Technology Driving Transition

OGTC

Offshore Energy 4.0 Programme

UKCS Technology Network

20th April 2021

Enable

oil and gas industry diversification and transition to a net zero North Sea

Accelerate

technology to deliver an affordable net zero North Sea

Inspire

a culture of innovation and transformation for a reimagined energy future

Our mission: Developing and deploying technology for an affordable net zero North Sea

Roadmap to net zero

Programme	Theme	Outcome
Emissions Reduction	Field development	 Technology to help reduce UKCS operational emissions to net zero
	Production, operations and logistics	
	Late life and decommissioning	
Energy System Integration	Renewables and energy storage	 Technology to help create an integrated net zero offshore energy system
	Hydrogen and other clean fuels	
	Carbon capture, utilisation and storage	
Offshore Energy 4.0	Smart assets	 Technology to enable remotely controlled operations empowered by data, automation and robotics
	Field automation and remote control	
	Robotics and autonomous systems	

Smart Assets

The North Sea is a smart offshore energy basin with fully digitised assets built embracing new materials.

Priority Areas	2030 Outcome	Technology Challenges	
Brownfield	**Increased Brownfield Automation** 50% of Brownfield Assets with 10 years remaining life with significant level of autonomous systems	Remote Operations	Robotics
		Wide Area coverage sensors	Streamlined ATEX Design
		Operational digital twins	Data Platforms
		Remote Digital Working	Secure and Reliable Comms
Future proof design	**Towards Full Greenfield Automation** 100% of greenfield assets with high autonomy levels	Remote Operations	Dynamic Digital Twins
		Automated Engineering Design	Wearables
		AI Decision Making	Smart Materials
		Operationalise XR/VR	Internet of Digital Twins
Efficiency	**Efficient Operations** 10% overall production efficiency gain by adoption of industry 4.0 technology	Robotic process automation	Integrated activity planning & logistics
		Autonomous Inspections systems	Digital Worker
		AI driven RCA	Production optimisation
		Predictive Maintenance	3D printing

Field Automation & Remote Control

Operations are remotely controlled, empowered by secure data using advanced sensors and edge computing

Priority Areas	2030 Outcome	Technology Challenges	
Secure and Reliable communications	**High Performance communications** Adaptive, secure, high performance communication platforms deployed across all assets	Cybersecurity	Low latency
		LEO satellites	Standard offshore energy architecture
		5G/LTA air platforms	Multifunctional adaptive systems
		Adaptable communications	Low Power Wide Area Networks
Sensors, Edge Computing and Automation Technologies	**Offshore Internet of Things** Fully sensored, data driven hardware and process automation fully enabled where feasible	Low Cost Sensors	Prognostics
		Self powered sensors	Edge computing capability
		Robotic Process Automation	Smart Actuators
		Automated condition – monitoring systems	Edge storage
Data Platforms and Visualisations	**Data Foundation** Full digital twins supporting automation and remote operations deployed across all assets	Data Standards	Real time modelling and simulation
		Data visualisations	Control towers
		Equipment level Digital twins	Internet of digital twins
		Open Data Platforms	XR/VR

Robotics and Autonomous Systems

Robotics, automation and visualisation reduce the need for people to work in hazardous environments

Priority Areas	2030 Outcome	Technology Challenges	
Air	**Aerial RAS** Aerial robotics enable manned and normally unmanned installations (NUI) to operate safely, efficiently and with a greater level of autonomy	Air - Locomotion	System level autonomy
		Air - Navigation	Robot residency
		System interaction	Longevity
		Power management	End Effector / Use case
Land	**Terrestrial RAS** Terrestrial robotics enable manned and normally unmanned installations (NUI) to operate safely, efficiently and with a greater level of autonomy	Land - Locomotion	System level autonomy
		Land - Navigation	Robot residency
		System interaction	Longevity
		Power management	End Effector / Use case
Sea	**Marine RAS** Enable remote operations of assets at sea, lowering reliance on support vessels, improving operational windows, with a high level of autonomy	Sea- Locomotion	System level autonomy
		Sea - Navigation	Robot residency
		System interaction	Longevity
		Power management	End Effector / Use case

OGTC OE4 Collaborative Activities 2021

Digital Transformation Leadership & Awareness for the Energy Transition
Strong Digital Leadership to ensure organisations harness the opportunity that Digital Transformation provides and is vital to the scaling and adoption of technology

OMO - Offshore Manning Optimisation
Collaborative project to establish remote operations and optimise the use of personnel onspecific offshore installation(s)

OLTER - Offshore Light Touch Energy RAS
Develop a Centre where industry, supply chain, academia, developers and other sectors can connect iand collaborate to scale the deployment of RAS for the UKCS

OEDA – Offshore Energy Data Architecture
Establishing an industry wide data comms architecture and standards, and supporting data visibility and access

Digital North Sea – Smart Basin
Establishing an industry wide data capability to support the creation of North Sea wide, cross sector smart basin

Project Data Analytics– P&A
Looking at how the industry can drive a step change in the performance of major projects through the application of data analytics

Shared Analytics– Fabric Maintenance
Establishing a shared UKCS Data Analytics platform

Offshore Energy Data Strategy – *Strategy for a modern Digitalised Offshore energy system*
Developing a sector wide data and infrastructure strategy that delivers the systems needed to support the secure capture, transport, and storage of critical industry data,

Hackathon Series
Code[Less] - Annual hackathon to be held and supported by industry to support the uptake of codeless and RPA approaches and open up the audience for data
Robotics Hack - Challenges related to the development of technology
RANGL – AI challenge for control problems - Rangl' is a competition platform created at The Alan Turing Institute as a new model of collaboration between academia and industry.

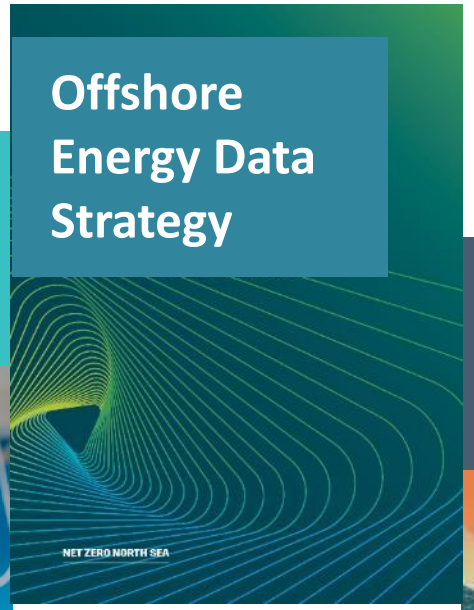
People | Innovation | Data | Technology

Research and insights

Developing a sector wide data and infrastructure strategy

Tech 20
Insight 60

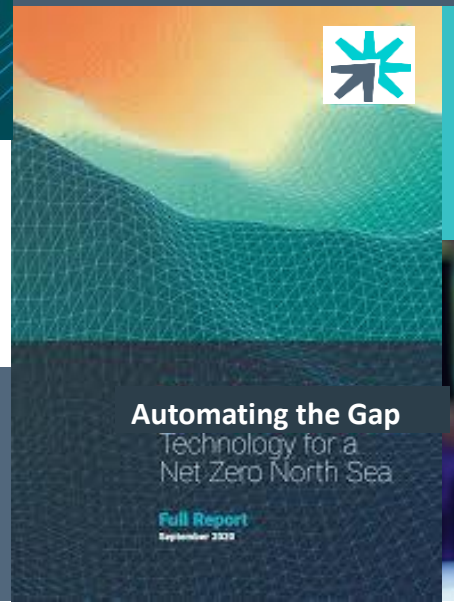
Offshore Energy Data Strategy



Identifying and addressing key data strategy gaps

Data & Digital Sector Collaboration

Producing world-leading research and thought leadership



Detailed overview of how RAS systems will drive and sustain the energy transition

Collaborating for transition

Technology, innovation and commitment to cross-sector working are essential

THE CROWN ESTATE

Oil & Gas Authority

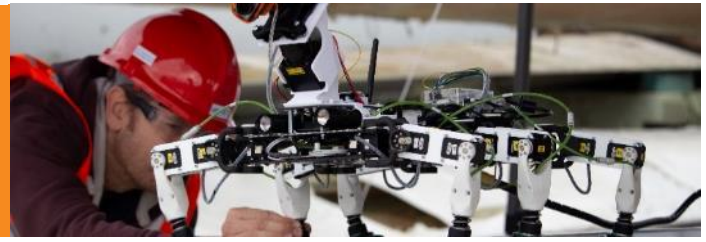
Department for Business, Energy & Industrial Strategy

OGUK

marine scotland

Accelerating technology development to achieve a net zero North Sea energy system

Collaborating to make a difference



CATAPULT Offshore Renewable Energy

NEREUS

North Sea Energy offshore system integration

TNO innovation for life