

HYDROGEN SOUTH WEST PATHWAYS WEBINAR SOUTH WALES ENERGY CLUSTER

22nd February 2024

Ben Burggraaf
Henry James

CEO Net Zero Industry Wales
Net Zero Portfolio Manager-Industrial Clusters WWU



Core members



Supporting Partners



Membership growing rapidly 45 members



Vision

A multi-sector ecosystem that drives the development of a hydrogen distributive infrastructure in the South West.

Mission

To accelerate the transition to hydrogen by connecting people, places and projects in the South West.

HSW MEMBERSHIP BENEFITS



SECTOR WORKING GROUPS

ToRs

To identify and facilitate the acceleration of H2 projects in the SW.

Define the technology, commercial, supply chain, skills, investment and regulatory barriers.

Meet bi-monthly and report to HSW Board quarterly.

AVIATION led by AIRBUS

1. Hydrogen Materials Test Hub
Airbus & Baker Hughes
2. Digital Modelling of H2/SAF Use at Airports
Costain & Bristol Airport
3. Regulation & Certification Pathways NCC

LAND TRANSPORT led by COSTAIN

1. HRS Bristol/Exeter/M4
2. HFC Heavy Duty LDV project

MARITIME led by MARITIME UKSW

1. Maritime Innovation Centre Appledore

INDUSTRIAL/DOMESTIC led by WWU

1. Hydrogen Electrolyser Prototypes Using
Waste Water WWU & Hydrostar

HSW MEETINGS

QUARTERLY MEMBERS MEETINGS 2024

28th March 2024 9.00 to 13.30 at Bristol Airport

AVIATION and AEROSPACE

3rd July 2024 10.00 to 14.00 in Devon

MARITIME

25th September 2024 TBC

LAND TRANSPORT

12th December 2024 TBC

ANNUAL YEAR REVIEW

HYDROGEN PATHWAYS WEBINARS

18th January Carbon Capture 7CO2

22nd February South Wales Energy Cluster

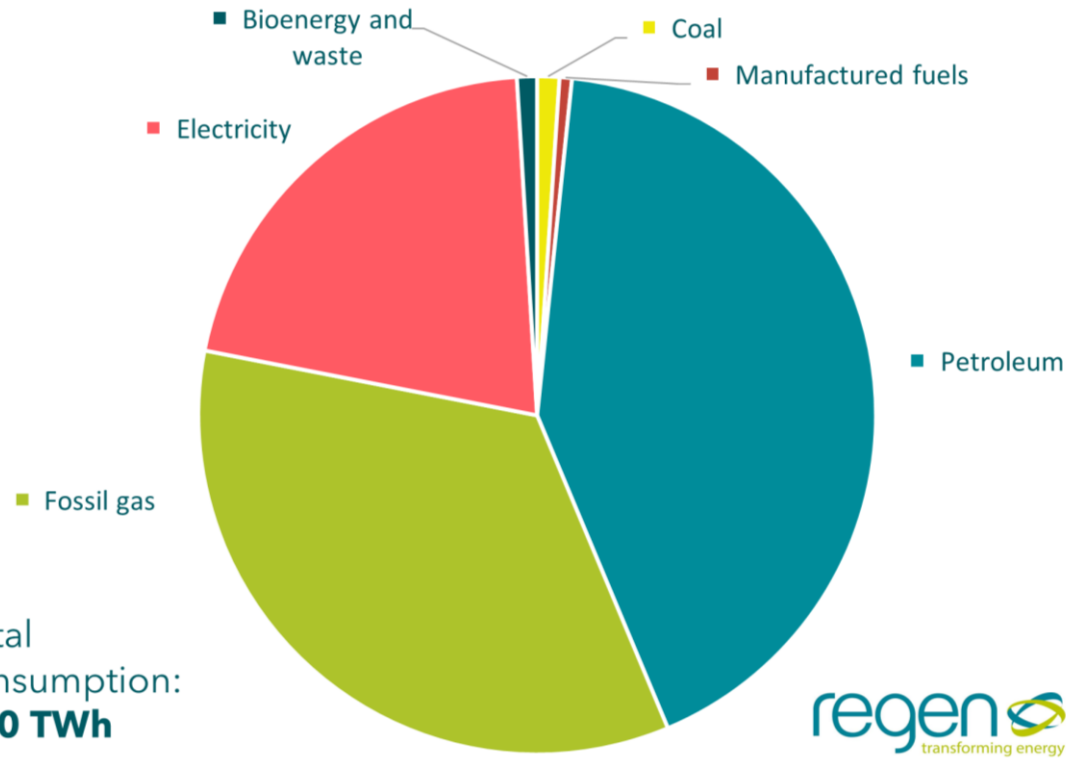
18th April HFCV Supply Strategy

OTHER MEMBERSHIP BENEFITS

1. Weekly Newsletter
2. Early engagement with hydrogen projects via the sector focused working groups.
3. Business to business commercial opportunities.
4. Promotional opportunity to present company capability via HSW website and Quarterly Members meetings.
5. Support and access to regional/national lobbying/

Energy in the South-West

Total energy consumption in the South-West, 2020 (TWh)



What are some of the key characteristics of the South-West?

Strong community energy ethos

Tourism which will result in distorted load patterns and high summer demand

Historically one of the early movers for solar and onshore wind

Potential for marine energy

Large rural-urban divide

Large areas subject to planning constraints, e.g. AONBs and National Parks

Lack of public transport links results in reliance on cars

Grid capacity issues preventing development

Agenda

Introduction

NEIW

WWU NZIC

H2 Awareness Modules

Q&A

Chris Steel

Ben Burggraaf

Henry James

George Jenkins

All



WALES & WEST
UTILITIES



**Empower businesses to build
greener futures**

What’s Net Zero Industry Wales?

- Not-for-profit umbrella organisation that supports Welsh Industrial Clusters and their partners in their Journey to Net Zero
- Membership organisation, reporting to an industry led board
- Core funded by Welsh Government

Purpose statement

Make Wales the country of choice for sustainable goods & services

By supporting a trusted, sustainable, prosperous & resilient Welsh industry that leads the transition to a healthier, equal & cohesive Wales

Resulting in an industry that the citizens of Wales are proud of, is globally responsible and builds on its industrial heritage



Single voice

Build partnerships

Support policy
development

Access funding



NZIW - Current priorities

Culture

Working groups

- Continue to facilitate & expand collaboration

Communications Events

- Increase membership, impact and attract investment

Bid-writing support

- Attract more grant funding into Wales

Grant funded project support

- Professional & credible project delivery

Policy & Regulation

Welsh & UK Government

- Develop & maintain decarbonisation pathways
- Support development of Carbon Budget 3
- Specialist studies to support policy

Collaborative delivery vehicle

- Program management office
- Project initiation & MoU development
- Project delivery & access to professional services

Infrastructure

CO₂ infrastructure development

- Lobby UK Government with CCSA to support CO₂ shipping
- Track delivery of projects

Hydrogen infrastructure development

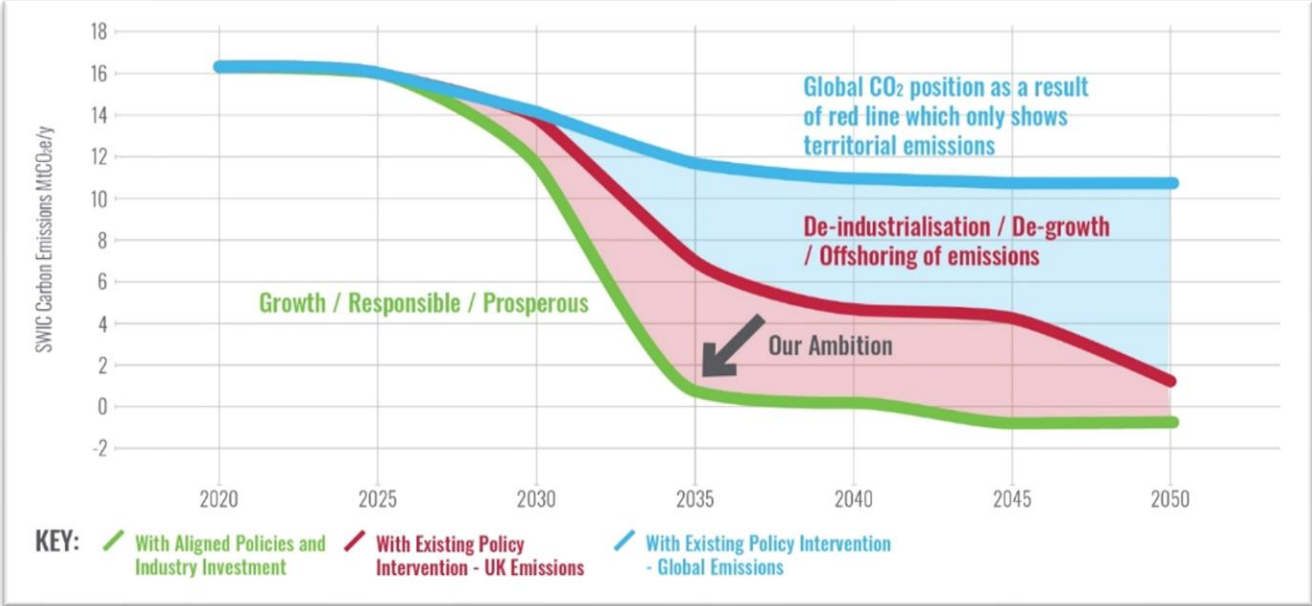
- Lobby UK Government to include H₂ infrastructure as part of regulated asset base
- Track delivery of projects

Electricity infrastructure

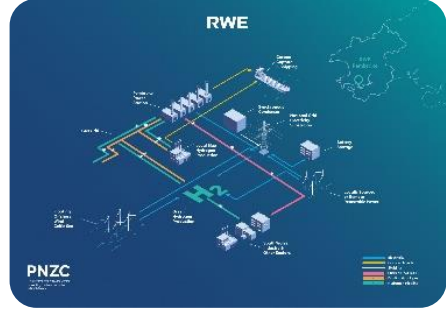
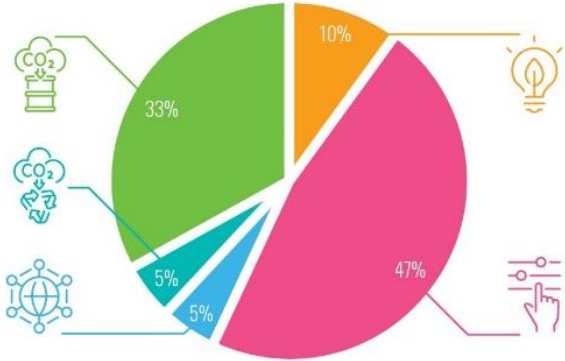
- Lobby UK Government to allow anticipatory investment into grid



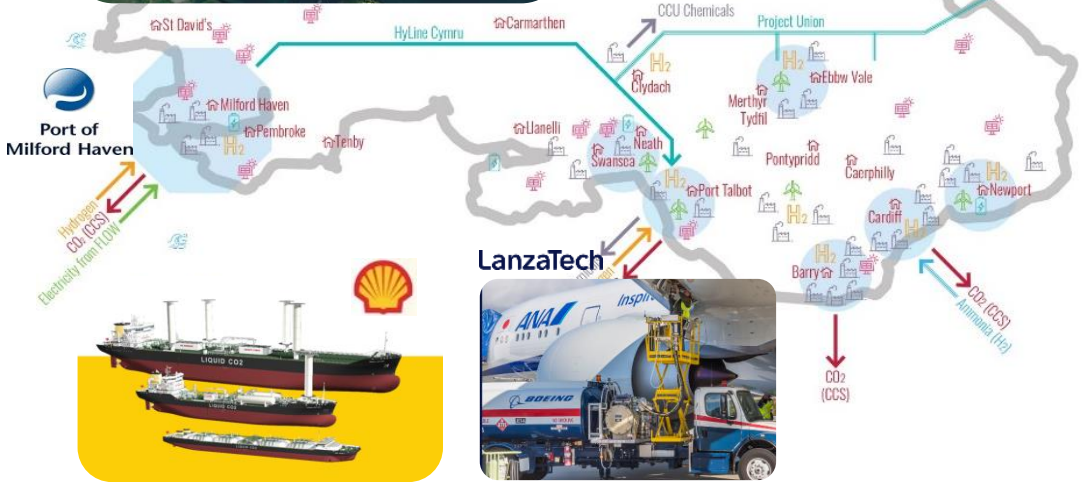
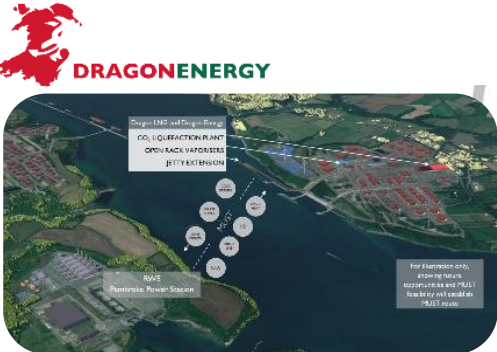
Our Cluster Plan will reduce CO₂ emissions by 16 million tonnes pa and unlock £30bn of investment opportunities.



1. Energy and Resource Efficiency
2. Fuel Switching
3. Clean Growth Hubs
4. Carbon Capture and Utilisation
5. Carbon Capture and Storage



Where does HyLine fit into the SWIC plan
 HyLine Cymru will connect low carbon hydrogen production to energy intensive industrial customers beginning to switch their processes to hydrogen in the 2020s or earlier. It could also facilitate the conversion of home and commercial heating to hydrogen, enabling South Wales towns to go green while keeping disruption to homes and communities to a minimum.



Turning the handle on “**five cogs**” for industries to reach net zero and unlock £30 bn of investment.

Impact Time Scale

Short Term
(Now – 2026)



Primary Cogs

1. Energy & Resource Efficiency

3. Clean Growth Hubs

4. Carbon Capture Utilisation

5. Carbon Capture Storage

The “Asks”

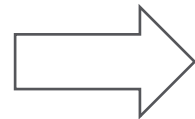
Continued financial support (e.g. through IETF beyond phase 3)

Clean growth hubs to be included in strategic visions of councils

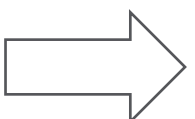
Sustainable Aviation Fuel price certainty

Allow shipping solutions to bid in Track 2 and Track 1 expansion

Medium term
(2026 – 2031)



Long term
(2031 – 2050)

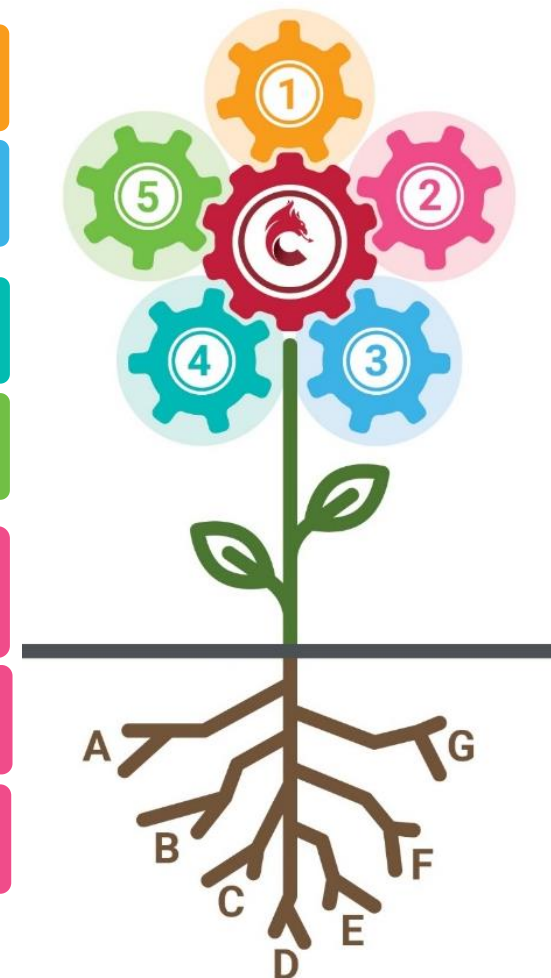


2. Fuel Switching (electrification & hydrogen)

Allow gas infrastructure companies to recover hydrogen investment through bills

Electrification business model support

Anticipatory investment in electricity grid infrastructure



Deployment of a CO₂ shipping solution will generate **£18.9bn** in gross benefits (GVA) and **unlock >£8bn of private investment**



Powered by:



Key conclusions of the report:

- There is a strong economic case for CO₂ shipping
- CO₂ shipping allows a “Just Transition” for one of the largest industrial clusters in the UK
- £2.4bn of public funding is required to support the development CCS infrastructure, over a 20-year period



How do we realise these benefits of this transformational change alongside deployment of **FLOW**?

- Timely, dependable and consistent delivery of the environmental & planning process, which will need a strong private & public partnerships – coordination (programme management)
- Upfront investment in skills, to have sufficient resource to construct, operate & maintain and retain as much value as possible in Wales; is there a role for a cooperative approach to fund this?

Sero Net
Diwydiant Cymru



Net Zero
Industry Wales



HyLine
Cymru

22nd February 2024



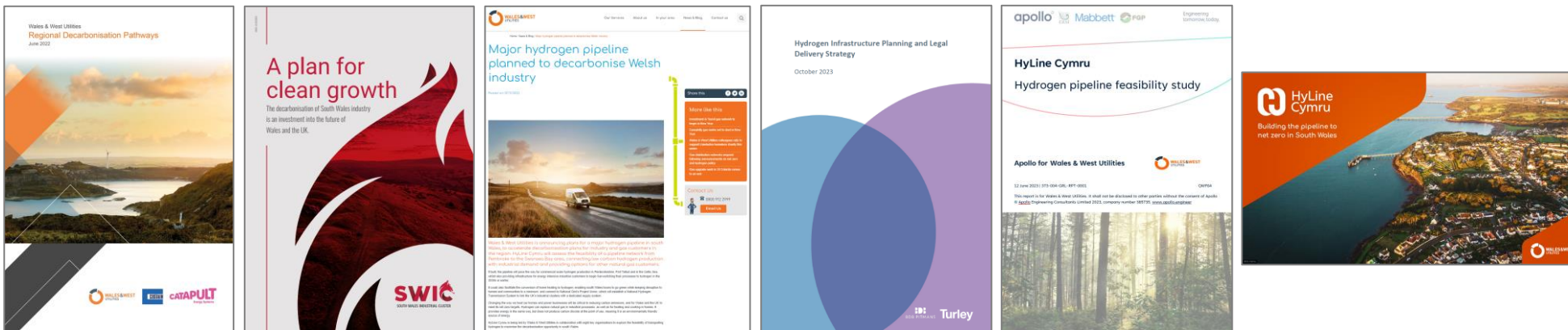
Contents

- Journey so far
- Building evidence
- HyLine and SWIC
- Why HyLine?
- Project benefits
- Timeline
- Key enablers
- Learning for HSW



Journey so far

- November 2022: Project publicly launched with SWIC partners
- March 2023: HyLine demonstrated as critical to the success of the SWIC Cluster Plan
- October 2023: Project presented at key political and industry events, including with Welsh Government
- November 2023: 12 months of feasibility work completed
Complementary work completed on planning options
- January 2024: Launch of pre-FEED report alongside complimentary Plaid Cymru event



Project development and certainty

Supporting organisations

Public



supported by



Private

RWE

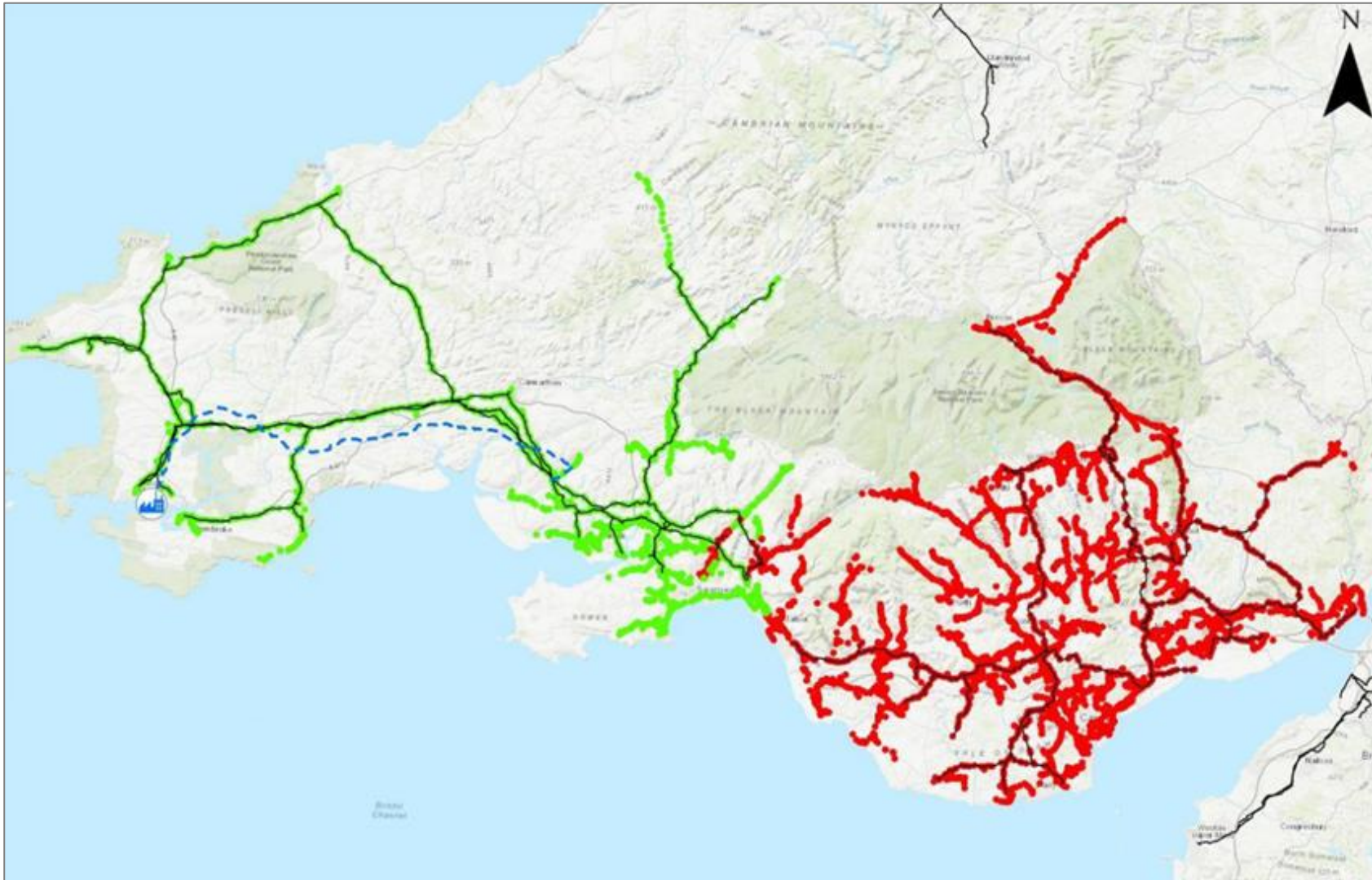


TATA STEEL

LanzaTech



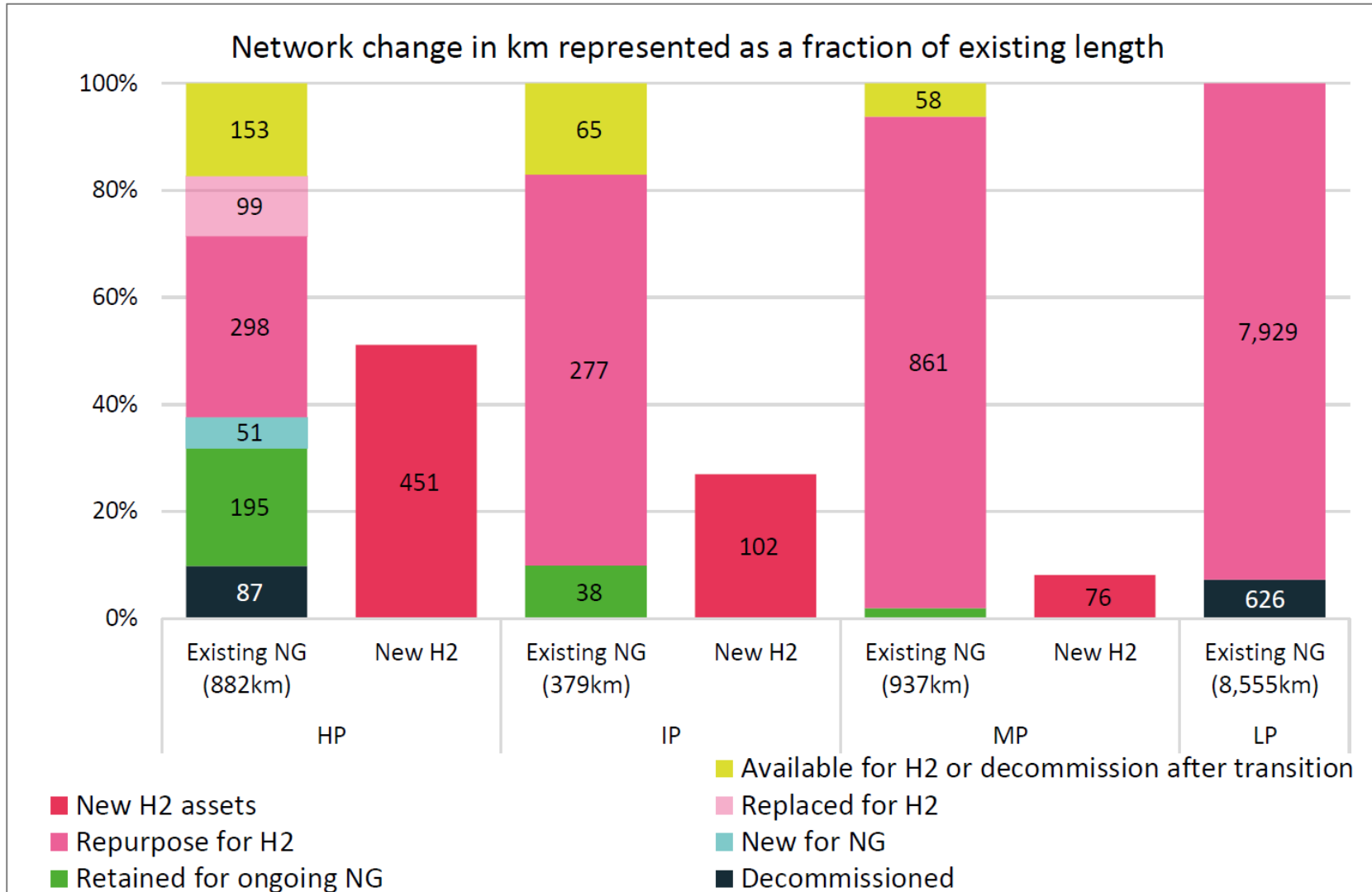
Regional Decarbonisation Pathways



CATAPULT
Energy Systems

COSTAIN

Regional Decarbonisation Pathways



QR CODE TO RDP





KEY

HyLine Cymru

EXISTING INFRASTRUCTURE

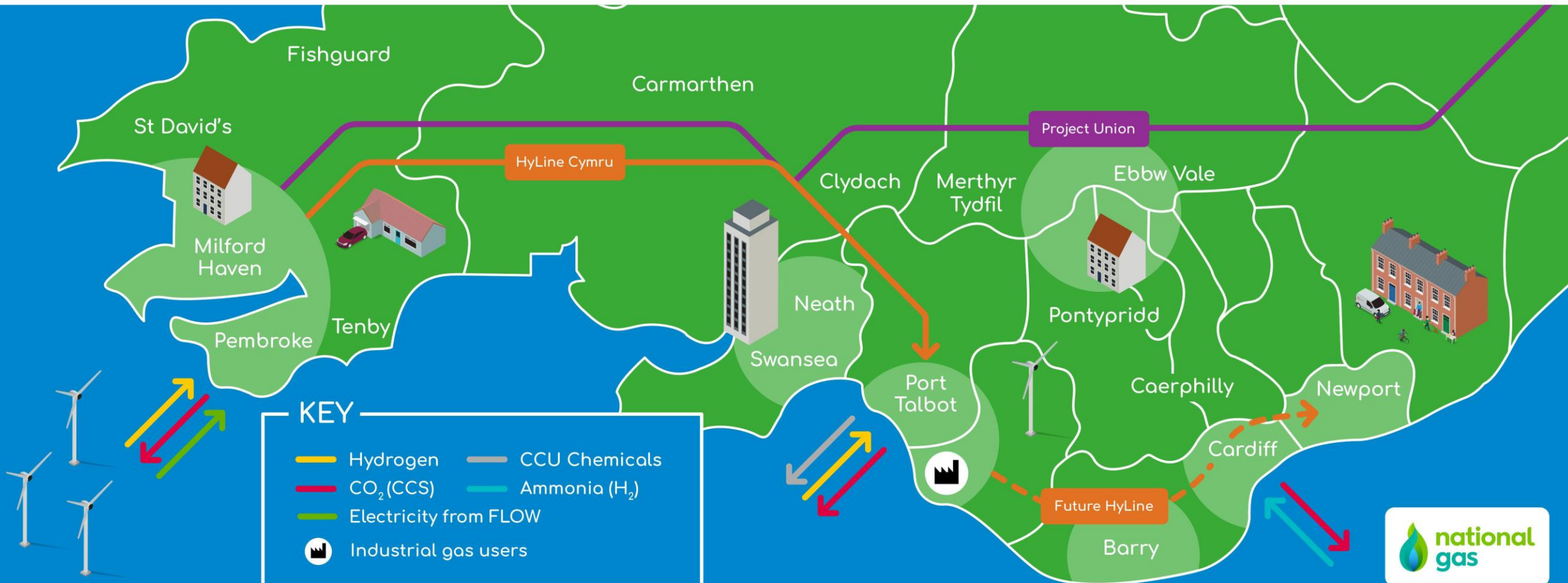
- National Transmission System (NTS) Feeder 2
- National Transmission System (NTS) Feeder 28
- Local Transmission System (LTS)

- Liquefied Natural Gas (LNG) import terminal
- National Transmission System (NTS) offtake
- Industrial gas users
- Offshore hydrogen production
- H2 Onshore hydrogen production

National & regional context

HyLine Cymru would connect low carbon hydrogen production to energy intensive industrial customers beginning to switch their processes to hydrogen in the 2030s. It could also facilitate the conversion of domestic and commercial heating to hydrogen; enabling South Wales towns to go green while keeping disruption to homes and communities to a minimum.

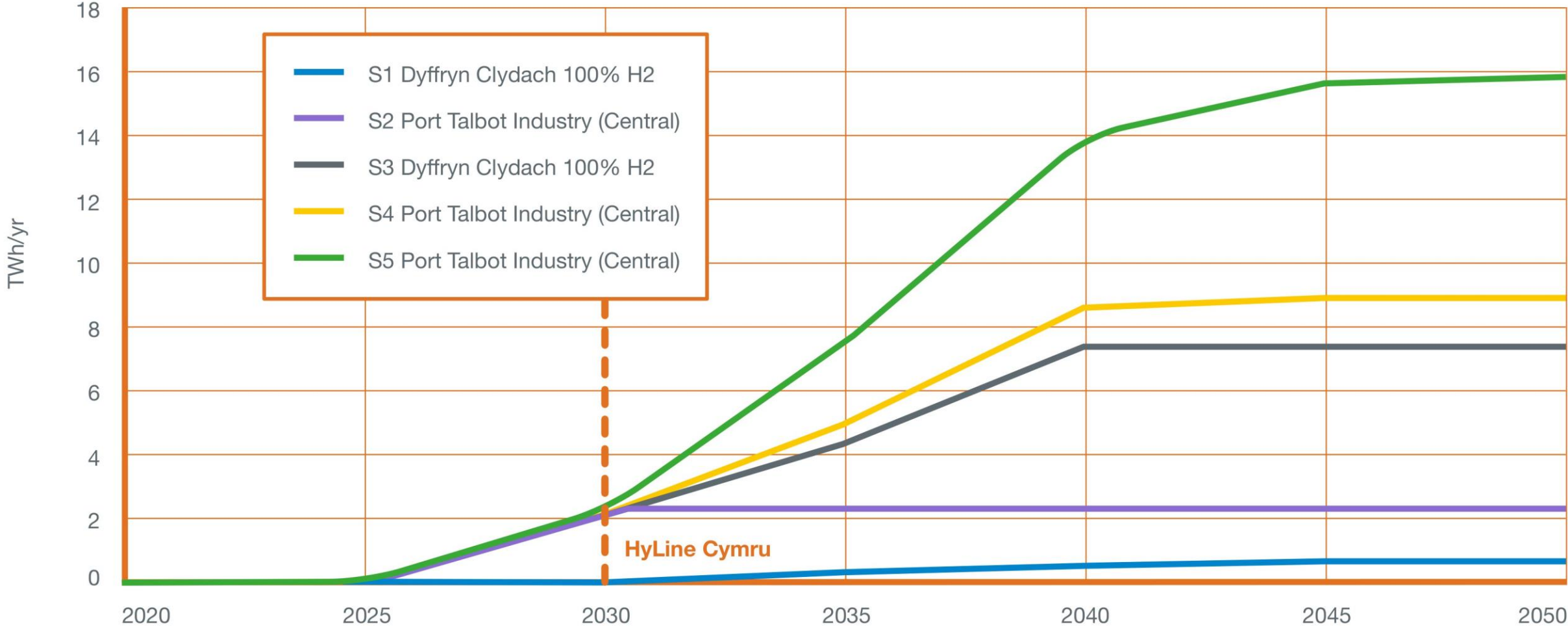
The below graphic demonstrates the integration of HyLine into the SWIC cluster plans and potential integration into the national Project Union proposal.



Future hydrogen demand pathways

Whilst the 2050 hydrogen demand will ultimately determine the final pipeline sizes, the pipeline will operate based on demand. Hence, it is important to understand how the hydrogen demand will develop over time to allow WWU to plan the future. A future pathways

analysis was undertaken to supplement the 2050 end state analysis for each of the five future demand scenarios. The pathways were analysed on five-year intervals taking both stakeholder specific data and more generalised pathways as described in the previous slide.



Why HyLine?

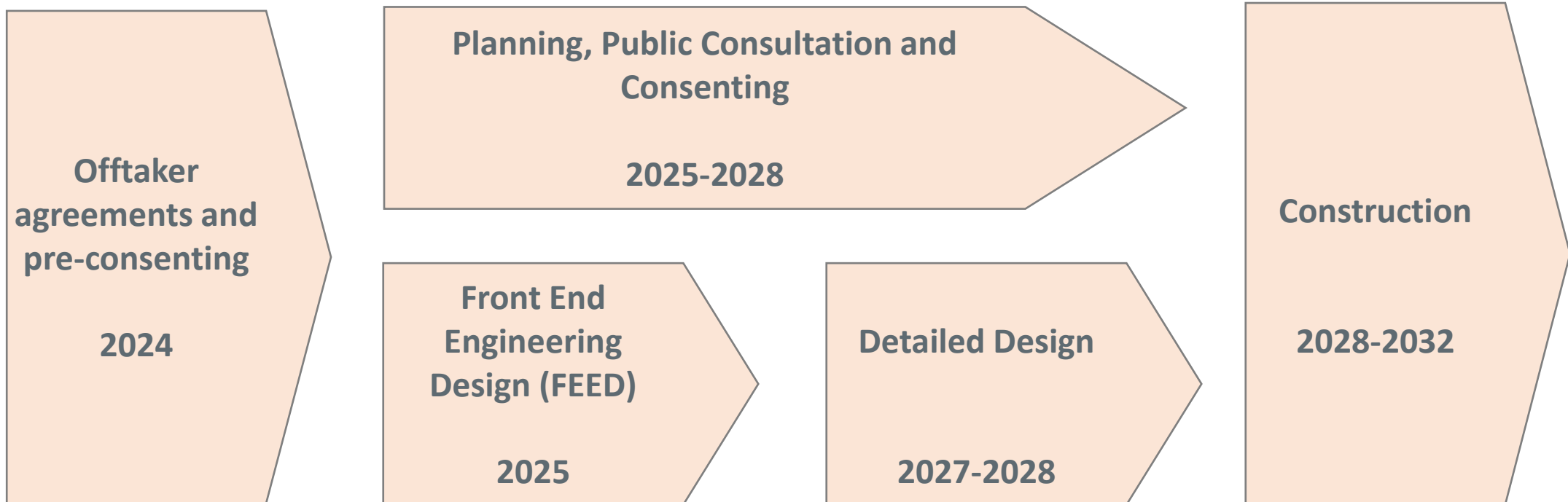
- ✓ Remove up to 3.2 MtCO₂e/year from Welsh industry
- ✓ Provide industry with a cost-effective route to decarbonisation
- ✓ Protect and create thousands of high skilled jobs in South Wales
- ✓ Put Wales at the forefront of the emerging hydrogen economy
- ✓ Contribute £billions GVA over its operational lifetime
- ✓ Unlock 4.5 GW of offshore wind generation

Local benefits

- Enables Local Area Energy Plans (LAEPs) to be delivered
- Provides a decarbonisation solution for local industry
- Prevents deindustrialisation and retains jobs
- Strategic spurs will provide hydrogen for:
 - Carmarthen
 - Llanelli
 - Swansea
 - Neath
 - Port Talbot
 - Other rural communities TBC
- Less disruption than the alternatives



Timeline



Ongoing engagement with local authorities

Learning for HSW

- The hydrogen economy is driven by demand, not production – clusters need to focus on building evidence
- Hydrogen transportation and storage solutions will vary across different regions of the UK
- Collaboration amongst partners, and engagement with LA's and Government must be clear and coordinated
- Sustainability must be considered across all supply chain activities
- Community needs should be addressed alongside a robust public engagement strategy
- Routes and timelines to planning permission must be understood
- Consenting authorities need to be adequately equipped



Contact information

Henry James | Net Zero Portfolio Manager
E henry.james@wwutilities.co.uk

Wales & West House, Spooner Close,
Celtic Springs, Newport, NP10 8FZ

Apollo contact information

Phil Westmorland | Decarbonisation director
E info@apollo.engineer



Delivery lead



Delivery partners





Hydrogen Awareness Level Training Modules

george.jenkins@ncc.com



Introducing the National Composites Centre

National Skills Vision

“To have a hydrogen-ready talent pipeline to support the developing economy and infrastructure”

The **National Composites Centre (NCC)** is the UK’s world leading composites research and development centre, committed to using digitally optimised, sustainable innovation for a net zero future.

The NCC is **one of seven centres** that make up the **High Value Manufacturing Catapult (HVM Catapult)**

First steps to achieve this vision:

Work with partners and collaborators to deliver a suite of **training modules** to increase the understanding of end-to-end hydrogen and to stimulate transition to a hydrogen-based economy.



NUCLEAR AMRC





Hydrogen Awareness Training Modules



Fully funded by Catapult



Awareness level



Online modular learning



6 Modules



2 – 3 Hours per module



Non-Sector Specific

<https://hydrogenaware.co.uk/>





Training Modules



Overall Considerations



Hydrogen Production



Storage and Distribution



Energy Use: H₂ as Feedstock



Energy Use: Industrial and Domestic



Energy Use: Transport

Learning Outcomes:

Awareness of:

- Existing and planned technologies
- Opportunities
- Challenges
- Regulation and Strategy
- Health and Safety

<https://hydrogenaware.co.uk/>





Who should be interested?

Roles

Engineers & Technicians

Business Leaders

Project Managers

Recruitment

Comms & Marketing

Early Careers

Students

Sectors

Manufacturing

Education

Public Sector

Utilities

Transport (Aerospace)

Defence

Transport (Ground)

Student

Construction

<https://hydrogenaware.co.uk/>



Questions

Q&A section

Upcoming events

Thu, 28 Mar 2024 09:30 – 14:00

Hydrogen South West Quarterly Members Meeting

Thu, 18 Apr 2024 09:30 – 10:30
Feedback from WWU HFC Vehicle trials.

Hydrogen Fuel Cell Vehicles Supply Strategy First Hydrogen and

Fri, 17 May 2024 09:30 – 10:30

Hydrogen Decarbonization Rail Sector

Wed, 3 Jul 2024 09:30 – 14:00

Hydrogen South West Quarterly Members Meeting



View upcoming events!