Scottish Enterprise

Digital Solutions for Energy Transition and Manufacturing

Phase 2 – Additional Information

Contents

Challenge 1 – Harris Tweed

Context

The Harris Tweed® supply chain is decentralised and heritage-based, involving:

- Commercially independent mills Harris Tweed Hebrides (HTH) and Kenneth Mackenzie Ltd (KMK), who serve as the primary economic operators for exports;
- ~150 self-employed, home-based weavers, who contribute core production inputs as commission weavers;
- The Harris Tweed Authority, a statutory body responsible for certifying finished cloth as genuine Harris Tweed®;
- Downstream customers. Lochcarron of Scotland is participating to demonstrate garment-level traceability using finished Harris Tweed® cloth.

Core Requirements

1. End-to-End Traceability
   Track and link product data from wool origin through yarn production, weaving, finishing, certification, and garment production.
2. Low-Burden Implementation
   Solution must be cost-effective, light-touch, and practical
3. Interoperability
   The solution must support both B2B data sharing with manufacturers and brands, and B2C readiness for issuing the Digital Product Passport.
4. Compliance-Ready Fields
   Capture expected data types:

- Composition and material origin
- Dyeing and finishing methods
- Energy, water and carbon impact
- Packaging and logistics
- End-of-life information

5. Scalability
   Solution should be scalable for broader use across the Scottish textile sector and adaptable to future legislative requirements.

Outcome

A working pilot that demonstrates DPP-compliant traceability from raw fibre to finished garment, enabling future compliance, strengthening supply chain transparency, and supporting the reputation of Scotland's textile sector.

Challenge 2 – Storm Energy

STORM

Challenge Overview

As the energy landscape evolves, decentralised systems are becoming the norm – with solar, battery, EV, and smart meter technologies deployed across homes and businesses. To enable trusted billing, carbon tracking, and energy trading at scale, we are seeking a solution that can:

- Capture performance data from multiple distributed sources
- Verify that data is accurate, tamper-proof, and traceable
- Share it securely with authorised parties in a standardised, transparent format.

This data layer is central to OpenGrid, a decentralised digital energy platform enabling households and businesses to trade energy and carbon credits securely and compliantly

Core Technical Requirements

- Interoperable Data Capture: Must integrate with multiple sources, including smart meters (SMETS2), solar inverters, batteries, sub-meters, and EV chargers.
- Trust Layer: Support cryptographic verification or blockchain anchoring to ensure traceability and prevent tampering.
- User Consent & Access: Must include GDPR-compliant user controls and standardised consent mechanisms (aligned with Ofgem's CC Solution guidance).
- APIs & Compatibility: Platform-agnostic design with open API access for downstream billing, trading, and analytics systems.
- Data Standardisation: Preference for compliance or alignment with PAS 2038, IEC 61850, OpenADR, or similar standards.

Advanced Trading-Ready Features (Desirable)

To support peer-to-peer trading and smart billing use cases, the following features are highly desirable:

- Smart Contract Compatibility: Ability to trigger programmable rules (e.g. price, timing, source) based on verified energy events.
- Marketplace Integration: Support for trading logic (price matching, order execution, or flexible auction-style matching).
- Carbon Credit Readiness: Translate energy use/generation into CO_2 equivalent and support tokenised tracking or credit issuance.
- User Identity Layer: Optional support for KYC or verified user credentials to protect transaction integrity.

- Regulatory Reporting Hooks: Ability to generate audit logs or summaries to comply with resale/licensing frameworks under Ofgem and other UK market rules.

Deployment and Pilot Considerations

- Initial Scope: Pilot will include mixed residential and business sites with a variety of metering setups and renewable assets.
- Integration Focus: Preference for modular “plug-in” design to overlay existing hardware/software without requiring wholesale replacement.
- Scalability: Solution should be scalable across thousands of endpoints with modular onboarding and low operational overhead.

Support & Documentation: UK-based or EU-aligned support preferred. Clear implementation documentation is essential.

Challenge 3 - OEUK

Offshore Energies UK (OEUK) Overview

Offshore Energies UK are the leading trade association for the UK's offshore energy industry, giving a voice to over 400 organisations and businesses throughout the country. Our membership is open to all companies from the largest producers and developers, to contractors, consultancies and the smallest start-ups. The majority of these members are based in Scotland. OEUK primarily cover the offshore energy Industry and Supply chain across; Carbon Capture Utilisation and Storage (CCUS), Hydrogen, Offshore Floating Wind and Oil & Gas including decarbonisation and decommissioning.

Current Barriers

Within Offshore Energies UK (OEUK) a large number of data sources across the offshore energy mix (oil & gas, wind, carbon capture and storage (CCS) and hydrogen. These data sources provide a large number of insights already that drive forward a number of improvement activities particularly in the areas of safety (personal and process) and industry performance against key metrics and regulatory compliance.

- Data Standardisation: data sources and key metrics are often non-aligned across differing sectors; organisations remain a persistent challenge.
- Security & Governance: sharing or operational, safety & environmental data securely and in compliance with internal and external standards requires robust protocols.
- Change Management: cultural and procedural adjustments to drive adjustments and performance can slow down digital adoption unless benefits are clear and immediate.
- Collaboration & Alignment: Collaboration & innovation demands a strong common data evidence base and early stakeholder engagement to gain an alignment.
- Isolation: A large number of cases the data sources are accessed in a standalone manner.

Potential Next Steps

With such a broad and increasingly diverse energy mix this has driven a reliance on innovative and collaborative solutions. Digitisation and block chain technology is the key aspect that will combine and unlock innovation and collaboration. Through a studies & workshops completed by Net Zero Technology Centre, North Sea Transition Forum and OEUK a digital collaboration tool that will encompass benchmarking, performance basis that help foster sharing of good practices & lesson learned. The obvious solution is a controlled access Data Trust.

Challenge 4 - Soltropy

Introduction

In the renewable energy sector, homes and businesses increasingly use a mix of technologies—solar PV, solar thermal, heat pumps, and traditional heating systems. A critical challenge is that each technology operates in isolation, monitored by its own proprietary system. This leaves the end-user with fragmented data and with difficulty in assessing and improving performance.

Ideal Partner Profile

We are seeking a long-term strategic partner with expertise in delivering robust, end-to-end IoT solutions.

Core Technical and Delivery Requirements

Partner must provide demonstrable, in-house experience across the following areas:

1. Unified Full-Stack IoT Platform Development:

- Multi-System Integration: Architecture must harmonise data from various third-party sources (e.g., solar PV inverters, heat pumps etc) alongside our solar thermal technology which incorporates 1-Wire bus technology to minimise cabling complexity.
- Bespoke Sensor Hardware: Proven capability in the electronic and mechanical design of robust, low-cost, and weatherproof (IP67+) sensor.
- Intelligent Cloud Analytics: Scalable cloud infrastructure with analytics for:
  - Automated fault detection and diagnostics across all connected systems.
  - Performance optimisation algorithms.
  - Generation of verifiable data suitable for ESG and carbon emissions reporting.
- Intuitive User Interfaces: Expertise in creating clear and intuitive front-end apps:
  - A customer-facing mobile/web app unify system data into one dashboard.
  - A comprehensive backend portal for technicians, featuring advanced diagnostics, fault reporting, and maintenance alerts.
- Blockchain for Data Integrity: Experience in leveraging blockchain.

2. Prototyping, Manufacturing & Deployment:

- In-house Prototyping: On-site facilities for rapid prototyping of hardware components.
- Small-Scale Manufacturing: Small-scale sensor hardware production runs.
- Field Trial Management: Track record of in-situ field trials of new IoT technologies.

3. Regulatory, Quality & Project Experience:

- Quality Management: Must have ISO 9001 Quality Management System.
- Regulatory Compliance: Design experience for UK/EU standards.

Sector Knowledge: Previous project experience in solar thermal, building management systems (BMS), or a closely related renewable energy sector is highly desirable.

Challenge 5 – TUAL

Essential Criteria

Operational Experience and Fit

- Embedded Systems Expertise
  - Partner must have direct experience working with embedded development teams and understand the constraints of edge-integrated hardware systems.
- EV Charging Domain Expertise
  - Hands-on delivery experience withing the EV charging environment—including protocols, safety standards, and charger behaviour—is essential for effective integration. Specific applied knowledge with OCPI/OCPP from both device and cloud sides.
- Expert Knowledge in Cloud and Infrastructure Engineering
  - Ability to plan, design, and implement cloud solutions on AWS (AWS certifications and partner status preferred)
- Collaborative Working Style
  - Willingness to work closely with in-house and agency embed and systems teams, including in-person engineering sessions in Glasgow as required.
  - Comfortable engaging in fast-moving, field-driven deployment cycles.

Team and Platform Capabilities

- Developed & Deployable Platform
  - The orchestration platform must already exist, with demonstrated deployment in real-world settings (e.g. industrial IoT, energy, or mobility).
  - The core functions—asset provisioning, OTA updates, and audit logging—must be field-proven, not conceptual.
  - User interfaces to control OTA update assets must be both field-proven and intuitive
- Tamper-Proof Logging Mechanism
  - Partner must offer an immutable audit mechanism (e.g. cryptographic ledger or blockchain) capable of logging update attempts, delivery state, and success/failure events—even under delayed sync conditions.
  - Comprehensive & field-proven firmware version management.
- Multi-Vendor Interoperability
  - Solution must support integration with varied charging hardware and telemetry stacks without requiring bespoke builds for each.

- Resilience to Connectivity Constraints
  - System architecture must operate effectively in low-bandwidth or intermittent environments, maintaining safe local operation without constant cloud access.
- Live Asset State Visibility
  - Must support real-time or near-real-time visibility of fleet-wide asset status and software version control for operational and compliance needs.

Desirable Criteria

Operational Experience and Fit

- Delivery Experience with Charging OEMs or Energy Platforms
  - Prior collaboration with charger manufacturers, grid integrators, or energy management platforms that operate in field-deployed infrastructure contexts.
- Track Record in Safety-Critical or Regulated Deployments
  - Background delivering systems in environments where auditability, operational assurance, and compliance pressures shape delivery practices (e.g. transport, healthcare, utilities).
- Cross-Disciplinary Integration Mindset
  - Demonstrated ability to work across software, hardware, and operations teams with sensitivity to end-user workflows and on-the-ground constraints.

Team and Platform Capabilities

- Native Blockchain-Based Audit Layer
  - Use of blockchain or similar technologies to reinforce tamper-proof auditability is strongly preferred
- Flexible Infrastructure Support
  - Ability to assist with cloud infrastructure (e.g. AWS setup or deployment acceleration) is beneficial.
- Track Record in Regulated Infrastructure

Prior deployments in regulated fleet, energy, or public infrastructure sectors will be viewed favourably.

Challenge 6 – Stewart Technology

Please check back for updates from this challenge holder.

Scottish Enterprise

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