

# Smarter Subsea Handling

Decommissioning and 'The Circular Economy'  
21<sup>st</sup> February 2024

Autonomous Lifting and Handling Systems for Subsea  
Infrastructure Construction Support and Removal

Fraser Dunsmore Pritchard, COO



# Agenda

- Introduction
- Background and Opportunity
- ROVAR variable buoyancy Products & Solutions
- Integrating Decommissioning and Circular Economy
- Key Points & Asks



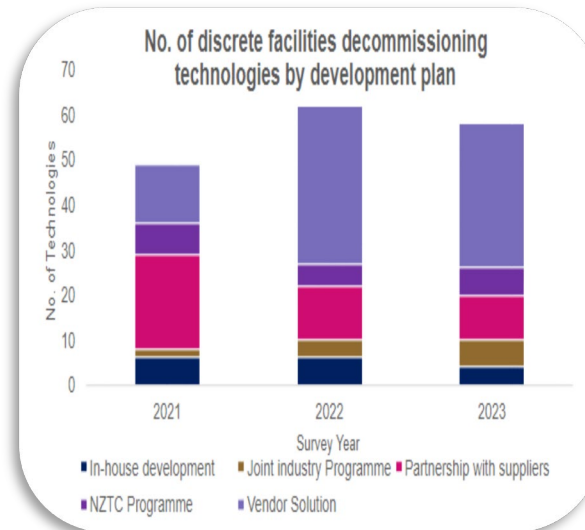
# Decommissioning and the Circular Economy – Background & Opportunities

## International and Regulatory Needs of Decommissioning

- UN Circular Economy embraces diverse means to reduce, recycle and remediate
  - Convert from linear tasks to parallel and circular ones
  - Reduce manufacturing, consumption and use - doing more with less
  - Recycle processes and equipment – paralleling activity, “Swiss army knife”
  - Remediate the environment - minimising carbon and marine damage
- NSTA and OPRED are supporting these principles for decommissioning
  - Industry agreement to cut decom costs from £40 billion to £33.3 billion by 2028
  - £21 billion expected to be spent on decommissioning between 2023 and 2032
  - NSTA expects industry to deploy new, emerging and existing technology
  - Operators to increase participation in technology development and adoption

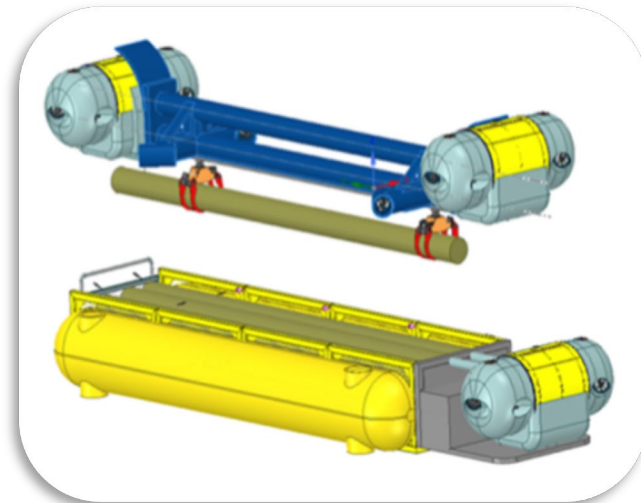
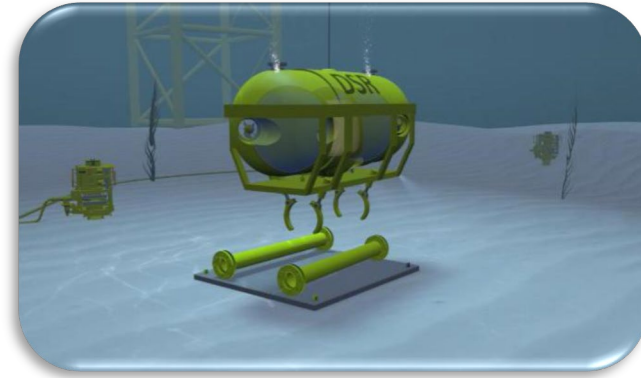
## Circular Decommissioning Opportunities

- Need for cheaper, repeatable, autonomous subsea solutions with low emissions
- Deploy solutions in lifting and handling infrastructure across all subsea sectors



# ROVAR Technology – Key Features and Products

- Global patented cryogenic variable buoyancy system
- **ROVAR**: “Remotely Operated Vehicle for Assets Recovery”
  - Vapourised liquid nitrogen displaces seawater for buoyancy
  - Buoyancy controlled through gasification system, relief valves to retain / release gas in caissons, positioning control system, and axes sensing
  - Bespoke tooling and thrusters for handling and lateral positioning
  - Lift repeatability varies with dewar caisson sizing, load and depth
  - Intellectual property across patent families in Europe, Americas and China
- Standard system, **ROVAR-20**: 20Te lifting and handling underwater vehicle specifically designed as vessel backdeck equipment for mobilisation during decommissioning and construction support across all offshore energies sectors
- **ROVAR-BB** (Buoyancy Beam) designed to handle and spread the load of long structures underwater such as cables, pipeline bundles, umbilicals and tubulars
- **ROVAR-WB** (buoyant Wet Basket) is an adapted seabed basket with integral buoyancy, designed to provide the means of both delivery and recovery for multiple items with independent and controllable lift



# ROVAR Solutions – Core and Additional

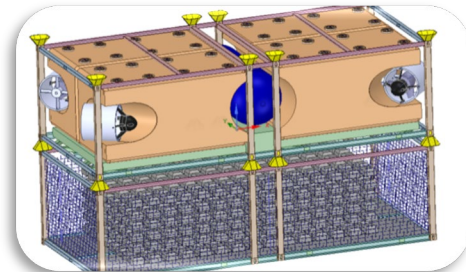
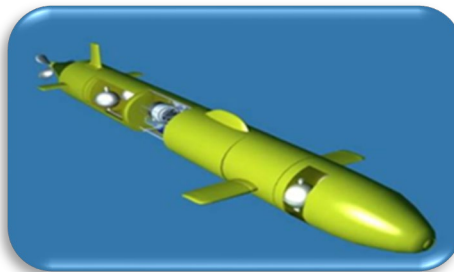
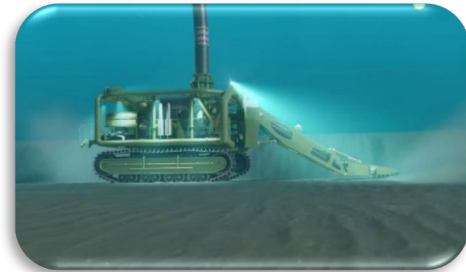
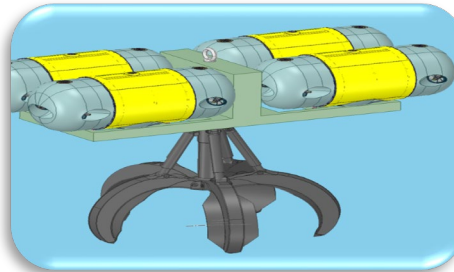
## Core Solutions / Decarbonisation & Energy Transition

- Decommissioning for oil & gas congested field clearance, removal and recovery, 10s to 100Tes
- Decommissioning of oil & gas pipeline bundles for cutting, lifting and tow
- Construction support for infrastructure deployment, both offshore wind and oil & gas
- Lifting and positioning of mooring lines, and dynamic cable handling for floating offshore wind



## Additional Solutions & Product Variations

- “Pick and Place” and “Hunt and Gather” modes
- Boulder clearance and debris removal
- Seabed vehicle assist for payload compensation in different soil conditions
- Submersible autonomous vehicle variable buoyancy
- Moonpool version for gantry lifts e.g. mattress deployment
- Salvage and recovery of lost and derelict equipment i.e. ghost gear



# ROVAR – How it integrates Decommissioning into the Circular Economy

## REDUCE & ELIMINATE

- Reduces reliance on larger vessels for operations
- Expands capability of simpler vessels to replace large vessels
- Reduces marine and subsea spread costs and consumables
- Reduces emissions of vessel and crane operations

## RECYCLE & REUSE

- Enables parallel operations marine, subsea and seabed
- Allows project developers to access a wider vessel market
- Simplifies recovery of infrastructure for reuse and repurpose
- Enables mobilisation for multiple in-parallel operations

## REMEDIATE & REGENERATE

- Reduces emissions and noise with use of smaller spreads and vessel
- Reduces eco-impact with “pick and place” and “hunt and gather”
- Minimises seabed damage with controllable subsea handling
- Reduces marine life impact with low impact extended operations in adverse weather



# Key Points & Asks

- ROVAR technology fully scalable to multiple oil & gas and offshore wind uses
- Technology proven to TRL6+, preparing for TRL7, market ready end 25 start 26
- Market driven Products – 20Te multi-purpose; Buoyancy Beam for pipelines, mooring lines and cabling; buoyant Wet Basket for self-lift
- ROVAR products demonstrate reduce, recycle, remediation principles
- Multiple uses promotes parallel and circular seabed and subsea operations
- Partners and Supply Chain Collaboration required:
  - A. Participants for final development & field trials of new UK technology
  - B. Supply Chain / JV Partners (vessels and marine contracting) for gotomarket
  - C. Investing Partners for commercial deployment and scaleup



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# ROVAR Team - Smarter Subsea Handling

## EXECUTIVE



**Phil Pritchard**  
Founder, CTO, Director



**Richard Stevens**  
CEO, Director



**Peter Watt**  
Head of Engineering



**Fraser Pritchard**  
Interim COO & Advisory Board



**Engineering team leaders –  
cryogenics and control systems**

## ADVISORY BOARD



**Prof. Ajit Sheno**  
Naval Architecture and Lightweight Structures



**Eleonora Gatti**  
Sustainability and ESG



**Kimberley Denjean**  
Commercial Deployment



**Roger Esson**  
Decommissioning and Net Zero



**Raffle Chan**  
Technology transfer, Asia



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