



SHARED: Smart Hydrogen and Resilient Energy Decarbonisation

Alpha Project Kick-off - 09/03/2026

UK Power Networks, The First Element, Frazer Nash Consultancy



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Introductions



Saoirse Lowe	Innovation Project Manager	
Amy Hedger	Co-founder and Director	
Matt Hogbin	Senior Scientist	
Gina Parker	Project Manager	
Luke Hollyman	Senior Consultant	

Project Team



UK Power Networks has delivered successful innovation projects and translated these into business-as-usual, with **over £400m benefits delivered in RIIO-ED1**. UK Power Networks has **committed in RIIO-ED2 to look at innovative approaches to improving supply performance**

- Role: Project management, stakeholder engagement



The First Element is a British start-up, co-founded by Professor Nigel Brandon, developing a portfolio of hydrogen enabling technologies, including an **integrated hydrogen smart tank with metal hydride storage and Internet-of-things (IoT) connectivity**.

- Role: Technology development and testing, supply chain assurance



Frazer-Nash is an engineering technology organisation, with their expertise includes **design and modelling energy systems and integration; hydrogen technologies**, the challenges of innovative technology scale-up and Green Book-compliant **CBA and quantitative assessment**

- Role: Network implementation analysis, business case development

Project Overview

Problem



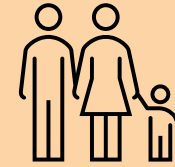
Network Topology

Due to network topology, **rural communities see a greater impact from network faults**, particularly those caused by extreme weather events



High Resilience Costs

Traditional network reinforcement and **resilience projects can be cost prohibitive and take years to deliver, delaying customers seeing the benefits of improved reliability**



Customer Experience

Rural communities tend to be amongst the most poorly served customers. This includes customers who are vulnerable/medically dependant and part of the priority services register (PSR)



Barrier to energy transition

Communities may be **less likely to decarbonise** as a result of their service interruptions. **Decarbonisation** of these communities would likely **exacerbate these issues**

Smart Hydrogen And Energy Resilient Decarbonisation (SHARED) **explores the use of low-cost hydrogen production and storage to reduce interruptions and their impacts for Worst Served Customers in rural communities.**

The Ofgem definition for Worst Served Customers are those that see 12 or more sustained (>3 minute) outages in a 3-year period, with a minimum of 2 in any one year

Solution

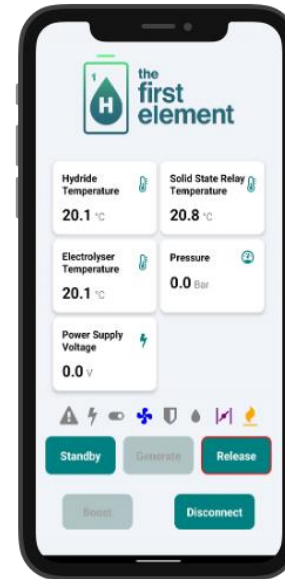


Low cost, modular hydrogen generation and safe, long term storage devices installed to power rural communities

Smart, remotely controlled device to restore power during a supply interruption, coming **online in a matter of seconds**

Installed **ahead of an interruption**, at pre-determined sites rather than in the event of an interruption

Automated solution **replaces the need for manual restoration via diesel generators** which must be driven to site – proactive over reactive



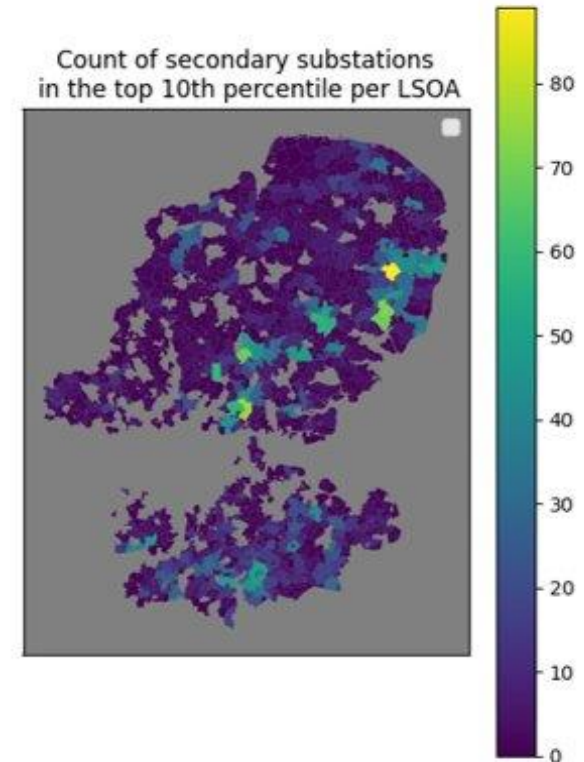
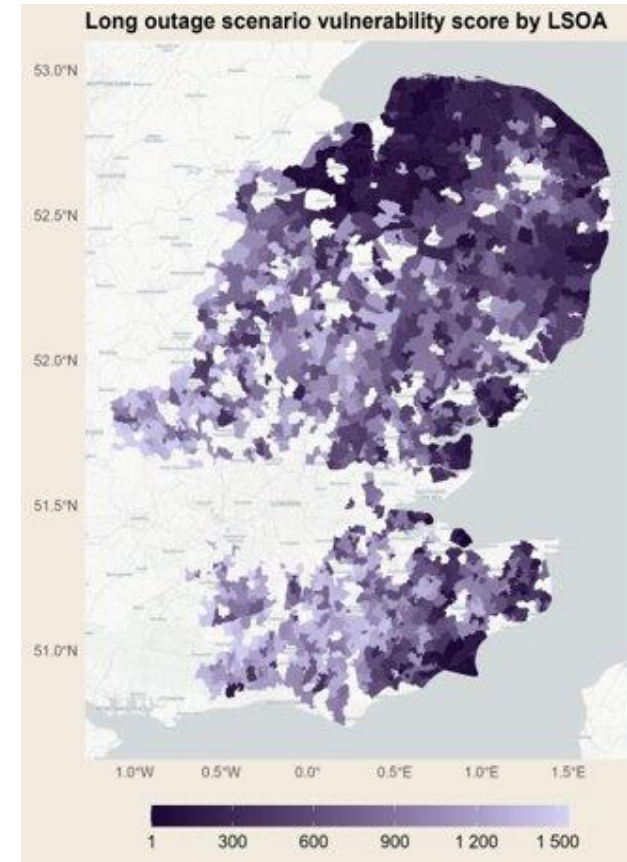
Discovery vs Alpha Project Outcomes

Discovery Outcomes

- Development of two outage scenarios (small, large), representative of real outages and conducted solution technology assessment across both scenarios;
- Identification of rural substations (shown below by LSOA) where SHARED solution would most benefit network & vulnerable customers;
- Identification of stakeholder mapping and definition of engagement plan

Alpha Objectives

- A final concept design for SHARED solution designed to stakeholder requirements, including control and monitoring;
- An established business case for the solution across UK Power Networks' license area;
- Identification of relevant sites suitable for solution



WP1 – Project Management

D1.1.1 Project Kick-off

- Contract signed
- Timelines and work packages agreed
- Kick-off meeting co-ordinated

D1.2.1 Mid-point review

- Review project progress & documentation

D1.3.1 End of Phase & closure

- Delivery & approval of all work packages
- Governance reporting complete
- Project Specific Conditions addressed & evidenced

Success will be deliverables delivered on time and to budget while meeting reporting requirements and Project Conditions

WP2 – Stakeholder Engagement

Objective

To engage key internal and external stakeholder to aid development of the solution and its rollout

Approach:



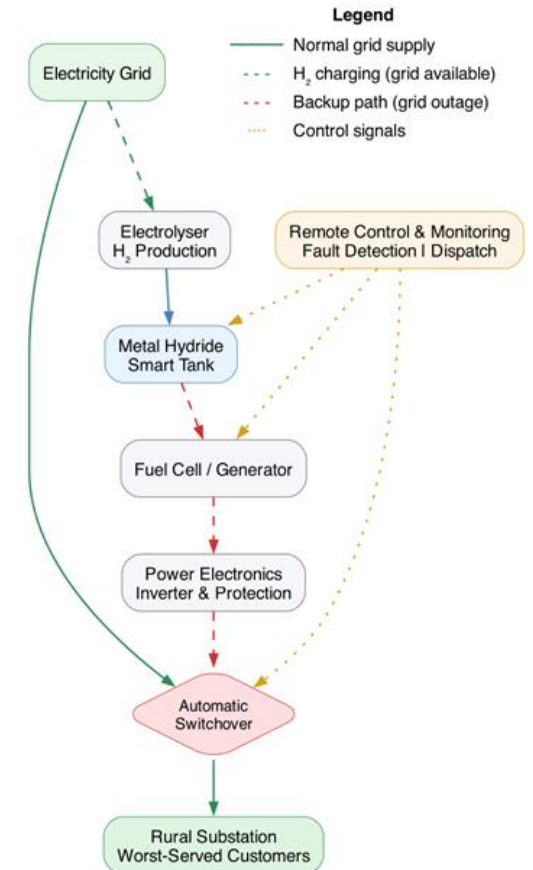
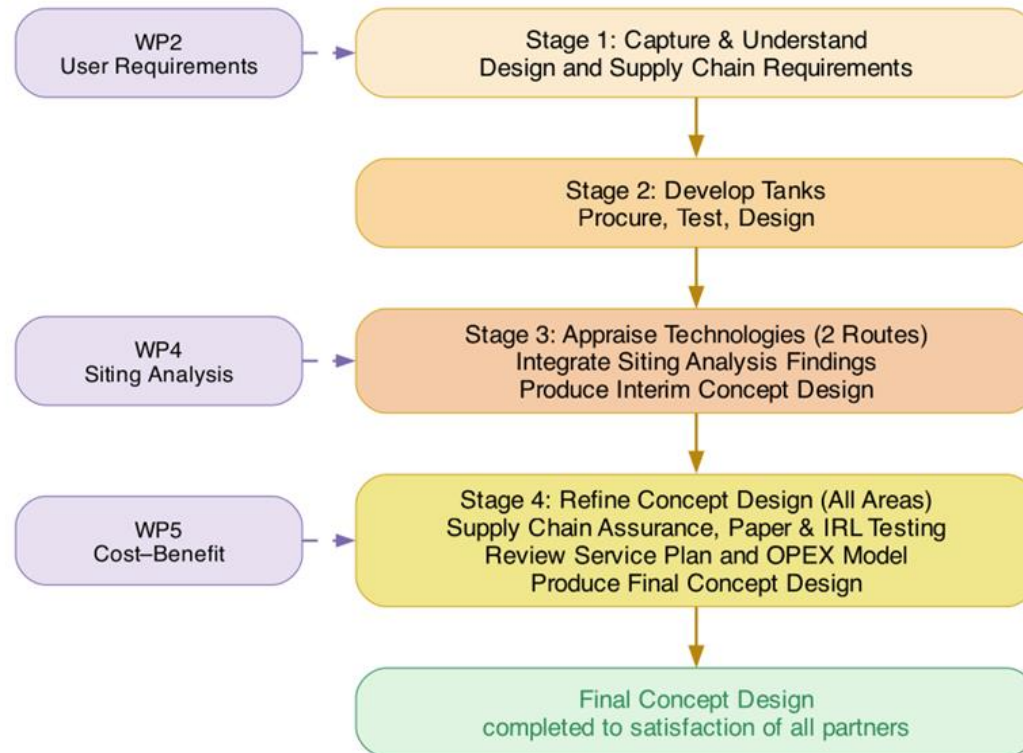
Throughout, we will capture our findings, simultaneously linking with ongoing ED3 engagement with Worst Served Customers

Success will be stakeholder engagement outputs are successfully captured within the solution concept design and cost-benefit analysis

WP3 – Solution Design

Objective

To develop the conceptual design of solution which is cost-effective for improving resilience in rural communities as determined by siting analysis in WP4, that meets user requirements captured in WP2



Success will be the concept design completed to the satisfaction of all project partners and capable of fulfilling the specified requirements

WP4 – Network Implementation

Objective

To understand how the solution designed in WP3 will integrate with UK Power Networks' existing control systems and finalise network locations where the final concept design is cost effective, and therefore understand how the SHARED system could be implemented on the network

Siting Analysis

Mapping the sites where SHARED is the best resilience intervention

Network Simulation

Demonstrating the control & interface of the system with the network

Network Integration Design

Identifying the connection & metering requirements for the network-side systems

Success will be having the requirements for integration and implementation on the network captured

WP5 – Business Case Development

Objective

To develop a thorough cost benefit analysis, based on final concept design and siting analysis, considering a variation of operating models to establish the business case

Commercial & operating
Model review

Cost-benefit
analysis

Business case &
roadmap

Success will be an established business case for the SHARED system as a solution for improving resilience for worst-served customers.

Planned Outputs

At the end of Alpha Phase, the project will have achieved the main objectives of:

1. Developing the requirements and initial design for the solution
2. Quantifying the economic, financial and commercial business case for the solution
3. Shortlisting network location options for a future demonstrator trial

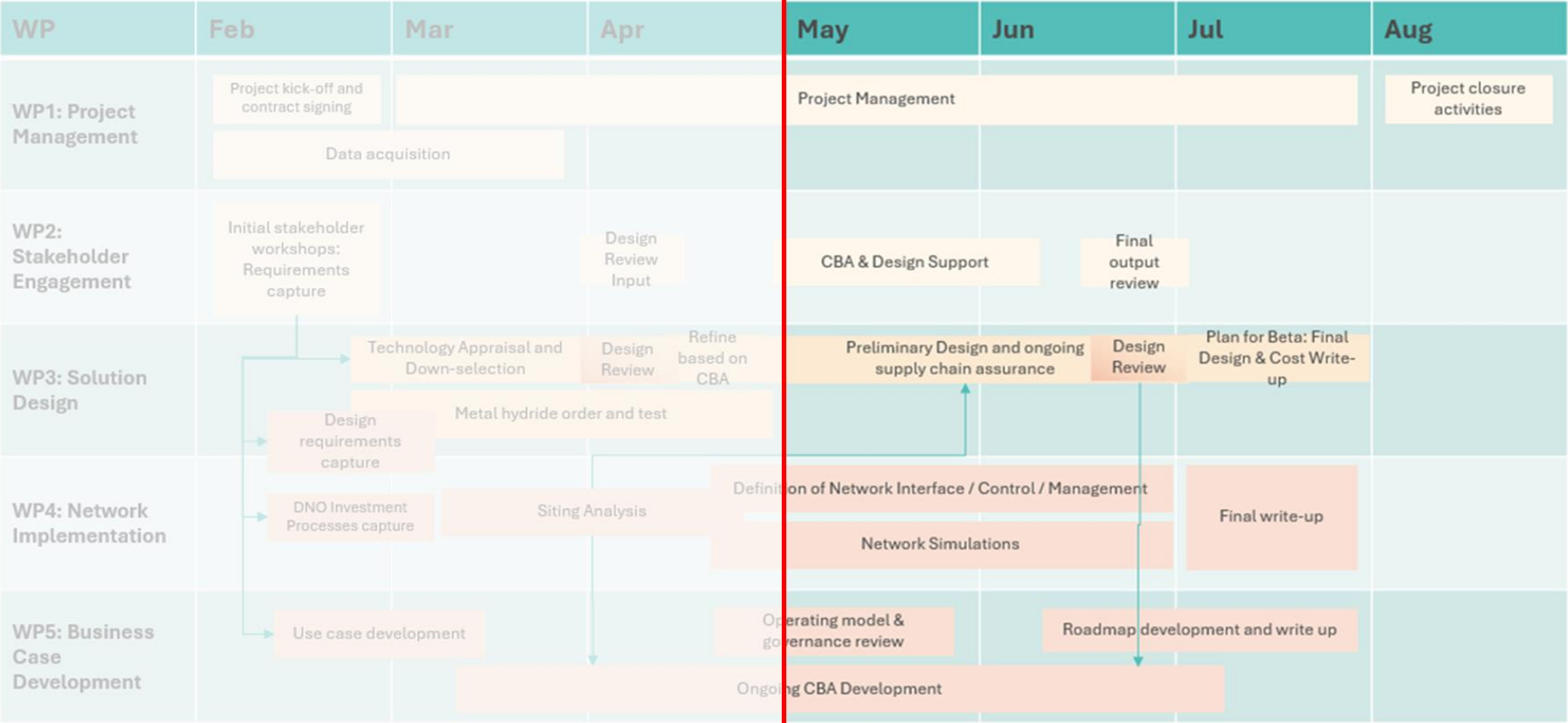
This will take format in the following deliverables table

Deliverable		Success Criteria
D1.1.1	Project Plan	Project governance set up to support project management meetings and enable successful delivery to cost, time and quality. Timelines agreed between partners and successful project kick-off.
D1.2.1	Mid-Point Report	Report progress against plan, key findings and lessons learnt and plans for remainder of project. Successful meeting with assigned IUK Innovation Lead & Monitoring Officer sharing project progress to date.
D1.3.1	End-Point Report	Final project report summarising progress against plan and scope, inputted by all project partners. Project delivered to plan, budget and expert assessors' and project partners' satisfaction.
D2.1.1	Stakeholder Engagement Report	Report captures all relevant insight from stakeholder engagement undertaken throughout Alpha to the satisfaction of all project partners. Stakeholder engagement successfully captured within solution concept design and cost-benefit analysis.
D3.1.1	Interim Concept Design	Interim concept design completed and reviewed by all project partners, including key network operation stakeholders in dedicated workshop.
D3.1.2	Final Concept Design	Final concept design completed based on siting analysis output and ongoing feedback, reviewed by all project partners, including key network operation stakeholders in a dedicated workshop.
D4.1.1	Siting Analysis	Siting analysis consider rural substation characteristics and historic outage data to successfully evaluate SHARED system's economic effectiveness, allowing identification of suitable substations.
D4.1.2	Network Simulation Outputs	Successful test of network faults in simulation to understand performance of SHARED system and benefits to grid, captured in output report.
D4.1.3	Connection and metering requirements technical summary note	Successfully captured connection and metering requirements, with concept design, to project partners' satisfaction.
D5.1.1	Business Case	Business case is established and includes overall cost-benefit analysis on finalised solution design concept and siting analysis.

Q1 Activities

Mid-point

As set in original project plan



By our mid-point, we will have completed:

- All initial workshops & requirements gathered;
- External stakeholders identified and contacted;
- Siting analysis underway and on way to interim concept design.

SIF Governance & Reporting

Project Specific Conditions (1 / 2)

Condition 1

The Funding Party must not spend any SIF Funding until contracts are signed with the Project Partners for the purpose of completing the Project

Condition 2

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 on the Innovation Funding Service (IFS).

Condition 3

The Funding Party must make reasonable endeavours to participate in all meetings related to the Project that they are invited to by Ofgem, UKRI and Department for Energy Security and Net Zero during the Alpha Phase.

Condition 4

The Project will be allowed a flexible start date and duration within the 8-month period from the date the Project Direction is issued. The Project must tell the monitoring officer the start date and end date of the Project.

Project Specific Conditions (2 / 2)

Condition 5

Prior to the end of Phase meeting, the Funding Party must provide to the Monitoring Officer a consumer engagement plan. This must include a clear approach to capturing and incorporating consumer experience and behavioural insights. The plan must also set out how learning from relevant hydrogen trials, including H100 Fife, has been considered.

Condition 6

Prior to the end of Phase meeting, the Funding Party must provide to the Monitoring Officer a summary of the proposed safety assurance, monitoring arrangements, and emergency response protocols for future trial activities.

Condition 7

Prior to the end of Phase meeting, the Funding Party must provide to the Monitoring Officer:

- a summary of the key outputs, findings, and lessons learned from the Project, together with a plan outlining how these will be disseminated openly to support replication and learning across GB electricity networks, as is required in the end of phase report;
- a statement setting out how learning from the Alpha Phase informs future scalability and application of the solution, including applicability to different rural network conditions and integration into business-as-usual resilience planning;
- a summary demonstrating where the SHARED solution is cost competitive when compared to alternative options, including diesel generators, battery storage, and network reinforcement.

Project Risks (1/2)

Ref	Risk Description	Likelihood	Impact	Mitigation	Related Work Package	Risk Owner	Status
R1	Stakeholder unavailability Key internal stakeholders might be unavailable or unidentifiable for user research sessions, delaying the understanding of user needs and requirements	Low	High	Stakeholder engagement will be conducted in the early phases of Alpha Phase to ensure input from engagement. Contacts and resourcing was acquired as part of this bid preparation, has been allocated for within costing, with dates agreed with key internal stakeholders. We will reengage as soon as project award notification to ensure engagement implemented throughout the project.	WP2	UKPN	Open
R2	Contract sign off delayed	Medium	Medium	When approval for Alpha Phase is reached, project partners to start working on the project contract. Project partners legal teams to meet to discuss comments and finalise contract. UK Power Networks will use learnings from the previous projects to help accelerate the legal approval.	WP1	UKPN	Open
R3	Delays in acquiring necessary data sources Cause delays in geospatial analyses putting the project behind schedule.	Medium	High	Data request for UK Power Networks are being prepared ahead of project start to allow more time to prepare and data acquisition will begin at the outset of the project.	WP1	UKPN	Open
R4	Insufficient data for Alpha Phase Although data is provided on time and in line with Alpha requirements it is insufficient for siting analysis and other key pieces	Low	Medium	Data request for siting analysis has been prepared ahead of Alpha Phase bid submission and agreed with data owners. Scope has been built on agreed data.	WP1	UKPN	Open
R5	Scope creep Uncontrolled changes or continuous expansion of the project scope may affect timelines, resources, and project quality	Low	Medium	The project scope has been designed in collaboration with the project partners. The partners carrying out the work are aware of the requirements. Scope for Alpha Phase is locked and any new opportunities to extend scope will be considered for subsequent phases of project.	WP1	UKPN	Open
R6	Resource constraints Insufficient resources (personnel, time, budget) may lead to delays or reduced quality of deliverables	Low	High	Project partners have made commitments to ensure the project is properly resourced.	WP1	UKPN	Open

Project Risks (2/2)

Ref	Risk Description	Likelihood	Impact	Mitigation	Related Work Package	Risk Owner	Status
R7	Budget overruns Project costs may exceed the allocated budget due to unforeseen expenses or underestimation, impacting financial resources	Low	Medium	Cost assessments for each partner have been undertaken based upon a thorough consideration of requirements. Through the project management plan and regular monitoring, cost analysis will also be undertaken to ensure any increases are dealt with early enough	WP1	UKPN	Open
R8	Project overruns Underestimating the time required for tasks could lead to schedule overruns and resource strain.	Low	Low	We will use good project management practices - with a weekly meeting, clear ownership of tasks and deliverables, and risk/dependency management We will mobilise the team in the week ahead of the project kick-off to ensure all parties are resourced, clear on their roles, and clear on timescales for their delivery commitments	WP1	UKPN	Open
R9	The barriers (policy, and regulatory) are too great to overcome. The project is not feasible and project stops.	Low	Low	We will complete a regulatory review and look for any considerable blockers to this project. The project will take learnings from other innovation projects.	WP5	FNC	Open
R10	Solution is found to be cost-prohibitive	Medium	High	We have structured Alpha Phase to ensure that we capture key requirements, including network investment decision processes, and the results of the siting analysis in the design and size of the solution. This, paired with the modular approach, will ensure we avoid any oversizing.	WP5	FNC	Open
R11	Delays in testing of metal hydride solution	Low	Low	Upon contract award, TFE will book and reserve lab space at Coventry University and place the order for the necessary materials for testing, well-ahead of required usage.	WP3	TFE	Open
R12	Solution does not meet network requirements	Low	High	We have structured Alpha Phase to ensure that we capture key requirements from UKPN, with dedicated stakeholders resourced to the project and dedicated workshops to cover design, safety and network integration requirements. Informal engagement with SSEN will validate these requirements are scalable to DNOs wider than UKPN.	WP3	TFE	Open

Questions & AOB