HYDROGEN SOUTH WEST

Members Network Update

02/11/2022

HYDROGEN SOUTH WEST

regen transforming energy

The wider energy context in the South West

Grace Millman - Hydrogen lead
Regen

About Regen

An independent centre of energy expertise, with a mission to transform the energy system for a zero carbon future.

Experts

We approach the energy transition from a position of knowledge and evidence. By understanding the technical, financial, political and societal enablers needed to make sustainable energy work, we can tackle the barriers preventing progress.

Pioneers

We choose to work in areas that are innovative or new. We take on challenges; we get cutting edge projects off the ground and we share the learning to inspire and enable others to follow.

Convenors

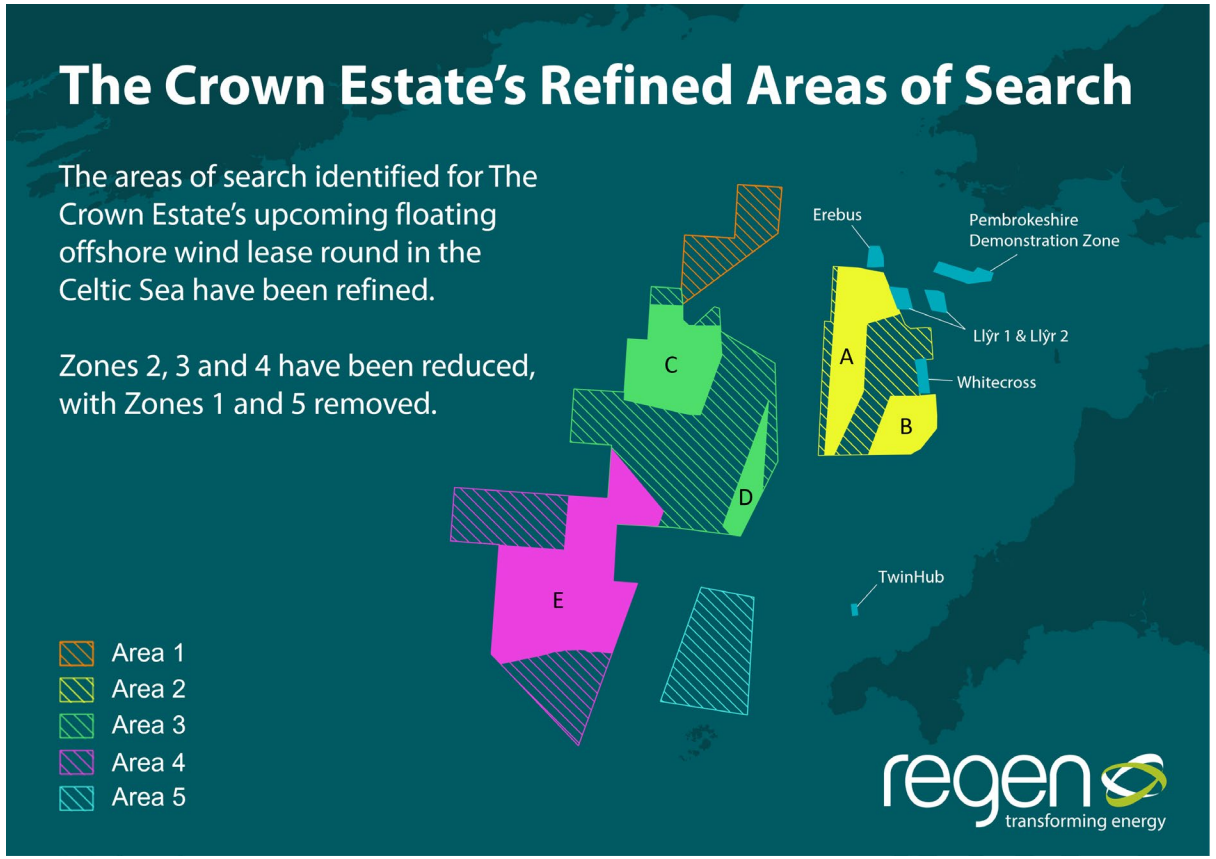
We bring the right people and organisations together to create ideas and solutions to achieve change. We work across the energy industry and its wide range of stakeholders.

Energy in the South West

- According to the Renewable Energy Planning Database, the South West has:
  - **2.5 GW** of solar
  - **280 MW** of onshore wind
  - **203 MW** of battery storage

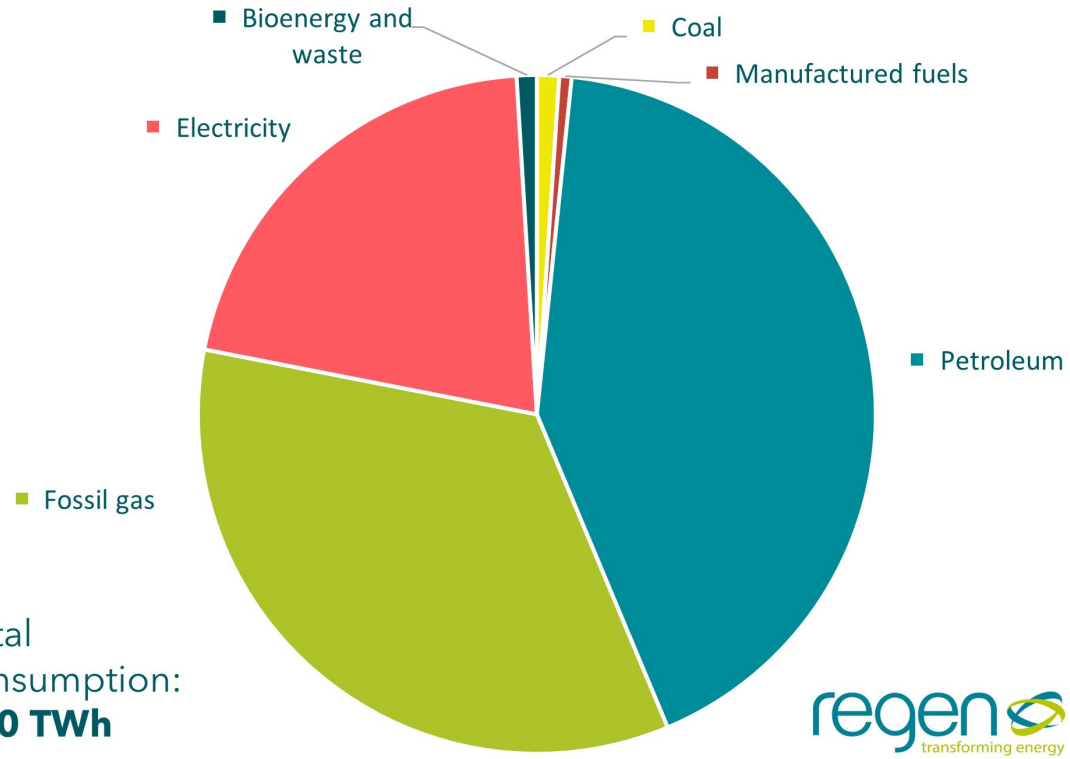
- With another 4 GW either under construction or in planning, including:
  - c.**30 MW** of geothermal
  - **1.7 GW** of battery storage
  - **2.2 GW** of solar
  - **40 MW** of floating offshore wind

- And **4 GW** of floating offshore wind in the Celtic Sea to be developed by 2035



Energy in the South West

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



Total consumption: **130 TWh**

Strong community energy ethos

Historically one of the early movers for solar and onshore wind

Large rural-urban divide

Lack of public transport links results in reliance on cars

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

Potential for marine energy

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

Grid capacity issues preventing development

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

What role can hydrogen play in net zero?

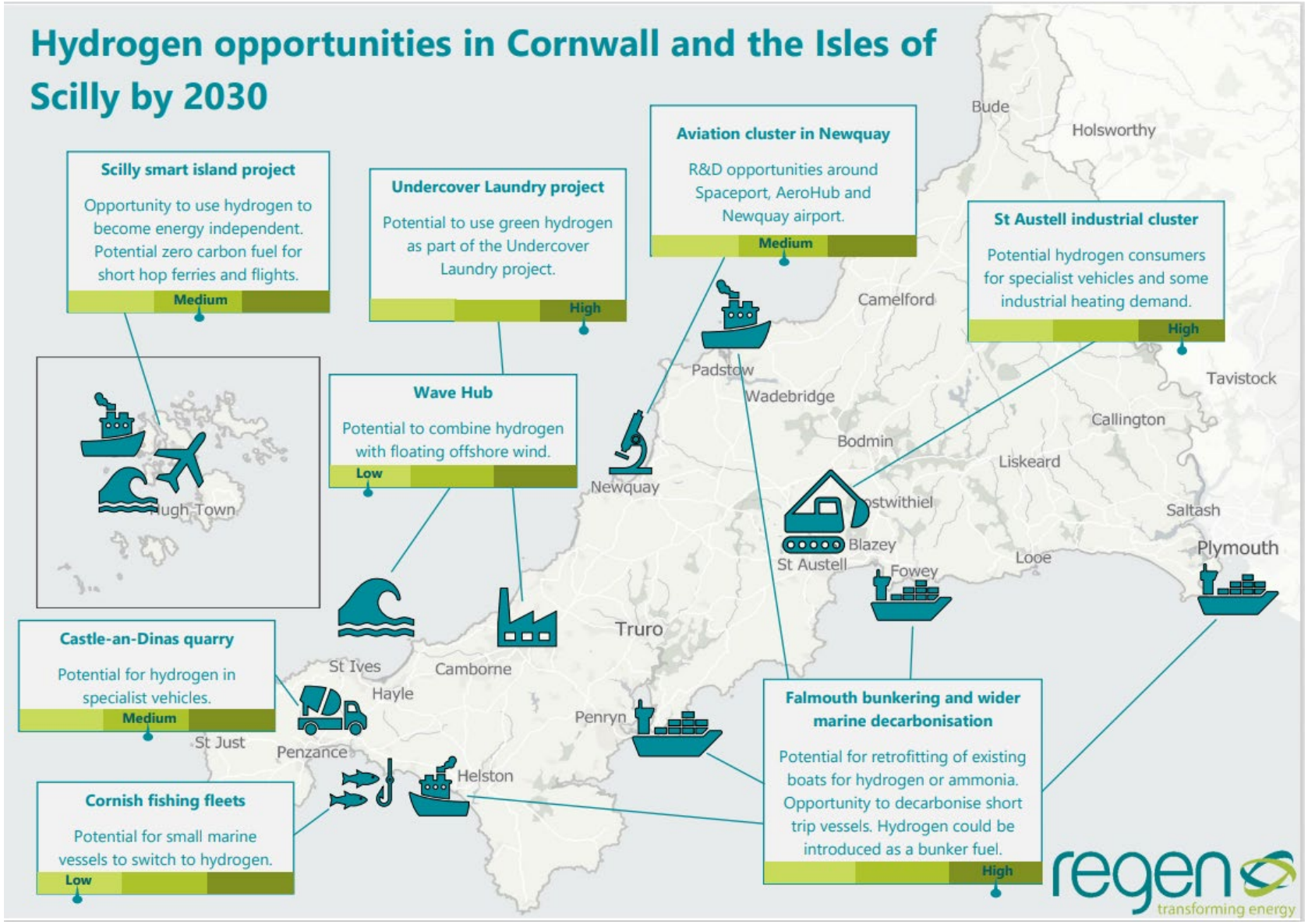
Hydrogen is being considered as a complement to electrification, helping to tackle areas that will be difficult to decarbonise, including:

- Heavy transport, including HGVs, specialist vehicles and some public transport
- Decarbonising current hydrogen demand (27 TWh)
- Flexible power generation
- Industrial processes requiring high temperatures or an open flame
- Manufacture of ammonia or other synthetic fuels, particularly as a fuel for shipping and aviation

Hydrogen opportunity study (May 2021)

- Regen carried out a hydrogen opportunities assessment for Cornwall Council and the Isles of Scilly LEP.

- Opportunities for hydrogen can be identified by considering a **region's unique geography, resources, strategic and decarbonisation priorities and existing hydrogen and non-hydrogen activity**.



Regen's 'A day in the life 2035' analysis

The winter day

00:00 19.04.2035

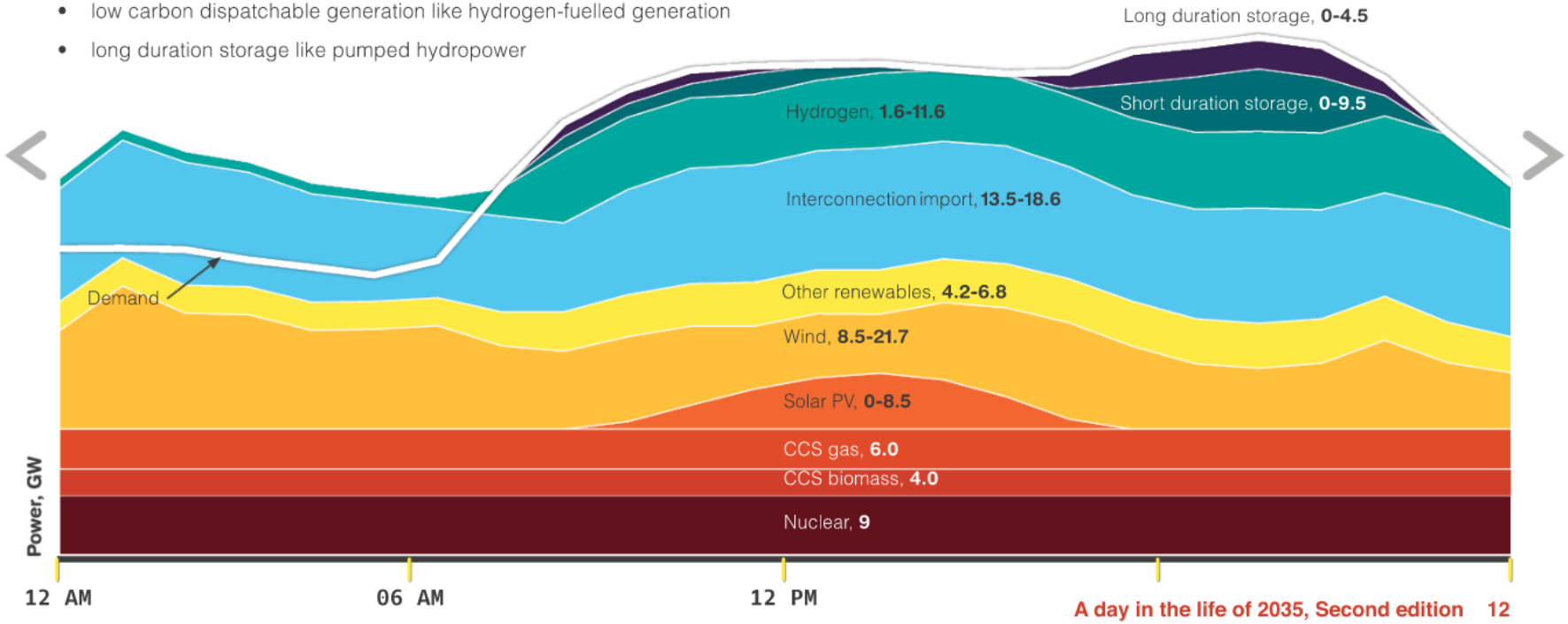
Supply Demand

How does a fully decarbonised electricity system operate when there is a high renewable supply deficit?

An occurance of cool, calm, cloudy weather causes high energy demand from building heat coupled with low renewable energy supply from wind and solar. This results in the available renewable energy not being able to meet demand for the day. To keep the system balanced throughout the day the system draws on:

- imports via interconnectors
- low carbon dispatchable generation like hydrogen-fuelled generation
- long duration storage like pumped hydropower

Click **here** for information on the technologies and their installed capacities. Toggle between a supply and demand view using the slider above.



Hydrogen has a complex and multi-faceted value chain and the development of this market requires a strategic approach that does not consider hydrogen as a replacement for natural gas, or equally akin to electricity.

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The opportunities presented by Hydrogen South West

David Eccles
Hydrogen South West

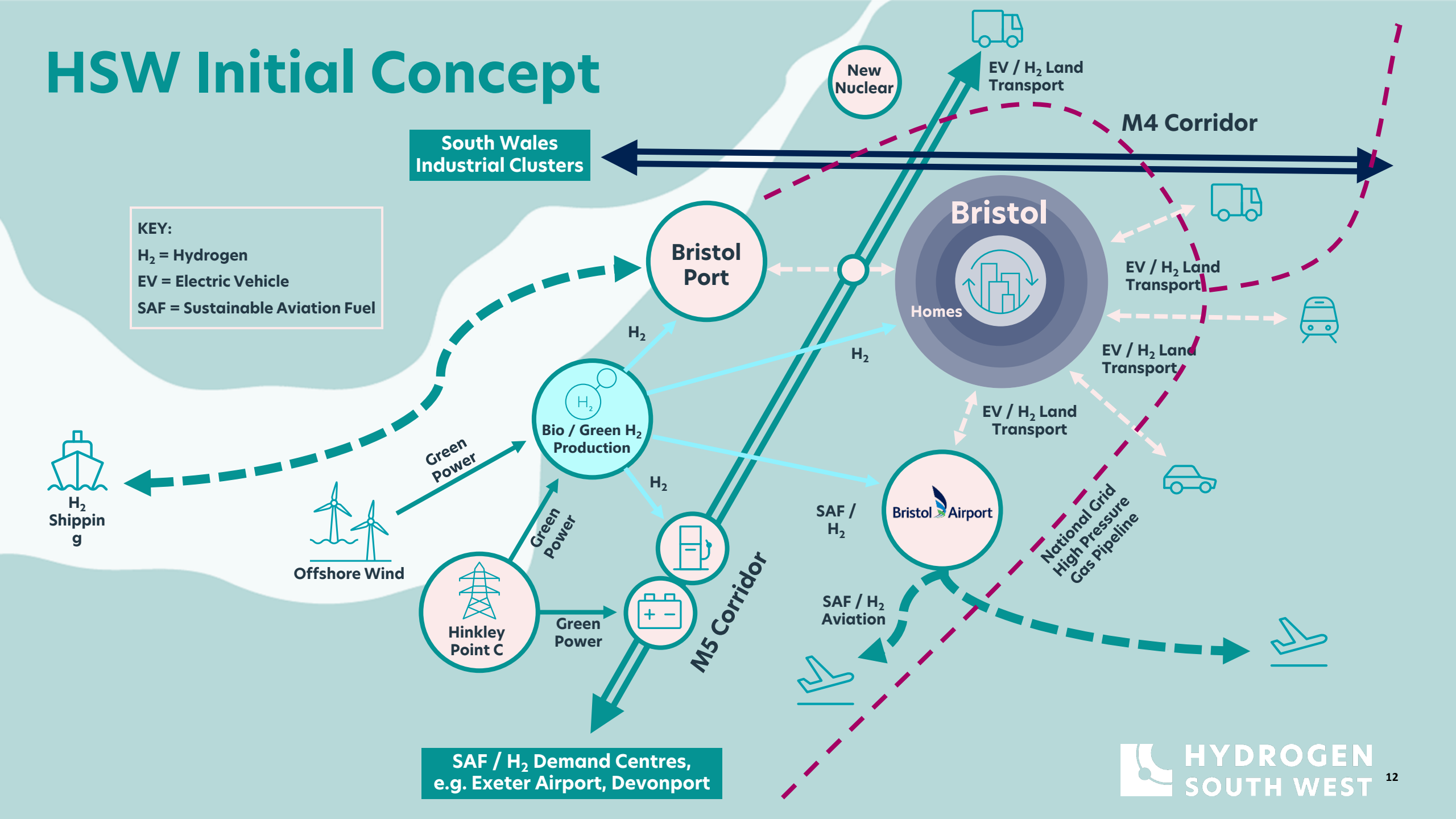
Connecting people, places and projects, to drive the development of hydrogen infrastructure

The South West has a rich engineering and energy history, and is home to a formidable cluster of leading aerospace and other industries, allied to a powerful research base.

These dynamic organisations have joined forces to create Hydrogen South West, which aims to create an infrastructure ecosystem that brings the benefits of hydrogen to the region.

HSW is looking to establish a **distributed demand/supply model** for the creation, transportation, storage and use of low carbon hydrogen in multiple sectors across the region.

HSW Initial Concept



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Our partners

Bristol Airport
Amazing journeys start here

AIRBUS

easyJet

wood.

hynamics
EDF GROUP

WALES&WEST UTILITIES

THE BRISTOL PORT COMPANY

COSTAIN

GKN AEROSPACE

Wessex Water
YTL GROUP

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Our supporting organisations

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Hydrogen South West is developing an infrastructure ecosystem that delivers hydrogen projects and generates investment for projects beyond heavy industrial clusters

Profile

Raise the Profile of HSW, particularly with regional politicians and government departments, in order to gain support for bids for funding to support projects

Partnerships

By creating a collaboration and information sharing organization that augments members' knowledge of the opportunities in the region

Projects

Support members by bringing stakeholder together, sharing information and to provide support to secure funding and financing

People

The South West as a Centre of Excellence for Skills and Research required within the hydrogen economy and the mechanisms by which these can be delivered

Project Acorn

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Starting with hydrogen Ground Support Equipment (GSE) is important long before a hydrogen aircraft arrives at the airport in order to:

- Train and practice the handling and storage of hydrogen as a new fuel
- Adapt safety regulation airside
- Prepare for refuelling process with crew and passengers on board
- Get used to handling hydrogen alongside kerosene

easyJet

Hydrogen Hub at Bristol Port

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- Study to explore configuring the Port to accept hydrogen/ammonia brought in by ship, powering its landside vehicles with hydrogen and establishing a hydrogen production facility at the Port
- The production facility could potentially form the basis of a Bristol hydrogen hub supplying a variety of potential end users
- Wales & West Utilities are exploring how their pipeline network could be re-configured to create a hub and spoke model for transporting the hydrogen to potential end users
- Could also be a component of Airbus' plans to establish the infrastructure required to support its test facility and then its aircraft from the mid-2030s

THE BRISTOL PORT COMPANY

wood.

hynamics EDF GROUP

WALES&WEST UTILITIES

HSW Membership - how to get involved

Phil Smith & Emma Carter
Business West

Why Membership

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Showcase

- The South West
- Your company

Learn

- Strategic infrastructure projects
- Emerging technology
- Government grants and programmes
- Sources of investment

Lead

- Shape a new industrial cluster

Grow

- Connect with new customers
- Find suppliers
- Find talent

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Membership benefits

Annual conference

Quarterly, face to face Business Development sessions

Connect with industry leaders

Hydrogen Pathways skills & training

- Online thematic webinars
- Face to face thematic workshops
- Skills Bootcamp (Weston College & West of England IOT)

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Access to...

- Funding
- Pilot Projects
- Infrastructure experience
- Engineering, aviation, maritime, land transport, logistics & more

Regular intelligence & news roundups

Shape & access future skills programmes

Named HSW contact

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Membership Entry

Members Must:

- Be involved in Hydrogen
- Commit to Collaborate
- Bring Expertise
- Bring Commerciality
- Add Value

Level	Employees	Annual Fee
Corporate	>500	£5k
Mid	>250 <500	£3.5k
Small	<250	£2k

Developing skills to serve the hydrogen world

Chris Steel
Business West

HSW Skills Consortium Route Map to 2024

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NATIONAL HYDROGEN SKILLS FORUM

SKILLS FORESIGHTING ENABLING LEARNING TRAINING PROVISION CREATION VIA SKILLS VALUE CHAIN PROCESS

DEVELOP CERTIFICATE of HYDROGEN TECHNOLOGY

LEVEL 3/4 INTRODUCTORY HYDROGEN TRAINING MODULES

"MAKE IT " MOVE IT" "USE IT"

- OPEN IP TO ENABLE DELIVERY BY THIRD PARTY DELIVERY PROVIDERS

INSTITUTES of TECHNOLOGY

HYDROGEN BOOT CAMP TRAINING COURSES

- INITIAL 10 WEEK PROGRAM 6 HOURS/WEEK STARTING JANUARY 2023

HYDROGEN PATHWAYS WEBINARS

- MONTHLY SECTOR FOCUSED

Nov 2022 Mar 2023 Dec 2023 Dec 2024

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Hydrogen Pathways Webinars Programme 2022/2023

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60 minutes Webinars with the following structure:

- Introduction
- Sector specific presentation
- Training provision
  - Hydrogen Boot Camp
  - Hydrogen Awareness Training modules
- Q&A

Programme

- Nov 17th WWU Hydrogen in Gas Distribution
- Dec 9th First Hydrogen Fuel Cell Transit Logistics
- Jan 19th ZeroAvia Fuel Cell Aerospace Application

- To be Scheduled in 2023:
  1. Hydrogen in Public Transport
  2. Airbus/easyJet/Bristol Airport Hydrogen Hub
  3. Hydrogen in HGV Logistics
  4. Innovate Edge support for Hydrogen Projects in SW
  5. Access to PE/Debt/Grant funding for Hydrogen projects
  6. Hydrogen Production Hynamics

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Hydrogen Boot Camp Training Modules Q1 2023

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- 60 hours training over 10 weeks starting Jan 2023
- Modules:
  - Introduction to Hydrogen
  - H&S Hydrogen
  - Hydrogen Types & Manufacturing Processes
  - Storage, Logistics & Distribution
  - Hydrogen Technologies
  - LCSA, Recycling & Eco Design
  - Hydrogen in Aerospace
  - Hydrogen in Vehicle, Plant & Rail
  - Power Train Layout & Development
  - Social & Financial Impact
  - Synoptic Project
  - Presentations
  - Review & Conclusions

WESTON COLLEGE

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Hydrogen Awareness Training Modules Q2 2023
Leading to Certificate of Hydrogen Technology

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- 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

Fully funded by Catapult

Awareness level

Online modular learning

6 Modules

2 – 3 Hours per module

Non-Sector Specific

CATAPULT High Value Manufacturing

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National Hydrogen Skills Forum 2023/24

Right People

Right Place

Right Time

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The Forum needs to ensure industry has access to appropriate skills to accelerate the transition to Hydrogen as a carbon zero fuel.

Its purpose is to:

- **Convene and collaborate with a range of stakeholders**
- Build on the **National Electrification Skills Framework and Forum**
- **Innovate UK Foresighting Hub being set up by HVMC**
- **Industry Driven to** identify a statement of requirements for skills providers to respond to

CATAPULT High Value Manufacturing

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Points of contact

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HSW Skills Consortium
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West of England IoT Hydrogen boot camps
Claire Arbery: claire.arbery@weston.ac.uk

National Hydrogen Skills Forum
Charlotte Holt: charlotte.holt@nccuk.com

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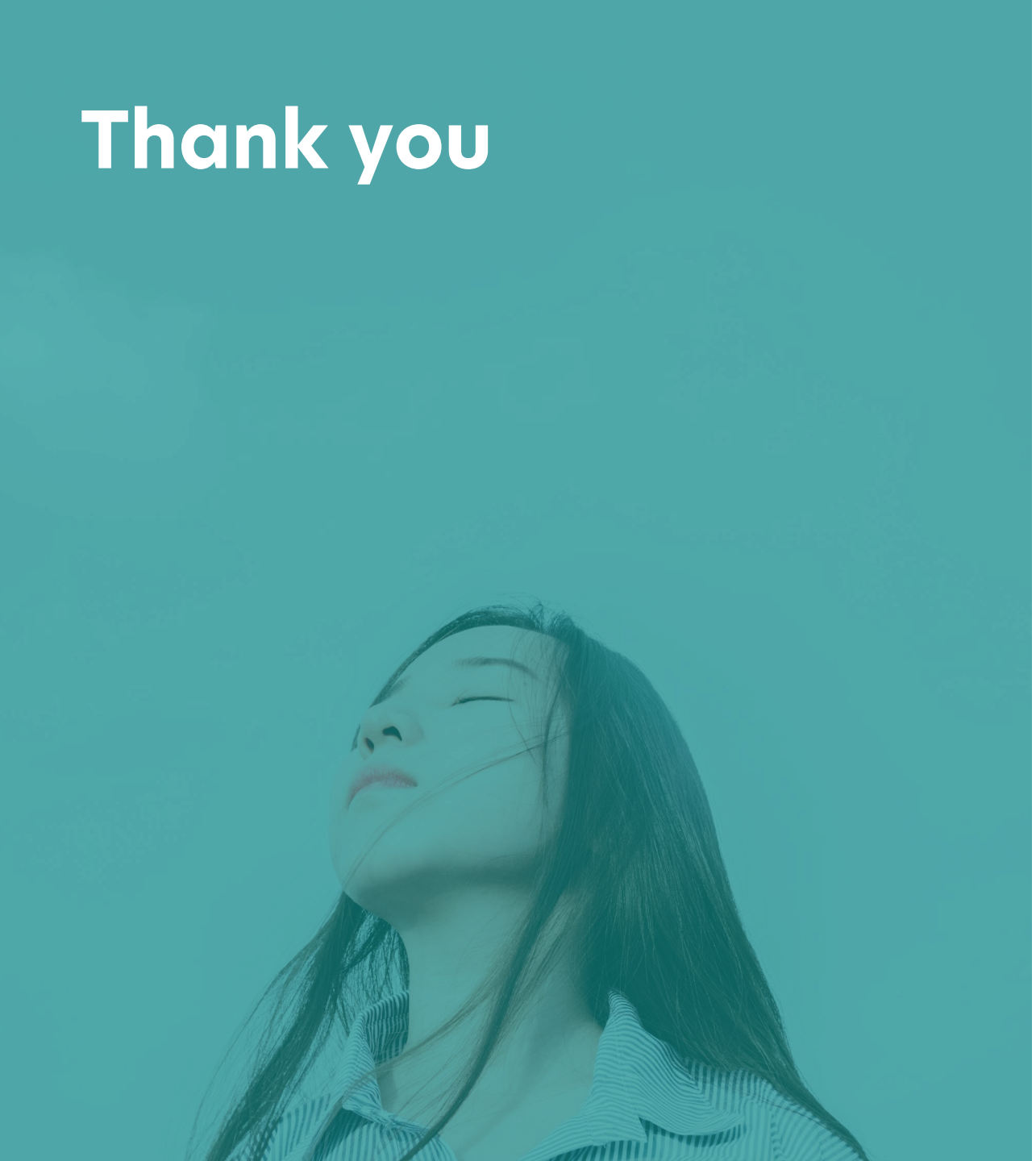
Thank you



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Get in touch: Info@hydrogensouthwest.com

Learn more:
www.hydrogensouthwest.com

Speak to our team to find out more about **membership** and **how to join** HSW

Accelerate the change