

2024

Asso.subsea

Company presentation



Bridging the distance - **Connecting the World**

Agenda

1. Introduction

2. Vessels And Trenchers

Company Owned Vessels

Trenchers

3. Main Projects Pipeline

4. ASSO Portfolio

1 Introduction

We are **Asso.subsea**

- Formerly known as Assodivers
- **Greek-owned and based company**
- Founded in **1976**
- Providing services to clients for more than **47 years**
- Specialized in **worldwide submarine utilities** installation and repair activities
- **In-house design** of vessels and tools
- **Creative, innovative, reliable and cost-effective solutions** fitted to customer needs

45+

Years
of Excellence



25+
units



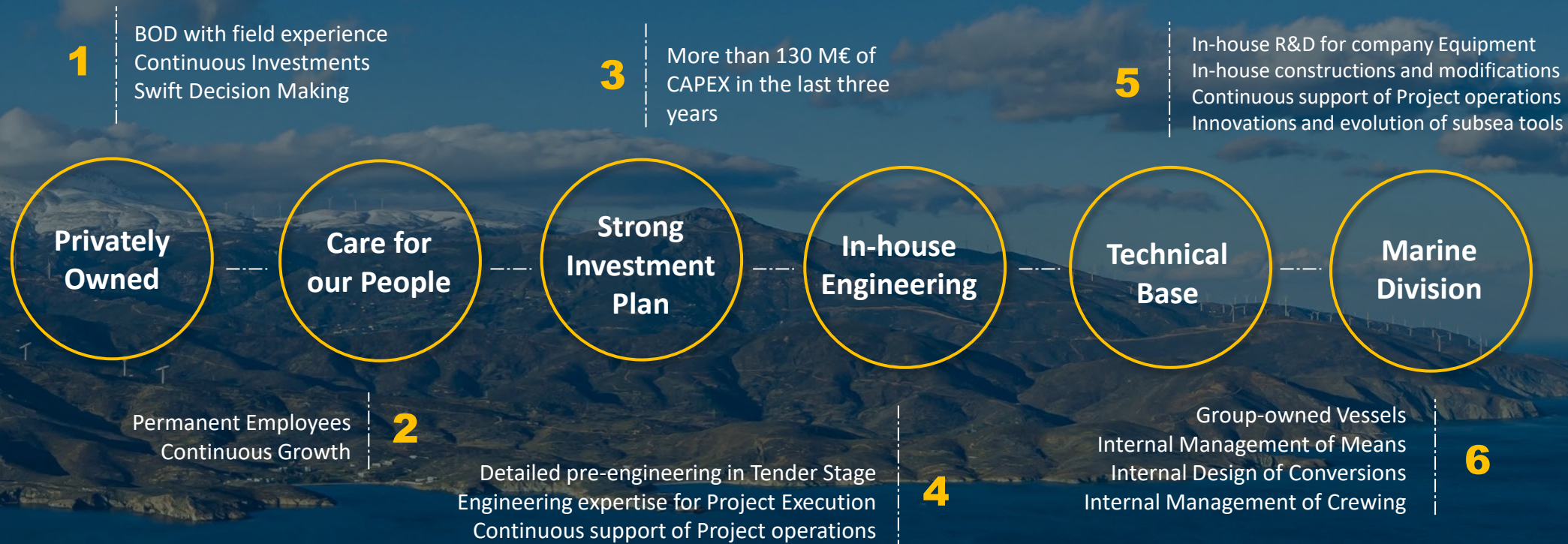
860
professionals



9
vessels

1 Introduction

ASSO Added Values



1 Introduction

ASSO QHSE Management System



Excellent project performance as measured by extensive set of KPIs



In 2022 LTIRF reduced to 0 and TRIR to 6, while man-hours increased to 1,230,000



Safety First

No fatality or serious injury in Group's history



Favorable results noted in Client QHSE Audits, Suitability Surveys, HSE inspections, CMID inspections, and PSC inspections



No significant environmental incident in Group's history



No maritime accident in Group's history

Integrated management system covering all ASSO activities, i.e. shore-based (offices, technical base), maritime, project-related

Certified to **ISO 9001:2015**, **ISO 14001:2015**, **ISO 45001:2018** by Bureau Veritas Certification

Ship management companies also certified to **ISM Code** by Bureau Veritas

Marine means also certified to **ISM Code**, **ISPS Code**, **MLC, 2006** by Bureau Veritas

Integrated management system overseen by single Group-wide function, namely the **R&QHSE Team**, which consists of QHSE Engineers, QHSE Advisors and DPA

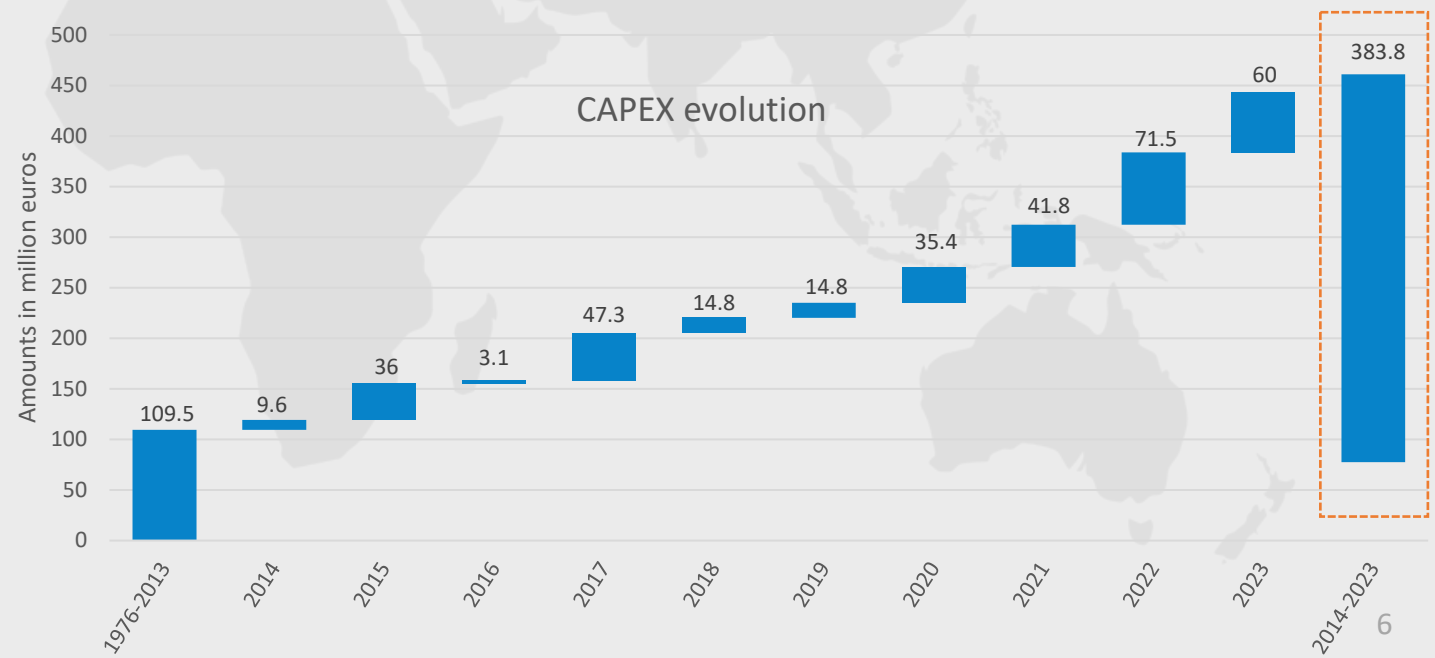


1 Introduction



Asso has been continuously investing in the company throughout the last 45 years, focusing on:

- ✓ Establishing a modern fleet that is constantly updated and renewed following the latest market trends
- ✓ Designing and building state of the art in house underwater machinery for all types of soils with the highest capabilities in the industry



Board of Directors

Executive Team



CEO



COO

Chief Operating Officer



CBO

Chief Business Officer



CFO

Chief Financial Officer

Cable Installation



Executive Director Cable Installation



Business Solutions



Assets



Engineering
Studies



Operations



Project Management

Central Functions



IT

Information
Technology



RQHSE



People
Operations
& Culture



Supply
&
Logistics



Financial

Business
Development

Commercial

Marine

Robotics

Inter-
connectors

OWFs

Specialty

1 Introduction

ASSO worldwide references

Our worldwide projects

Asso.Subsea has participated in a string of operations worldwide, working for some of the leading players in the field.

25 FOC-flexibles-others, 77 repairs

207

Main Projects

80

Inter-connectors

25

OWF
Offshore windfarms

Arabian Gulf

GCCIA
Kahramaa

Indonesia

Java-Bali

USA & Australia

Hudson River
Replacement
BassLink

Belgium & Holland

Seamade OWF Project
HKZ Interlink Repair

France

Fecamp
St Brieuc
IFA 2 Interconnector

UK & Ireland

Viking Link Interconnector
IFA2 HVDC & HVAC
Interconnector
Rampion OWF
Western HVDC Link
Shannon River
Rathlin
Isle of Man

Greece

Lavrio – Karystia
Kafireas Interconnection
St. George OWF
Evia – Andros – Tinos
Cyclades Phase A, B, C, D
Attica – Evia
Attica – Crete
Mantoudi- Skiathos

Turkey

Çanakkale II
Çanakkale I

Germany & Denmark

Viking Link Interconnector
COBRA Interconnector
Kaskasi OWF Exports
Deutsche Bucht – GT1 - Albatros
Kriegers Flak CGS
CWA I
DolWin 3
BorWin 3
Veja Mate
HelWin 2
SylWin 1
BorWin 2 – HelWin 1

Italy & Spain

Malta-Sicily Repair
Messina
SAPEI
Mallorca – Ibiza
COMETA
Italy-Montenegro (MONITA)
Capri-Torre Annunziata
Italy-Greece (GRITA)
ESMA (Remo)

1 Introduction

Asso Worldwide

Asso Experience

Cable Installation  **1.427 km**

Cable Protection  **3.846 km**

Jetting **2.150 km**

Mechanical Trenching **1.130 km**

Simultaneous Lay
& Burial **510 km**

1 Introduction

Asso in Europe



Asso Experience

● Interconnectors

● Exports

↑↑ IAC

Agenda

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2. Vessels & Trenchers

Company Owned Vessels

Trenchers

3. Main Projects Pipeline

4. ASSO Portfolio

2 Vessels & Trenchers

Our Fleet

Cable Laying Vessels

Company owned CLV's diversified characteristics and ASSO flexibility provide complete 'laying' solutions for:

- Deep water operations
- Shallow water operations
- Challenging shore landings
- Platform pull-ins
- Simultaneous lay and burial



CLV Ariadne

Key Features:

DP-3 Specialized Cable Laying Vessel
Extensive track record on diverse subsea construction projects under harsh environmental conditions (also as Viking Poseidon).
High Sea State capability.
Accommodation: 106 Persons
Built 2009, Norway - under Greek Flag and ABS Class

Currently Equipped with:

- **2x Turntables of 7,000T combined total**
(5,000T & 4,000T)
- **1x Work-Class ROV**
- **1x 250T Offshore Crane**
- **Pick-up Arm and Cable Pathway**
- **PLGR Equipment**



CLV Atalanti

Key Features:

DP-2 Specialized Cable Laying Vessel
Extensive track record on diverse subsea cable installation projects.
Shallow water operation with beaching capability.
Bundle and SLB cable laying capabilities
Accommodation: 77 Persons
Hull built 2008, China / Outfitted 2010, Greece - under Greek Flag and ABS Class

Equipped with:

- **1x Turntable of 4500T**
- **1x Turntable of 2500T**
- **1x Work-Class ROV**
- **1x 35T Offshore Crane**
- **3x Pick-up Arms and Cable Pathways for maximum flexibility**
- **2x Spud cans for position keeping**
- **4 point mooring system**

2 Vessels & Trenchers

Our Fleet Trenching Support Vessels

Company owned TSVs optimized for supporting the Group's specialized subsea spreads:

- Hard-soil trenching vehicles
- Jetting vehicles
- Multi-functional pre-trenching ploughs
- Boulder removal grabs
- Mattress installation frames etc.
- State-of-the-art Work-Class ROV systems



TSV Argo

Key Features:

DP-2 Specialized Trenching Support Vessel. Extensive track record on diverse subsea cable installation projects.
Multi-role capability
80T Bollard pull capability
SPS Certified
Accommodation: 112 Persons

Built 2011, Spain – under Greek Flag and ABS Class

Equipped with:

- 2x Trenching support spreads
- 1x 150T Offshore Crane
- 2x Work Class ROVs
- 1x Moonpool



TSV Aethra

Key Features:

DP-2 Specialized Trenching Support Vessel. Extensive track record on diverse subsea cable installation projects.
Multi-role capability
150T Bollard pull capability
SPS Certified
Accommodation: 87 Persons

Built 1999, Norway – under Greek Flag and ABS Class

Equipped with:

- 2x Trenching support spreads
- 1x 100T A-frame
- 1x 150T Offshore Crane
- 1x Work Class ROV
- 1x Moonpool with Boulder Grab System



TSV Athena

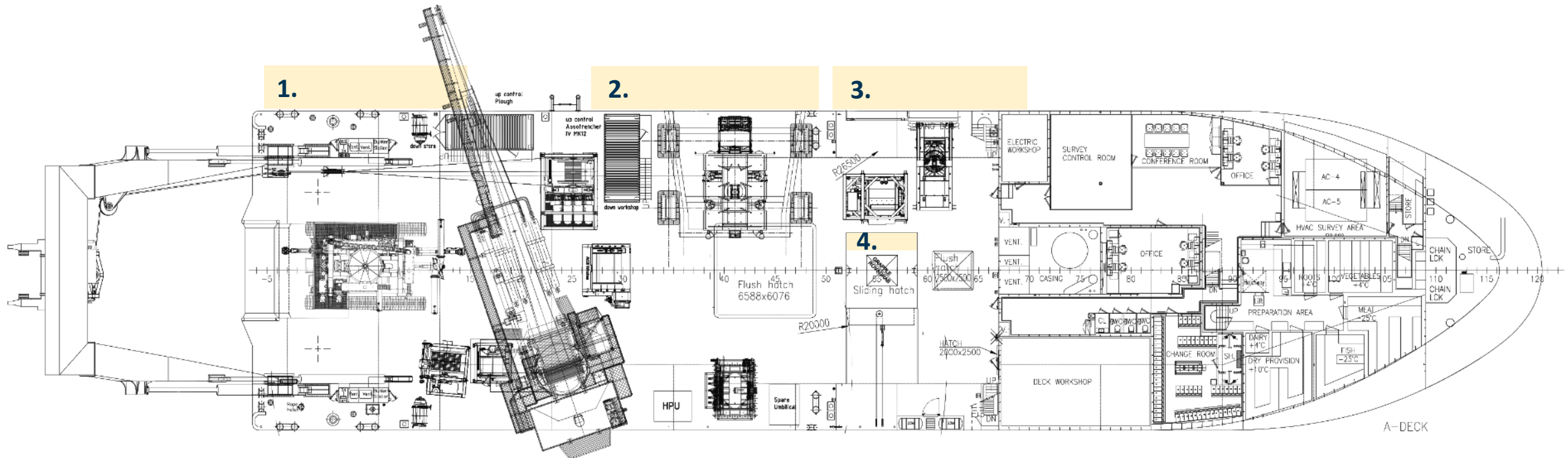
Key Features:

DP-3 Specialized Trenching Support Vessel. Extensive track record on diverse subsea offshore projects.
Multi-role capability
110T Bollard pull capability
SPS Certified
Double-deck for simultaneous operations
Accommodation: 100 Persons

Built 2013, Singapore– under Greek Flag
Equipped with:

- 2x Trenching support spreads (from 2022)
- 275T Offshore Crane
- 1x 170T A-Frame
- SAT & Surface Diving Systems
- Anchor and chain handling systems
- 1,500T Cable Carousel (optional)

2 Vessels & Trenchers



1.

AssoTrencher IV series Spread

- AssoTrencher IV series Vehicle
- Control Room / Workshop
- Umbilical Winch
- AHC Lifting Winch
- Dedicated 100T A-Frame

2.

AssoJet III series Spread

- AssoJet III series Vehicle
- Control Room / Workshop
- Umbilical Winch
- Dedicated 35T A-Frame

3.

Atom II ROV Spread

- Atom II ROV Vehicle
- Control Room / Workshop (Vessel Intergrated)
- Umbilical Winch
- Dedicated 12T A-Frame

4.

AssoGrapple I Spread

- AssoGrapple I Vehicle
- Control Room / Workshop
- AHC Umbilical Winch
- Vertical Lifting System (Moonpool)

2 Vessels & Trenchers

Our Fleet

General Support Vessels

The primary role of the Alcyone is to support all shore-end trenching operations related to cable laying (either pre-excavation or post lay burial), and any near-shore or coastal subsea scope which may be necessary.

The primary role of the Astrea is to support in the context of route preparation such as PLGR surveys. She is also engaged as a TSV with trencher tools.



MSV Alcyone

Shore-end Trenching Support Vessel

Key Features:

7-point anchor spread
2x Anchoring Spud-poles
2~2.5m draft capable to reach shallow shore-ends
MultiRole capability
Accommodation: 12 Persons

Built 2006, Italy – under Greek Flag and ABS Class

Equipped with:

- 1x Clam shell excavation Gear
- 1x Hammer
- 1x inspection class ROV
- 1x 120T Crane



MSV Astrea

Multi-purpose Support Vessel

Key Features:

DP-2 Specialized Trenching Support Vessel. Extensive track record on diverse subsea cable installation projects.
MultiRole capability
Shallow water operation capability
SPS Certified
Accommodation: 55 Persons

Built 1987, Norway / Conv. 2008, Greece – under Greek Flag and ABS Class

Equipped with:

- 1x Trenching support spread
- 1x 55T A-frame
- 1x 20T Offshore Crane
- 1x Work Class ROV

2 Vessels & Trenchers

Deep Water Trenchers

Soft Soil Trencher

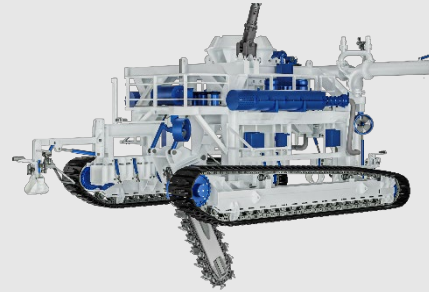


AssoJet III Mk1
Jetting Vehicle (1.3 MW)



AssoJet III Mk2
Jetting Vehicle (1.56 MW)

Hard Soil Trencher



AssoTrencher IV Mk9
Mechanical Trencher – Chain
or Wheel modules



AssoTrencher IV Mk12
Mechanical Trencher – Chain
or Wheel modules

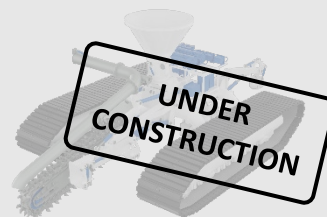


AssoTrencher IV Mk13
Mechanical Trencher – Chain or
Wheel modules and backfilling mode

Shallow Water Trencher

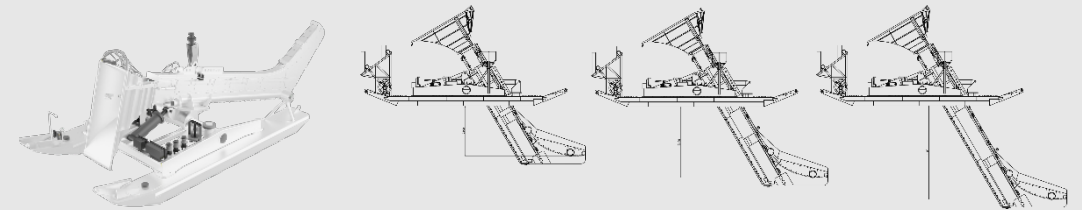


Assotrencher V Mk3
Shallow water trencher – configurable with jetting swords,
cutting chain or wheel



Assotrencher V Mk4
Shallow water trencher

Simultaneous Lay & Burial Plough



Hydroplow(s)
Jet Sleds – configurable for surface fed or onboard pumps – variable depth stingers

2 Vessels & Trenchers



Subsea Mechanical Trenchers **AssoTrencher IV series**

IN-HOUSE
DESIGN

- ✓ 1.56 MW of installed power
- ✓ In house trenching tool for max efficiency
- ✓ In house design hydraulic system
- ✓ In house design of water pumps & distribution system
- ✓ In house design of cameras , lights & telemetry architecture
- ✓ Low compression on seabed surface
- ✓ Assured cable depth in various soil conditions with the use of eductor(s)
- ✓ Dead-sub automatic release of product
- ✓ Post-Lay burial with minimum slack requirement of laid product
- ✓ Option for cutting chain and cutting wheel



2 Vessels & Trenchers

Subsea Mechanical Trenchers AssoTrencher IV - Working Principles

**IN-HOUSE
DESIGN**

Very low cable pathway profile approx.
50-70cm ensuring minimum slack
requirements with very long track record


Up to
50 MPA



Rear eductor

Mid-eductor
(Mk12 & Mk13 only)

Interchangeable cutting wheel
(1.25m trench depth capability)

Cutting chain also available for max.
versatility (1.4m & 2.3m trench depth
capability)

2 Vessels & Trenchers Mouldboards Design

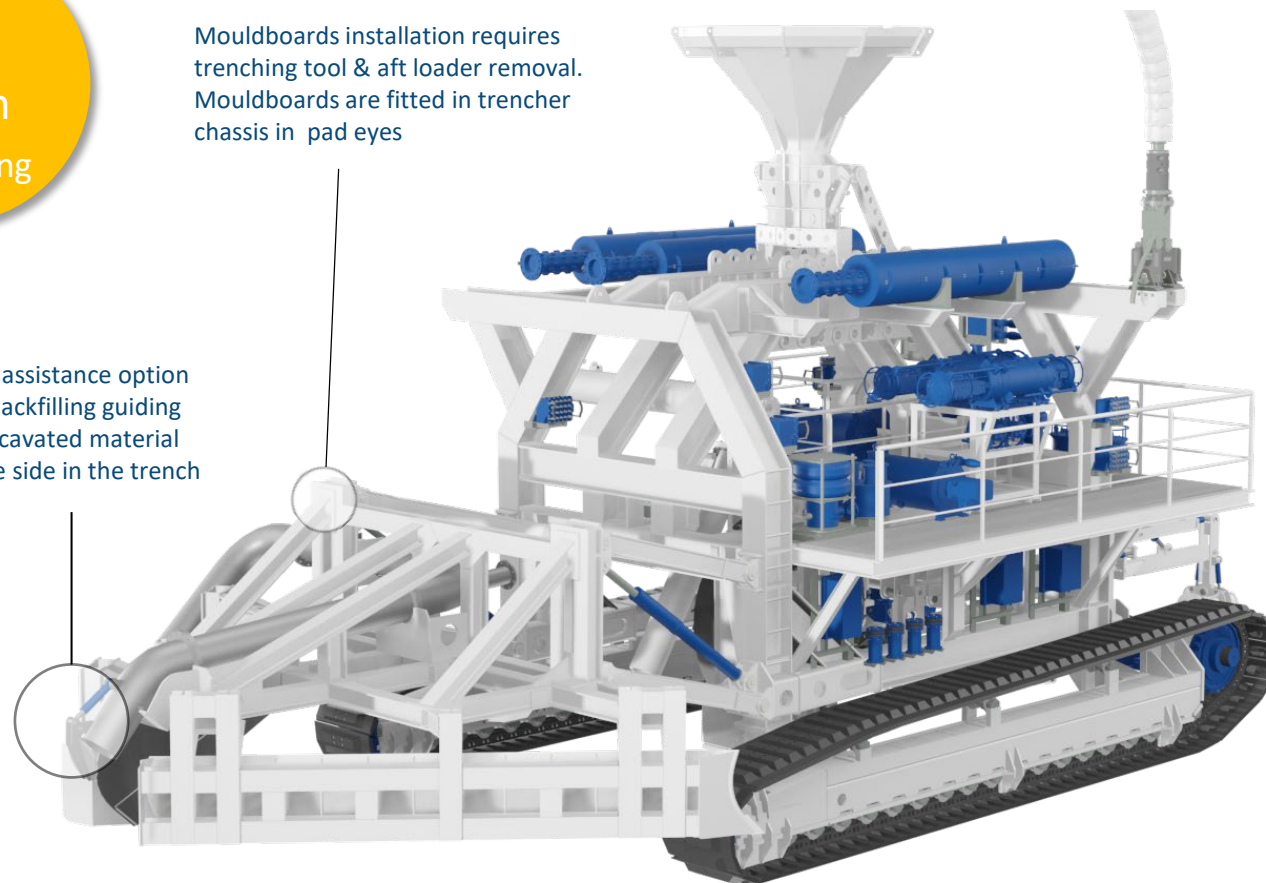
Subsea Mechanical Trenchers AssoTrencher IV Mk13-Backfilling tool


106km
Backfilling

Mouldboards installation requires trenching tool & aft loader removal. Mouldboards are fitted in trencher chassis in pad eyes

Eductor assistance option during backfilling guiding extra excavated material from the side in the trench

**IN-HOUSE
DESIGN**



2 Vessels & Trenchers



Subsea Jetting Trencher AssoJet III series

- ✓ 1.3MW (Mk1) and 1.56MW (Mk2) of installed jetting power
- ✓ 3.0m jetting swords cable lowering depth capability
- ✓ 1.0m (approx.) jet backfilling swords for slope collapsing & trench backfilling / Swords length can increase with extensions, if needed
- ✓ Single eductor option for cleaning/intervention operations
- ✓ In house design of cameras , lights & telemetry architecture
- ✓ In house design hydraulic system
- ✓ In house design of electrical power distribution
- ✓ In house design of control system
- ✓ Strategically removable buoyancy blocks for fast easy access
- ✓ Enhanced maintenance/repair capability – on-board workshops
- ✓ Option for tracked mode

IN-HOUSE
DESIGN



2 Vessels & Trenchers



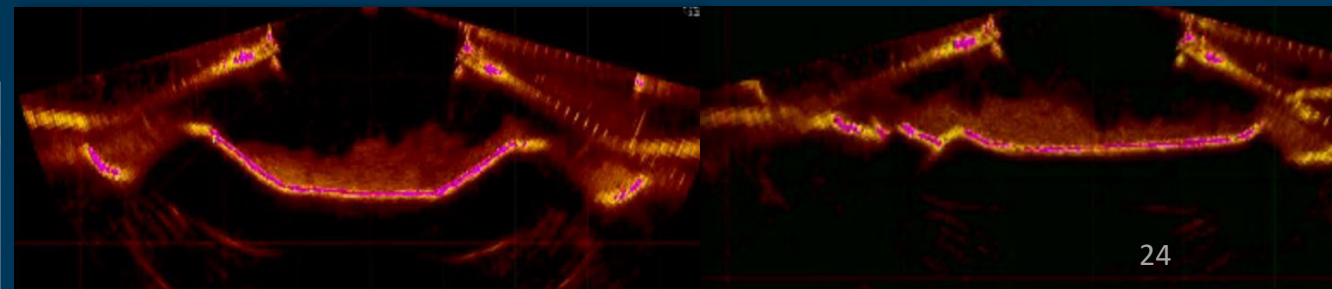
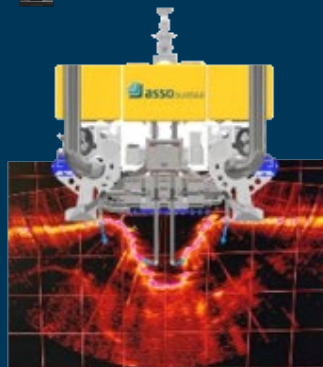
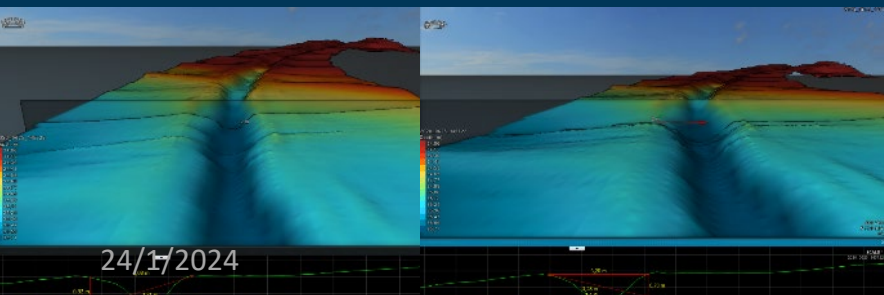
Jetting Operations

AssoJet III jetting & backfilling

Up to
3.3m DOL



1. Jetting swords pivot configuration ensures adequate trench cleaning at all the range of jetting swords depth capability.
2. Backfilling operation is based on the application of shear forces on the trench slopes by means of jetting. Water supply at both swords leads to trench slopes collapsing providing additional cover on top of the cable.
3. Backfilling swords are capable to be lowered 1.0m (approx.) into the existent trench.
4. External backfilling swords are adjustable according to trench shape/status.
5. All backfilling swords are adjustable according to trench shape/status.



2 Vessels & Trenchers

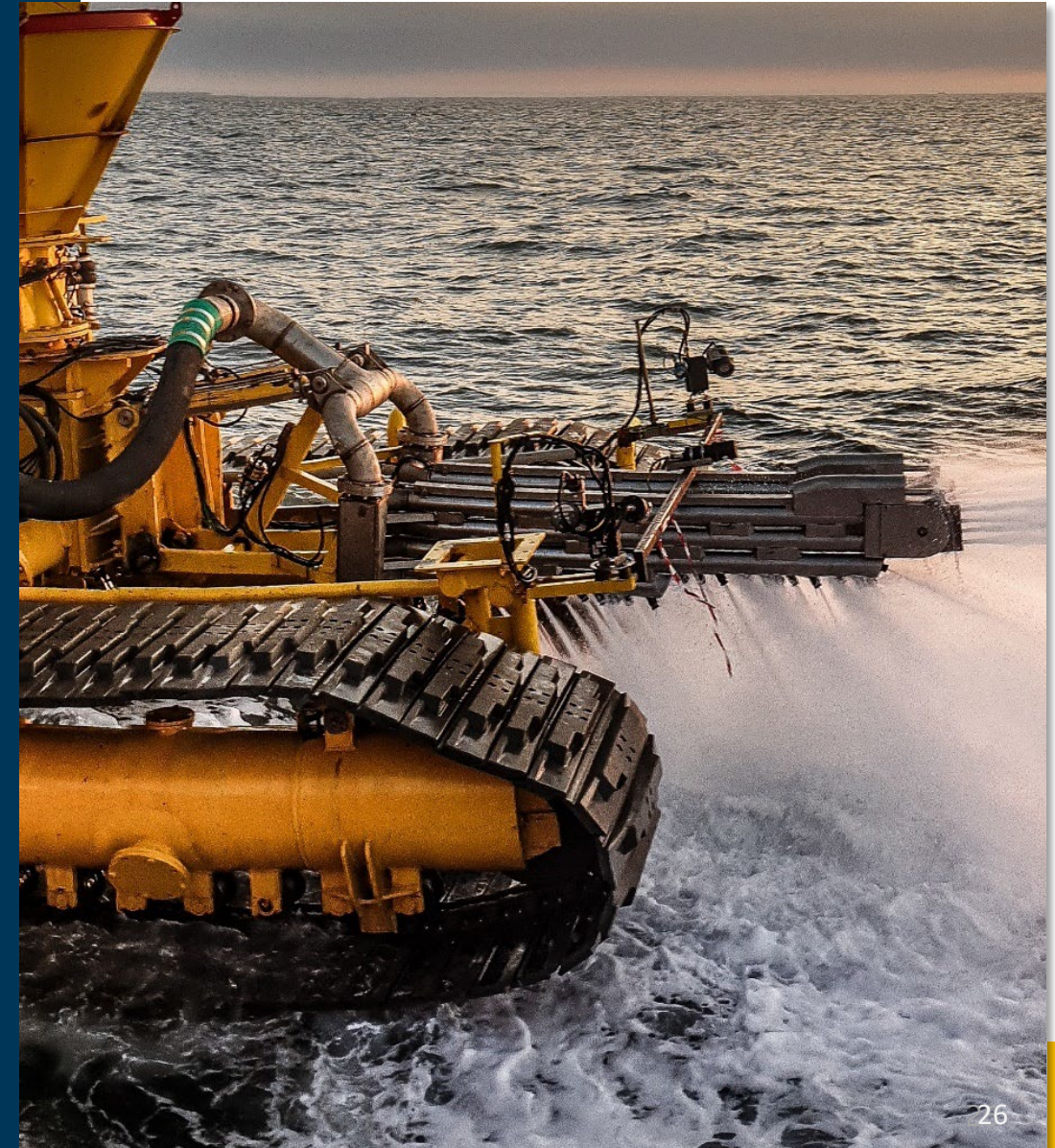


Versatile Multi-Mode Trencher AssoTrencher V series

IN-HOUSE
DESIGN

Key Features:

- ✓ 2.3m cutting chain trenching depth capability
- ✓ 1.3m cutting wheel trenching depth capability
- ✓ 2.3m jetting swords trenching depth capability
- ✓ Combination of jetting and trenching techniques to ensure optimum result
- ✓ Wide range of tracks surface for traction & distribution of vehicle weight over wide range of seabed
- ✓ Minimum slack requirement due to bottom loading technique ensuring minimum product lift
- ✓ Shallow water or deep water mode available
- ✓ Onboard pumps or surface fed option by shallow drafted vessel/barge supported or from TSV
- ✓ Wide range of ancillary equipment available
- ✓ Wide soil range capability
- ✓ Diverless loading techniques
- ✓ Zero-visibility operation even in shallow water conditions



2 Vessels and Trenchers



Versatile Multi-Mode Trencher

AsoTrencher V Mk3

Key Features:

- ✓ Bottom loading system with monitoring to allow for safe handling
- ✓ Zero-visibility operation even in shallow water conditions
- ✓ In house design hydraulic system
- ✓ In house design of cameras , lights & telemetry architecture
- ✓ Low compression on seabed surface
- ✓ Assured cable depth in various soil conditions with the use of eductor
- ✓ Dead-sub automatic release of product
- ✓ Post-Lay burial with minimum slack requirement of laid product
- ✓ Combination of trenching & jetting techniques

Jet/chain/
cutting
wheel/
backfilling

Support Vessel (Shallow Water Mode):

Power units, control cabin, workshop and spares cabin are installed on a shallow draught support vessel. The support vessel follows the vehicle during continuous trenching operations in DP mode, towed by the vehicle itself or positioned using spuds depending on the vessel thus eliminating the need for long umbilical and Tether Management System (TMS)

Independent Operation (Extremely Shallow Water Mode):

Power units, control cabin, hydraulics and water pump ancillary equipment fitted onboard a compact sized thruster maneuvered pontoon able to follow along the vehicle in order to perform trenching operations at even the most remote of areas.

AssoTrencher V Mk3

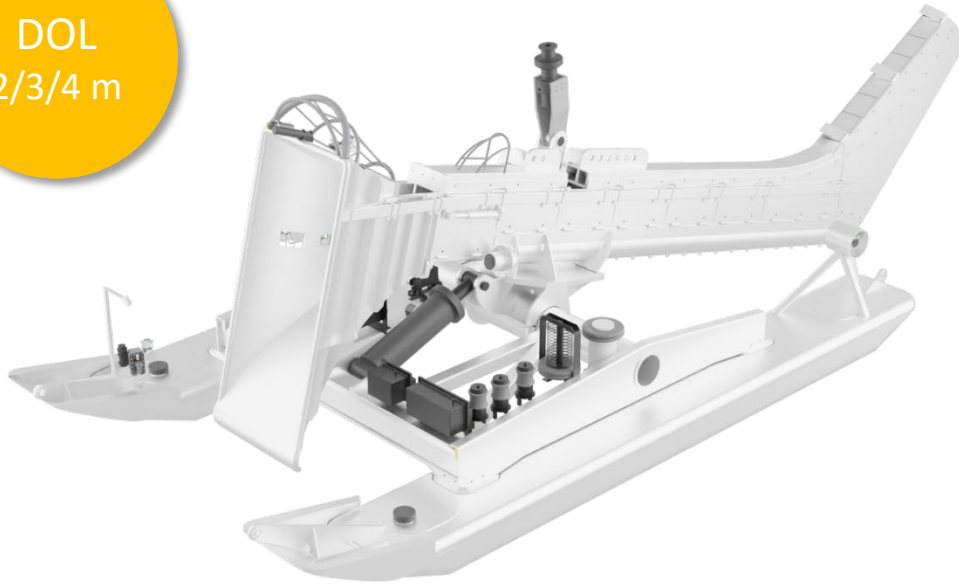
Jetting & Backfilling Operations



- ✓ Jetting operation will be performed following surface fed set-up onboard support vessel and 2.30m capability jetting swords.
- ✓ Backfilling operation is based on the application of shear forces on the trench slopes by means of jetting.
- ✓ Backfilling swords are capable to be lowered up to 2.0m into the existent trench.
- ✓ Water supply at both swords leads to trench slopes collapsing providing additional cover on top of the cable.
- ✓ The tool penetration depth is determined by the DOT achieved during the PLB jetting pass, the DOL requirement, thickness of non-cohesive sediment, backfilled material before implementing the jet backfilling pass

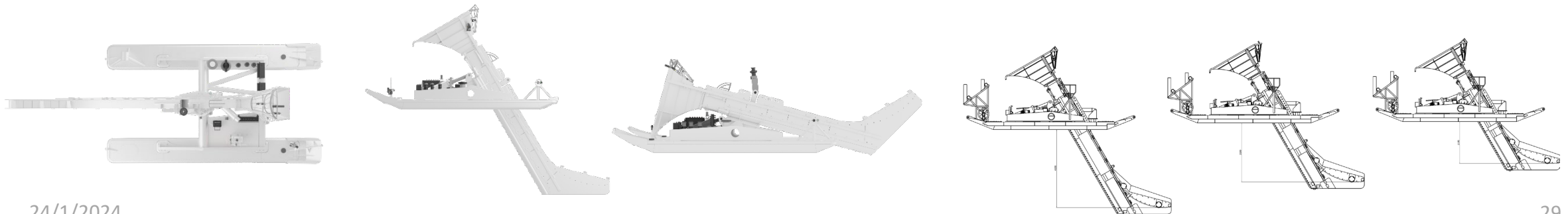
2 Vessels and Trenchers

DOL
2/3/4 m



HydroFlow Soft Soil Jetting Sled

- ✓ Asso.subsea Hydroflow is a lightweight jetting sled that is intended for use in tandem with a CLV (Cable Lay Vessel) for SLB (Simultaneous Laying and Burial).
- ✓ The HydroFlow is operated using the ASSO's proven custom-made and dedicated LARS, which ensures safe vehicle deployment and recovery even in challenging weather conditions.
- ✓ Electronic Equipment HydroFlow design maintains ASSO's tested innovative diver-less cable loading capabilities, constantly performed in various ASSO projects involving the HydroFlow since 2012





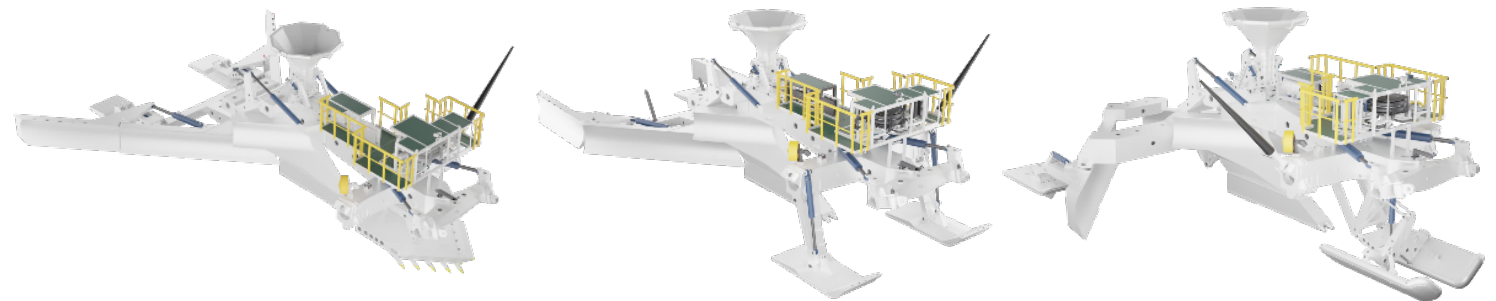
Boulder Clearance & Pre-trenching services

Multi-Functional Plough

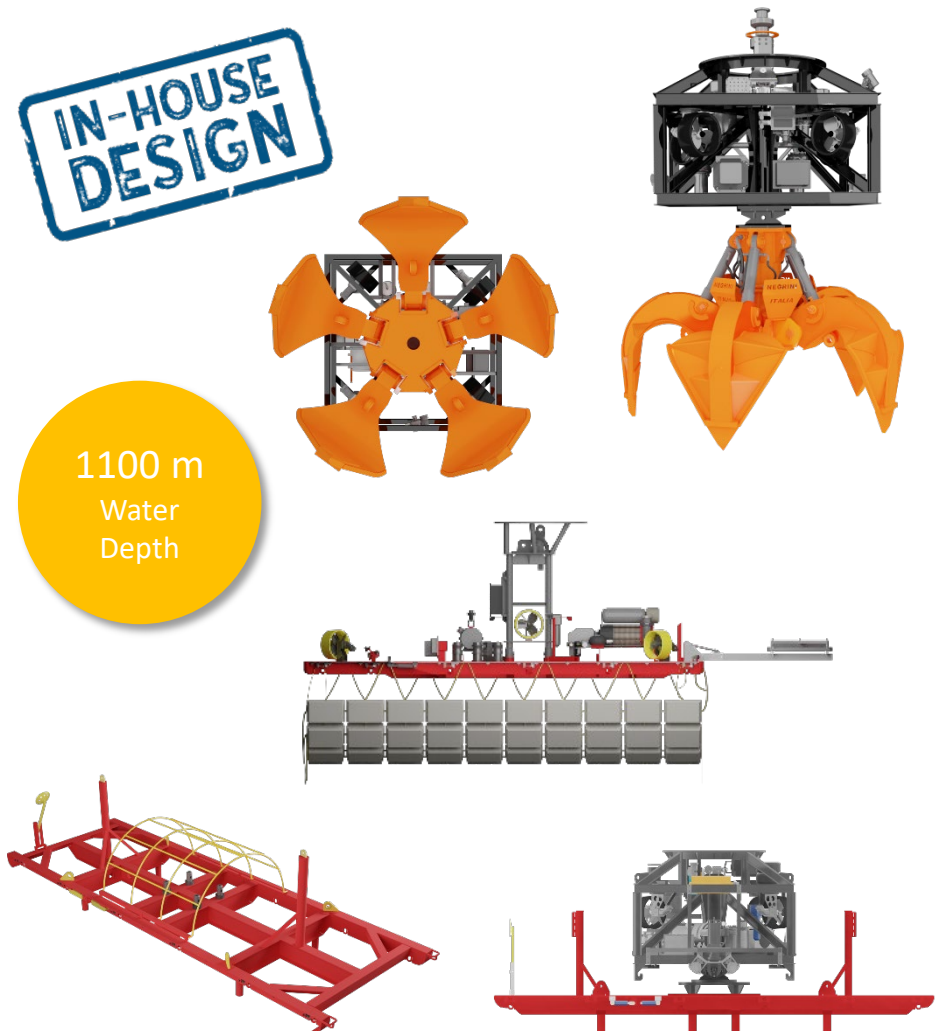
Key Features:

- ✓ 3x modes of operation:
 - ✓ Boulder Clearance Mode
 - ✓ Pre-Trenching Mode
 - ✓ Backfilling Mode
 - ✓ Fully instrumented & steerable
 - ✓ Continuous Bollard Pull 150Te
- ✓ Boulders disposal up to ~2.0m
 - ✓ 0.7m penetration during BC for buried boulders
 - ✓ Clearance corridor of 12m
 - ✓ More than 600kPa soil strength capability
 - ✓ Trench depth up to 1.7m
 - ✓ Y-shaped Share and Trench Type
 - ✓ Trench base width 0.5m

Up to
1.7m
DOL



2 Vessels & Trenchers



Additional services

Boulder removal and Mattresses installation

AssoGrapple series

Key Features:

- ✓ In-house system design
- ✓ 3.1m x 2.1m x 6.5m, along with a powerful 200HP HPU
- ✓ Fast and accurate removal of boulders
- ✓ Highly maneuverable with four thrusters

- ✓ Min/Max boulder dimension: from 0.3m up to 3.0m in one direction (Length, Width, Height)
- ✓ Max Capacity heaped: ~2.3 m³
- ✓ Max weight of the boulder: 15Te
- ✓ Max Operational Depth: 3,000m

AssoMat Series

Key Features:

- ✓ This in-house system designed for fast and accurate installation of mattresses and similar products designed for provision of protection on cables, pipelines and crossings

- ✓ Max product weight: 12000kg
- ✓ Max Operational Depth: 3,000m
- ✓ Up to 8 low light cameras 12 LED lights
- ✓ Up to 4 pan/tilt
- ✓ Up to 4 sonar (both imaging & profiling)
1 x altimeter ,1 x gyro compass

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3. Main Projects Pipeline

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3 Main Projects Pipeline

- Interconnectors
- Exports
- ⚡ IAC
- ⚡ FOWF



Agenda

1. Introduction

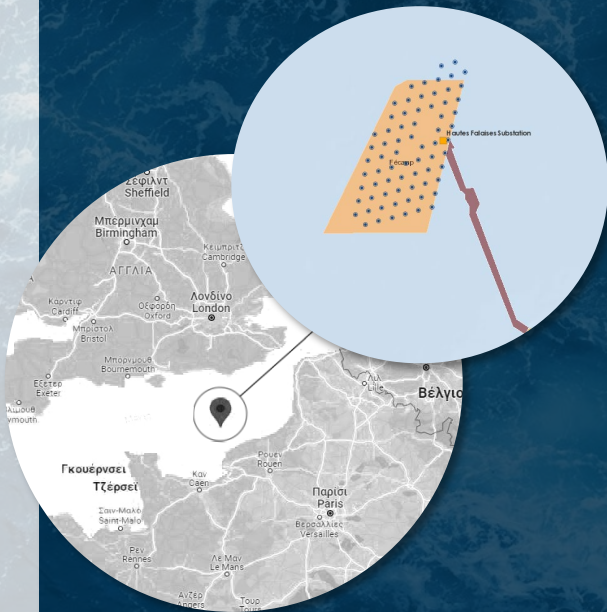
2. Vessels & Trenchers

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Fecamp OWF

2022 - 2023

Cable Installation & Protection

France



Scope of Work

- Cable loading of 118.884 m submarine MV in a single campaign
- Route preparation activities (Boulder Clearance & PLGR)
- Cable pull-in on WTG & OSS platform (initial & final)
- Pre-trenching activities of 900m
- Free lay Installation of 115.711 m
- PLIB @1,5m DOB of 102.270m
- Backfilling of 104.740 m
- As-buried survey (MBES & TSS350)

Client / End Owner

Prysmian Powerlink Srl
Eolien Offshore des Hautes
Falaises (EOHF)

Cable/ Asset

57 IAC MV cables
14 Collector MV cables

Vessels

- CLV Ariadne
- TSV Argo
- TSV Athena
- MSV Astrea

Burial Tools

- AssoTrencher IV Mk9
- AssoTrencher IV Mk13
- Assograpple

Fecamp OWF

2022 - 2023

Cable Installation & Protection

France



Thank you



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