energy Equity (FREE)	NPG Ltd	£130,157.00	£17,330.00	£112,827.00	Yes	Yes
[REDACTED]							
10107145	Gas Volume for Embedded Electrical	SPG PLC	£137,830.00	£14,000.00	£123,830.00	No	Yes

	Generation Modelling						
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6 Expert Assessors Recommendations [Novel approaches to deliver a secure power system]

6.1.1 10101698, REVISE - Revisiting and Evaluating Environmental Inputs on Line Ratings

Submitted Project description

The primary focus of REVISE is revisiting the current methodology for assigning overhead line ratings. The calculation process uses historical environmental data captured in the 1980s that is applied uniformly across the UK disregarding local/regional climate variations. The existing transmission network is increasingly constrained by system capacity limits exacerbated by rapidly increasing renewable integration.

Improving understanding of line ratings, using latest generation high-resolution weather topographic data combined with the latest techniques for system modelling, will allow for improved targeted investment to ensure we meet demand for the connection of new renewables to the network, securing a safer and greener future.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A

5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A
7: Projects must provide value for money and be costed competitively.	Met	N/A
8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met	N/A

Recommendation to the Gas & Electricity Markets Authority

FUND

All Expert Assessors recommended this Project for funding and agree that the Eligibility Criteria have been met. The Project addresses the Innovation Challenge as it aims to improve processes for assessing the ratings of overhead lines, thus allowing more efficient operation of a net zero power system. However, it was noted by Expert Assessors that more information could have been provided on how this data-driven innovation goes beyond what should be business as usual (BAU) in the sector, or how it will be embedded into BAU.

The Expert Assessors stated that the Project has a clearly identified potential to deliver a net benefit to electricity consumers, as improving the ratings of overhead lines could reduce curtailment of renewable generation, thus reducing both the economic and carbon cost of electricity. There is also scope for these changes to reduce the costs of network reinforcement.

The Project includes a strong team of Project Partners, with the breadth of skills needed to address this problem. It includes the Met Office to ensure that necessary data is available, which is a key resource. In addition, this Project builds from existing processes and standards, and from recent research at University of Strathclyde.

The Project also has a robust methodology which gives confidence that it will be capable of progressing in a timely manner and should deliver value for money to network customers.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to completion of the Discovery Phase the Funding Party must set out robust guidelines to ensure that data from this study is used to enhance competition in any future funding rounds and share with the Monitoring Officer.

Prior to the completion of the Discovery Phase the Funding Party must deliver a clear Stakeholder Engagement plan to the Monitoring Officer to ensure wider participation and dissemination to other energy networks.

6.1.2 10102960, SYSMET - SYstem Strength Measurement and EvaluaTion

Submitted Project description

As the share of inverter-based resources including renewable generation increases, lower system strength can lead to uncontrolled voltage changes which can escalate to instability and risk widescale customer disconnections.

To secure the net zero grid, network operators urgently need to monitor system strength conditions to implement the most effective and economic mitigations. At present, neither the requirements for system strength monitoring nor the possible hardware and digital solutions are well defined.

The SYSMET Project brings together leading experts who will create the pathway to confident implementation of measurement-based tools that provide comprehensive visibility of system strength status for operational decision making.

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

Recommendation to the Gas & Electricity Markets Authority

FUND

All Expert Assessors recommended this Project for funding and agree that the Eligibility Criteria have been met. The Project addresses the aims of the Innovation Challenge as it addresses network stability, to enable more renewable generation to connect to the system.

The Expert Assessors identified the Project has the potential to deliver net benefit through reduced constraints, increased system resilience and increased renewable connections, all optimising network operating costs and reducing consumer bills. Although one Expert Assessor stated that more consideration on the possible impacts on consumers would improve this aspect of the proposal.

The Expert Assessors noted the strong methodology setting out the challenges of network management posed by the proliferation of variable inverter-based resources which, with their lower inherent stability, tend to reduce system strength. The detailed and clear application and planning documentation gives confidence that the Project will be capable of progressing in a timely manner.

The Project includes participation from a range of stakeholders including Transmission and Distribution owners. However, one Expert Assessor stated that more detail on the complementarity of the three transmission partners would strengthen the justification for the size of the consortium.

Decision from Gas & Electricity Markets Authority**FUND**

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

N/A

6.1.3 10102735, Hydrogen Storage in Aquifers

Submitted Project description

Presently large-scale storage of hydrogen in a net zero system is primarily in depleted gas fields. This Project considers the alternative of using aquifer formations.

Aquifers offer countervailing benefits: the aquifer is at pressure at the start of storage use, so the requirement for cushion gas is reduced, and there is no risk of contamination of stored hydrogen with residual methane.

The Project will assess and model the reservoir performance of known geological structures in two locations, to inform developers of hydrogen storage and identify the relative cost and performance of depleted gas fields as compared with aquifers.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

All Expert Assessors recommended this Project for funding and agree that all Eligibility Criteria have been met. The Project meets the aims of the Innovation Challenge as it offers the prospect of increasing the size and availability of large geological storage structures, possibly reserving the depleted gas fields for CO2 sequestration. One Expert Assessor noted that more information on the total aquifer storage relative to the capacities needed, would have enhanced the application.

The Project methodology provides a detailed explanation of their approach, and its novelty. The direct comparison with the currently proposed use of depleted gas fields is compelling and should provide valuable insights. In addition, the use of lab experiments will answer some key technical questions early on, thus providing an early indication of the solution’s feasibility. One Expert Assessor stated that more information on the risk mitigation of the lab experiments should be provided.

A comprehensive Project Team is well placed to implement the Project and promote the results. The Project builds on existing data and analysis of Project participants and early studies undertaken.

The Project provides a clear and complete Project plan and Project management capability. The clear separation of tasks provides confidence in the time has been allocation to bring together the disparate results into a final report. Furthermore, Expert Assessor have suggested a clear pathway for dissemination has been identified, and the participants have good connections to promote the results with key stakeholders and decision makers.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the start of the Discovery Phase the Funding Party must present the Monitoring Officer with an updated risk register outlining the mitigation for potential sub-optimal results from the lab experiments.

Prior to the start of the Discovery Phase the Funding Party must present the Monitoring Officer with a revised budget clarifying why Progressive Energy has costed 'Project management, report writing and partner liaison' twice in its budget.

6.1.4 10103996, Network Security in a Quantum Future

Submitted Project description

The energy system is key to UK critical infrastructure. It must be secure against state actors, organised crime, and other potential threats. Emerging quantum computing technology will open significant new attack vectors against existing cybersecurity.

This Project will investigate the quantum threat to the energy system's cybersecurity, developing a novel assessment framework and a prioritised mitigation approach.

The aim is to ensure that critical energy infrastructure remains secure in a post-quantum era, applying expertise in quantum and cybersecurity to cut through the hype, helping the industry to understand the actual threat and timelines, and enabling mitigation strategies to be developed.

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The majority of the Expert Assessors recommended this Project for funding, and all three Expert Assessors agreed that all Eligibility Criteria have been met. One Expert Assessor did not recommend the Project for funding as they felt it was more suitable for an alternative funding mechanism. The Project addresses a topic of strategic importance and early investment in the area is crucial.

The Project meets the aim of the Innovation Challenge as it targets improved system resilience from cybersecurity threats related to quantum computing. One Expert Assessor noted the Project's case would have been strengthened had a brief synopsis of the state of the art been given as this would have better illustrated the need for the specific innovation.

The Project has identified a potential to deliver a net benefit to energy consumers as it will reduce costs on the network due to cybercrime and reduce direct costs incurred by consumers from outages caused by quantum-enabled cyberbreaches.

The Project includes participation from a sufficient range of stakeholders, but one Expert Assessor noted that efforts should be made to consult directly with other stakeholders such as other market participants. The Project management is well developed and appropriate, with robust milestones and deliverables although one Expert Assessor would have liked more detail in Work Package 1 and 2.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to completion of the Discovery Phase the Funding Party to the Monitoring Officer must outline proactive measures for Critical National Infrastructure which are necessary to maintain high security standards against evolving threats.

6.1.5 10105895, LDES NODE

Submitted Project description

LDES NODE will develop a methodology to inform the optimal locations of Long Duration Energy Storage (LDES) technologies when deployed on electricity distribution network.

With optimal deployment on the electricity distribution network, LDES technologies can assist with alleviating local constraints and maximising the output of renewable generation as well as performing valuable stability and resilience grid services.

The LDES NODE methodology and corresponding mapping tool will provide regional stakeholders with data-driven insights into key locations for LDES installation, allowing co-ordination with broader net zero energy plans.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A
7: Projects must provide value for money and be costed competitively.	Met	N/A

8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met	N/A
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Recommendation to the Gas & Electricity Markets Authority

FUND

All Expert Assessors recommended this Project for funding and agree that the Eligibility Criteria have been met. The Project addresses the Innovation Challenge as it seeks to reduce use of fossil fuel plants to provide system flexibility and balancing services by developing a tool to optimise the placement of long duration storage technologies. However, one Expert Assessor noted that the specific technologies are not identified, and this will have an impact on any benefits of a Distribution versus Transmission network roll-out.

The Project proposes the creation of core innovation that will deliver an analysis methodology and associated tools to map optimal deployment across an electricity distribution network. The Expert Assessors agreed this is innovative as it creates a local framework and novel technologies to meet the local needs and constraints whilst progressing to net zero.

There is a clear Project plan presented with timelines, dependencies and outputs which provides in detail the steps needed to deliver a successful Project. The four Work Packages and their milestones are described in sufficient detail and quality and offer a good methodology. In addition, the Project Partners have the necessary skills and experience to deliver a complex Project.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to completion of the Discovery Phase the Funding Party must present, to the Monitoring Officer, how the findings can be integrated into the Local Area Energy Plans to help enhance planning at a local level.

6.1.6 10104053, Look North2

Submitted Project description

Offshore Energy Hubs (OEH) integrate electricity/hydrogen production offshore between the UK and other European countries. OEHs could stimulate UK offshore wind rollout potential and support the development of a hydrogen economy. Many European TSOs are exploring this concept, but the UK is yet to fully consider this.

The Project will explore potential benefits and associated costs of developing OEHs in the UK, developing scenarios that quantify benefits such as curtailment reduction, grid losses reduction and infrastructure optimisation.

Future phases will explore what commercial models and market designs are needed to integrate OEHs into the whole energy system and with Europe.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>All Expert Assessors recommended this Project for funding and agree that the Eligibility Criteria have been met. The Project addresses the Innovation Challenge as the development of Offshore Energy Hub (OEH) will enable reduction in renewable energy curtailment at GWh scale. The offshore wind energy operators will have the option of utilising the excess renewable energy for hydrogen production instead of been asked to curtail production.</p> <p>While this is expected to lead to a reduction in constraints payments, one Expert Assessor noted that due to lack of clarity and regulation at this stage, it is not certain if the reduction in cost of operating the electricity network will translate into reduction in energy bills for consumers.</p> <p>The Project offers an innovate approach to develop a new market and commercial framework that will govern the development of OEH and integrating that with the European Union -such a framework is not currently in existence. The Project will also produce a cost benefit analysis for the development of OEH which provide useful information for future development.</p>

The Project has a strong consortium and includes representation from major stakeholders in the sector and is well placed to conduct the Project and deliver the expected cost-benefit analysis. However, one Expert Assessor noted that there is a lack of alignment in the Project plan between the time and cost allocation for the Work Packages.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with relevant Discovery Round 3 Projects (HIRE and BluePrint) and understands the duplication risk or knowledge sharing opportunity of the scope of this Project.

Prior to the completion of the Discovery Phase the Funding Party must present to the Monitoring Officer a stakeholder plan to identify additional stakeholders that may enhance the study in any future funding rounds (e.g. consideration of EU stakeholders).

6.1.7 10104876, EquiFlex

Submitted Project description

Increasing flexibility is required in energy networks to manage changing demand and generation patterns. This includes reducing power consumption at system peaks (e.g. winter teatimes); and increasing power consumption at certain times to take advantage of renewable energy availability.

Consumers can benefit from providing flexibility, through payment for providing services to the network. However, currently, access to participation in flexibility markets is limited to the most affluent and engaged consumers.

Equiflex aims to promote equal access to the participation in flexibility markets, ensuring no customers are unfairly left behind and enabling a just transition to Net Zero.

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The Eligibility Criteria have been met and the majority of Expert Assessors recommended this Project for funding. The Project addresses the Innovation Challenge by looking to increase the number of consumers across segments (regional, spatial, income, and other key socio-demographic indicators) participating in markets and reducing their unit cost of energy.

There is a potential to deliver a net benefit to gas and electricity consumers because, by identifying flexibility options that are attractive to the target consumers, it could reduce total network costs and hence charges to consumers. Although one Expert Assessor mentioned that there is existing work in this focus area such as the Centre for Sustainable Energy's Smart and Fair programme as well as existing academic work on flexibility capital, therefore the Project should be mindful to build on this to prevent duplication of efforts.

The Project will investigate the linkages between plans for the development of electricity distribution networks and Local Area Energy Plans (LAEP) and LHEES (Local Heat and Energy Efficiency Strategy) documents developed by local authorities. This should help integrate findings into the development of the RIIO business plans.

The Project Partners contain appropriate experience to identify potential solutions in order to reach out to less affluent and knowledgeable customers to encourage them to offer flexibility services. These customers will need to be engaged to help manage higher levels of renewable electricity and increased peak electricity demand.

The Project benefits have been identified and are considered to be a progression from the previous Network Innovation Allowance Project. The Project has defined sensible metrics that will allow a proper social cost-benefit analysis to see whether cheaper solutions can be found. However, one Expert Assessor highlighted the risk that desk based research might miss out on key information that is only achievable through extensive stakeholder engagement.

The Project methodology gives confidence that it will be capable of progressing in a timely manner, however one Expert Assessor noted that the reliance on Frazer Nash may create a risk of other key stakeholders not engaging properly.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer showing linkages and an understanding of the duplication risk or knowledge sharing opportunity of the scope of this Project against Discovery Round 3 Projects Flex Direct and Carbon Flex.

6.1.8 10105062, SizeWise

Submitted Project description

Propositions for residential batteries are targeted at affluent customers, with large batteries that are expensive. However, no simple tools exist to support customers in choosing the optimal mix of low carbon technologies (LCTs) to suit their needs.

Smaller, cheaper batteries coupled with solar arrays or other LCTs may make for more investable propositions with shorter payback periods. They are also accessible to more customers and more easily integrated into the electricity system.

SizeWise seeks to define the optimum use of batteries with LCTs for different households and develop tools to make it easier and more affordable for customer to engage.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

All Expert Assessors recommended this Project for funding and the majority agree that all Eligibility Criteria have been met. One Expert Assessor considered that the Project did not meet the criteria of providing value for money and being costed competitively as the consulting rates were high.

The Project meets the aims of the Innovation Challenge by investigating the possible wider roll-out of battery solutions, whilst looking at how to increase the adoption of residential battery systems which would help to manage peak demand and stability. It aims to increase the number and range of consumers participating in markets and reducing their unit cost of energy as well as

reducing risks related to integrating home LCTs . One Expert Assessor did note that more clarity could have been provided as to the primary target user of the tool being developed.

The Expert Assessors stated that the Project benefits for customers are discussed comprehensively. Small-scale flexibility could contribute to the future system greatly, but it has always been difficult to implement. This Project could potentially highlight a route to mass rollout of residential-scale battery storage. However, one Expert Assessor noted it was unclear how new data would be generated or how network innovation would be addressed.

The Project Partners and their roles on the Project have been identified. The areas of expertise and the resources the team bring to bear on the Project provide confidence that the right inputs will be available to execute the Project.

The Project plan is clear, concise and effective, with the list of milestones and risks that are appropriate and capable of being delivered in a timely manner. The required resource expertise and associated requirements have been well thought through and understood.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with Discovery Round 3 Project – Balancer – and understands the duplication risk or knowledge sharing opportunity of the scope of this Project.

Prior to the completion of the Discovery Phase the Funding Party must present, to the Monitoring Officer, to the Monitoring Officer how new data would be generated, and how network innovation would be addressed with a solution resulting from the proposed data generation and analysis.

6.1.9 10105063, Balancer

Submitted Project description

Balancer will explore energy equity within the UK's net zero transition by enabling communities to participate in flexibility markets and benefit from emerging low carbon technologies. The main objective of Balancer is trialling innovative business models utilising cutting-edge front-of-the-meter community batteries strategically placed at the grid-edge.

These batteries can offer various services and benefits to both the network and communities they serve; aspects which haven't yet been fully explored. By balancing the battery's functionality into separate parts of automatic grid-support and consumer-oriented functionalities, they can reduce network costs, ensure power quality, and increase network capacity, while delivering wider benefits to customers.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The majority of the Expert Assessors recommended this Project for funding and agreed that the Eligibility Criteria have been met. The Project addresses the Innovation Challenge because it aims to bring advantages of low carbon technologies to consumers who have limited resources through a novel form of network control.

It adopts a novel approach to battery storage solutions, moving it out of the consumers' premises to the network. This should mean the consumer doesn't have to worry about the system and can participate in the flexibility market without too much effort. However, one Expert Assessor raised concerns that the proposal for a co-ownership commercial model with the DNO could restrict competition in provision of these front of meter batteries.

Most of the Expert Assessors stated that the Project represents value for money and is competitively costed with well-planned and costed work packages. The Project has a robust methodology which gives confidence that it will be capable of progressing in a timely manner because the plan presented has been well thought through and the Project Team has experience in the field.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with Discovery Round 3 Project – Sizewise - and understands the duplication risk or knowledge sharing opportunity of the scope of this Project.

Prior to the completion of the Discovery Phase the Funding Party must outline to the Monitoring Officer the potential risks from cyber security attacks on software impacting on network stability.

Prior to the completion of the Discovery Phase the Funding Party must detail outline to the Monitoring Officer the risks and key drivers of the redistribution of wealth between whoever pays for the batteries and who gets to use them.

Prior to the completion of the Discovery Phase the Funding Party must outline to the Monitoring Officer any potential impacts on competitive markets in battery storage and flexibility.

6.1.10 10105065, CarbonFlex

Submitted Project description

CarbonFlex will demonstrate how socially-inclusive demand-side flexibility can be used to support a net zero secure urban energy system, enabling surrounding communities to electrify and decarbonise quickly, cost-efficiently and equitably.

'Carbon flexing' algorithms will be coupled with smart controls to match electric residential space and hot water heating demand in multi-occupancy buildings with periods of low carbon electricity and an expected high network flexibility demand. We will engage with landlords and tenants to co-design a carbon flexing service that delivers value to low-income households whilst cultivating a dynamic resource for DSOs to manage local grid congestion.

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

Recommendation to the Gas & Electricity Markets Authority
FUND
All Expert Assessors recommended this Project for funding and agreed that the Eligibility Criteria have been met. The Project addresses the Innovation Challenge because it has potential to increase the number of consumers across segments (regional, spatial, income, and other key socio-demographic indicators) participating in markets and reducing their unit cost of energy.

The Expert Assessors agreed that the potential benefits of this Project accrue to both the energy network and vulnerable customers. The Project proposes an innovation with the right Project Partners to address that challenge. If successful, it could be scaled elsewhere in London and across GB. However, one Expert Assessor raised a concern that there was no mention of mitigation for consumer protection to ensure any tenants will not be in a financially worse position.

The Expert Assessors stated that the Project methodology gives confidence that it will be capable of progressing in a timely manner because the milestones and deliverables are well defined and previous experience and activity have established a solid platform for the work and Project Partners.

The Project Team that will be delivering this Project not only has the capability for innovation but also possesses distribution channels to obtain realistic feedback from the market and distribute the future product.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must outline to the Monitoring Officer the direct financial benefits to the consumers as well as reducing carbon externalities for wider system benefits. This response should include how reduction of carbon is expected to deliver delivering real energy bill reductions for the social housing tenants.

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer showing linkages and showing an understanding of the duplication risk or knowledge sharing opportunity of the scope of this Project against Discovery Round 3 Projects – Flex Direct and EquiFlex.

6.1.11 10105067, Flex Direct

Submitted Project description

Procuring flexibility through energy efficiency upgrades being rolled out by Local Authorities and Social Housing Providers, such as home insulation and storage heating, offers a significant opportunity for Distribution System Operators (DSOs) to enable disadvantaged customers to participate and benefit from new energy markets. Flex Direct aims to transform the way this type of flexibility is procured by DSOs.

The Project will develop novel commercial models and coordinated market approaches to enable Local Authorities and Social Housing Providers to operate as flexibility aggregators in direct contract with DSOs. This will incentivise use of energy efficiency in flexibility markets and facilitate participation of 'hard-to-reach' customers at scale.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

7: Projects must provide value for money and be costed competitively.	Met	N/A
8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Not Met	The application lacked detail in the overall project management strategy and methodology particularly in the risk register.

Recommendation to the Gas & Electricity Markets Authority

DO NOT FUND

The majority of Expert Assessors did not recommend this Project for funding because concerns were raised around the impacts on housing tenants, networks and markets - in addition to potential overlaps with other Projects such as EquiFlex and CarbonFlex. One Expert Assessor raised concerns that that this has the potential to lead to excessively risky behaviour by Local Authorities – e.g. the concept of cutting flex providers out of part of the market and engaging Local Authorities and housing providers directly could raise significant policy and regulatory questions. The Expert Assessors also noted that creating another layer of revenue streams in an already complex market context might weaken other emergent markets and undermine the bankability of other parts of the flex market or increase perceived risk and cost.

However all Expert Assessors agreed that the Project addresses the Innovation Challenge because there is potential to enable disadvantaged consumer segments to participate in flexibility markets and benefit from novel low carbon technologies.

This Project builds on existing work from Socially Green which has identified additional need for targeted innovation support. The benefits to the consumers are clear, as are the benefits to DNOs. The Project identifies the three core challenges preventing conventional flexibility aggregators, particularly those representing vulnerable customers, from accessing the DSO flexibility auctions. One Expert Assessor considered the problem statement would have been improved by being validated through a user-centric or consultative development process.

However, the Expert Assessors noted the methodology behind the potential benefits relies on the assumption of the availability of public funding, which may not be in place past 2025. The application also did not address assessment of the wider consumer impacts of schemes of this type and associated issues like rebound effects therefore did not recommend for funding.

The majority of Expert Assessors did not think the Project methodology was well thought through and therefore capable of progressing in a timely manner. Whilst the work packages were deemed adequate, and responsibilities between Project Partners are clearly delineated the overall project management strategy and methodology lacked detail. In addition, improvements could have been made to the risk register to include extra detail, particularly regarding managerial and commercial risks, and there's confusion regarding risk impact classifications.

The Project Partners represent a cross-section of necessary stakeholders for delivery at this stage. Additionally, the consultation which will be undertaken by CSE and the validation which will be undertaken by Sia Partners provides further engagement and outreach to the stakeholders most challenged by the current business as usual processes. One Expert Assessor noted concerns that the balance of costs amongst Project Partners does not seem to be equal and some of the Project Partners bear significantly more weight than others, calling into question the participation of some of them.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem disagrees with the Expert Assessors and has approved funding for this project. Ofgem acknowledges the valid concerns raised by the Expert Assessors regarding the lack of detail and has added a specific condition to reflect this. Ofgem expects the Project during the Discovery Phase to address these concerns relating to the financial risks for local authorities, the wider impact on aggregators and the flex market and the wider consumer impacts. Therefore, Ofgem has considered the Project worthy of further exploration at feasibility level.

Recommended Project specific conditions

Prior to the start of the Discovery Phase the Funding Party must present an updated Project plan to the Monitoring Officer assessing impacts on housing tenants, networks and markets.

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer to show linkages and to understand the duplication risk or knowledge sharing opportunity of the scope of this Project against Discovery Round 3 Project – EquiFlex and CarbonFlex.

6.1.12 10106183, GridLink

Submitted Project description

GridLINK seeks to demonstrate the use of a Digital Support System (DSS) to optimise the placement and network running arrangements of smart switches which dynamically link multiple LV feeders at multiple points on the LV network. The DSS will determine the running arrangement and placement based on number of network scenarios such as enabling more connections, improving access to low voltage flexibility, and network reliability providing more capacity and resilience to support in their customers' net zero journeys.

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

Recommendation to the Gas & Electricity Markets Authority
FUND
<p>All Expert Assessors recommended this Project for funding and agree that the Eligibility Criteria have been met. The Project addresses the Innovation Challenge because it addresses the potential to manage peak demand and potentially improves stability of the LV substation network, supporting additional low carbon technology.</p>

The Expert Assessors noted that the Project has identified potential to deliver a net benefit to electricity consumers through its targeting of improvements to the speed and cost-efficiency in the connection of additional low carbon technologies to the LV network, potentially reducing the time required to meet consumer expectations for decarbonisation and cost savings. It will also introduce AI into a specific area of network risk and is seeking to solve a specific challenge in a targeted way using novel data-led approaches to system management and decision support.

One Expert Assessor noted that the negative impacts of a successful rollout have not been considered. This could include a commercially driven behavioural risk of 'maxing out' the load carrying capacity of the substation networks to maximise LCT uptake and system efficiency. This may have the inadvertent consequence of reducing overall resilience. Although a risk register was provided, all Expert Assessors agreed it was somewhat weak in description.

Despite this, the Assessors felt there was sufficient information in the project plan which should allow for a timely Project delivery assuming the risk register is revisited and updated. The Project Plan also clearly sets out the milestones and deliverables which was positively noted by the Expert Assessors.

The Project Partners are appropriate for the approach described in the proposal, with extensive experience and access to relevant data required for the Project.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to Kick Off, the Funding Party must provide an updated and detailed risk register to the Monitoring Officer prior to any work commencing on the Project.

6.1.13 10106405, LV Optimiser - LVOE

Submitted Project description

The LVOE Project focuses on an innovative LV (Low Voltage) power electronic device (LV Optimiser) with its novel control algorithm designed to address LV voltage quality and imbalance, enabling the vast adoption of Low Carbon Technology (LCT) connections within the LV network.

The Low Voltage network is currently undergoing substantial changes due to the increased integration of LCTs such as solar panels, heat pumps and electric vehicle chargers. Traditional strategies are no longer effective at mitigating the strain from LCTs.

The LV Optimiser will provide a technical solution to dynamically operate the network, allowing for the widespread introduction of LCTs.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A
7: Projects must provide value for money and be costed competitively.	Met	N/A

8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met	N/A
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Recommendation to the Gas & Electricity Markets Authority

FUND

The majority of the Expert Assessors recommended this Project for funding and stated that the Eligibility Criteria have been met. The Project addresses the Innovation Challenge because the integration of low carbon technology into the distribution network is one of the biggest challenges faced in power systems as it presents a massive change in the way networks operate. The integration of low carbon technology into the distribution network represents a significant change in the way networks operate and new protection schemes emerge. This will ultimately reduce the use of fossil-fuelled plants to provide system flexibility and balancing services. However, the Expert Assessors did note that this Project needs to ensure that it adds to existing work and does not replicate it.

One Expert Assessor did not recommend the Project for funding as the Assessor felt it was unclear how the Project would deliver a net benefit to consumers due to a lack of information on potential system costs or how any savings would feed through to consumer bills. The Expert Assessor also noted the potential benefits needed further quantification in order to justify the Project providing value for money.

The Project demonstrates good understanding of the challenges to be resolved to enable a fully decarbonised power system and will build on other publicly available innovation work that is relevant to the Project. The Project has clear and quantified potential to deliver a net benefit to electricity consumers. There will be a new product to the market and it is expected that the technology will provide £6 billion potential benefits before 2035.

The Project Partners give confidence that they will provide relevant input to the Project, alongside having the appropriate resources, equipment and facilities needed for the current phase of work against a detail Project Plan.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide an overview to the Monitoring Officer to show how this project compliments business as usual (BAU) LV activities and why future phases should be funded through SIF rather than BAU.

6.1.14 10106474, Fuel Cell Renewable Energy Equity (FREE)

Submitted Project description

The Project will explore how fuel cell micro Combined Heat and Power (CHP) systems can provide UPS functionality for individual homes as well as support other nearby homes which depend on direct electrification to provide heat, power and mobility.

Fuel cell technology can generate at efficiencies equivalent to the highest efficiency central generation plant even at micro-generation level. Its location within the LV network further ensures that system losses are minimised, by-product heat can be utilised, and local balancing is more easily achieved.

This results in increased resilience and lower operating costs for consumers and the energy system.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The majority of the Expert Assessors recommended this Project for funding and stated that the Eligibility Criteria have been met. The Project meets the aims of the Innovation Challenge as it will assess intermittency of supply issues by providing a local community system (via Micro-CHP) containing storage, heat recovery and hydrogen production at a claimed cost reduction both to the consumer and the DNO.

The Project identified benefits through controlling intermittency on the grid at reduced cost to the consumer. One Expert Assessor noted that, although savings were given against a hydrogen boiler baseline, no details were given against a current natural gas boiler baseline which would have provided greater clarity regarding consumer benefits. One Expert Assessor noted the

uncertainty in the Project solution and the potential risks in relation to the use of hydrogen and storage. The Expert Assessor also pointed to the previous attempts to launch Micro-CHP in the UK without success and was concerned that some of these risks, including high cost and unit weight, do not appear to have been considered. Consequently, the Expert Assessor did not believe the potential benefits outweighed the risks for the Project, and did not recommend the Project for funding.

The Expert Assessors believe that the Project team is experienced, reputable and broad enough to deliver this Project. The Project plan was clear and realistic, giving confidence that the Project has a robust methodology to deliver its aims.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

N/A

6.1.15 10107145, Gas Volume for Embedded Electrical Generation Modelling

Submitted Project description

GDNs require a new forecasting framework to manage the increasingly disruptive demands from flexible embedded generators, a need recognised by the 'Electricity and Gas Resilience Task Group' (EGRITG).

This Project will design a notification platform for embedded generators to inform GDNs of upcoming demands, combined with electricity market forecasting and advanced machine learning techniques to refine embedded gas demand forecasts.

The Gas Trader Energy Balancing Project will strengthen system resilience and robustness by creating an innovative whole system balancing approach for the GB Gas Network, bringing sites, such as embedded power generation sites, into alignment with existing balancing processes.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Not Met	The application lacked detail on the quantification of benefits as well as linkages to innovation aspects of the Project.
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A
7: Projects must provide value for money and be costed competitively.	Met	N/A
8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met	N/A

Recommendation to the Gas & Electricity Markets Authority

DO NOT FUND

The majority of the Expert Assessors did not recommended this Project as not all the Eligibility Criteria have been met. Expert Assessors did not recommend this for funding because the Project has not made a clear case for a net benefit to consumers other than a potential avoidance of demand outages. The application could have been strengthened by including more details on the quantitative analysis concerning the cost advantages of implementing better forecasting models and their environmental impact and specifying particular aspects of innovation and linking them to specific benefits.

All Expert Assessors agreed that the Project addresses the Innovation Challenge because it has the potential of forecasting demand on the network and will protect GB gas users and strengthen the energy system resilience and robustness. The application has identified issues with gas demand forecasting due to a lack of input data, particularly from embedded power stations. However, it is argued that existing software tools could incorporate this data if required by regulation, and there's scepticism about the need for a new software model. Concerns were raised about the Project's focus on creating a proprietary tool for licensees rather than fostering collaboration and sharing data across the industry.

The majority of the Expert Assessors believe the Project will deliver value for money by delivering an improved industry capability to provide increased accuracy to gas nominations and significantly reducing the risk to imbalance in system supply and therefore reducing operating costs of the network. There were concerns towards the high day rates for the software developer, which are seen as unjustified and marked contrast with the rates of other Project Partners. Expert Assessors also highlighted a lack of supporting detail, justification, and quantification of benefits, which weakens the overall case for funding.

The Expert Assessors stated that the Project methodology gives confidence that it will be capable of progressing in a timely manner. However, one Expert Assessor noted that the methodology would be improved through greater engagement with gas industry experts.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem has taken account of the Expert Assessors' concerns and has approved funding for this project only on specific conditions outlined below. Ofgem acknowledges the valid concerns raised by the Expert Assessors regarding concerns about the Project's benefits and focus on creating a proprietary tool for licensees rather than fostering collaboration and sharing data across the industry. The Project is therefore requested to address these concerns during the Discovery Phase and Ofgem has considered the Project worthy of further exploration at feasibility level.

Recommended Project specific conditions

Prior to the start of the Discovery Phase the Funding Party must provide an updated Project plan to the Monitoring Officer providing more details the role of and responsibilities of Cadent, NGN and Lane Clark & Peacock in the Project.

Prior to completion of the Discovery Phase, the Funding Party presents a robust overview to address concerns raised by the Expert Assessors. This should include the role of AI design and implementation, including how the machine learning modelling in GDNs will be utilised, in the optimisation of pipeline integrity management, demand forecasting, and enhanced safety protocols.

7 SIF Discovery Phase – [Unlocking system flexibility to electrify heat]- Summary

This section covers the assessment of Round 3 Discovery Phase Applications received into the 'Unlocking System Flexibility to Electrify Heat' Innovation Challenge¹⁰.

For the Discovery Phase, three Applications were submitted to Innovate UK through the Innovation Funding Service (IFS) portal by the closing deadline of 22 November 2023 and are listed below.

Project reference number	Project name	Funding licensee	Total Project costs (£)	Total Project contribution (£)	Total SIF Funding requested (£)	Expert Assessors Recommended for funding (Yes/No)	Ofgem Recommended for funding (Yes/No)
10103019	CoolDown	ENW Ltd	£168,743.00	£18,747.00	£149,996.00	Yes	Yes
10105050	OptiHeat	UKPN Ltd	£125,916.00	£12,592.00	£113,324.00	Yes	Yes
10105054	WASH (WAstewater Sourced Heat)	UKPN Ltd	£139,183.00	£13,919.00	£125,264.00	Yes	Yes

¹⁰ <https://www.ofgem.gov.uk/publications/strategic-innovation-fund-round-three-innovation-challenges>

8 Expert Assessors Recommendations [Unlocking system flexibility to electrify heat]

8.1.1 10103019, CoolDown

Submitted Project description

As Britain warms due to climate change, electrification of heat will mean increasing customer access to space cooling leading to increased summer peak demands. In current distribution network planning cooling demand is currently poorly accounted for and based on limited, high-level modelling. Additionally, cooling has potential to provide flexibility during periods of network stress has not been considered.

CoolDown will, for the first time, explore the impact of cooling on network capacity by producing improved uptake and demand Projections as well as developing novel commercial models to incentivise and unlock space-cooling flexibility, reducing network reinforcement requirements and optimising value for customers.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A

5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A
7: Projects must provide value for money and be costed competitively.	Met	N/A
8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met	N/A

Recommendation to the Gas & Electricity Markets Authority

FUND

The Majority of Expert Assessors recommended this Project for funding, and the majority of the Expert Assessors felt the Eligibility Criteria were met. This Project represents a new and innovative idea. The Project has applicability in the GB with climate change impacting the cooling load and this becoming an issue in the distribution networks.

The Project Team have set out a robust and logical methodology to ensure delivery. The Project has some potential to understand the potential costs and benefits of an increased need for cooling (with the intention of unlocking novel commercial arrangements and flexibility). Exploring it now will not only help mitigate potential risks, but also could help develop innovative and novel solutions that benefit networks and consumers.

Although one Assessor noted that the application lacked some pre-work to establish the specific issues around cooling loads in the GB, the majority view was that the application has articulated how it could use this analysis commercially in different ways in the future. A suitable Project and risk management strategy has been put forward and this is being implemented by experienced organisations with suitable expertise. However, One Expert Assessor noted the whilst the Project introduces novelty, the risk and level of novelty were not well identified in the Project narrative, and technological uncertainty or risk seems to have been under addressed.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the end of the Discovery Phase the Funding Party must provide a plan to the Monitoring Officer showing how 'users' of cooling technologies will be impacted by this innovation and how this solution will provide significant benefits to the network. This should identify how the impacts differ across various customer types.

8.1.2 10105050, OptiHeat

Submitted Project description

OptiHeat will transform how consumers make decisions on building fabric upgrades, heat pump and/or renewable energy technology installations. Our innovative tool optimises home upgrade recommendations and energy costs for consumers while modelling the resulting reduced load on the network.

The benefits include providing DNOs insight into the size and location of likely LCT installations, enhancing network planning efficiency and running of the networks. Additionally, it will support and empower vulnerable consumers and social landlords to efficiently upgrade their heating systems, promoting an inclusive rollout of right-sized LCTs and ensuring equitable sharing of the benefits for all in the energy transition.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

The majority of Expert Assessors recommended this Project for funding, and the majority of Expert Assessors considered all Eligibility Criteria to be met. However, one Expert Assessor felt that the application could have been strengthened by providing greater clarity on how it intends to address network reinforcement costs driven by heat electrification as intended in the Innovation Challenge.

The Project was considered to demonstrate a methodology for creating appropriate carbon mitigation measures for domestic housing, allowing DNOs to design physical reinforcements on their networks. However, one Expert Assessor expressed concern that over the Project's ability to

cover the multiplicity of GB housing types and the risk that the Project's value could be diminished if it does not consider a wide enough scope of dwelling types.

The development of the tool offering a more nuanced appraisal of the best approach to decarbonising a home, taking account of generation, energy efficiency and heat decarbonisation has the potential to be valuable to both customers and Distribution Network Operators.

The Project was considered to deliver value for money and the outputs described could make a contribution towards addressing the identified challenge. The allocation of costs to work package deliverables was considered reasonable and the Project management documents provide evidence of a well-structured and planned Project.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide insights to the Monitoring Officer how the outcome of the Project will not undermine competitive markets with reference to similar existing tools already available and how this tool will complement rather than duplicate these tools.

Prior to the completion of the Discovery Phase the Funding Party must provide to the Monitoring Officer, evidence of considerations of how the benefits of this tool may vary depending on the customer and housing type.

Prior the completion of the Discovery Phase, the Funding Party must engage with Innovate UK's Net Zero Heat and Transforming Construction funding programmes to discuss how learnings from Projects within those programmes can help inform the Project. Innovate UK can facilitate an introduction if necessary.

During the Discovery Phase the Funding Party must engage with SSEN on the MaxFlex to examine areas of potential commonality and overlap, and how the Projects could inform each other on their findings. Innovate UK can facilitate an introduction if necessary. The Funding Party must provide to its Monitoring Officer a summary of these engagements by the end of the Discovery Phase.

8.1.3 10105054, WASH (Wastewater Sourced Heat)

Submitted Project description

The UK heating sector contributes nearly one third of the country's annual carbon emissions. One solution to decarbonising the sector is low-carbon district heating (DH). According to the Climate Change Committee, DH could meet 18% of UK heating by 2050. WASH will investigate the incorporation of heat from wastewater into DH networks.

The objective is to assess the feasibility of wastewater heat as a source for heat pumps that supply DH networks, provide essential knowledge to assess the potential for heat pump flexibility,

and explore how water companies, DH network operators and DNOs can work collaboratively to decarbonise DH networks.

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

Recommendation to the Gas & Electricity Markets Authority

FUND

All Expert Assessors recommended the Project for funding, and all agreed that the Eligibility Criteria have been met. Expert Assessors agreed that the Project addresses the Innovation Challenge by considering an alternative pathway to reducing electricity network infrastructure by making use of waste heat into heat networks as a potentially novel way of improving the efficiency.

The Expert Assessors found the scope of this Project to be interesting and addresses a gap in the market for developing heat networks and therefore consider the Project to be innovative and novel. It is expected that the Project will deliver the groundwork for a highly collaborative solution across industry boundaries that will help a market for new sources of heat to be realised.

Using wastewater heat source can reduce the electricity demands of the DH Network Operators and therefore the electricity network infrastructure required to serve it. This could lead to a reduction in the Distribution Use of System (DUoS) charges and therefore the Expert Assessor consider this Project to deliver net benefits to electricity consumers.

The Project team has significant experience in the delivery of innovation Projects. As a result the Expert Assessors believe they are well placed to conduct the technical elements of the Project, to ensure deliverables are met.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase, the Funding Party must provide, to the Monitoring Officer, a stakeholder engagement plan to outline how it will engage with other stakeholders in with District Heating operational experience and water companies who would benefit from the learnings created from the Project.

Prior to the completion of the Discovery Phase the Funding Party must provide evidence, to the Monitoring Officer, of engagement with the Association for Decentralised Energy and the UK Decentralised Energy Association to share findings and take on board existing knowledge

9 SIF Discovery Phase – [Enabling power-to-gas to provide system optimisation]- Summary

This section covers the assessment of Round 3 Discovery Phase Applications received into the 'Enabling Power-to-Gas to provide system optimisation' Innovation Challenge¹¹.

For the Discovery Phase, six Applications were submitted to Innovate UK through the Innovation Funding Service (IFS) portal by the closing deadline of 22 November 2023 and are listed below. In order to protect the intellectual property rights (IPR), unsuccessful Projects have been redacted from final published version.

Project reference number	Project name	Funding licensee	Total Project costs (£)	Total Project contribution (£)	Total SIF Funding requested (£)	Expert Assessor Recommended for funding (Yes/No)	Ofgem Recommended for funding (Yes/No)
10098557	Realistic modelling of power-to-gas operability	NGT PLC	£142,751.00	£14,276.00	£128,475.00	Yes	Yes
10102109	B-Linepack+	NGT PLC	£168,004.00	£18,004.00	£150,000.00	Yes	Yes
10102658	ALCHEM (Advanced Low Carbon Hydrogen and Energy Management)	WWU Ltd	£97,152.00	£9,716.00	£87,436.00	Yes	Yes
[REDACTED]							
10105025	Exploring Geological Hydrogen	CADENT Gas Ltd	£153,907.00	£15,525.00	£138,382.00	Yes	Yes

¹¹ <https://www.ofgem.gov.uk/publications/strategic-innovation-fund-round-three-innovation-challenges>

	Storage Opportunities for the East Midlands (EMStor)						
10106835	PATCH – Production And long-Term Containment of Hydrides	NGN Ltd	£163,921.00	£16,393.00	£147,528.00	Yes	Yes

10 Expert Assessors Recommendations [Enabling power-to-gas to provide system optimisation]

10.1.1 10098557, Realistic modelling of power-to-gas operability

Submitted Project description

The Project will develop an integrated hierarchical network of established models for simulating the operation of decarbonised future GB energy system scenarios with highly interconnected gas and power networks. The realistic modelling of power-to-gas and storage operators' behaviour will be emphasised. The integrated models will be demonstrated on a simulation platform as real-time digital twins for future system scenarios.

Considerable novelty will lie in the combination of modelling scale and granularity; representation of many autonomous decentralised agents making sub-optimal decisions; and the optimal resolution of dilemmas arising from the finite energy budgets constraining primarily weather-driven low to zero carbon scenarios.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A

5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A
7: Projects must provide value for money and be costed competitively.	Met	N/A
8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met	N/A

Recommendation to the Gas & Electricity Markets Authority
<p>FUND</p> <p>All Expert Assessors recommended this Project for funding and agree that the Eligibility Criteria have been met. The Project addresses the Innovation Challenge because it investigates commercial and technical innovation to secure system benefits from hydrogen storage deployments. The Project’s integrated models will be demonstrated on a simulation platform as real-time digital twins for future system scenarios showing optimised demand flows and making better-informed decisions for achieving net zero objectives.</p> <p>The Project has identified a clear benefit for gas and electricity consumers because it has the potential to deliver a net benefit to consumers by reducing system operating costs which could reduce bills. The Project costs were considered reasonable by all assessors and that value for money was demonstrated to a satisfactory level in the Application.</p> <p>The consortium is well placed to carry out the Project and exploit the results. Although it was noted by Expert Assessors, that the majority of the work packages are heavily dependent on one Project Partner and having a wider Project team would strengthen the Project’s chances of success. The Expert Assessors considered the Project plan to be clear although somewhat generic, giving confidence in the Project’s ability to deliver in a timely manner. However, it was noted the Project start and end dates were incorrect for this Discovery Phase.</p>

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide, to the Monitoring Officer, examples of how the Project learning will be adopted into BAU activities, with this they must provide evidence of engagement with key network stakeholders to secure buy in early on in the Projects development.

Prior to the start of the Discovery Phase, the Funding Party must summarise the availability of data to allow for modelling and that it has been triaged as described in the application. As part of this condition, the Funding Party must provide evidence, to the Monitoring Officer, that it is meeting Ofgem's Data Best Practice Guidelines.

10.1.2 10102109, B-Linepack+

Submitted Project description

The national gas transmission system currently has the ability to pack additional gas into the lines (linepack) in order to provide flexibility and more efficiently manage supply and demand across the network. The amount of energy able to be stored by linepacking in the future may potentially decrease with the addition of blended or 100% hydrogen.

This Project will explore the feasibility of smaller, intermediate scale storage sites (purpose built geological storage solutions with minimal geographical constraints e.g. lined shafts, engineered rock caverns, underground silos) to supplement linepack capacity and provide system flexibility and network optimisation.

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

Recommendation to the Gas & Electricity Markets Authority
FUND
All Expert Assessors recommended the Project for funding and all agreed that the Eligibility Criteria have been met.

Hydrogen storage will be required to transition to a zero carbon gas infrastructure and this study will determine a cost-benefit analysis of adding localised small to medium scale storage capabilities.

This novel hydrogen storage mechanism fits within a gap in the market. Understanding and optimising deployment across the network could provide distinct advantages to operational costs, lowering costs to consumers, and enhancing security of supply.

The Project Team is comprehensive and appropriate for the Project. Clear separation and assignments of tasks has been articulated with the key interaction point described and accounted for. And the Project plan and management is well thought out and presented - the Project plan in particular is to be commended.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase, the Funding Party must provide, to the Monitoring Officer, Stakeholder Engagement plan to ensure wider participation and dissemination in any future funding round. It should also identify any additional dissemination activities carried out by the funding party relating to this Project.

10.1.3 10102658, ALCHEM (Advanced Low Carbon Hydrogen and Energy Management)

Submitted Project description

Due to high energy requirements, the cost of producing green hydrogen through commercially available technology remains three times higher than the production of grey hydrogen.

Additionally, current green hydrogen production technology struggles with ramping up, and down, when renewables are intermittent for risk of creating dangerous hydrogen and oxygen mixtures.

The ALCHEM (Advanced Low Carbon Hydrogen and Energy Management) Project addresses both problems through its innovative biomass electrolysis technology, which uses liquid waste biomass to produce green hydrogen and green chemicals with no oxygen, using 75% less energy than conventional water electrolysis.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A
7: Projects must provide value for money and be costed competitively.	Met	N/A

8: Projects must be well thought through and have a robust methodology so that they are capable of progressing in a timely manner.	Met	N/A
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Recommendation to the Gas & Electricity Markets Authority

FUND

The majority of Expert Assessors agree that the Project has met the Eligibility Criteria and recommended this application for funding. However, one Expert Assessor raised concerns about the limited range of stakeholders involved in the collaboration which could present a barrier to scaling up this technology. Overall, the Project has identified potential to deliver a net benefit to gas consumers because it could reduce the cost of green hydrogen as a fuel source for customers, however this is conditioned by the high level of risk surrounding the claimed performance of the technology. In addition, one Expert Assessor noted that the level of technology risk is not addressed in the proposal. Although the Expert Assessors agreed that the impacts and benefits are considerable, it was noted that the core justification for the benefits could have been strengthened.

The Project is novel compared to existing solutions and all Expert Assessors felt that the Innovation Challenge had been addressed in the application. The Project Team have presented a compelling proposal which presents an opportunity to unlock whole system value.

The methodology is clear, and the Project presents a strong explanation of how it addresses the Innovation Challenge. However, the Expert Assessors noted that the Project lacked a robust analysis to validate the core claim of the lower energy needs in hydrogen production compared to conventional water electrolysis.

The applicant has highlighted the financial and technical barriers the network faces for the deployment of hydrogen, and this was noted by the Expert Assessors. However, they felt that the identification of feedstocks, and end users, as well as the consumer benefits, had been addressed sufficiently for the Discovery Phase.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the majority of Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

As part of the Discovery Phase Final Deliverable, the Funding Party must outline and submit to the Monitoring Officer a Stakeholder Engagement plan to ensure wider participation and dissemination.

As part of the Discovery Phase Final Deliverable, the Funding Party must submit to the Monitoring Officer details on the thermodynamic principles on which the claim of the much lower power requirements in hydrogen production than with water electrolysis is based.

As part of the Discovery Phase Final Deliverable, the Funding Party must submit to the Monitoring Officer a summary of the current technology status in terms of the scale of units tested, and the performance on actual waste streams.

10.1.4 10105025, Exploring Geological Hydrogen Storage Opportunities for the East Midlands (EMStor)

Submitted Project description

Low carbon hydrogen can be used to decarbonise industrial processes, to provide heat, for transport and for electricity production. Production of hydrogen through electrolysis using renewable energy is a way of using up excess renewable energy and the hydrogen can be stored and used later during periods of peak demand.

Cadent is developing a 100% hydrogen pipeline network in the East Midlands and South Yorkshire to connect clusters of potential hydrogen users and producers. This Project will investigate options for medium and large-scale storage of hydrogen to enable the flexible use of hydrogen in the region.

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

Recommendation to the Gas & Electricity Markets Authority
FUND
All Expert Assessors recommended this Project for funding and agree that the Eligibility Criteria have been met. The Project addresses the innovation challenge because it aims to identify new business models and technical design for long duration hydrogen storage to provide system services. It has a clearly identified potential to deliver a net benefit to gas consumers, reducing

costs to the consumer by the establishment of localised electrolytic hydrogen production and local storage.

The Project involves an innovative and robust methodology to investigate depleted UK oil fields for hydrogen storage which is considered novel. Alternative hydrogen storage options will also be explored to support the development of a UK Hydrogen storage market which is currently unavailable.

The Project Team is well placed to conduct the Project and there is a clear outline of the roles and responsibilities throughout the Project. In addition, further expertise will be sourced from stakeholders outside of the core Project Team.

The Project plan has been articulated well and the work packages and milestones are clear and concise. There is a good balance of responsibilities amongst the Project Partners which provides confidence in the delivery and management of the Project.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with relevant studies and Projects and understands the duplication risk or knowledge sharing opportunity of the scope of this Project. As part of the Discovery Phase Final Deliverable, the Funding Party must provide evidence to the Monitoring Officer of discussions to address any concerns or considerations related to the regulatory landscape associated with hydrogen storage assets.

10.1.5 10106835, PATCH – Production And long-Term Containment of Hydrides

Submitted Project description

PATCH - Production and long-Term Containment of Hydrides - In a hydrogen future, additional gas storage will be required to meet increasing demand and futureproof against evolving green applications of hydrogen and its hydrides.

PATCH will provide the future hydrogen system with an economic and safe long-term storage solution for hydrogen, which is imperative in removing Britain's dependence on natural gas.

PATCH will provide a synergetic solution, leveraging industrial by-products for chemical hydride production, storage, regeneration, and network injection. Using waste energy/gases from industry and excess renewable electricity, to produce chemical hydrides, helping deliver Britain's net zero commitments by 2050.

Eligibility Criterion	Met / Not Met	Additional justification for recommendation
1: Projects must address the Innovation Challenge set by Ofgem.	Met	N/A
2: Projects must have clearly identified potential to deliver a net benefit to gas or electricity consumers	Met	N/A
3: Projects must involve network innovation.	Met	N/A
4: Projects must not undermine the development of competitive markets.	Met	N/A
5: Projects must be innovative, novel and/or risky.	Met	N/A
6: Projects must include participation from a range of stakeholders.	Met	N/A

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

Recommendation to the Gas & Electricity Markets Authority

FUND

All Expert Assessors recommended the Project for funding and all agreed that the Eligibility Criteria have been met. The Expert Assessors consider this application to align with the innovation challenges as it is exploring hydride storage for hydrogen at scale, a first of its kind in GB, and involves network innovation by examining hydride storage use cases at a GDN level.

The Project has a clearly identified potential to deliver a net benefit to gas consumers through improvements to network resilience and decarbonisation through the transition to a blended hydrogen gas system.

The Project Team has experience of innovation Projects with tight timelines and this provides confidence that the Project will be delivered in a timely fashion. In addition, the Project has a robust methodology which gives confidence that it will be capable of progressing in a timely manner. One Expert Assessor suggested it was unclear if any of the Project Partners has significant expertise in hydride manufacturing which the Expert Assessor deemed to be at the heart of the Project.

One Expert Assessor noted there is uncertainty about the actual benefits and the suitability of hydride technology for the wider market. However, the Discovery Phase will provide evidence on this.

Decision from Gas & Electricity Markets Authority

FUND

Ofgem agree with the Expert Assessors and approve this Project for funding.

Recommended Project specific conditions

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer that it has considered linkages with relevant studies and Projects (e.g. HyNTS Hybrid Storage) and understands the duplication risk or knowledge sharing opportunity of the scope of this Project.

Prior to the completion of the Discovery Phase the Funding Party must provide evidence to the Monitoring Officer of engagement with expertise in hydride manufacturing to understand impacts for enabling testing.

The Funding Party must provide evidence to the Monitoring Officer by the end of the Discovery Phase of the wider impacts to the different customer groups.

Prior to the completion of the Discovery Phase the Funding Party must out to the Monitoring Officer the benefits related to safety and logistics and how these benefits can be scaled to other networks.