Committee	Board		
Date paper prepared	3/6/26	**Date of committee meeting**	17/06/2026
Subject	Hydrogen Projects Update June 2026		
Author	Joe MacPhee		
Action requested	I. For noting		
Purpose of the paper	The purpose of this report is to update the NWH Board of Management on current and future developments in Hydrogen activities led and supported by UHI North, West and Hebrides (UHI NWH).		
Summary of the paper	UHI NWH are involved in a number of local, national and international projects involving Hydrogen developments following the redevelopment of the Technology and Innovation Centre, the creation of a STEM learning space for school engagement, investment in mobile equipment to support outreach to communities beyond Stornoway and the development of the Hydrogen Lab supported by Point and Sandwick Trust. A summary of the key projects is provided in the Report.		
Consultation			
Resource implications	Funding is required to enable key members of staff to be released and other research staff to be recruited to support and respond to project collaboration and income generation opportunities.		
Risk implications	The main risk is in relation to not having the staff resource capacity to capitalise on opportunities.		
Link with strategy	The project links directly to key College priorities for curriculum growth, income generation, new research activity and international.		

Equality, Diversity, and Inclusion	Ensuring our documents can be read and understood by everyone, including people with disabilities or impairments, is a legal requirement under the Equality Act 2010.
Island Community Impact	Summarise how any actual or potential (positive or negative) impacts on island communities have been considered in the development of the paper. the Island communities impact assessments: guidance and toolkit - gov.scot (www.gov.scot) **Things to consider:** • Will your policy, strategy, service, or decision have the same impact across the region or area? Think about whether there are potential island impacts which differ from the regional impact or whether there are any barriers which may unfairly disadvantage islanders. • If your policy, strategy, or service is mainland-focused, you should consider if there is a corresponding need in island communities and think about how this has been otherwise considered or catered for. • It is also a good idea to identify any benefits for the island community, such as better access to services.
Paper status	☐ **Open – The paper may be circulated to non-members of the committee and published online without restriction.** ☒ **Restricted** – The paper must not be circulated to non-members or published online until after the committee meeting. ☐ **Confidential** - The paper must not be circulated beyond the committee members and should not be published online. Some information is considered commercially sensitive. [Please note papers may still be subject to Freedom of Information requests – see below].
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HYDROGEN DEVELOPMENTS UPDATE JUNE 2026

INTRODUCTION

The purpose of this report is to update the Finance and General Purposes Committee on current and future developments in Hydrogen activities led and supported by UHI North, West and Hebrides (UHI NWH).

Nigel Holmes, Chief Executive of Hydrogen Scotland, will present an overview to the UHI NWH Board on current Hydrogen projects in Scotland and future opportunities.

BACKGROUND

Under current plans demand for Green Hydrogen in the UK is anticipated to reach around £25bn by the year 2045. This includes 14.9TWh per annum required for transport targets laid out by the Scottish Government. Across Europe, Green Hydrogen demand is anticipated to rise to around 20 million tonnes by 2030, further tripling to 60 million tonnes by 2050. There is also a significant global market for Green Hydrogen, particularly in Africa.

The Scottish hydrogen sector (including green, blue and grey hydrogen) in the 2022/23 financial year produced a total turnover of £57 million, with a business count of 100 and total FTE count of under 500; however export and import of all hydrogen were both under £500,000.

Over the next decade, the sector will require substantial workforce development in:

- electrolyser operation and maintenance
- hydrogen safety and risk management
- grid and microgrid integration
- renewable intermittency management
- hydrogen storage and compression
- fuel cell systems
- remote and islanded energy systems

CURRENT PROJECT ACTIVITY

UHI NWH are involved in a number of local, national and international projects involving Hydrogen developments following the redevelopment of the Technology and Innovation Centre, the creation of a STEM learning space for school engagement, investment in mobile equipment to support outreach to communities beyond Stornoway and the development of the Hydrogen Lab supported by Point and Sandwick Trust. A summary of the main projects are highlighted below:

<u>Creed Hydrogen Skills and Innovation Centre</u>

The hydrogen facility under construction in Stornoway by PlusZero, in partnership with UHI NWH and Comhairle nan Eilean Siar, represents a strategically important development for hydrogen education, workforce training, and applied energy research within the UK. The facility will provide industrial-scale green hydrogen production integrated with teaching, skills development, and research, creating a unique opportunity to develop advanced training methods for the emerging hydrogen economy.

This dual purpose model—industrial production combined with education and R&D — positions Creed Park as a unique asset in the UK's hydrogen landscape, with the potential to become a flagship for skills development in the sector enabling students to train on equipment that reflects the scale and complexity of the large scale hydrogen projects planned across the UK over the next decade.

UHI NWH currently delivers the PDA Hydrogen: An Introduction for Technicians, a programme designed to upskill workers entering the hydrogen sector. The course is delivered primarily online, with a 3–4 day residential component providing hands on experience with hydrogen equipment.

There are no comparable training facilities or academic programmes in the UK that combine:

- industrial scale hydrogen production
- direct student access to operational equipment, and
- an integrated research and teaching environment.

The project is currently experiencing some delays due to challenges with the private sector funding element of the project leading to delays in the in the procurement of electrolyser equipment. The revised forecast completion date is late November 2026. A visit has been arranged for Board Members to the facility on Thursday 18th June 2026 and to meet the operator on site.

There is no direct funding contribution from UHI NWH to the project and therefore no significant financial risk from the delayed completion date.

The project has the potential to contribute to income generation targets once the project is fully established through increase in part-time students and commercial income through engagement with employers. Additional staff will only be engaged where there is a clear business case and a viable number of students and businesses.

Staff are also developing a funding proposal to develop a digital training, simulation, and remote access ecosystem that will enhance accessibility, educational impact, operational readiness, and research capability associated with the Creed Park facility. A draft copy is available at Appendix 1 below.

Other related activity includes a bid to the University Transformation Fund (UTF) to develop a Hydrogen Research Strategy. The research will aim to expand the UHI NWH Renewable Energy portfolio and incorporate two new areas of investigation:

1. The advancement of hydrogen technologies, supported by UHI NWH Future's Energy Lab and the Creed project, to include research focused on enhancing production efficiency, optimising storage and transportation methods, and improving both electrolyser membrane technology and fuel cell design.
2. Develop a hydrogen economy model by examining community-owned renewable electricity for hydrogen production, evaluating integration with hybrid renewable-battery systems for industrial decarbonisation, analysing competitive production costs, and pinpointing measures to enable a viable local hydrogen market.

Support for this research is expected to be transformative, as it will provide valuable income growth for UHI NWH as part of their financial recovery plan, enable the institution to pursue competitive research funding, and facilitate collaboration with other universities and industry experts to advance the green hydrogen economy in the region.

British Council – Going Global Partnership

UHI NWH were successful in securing grant funding of £25k from the British Council for the purposes of the UK-South Africa International Skills Partnerships of the Going Global Partnerships Programme.

As part of a Going Global programme, a delegation from UHI North, West and Hebrides visited project partner Thekwini College in Durban, South Africa, for a week focused on green hydrogen development in the KwaZulu-Natal province. South Africa is just beginning on the path to developing a green hydrogen economy, and UHI NWH were invited to draw on their 20 years of experience and expertise to assist in establishing a new hydrogen training laboratory and to develop relevant technician-level training materials to support this emerging sector.

During this highly productive visit, UHI NWH staff delivered hydrogen-focused training to eight Thekwini College lecturers and engaged with a wide range of industry stakeholders, research partners, national accreditation bodies, and eThekwini Municipality officials. These engagements enabled valuable knowledge exchange and supported discussions on the co-development of new hydrogen training programmes in South Africa. The visit included a conference that drew together researchers from Durban

University of Technology and from across the KwaZulu-Natal region alongside national accreditation bodies, resulting in a clear strategy for future hydrogen skills development and training provision, with the goal of making Thekwini College the leading hydrogen technician training centre in the KwaZulu-Natal province.

A reciprocal visit by Thekwini College staff to the Stornoway campus of UHI North, West and Hebrides is planned for later in the year to continue the collaboration and deliver further hydrogen training.

Discussions are on-going with the British Council to extend the project for a three-year period.

International Collaboration - Germany

Dr Alasdair Macleod, Engineering Lecturer and Roddy Ferguson, Curriculum Manager, visited the Gewerbliche Schule in Backnang, Germany - home to the HyLab | Hydrogen Learning Center Backnang.

The visit explored opportunities for partnership and knowledge exchange in hydrogen technologies and toured the school's cutting-edge facilities, which are currently undergoing a €10 million upgrade to support hydrogen, construction, and automotive engineering. They also met with local industry partners involved in high-temperature hydrogen fuel cell research, further strengthening the potential for international collaboration.

KEY CHALLENGES AND RISKS

Key challenges include limited staff resources and research capacity within UHI NWH to support further activity and respond to project collaboration and income generation opportunities. It is anticipated that the UTF investment bid in will enable the recruitment of two research associates, who will be tasked with developing a Hydrogen Research Strategy for the region.

RECOMMENDATIONS

It is recommended that the Finance and General Purposes Committee note the update on current and future developments in Hydrogen activities led by UHI NWH.

Joe MacPhee
Head of Strategic Projects

Appendix 1

Draft Proposal

Enhancing Training and Research Capacity at the Creed Park Hydrogen Facility

Summary

The hydrogen facility under construction in Stornoway by **Plus Zero**, in collaboration with **UHI North, West and Hebrides (UHI NWH)** and **Comhairle nan Eilean Siar**, represents a strategically important development for hydrogen education, workforce training, and applied energy research within the UK. The facility will provide **industrial-scale green hydrogen production** integrated with **teaching, skills development, and research**, creating a unique opportunity to develop advanced training methods for the emerging hydrogen economy.

This proposal seeks funding to develop a **digital training, simulation, and remote-access ecosystem** that will enhance accessibility, educational impact, operational readiness, and research capability associated with the Creed Park facility. These developments will ensure that the facility becomes a **nationally significant centre for hydrogen skills**, overcoming geographical constraints and enabling UK-wide participation.

1. Introduction

The new hydrogen production facility at Creed Park, Stornoway is a major strategic collaboration between **plus Zero**, **Comhairle nan Eilean Siar**, and **UHI NWH**. The facility will produce green hydrogen at **megawatt scale**, while also serving as a **national centre for hydrogen training and applied research**.

This dual-purpose model—industrial production combined with education and R&D—positions Creed Park as a **unique asset in the UK's hydrogen landscape**, with the potential to become a flagship for skills development in the transition to Net Zero.

2. Background and Rationale

UHI NWH currently delivers the **PDA Hydrogen: An Introduction for Technicians**, a programme designed to upskill workers entering the hydrogen sector. The course is delivered primarily online, with a **3–4 day residential component** providing hands-on experience with hydrogen equipment.

At present, this practical component is limited to **kilowatt-scale systems**. The Creed Park facility will operate at the **megawatt scale**, enabling students to train on equipment that reflects the scale and complexity of the **large-scale hydrogen projects planned across the UK** over the next decade.

There are **no comparable training facilities or academic programmes** in the UK that combine:

- industrial-scale hydrogen production,
- direct student access to operational equipment, and
- an integrated research and teaching environment.

This positions Creed Park to become a **national centre of excellence for hydrogen skills**.

However, the **geographical remoteness** of the site presents challenges:

- travel cost and time,
- limited duration of residential training,
- variable prior experience among learners,
- reduced opportunities for repeated hands-on access.

A **digital augmentation strategy** can significantly enhance the educational value of the facility, broaden access, and support national workforce development.

3. Strategic Need

The UK hydrogen sector is expected to expand rapidly over the next decade, requiring substantial workforce development in:

- electrolyser operation and maintenance
- hydrogen safety and risk management
- grid and microgrid integration
- renewable intermittency management
- hydrogen storage and compression
- fuel-cell systems
- remote and islanded energy systems

Current training provision is limited and typically operates at **laboratory or desktop scale**. The Creed Park facility offers a rare opportunity to expose learners to **MW-scale hydrogen infrastructure**, but its remote location limits the frequency and duration of physical access.

Digital augmentation can:

- improve learner preparedness,
- reduce on-site training time,
- enhance safety,
- support national access,
- and enable research and innovation.

4. Project Objectives

Objective 1 — Immersive 3-D Virtual Facility

Develop a high-fidelity interactive 3-D model of the Creed Park hydrogen site enabling users to:

- walk through the facility in VR,
- interact with equipment,
- access embedded technical information,
- simulate operational procedures,
- conduct safety familiarisation exercises.

Deliverables

- VR walkthrough application
- Desktop-accessible virtual tour
- Interactive equipment modules
- Safety scenario simulations

Educational Benefits

- Reduced cognitive load during residential training
- Improved procedural familiarity
- Enhanced safety awareness
- Remote accessibility for industry learners

Objective 2 — Hydrogen Digital Twin Platform

Develop a dynamic **Digital Twin** of the hydrogen production system incorporating:

- wind-turbine generation with real weather datasets
- electrolyser dynamics
- hydrogen storage and compression
- fuel-cell operation
- energy balancing and dispatch
- transport and logistics modelling

The Digital Twin will function as both a **teaching tool** and a **research platform**.

Example Features

- Renewable variability modelling
- Electrolyser efficiency and degradation studies
- Grid-interaction and curtailment scenarios
- Hydrogen buffering and hybrid-system optimisation

This creates a pathway toward **applied research, consultancy, and innovation**.

Objective 3 — Remote Hydrogen Laboratory

Develop a **kW-scale isolated hydrogen system** that can be safely operated remotely via secure software interfaces.

This will enable:

- remote experimentation,
- real-time monitoring,
- data logging,
- fault-diagnosis exercises,
- control-systems training.

Students will be able to:

- start/stop electrolysers,
- modify load demand,
- observe transient responses,
- analyse hydrogen flow dynamics,
- compare simulated vs real system performance.

5. Research and Innovation Component

The combined Digital Twin + Remote Laboratory framework enables research in:

- renewable intermittency and forecasting
- hydrogen systems optimisation
- predictive maintenance
- AI-assisted energy management
- human–machine interaction
- remote operations for islanded energy systems

The facility could become a **national testbed** for distributed hydrogen infrastructure and remote-operations research.

6. Novelty and National Significance

This project is potentially **unique within the UK** because it combines:

Capability	Existing UK Provision
MW-scale hydrogen training	Rare
VR industrial hydrogen training	Limited
Digital Twin integrated with real facility	Very limited
Remote-access hydrogen experimentation	Rare
Combined teaching + research platform	Potentially unique

The project directly supports:

- Net Zero workforce development
- the UK Hydrogen Strategy
- hydrogen skills shortages
- rural and island innovation

- digital delivery of technical education

7. Proposed Work Packages

WP	Title	Duration
WP1	Site capture and 3-D modelling	Months 1–3
WP2	VR environment development	Months 2–6
WP3	Digital Twin modelling	Months 3–9
WP4	Remote lab hardware integration	Months 5–10
WP5	Educational content development	Months 6–11
WP6	Testing and deployment	Months 10–12

8. Expected Outcomes

Educational

- Enhanced learner preparedness
- Increased training capacity
- Improved retention and understanding
- National accessibility

Economic

- Workforce development
- Industry engagement
- Attraction of hydrogen-sector partnerships
- Potential commercial licensing of training tools

Research

- Publication opportunities
- Applied energy-systems research
- Future collaborative funding applications

9. Funding Requirement

Funding is sought for:

- software development,
- VR environment creation,
- Digital Twin modelling,
- remote laboratory hardware,
- control-systems integration,
- research assistant support,
- educational content production.

A detailed costing can be provided following discussion.

10. Long-Term Vision

The Creed Park facility has the potential to evolve into:

- a **national hydrogen training centre**,
- a **remote energy-systems research hub**,
- a **demonstrator for island-based renewable hydrogen systems**,
- a **model for digitally enhanced industrial technical education**.

The combination of physical infrastructure and advanced digital learning tools would position the **Outer Hebrides as a UK leader in hydrogen skills development and applied renewable-energy innovation**.

11. Risk Assessment

The proposed project involves digital development, hardware integration, and coordination across multiple partners. The following table summarises the key risks, their likelihood and impact, and proposed mitigation strategies.

Risk Assessment Table

Risk Category	Description	Likelihood	Impact	Mitigation Strategy
Technical – VR Development	VR environment may require more time or higher fidelity than initially estimated.	Medium	Medium	Use modular development; prioritise core functionality first; employ experienced VR developers; iterative testing with students.
Technical – Digital Twin Complexity	Modelling MW-scale hydrogen systems may require additional data or specialist expertise.	Medium	High	Early engagement with PlusZero engineers; phased model development; begin with reduced-order models; validate against real operational data.
Technical – Remote Lab Integration	Remote operation of hydrogen equipment requires robust safety and cybersecurity systems.	Low	High	Use isolated kW-scale system; implement multi-layer safety interlocks; external cybersecurity review; strict access controls.
Operational – Data Availability	Real-time or historical operational data from the facility may not be available early in the project.	Medium	Medium	Use synthetic datasets initially; integrate real data once available; maintain flexible data-ingestion architecture.

Risk Category	Description	Likelihood	Impact	Mitigation Strategy
Operational – Construction Delays	Delays in the physical completion of the Creed Park facility could affect integration timelines.	Medium	Medium	Develop VR and Digital Twin independently of physical completion; use design drawings and engineering models; adjust timeline if needed.
Educational – User Adoption	Learners or instructors may require additional training to use VR or Digital Twin tools effectively.	Low	Medium	Provide onboarding materials; run pilot sessions; integrate tools gradually into curriculum; gather user feedback.
Partnership – Coordination Across Organisations	Multi-partner collaboration may introduce communication or scheduling challenges.	Medium	Medium	Establish a steering group; monthly progress meetings; clear work-package ownership; shared project management tools.
Financial – Cost Overruns	Hardware or software development costs may exceed initial estimates.	Low	Medium	Build contingency into budget; prioritise essential features; competitive procurement; staged payments tied to deliverables.
Cybersecurity	Remote access to hydrogen systems introduces cybersecurity risks.	Low	High	Use isolated hardware; no connection to operational MW-scale systems; external penetration testing; strict authentication protocols.
Health & Safety	Remote lab equipment must be safe for unsupervised operation.	Low	High	Use low-pressure, low-volume hydrogen systems; multiple hardware interlocks; automatic shutdown protocols; compliance with UK hydrogen safety standards.
Sustainability – Long-Term Maintenance	Digital tools may require ongoing updates beyond the project period.	Medium	Medium	Develop maintenance plan; train internal staff; explore licensing or industry partnerships to support long-term sustainability.

Overall Risk Evaluation

The project carries **moderate technical and operational risks**, typical for digital-infrastructure and training-technology development. However:

- risks are **well understood**,
- mitigation strategies are **clear and actionable**,
- and the project design ensures **no safety or cybersecurity exposure** to the MW-scale hydrogen facility.

The combination of **isolated hardware**, **modular software development**, and **strong partner collaboration** ensures that risks remain manageable and do not threaten project delivery.