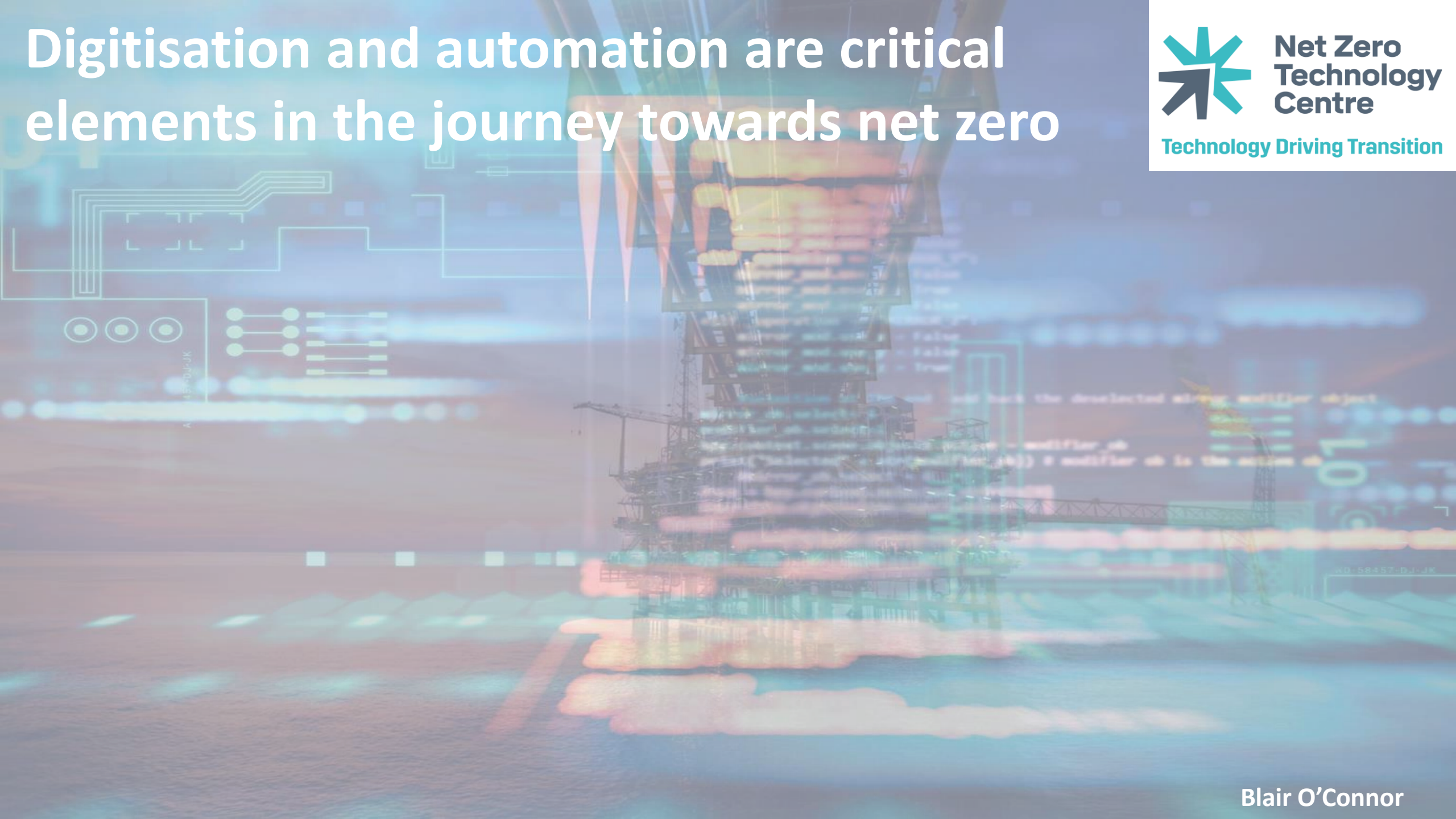
Net Zero Technology Centre

Technology Driving Transition

Digitisation and automation are critical elements in the journey towards net zero



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Blair O'Connor

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Agenda

1. Journey so far
2. Our roadmap
3. Next steps - Energy Transition Fund (ETF) projects
4. The destination

Journey so far

Our Roadmap

Net Zero Technology Centre

1 Net Zero Solution Centre

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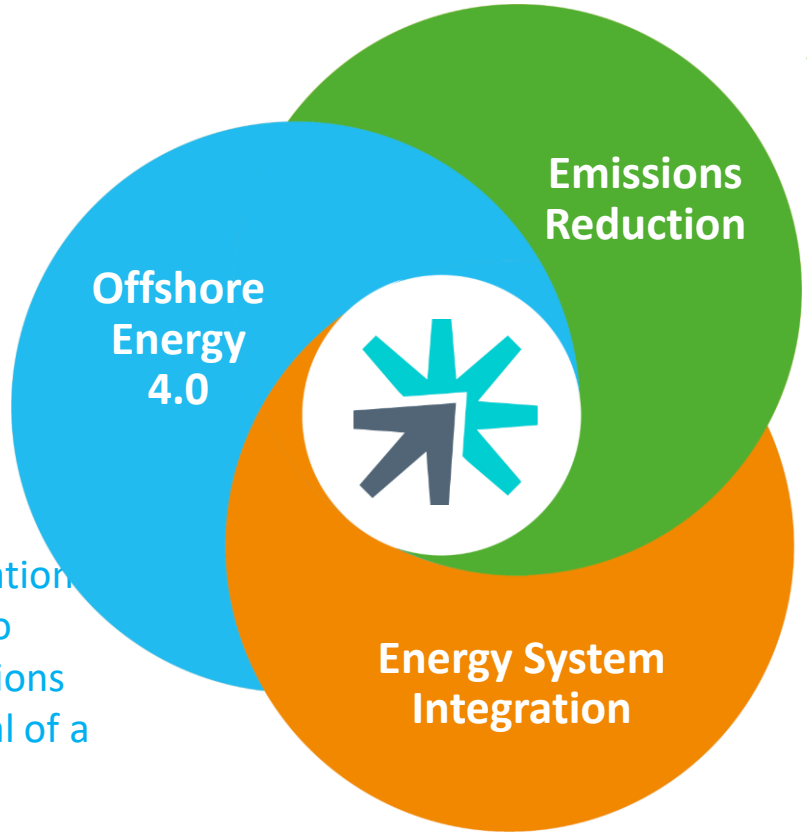
3 clear programmes



Oil and gas are key part of the future energy mix, but we must decarbonise existing operations.

Digitisation and automation are critical for a net zero future, to reduce emissions and unlock the potential of a smart basin.

We need investment and innovation in new affordable clean energy production and storage solutions to create and enable an integrated energy future.

Our purpose: Developing and deploying technology for an affordable net zero Energy Industry

Net Zero Technology Centre – Roadmap

Our Technology Roadmap for a net zero Energy Industry

Programme	Theme	Priority Areas	Outcomes by 2030
Emissions Reduction Develop technology to reduce UKCS operational emissions to net zero	Field development Production, operations and logistics Late life and decommissioning		
Energy System Integration Integrate infrastructure to create a net zero offshore energy system	Renewables and energy storage Hydrogen and other clean fuels Carbon capture, utilisation and storage		
Offshore Energy 4.0 Develop remotely controlled operations empowered by data, automation and robotics	Smart Assets and Field Automation Digital and Data Architecture Robotics and Autonomous Systems	Brownfield Greenfield Efficiency	

Next Steps

Net Zero Technology Transition Programme

Leverage Scotland's technical innovation to deliver green growth and build global leadership in net zero technology solutions.

Energy Hub	Integrating renewables, hydrocarbons and CCUS.
Hydrogen Backbone Link	Enabling wind-green hydrogen projects for the UK and export to Europe.
Alternative Fuel Gas Turbine	Accelerating development of gas turbines capable of running on clean fuels.
Offshore low touch energy robotics & autonomous systems	Enabling next generation robotics and autonomous systems for the offshore energy sector.
Offshore Manning Optimisation	Remote operations to create safer, more efficient and lower carbon operations.
Data 4 Net Zero	Developing analytics to unlock energy transition action and deliver the world's first smart energy basin.
Offshore Energy Digital Architecture	Implementing a sector-wide data and infrastructure strategy to enable digitisation.

- 4% reduction in UK emissions (14 MTCO2e)
- Cumulative economic output of £403bn
- Create 21, 000 jobs by 2050
- Develop next generation education and skills
- Create high value design and manufacturing capability
- Drive competitive technologies for CCS, H2 and floating wind
- Delivering net zero for the North Sea
- Diversify supply chain and double exports

Scot Gov Funding : £16.5M

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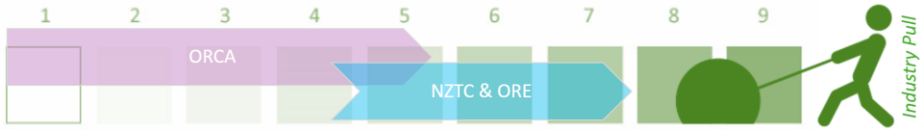
Offshore Low Touch Energy RAS (OLTER)

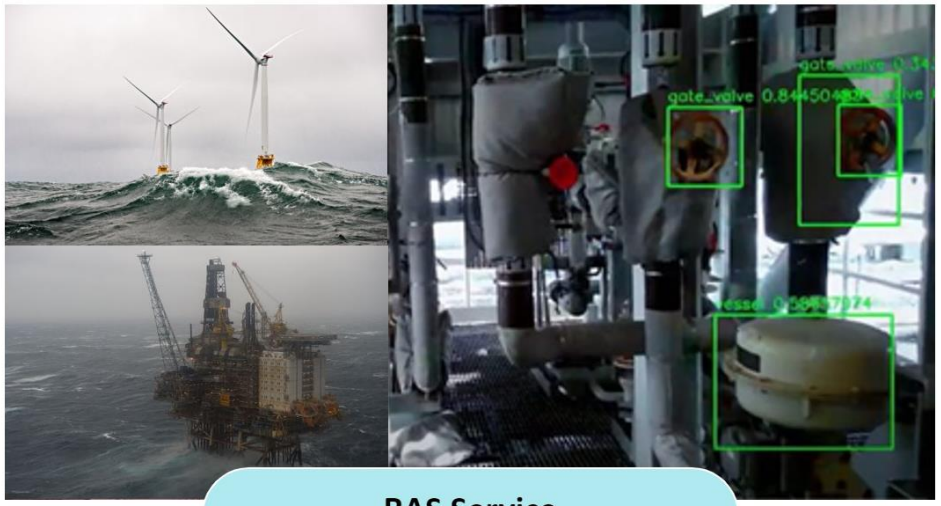
OLTER (Offshore Low Touch Energy RAS) proposes to be the programme accountable for UK Offshore Industrial RAS (Robots and Autonomous System). A place where the offshore industry, supply chain, academia, developers and other sectors can connect in deploying RAS for the UKCS.

This programme creates a RAS Service consisting of digital and physical hubs, essential for trust, innovation and scaled industrialisation in the UK.

The aim is to:

- Consolidate RAS data and knowledge in the UK
- Showcase how digitalised offshore energy assets use robotic systems to reduce human exposure and emissions
- Offer options to increase productivity, resilience and improve next generation net zero design





RAS Service
Deployment & Certification
Service driven, enabling At Scale Adoption & Adaption of emerging RAS technology
A single "voice" under which to consolidate Knowledge for Offshore RAS

Data Hub

- Payload Sensor Data Analytics
- Vehicle Performance Data & Digital Twin Access, Optimised via Data Trust.

Competencies Hub

- Standards & Specifications
- Testing & Certification
- Innovation Space with Workshops & Warehousing
- Start-Up Nurturing

Offshore Manning Optimisation (OMO)

The OMO project will serve as a “lighthouse project” that will both inspire and equip the wider industry with the tools, technology, techniques and approaches required to successfully employ remote operations technology and optimised manning practices in their brownfield operations in the UKCS.

As the UKCS accelerates towards a net zero future and a more integrated Energy Industry, optimised manning technology and capabilities have a key role to play in unlocking the key benefits of safer, more efficient, and environmentally friendly operations that reduce the offshore CO2 footprint.

The project aims to deliver the following objectives:

- The widespread remote operation of UKCS assets with a significant reduction in associated emissions
- The successful establishment of the ROCE at the centre of a thriving ecosystem that creates and protects high value jobs in Scotland
- A safer working environment with accessible Energy Industry jobs available to all of society
- The development of next generation skills and expertise in remote operations and associated disciplines

Data for Net Zero (D4NZ)

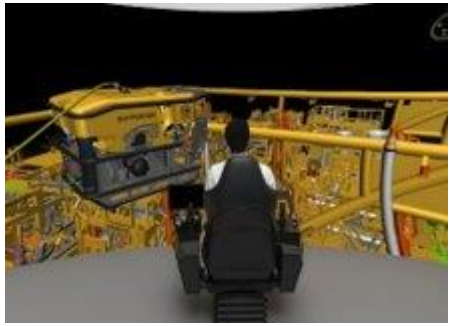
The project seeks to establish a demonstrator of the world's first digitalised Smart Energy Basin. It will be analogous to the 'smart cities principle', developing a virtual model of the UKCS basin to place data science, visualisation and computer modelling for decision making.

Data from other offshore industry stakeholders such as the fisheries, oceanography, hydrography, and logistics sectors will be integrated, to better align social, economic, environmental, and regulatory interdependencies and enhance knowledge transfer.

Using an integrated suite of data science, visualisation and modelling tools, the project will enable to accelerate a range of cross-sectoral decision-making approaches for energy integration and the transition to a net zero energy system.

The projects aim is :

- Connect the energy landscape at basin level and across sector.
- Provide industry partners the opportunity to diversify in the energy ecosystem, and to optimise supply to demand, whether it be power supply, or logistics, and to assess trade-offs among sectoral objectives.



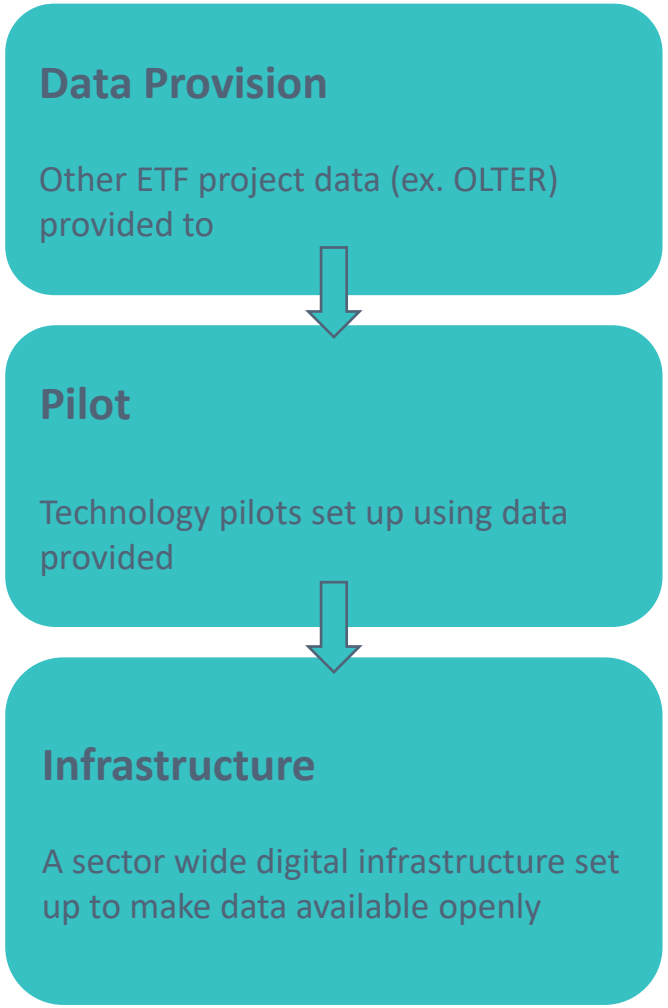
Offshore Energy Digital Architecture (OEDA)

The project will develop a sector-wide data and digital infrastructure to demonstrate that industry data can be secured, captured, transported and made available in an open manner.

Through successful pilots, the OEDA project will serve as an enabling project, demonstrating how to inspire and equip the wider industry with tools, technology, techniques and approaches required to successfully integrate disparate technologies and collaborate around industry data sets. The data access will be piloted utilising data provided by other NZTTP projects.

The aim is to:

- Provide UKCS wide data catalogue that will provide visibility over all UKCS data sets.



How to get involved?

1. Industry Engagement

Through 1-2-1 engagement we will establish your interest in being involved in the project(s) and your potential role in the project(s):

Strategic Partner

Delivery Partner

Technical Partner

2. Confirm Contribution

Confirm interest in being part of the consortia through the issue of a Letter of Intent per project for phase 1.

4. Project Shaping

Help shape the ETF programme per themes and be part of Scottish Government strategic work

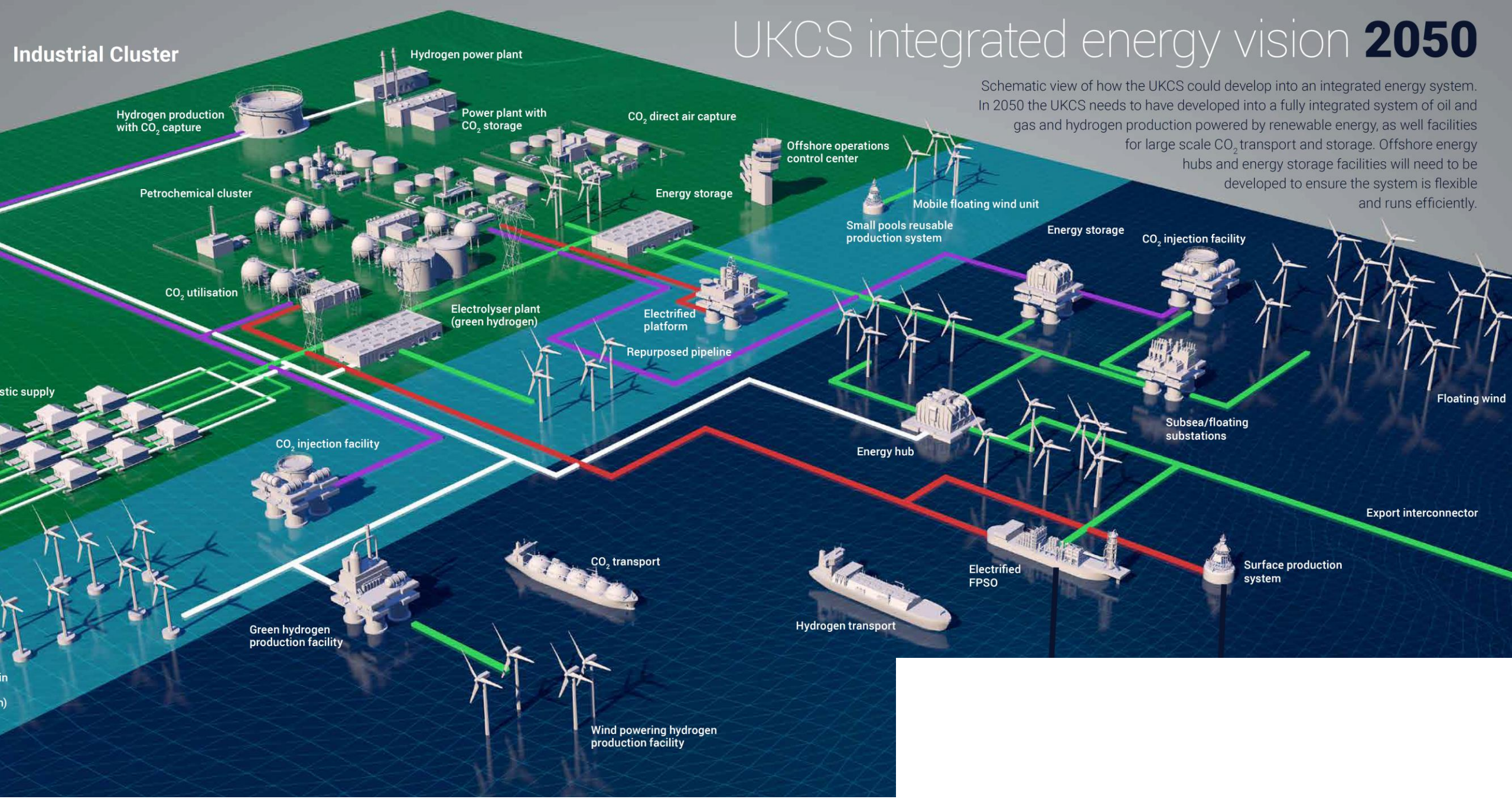
3. Consortium Development

Once we have engaged with all interested parties and received all LOI's we will confirm the Consortia for the project(s)

The destination

UKCS integrated energy vision **2050**

Schematic view of how the UKCS could develop into an integrated energy system. In 2050 the UKCS needs to have developed into a fully integrated system of oil and gas and hydrogen production powered by renewable energy, as well facilities for large scale CO_2 transport and storage. Offshore energy hubs and energy storage facilities will need to be developed to ensure the system is flexible and runs efficiently.



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