Electricity Distribution

REACH Innovate UK Quarterly Review Meeting

March 2025

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Agenda page

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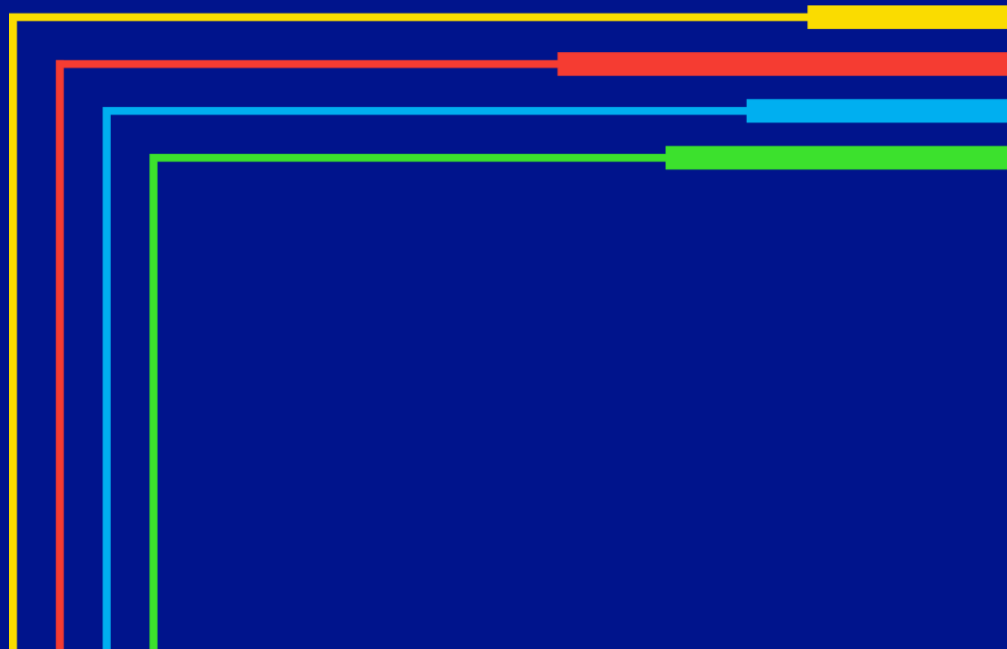
High Level Progress



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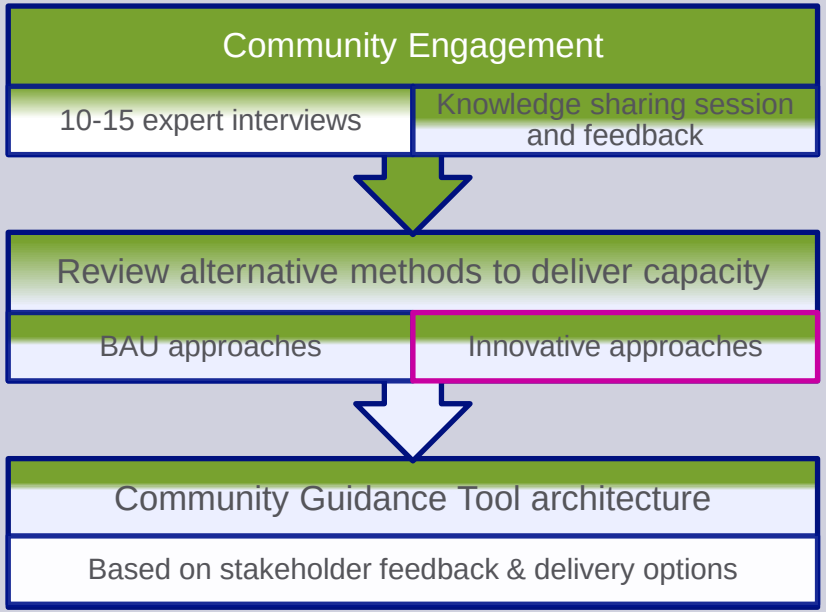
Planned Q1 activity

REACH Energy Centre Specification, CBA & CO_2 assessment

- Initial Data Gathering and Site Visits
- High Level Feasibility Study (VEPOD, PASSIV, NGED)
- Assessment Criteria – 2 communities selected
- Detailed Feasibility (VEPOD, PASSIV, NGED)
- CBA and Carbon Assessment

Community Guidance Tool



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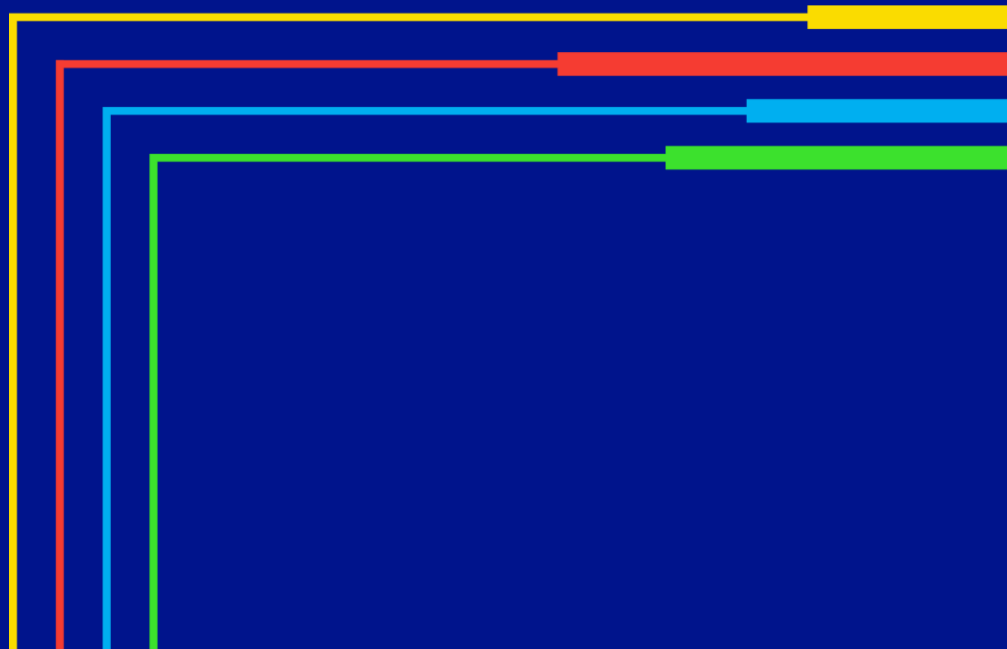
Work Package Progress



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There are a variety of different
charging speeds and number configurations

A1 Community Engagement

Partner: Regen

Objective

- ✓ **Develop detailed requirements: working directly with our communities to finalise project details and identify recommendations**
- ✓ **Wider cohort engagement: supporting broader engagement and knowledge exchange**
- ✓ **Define user requirements for options support tool**

Key Tasks

Work Completed

Direct engagement with the selected communities

- Kick-off meeting with seven communities
- Arranging sub-contracts for community partners
- Data collection on seven communities
- Selection process and meeting
- Arranging sub-contracts for selected community partners
- Arranging site visits with selected communities

Wider cohort engagement

- Knowledge sharing event
- Organising interviews with community stakeholders

Upcoming Work

- Outline community interview results to inform the Options Tool user requirements (WPA1 D4)
- Collaborative data gathering: Site visits to two communities, Data analysis, Reports provided to communities (WPA1 M7, WPA1 D3)
- Organise second event to engage wider community energy stakeholders (WPA1 M6, WPA1 D2)
- Summarise findings from detailed and wider engagement to inform the design of the REACH solution and Options Tool (WPA1 M8)

A2 Capability Led Network Assessment

Partner: SGC

Objective

- ✓ **Where and when are overloads likely to happen based on existing network forecasts.**
- ✓ **Likely resolutions using existing policies and solutions**
- ✓ **Costs and timescales relating to outputs of 2.**
- ✓ **Gap analysis of costs and benefits of using REACH alternative**

Key Tasks

Work Completed

- Collaborative workshops conducted with the NGED Planning Team.
- Comprehensive data relating to NGED Rural networks sourced and compiled for evaluation.
- Detailed analysis conducted on headroom for NGED Rural networks to understand future capacity.
- Initial draft of the Rural Network Overload Report completed for WPA2 D1 project.*

* Key subject matter expert required an extended hospital stay so shift of the report date. This has no project impact.

Upcoming Work

- For the selected communities identify the BAU network resolutions
- Report WPA2 D2 (due 04/04/25).
- Develop the BAU costs and Timescales for WPA2 D2.
- Develop the counterfactual benefits, costs and timescales of using REACH energy centre.
- Report WPA2 D3 Second release of D2 as D2.1 (due 23/05/25).

A3 Energy System Break Points

Partner: SGC

Objective

- ✓ **Establish a process diagram for communities to follow when initiating community energy projects highlighting where electrical networks will likely cause problems**
- ✓ **Repackage the WP-A2 D2.1 report into a community friendly format including process diagrams and scenario maps.**

Key Tasks

Work Completed

- Confirmed REACH as the main mechanism to address demand constraints due to lack of smart alternatives.
- Proposed a two-stage approach: use a temporary module for urgent constraints without negotiating an enduring energy centre.
- Drafted a flow diagram to identify and engage communities benefiting from the temporary module, ensuring no restrictions during reinforcement.
- Refined the proposal based on a better understanding of the community's 'customer journey', outlining engagement strategies and questions.

Upcoming Work

- Revise the initial flow diagram to include changes and enhance details.
- Determine the status community energy projects must achieve to initiate connections.
- Write a report describing network connection challenges faced by communities, outlining processes and contact details to overcome them.
- Include network assessment outputs like potential challenges and reasons for timeline delays.
- Develop process diagrams for rural community energy projects.

A4 Review Delivery Options (Project Direction)

Partner: Regen, SGC

Objective

✓ **Establish alternative delivery options for community energy developments according to key network parameters**

Key Tasks

Work Completed

- Identified and categorised alternative delivery options through horizon scanning and internet searches.
- Categorised options included low-cost network reinforcement, smarter network management, flexible connections, and flexible procurement.
- Analysis began in February and continues through March.
- Initial horizon scanning mapped innovation projects to categories.
- A workshop with NGED staff was organised for March 11th.

Upcoming Work

- Conduct additional workshops with NGED teams to explore alternative delivery options in detail.
- Continue analysing alternative delivery options to understand viable pathways and their potential impacts.
- Finalise the WPA4 summary report to consolidate findings and recommendations for a clear overview of project outcomes and specific project directions.

A5 Options Assessment Tool

Partner: SGC

Objective

- ✓ **Develop the decision tree architecture based on inputs, required calculations and outputs**
- ✓ **Determine community energy use profiles**
- ✓ **Define community input data**
- ✓ **Define network constraint data**
- ✓ **Define Energy Centre parameters**
- ✓ **Identify data sources necessary to support process flow diagram and method of incorporating into future tool (Beta phase)**

Key Tasks

Work Completed

- Outlined the process from WPA3 to guide communities in engaging with NGED.
- Determined process flow for communities to pursue energy centre discussions.
- Acknowledged engagement complexity due to modular options and community diversity.
- Focused on identifying data to create a process for users to explore scenarios.
- Mapped requester, type, source, and importance for the options tool architecture.

Upcoming Work

- Engage in surveys and interviews conducted by Regen to gather user requirements.
- Create a MoSCoW prioritisation to organise user requirements into categories.
- Design a decision tree architecture derived from input requirements and calculations.
- Present the architecture diagram as a comprehensive flowchart.
- Include a report and method statement for construction in subsequent project phases.

B1 Energy Centre Design

Partner: VEPOD

Objective

- ✓ **Identification of all energy centre community support tool data requirements**
- ✓ **Testing for the community to provide the necessary data (Regen support)**
- ✓ **Support to SGC for providing data dependencies and weights for the tool**

Key Tasks

Work Completed

- Collaborated with Regen to evaluate rural REACH energy centres using twelve criteria.
- Community interviews and research provided data for ten criteria, while detailed studies assessed distance to HV connection and centre scale, influencing evaluations across seven communities.
- A Visio-based data map and Excel model illustrated data sources and relationships, calculating energy storage needs.
- Coordinated with NGED to establish an artificial network capacity value for energy storage sizing due to power demand variations.

Upcoming Work

- Develop a design specification report for 2 communities, determining module capacity and sizing.
- Calculate costs and footprints for energy centres at 2 locations.
- Create technical drawings, including module sizing, software architecture, and interface connections for network integration.
- Assist with WPB1 M5 by ensuring technical parameters facilitate switchgear module connection to the HV network.
- Compile feasibility reports for each community and collaborate with SGC for community support tool data.

B2 Heat Solution

Partner: Passiv

Objective

- ✓ **Support the selection of sites where a shared heating solution is proposed**
- ✓ **Establish the techno-economic feasibility of a shared heating solution at each site;**
- ✓ **Determine a high-level technical solution enabling central coordination of distributed heat pumps to minimise network load**

Key Tasks

Work Completed

- Assisted project partners in selecting two shortlisted communities.
- Defined data requirements for the two shortlisted communities.
- Compiled a report on residential heat decarbonisation pathways as part of a wider feasibility study for the communities.
- Simulation of annual, half-hourly power load profiles following mass heat pump adoption across the two shortlisted communities, looking at typical and coldest year weather scenarios.

Upcoming Work

- Compare simulations of two control solutions to minimise network load from distributed heat pumps in the two shortlisted communities..
- Share modelling data and present findings from heat-pump power load simulations and evaluation of community level control solutions with partners.

Supporting B1 & B2: Network Studies

Partner: National Grid DSO

Objective

- ✓ **Headroom assessment for the initial communities identified in Discovery**
- ✓ **Assistance in the determination of time-series requirements and methodology**
- ✓ **Time-series database creation, or refinement, for feasibility assessments**
- ✓ **Assistance in the evaluation of the energy center's effectiveness,**

Key Tasks

Work Completed

- Network headroom assessments using SINCAL to study the 11kV network surrounding each of the 7 communities
- Reinforcement required to accommodate load growth under ‘Best View’ and ‘Consumer Transformation’ load growth scenarios was provided
- LV studies using ConnectLV, assessing the extent of network reinforcement required across secondary substations and LV circuits

Upcoming Work

- Half hourly demand modelling, to assess the extent to which the deployment of an energy centre and heat control can manage loading across the selected communities.

B3 Commercial Model and Ownership structure

Partner: Frontier Economics

Objective

- ✓ **Develop commercial and ownership models to understand the financial feasibility of the REACH energy centre**

Key Tasks

Work Completed

- The work package hasn't officially commenced yet.
- However, strategic discussions with project partners have laid the groundwork, setting the foundation for a successful implementation.

Upcoming Work

- Understand energy centre intervention and counterfactual actions.
- Develop and evaluate commercial and ownership models for asset ownership and payment flows.
- Create an illustrative model to assess financial flows within the commercial model.
- Conduct a cost-benefit analysis using the SIF framework to evaluate business model value.
- Deliver a Commercial Model Report and a SIF CBA workbook as key outputs.

B4 Carbon Accounting

Partner: Cranfield University

Objective

- ✓ **Develop a methodology for a carbon assessment decision support tool to assess and compare carbon impacts of the baseline case and the proposed solutions**
- ✓ **Understand the counterfactual carbon emissions**
- ✓ **Demonstrate the areas where carbon saving is likely through use of the REACH energy centre**

Key Tasks

Work Completed

- Systematic literature review using Scopus and rapid literature search on grey literature successfully delivered comprehensive report on impacts of low-carbon technologies in urban and rural environments.
- Off-grid households face deeper fuel poverty, requiring an additional £568 annually to escape.
- Older rural homes are less energy-efficient, leading to higher emissions and costs.
- Deployment of heat pumps is challenged by infrastructure needs, EV adoption is hindered by limited charging infrastructure and costs, and HVO offers lower emissions than fossil diesel.

Upcoming Work

- Develop a baseline carbon assessment model for two communities.
- Create a Business-As-Usual energy and environmental impact assessment model.
- Evaluate carbon impacts of alternative REACH Low Carbon Technology scenarios.
- Conduct an environmental impact assessment to identify uncertainties, hot spots, and sensitivities.
- Develop a framework for a standalone assessment tool for future use by the energy industry and communities.

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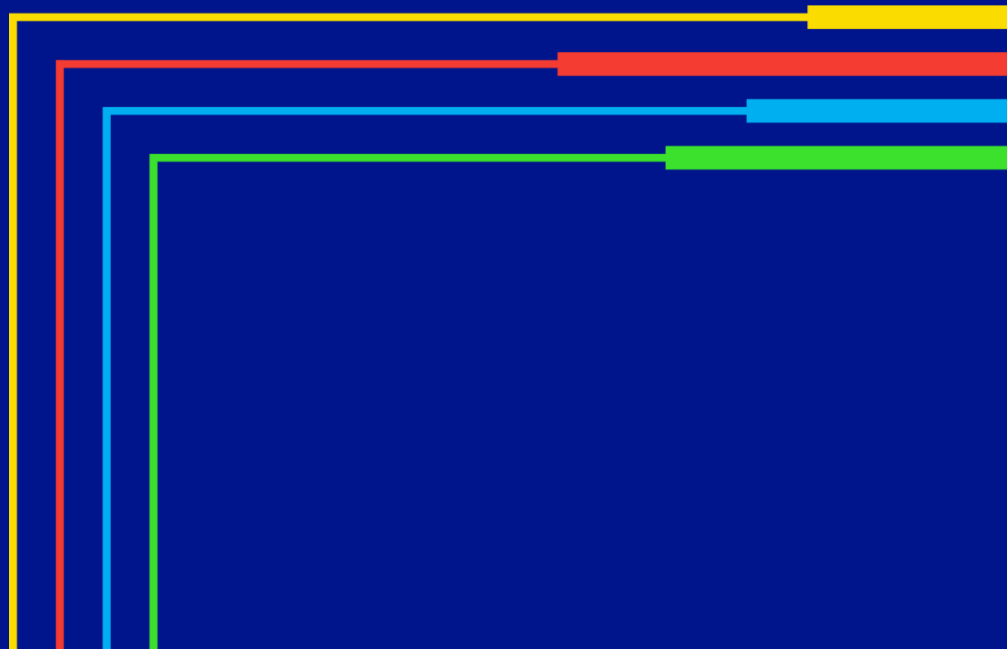
KOM review



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KOM Review (to end March)

Title	Responsibility	Due Date	Actual Date	Comments/ Status
WPC1 M1: Kick Off Meeting	SGC	02/12/2024	02/12/2024	Completed
WPA1 M1 - Kick off meeting with communities	REGEN	20/12/2024	20/12/2024	Completed
WPB1 M1 - Data requirements passed to Regen ahead of site visits	VEPod	06/01/2025	06/01/2025	Completed
WPB2 M1 - Data requirements for tool captured	Passiv	06/01/2025	06/01/2025	Completed
WPA1 M3 - Selection for Feasibility	REGEN	10/02/2025	07/02/2025	Completed
WPA1 M6a - Event One held	REGEN	12/02/2025	11/02/2025	Completed
WPB1 D2 & M2 - High Level feasibility studies undertaken for 7 communities	VEPod	24/02/2025	24/02/2025	Completed
WPB2 M2 - High level feasibility studies complete	Passiv	24/02/2025	14/03/2025	Completed
WPA2 D1 & M1 - Rural Network Overload Report	SGC	21/01/2025	14/03/2025	In Progress
WPA1 M5 - High Level Feasibility Studies Completed	REGEN	24/02/2025	14/03/2025	Completed
WPB4 M1 - Report on literature assessment of impacts of low carbon technologies in Urban environments APPROVED	Cranfield	28/02/2025	14/03/2025	Completed
WPA1 D1 - Briefing note on Community Selection	REGEN	07/03/2025	07/03/2025	Completed
WPA4 D1 - Workshop Agenda	REGEN	07/03/2025	07/03/2025	Completed
WPA1 M4 - Interviews completed	REGEN	21/03/2025		In Progress
WPB1 D4 & M4 - Energy Centre design specification report for 2-3 selected communities	VEPod	27/03/2025		In Progress
WPB2 M4 Refined techno-economic feasibility report for 2-3 chosen communities	Passiv	27/03/2025		In Progress
WPA4 M2 - Summary Report on Delivery Options	REGEN	28/03/2025		In Progress
WPB2 - M3 Summary report explaining control strategy	VEPod	28/03/2025		In Progress

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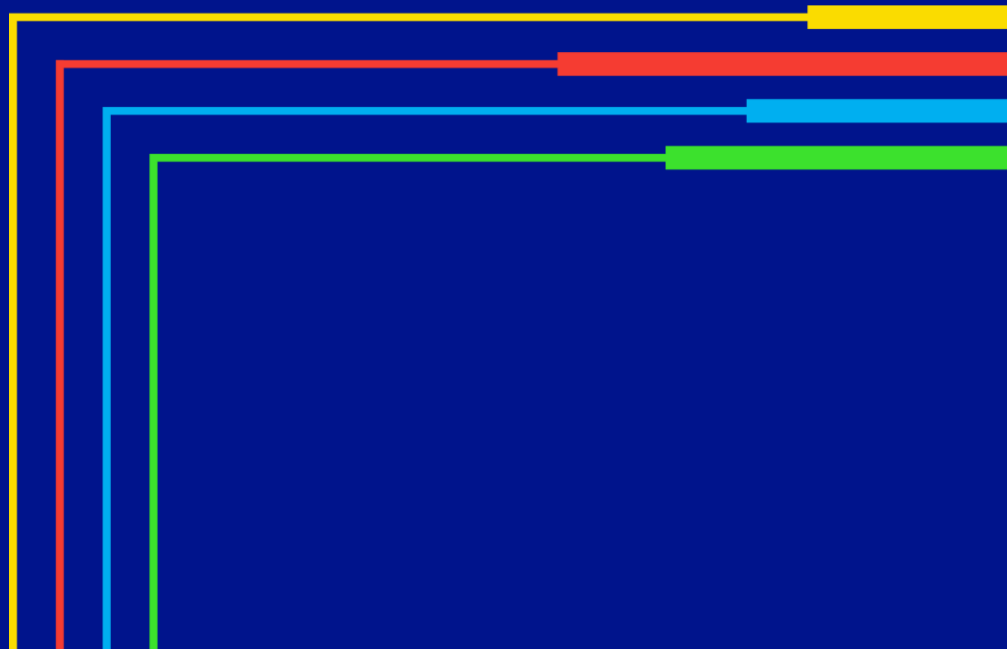
RAID Log review



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RAID Log Review (Top 5 Risks)

Ref	Risk Description	Likelihood (Low/Medium/High)	Impact (Low/Medium/High)	Mitigation
1	Identification of acceptable funding models is unsuccessful.	Medium	High	A range of potential funding models have already been identified, we have a designated work package to work closely with community groups to establish customer acceptance of known models.
14	No ownership model offers a positive CBA for either communities to build energy centres themselves, or DNOs to develop within a new regulatory sandbox.	Medium	High	Evaluate progression options at the end of Alpha phase, stop project if required.
27	Revised energy centre deployment use case as deployed by NGED would require regulatory change.	High	High	Innovate UK and Ofgem sandbox team engagement to explore required regulatory change
2	Technical parameters and local planning requirements impact the ability to deploy a REACH Energy Centre - risk is that no suitable site is identified for a beta trial based on planning constraints.	Medium	High	Project partners Regen experience in local planning to the team. This risk remains as we move into Alpha, but is mitigated by the inclusion of more communities than previously stated to build resilience. In Discovery we asked communities specifically mention planning concerns (i.e. AONBs) Heat control would operate separately to energy centre - if Energy Centre size / planning means no suitable site is identified, we may want to opt for a design that is suitable to local planning
3	Energy Centre feasibility study cannot be achieved in Alpha Phase budget/ timeline restrictions.	Medium	High	A review of the Alpha phase scope has taken place at the end of Discovery, with MoSCoW prioritisation of key features taking place. The design work will focus on the most important features first.

REACH RISK Register 20241204.xlsx

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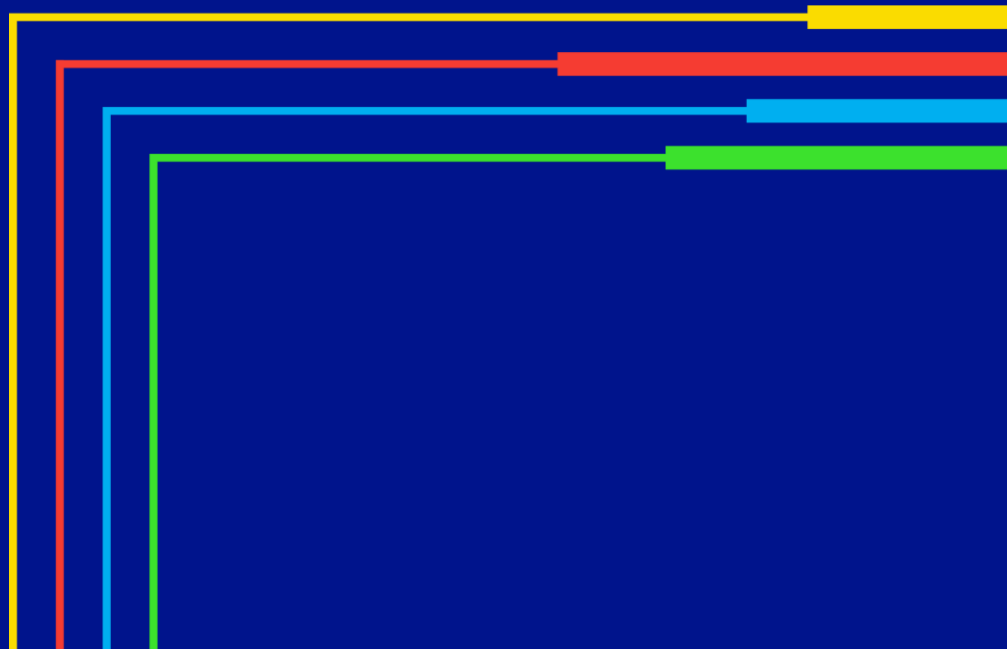
Gantt Chart Review



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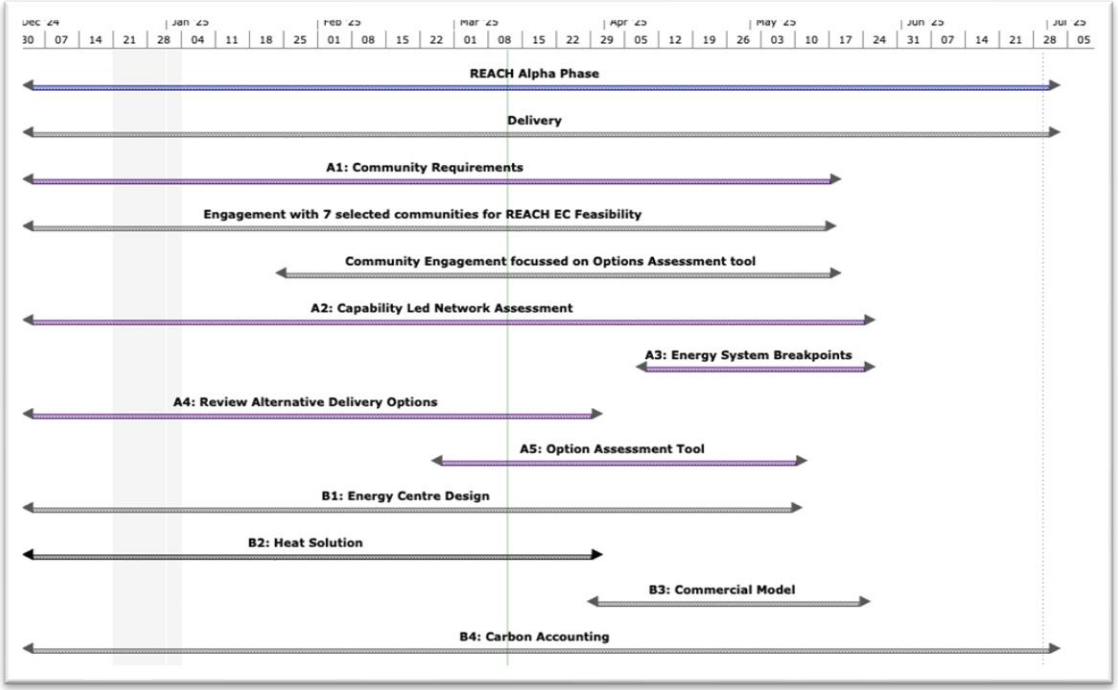
Gantt Chart Review



[20241223 REACH Alpha Project Plan 5th December Start - LIVE Version.mpp]

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Project Finance Overview

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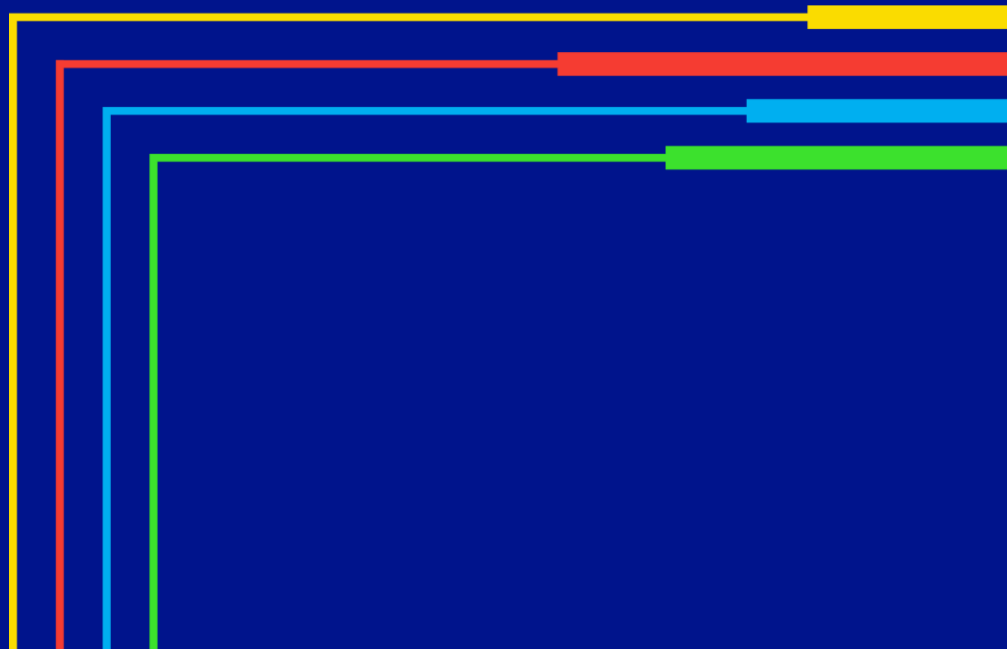

Project Finance Summary

	Total Project Costs	Project Contribution	SIF Funding requested
National Grid Electricity Distribution	£57,685.00	£6,893.00	£50,792.00
Cranfield University	£57,376.00	£11,475.00	£45,901.00
Frontier Economics	£55,265.00	£5,526.00	£49,739.00
Regen SW	£171,475.00	£17,147.00	£154,328.00
Smart Grid Consultancy Ltd	£206,050.00	£83,432.00	£122,618.00
VEPOD	£36,281.00	£8,994.00	£27,287.00
Passiv UK	£43,725.00	£4,373.00	£39,352.00
Total Cost by Category	**£627,857.00**	**£137,840.00**	**£490,017.00**

A **total project expenditure of £627,857** is expected,

With total **contributions totaling £137,840** made across project partners

The total **SIF funding requested is £490,017**

SIF Funding Requested Spend Profile

Budgeted

Partner	December 24	January 25	February 25	March 25	April 25	May 25	Total
National Grid Electricity Distribution	£ -					£ 50,792.00	**£ 50,792.00**
Cranfield University	£ -	£ 17,365.00		£ 16,635.00	£ 11,901.00		**£ 45,901.00**
Frontier Economics	£ -			£ 34,817.00		£ 14,922.00	**£ 49,739.00**
Regen SW	£ -		£ 77,792.00			£ 76,536.00	**£154,328.00**
Smart Grid Consultancy Ltd	£ 8,478.00	£ 14,353.00	£ 14,475.00	£ 30,178.00	£ 10,728.00	£ 44,406.00	**£122,618.00**
VEPOD	£ 7,670.00		£ 12,028.00		£ 3,149.00	£ 4,440.00	**£ 27,287.00**
Passiv UK	£ 4,293.00			£ 35,059.00			**£ 39,352.00**
Total	£ 20,441.00	£ 31,718.00	£ 104,295.00	£116,689.00	£ 25,778.00	£191,096.00	**£490,017.00**

Actual

Partner	December 24	January 25	February 25	March 25			Total
National Grid Electricity Distribution	£ -	£ -	£ -	£ -			**£ -**
Cranfield University	£ -	£ -	£ -	£ 17,365.00			**£ 17,365.00**
Frontier Economics	£ -	£ -	£ -	£ -			**£ -**
Regen SW	£ -	£ -	£ -	£ -			**£ -**
Smart Grid Consultancy Ltd	£ 8,478.00	£ 8,478.00	£ 8,478.00	£ 14,250.00			**£ 39,684.00**
VEPOD	£ -	£ 7,670.00	£ 12,028.00	£ -			**£ 19,698.00**
Passiv UK	£ -	£ -	£ -	£ -			**£ -**
Total	**£ 8,478.00**	**£ 16,148.00**	**£ 20,506.00**	**£ 31,615.00**			**£ 76,747.00**

Forecast

Partner				March 25	April 25	May 25	Total
National Grid Electricity Distribution				£ -	£ -	£ 50,792.00	**£ 50,792.00**
Cranfield University				£ -	£ 28,536.00	£ -	**£ 28,536.00**
Frontier Economics				£ -	£ 34,817.00	£ 14,922.00	**£ 49,739.00**
Regen SW				£ 77,792.00	£ -	£ 76,536.00	**£154,328.00**
Smart Grid Consultancy Ltd				£ -	£ 14,353.00	£ 68,581.00	**£ 82,934.00**
VEPOD				£ -	£ 3,149.00	£ 4,440.00	**£ 7,589.00**
Passiv UK				£ 4,293.00	£ 35,059.00	£ -	**£ 39,352.00**
Total				**£ 82,085.00**	**£115,914.00**	**£215,271.00**	**£413,270.00**

Total Project Cost Spend Profile

Budgeted

Partner	December 24	January 25	February 25	March 25	April 25	May 25	Total
National Grid Electricity Distribution	£ -	£ -	£ -	£ -	£ -	£ 57,685.00	£ 57,685.00
Cranfield University	£ -	£ 21,706.16	£ -	£ 20,793.66	£ 14,876.19	£ -	£ 57,376.00
Frontier Economics	£ -	£ -	£ -	£ 38,685.17	£ -	£ 16,579.83	£ 55,265.00
Regen SW	£ -	£ -	£ 86,435.28	£ -	£ -	£ 85,039.72	£171,475.00
Smart Grid Consultancy Ltd	£ 14,246.62	£ 24,119.10	£ 24,324.11	£ 50,711.78	£ 18,027.57	£ 74,620.82	£206,050.00
VEPOD	£ 10,198.09	£ -	£ 15,992.52	£ -	£ 4,186.93	£ 5,903.46	£ 36,281.00
Passiv UK	£ 4,770.06	£ -	£ -	£ 38,954.94	£ -	£ -	£ 43,725.00
Total	£ 29,214.77	£ 45,825.25	£ 126,751.90	£149,145.54	£ 37,090.69	£239,828.84	£627,857.00

Actual

Partner	December 24	January 25	February 25	March 25	Total
National Grid Electricity Distribution	£ -	£ -	£ -	£ -	£ -
Cranfield University	£ -	£ -	£ -	£ 21,706.16	£ 21,706.16
Frontier Economics	£ -	£ -	£ -	£ -	£ -
Regen SW	£ -	£ -	£ -	£ -	£ -
Smart Grid Consultancy Ltd	£ 14,246.62	£ 14,246.62	£ 14,246.62	£ 23,946.02	£ 66,685.87
VEPOD	£ -	£ 10,198.09	£ 15,992.52	£ -	£ 26,190.61
Passiv UK	£ -	£ -	£ -	£ -	£ -
Total	£ 14,246.62	£ 24,444.71	£ 30,239.14	£ 45,652.17	£114,582.64

Forecast

Partner	March 25	April 25	May 25	Total
National Grid Electricity Distribution	£ -	£ -	£ 57,685.00	£ 57,685.00
Cranfield University	£ -	£ 35,669.84	£ -	£ 35,669.84
Frontier Economics	£ -	£ 38,685.17	£ 16,579.83	£ 55,265.00
Regen SW	£ 86,435.28	£ -	£ 85,039.72	£171,475.00
Smart Grid Consultancy Ltd	£ -	£ 24,119.10	£115,245.03	£139,364.13
VEPOD	£ -	£ 4,186.93	£ 5,903.46	£ 10,090.39
Passiv UK	£ 4,770.06	£ 38,954.94	£ -	£ 43,725.00
Total	£ 91,205.34	£141,615.98	£280,453.04	£513,274.36

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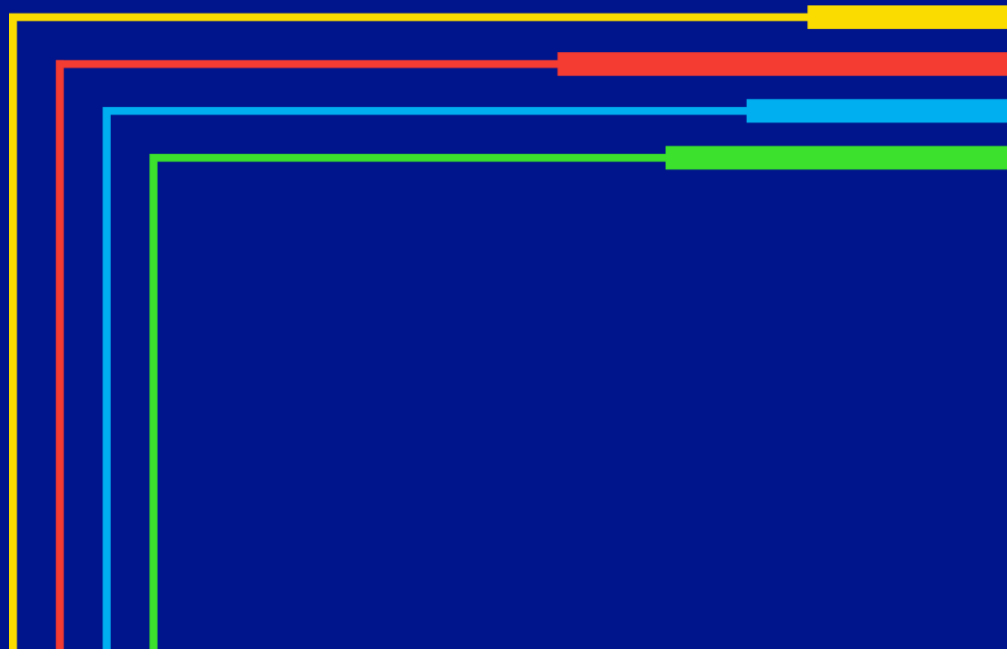
SIF Conditions



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SIF Funding Conditions

	Default SIF Conditions				Specific SIF Conditions
Detail	The Funding Party must not spend any SIF Funding until contracts are signed with the Project Partners named in Table 1 for the purpose of completing the Project.	The Funding Party must report on the financial contributions made to the Project as set out in its Application. Any financial contributions made over and above that stated in its Application should also be reported and included within the Project costs template.	The Funding Party must make reasonable endeavors to participate in all meetings related to the Project that they are invited to by Ofgem, UKRI and DESNZ during the Alpha Phase.	Alpha phase will last for a period of 8 months from the date the Project Direction is issued, the Project will be allowed a flexible start date within the 8-month period. The Project must provide the monitoring officer with the start date and must complete within 6 months of the start date and cannot be completed after the 8-month period has ended	The Funding Party must provide to its monitoring officer by the end of the Alpha Phase comparisons with other innovative approaches to support rural communities in accelerating connection time.
Progress	**All contracts agreed**	**Finance reporting on track**	**All meetings attended, end of phase dissemination planned**	**Start date: 03 Dec 2024** **End date: 30 May 2025**	**WPA4 in progress**

Challenges to taking project into BAU

- Regulatory framework which limits DNO ownership of battery storage
- Cost benefit analysis may indicate community ownership would not be feasible, due to the high CAPEX required, and unavailability of sufficient revenue streams
- Heat provision still relies on individuals purchasing heat pumps rather than a central provision

Ideas for potential future challenges

- Projects looking to provide alternative innovative ways to accelerate the connection of demand assets in constrained areas of rural network.
- Demand provision for agricultural equipment - outside the scope of REACH

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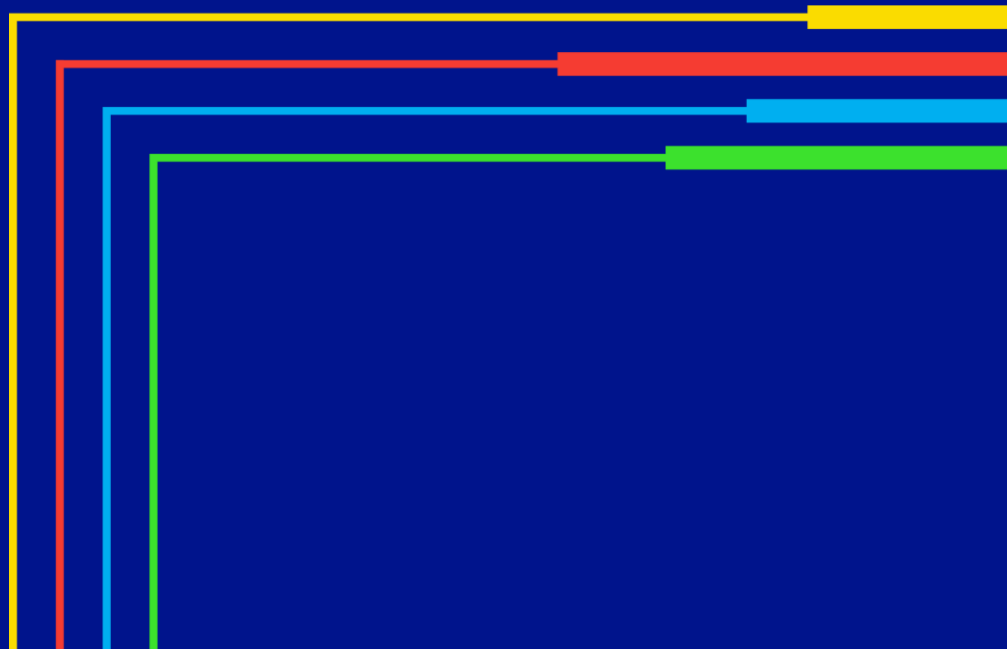
Schedule Next Meeting



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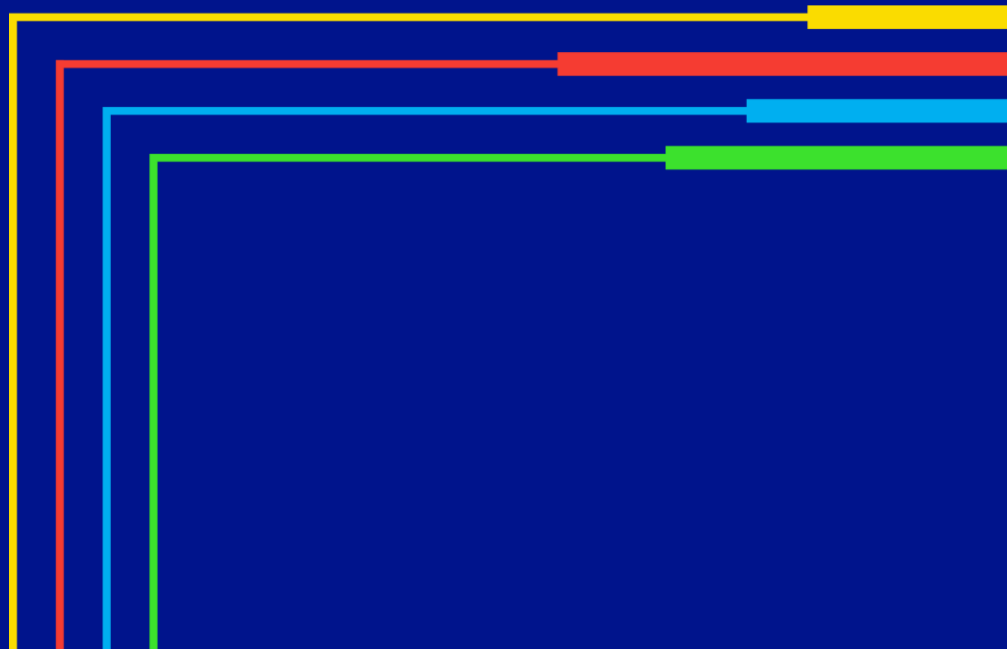
Any Other Business & Close



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