



Accelerate Deployment workstream: Technology Managers' Network meeting NSTA's Technology Insights 2025 - Preview

Clara Altobell – Co-lead of Accelerate Deployment



22nd October 2025

Agenda

1. Welcome and introduction
2. NSTA presentation on Technology Insights report
3. Q&A following presentation
4. AOB & meeting close

Clara Altobell

Alan Ransom, Ernie Lamza

All

Clara Altobell

Remote Operations and Robotics Technology Showcase

**- Wednesday 19th November
8am to 1:30pm**

Location: NZTC Innovation Hub
Hosted by: Clive Sirju (CNOOC)

The event will raise awareness of ready to deploy remote operations and robotics technologies that:

- Reduce operational cost
- Improve safety
- Reduce operational risk
- Reduce emissions
- Offer other significant benefits

Invites out this week
Register via Eventbrite

For more information contact:
info@the-tlb.com

Remote Operations and Robotics Technology Showcase Programme
Wednesday, 19 November 2025, 8.00am to 1:30pm

Speaker Programme	
08.00	Arrival, Coffee
08.15	Welcome, introductions and safety briefing. <i>Clive Sirju, Technology Leadership Board, Accelerate Deployment Workstream</i>
08.20	Keynote speech by: Myrtle Dawes, Chief Executive Officer, Net Zero Technology Centre
Remote operations and robotics technology case studies	
08.30	Net Zero Technology Centre – Advancing Remote Operations (ARO)
08.50	Flylogix – Reducing the cost, risk and environmental impact of offshore methane emission measurements. <i>Charles Tavener, Chief Executive Officer, Flylogix Holdings Ltd</i>
09.10	Skeye - Operator rounds using remote drone operations at Shell Rotterdam <i>Pieter Franken, Health, Safety, Quality and Compliance Director, Skeye</i>
09.30	Eserv and SSE Thermal <i>Dan Millard, CEO and founder, eserv and Gordon Burnside, Digital Engineering Lead and Data & Analytics Manager, SSE Thermal</i>
09.50	Sib and Pertamina - Remote Operations in Practice: Scaling AI and Automation for Offshore Impact
10.10	Technology Showcase & Networking (coffee)
Remote operations and robotics technology case studies	
11.10	Zelim and Valaris - Using AI for automatic man-overboard detection to enhance offshore safety <i>Andy Tipping, Co-founder & Business Development Director, Zelim and Kyle Finnie, Trainee Engineer, Valaris</i>
11.30	Fugro and DNV – Remote Inspection case study <i>Jeff Richardson, Regional Manager - EUAF Remote Operations Centres, Fugro and Jose Guilherme Moraes, Fleet in service Team Leader, DNV</i>
11.50	Reach Subsea – The role of USVs in a modern Subsea Vessel fleet <i>Alastair McKie, Managing Director, Reach Subsea</i>
12.10	Oceaneering and TotalEnergies - Freedom - Realising the Potential <i>Gordon Beattie, Product Manager, Survey & Subsea Robotics, Oceaneering International Services Ltd and Andy Gower, R&D Subsea Robotics Project Lead, TotalEnergies EP Norge AS.</i>
12.30	Feedback from the floor
12.35	Technology Showcase & Networking (lunch)



North Sea
Transition
Authority

Technology Insights 2025

Technology Leadership Board: Accelerate Deployment Workstream Pre-launch Presentation

Alan Ransom, Senior Technology Advisor
Ernie Lamza, Technology Manager

22nd October 2025

Disclaimer

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UK Stewardship Survey

- Opens at the beginning of November – closes at end of February
- Completion by all active UKCS Operators
- Technology deployment and needs data
- Technology Plans
- Data checking, analysis and anonymisation
- Consolidated Technology Needs
- Comprehensive Technology Listing
- Draft Technology Insights Report
- Internal reviews and approvals
- Preview of subset of content to TLB's Technology Managers' Network
- Formal publication on NSTA website

Intent / objectives

- Report of technology activity across the UKCS
- Raise awareness of what technology is being used
- Gain understanding of common and collective technology gaps and closure activity
- Encouragement to potential end users to consider, trial and/or deploy beneficial technologies
- Better outcomes for end users (lower costs, improved safety, enhanced environmental performance, etc.)
- Better outcomes for technology developers/providers (more business, stronger track record, raised export potential)

NSTA Technology Survey 2025

46 UKCS Operators completed the annual Technology Survey and submitted Technology Plans by the end of February 2025.

There was strong evidence of a continuing focus on technologies for the effective and cost-efficient development, operation and decommissioning of remaining hydrocarbon resources and the reduction of emissions across the full lifecycle.

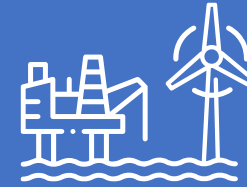
Notable examples:

Drilling and well construction



- Low-cost platform modular drilling rig systems
- Single lift well to well transfers
- Logging While Drilling sonic logging for top of cement identification
- Digital well planning using AI
- Combine wireline tool strings
- Tubing retrievable surface controlled subsurface safety valve

Facilities Design and Inspections



- High frequency vibration and axial data analysis
- Cost efficient pipelines and longer tie-backs
- Subsea gas compression and multiphase boosting
- Non-intrusive inspection technologies
- AI for risk-based inspection systems
- Controls and automation

Well intervention



- Wireless downhole surveillance technologies
- Disposable fibre-lines
- Retrofit DHSVs and ESPs
- Flexible zonal isolation solutions
- Real time slickline and coiled tubing solutions
- Water shut-off solutions

Emission reduction



- Flare gas recovery systems
- Vapour recovery systems
- Enhanced emissions monitoring – including fugitives and flare efficiency measurement
- Electrification
- Hybrid energy systems
- Emissions monitoring during wells activities

Technology Survey & Plans



Number of technologies reported (UKCS Operators)

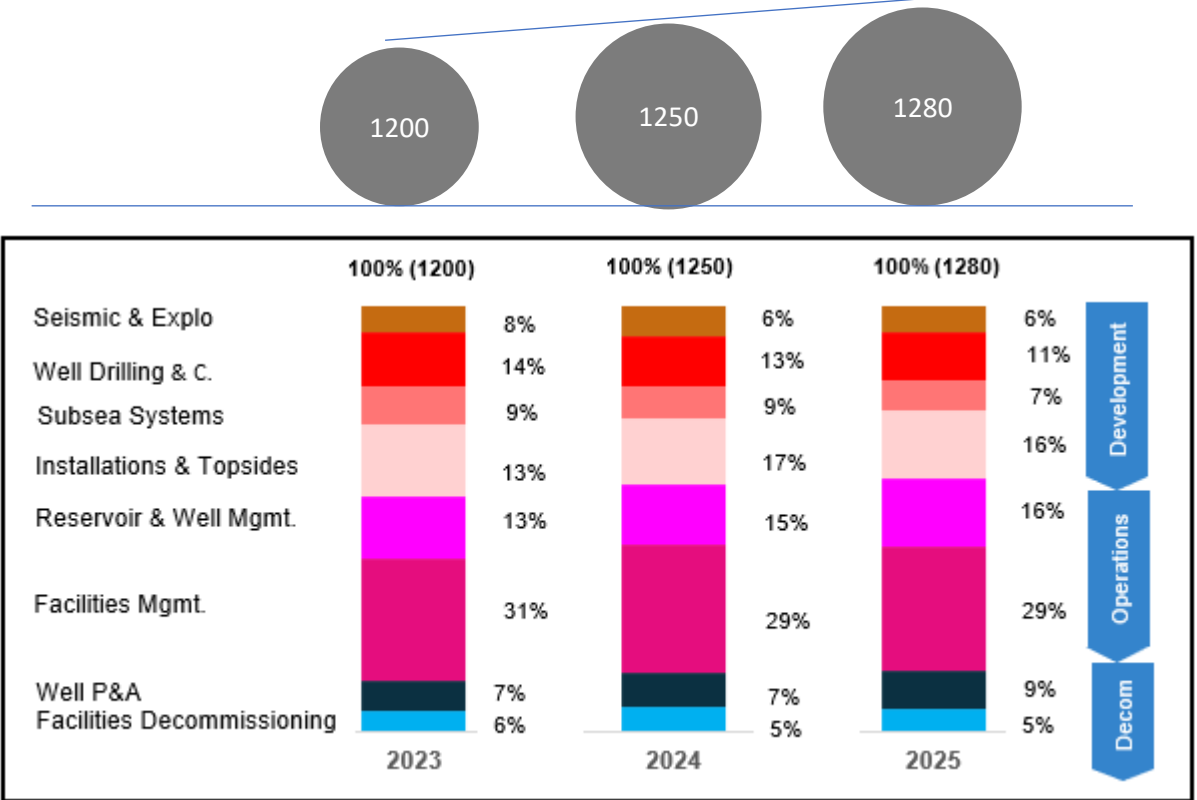
1,280 technologies have been referenced in 2025. This includes each case of the reported use of a specific technology by an operator. If an Operator uses a technology on more than one asset it is only counted as a single use for this figure.

This net increase accounts for removal of successful technologies now considered mainstream and unsuccessful technologies after their screening and pilots. 1280 includes new and previously reported technologies.

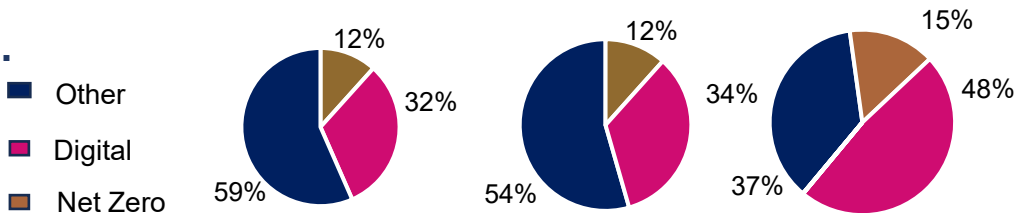
Balance between technologies for new asset developments (40%) and those for asset operations (45%) the remainder is Decommissioning/P&A (14%)

Installation & Topsides remains steady because of recent focus on emission reduction.

Digital and Net Zero themes, which cut across all these domains, are expanding rapidly.

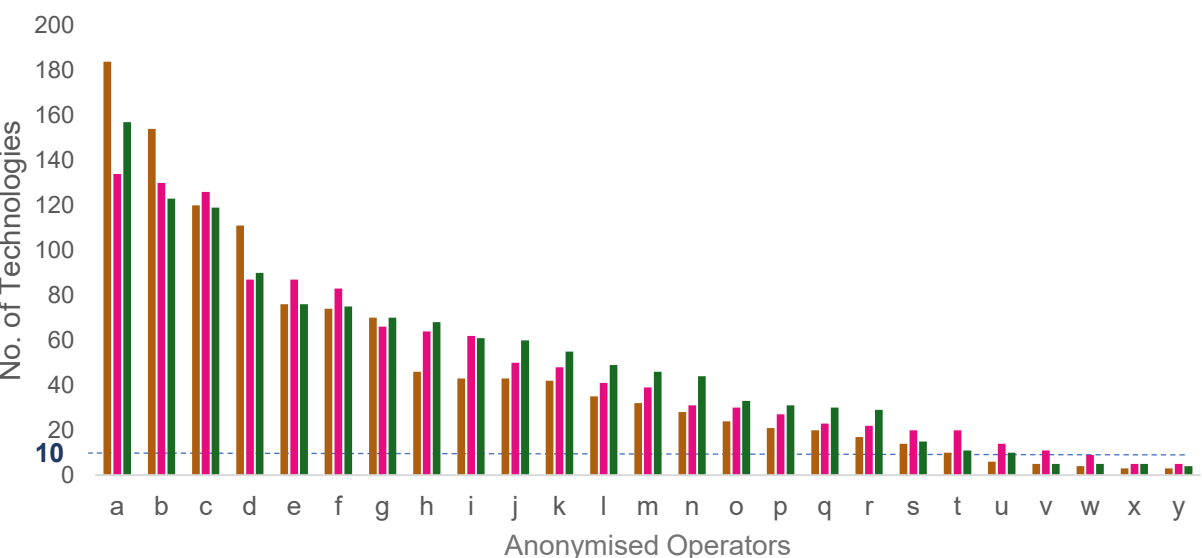


Of which...



Operators' Technology Uptake & Sources

Number of technologies reported by Operator



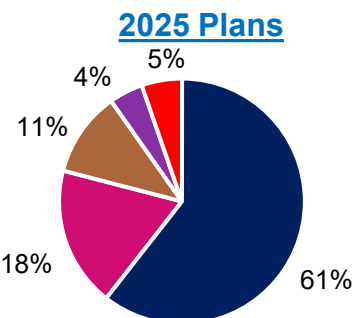
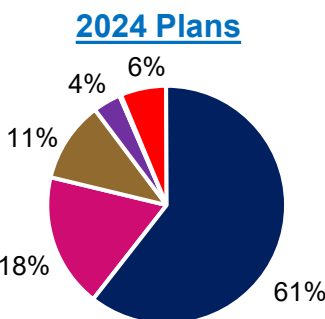
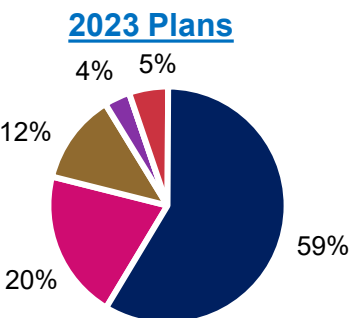
Focus on active technology management among UKCS Operators has increased steadily.

Twenty one operators are reporting more than 10 distinct technologies this year

Over half of the technologies (61%) are sourced directly from vendors/suppliers and this trend continues to increase this year

Technology sourcing

2023 2024 2025



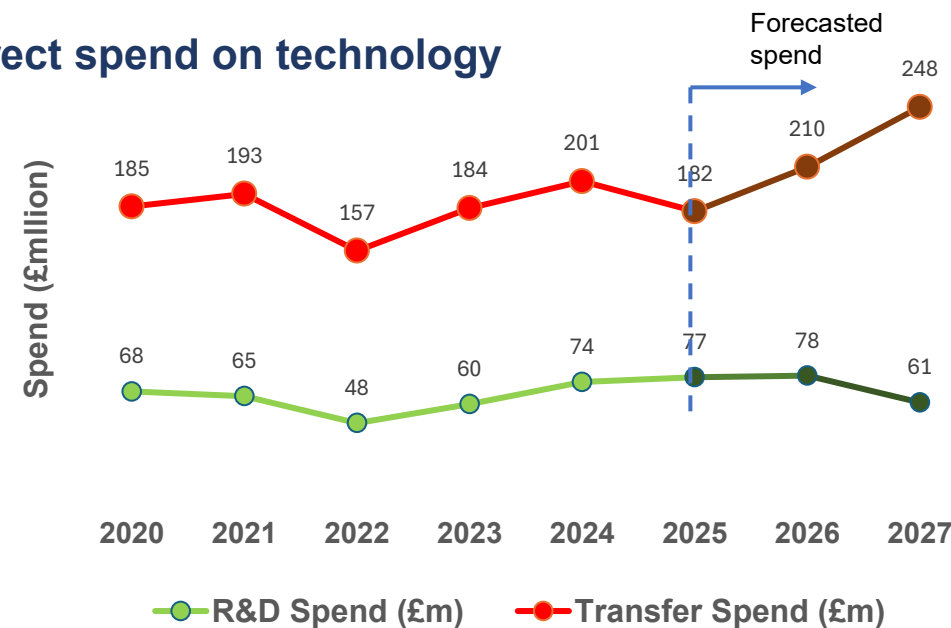
- Partnership with Suppliers
- In-House Development
- Joint Industry Programme
- NZTC Programme
- Vendor Solution

However, in 22% of the cases, Operators actively partner with selected suppliers to develop solutions in partnership, and/or from Joint Industry Projects

There is a consistent contribution from the Net Zero Technology Centre (NZTC) in supporting and facilitating technology innovation (5% of overall technologies surveyed)

Operators' Technology Spend 2025

Direct spend on technology



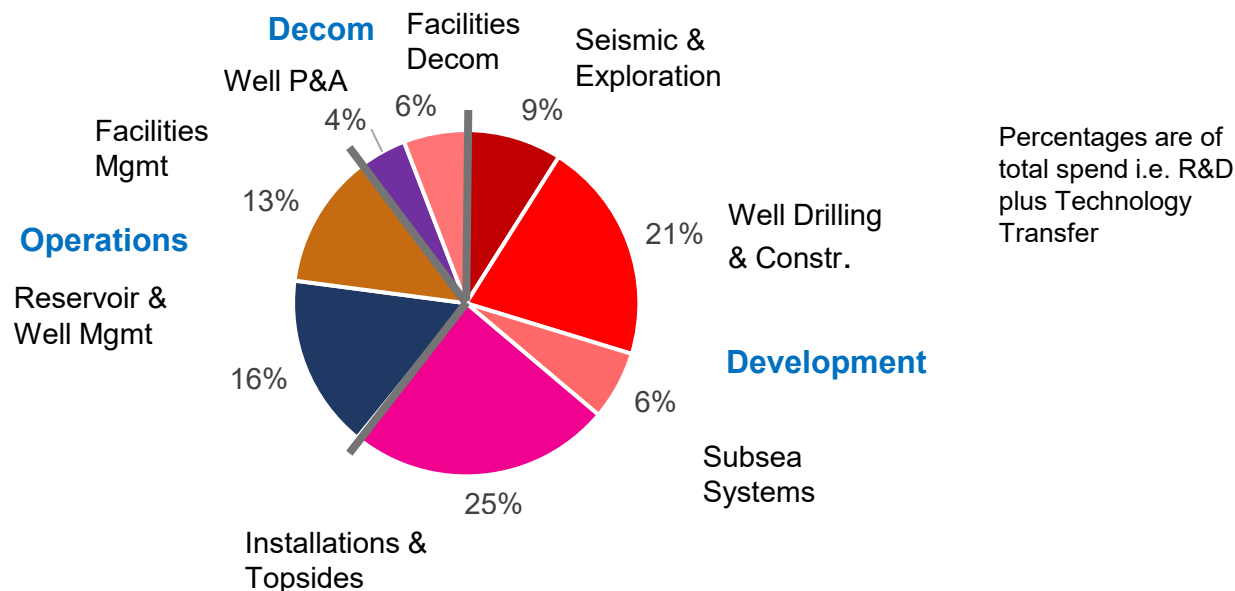
Operators make a sizeable contribution to technology research and development (R&D) for UKCS needs.

In 2025, £77m of direct R&D spend is targeted, this is comparable to previous years, but less in real terms than a decade ago (Note: These are “money of the day” values (not factored for inflation)).

The forecasted *Technology Transfer* spend (defined as the cost to deploy the technologies in the field) continues to increase as the direct R&D expenditure remains more constant

Development categories attract the largest proportion of Operators' technology spend (61%).

NSTA note's that well P&A is ~ half of decom spend and is running behind expectations



Technology Categories

1. Seismic & Exploration

2. Well Drilling & Construction

3. Subsea Systems

4. Installations & Topsides

5. Reservoir & Well Management

6. Facilities Management

7. Well Plugging & Abandonment

8. Facilities Decommissioning

9. Digital & Data

10. Net Zero

Production Enhancement

Highlights from relevant technology categories:

- 2. Well Drilling & Construction
- 5. Reservoir & Well Management

Emission Reduction

Highlights from relevant technology categories:

- 4. Installation & Topsides
- 9. Digital & Data
- 10. Net Zero

2. Well Drilling & Construction

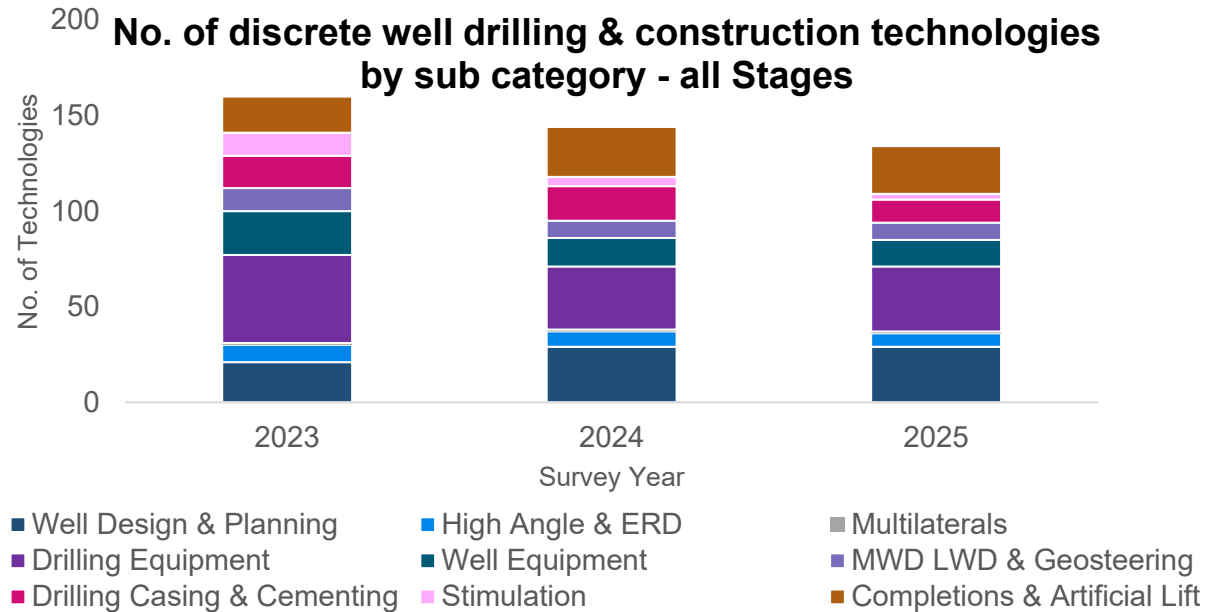
- Operators' technology focus spreads across all aspects of well planning and delivery.
- Advances in general well planning and drilling technologies are complemented by more specific technologies for special wells (e.g. extended-reach and multi-laterals) or drilled in thin reservoirs (e.g. using geo-steering).

5. Reservoir & Well Management

The main areas of Operators' technology focus is on:

- Improved recovery,
- Intelligent reservoir monitoring, and
- Well surveillance, management and intervention.

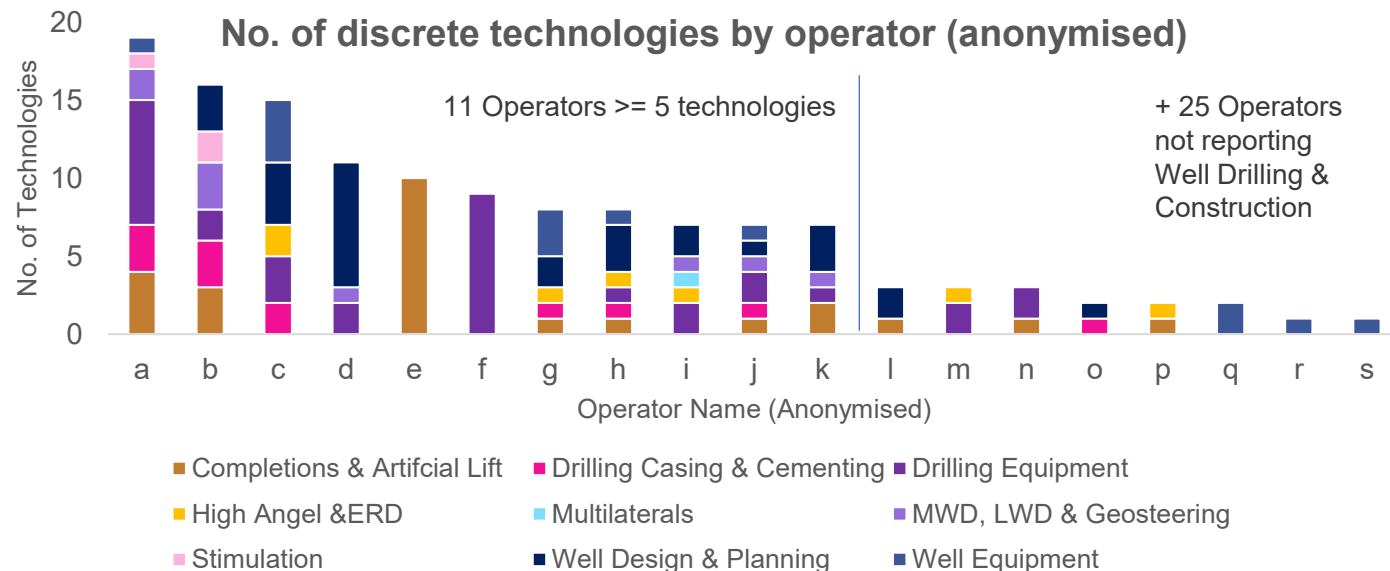
2. Well Drilling & Construction technologies



Operators' technology focus spreads across all aspects of well planning and delivery.

Advances in general well planning and drilling technologies are complemented by more specific technologies for special wells (e.g. extended-reach and multi-laterals) or drilled in thin reservoirs (e.g. using geo-steering).

11 Operators carry at least 5 wells technologies in their current Technology Plans, and 10 more Operators report at least 1 technology.



This level of interest is commensurate with the number of Operators currently engaged in exploration and/or development drilling.

2.3 Drilling Equipment/Well Equipment

Deployable Technologies (TRL 8-9)

- **Wellhead fatigue management** - BOP tethering to mitigate wellhead fatigue. Tethers may be secured to the template or to gravity bases.
 - TRL 9 Commercially Available
- **Sonic logging** - LWD sonic tool used to log across 9 5/8" casing for top of cement identification after well encountered severe losses during cementing. Reducing the uncertainty in top of cement measurement was the driver behind implementing the tool.
 - TRL 9 Commercially Available
- **Emissions Monitoring** - Reduces emissions during wells activities. Software system helps operators reduce emissions by accurate monitoring against identifiable targets - using cloud based techniques, Measure real-time emissions vs. baseline and target during drilling, Measure the well's emissions during each drilling section, Measure the well's emissions against the planned target, Analyse real-time well emissions.
 - TRL 9 Commercially Available
- **Completion Insertion & Removal under Pressure technology** – enables running and retrieving long gun strings under wellhead pressure when the surface pressure control equipment, or lubricator, is shorter than the gun string.
 - TRL 9 Commercially Available
- **Geosteered Horizontal Wells** - Several well designs have been implemented to overcome a low permeability reservoir in tight gas fields. To optimise the length drilled in the reservoir this tool was used as part of a 24hr/day geosteering operation managed with a mix of in office and remote working.
 - TRL 9 Commercially Available

- **A number of low-cost platform retrofittable workover rigs** are being adopted such as lightweight wireline systems, and modular drilling rig systems
 - TRL 9 Commercially Available



Technology Example:

The new 90' Lynx™ Wire Line Mast is setting a new industry standard. Introducing superior efficiency, increased working environment and without the need for external cranes once installed. Also features BOP access in compliance with Norsok S-002.

[Link: TI 22 - 27. Technology Example - Lynx Mast.pdf](#)

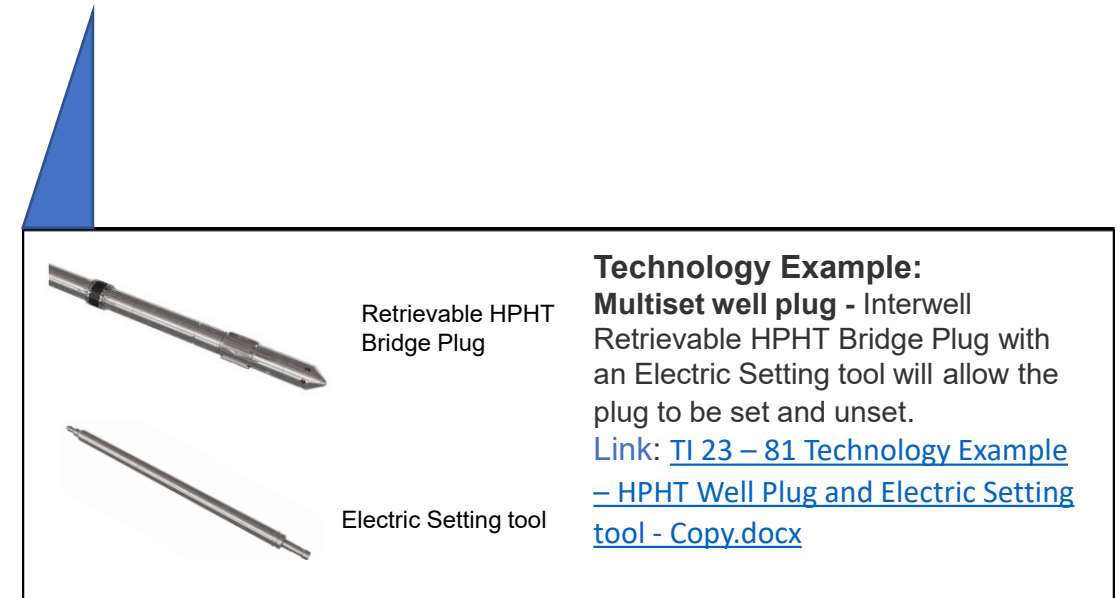
Emerging Technologies (TRL 1-7)

- **CICM (Casing Integrity & Cement Mapping) tool** - Used to measure casing wear. Technology has not been run in the UK North Sea. Collect casing and cement integrity measurements any time you run drill pipe in the well, Reduce cost and rig time required to obtain well integrity data, Eliminate the need for a dedicated logging run
 - TRL 8 Early Commercialisation
- **Interlift** – single lift well to well transfers, eliminates use of a wireline mast, eliminates working under suspended loads, and reduces POB.
 - TRL 5-7 Late Development/Pilot
- **Zonal isolation in the reservoir** - hybrid external casing packer / gravel pack system
 - TRL 8 Early Commercialisation

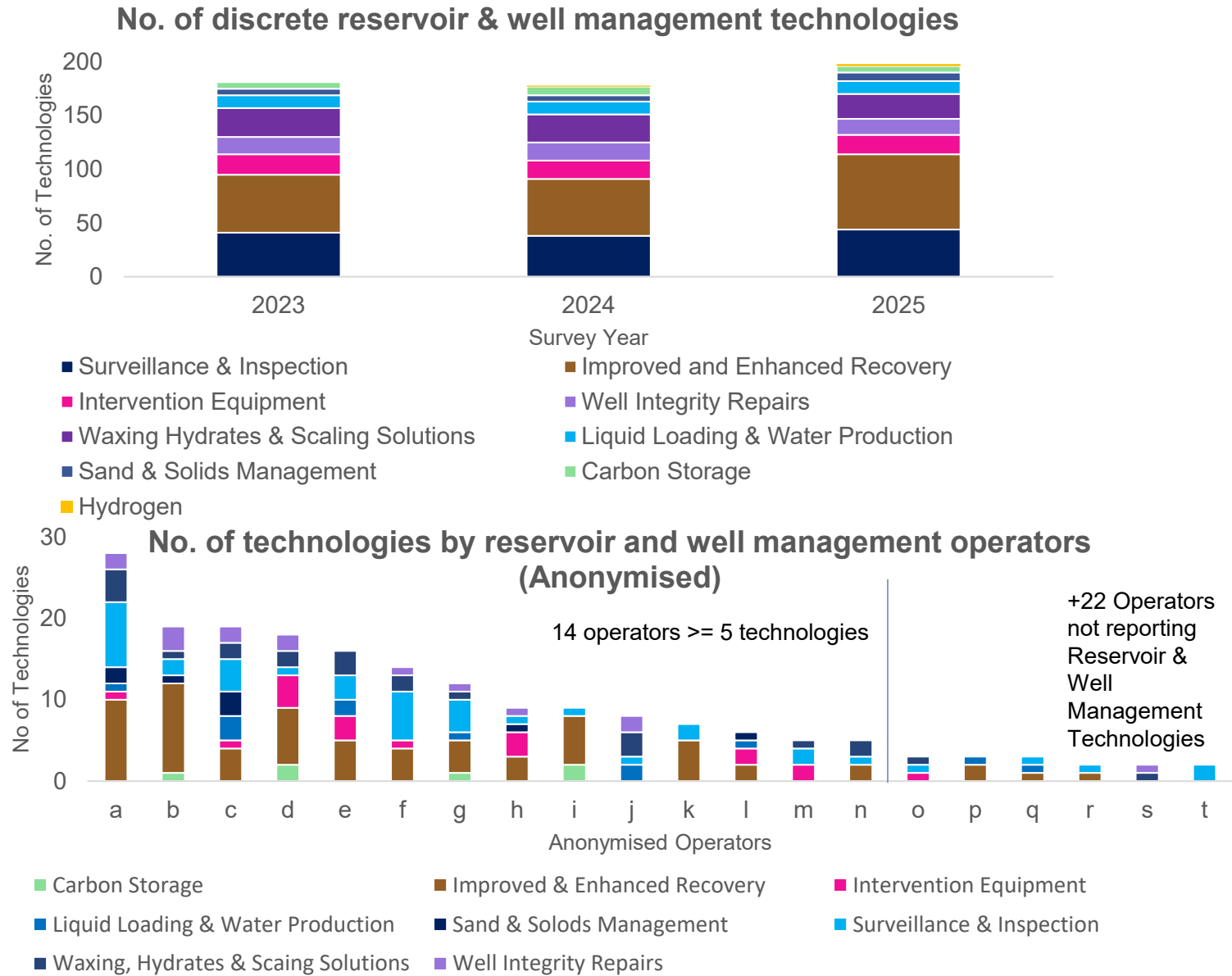
2.7 Completions and Artificial Lift

Deployable Technologies (TRL 8-9)

- **Controllable Completion for Oil Producers** - involves compartmentalising the open hole to allow future intervention to shut-in zones individually. The design includes a controllable inner string, consisting of swell packers set inside the screens in a blank pipe section and an opened sliding sleeve per zone for initial flow.
 - [TRL 9 Commercially Available](#)
- **Open-hole packers** - New technology for gravel pack completions
 - [TRL 9 Commercially Available](#)
- **ICV smart completion** - Smart completion to control multizonal sand face inflow
 - [TRL 9 Commercially Available](#)
- **TRSCSSSV with self-equalizing** - Tubing retrievable surface controlled subsurface safety valve
 - [TRL 9 Commercially Available](#)
- **Combined Wireline Toolstrings** - "Single run toolstring to punch tubing and set straddle for use in retro-fit gas lift applications. Saving a toolstring run on LWIV operations. Bridge Plug with integrated Junk Catcher, again saving an additional wireline run."
 - [TRL 9 Commercially Available](#)
- **Multiset Well Plug** - Multiset well plug with an electric setting tool will allow the plug to be set and unset repeatedly in a single run.
 - [TRL 8 Early Commercialisation](#)



5. Reservoir and Well Management technologies



The main areas of Operators' technology focus are on improved recovery, intelligent reservoir monitoring, and well surveillance, management and intervention. The number of technologies for carbon storage operations is increasing and 2 hydrogen technologies are reported this year

There is widespread interest in these technologies, with 14 Operators carrying at least 5 Reservoir and Well Management technologies in their plans, 24 operators are reporting at least 1 technology

5.1 Surveillance & Inspection

Deployable Technologies (TRL 8-9)

- **Wireline Probe for Modular Formation Dynamics Tester Pressure Measurement** - The wireline probe is a specialised tool used in the oil and gas industry for fluid extraction and reservoir characterisation.
 - TRL 9 Commercially Available
- **Integrated Emissions Tracking Solution** - software solution to enable secure continuous access to data both onboard and onshore via a cloud environment.
TRL 9 Commercially Available
- **Virtual metering system** – use of dual gradiometer gauges & reservoir modelling to provide a virtual metering solution.
 - TRL 9 Commercially Available
- **Downhole Fibres/Gauges DTS for Flow Indication** - use of downhole temperature sensors to measure the flow of each zone during a DST avoiding the need for a PLT. Also reduces emissions.
 - TRL 9 Commercially Available
- **EDR (end point detection response)** - Associated with MDR [Managed Detection and Response] and DFIR [Digital Forensic and Incident Response] this service makes the endpoints more secure and enables safer operations.
 - TRL 9 Commercially Available
- **Remote/Remedial Well Surveillance** - Assesses the application of instrumented wellhead equipment including VR transmitters and wireless downhole instrumentation.
 - TRL 9 Commercially Available
- **DAS (Distributed Acoustic Sensing)** uses fibre optic technology in a number of new reservoir sensing methods - The Disposable FLI system uses fibre-optic technology to capture distributed temperature and acoustic measurements along the entire length of the well in real time.
 - TRL 9 Commercially Available
- **Smart monitoring for ESP (Electrical Submersible Pumps)** - Condition based monitoring and automatic optimisation of ESP (Electrical Submersible Pump) wells.
 - TRL 9 Commercially Available

Emerging Technologies (TRL 1-7)

- **Virtual metering** - Using Machine Learning for virtual metering and operational envelopes
 - TRL 5-7 Late Development/Pilot
- **Hydrogen Storage Pilot** – advancing on successful laboratory-scale experimentation and desktop modelling/analysis to demonstrate suitability at an industrial-scale.
 - TRL 1-4 Early Development

5.3 Well Intervention Equipment

Deployable Technologies (TRL 8-9)

- **Interventions via Derrick** - perform interventions rig up operations via the drilling derrick to remove the need to install air hoists and eliminate people working at height.
 - TRL 9 Commercially Available
- **High Expansion Wireline Plug** - fits through restrictions in the tubing string
 - TRL 9 Commercially Available
- **Hydraulic Workover Unit Rotating Base** - HWO unit orientation can vary dependent on well slot and deck space. Previously units could be skidded between slots but not rotated to allow for different configurations - requiring full rig down and rig back up. HWO rotating base solves this issue.
 - TRL 9 Commercially Available
- **Ultra High Expansion Plug** - Flexible zonal isolation solution which can be run in flowing wells and set as a platform for cement to be deposited once pressure and flow have abated.
 - TRL 9 Commercially Available
- **Use of real time slickline** to save both time and cost by removing the need for e-line wireline equipment
 - TRL 9 Commercially Available
- **Coil Hose** - Deployment of light weight circulation system to provide a lower cost more efficient alternative to traditional coiled tubing systems.
 - TRL 9 Commercially Available
- **lightweight wireline system**, - Full wireline spread takes minimum 6 POB, typically 48 hours+ to rig up and ~24 hours to move between wells. This puts strain on platform schedule/manning the system is lightweight, unitized and designed for minimum rig up/down time.
 - TRL 9 Commercially Available

Emerging Technologies (TRL 1-7)

- **Safer Lubricator System** – raising the lubricator by piston to replace the need to pick it up by gantry crane or air hoist when making/breaking tools. This removes the need to work underneath a suspended load.
 - TRL 5-7 Late Development/Pilot
- **Flow Assurance Module (FAM)** – A valve manifold module fixed on the annulus side of the Xmas tree to allow injecting scale inhibitor down to the well without breaking tree cap. This allowed the operators FPSO to use ROVSV rather than LWIV for scale squeeze with less intervention days.
 - TRL 5-7 Late Development/Pilot



Technology Example:

The Oilenco UniLOT (Universal Lockout Tool) provides a means to permanently lock-open a tubing retrievable subsurface safety valve (TRSSSV) so that it remains open with no obstruction from the flapper
[Link: TI 25- 02 Technology Example - Oilenco E-Line deployed hold open sleeve for TRSSSV.docx](#)



Technology Example:

Digital Slickline was selected for a pre-abandonment phase of nine wells (versus a sequential slickline and electric line operation). Provided real-time quality control and datadriven decisions across the entire operation.

[Link: TI 24 – 09 Technology Example – Baker Hughes Realtime Slickline System \(Altus\).docx](#)



Technology Example:

The new 90' LynxTM Wire Line Mast is setting a new industry standard. Introducing superior efficiency, increased working environment and without the need for external cranes once installed.

[Link: TI 22 - 27. Technology Example - Lynx Mast.pdf](#)

5.4 Well Integrity Repairs



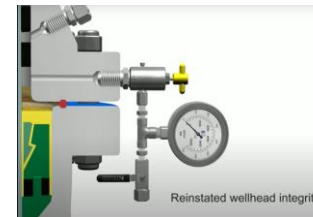
Deployable Technologies (TRL 8-9)

- **Heated flushing and re-greasing of tree valves** - Where valves could not be re-instated by standard remediation procedures. Following the flushing exercise, all valves successfully met the performance criteria, the majority with zero leak rates.
 - [TRL 9 Commercially Available](#)
- **Gas Ingress isolation valve** - used when getting gas returns up control line of downhole SSSV. GIIV prevents gas returning to hydraulic panel by holding positive pressure.
 - [TRL 9 Commercially Available](#)
- **Novel wellhead sealing for production wells** due to integrity issues - A time activated sealant is deployed in its liquid phase into the voids of wellhead sealing areas. Once in place, the sealant converts to a resilient, self-bonding and pressure-energized solid material.
 - [TRL 9 Commercially Available](#)
- **HPHT Storm Choke** - Pressure dependent valve to replace failed SSSV operation
 - [TRL 9 Commercially Available](#)
- **Swellable seals** - swellable seals used when gas influx is seen in wireline retrievable SSSV control line. Polished bore of safety valve landing nipple can be damaged and this seal swells in oil or water, creating a seal in the damaged area
 - [TRL 9 Commercially Available](#)
- **U-cup modification** - wellhead P-seal repair - typically replacing a u-cup seal with a spring energised P-seal to improve seal integrity and/or service life.
 - [TRL 8 Early Commercialisation](#)

- **Slim Pump Safety Valve (SPSV)** - The Slim Pump Safety Valve can be incorporated into Cable Deployed ESP's or Jet Pump Systems, providing an API qualified valve with minimal additional system complexity.
 - [TRL 8 Early Commercialisation](#)

Emerging Technologies (TRL 1-7)

- **Intelligent Safety Valve** - Pulse actuated downhole safety valves - Self-contained and self-powered, the ISV does not require any mechanical interface with other surface systems to function. the ISV is designed to send a wireless signal to surface at 24-hour intervals, confirming continued operation without the need of a function test.
 - [TRL 5-7 Late Development/Pilot](#)
- **DHSV Control line remediation** - DHSV control lines run behind the tubing in a well - but can be a direct conduit to the reservoir if barrier failures occur. Repairs of these can be completed using sealant for low rate leaks, however other currently unable to resolve intrusive issues. for deployment into DHSV control lines.
 - [TRL 5-7 Late Development/Pilot](#)



Technology Example: A time activated sealant is deployed in its liquid phase into the voids of wellhead sealing areas, the sealant converts to a resilient, self-bonding and pressure-energized solid seal.

[Links: TI 24 – 07 Technology Example – KCI wellhead sealing technology.docx](#)



Technology Example:

SLB – Wireless Downhole Safety Valve : wells that require remediation after a (TR-SSSV) failure, or wells originally completed without a subsurface safety valve and now requiring one due changes in policies or regulations

[Links: TI 22 - 30. Technology Example - SLB Tubing Retrievable Subsurface Safety Valve.pdf](#)

4. Installations & Topsides

- Operators continue to focus on cost-effective installation solutions to support development of more marginal hydrocarbon resources.
- Emission reduction is an important priority for technology efforts in this category, such as improved operational monitoring and controls leading to power management efficiencies and reductions in flared and vented gas.

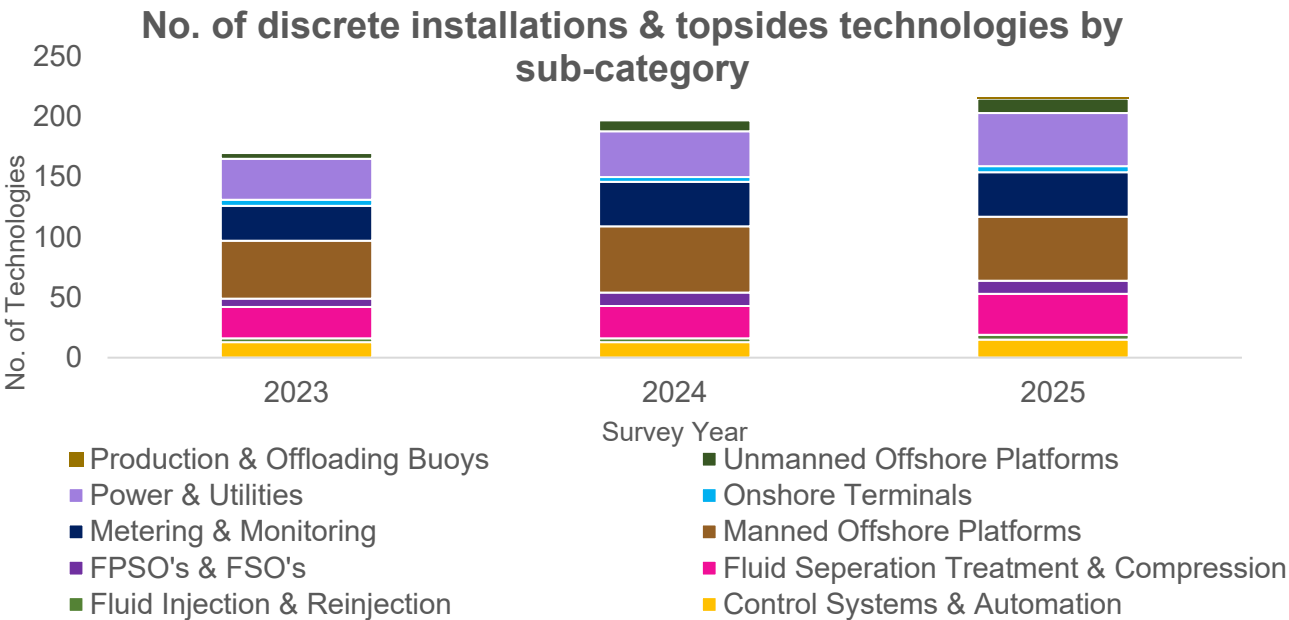
9. Digital & Data

- Digital technologies have an increasingly strong presence in Operators' Technology Plans, with 28 out of the 46 Operators reporting technology targets in this category. This is also a trend that has seen continuous growth since the Technology Insights publication began.
- Digital & Data applications are one of the strongest areas of interest according to Operators' Technology Plans, with 614 technologies submitted this year, an increase of 45% on 2024's total.

10. Net Zero

- In line with industry commitments to the North Sea Transition Deal to reduce greenhouse gas emissions, interest in technologies to address Flaring & Venting, Energy Efficiency, and Low-Carbon Power has grown significantly.
- Companies with the largest UKCS operational footprint show greatest interest, but in general there is a broad presence of these technologies in the reported plans (22 Operators out of 46) with 194 technologies submitted this year, up 34% on 2024's total.

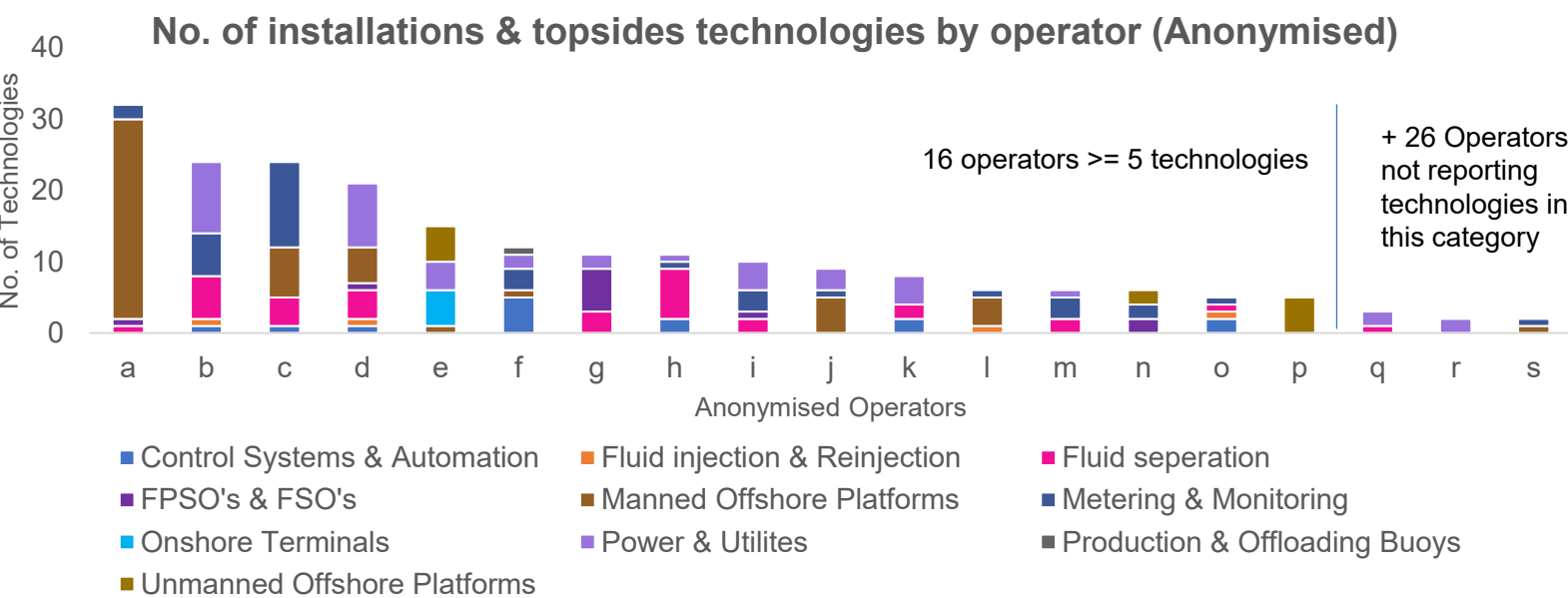
4. Installations & Topsides technologies



216 technologies related to design and equipment for surface installations were reported in 2025, the second largest category after Facilities Management.

Operators' focus includes:

- process equipment able to cope with more complex fluid compositions.
- facilities monitoring and remote operations.
- increasing attention on power efficiencies and emission reduction.



16 Operators carry at least 5 Topsides technologies in their current Plans, and 11 more Operators report at least 1 technology.

Deployable Technologies (TRL 8-9)

- **Weldless flange to pipe connections** - connectors deployed during 2024 shutdown to facilitate replacement of sections of an HP flare header. This reduced construction time offshore.
 - TRL9 Commercially Available
- **Proprietary miniaturised methane sensor** - provides high resolution for leak grading. Paired with software and customised algorithm to offer localised, quantified emissions leak data in the field.
 - TRL9 Commercially Available
- **Zero Flaring** - Fast opening, high integrity (SIL3), large bore automated ESD valves to support flare recovery concepts.
 - TRL9 Commercially Available
- **Brownfield flare gas recovery** - Brownfield deployment of flare gas recovery units with a view to meeting zero routine flaring commitments
 - TRL9 Commercially Available
- **Eductor Vapour Recovery** - Reduce the CO₂ footprint from flaring of process flash gas. Use of the latest eductor vapour recovery compression technology to capture flash gas to reduce flaring.
 - TRL9 Commercially Available
- **Flare gas recovery to achieve zero flare gas emission** - Develop a safe flare recovery system to recover flare gas, minimise CO₂ emission, and reduce import gas usage.
 - TRL9 Commercially Available



Technology Example

A flare gas recovery unit (FGRU) is a system that captures flare gases and redirects them back into production workflows for reuse as fuel gas. This process helps to reduce routine flaring and emissions while saving operators on long-term production costs.

[Link: TI 24 – 11 Technology Example – Flare Gas Recovery Unit \(Zeeco\).docx](#)

- **Low Shear Valves** - Control valve that minimizes mixing energy. Inline and angle type. Leaves droplets intact to improve performance of subsequent separation / treatment.
 - TRL9 Commercially Available
- **Microbubbles** - injection upstream of the degasser to enhance oil in water separation and therefore improve discharge performance
 - TRL 8 Early Commercialisation
- **Ceramic based static / passive membrane filtration system** - A commercial ceramic based static / passive membrane system, which will allow offline oil removal from produced water.
 - TRL 8 Early Commercialisation
- **Stemless Valves** - Axial flow stemless valves could remove fugitive emission and the reliability and integrity issues associated with a conventional valve. Also, they may reduce flow-induced instability in some services .
 - scaling/fouling of topsides process

Emerging Technologies (TRL 1-7)

- **LP mode instrumentation for reliability** - Installation of nucleonic level detection systems to improve reliability and improve slugging. Nucleonic level detection systems are installed to enhance the reliability of LP (low pressure) mode instrumentation by providing a non-intrusive, real-time measurement of liquid or solid levels.
 - TRL 5-7 Late Development/Pilot
- **Super compact production separator** - Working with the Net Zero Technology Centre to develop a super compact multi-phase separator with potential to add value across full asset life cycle.
 - TRL 5-7 Late Development/Pilot



Technology Example

Packages are certified to work in a SIL3 loop (SIL IEC 61508), providing reliable and rapid closure in the case of a system malfunction. They are tested and certified for transportation, harsh vibrating use, marine installation, and more.

[Link: TI 25- 06 Technology Example - ESI Fast Opening High Integrity Valves.docx](#)

Deployable Technologies (TRL 8-9)

- **Emissions analysers** – mounted on unmanned remote operated vehicles combine with artificial intelligence, satellite communication and low-cost electronics, this technology offers a new generation of smaller, more efficient methods for methane emissions measurement on operators' sites.
 - TRL 9 Commercially Available
- **Predictive emission monitoring & streamlined reporting** to improve accuracy of emission reporting from combustion plant and flare
 - TRL 9 Commercially Available
- **NIR Spectral Analysis offshore** - Lab studies and field trials to establish the potential to utilise NIR Spectral analysis characterisation of production stream crudes for hydrocarbon characterisation, stream allocation and cell stock management
 - TRL 9 Commercially Available
- **Oil Metering Upgrade** - Upgrade of 3 operators assets oil metering to 32-path M&T DFX Ultrasonic Flow Meters to improve accuracy..
 - TRL 9 Commercially Available
- **Methane Emission Surveys** - Use of remote systems e.g. fixed wing or drones to collect data on unburnt hydrocarbons/methane and fugitives
 - TRL 9 Commercially Available
- **AI for Emissions Reduction** A digital solution that helps carbon intensive companies to overcome these challenges, decarbonise their operations and reduce emissions, energy and fuel costs.
 - TRL 9 Commercially Available

- **Flare combustion efficiency modelling** - Cloud based solution which calculates flare combustion efficiency using existing data (flare flow rates, gas composition, weather data etc.).
 - TRL 8 Early Commercialisation

Emerging Technologies (TRL 1-7)

- **Autonomous Methane Measurement** - Measurement of methane emissions from unburnt fuel gas, unburnt flare gas, venting and fugitives. Use of ATEX rated autonomous measurement device to detect and quantify baseline methane emissions and abnormal events using TDLAS measurement technique.
 - TRL 5-7 Late Development/Pilot



Technology Example :

FLIR Camera The FLIR G300 an optical gas imaging (OGI) camera visualises gas, so you can monitor installations in remote or hazardous areas for gas leaks, hydrocarbon or volatile organic compound (VOC) leaks. Cameras are widely used in industrial settings, such as offshore platforms.

[Link TI 23 – 05 Technology Example – FLIR Emissions Monitoring Camera - Copy.docx](#)



Technology Example :

ABB PEMS to improve efficiency and streamline emissions reporting. ABB offer the PEMS solution

[Link: TI 22 - 58. Technology Example - ABB PEMS System.pdf](#)

Deployable Technologies (TRL 8-9)

- **Power Generation Efficiency Enhancement** - to increase aeroderivative gas turbine for power generation to 38% thermal efficiency rather than current 15-19%.
 - TRL 9 Commercially Available
- **Plant Data Management** - connects plant data to specialist cloud software to enable automatic scripting in the IT environment for purposes of logging, monitoring and alert generation.
 - TRL 9 Commercially Available
- **Helix Wind turbine** – Adding a wind turbine to a Hybrid Power System to reduce the running hour of the back-up diesel generator
 - TRL 9 Commercially Available
- **Hybrid power system** - Hybrid power system providing a maintenance free solution in the form of solar panels, providing power to the platform whilst charging batteries. Two small lean-burn diesel-engine driven generators will provide energy in case the renewable system fails.
 - TRL 9 Commercially Available
- **Platform Electrification (Power Supply)** - Development of grid tie-in, conversion of AC to HVDC for transmission in a subsea HVDC cable to an offshore sub-station
 - TRL 9 Commercially Available
- **Hydrogen Fuel Cell Generator** - Power is generated from a process of splitting pressurised hydrogen into positive ions and electrons – flow of electrons is used as power.
 - TRL 8 Early Commercialisation

- **Wave Energy Converter** - Innovative system for generating electricity from ocean waves
 - TRL 9 Commercially Available
- **Combined Cycle Gas Turbine** - Modification of existing gas turbine to add steam raising to combined heat and power output.
 - TRL 8 Early Commercialisation
- **Electrification of Asset via Floating Wind Solution** – Partial/full electrification of asset with a floating wind power source
 - TRL 8 Early Commercialisation

Emerging Technologies (TRL1-7)

- **Capacitive Transfer System** - New capacitive cable system design with aims to reduce cable power losses by 10% allowing for smaller cables with lower losses
 - TRL 5-7 Late Development/Pilot
- **WHR to Power**- Currently all the waste heat from the simple cycle GTs goes to the atmosphere that could potentially be used to generate electrical power. the challenge do this economically on a brownfield asset. Vendor hopes that this may be a compact engine to economically deploy offshore.
 - TRL 5-7 Late Development/Pilot

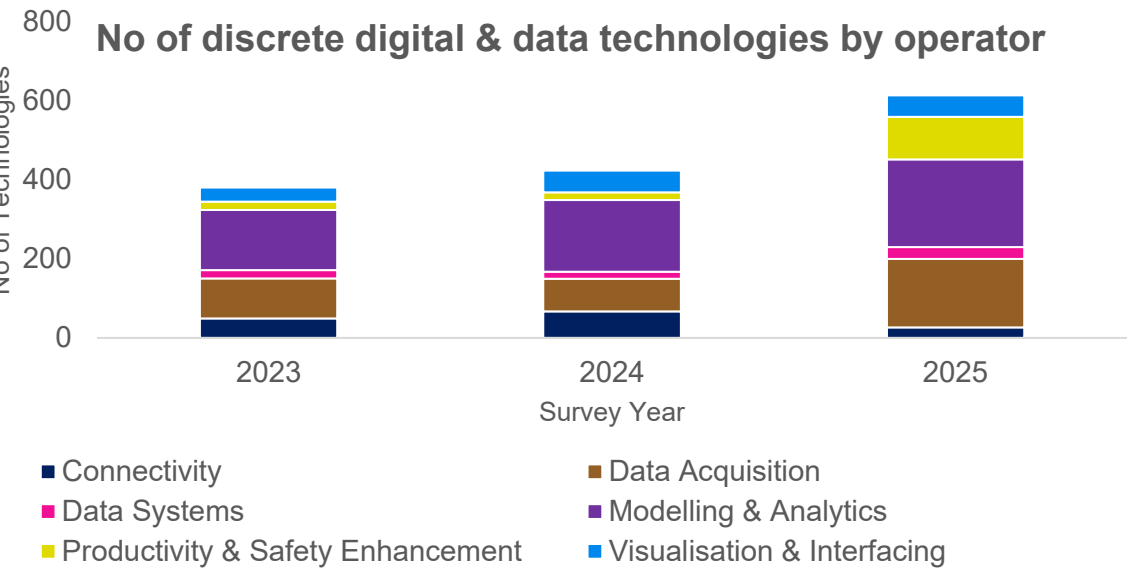


Technology Example:

The R&D carried out by the EODev and Toyota teams has enabled the REXH2 to be perfectly adapted to the extreme conditions of the marine environment, reaching power levels of 70 kW per unit, up to megawatts when stacked.

[Link: TI 24 – 12 Technology Example – EO Dev Hydrogen Fuel Cell for Offshore Applications.docx](#)

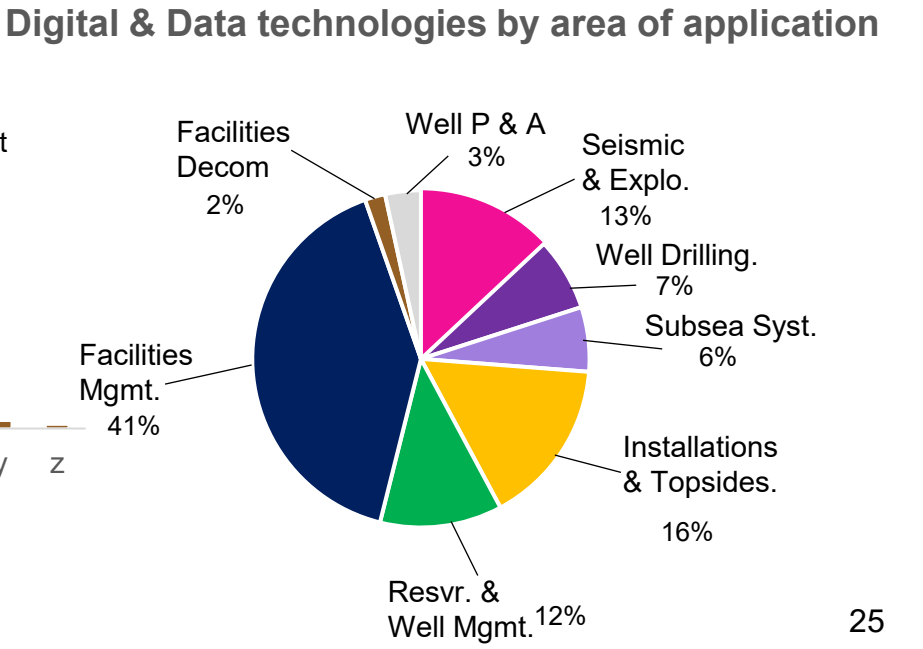
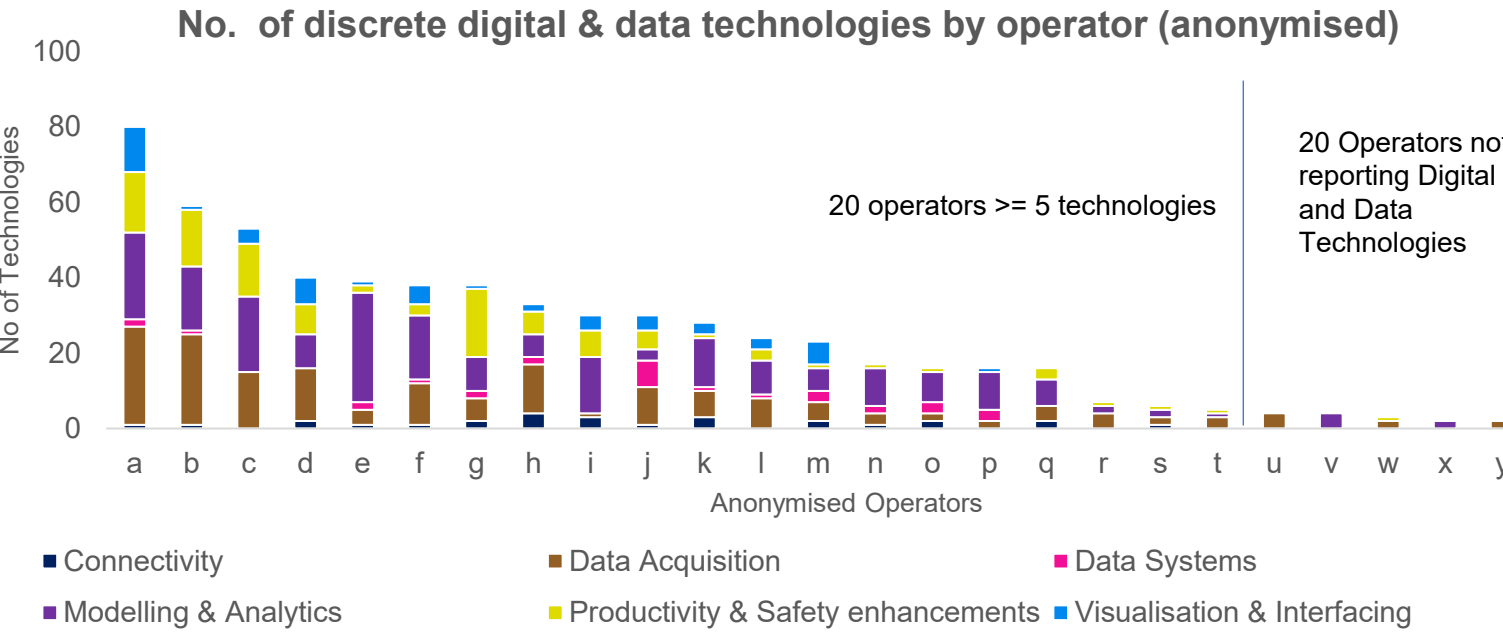
9. Digital & Data technologies



Digital & Data applications are one of the strongest areas of interest according to Operators' Technology Plans, with 614 technologies submitted this year an increase of 45% on 2024's total)

There is broad industry participation, with 28 Operators (61% of total respondents) having reported interest in digital technologies

Digital & Data is defined in this document as a 'cross-cutting' category, in which digital and data are integral parts of technology solutions in most areas of the offshore asset lifecycle (chart below)



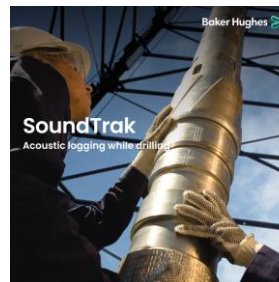
9.2 Data Acquisition

Deployable Technologies (TRL 8-9)

- **Methane Measurement Deployment** – NZTC project on methane measurement deployment involving measurement of methane emissions from unburnt fuel gas, unburnt flare gas, venting and fugitives.
 - TRL 9 Commercially Available
- **Integrity scanning for risers** - Integrity scanning for risers using crawlers.
 - TRL 9 Commercially Available
- **Emissions Monitoring Software** - for flaring and crude arrivals.
 - TRL 9 Commercially Available
- **Downhole Fibres/Gauges DTS** - flow Indication for each zone in a DST using downhole temperature sensors to avoid the need for a PLT, reducing further emissions.
 - TRL 9 Commercially Available
- **Sonic logging** - LWD sonic tool to log across 9 5/8" casing for top of cement identification after well encountered severe losses during a cementing job. Reduces the uncertainty in top of cement measurement.
 - TRL 9 Commercially Available
- **Compact Sensors - LoRaWAN Sensors** - Installation of a LoRaWAN network (Long Range Wide Area Network) to enable installation of wireless long battery life wireless pressure instruments to replace existing pressure gauges on wellbay annuli.
 - TRL 9 Commercially Available
- **Hand held laser scanner** - Allowing the offshore team to complete 3D point cloud scans where and when required to significantly increase the productivity and efficiency of maintenance and modifications projects, especially when linked to a digital twin
 - TRL 9 Commercially Available

Emerging Technologies (TRL 1-7)

- **DAS micro seismic events** - recorded at seabed including automatic detection of events, processing algorithm development and tests.
 - TRL 1-4 Early Development
- **Surface DAS** - fibre optic for 3D reservoir imaging.
 - TRL 1-4 Early Development
- **Through tubing CBL and casing wear logging** – To verify appropriate annular barriers through multiple tubing / casing strings.
 - TRL 5-7 Late Development/Pilot
- **Seabed digital acoustic sensing (S-DAS)** – for carbon storage sites
 - TRL 5-7 Late Development/Pilot
- **Inventory Optimisation** - Automated inventory optimisation and reporting tool.
 - TRL 1-4 Early Development
- **Automating remote visual inspection** – to reduce time to complete visual inspection, increase data quality and reduce human exposure due to lower offshore POB . Fully automated remote visual inspection by utilising point cloud data.
 - TRL 1-4 Early Development



Technology Example:

The SoundTrak™ service employs proprietary acoustic technology to directly measure valid formation slowness. Multi-frequency excitation ensures high data quality in both fast and slow formations, as well as in a wide range of hole sizes. These measurements can be used for a variety of real-time and post-well applications.

[Link: TI 25- 05 Technology Example - Baker Hughes Sound Track acoustic logging.docx](#)

9.4. Modelling & Analytics

Deployable Technologies (TRL 8-9)

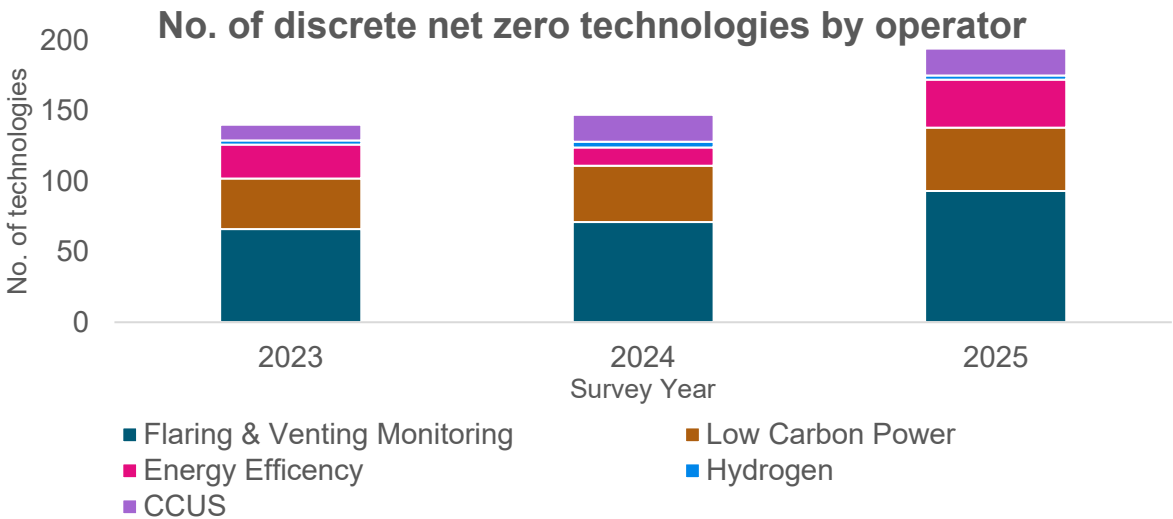
- **Seismicity Monitoring System Design** - modelling of expected levels of seismicity and system design for potential future deployment to monitor carbon storage sites.
 - TRL 9 Commercially Available
- **Advanced NDT (Phased Array Ultrasonic Testing) on Difficult to Inspect Components** - Undertook novel inspection technique on onshore large roller bearing to validate the applicability to static NDT of triple roller bearing without requirement for rotation (acoustic) or visual inspection (open / splitting of the bearing) to evaluate offshore bearing condition. Followed by offshore inspection.
 - TRL 9 Commercially Available
- **Dynamic Simulation Modelling** - of Waste Heat Recovery Unit (WHRU) and its control loop to enhance the control tuning, prior to implementation of upgrade to remove a long-standing issue and enhance / reduce commissioning time for the system. Includes process safety impact to ensure dangerous operation cannot occur and CFD modelling of gas turbine purge sequence to validate time required to sufficiently inert the exhaust prior to firing.
 - TRL 9 Commercially Available
- **Multiphysics Petrel Plugin** - to improve production forecasts from reservoir simulators, more accurately locate the remaining oil, and de-risk infill drilling opportunities.
 - TRL 8 Early Commercialisation
- **Depo gridding** - Trial using unstructured depogrids to model reservoirs, while honouring complex geological structures and layering more accurately than standard geocellular models. Can be used in a next generation simulator.
 - TRL 9 Commercially Available
- **Subsurface illumination** - Enables 3D visualisation of the subsurface while drilling and delivers automated high- resolution models in real time.
 - TRL 9 Commercially Available

- **Advanced Self-Service Analytics** - an advanced analytics tool to improve automation and provide engineering-based modelling and machine learning capabilities.
 - TRL 9 Commercially Available
- **4D time-lapse seismic data processing** - To image oil and water movements within the reservoir. Primary tool used for locating infill drilling targets
 - TRL 9 Commercially Available
- **Depth-dependent seismic facies inversion** - Pre-stack simultaneous facies modelling
 - TRL 9 Commercially Available

Emerging Technologies (TRL 1-7)

- **Proprietary Miniaturised Methane Sensor** - provides high resolution for leak grading. Paired with software suite and custom algorithms the self-contained and field-proven package offers localised, quantified emissions data.
 - TRL 5-7 Late Development/Pilot
- **Machine Learning For Detection** – and extraction of micro seismic events from antenna recordings.
 - TRL 5-7 Late Development/Pilot
- **Subsurface CO₂ storage assessment** - Subsurface modelling with potential for new data acquisition and processing to allow modelling of CO₂ injectivity, migration within the reservoir and containment of the CO₂ subsurface.
 - TRL 1-4 Early Development

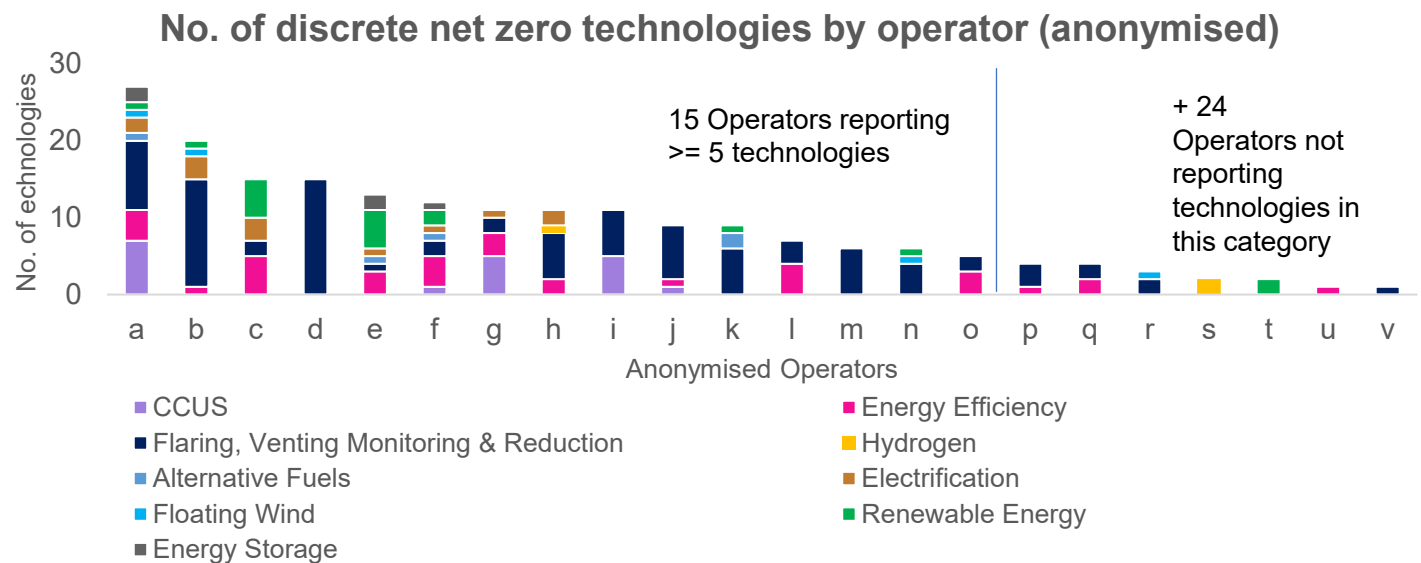
10. Net Zero technologies



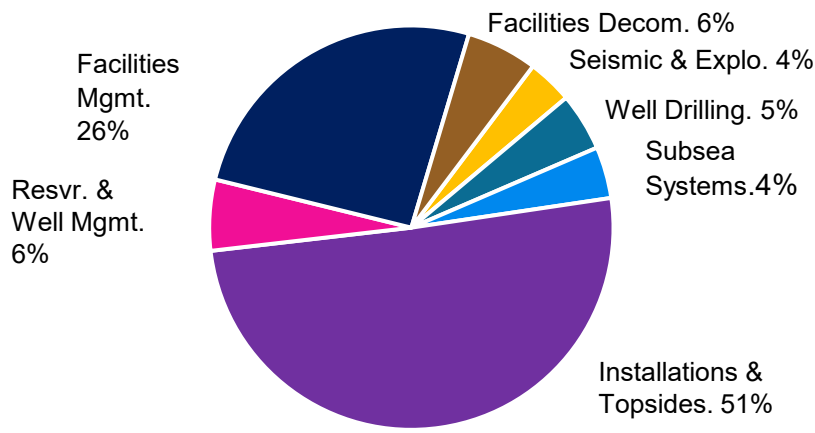
In line with industry commitments to the North Sea Transition Deal to reduce greenhouse gas emissions, interest in technologies to address Flaring & Venting, Energy Efficiency, and Low-Carbon Power has grown significantly

Companies with the largest operational footprint in the UKCS show greatest interest, but in general there is a broad presence of these technologies in the reported plans (22 Operators out of 46)

Net Zero is defined in this document as a ‘cross-cutting’ category, where technologies are an integral part of the offshore asset lifecycle (chart below)



Net Zero technologies by area of application



Deployable Technologies (TRL 8-9)

- **Catalytic Gas Sensor** - Poison Resistant Pellistor (PRP) catalytic gas detector for fixed fire & gas detection system.
 - TRL 9 Commercially Available
- **Cloud Based Emissions Monitoring system** – to reduce emissions during wells activities. Software helps operators reduce emissions by accurate monitoring against identifiable targets using cloud-based techniques. Real-time measurement of emissions vs. baseline plan.
 - TRL 9 Commercially Available
- **Flare Gas Recovery** – proprietary self-contained flare gas recovery system.
 - TRL 9 Commercially Available
- **Flare Combustion Efficiency Modelling** - Cloud based solution which calculates flare combustion efficiency using existing data (flare flow rates, gas composition, weather data etc.).
 - TRL 9 Commercially Available
- **Plant performance optimisation** – Enables optimised running parameters to reduce GHG emissions
 - TRL 9 Commercially Available
- **Liquid ring compressor** - Can compress nearly all gases and vapours without any metallic parts contacting one another, used for flare gas recovery
 - TRL 9 Commercially Available
- **Flare combustion efficiency measurement** – An online, live measurement of combustion efficiency providing control feedback to improve the combustion efficiency of flaring operations and thereby reduce overall emission rates of CO₂ and methane
 - TRL 8 Early commercialisation

Emerging Technologies (TRL 1-7)

- **Proprietary Miniaturised Methane Sensor** – provides high resolution for leak grading. Paired with software suite and custom algorithms the self-contained and field-proven package offers localised, quantified emissions data.
 - TRL 5-7 Late Development/Pilot



Technology Example: A flare gas recovery unit (FGRU) is a system that captures flare gases and redirects them back into production workflows for reuse as fuel gas. This process helps to reduce routine flaring and emissions
[Link: TI 24 – 11 Technology Example – Flare Gas Recovery Unit \(Zeeco\) Rev 02.docx](#)



Technology Example:

X-PAS™ is a digital solution for complex assets to predict threats, prevent system trips and reduce maintenance costs.
[Link: TI 22 -11. Technology Example - OPEX Group - XPAS Plant Performance Optimisation - Copy.docx](#)



Technology Example:

Liquid ring compressor uses a liquid ring formed from the operating liquid, instead of a mechanical piston, as an energy carrier to compress gases and vapours. Liquid ring compressors can compress nearly all gases and vapours without any metallic parts contacting one another.
[Link: TI 23 – 07 Technology Example – Liquid Ring Compressors for Flare Gas Recovery - Copy.docx](#)

Deployable Technologies (TRL 8-9)

- **Photovoltaics - solar power system** - Power generated using Photovoltaics arranged in arrays. Power output proportional to incident light intensity – highly seasonal.
 - [TRL 9 Commercially Available](#)
- **Hybrid power system** - Providing a low maintenance solar panel solution, providing power to the platform whilst charging batteries. Two small lean-burn diesel-engine driven generators provide energy in case the renewable system fails.
 - [TRL 9 Commercially Available](#)
- **Wave Energy Converter (WEC)** - comprising WEC, subsea battery storage, subsea control system topside, subsea equipment, a residential hybrid autonomous underwater vehicle and a docking station.
 - [TRL 8 Early Commercialisation – 3 new operators reporting this year](#)
- **Alternative Liquid Fuels** – including hydrotreated vegetable oil, e-methanol and bio-diesel.
 - [TRL 8 Early Commercialisation](#)
- **Transportable, autonomous energy container** combining wind turbine, solar panels and battery storage for use on platforms in lighthouse mode
 - [TRL 8 Early commercialisation](#)
- **Fuel cell power generation** - Installation of 600kW fuel cell technology to produce electricity from imported gas with minimal emissions and high efficiency.
 - [TRL 8 Early Commercialisation](#)

Emerging Technologies (TRL 1-7)

- **E-Methanol** - Generating low carbon fuel offshore in an economical way without impacting MAH
 - [TRL 5-7 Late Development/Pilot](#)
- **Battery storage** - On-site battery system to provide additional power resilience. [TRL 5-7 Late Development/Pilot](#)
- **Alternative fuel** - Deployment of green hydrogen equipment for site services.
 - [TRL 5- 7 Late Development/ Pilot](#)
- **Low carbon power solutions** - Wind power solutions and grid connection
 - [TRL 1-4 Early Development](#)



Technology Example:

With a unique combination of Amphibious Energy's Nautilus Offshore Wind Turbine, vertical orientated solar photovoltaic panels, and battery storage integrated with the container, it directly competes with conventional transportable power generators.

[LINK: TI 24 - 05 Technology Example - Amphibious Energy - EnergyPod.docx](#)



Technology Example:

The R&D carried out by the EODev and Toyota teams has enabled the REXH2 to be perfectly adapted to the extreme conditions of the marine environment, reaching power levels of 70 kW per unit, up to megawatts when stacked.

[Link: TI 24 – 12 Technology Example – EO Dev Hydrogen Fuel Cell for Offshore Applications.docx](#)

10.3 Energy Efficiency

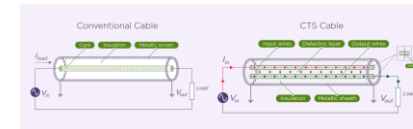


Deployable Technologies (TRL 8-9)

- **Export Gas Compressors** - re-wheeled for improved efficiency.
 - TRL 9 Commercially Available
- **Power Generation Efficiency Enhancement** – by using aeroderivative gas turbine for power generation at 38% thermal efficiency rather than current 15-19%.
 - TRL 9 Commercially Available
- **Shutdown Generator Study** – use of smaller/more efficient power generators during annual shutdown periods.
 - TRL 9 Commercially Available
- **Turbine Power Management System Obsolescence** – Replaces existing, obsolete system to provide automatic synchronisation facility between main turbine generators as well as load sharing and load shedding functions.
 - TRL 9 Commercially Available
- **Optimised power management** - Improves visibility through greater data handoff at high resolution for improved fault-finding and maximising efficiency
 - TRL 9 Commercially Available
- **Integrated operations centre** - Optimising the production and energy efficiency of the from visualisation portals allowing stakeholders to assess status and plans. A separate area is related to a dashboard visualising status
 - TRL 9 Commercially Available
- **Optimising GT Efficiency** - To increase the efficiency of simple cycle GTs offshore driving compression and power generation.
 - TRL 9 Commercially Available
- **Combined Cycle Gas Turbine** - modification of existing gas turbine to add steam raising and combined heat and power capability.
 - TRL 8 Early Commercialisation

Emerging Technologies (TRL1- 7)

- **Capacitive Transfer System (CTS)** - New capacitive cable system design with aims to reduce cable power losses by 10% allowing for smaller cables with lower losses for same power capacity
 - TRL 5-7 Late Development/Pilot
- **Gas compression analytics** - Use of data science methods to improve gas compression up time
 - TRL 5-7 Late Development/Pilot
- **Advancing remote operations** - Remote operations to create safer, more efficient and lower carbon operations
 - TRL 1-4 Early development



Technology Example:

Capacitive Transfer System (CTS) is an innovative concept for power cable design leading to lower losses and facilitating more power delivery than equivalent legacy cable systems.

Link: [TI 24 – 06 Technology Example – Enertechnos CTS cable system.docx](#)

Deployable Technologies (TRL 8-9)

Seismicity Monitoring System Design - modelling of expected levels of seismicity and designing for potential future deployment to monitor carbon storage sites.

- TRL 9 Commercially Available

Seabed 4D gravity monitoring - Undertaking modelling of seabed gravity sensing survey technology over carbon storage sites

- TRL 9 Commercially Available

In-line inspection for offshore pipeline repurposing - an offshore pipeline will be repurposed for CO₂ transportation. Fracture and corrosion assessment has been completed but an in-line inspection using intelligent pigs will confirm assumptions and results from this assessment.

- TRL 9 Commercially Available

CO₂ injection well design - cement sheath modelling - Initial flow assurance results have indicated cryogenic injection conditions for most of the wells' design life. This technique looks at the impact of cold temperatures on the effectiveness of the annular cement sheath over the life of the well and post abandonment.

- TRL 9 Commercially Available

Emerging Technologies (TRL 1-7)

SPARK - Gas sequestration project in partnership with NZTC and HWU

- TRL 5-7 Late Development/Pilot

Seabed digital acoustic sensing (S-DAS) - Modelling of S-DAS over carbon storage sites

- TRL 5-7 Late Development/Pilot

Qualification testing for well elastomers - Existing elastomers are not qualified for anticipated low temperatures or for the CO₂ and accompanying impurities expected in the stream captured from emitters. Lab testing and qualification activity will enable appropriate elastomer material selection for new CO₂ injection wells.

- TRL 5-7 Late Development/Pilot

Subsurface CO₂ storage assessment -

Subsurface modelling, potentially incorporating new data acquisition and processing to allow modelling of CO₂ injectivity, migration and containment to better understand the risks involved.

- TRL 5-7 Late Development/Pilot

MMV – Measurement, Monitoring and Verification technology assessments. Preparation of MMV plans tailored to specific storage sites to enable achievement of required detectability thresholds for any given licence area. Assessment includes wide variety of available and emerging technologies.

- TRL 5-7 Late Development/Pilot

Impurity impact on CO₂ stream - Presence of impurities in CO₂ streams is not well understood in terms of the impurity impact on CO₂ phase behaviour and temperature conditions and corrosivity.

- TRL 1-4 Early development

Useful Links

NSTA Website

[North Sea Transition Authority \(nstaauthority.co.uk\)](https://nstaauthority.co.uk)

Previous 2024 Technology Insights Survey

[NSTA Technology Survey & Insights 2024](#)

UK Energy Technology Platform website

[TechnologyCatalogue.com \(energytechnologyplatform.com\)](https://technologycatalogue.com)

Technology Leadership Board (TLB)

[Home - The Technology Leadership Board \(the-tlb.com\)](https://the-tlb.com)

List of all Technologies (alphabetical)

2025 NSTA Insights Technology Listing - All 1279 listed discrete technologies																		
Technology Descriptions (Field)					Note: all newly reported technologies in November 2024 survey are highlighted in Green													
					Cross Cutting Categories			Alphabetical Listing by Technology										
Survey Period	Survey Company	Field Name	Field Area	D & D	Digital and Data Sub-category	Net Zero	Net Zero Sub-category	Unique code	Technology Name	Description	Category	Technology Sub-category	Deployment Status	Development Phase	Maturity Stage	Technology Aim(s)		
Title	Name	Field Name	Area	Y/N	category	Y/N	category	code	Technology Name	Description	Category	Technology Sub-category	Deployment Status	Development Phase	Maturity Stage	Technology Aim(s)		
November 2024	12	11	CNS					1	ABB Alarm Insight System	Upgrade of ABB Alarm Insight System	Installations and Topsis	CONTROL_SYSTEMS_AND_AUTO	COMPLETED	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	OPEX EFFICIENCY, SAFETY ENHANCEMENT		
November 2024	24	5	NNS					1we1cr	Abrasive Cutting	Abrasive Cutting	Well P&A	CASING_SECTION_REMOVAL	COMPLETED	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	ABEX EFFICIENCY		
November 2024	2	2	NNS	Y	DATA_ACQUISITION			1n1h2r	Abyss - Laser Scanning	Corrosion monitoring and categorization (Return to scene)	Facilities Management	INTEGRITY_MONITORING_INSPECTION	COMPLETED	VENDORS_SOLUTION	LATE_DEVELOPMENT	OPEX EFFICIENCY		
November 2024	28	3	CNS					1we1ior	Acid Diverter Open Path Sequence	Effectively treat heterogenous reservoir layers in HT wells	Reservoir and Well Management	IMPROVED_AND_ENHANCED_RECOMPLETION	IN_PROGRESS	VENDORS_SOLUTION	EARLY_COMMERCIAL	POSITIVE INCREASE		
November 2024	6	2	CNS					1we1ior	Acid stimulation	Well acid stimulation of 1 well in 2022 (with 2 more planned) to improve well production rates	Reservoir and Well Management	WAXING_HYDRATES_AND_SCALING	COMPLETED	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	PRODUCTION EFFICIENCY		
November 2024	12	14	CNS					1we1ior	Acid Wash	Acid wash	Reservoir and Well Management	WAXING_HYDRATES_AND_SCALING	COMPLETED	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	PRODUCTION EFFICIENCY		
November 2024	23	1	CNS	Y	DATA_ACQUISITION	Y	FLARING	1fv1em	Acoustic Emissions Sensor - passing valves	Acoustic emissions sensor used to survey Blow Down Valves	Installations and Topsis	METERING_AND_MONITORING	BUSINESS_AS_USUAL	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	EMISSIONS		
November 2024	25	1	CNS					1	Acoustic Insulation Jackets	Best practice simple insulation system for reducing noise	Facilities Management	INTEGRITY_MONITORING_INSPECTION	COMPLETED	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	SAFETY ENHANCEMENT, OPEX EFFICIENCY		
November 2024	28	8	CNS					1n1pli	Acoustic Resonance Technology (ART)	Ultrasonic, Integrity tool (internal pig)	Subsea Systems	INSPECTION_INTERVENTION_SYSTEMS	COMPLETED	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	OPEX EFFICIENCY		
November 2024	28	1	NNS	Y	DATA_ACQUISITION			1abm1bv	Acoustic, Gamma, EM (Electro Magnetism) - T	Multi casing logging for barrier verification	Well P&A	WELL_INSPECTION_AND_CEMENTATION	IN_PROGRESS	PARTNERSHIP_WITH_SUPPLIERS	LATE_DEVELOPMENT	ABEX EFFICIENCY		
November 2024	16	1	CNS					1ss1uir	Active healing solution for low insulation resistance	V-LIFE - Active healing solution for low insulation resistance	Subsea Systems	PIPELINES_RISERS_JUMPERS_CEMENTATION	IN_PROGRESS	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	PRODUCTION EFFICIENCY		
November 2024	3	1	CNS	Y	PRODUCTIVITY_AND_SAFETY_ENHANCEMENT			1	Activity Integration Workbench	AIW is a new tool to improve site execution efficiency at	Installations and Topsis	MANNED_OFFSHORE_PLATFORMS	COMPLETED	IN_HOUSE_DEVELOPMENT	EXISTING_TECHNOLOGY	OPEX EFFICIENCY		
November 2024	12	4	CNS					1	Additive Manufacturing of Metal and Polymer	Increased difficulties in availability of raw materials caused	Facilities Management	FACILITY_INTEGRITY_REPAIRS	IN_PROGRESS	VENDORS_SOLUTION	EARLY_DEVELOPMENT	EMISSIONS, OPEX EFFICIENCY		
November 2024	25	10	CNS					1	Add-on Gate Valve	Positive isolation for the pipework flanges	Facilities Management	MAINTENANCE_AND_OPERATIONS	COMPLETED	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	OPEX EFFICIENCY		
November 2024	12	21	CNS					1we1ie	Adjustable Torque Limiter	Adjustable Torque Limiter to rotate sand screens to get	Well Drilling and Completion	DRILLING_CASING_AND_CEMENTATION	COMPLETED	VENDORS_SOLUTION	LATE_DEVELOPMENT	CAPEX EFFICIENCY		
November 2024	28	16	NNS					1ss1fa	Adopting a factory approach	New/alternative contracting strategies	Facilities Decommissioning	PREPARATION_AND_REMOVAL_SYSTEMS	PLANNED	IN_HOUSE_DEVELOPMENT	EARLY_DEVELOPMENT	ABEX EFFICIENCY		
November 2024	26	7	IS	Y	MODELLING_AND_ANALYTICS			1	Advanced analytics trip prediction	We have built a machine learning model that has analysed	Facilities Management	EQUIPMENT_MONITORING_RELIABILITY	BUSINESS_AS_USUAL	PARTNERSHIP_WITH_SUPPLIERS	EARLY_DEVELOPMENT	PRODUCTION EFFICIENCY		
November 2024	16	1	CNS	Y	DATA_ACQUISITION			1n1h2r	Advanced Inspection Tools	Corrosion mapping of FSU side shell using automated corrosion scans with integration of 3D model	Facilities Management	INTEGRITY_MONITORING_INSPECTION	COMPLETED	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	OPEX EFFICIENCY		
November 2024	16	4	SNS	Y	VISUALISATION_AND_INTERFACING			1n1h2r	Advanced laser scan and 3D model integration	Eserv: Using 3D and Artificial Intelligence (AI) technologies, a digital map of all three bridge-linked	Facilities Management	MAINTENANCE_AND_OPERATIONS	BUSINESS_AS_USUAL	VENDORS_SOLUTION	EXISTING_TECHNOLOGY	OPEX EFFICIENCY, PRODUCTION EFFICIENCY		

2025 Operators Technology Needs Spreadsheet:

These are the submitted technology needs of the operators who chose to include them, the Operators names are anonymised - if any of the Technology needs are of interest to vendors or other operators - please contact NSTA and we will ask the operator to contact you to discuss further

Number of *UKCS															Specific Technology		*Data and Digital Sub		*Net Zero Sub		*Maturity		*Development		Operator
Assets	Area	Tech Need Name	Tech Needs Description	*NSTA Category	*NSTA Sub Category	*Technology Aims	Name	Vendor Name	*Data and Digital	Category	*Net Zero	Category	Stage	Plan											
4	1 NNS	B annulus pressure monitoring	B annulus pressure monitoring	Well Drilling & Constr	Completions & Artificial Lift	Integrity	Metris Eclipse	SLB	Yes	Productivity & Safety Enhancements	No		Existing Technology TRL 8-9	Vendor Solution											
4	1 NNS	Gas lift system	IPO gas lift valves and Orifice injection valve	Well Drilling & Constr	Completions & Artificial Lift	Increase Field Recovery	Camco	SLB	No		No		Existing Technology TRL 8-9	Vendor Solution											
4	1 NNS	Dual ESP system	Dual ESP system	Well Drilling & Constr	Completions & Artificial Lift	Increase Field Recovery	REDA	SLB	Yes	Productivity & Safety Enhancements	No		Existing Technology TRL 8-9	Vendor Solution											
4	1 NNS	Donwhole PDG	PDG	Well Drilling & Constr	Completions & Artificial Lift	Increase Field Recovery	Metris Express	SLB	Yes	Productivity & Safety Enhancements	No		Existing Technology TRL 8-9	Vendor Solution											
4	1 NNS	AICD	Autonomous inflow control device	Well Drilling & Constr	Completions & Artificial Lift	Increase Field Recovery	AICD	Inflow control	No		No		Existing Technology TRL 8-9	Vendor Solution											
4	1 NNS	ICV smart completion	Smart completion to control multizonal sand face inflow	Well Drilling & Constr	Completions & Artificial Lift	Increase Field Recovery	TBD	TBD	No		No		Existing Technology TRL 8-9	Vendor Solution											
5	1 SNS	Private 4G/5G network	Provision of a dedicated mobile network at Onshore Terminal	Facilities Management	Site Inspection & Monitoring	Operational Excellence	Private 4G network	Vodafone	Yes	Connectivity	No		Existing Technology TRL 8-9	Vendor Solution	N/										
5	1 SNS	Mobile device applications	Provision of IoT devices and mobility applications on EX rated devices.	Facilities Management	Maintenance & Operations	Operational Excellence	Mobile private network (MPN) mobility		Yes	Connectivity	No		Early Commercialisation TRL 6-7	Partnership with Suppliers	N/										
5	1 SNS	Provision of instrumentation wifi mesh	Limited number of Emerson wirelessHART sensors in use in CSL on low criticality loops. Also introduced for well head monitoring on plugged wells on currently cold stacked and normally unmanned platform.	Facilities Management	Control Systems & Automation	Asset Management	transmitters and creation of wifi instrumentation mesh	Emerson	No		No		Existing Technology TRL 8-9	Vendor Solution	N/										
5	1 SNS	Waste water remediation	Research into waste water remediation options	Facilities Management	Waste Mgmt & Recycling	Efficiency Enhancement			No		No		Development TRL 1-3	Joint Industry Programme	N/										
5	1 SNS	Corrosion under insulation detection	Research into CUI detection	Facilities Management	Inspection & Intervention systems	Integrity			No		No		Early Development TRL 1-3	Joint Industry Programme	N/										
5	1 SNS	Drone inspections	Remote drone inspections; structural visual and electrical nav aid general visual inspection. In place as routine for offshore well cold stacked and normally unmanned platform.	Facilities Management	Inspection & Intervention systems	Integrity	Drone inspections	Cyberhawk	No		No		Existing Technology TRL 8-9	Vendor Solution	N/										
5	1 SNS	Pipeline inspection	Use of intelligent pigs in pipeline inspection	Subsea Systems	Pipelines, Risers, Jumpers & Connections	Integrity	Intelligent pigging pipeline inspection		No		No		Existing Technology TRL 8-9	Vendor Solution	N/										

- Technology Needs spreadsheet
 - “Technology Needs” only version (no technology reporting in this section)
 - Ensure technology needs list is in Excel format, and the spreadsheet is not locked
 - Remove JIPs, Studies, Research Programmes & similar - only technology needs (technology gaps) to be reported

- NSTA Stewardship Technology Survey Submission
 - Remove non-technologies as above
 - Avoid using “other” where possible
 - This year we ask that the question, “Are there any technologies to report” has options to allow us to understand why with tick boxes for the most common reasons - Asset under CoP, Asset being Decommissioned, No technologies to report.
 - Old technologies – select “business as usual” and remove the following year.

Thank you

Questions?

Agenda

1. Welcome and introduction
2. NSTA presentation on Technology Insights report
3. Q&A following presentation
4. AOB & meeting close

Clara Altobell

Alan Ransom, Ernie Lamza

All

Clara Altobell

Remote Operations and Robotics Technology Showcase

**- Wednesday 19th November
8am to 1:30pm**

Location: NZTC Innovation Hub
Hosted by: Clive Sirju (CNOOC)

The event will raise awareness of ready to deploy remote operations and robotics technologies that:

- Reduce operational cost
- Improve safety
- Reduce operational risk
- Reduce emissions
- Offer other significant benefits

Invites out this week
Register via Eventbrite

For more information contact:
info@the-tlb.com

Remote Operations and Robotics Technology Showcase Programme
Wednesday, 19 November 2025, 8.00am to 1:30pm

Speaker Programme	
08.00	Arrival, Coffee
08.15	Welcome, introductions and safety briefing. <i>Clive Sirju, Technology Leadership Board, Accelerate Deployment Workstream</i>
08.20	Keynote speech by: Myrtle Dawes, Chief Executive Officer, Net Zero Technology Centre
Remote operations and robotics technology case studies	
08.30	Net Zero Technology Centre – Advancing Remote Operations (ARO)
08.50	Flylogix – Reducing the cost, risk and environmental impact of offshore methane emission measurements. <i>Charles Tavener, Chief Executive Officer, Flylogix Holdings Ltd</i>
09.10	Skeye - Operator rounds using remote drone operations at Shell Rotterdam <i>Pieter Franken, Health, Safety, Quality and Compliance Director, Skeye</i>
09.30	Eserv and SSE Thermal <i>Dan Millard, CEO and founder, eserv and Gordon Burnside, Digital Engineering Lead and Data & Analytics Manager, SSE Thermal</i>
09.50	Sib and Pertamina - Remote Operations in Practice: Scaling AI and Automation for Offshore Impact
10.10	Technology Showcase & Networking (coffee)
Remote operations and robotics technology case studies	
11.10	Zelim and Valaris - Using AI for automatic man-overboard detection to enhance offshore safety <i>Andy Tipping, Co-founder & Business Development Director, Zelim and Kyle Finnie, Trainee Engineer, Valaris</i>
11.30	Fugro and DNV – Remote Inspection case study <i>Jeff Richardson, Regional Manager - EUAF Remote Operations Centres, Fugro and Jose Guilherme Moraes, Fleet in service Team Leader, DNV</i>
11.50	Reach Subsea – The role of USVs in a modern Subsea Vessel fleet <i>Alastair McKie, Managing Director, Reach Subsea</i>
12.10	Oceaneering and TotalEnergies - Freedom - Realising the Potential <i>Gordon Beattie, Product Manager, Survey & Subsea Robotics, Oceaneering International Services Ltd and Andy Gower, R&D Subsea Robotics Project Lead, TotalEnergies EP Norge AS.</i>
12.30	Feedback from the floor
12.35	Technology Showcase & Networking (lunch)