



Project Union Overview
August 2021

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Project Union overview



Development of a UK hydrogen “backbone” by repurposing ~2,000 km of existing assets (~25% of NTS today)



Integral to delivering the UK's hydrogen strategy



Aligned to green and blue hydrogen developments and CCUS clusters

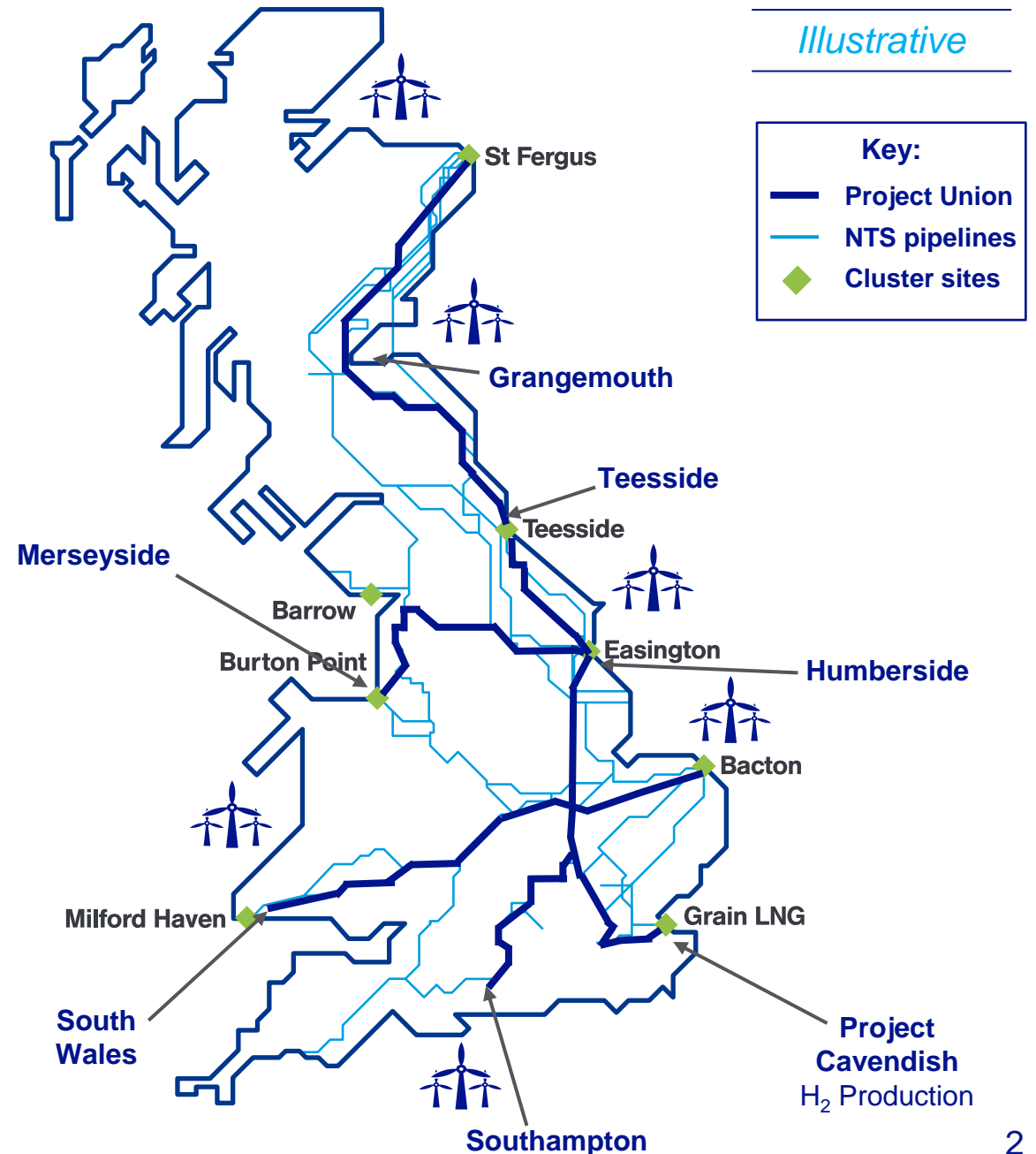


Decarbonise heavy industry (e.g. steel, concrete, and glass manufacturers)



Connect hydrogen production, demand, storage, and export centres

National Grid



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We cannot reach net zero without Project Union

Project Union is required for:



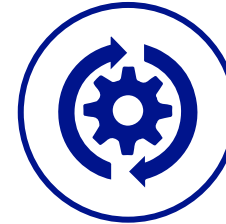
Decarbonisation of industry

- Without national transmission of hydrogen & CCUS, we will miss industrial net zero targets¹
- **~50% of industrial emissions** are outside of the Industrial Clusters
- Project Union will provide **fair access** to green and blue hydrogen for these sites and **allow them to decarbonise**



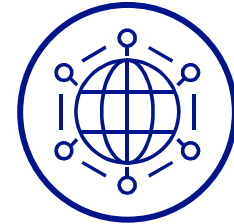
Energy storage

- The UK will require **>100TWh** of hydrogen for **inter-seasonal energy storage** by 2050²
 - **There is no other option for storing sufficient energy**
- **Union is required** to move sufficient volumes in the network
- Additionally, **intra-day energy storage** requires line-pack within the NTS to manage intermittent renewable supply and demand



Connectivity and efficiency

- **Project Union connects green & blue hydrogen projects and industry clusters** together, enabling **greater system efficiency** through coordinated and shared infrastructure
- **Without Project Union** each cluster and project requires independent capacity to handle peak demand, resulting in **over-built, duplicate storage and transmission systems**



Market coupling

- **Connecting isolated production sites to enable competition, driving costs down** for consumers
- Providing access for producers to larger markets, enabling **faster scale-up and transition to net zero**
- Access to **import / export opportunities** to Europe and Ireland by mid-2030's (in support of Gov. Hydrogen Strategy)

Source: 1) UK Industrial Decarbonisation Strategy (March 2021); 2) Nilay Shah, Professor Imperial College

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Project Union is a no regrets option for a green, equitable future



Levelling up, Job Creation

- **Providing fair access** to hydrogen infrastructure across the UK
- Enabling **existing industries to decarbonise and continue to attract capital** as global investors target net zero
- Enabling the hydrogen and CCUS economy, **with potential for >100,000 jobs** by 2050



Global Leader in Green Innovation

- Position the UK as a **global leader in Green Innovation** in a rapidly growing hydrogen economy
- **Attract technology developers and global investors** by getting the best value from our national infrastructure
- Enable rapid scale up of UK hydrogen industry, with opportunity to export hydrogen UK capability



Providing flexibility and optionality

- **Near-term:** fastest and cheapest delivery option for **flexibility in power generation, storage and consumption**, at national scale
- **Longer term:** provides **optionality** to future hydrogen decisions by government and consumers (e.g. hydrogen for heating)

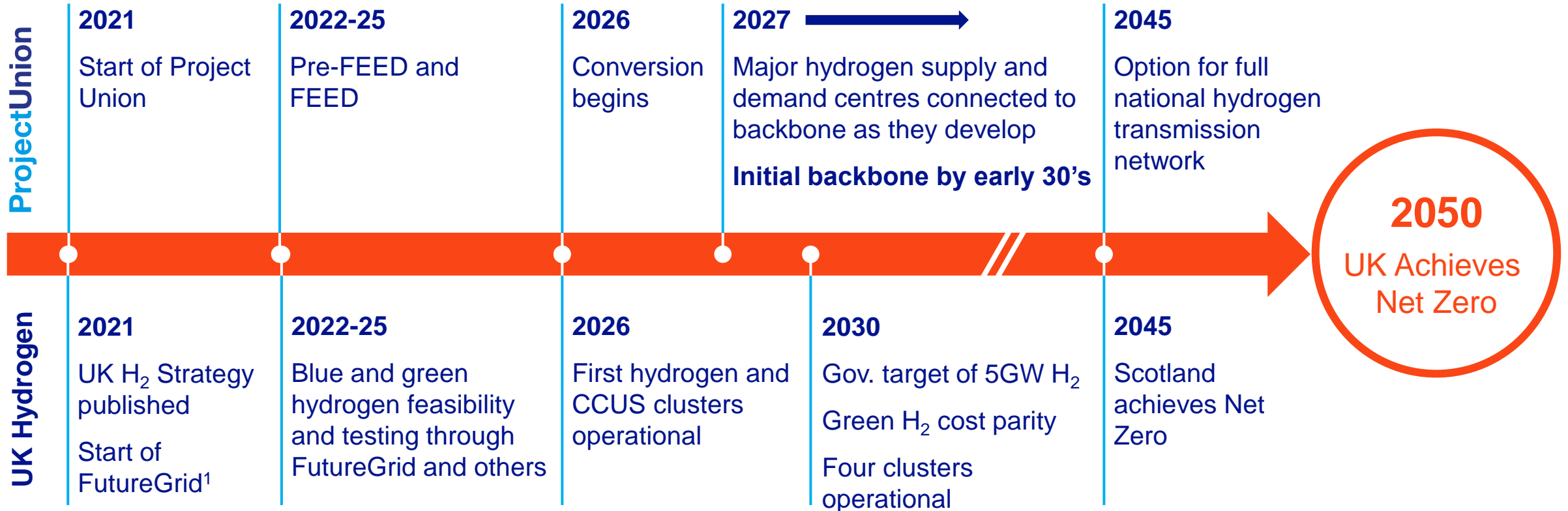


Project Union is critical for levelling up, attracting investment and providing optionality

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Roadmap to 2050

“There is huge potential for hydrogen to help the UK transition towards a green economy and we are committed to investing in its development as part of our plans to build back greener”
 - Energy Minister Anne-Marie Trevelyan



We are starting now to reach net zero

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Project development



We have moved from ideation, into strategy development and stakeholder engagement



Appointed EY as external advisor to support next phase of project development



Project Union is now a central feature to the future of UK net zero energy system



Next step to secure funding for transition strategy and pre-FEED work packages

National Grid



nationalgrid