



Clean  
Energy  
Project



Shetland  
Islands  
Council



L<sup>ER</sup>WICK  
PORT AUTHORITY



Net Zero  
Technology  
Centre  
Technology Driving Transition



University of  
**Strathclyde**  
Glasgow

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# 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

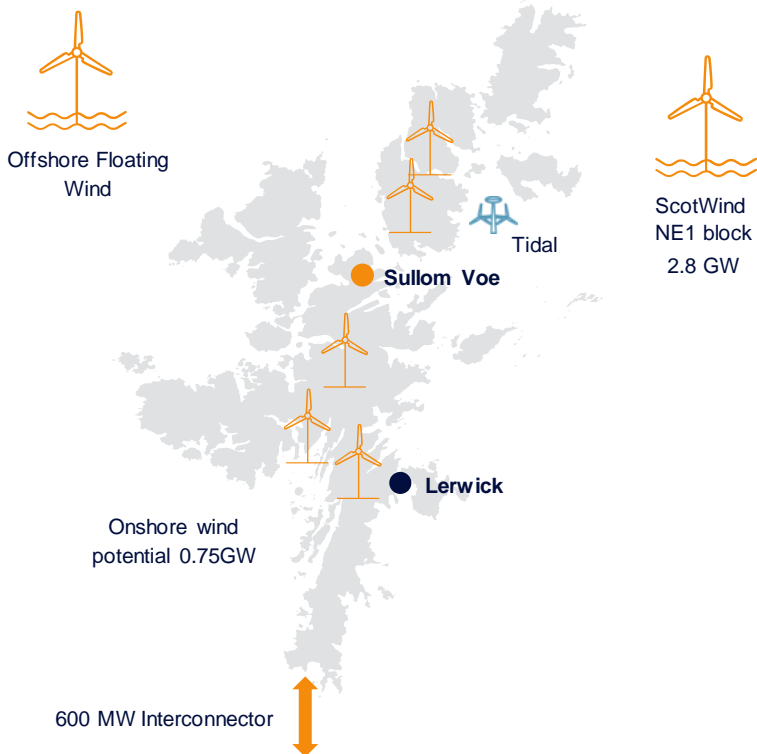




# Key Enablers

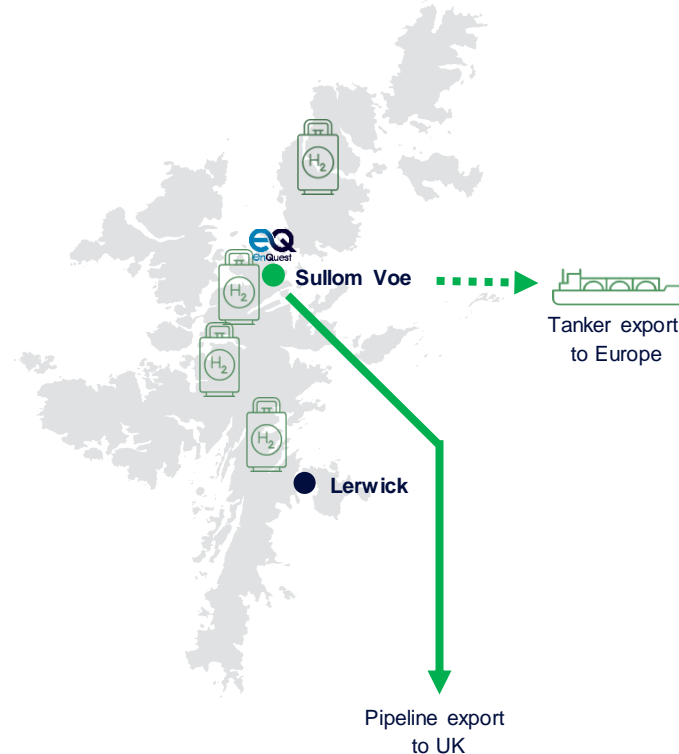
## Wind & Tidal

Up to 30GW  
wind energy potential



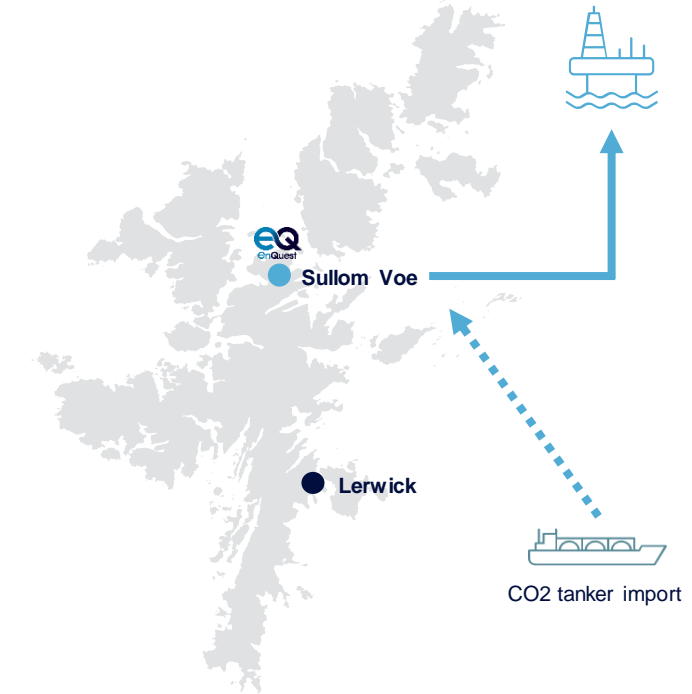
## Green Hydrogen

Potential to produce & export > 1MTPA



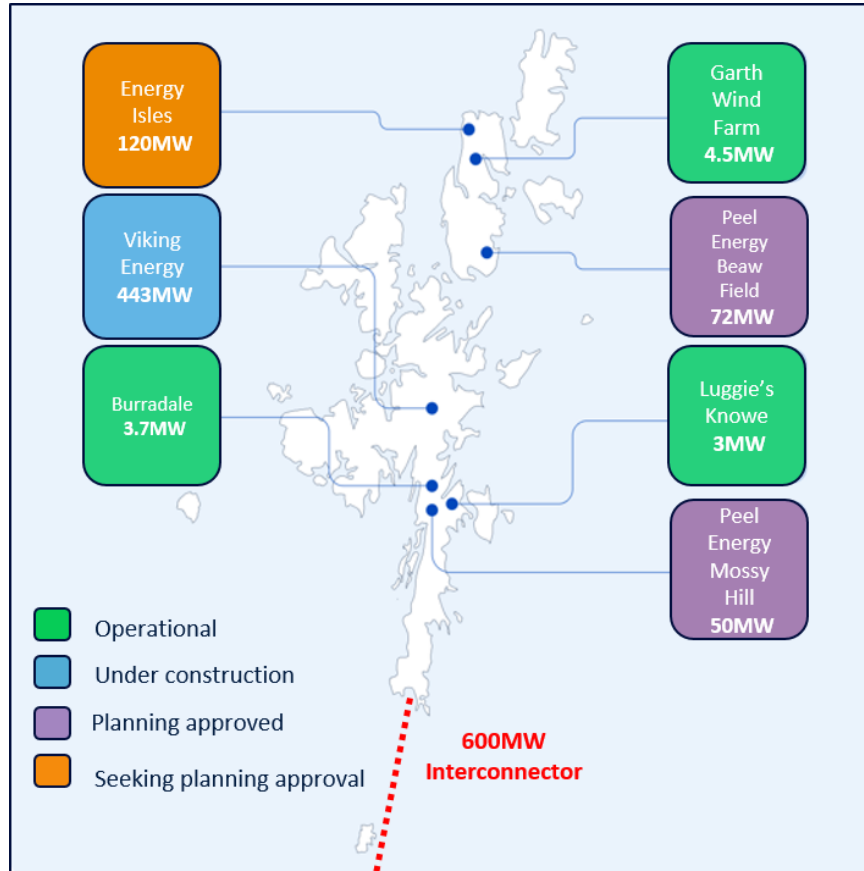
## CCUS

Potential to store up to 10MTPA



# Onshore Wind & Tidal

## Onshore Wind



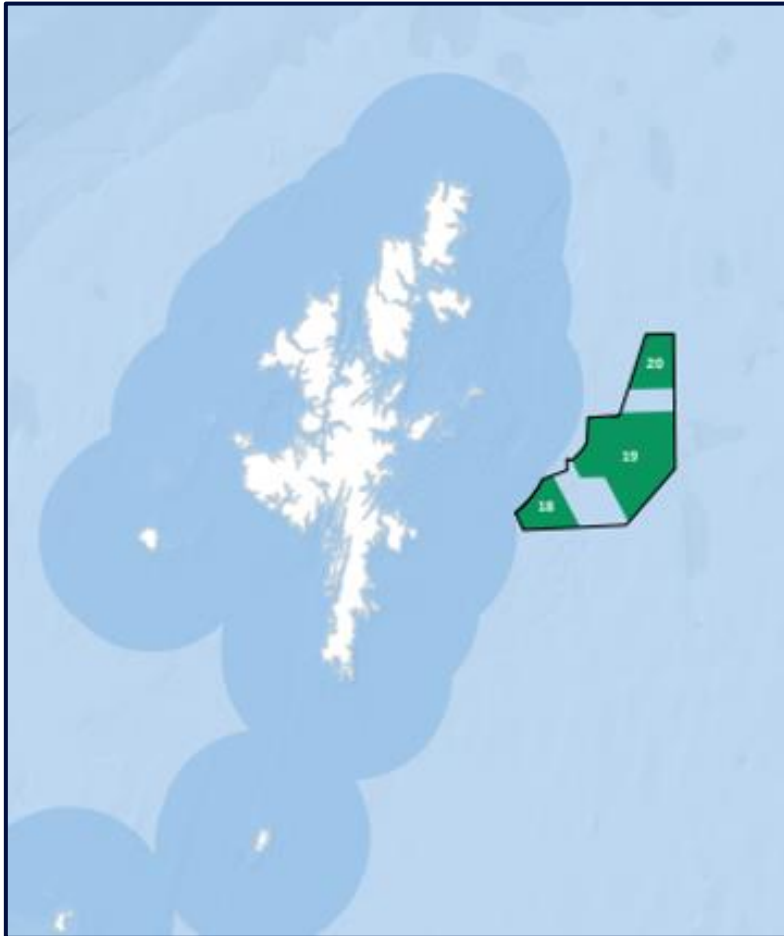
## Tidal



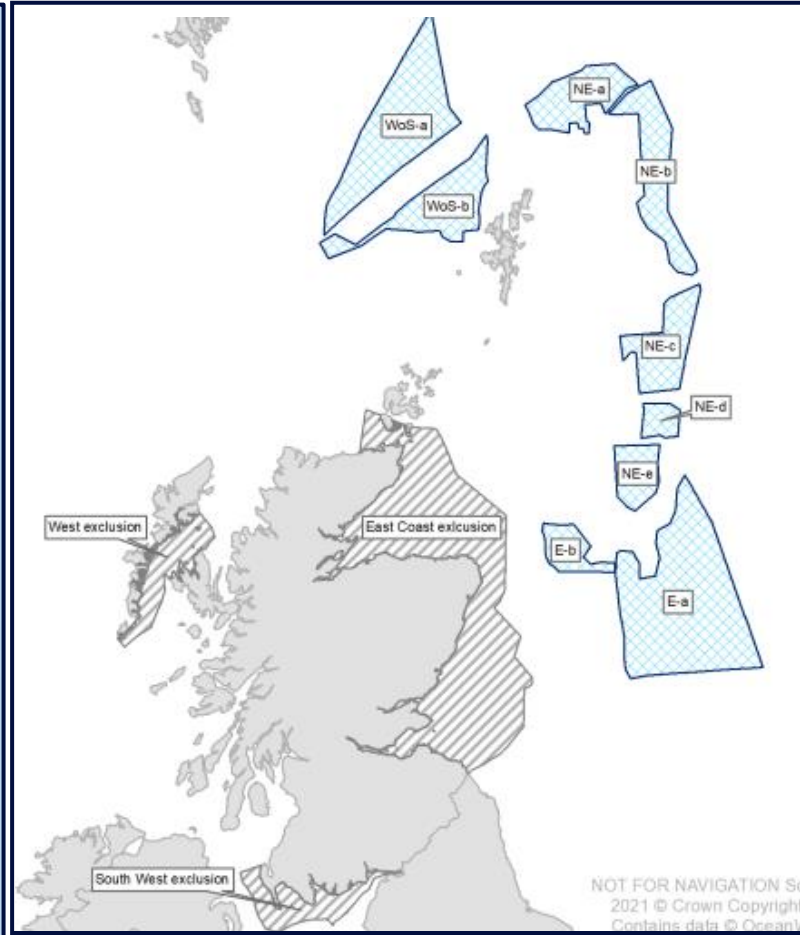
- **Onshore Wind:** Over 0.75GW available by 2028 providing local power, export & potentially green hydrogen locally
- **Tidal:** Significant local contribution of over 15MW by 2028
- **Next Steps:** Utilizing onshore wind & tidal energy to start generation of green hydrogen

# Offshore Wind Licensing

ScotWind

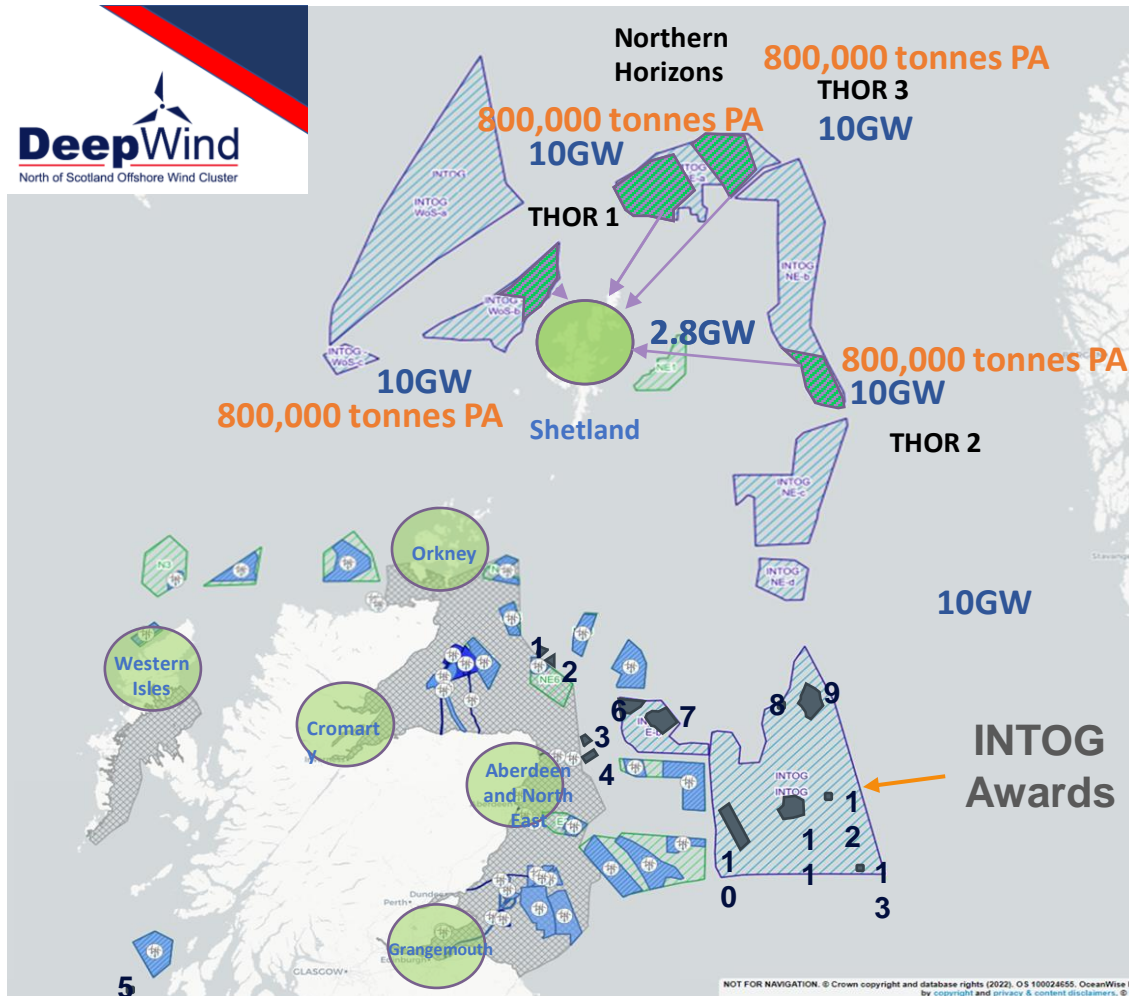


INTOG



- **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

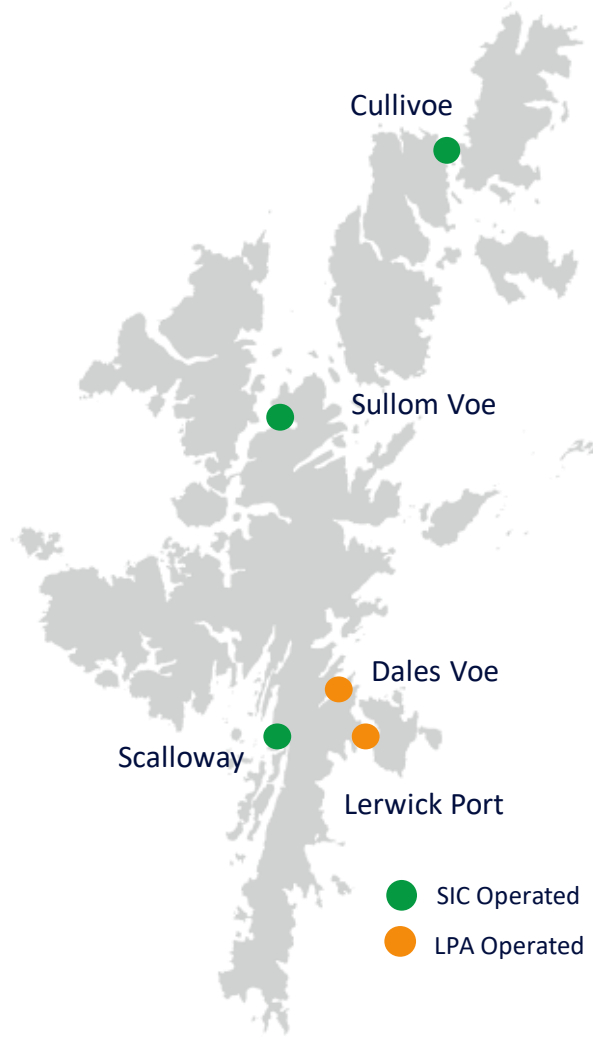
# Future Offshore Wind Licensing



- The INTOG Areas of Search modelling has identified areas around Shetland where there are a very small number of oil and gas infrastructure 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**






# Shetland Ports



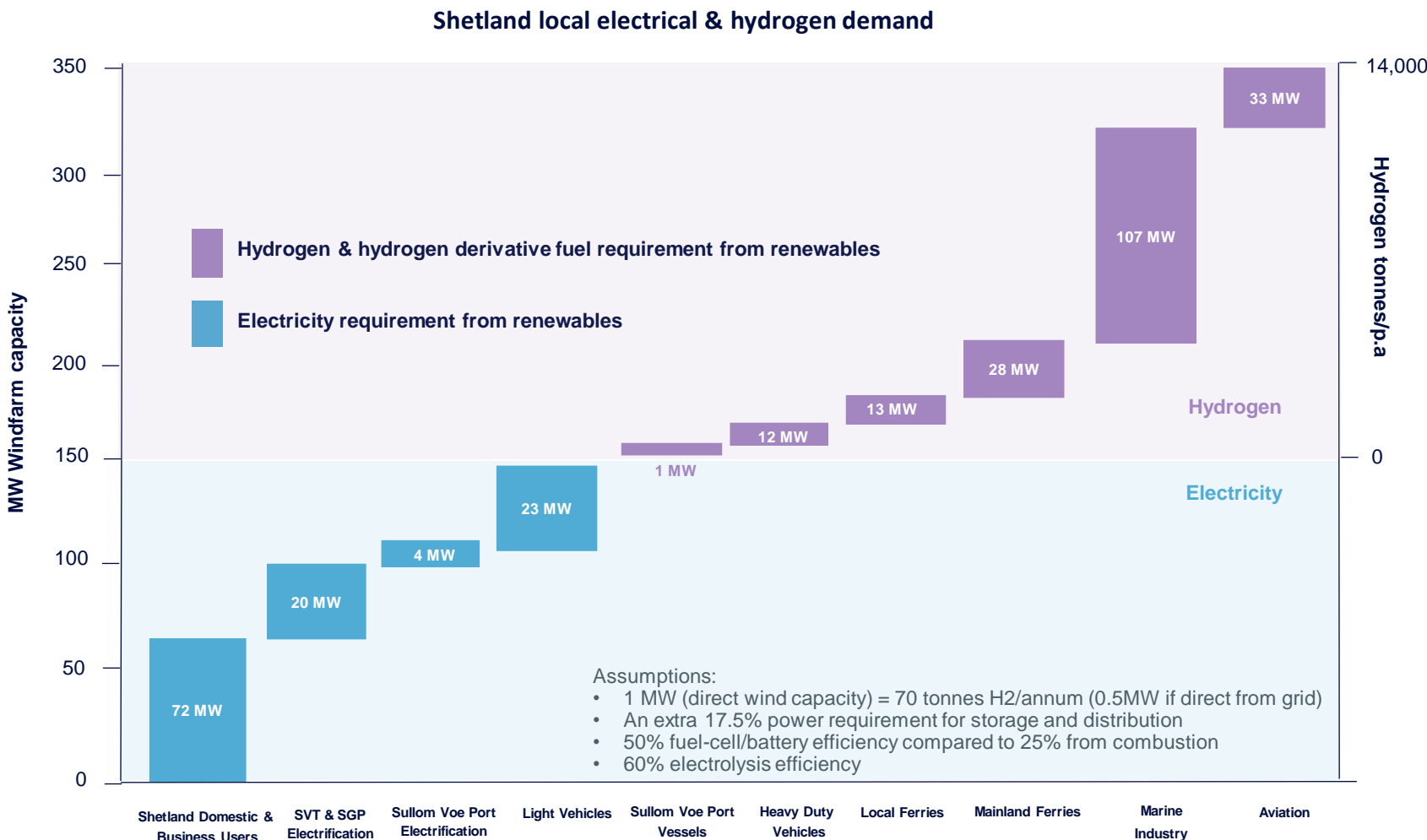
- **SIC Ports:** Sullom Voe exported over 8bnbbls crude oil and LPG for over 40 years with all ports supporting oil & gas sector operations
- **Lerwick Port Authority:** Supporting oil & gas sector operations and projects plus decommissioning
- **Next Steps:** Assessing & marketing & developing port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

# Shetland Green Hydrogen Deliverability

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










# Local Hydrogen Demand



EnQuest: New Energy



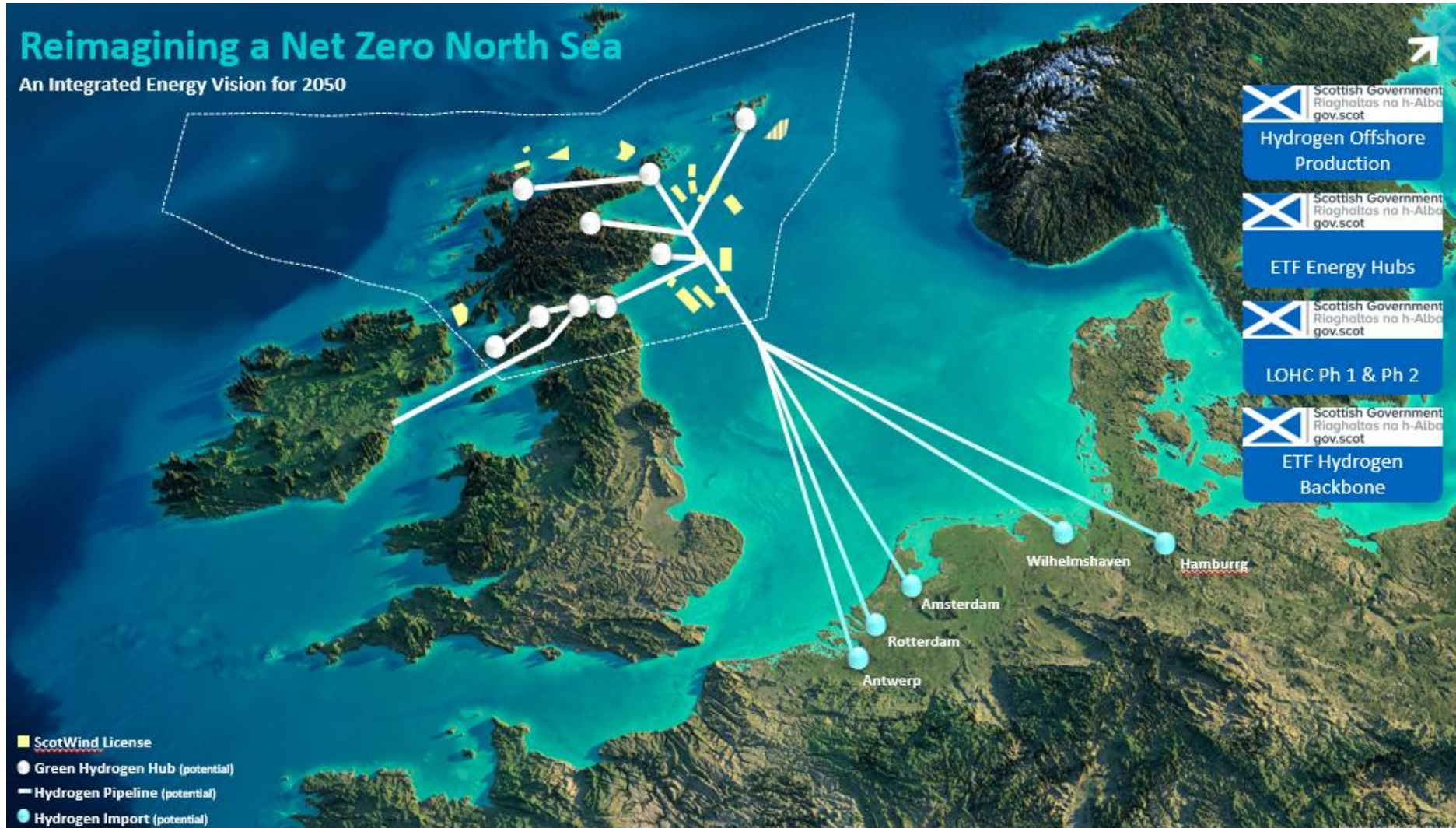
## EnQuest aims to deliver Scotland's largest Energy Hub at SVT

	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 <sub>2</sub> and H <sub>2</sub> Storage Potential	Multiple CO <sub>2</sub> 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:

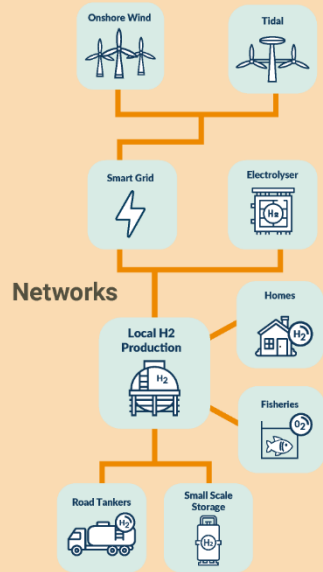


# Shetland Hydrogen Road-map

**2023-2027**

Localised Green Hydrogen Production

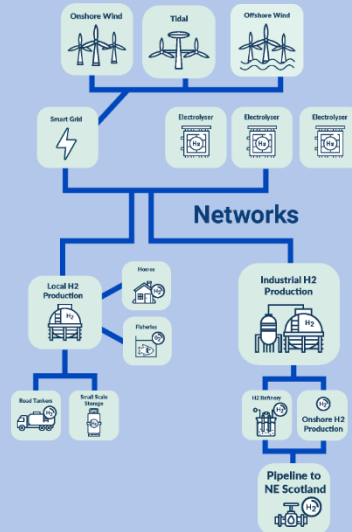
**Production**  
Small-scale electrolytic production



**2027-2030**

Localised & Initial Industrial Green Hydrogen Production

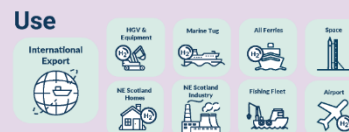
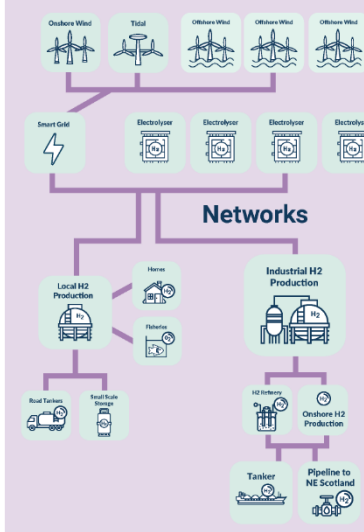
**Production**  
Onset industrial scale green hydrogen production powered by floating offshore wind



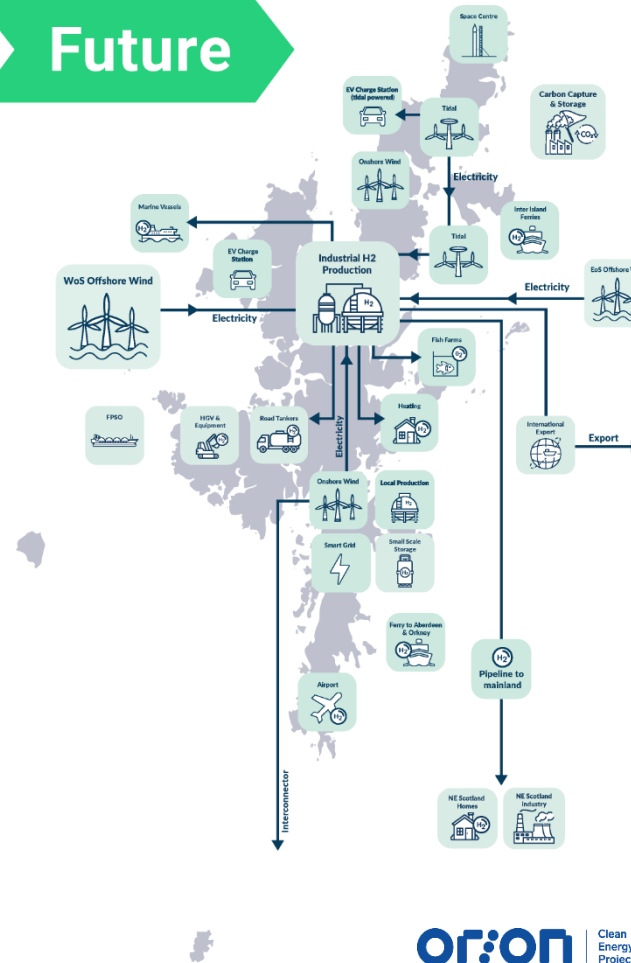
**2030-2035**

Industrial Scale Green Hydrogen Production

**Production**  
Increase onset industrial scale green hydrogen production powered by floating offshore wind



**Future**



## 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:

