



Clean
Energy
Project



Shetland
Islands
Council



L_{ER}WICK
PORT AUTHORITY



Net Zero
Technology
Centre
Technology Driving Transition



University of
Strathclyde
Glasgow

ORION Project – helping Shetland become a regional hydrogen hub

Ambition

Create

Create on Shetland a green hydrogen export business at industrial scale by harnessing offshore wind power and creating new jobs

Transform

Transform Shetland's current dependency on fossil fuels to affordable renewable energy to address fuel poverty and improve community wealth

Enable

Enable offshore oil and gas sector transition to net zero by electrification, utilising initially onshore wind, sustaining thousands of jobs and security of supply



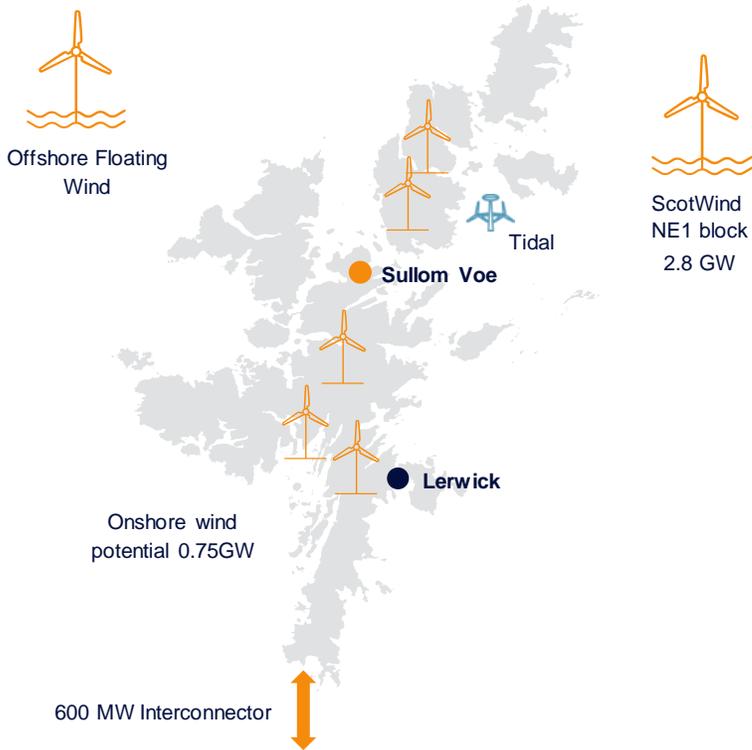
Energy Vision

Skilled workforce, industrial land, ports, wind & tidal

Key Enablers

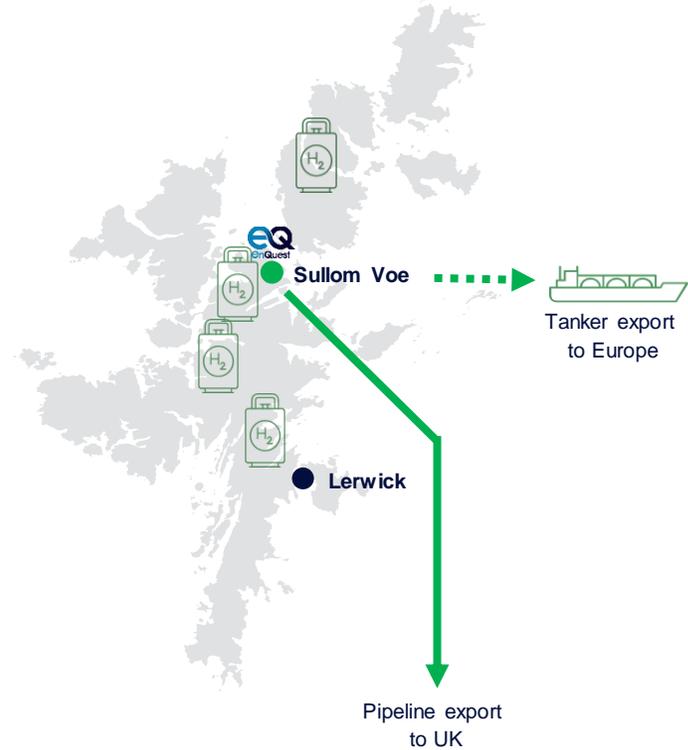
Wind & Tidal

Up to 30GW wind energy potential



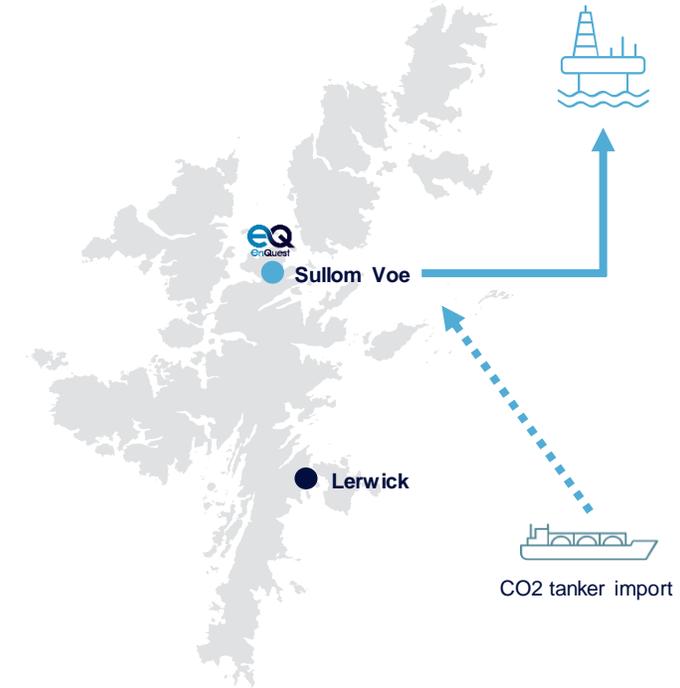
Green Hydrogen

Potential to produce & export > 1MTPA



CCUS

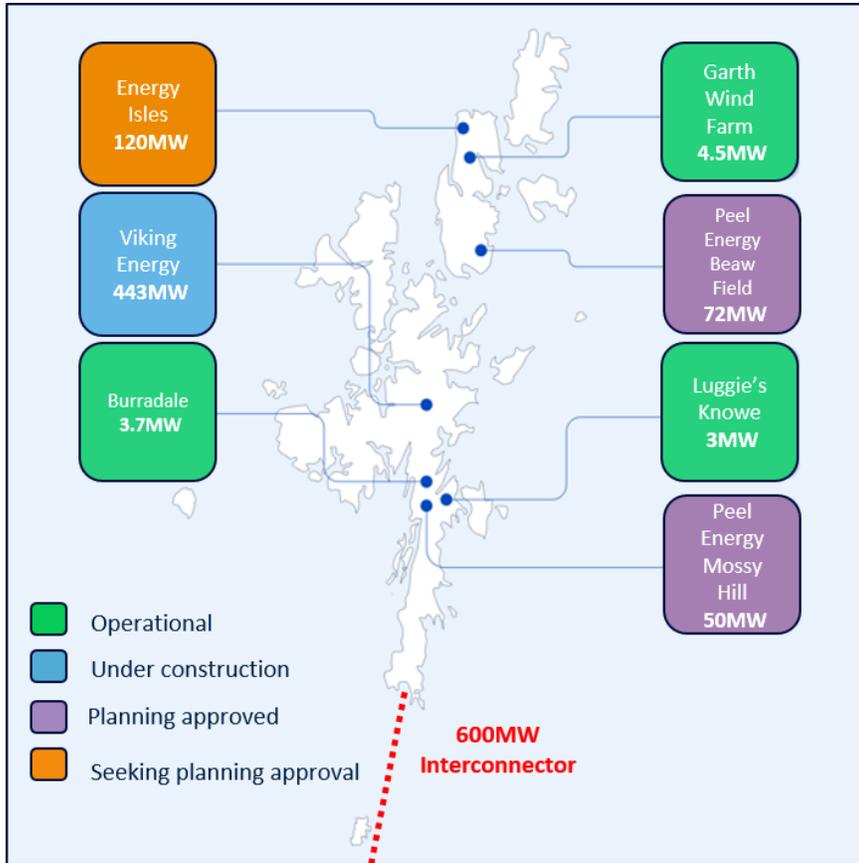
Potential to store up to 10MTPA



Significant wind & tidal resource will enable green hydrogen production at scale

Onshore Wind & Tidal

Onshore Wind

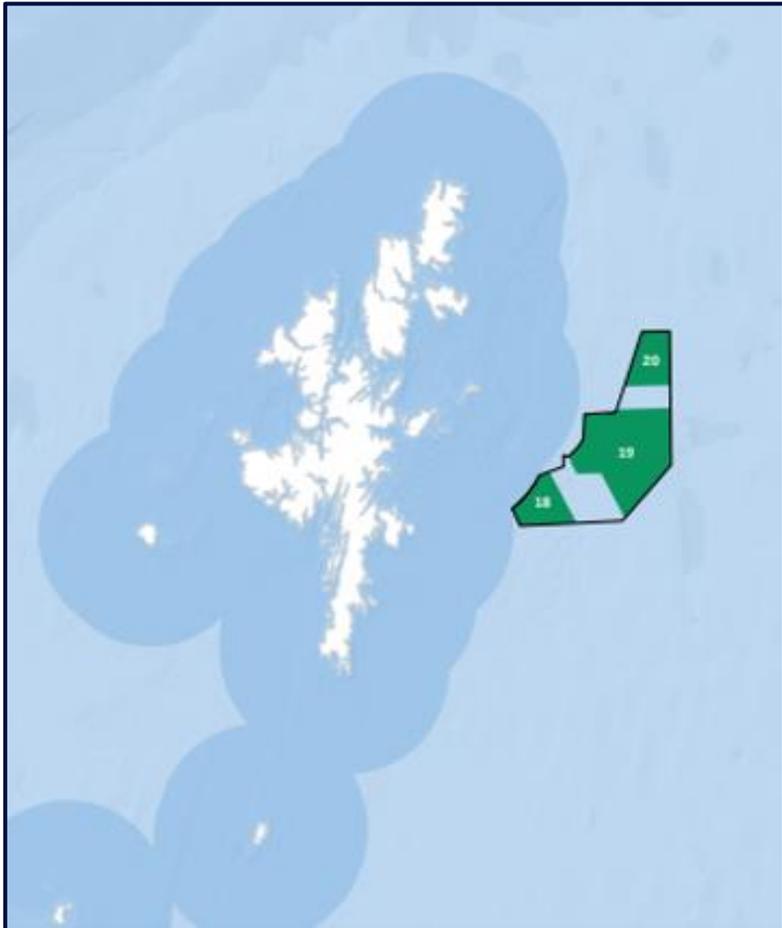


Tidal

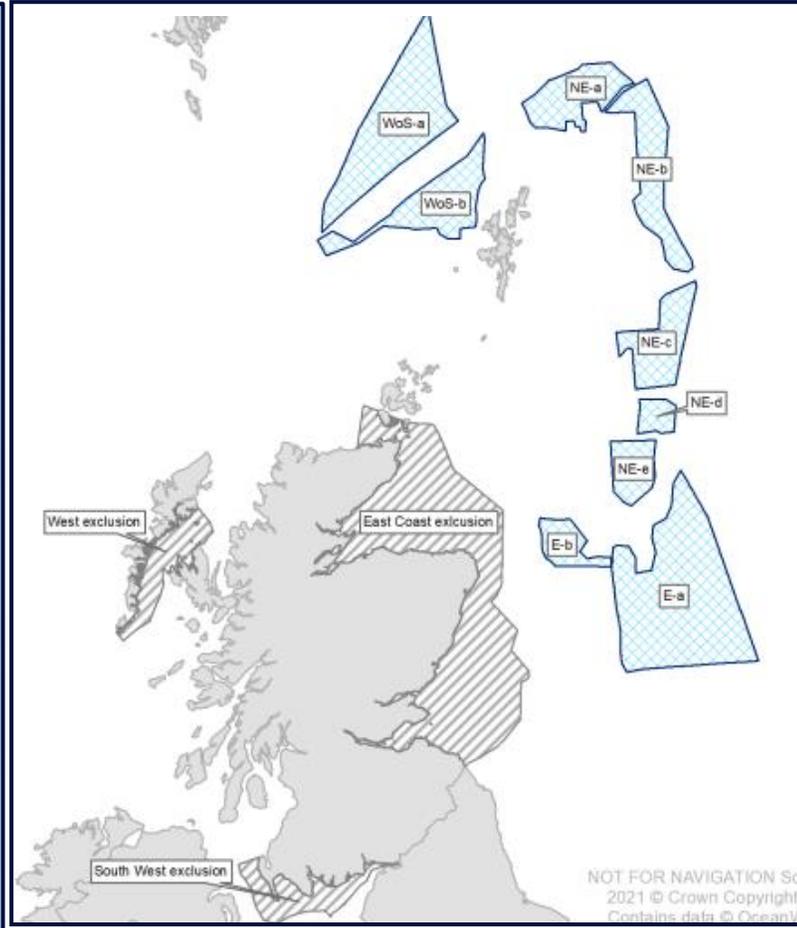


- **Onshore Wind:** Over 0.75GW available by 2028 providing local power, export & potentially green hydrogen locally
- **Tidal:** Significant local contribution of over 15MW by 2028
- **Next Steps:** Utilizing onshore wind & tidal energy to start generation of green hydrogen

ScotWind

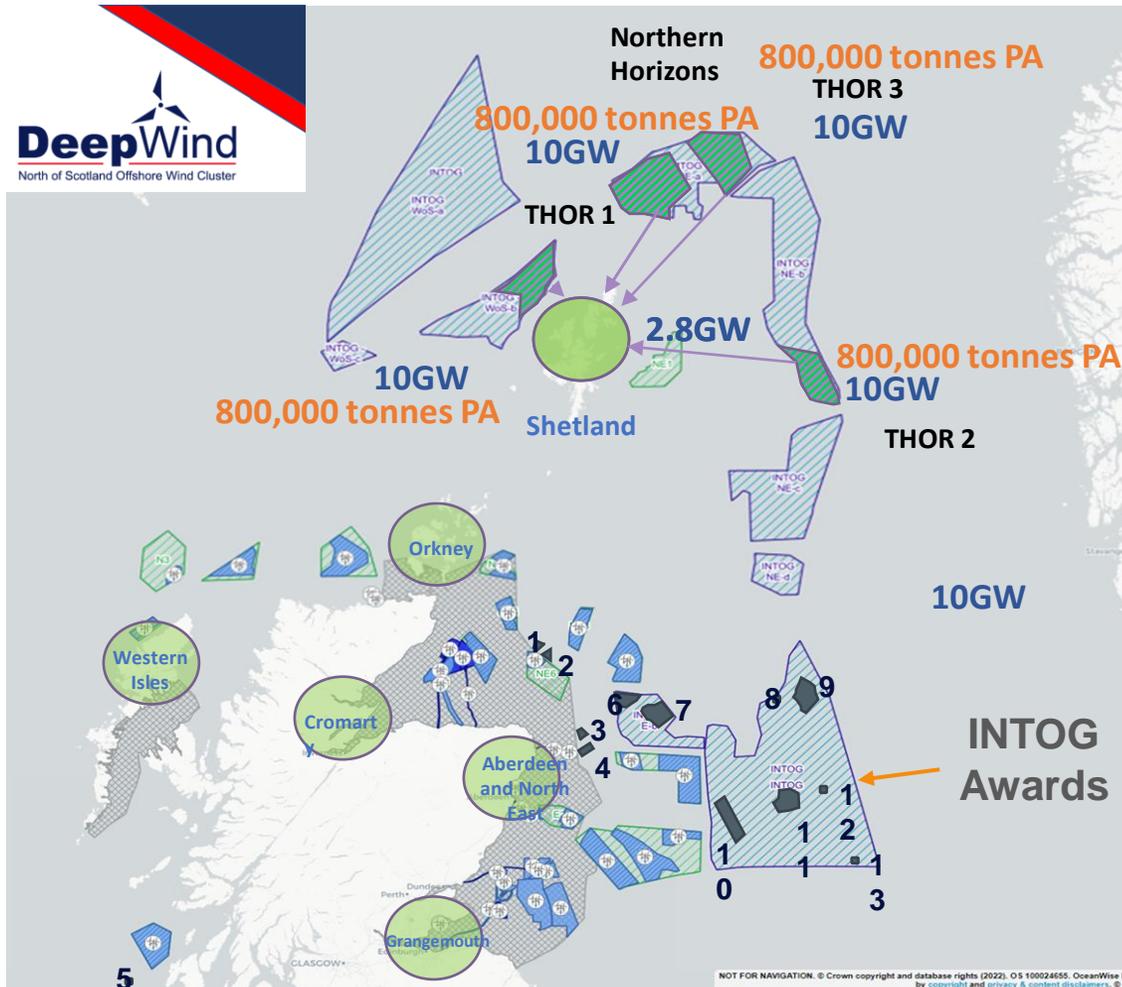


INTOG



- **ScotWind:** NE1 awards made to Ocean Winds, Mainstream RP & ESB for 560sq kms with 2.8GW wind energy for green hydrogen production
- **INTOG:** No licences awarded but WOS oil & gas operators need clean energy to decarbonize and more offshore wind required to develop a renewable energy hub
- **Next Steps:** Working collectively with NE1 offshore wind developers

Future Offshore Wind Licensing



Source: DeepWind

- The INTOG Areas of Search modelling has indentified areas around Shetland where there are a very small number of oil and gas infastructure projects
- These offer areas for large scale wind farm projects of the type proposed by Highlands and Islands Enterprise in the THOR concept
- **THOR - Terawatts of Hydrogen from Offshore Renewables**

Sullom Voe Tanker Terminal



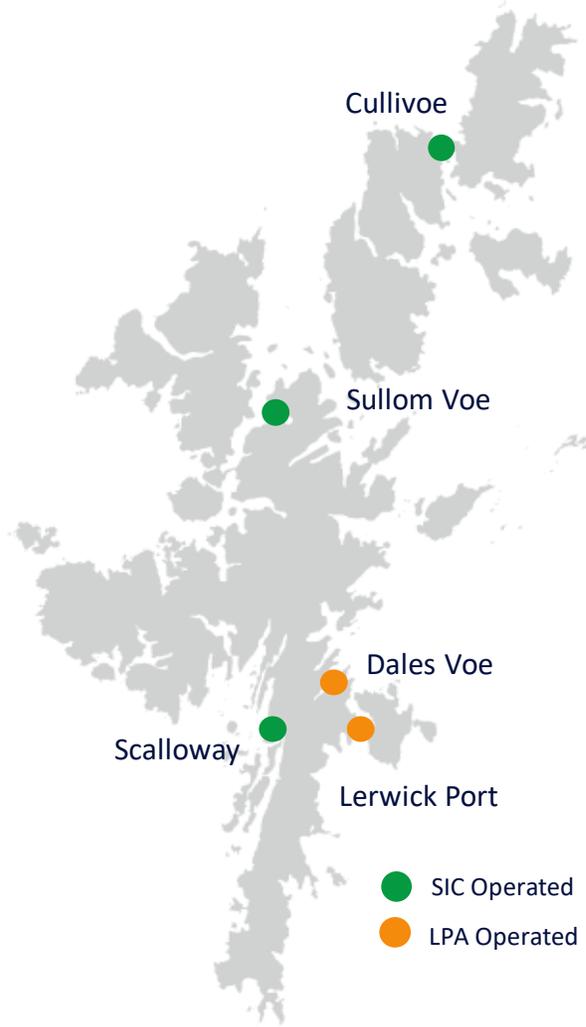
Dales Voe Facility



Lerwick Port Facility



Scalloway Port Facility



- **SIC Ports:** Sullom Voe exported over 8bnbbls crude oil and LPG for over 40 years with all ports supporting oil & gas sector operations
- **Lerwick Port Authority:** Supporting oil & gas sector operations and projects plus decommissioning
- **Next Steps:** Assessing & marketing & developing port capability for supporting offshore wind development, clean fuel & CO2 export

- 40 years+ oil & gas export from Sullom Voe
- Deep water berthing facilities
- Support offshore wind & clean fuel export

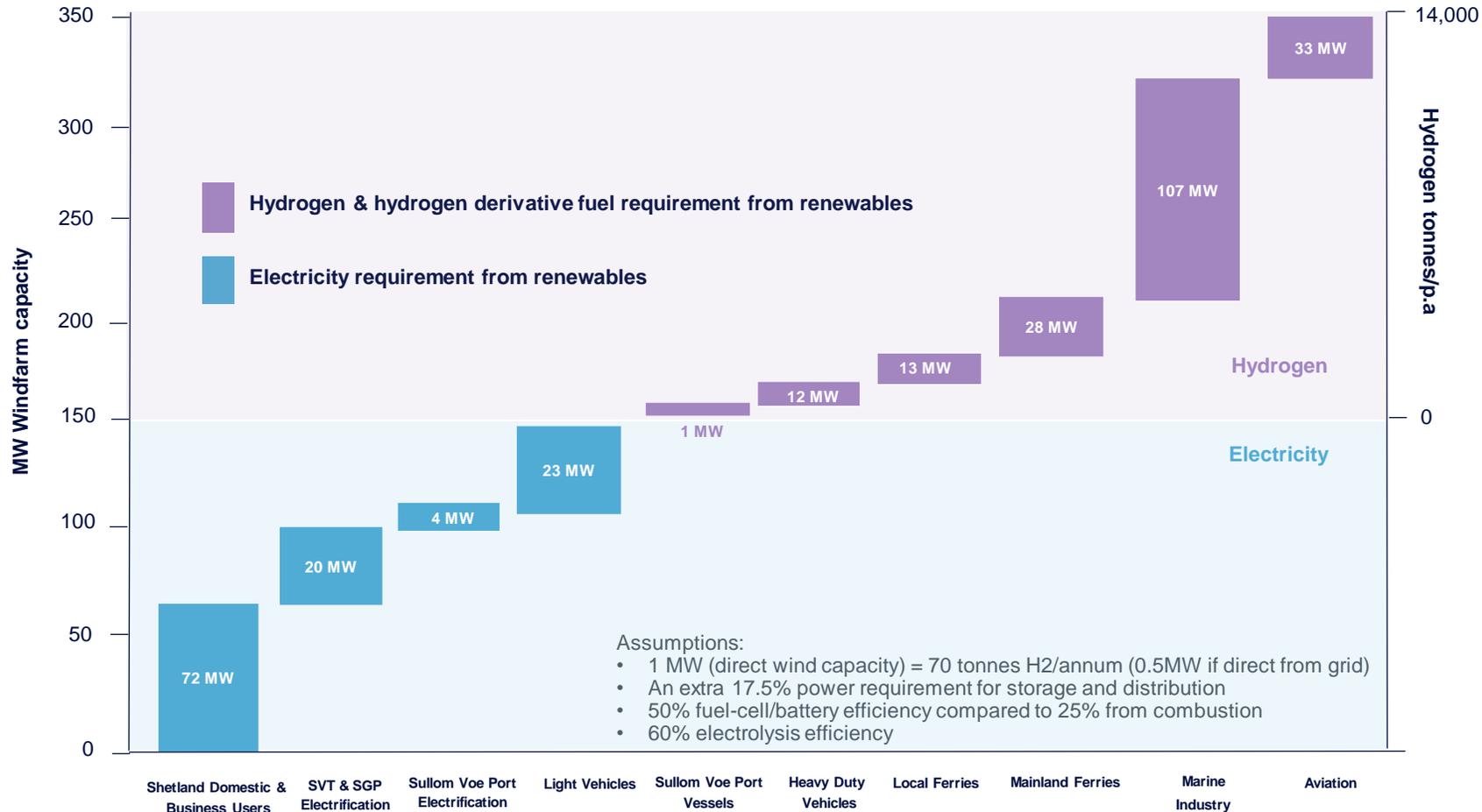
Shetland Green Hydrogen Deliverability

Energy Source	Energy (MW)	Land Area (Hectares)	Green H2 (t/day)	Oxygen (t/day)	Ammonia (t/day)	Customers
 <p>ScotWind Offshore Floating Wind</p>	2800	100	700	5400	4000	Regional Use <ul style="list-style-type: none"> • Tanker Export • Pipeline Export
 <p>Onshore Wind</p>	200	10	50	400	460	Local Use <ul style="list-style-type: none"> • HDV's • District Heating • Marine Vessels
 <p>Tidal</p>	15					

Current renewable energy available to create green hydrogen initially for local use then export

Local Hydrogen Demand

Shetland local electrical & hydrogen demand





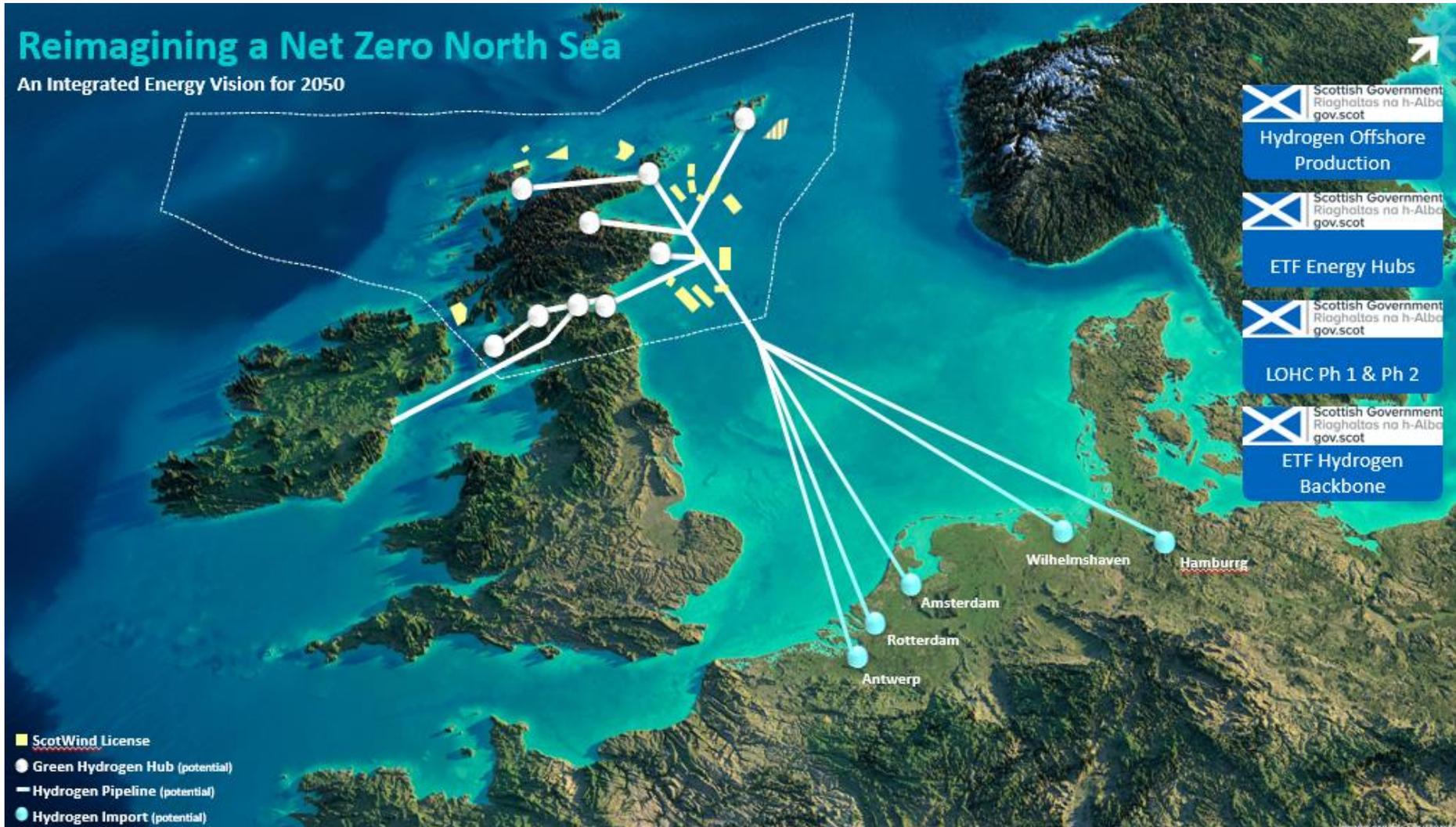
EnQuest: New Energy

EnQuest aims to deliver Scotland's largest Energy Hub at SVT

	Existing Brownfield Acreage	1,000-acre brownfield industrial COMAHsSite
	Existing Pipeline Infrastructure	Pipeline connections to offshore storage sites and Mainland UK
	Established Supply Chain and SVT Workforce	Shetland has five decades of Energy Industry experience
	Wind Resource	10GW+ onshore & offshore wind potential
	Regional CO ₂ and H ₂ Storage Potential	Multiple CO ₂ storage sites accessible from existing infrastructure
	Deepwater Jetties	24m deep jetties accepting VLCC size vessel
	Strategic Location	Strategically located to service UK and Europe



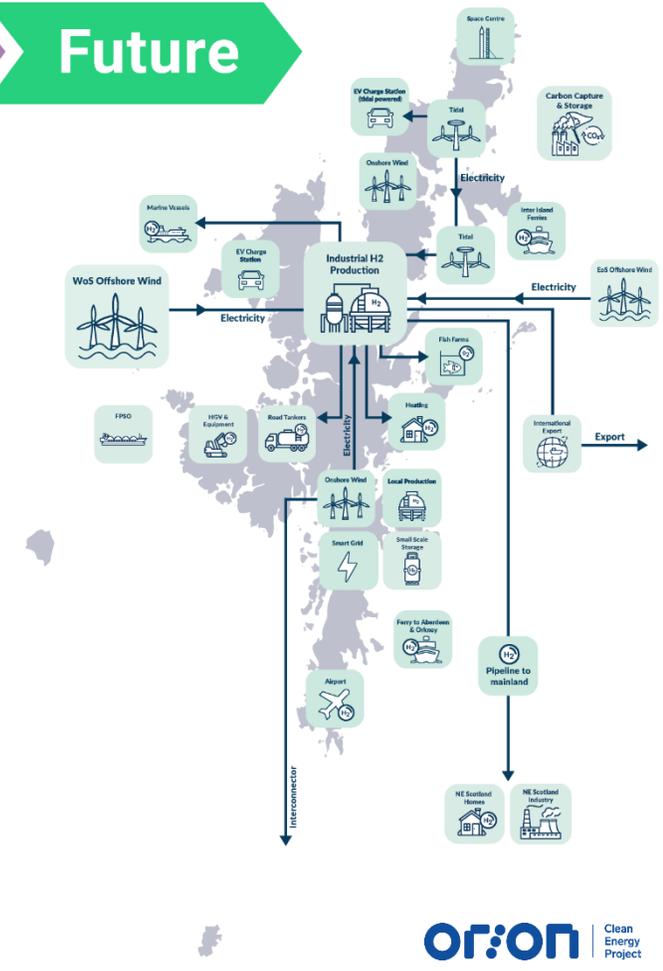
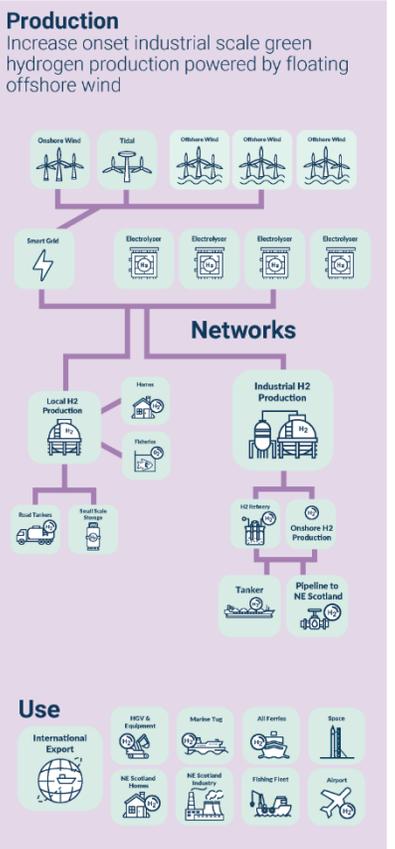
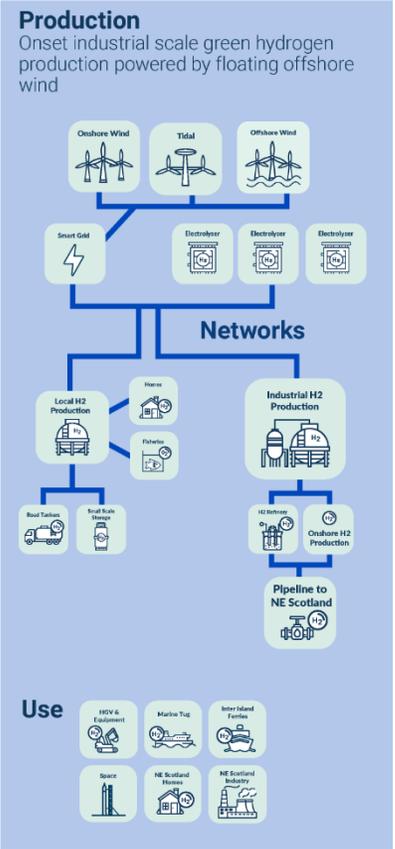
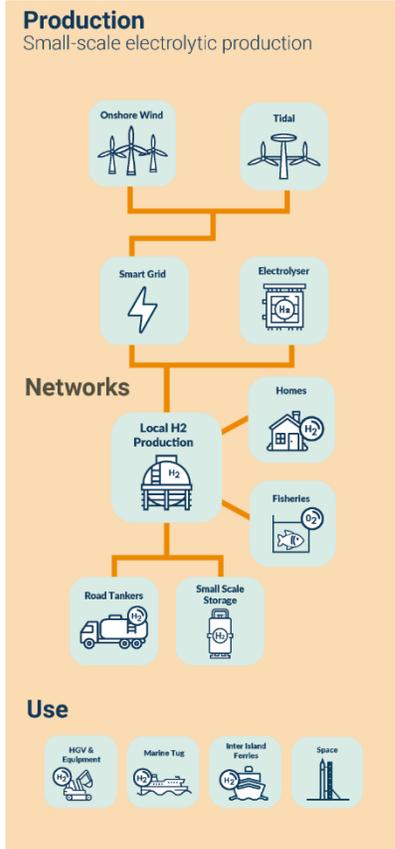
NZTC Green Hydrogen Studies



Source:



Shetland Hydrogen Road-map



Key Actions & Milestones

2023-2027

- All onshore wind farms operational
- Trials for export H2 & import CO2
- Port & Jetty development in progress
- PPA in place with clean fuel offtakers
- Local green H2 market

2027-2030

- Phase 1 ScotWind & INTOG
- Sullom Voe H2 production & CCUS
- SIRGE H2 pipeline export
- Shetland ports support offshore wind
- WOS development commences

2030-2035

- ScotWind & INTOG full production
- New offshore wind areas licenced
- Pipeline H2 export at scale
- Tanker import (CO2) & export (H2)
- All ports decarbonized

Shetland's Green Hydrogen Future

- Discussions in progress to utilize onshore wind & tidal energy to create green H2 for local use
- Offshore floating wind blocks awarded with 2.8GW potentially available for green H2 production at scale
- Sullom Voe region ideally located and suited for manufacture, storage & transportation of green H2
- Requirement for more offshore wind areas to be licensed and investment hydrogen & port infrastructure

Shetland: Islands of Opportunity

In Partnership with:



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