

Unique Value Propositions

Norwegian delegation to Angola | October 2022



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Value proposition

Web Page: <https://www.onesubsea.slb.com/>

Conventional subsea field developments have been relying on electrohydraulic architectures. However, over the last two decades, major improvements have been made in the development, qualification and track record of all-electric solutions (AES). AES simplifies and improves subsea developments with a significant reduction in costs, delivery times and installation. Furthermore, the AES enhances the energy efficiency and emission footprint and facilitates the integration of renewable sources and transition technologies.

Replacing energy-consuming gas lift systems with electric subsea boosting systems can offer an 80% reduction in energy consumption and GHG emissions. Over the life of the field, this can amount to more than 100 000 tons of GHG emissions.

Certified as a Lower Emissions Oil and Gas Solution (LEOG).

Link to further Value Propositions – Norwep web page: <https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=onesubsea>



Value proposition

Web page: <https://www.akersolutions.com/>

Through regional service bases and central support, we deliver services to optimize our client's assets, enhance production rates and increase recovery. Through Aker Solutions regional services bases and central support, we can deliver global integrated subsea Lifecycle Services 24/7 including:

- Installation and commissioning of systems
 - Intervention support
 - Maintenance, repair and spares supply
 - Refurbishment and recertification
 - Customer property management including storage and preservation
 - Operational and technical support
 - Re-supply of brownfield equipment
 - Manpower support
 - Integrated operations
 - Condition monitoring
- **Link to further Value Propositions – Norwep web page:** <https://www.norwep.com/technologies-solutions/uvp/life-of-field-services>

DEEPOCEAN

Value proposition

Web page : <https://www.deeppoceangroup.com/>

“DeepOcean has set a target to achieve a 45 percent reduction in CO2 emissions before 2030. By 2040 we aim to be carbon neutral”.

DeepOcean is a technology-driven, independent solution provider in the ocean space with major presence in West Africa, US & Europe.

We offer companies within oil and gas, offshore renewables, deep sea minerals, and other non-energy niches a full range of services – from survey, engineering, project management, and installation to maintenance and recycling.

DeepOcean has a GO GREEN attitude, continuously looking to make our customers’ operations more sustainable, through reducing both carbon footprint and costs with smart technologies and optimized operations.

Green Technology highlights in development by DeepOcean

- USV (Unmanned Surface Vehicle) -Remote controlled Survey & Inspection vessel. Up to 90% reduced Co2 emission
- Vessel fleet gradual upgraded with battery packs. Reduced fuel consumption by +/-15%
- ROC (Remote control center) for Remote WROV operations – Currently in operations for major clients in Europe
- Vessel fleet digital real time reporting of emissions & fuel consumption to optimize operations

Link to further Value Propositions – Norwep web page: <https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=deeppocean>

Archer

Value proposition

Web page: <https://www.archerwell.com/>

P&A and Slot Recovery operations are complex, costly and time consuming due to the high number of variables during planning and execution. Archer’s toolbox of several unique & novel technologies delivers the most efficient P&A downhole operations and can be deployed rig-less on HWO units or LWI vessels, reducing overall cost and lower CO2 emissions.

Certified as a Lower Emissions Oil and Gas Solution (LEOG).

Use company contact for detailed value proposition.

Link to further Value Propositions – Norwep web page: <https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=archer>



Value proposition

Web page: <https://www.multisolutions.no>

With our network WW and our local presence as now in Angola, we are striving to be the best option regarding environmentally solutions for the oil & gas industry. This cover some of the type of chemical use for the downhole operations and stimulation as well as for the top side cleaning solutions and systems.

With the chemical and services, which are innovative and proven onshore and offshore technologies that solve the toughest challenges faced by the energy sector. This while we increase the production and greatly minimizing liabilities. The safest for personal handling and biodegradable and are allowed to be released into the sea, we think that we as a company are making the deferens.

We support the UN's sustainability goals and the ESG standards in all our operations. We have a global 24/7 service for our customers.

Down hole / matrix stimulations

- Wellbore productivity
- Injection Wells
- Spearhead and acid frac / stimulation applications.
- Pipeline, flow lines, separators
- Well clean up

Top side cleaning and descaling

- Heat exchangers
- Boilers
- Surface
- Closed pipe flushing
- Potable water disinfection / cleaning
- Fire extinguish systems
- Vacuum / sanitary systems
- Tank cleaning products and system

Link to further Value Propositions – Norwep web page: <https://www.norwep.com/technologies-solutions/multi-solutions-in-hydro-power>



Value proposition

Web page: <http://www.jotun.com>

Jotun's Offshore Maintenance System fighting the costly effects of corrosion.

The Challenge.....

Offshore maintenance can be unpredictable due to harsh weather and time consuming, since applicators often have to manually apply 5-6 coats to achieve specified 3 coat thickness..... costing so much more than it should.

The Solution.....

Jotun's NORSOK complaint surface tolerant maintenance system for brush and roller.
Extend your maintenance intervals and save huge amounts of time and money on paint maintenance.

This Jotun, NORSOK compliant maintenance system for brush and roller allows a **zinc containing primer to be applied manually on St3 prepared surfaces**

Field exposure shows that zinc containing systems, on average, up to double the time before Ri3 (rusted area of 1%, end of durability of paint system according to ISO 12944) is reached
Our Zinc Rich Barrier Smart Pack primer, which is coat number 1 of 3 exceptional paints has been developed for brush and roller maintenance with NORSOK (ISO 20340) DFT requirement in one coat

The Barrier Smart Pack primer is a Surface Tolerant maintenance primer with newbuilding performance. It has an easy 1:1 mixing ratio..... Making it easy to get right, and hard to get wrong.

We complete this world class, 3-coat system with our Jotamastic Smart Pack HB Surface tolerant maintenance primer, with newbuilding performance and its very 1:1 mixing ratio as the second coat.

We complete the system with our Hardtop One – Our One component brush and roller Polysiloxane topcoat with excellent hiding power in one coat

This is, Maintenance Made Easy.

Link to further Value Propositions – Norwep web page: <https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=jotun>



Value proposition

Web Page: <https://www.bluelogic.no/home>

“Zero spill and environmental care” together with simplicity and reduced overall marine operation cost have been the main drivers in Blue Logic’s philosophy. This philosophy is accomplished by; Risk focus, barrier philosophy and high efficiency to ensure operations without operational downtime, reduced maintenance requirements as well as to avoid damage to third party products and systems. Blue Logic has a wide range of different core mechanical, hydraulic and electrical subsea products. There is also several “spin off” products/systems from core products.

A new product in our portfolio is subsea docking station (SDS) for drones. The docking station includes inductive connectors for charging and communication, allowing subsea drones to operate without a support vessel.

Link to further Value Propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/valve-stab>



Value proposition

Web Page: <https://imenco.no/>

PRESENTATION OF IMENCO AND IMENCO CORROSION TECHNOLOGY

Imenco is a company providing engineering services and engineered products to “the Ocean Industries” - offshore oil and gas, offshore wind, aquaculture (fish farming) and marine/naval applications. Imenco Corrosion Technology is providing asset integrity- and life extension solutions for offshore assets through methods and equipment for retrofit of Cathodic Protection.

We will at this occasion focus on our new technology for lifetime extension of Mooring Chains – where we are setting a new standard through an ROV installable cathodic protection system – the Pacu™.

- Extend the lifespan of existing and new mooring chains
- Reduce risk of damage or failure of mooring systems
- Avoid the cost related to potential pre-emptive chain replacement
- Dramatically reduced carbon footprint in retrofit of cathodic protection vs. replacement both in materials and in operations

Link to further Value Propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=imenco>



Value proposition

Web Page: <https://argeo.no/>

Argeo is a Norwegian company with a mission is to transform the ocean surveying and inspection industry utilizing autonomous underwater and surface vehicles, and unique sensor and imaging technology, to significantly increase efficiency and quality, and reduce the industry CO2 footprint.

Argeo aims to provide services an integrates solution partner from project planning, data acquisition, data processing and interpretation to data integration and analysis from partners.

Argeo is offering the following services:

- Acquisition, processing and delivery of products and services related to the acquisition of geophysical and environmental data in shallow and deep water up to 6,000 meters.
- Acquisition, processing and delivery of products and services related to the inspection and survey of pipelines and other subsea equipment/assets installed including electromagnetic data related to the state of the cathodic protection system.
- Provision Data as a Services (DaaS) for a flexible data access models to the clients in all market segments throughout the entire project lifecycle.
- Our services are provided using AUV (Autonomous Underwater Vehicle) or USV (Unmanned Surface Vehicle) or ROV. Our services can be provided with or without an Argeo provided support vessel.

Argeo is a publicly traded (Norwegian Euronext Growth) stock exchange company with a management team with over 20+ years of experience from the seismic, shipping and energy industries.

Link to further Value Propositions – Norwep web page: N/A



Value proposition

Web page: <https://www.dofsubsea.com/>

DOF Subsea, headquartered in Bergen, Norway, is a global subsea contractor with more than 4000 employees with 300 engineers. Established in 1979, DOF delivers bespoke vessel and subsea services to the oil & gas, renewables and infrastructure markets. The company owns and operates 59 vessels, more than 70 ROV`s (Work Class Remote Controlled Systems / Observation Class Remote Controlled Systems) and has our own custom subsea tooling pool, sensing equipment and specialized, AUV (autonomous underwater vehicles), ROTV (remote operated tow vehicles), MHS (Module Handling Systems) HLS and VLS systems (Horizontal / Vertical Lay Systems).

DOF has a high focus on sustainability, environmental footprint and overall governance. DOF is a leader in the marine transition into environmentally friendly solutions, recognized by independent third-party auditors. DOF participates in a number of research projects for the purpose of developing future solutions for vessel emission reduction, propulsion systems and next generation subsea solutions.

DOF delivers complete projects, including project management, engineering, supply chain, logistics and offshore execution. Our area of expertise includes geotechnical (soil assessments), geophysical (seabed mapping), IMR (Inspection, Maintenance & Repair), Construction & SURF (installation of subsea hardware / equipment, installation of flexibles, risers and umbilical and installation of FPSO`s (Floating Production, Storage and offloading units). Lastly, DOF offers full EPRD (Engineering, preparations, removal and disposal) decommissioning services.

DOF is especially proud of our recognition from Amnesty International as a leading company on human and work rights. These efforts are close to our values (teamwork, integrity, respect and excellence) which we take with us anywhere we work. We believe that all humans should have equal rights for education and career opportunities. As an example of this we have in Brazil trained and developed thru our marine academy 4 female vessel captains currently captaining their dedicated vessel for DOF.

DOF believe we can contribute to the sustainable development of Angola within our area of expertise. Being present in Angola since 2006 is a testimony to that, having our own team employed locally in Luanda, able to deliver projects, supply chain and logistical support. DOF has a marine academy established in Angola, focused on training and developing Angolan offshore personnel, working throughout our vessels and subsea projects. In addition to creating sustainable jobs in country, DOF can contribute by developing local Angolans, training and building experience at international standards. DOF would welcome any discussion with how we can support and help with our competence and solutions.

Link to further Value Propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=dof>



Value proposition

Web Page: <https://rts.as/>

The RTS CUBE/SDM is a self-contained in-house developed monitoring system used for installation of large subsea structures that includes suction cans. It is interfaced on the structure and used during the deployment and installation phase as an “installation aid” to monitor heading, level and deflection of structure during suction process. This system is used to ensure the basis of the critical tie-back development is installed in an efficient, correct and safe way.

System can also be used on single suction anchors.

The system can also be used for long-term monitoring to ensure structure stability and position. In addition to monitoring heading, deflection and differential pressure in suction cans. Live video can also be provided by the system.

(System has been used on more than 250 structure installations around the world. Biggest structure is the Åsgard template that has size of a football pitch)

RTS also delivers several other services and systems:

- RTS has technicians to support clients during mobilisation of survey sensors or other equipment provided by RTS. RTS can also provide support engineers that can assist for the more advanced RTS Cube system both during mobilisation and also offshore
- The RTS IRIS is a 4K HD subsea camera rated to 6000 meter water depth.
- The RTS NEMO Subsea Navigator is a combined INS and DVL solution for water depths up to 4000m. The unit is purpose-built for ROV navigation and features state-of-the-art field proven components from renowned subsea manufacturers iXblue, Nortek and RTS.
- The RTS MUX system is a high-end multiplexer for ROVs and covers the increasing demand for accurate, flexible, and robust subsea data transfer to topside through the ROV umbilical fibre. Offered models and options allow for supplementary functions such as Composite and HD video, fibre assembly adaptors and channel customization.

Link til YouTube animasjon

https://www.youtube.com/watch?v=jV_bFybeavI

Link to further Value Propositions – Norwep web page: <https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=rts>



Value proposition

Web Page: <https://www.ksat.no/>

KSAT offers a world leading oil spill detection service based on Synthetic Aperture Radar (SAR) satellite imagery. SAR is a well-suited sensor for oil spill detection due to its ability to see very thin oil films on the sea surface even in darkness and cloudy weather.

The service provides regular or emergency monitoring for oil slicks on the sea surface. The oil spill detection service can be combined with vessel detection and activity monitoring.

In Norway KSAT monitors all of the O&G assets on the Norwegian continental shelf on a daily basis in a collaborative manner for NOFO (The Norwegian Clean Seas Association for Operating Companies).

KSAT has also been providing monitoring pollution and vessel activities over a very large parts of European waters for the European Maritime Safety Agency since 2006.

KSAT has licenses and equipment to task, downlink and process SAR imagery acquired globally from all the relevant commercial SAR satellites in orbit. In addition, KSAT owns and operates the world's largest commercial ground station at the island of Svalbard (SvalSAT). Hence, global analysed imagery can be accessed and delivered extremely fast.

Link to further Value Propositions – Norwep web page: <https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=ksat>



Value proposition

Web Page: <https://www.norconsult.com/>

Norconsult is Norway's largest and one of the leading multidisciplinary consultancy firms in the Nordic region. Our services are geared towards community planning and design, and we have become a leading player both nationally and internationally.

In more than 90 years in Norway and 60 years internationally, Norconsult has helped shaping the sustainable power development and energy supply.

Link to further Value Propositions – Norwep web page: <https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=norconsult>



Value proposition

Web Page: <https://www.inflowcontrol.no/>

The AICV® has the unique ability to completely choke unwanted water and gas production without any well intervention. AICV® technology reduces unwanted gas and water breakthrough enabling mature fields to be more profitable by supporting oil production. By reducing the unwanted water/gas production the oil production and recovery can be increased significantly.

Environmental benefits are achieved by reducing gas and water production, which supports companies' goals of being less carbon intensive within their total production operations.

To ensure optimum oil production and recovery, the AICV® is completely self-regulating and does not require any form of communication from the surface to adjust the valves down hole. The AICV® can be individually adapted to fit any producing wells.

A major challenge in oil production from horizontal wells is increasing the total oil recovery from the reservoir. Most wells and fields only recover and produce a limited portion of the actual oil in a given reservoir due to unwanted water and gas breakthrough. The Autonomous Inflow Control Valve (AICV®) completely shuts off unwanted water and gas at breakthrough points and is unique in that it can stop unwanted fluids completely without choking the parts of the well that are producing oil.

AICV® technology offers reduced surface water handling, along with additional time and cost savings during installation, resulting in over 550,000 tons of atmospheric CO₂ emissions spared over the course of 4 years.

Certified as a Lower Emissions Oil and Gas Solution (LEOG).

Link to further Value Propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/uvp/aicv-autonomous-inflow-control-valve>



Value proposition

Web Page: <https://www.autronicafire.com/en>

Autronica Fire and Security is a leading innovator, manufacturer and supplier of fire and gas safety worldwide. Our products ensure safety in applications on land, sea and in the petrochemical, oil and gas sectors. The AutoSafe Integrated Fire and Gas (IFG) 4 is designed for the toughest requirements and expands the possibilities of a fire and gas detection system even further.

Autronica fire and gas detectors are tested for harsh environment and are certified to tolerate a wide range of temperatures. We have the best knowledge about these products in the industry and will provide the best help for our customers with selecting the correct equipment for the correct application.

Autronica designs and manufactures interactive addressable fire & gas systems with independent SIL-2 certification (by TUV). With functions that give substantial installation, operational and lifecycle cost savings, Autronica is in front with the development.

Supporting the EPC's and shipyards as well as future owners of the installations is a top priority to us, which can also be seen from our extensive project references.

The product range includes:

- AutoSafe® IFG (Integrated Fire & Gas detection system) with SelfVerify®
- Flame and gas detectors
- High Sensitive Smoke Detection (HSSD)
- Gas Sampling Systems (GSS)
- Services offered includes system design, project management, installation supervision, commissioning, after sales service, and training.
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Link to further Value Propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=autronica>

In more than 90 years in Norway and 60 years internationally, Norconsult has helped shaping the sustainable power development and energy supply.

Link to further Value Propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=norconsult>



Value proposition

Web Page: <https://ennotech.com/>

The Ennox technology is branded Ennox Green Extraction (EGX). The EGX is a novel and game changing processing unit for recovering oil from drill cuttings, oil contaminated soil and other oily solids in a more effective and economical manner, and with significantly less environmental impact than current technologies in the market.

The EGX unit is highly mobile and delivered in a standard 20-foot enclosed container. It will extract close to 100% of hydrocarbons without the use of heat or harmful chemicals and can process up to 10 tons per hour. Furthermore, the EGX process enables the customer to reuse and sell the handled waste. The EGX will redefine how waste management is executed. The unit enables cleaning at the production site, reducing the impact of the waste and transport.

Link to further Value Propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/eqx-ennox-green-extraction>



Value proposition

Web Page: <https://www.yinson.com/>

Yinson Production specializes in the provision of integrated services for Floating, Production, Storage, Offloading, (FPSO) and Floating, Storage, and Offloading, (FSO) units.

We design, construct, and operate industry-leading production assets for the offshore oil and gas industry towards improving global access to stable and affordable energy.

We are also leading the way towards Net Zero, Yinson's Climate Goal for 2050, with responsible solutions, working closely with likeminded partners in realizing our Zero Emissions FPSO concept.

Yinson GreenTech aims to build a profitable global business, which, through investments in green technologies, accelerates the transition to a net zero world.

Our focus will primarily be in the markets that we currently operate in and within the marine, transport and energy business segments.

Link to further Value Propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/yinson-production-yinson-renewables-in-solar-power>



Value proposition

Web Page: <https://www.dnv.com/>

The primary sources of gas turbine compressor GHG emissions are direct emissions from combustion and process vents, and leaks of natural gas from the compressor.

An important tool in reducing GHG emissions is monitoring and understanding where and how they occur. The DNV real-time emissions monitoring solution addresses precisely this, using machine performance data to calculate and report emissions, the machine efficiency, and thereby enabling appropriate reduction measures.

Certified as a Lower Emissions Oil and Gas Solution (LEOG).

Managing and documenting energy efficiency initiatives is key to ESG visibility and shareholder communication. ISO 50001 is the international Energy Management System (EnMS) standard for structuring corporate and platform/plant-specific energy efficiency initiatives. DNV follow a three-step process starting with a gap analysis of the current EnMS against the requirements and best practices of the ISO50001 standard. By engaging stakeholders across the operator's organisation, DNV assesses how the platform/plant currently functions and pinpoint existing strengths, weaknesses, and focus points, enabling the operators to manage their energy efficiency and GHG reduction initiatives.

Link to further Value Propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=DnV>

<https://www.norwep.com/technologies-solutions/rig-audit-condition-assessment-and-rig-intake>

<https://www.norwep.com/technologies-solutions/recertification-verification-of-well-control-equipment>

<https://www.norwep.com/technologies-solutions/risk-assessment-and-reliability-studies>

<https://www.norwep.com/technologies-solutions/uvp/dnv-real-time-emissions-monitoring>



Value Proposition

Web page: <https://minox.no/>

Seawater injection is the most important means of improved oil recovery (IOR). Prior to injection, the water must be deoxygenated to prevent corrosion of piping, equipment, and reduce bacteria growth in the reservoir. Conventional technologies like vacuum towers for deoxygenation require chemicals, leading to reservoir souring, significant space and weight impact on the installation, and increased logistics. Minox technology mechanically reduces the dissolved oxygen to less than 10 ppb without use of scavenging chemicals, leading to reduced CO2 emissions and overall reduced OPEX.

Minox provides a lightweight and compact solution for topside deoxygenation of injection water, achieving very low levels of oxygen without any use of oxygen-scavenging chemicals. The reliable and proven technology provides a green and cost-effective deoxygenation alternative compared with competing technologies.

Through rebuilds of existing stripping columns for water deaeration Minox has a proven track record of significantly reducing our clients CO2 emissions with up to 96 000 tons a year. Certified as a Lower Emissions Oil and Gas Solution (LEOG).

Link to further value propositions – Norwep web page:

<https://www.norwep.com/technologies-solutions/find-technologies-solutions?searchTerm=minox>