



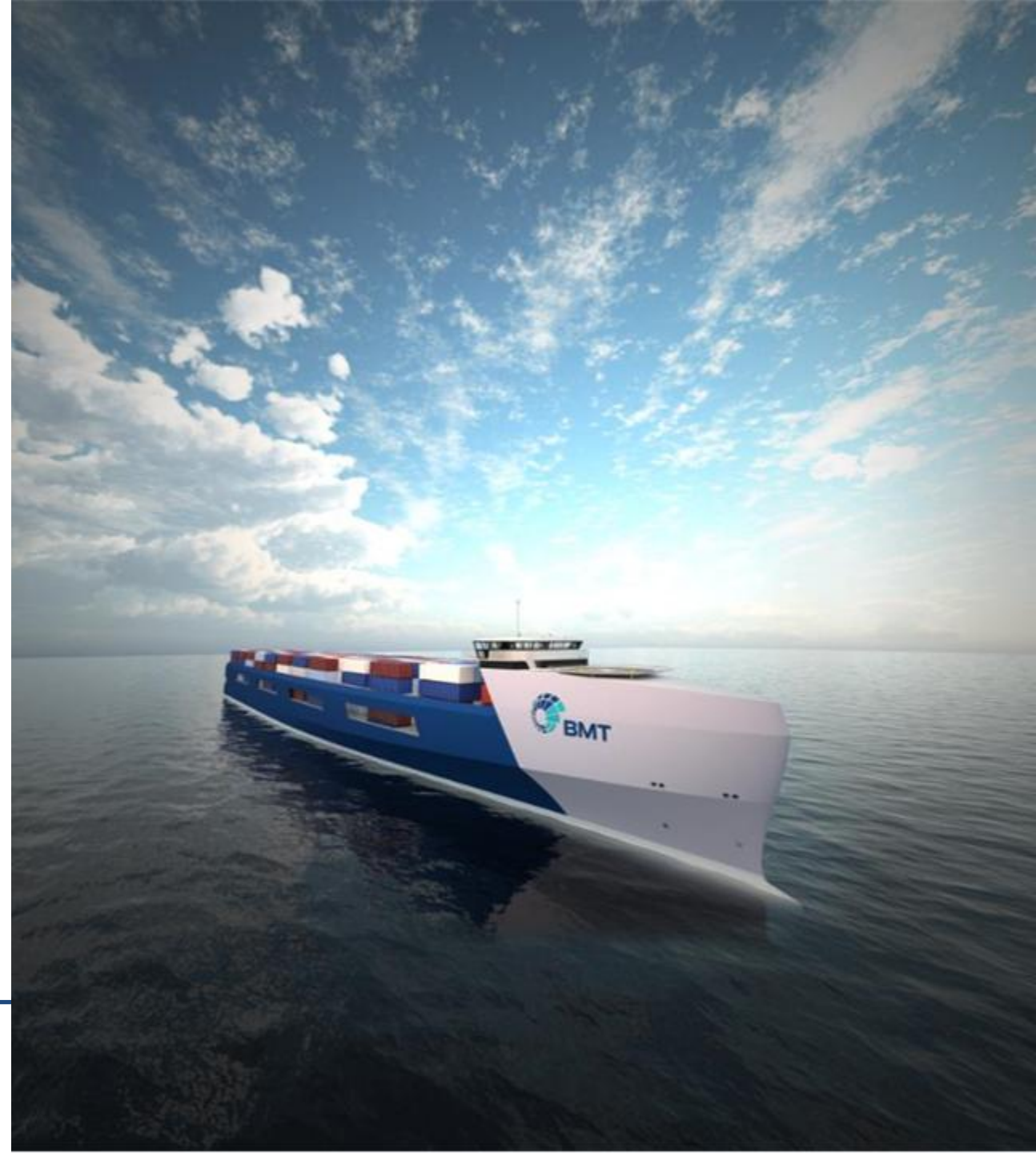
Ports as Energy Hubs: A chance to sustain island connectivity?

**IMarEST Maritime Industry
Decarbonisation Symposium
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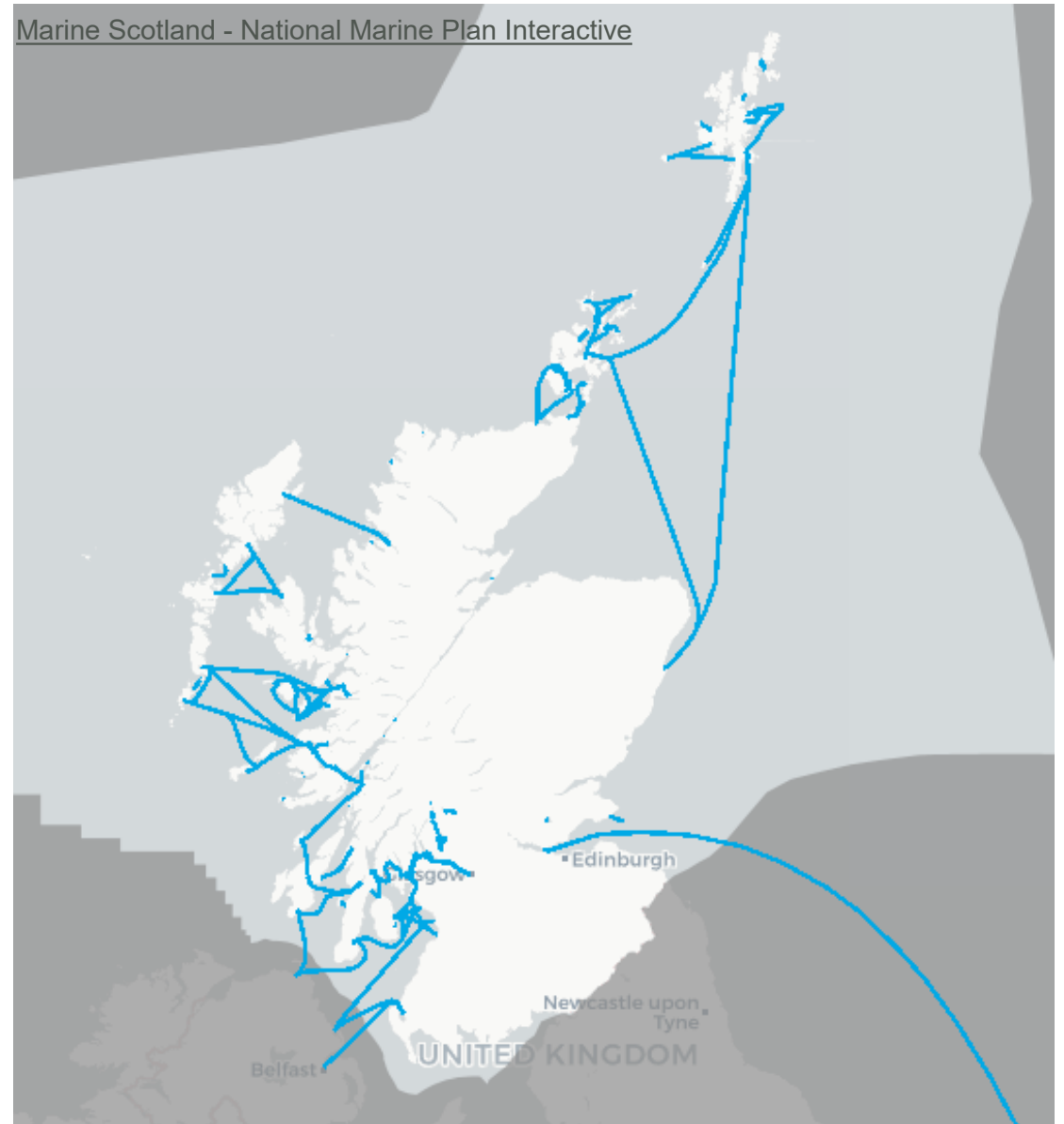
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Introduction

- Scottish Gov Net Zero mandate for 2045
- Island connectivity is critical.
 - Ferry routes shown on right
- 128 local authority ports and 34 private. [1]
 - Top 16 ports plus 10 competent harbour authorities
- 101 Scottish islands
 - 6 off-grid Scottish islands
 - Some are 'self generating'
 - Many connections by subsea cables
- Leveraging a Just Transition is fundamental

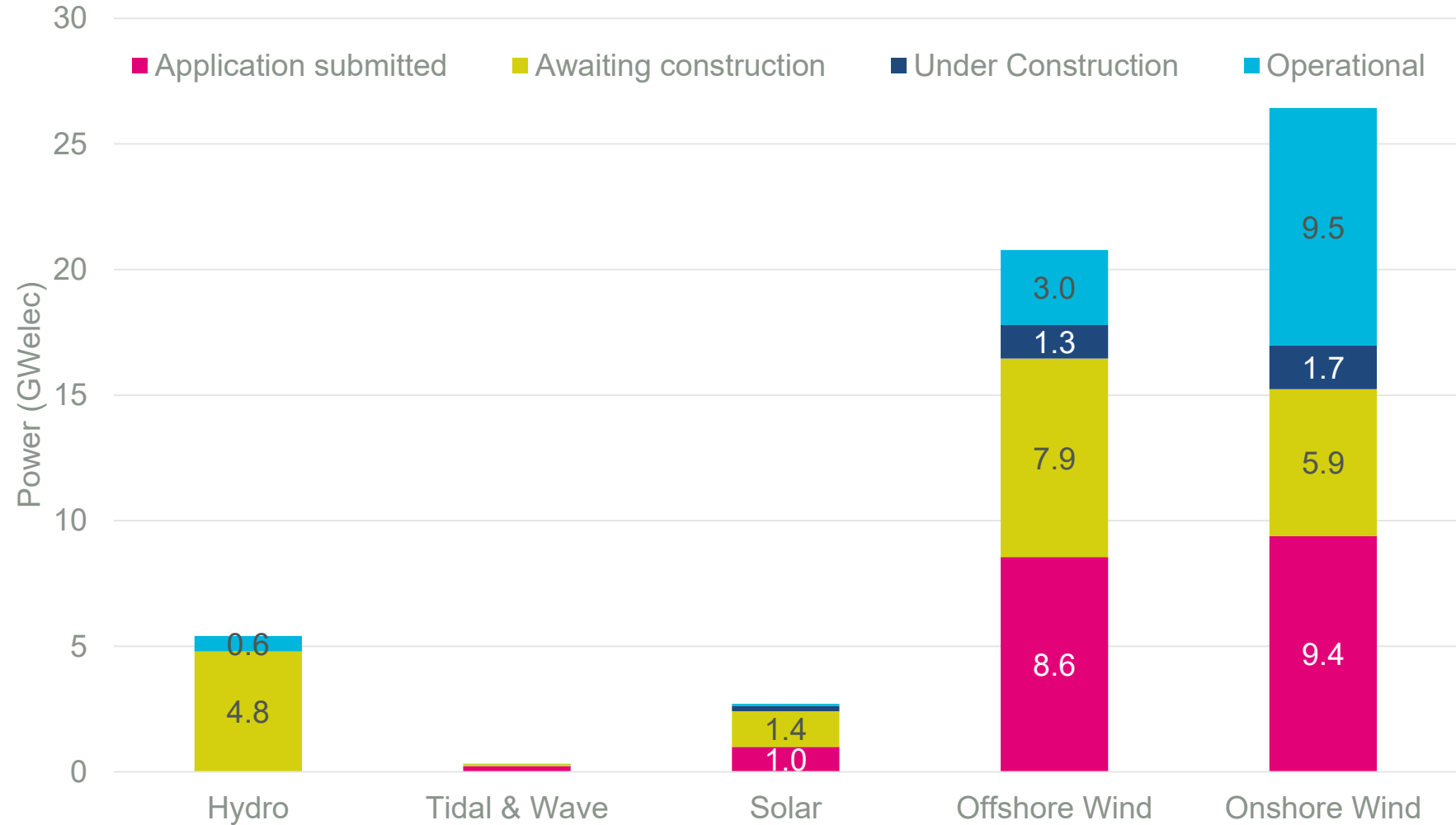


Renewable Energy Status

- 40GW submitted or awaiting construction
- 3.3GW in construction
- 13GW operational

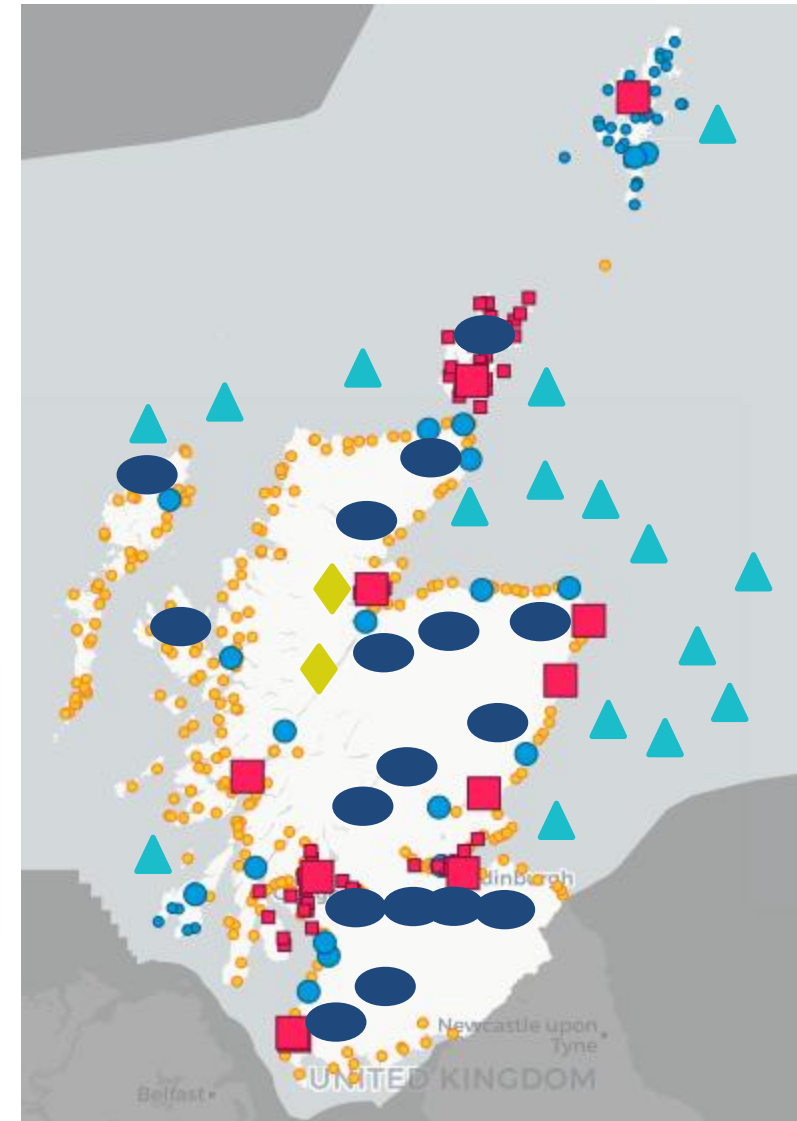
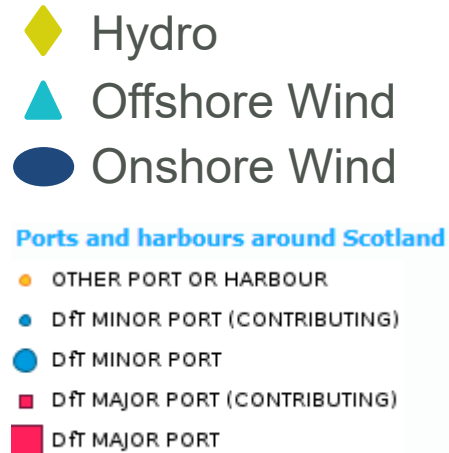
BUT

- 21.7GWh demand in Q3 2024 for Scotland [2]



Renewable Energy Sites

- Offshore wind predominately east coast
 - But near ports
- Hydro in the highlands
- Onshore wind more disparate
 - Lots in the central belt
 - Significant near coast



Ports supporting Regionalisation

- Ports likely to be strategic nodes in the energy transition
 - Infrastructure host (renewables, storage & production)
 - Increased logistics support
- Provides resilience & security to communities
- Stops curtailment of renewables (wind)
 - Export of excess energy?
 - Creates jobs & economic growth



Perceived Challenges

Infrastructure & Connectivity

- Grid Delays
- Space Constraints
- Shore Power Barriers
- Production infrastructure

Energy Demand & Supply Complexity

- Different ship energy profiles
- Fuel diversity
- Peak electrical demands – shoreside & vessels

Technology

- Sensor & signal processing
- Elec variability & compatibility
- Automation – like Port of Rotterdam?

Regulatory, Planning & Governance

- Multi-national barriers
- Uncertainty in IMO regulation
- Planning permission approvals

Economics

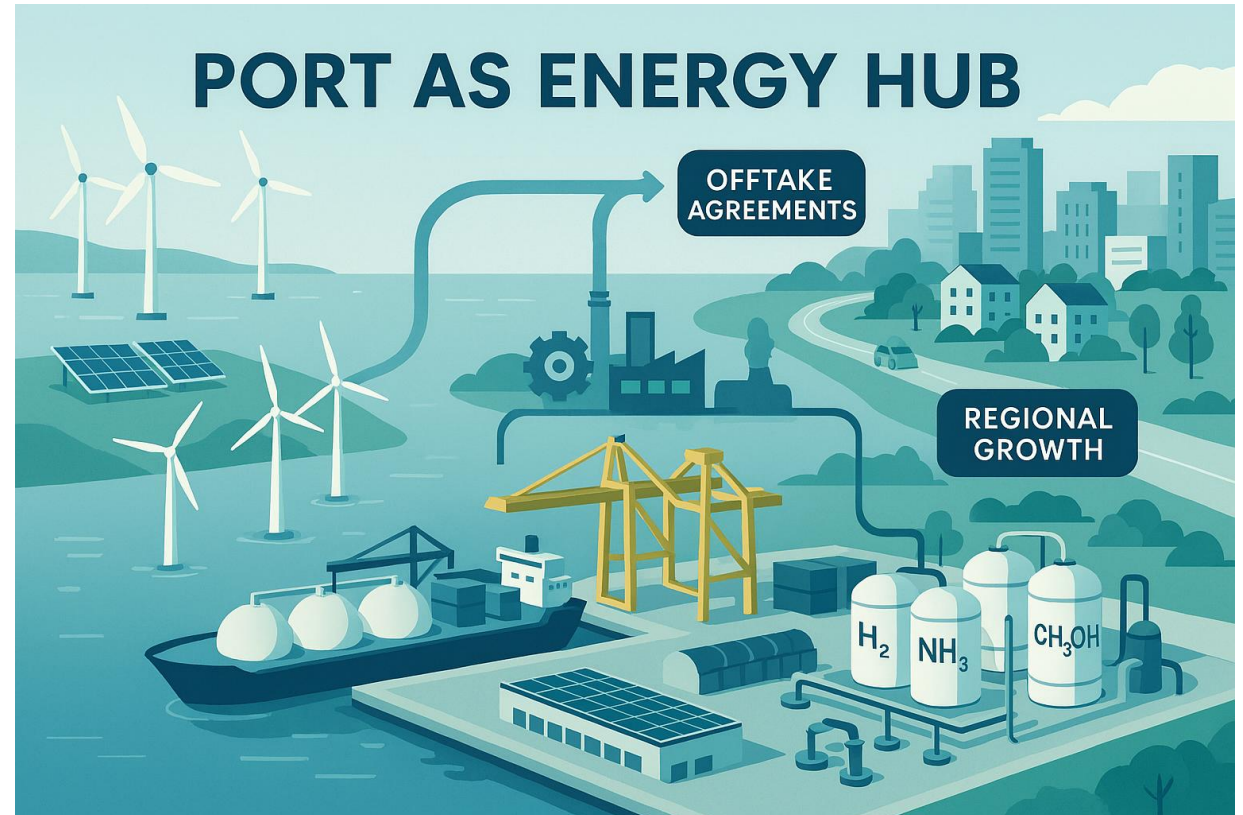
- Investor willingness
- High Upfront Costs
- Offtake agreements
- Supply capacity

Strategy & Collaboration

- Port – Vessel Operator Collaboration
- Multi-Sector Deals
- Offtake agreements

Possible Solutions

- Long term agreements
- Investment in infrastructure
 - Hosting facilities
 - Energy storage / fuel production
- Alignment with regional growth
- Remove hazards from built environments – fuel bunkering & export



Bunker Vessels

- Refuel offshore – regulator depends on location of refuelling
- Provide COMAH site away from built areas?
- Ideally need calm sea state and ‘static’ vessels.
- **This is nothing new.**
- Naval vessels undergo Replenishment at Sea (RAS) – Dynamic refuelling



Conclusions

- Ports are clearly going to be fundamental to a Just transition.
- Provide energy to ensure ferry operations.
- Potential to support economic growth & job creation.
- Allows reduction in curtailment of wind energy.



Thank you for listening

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