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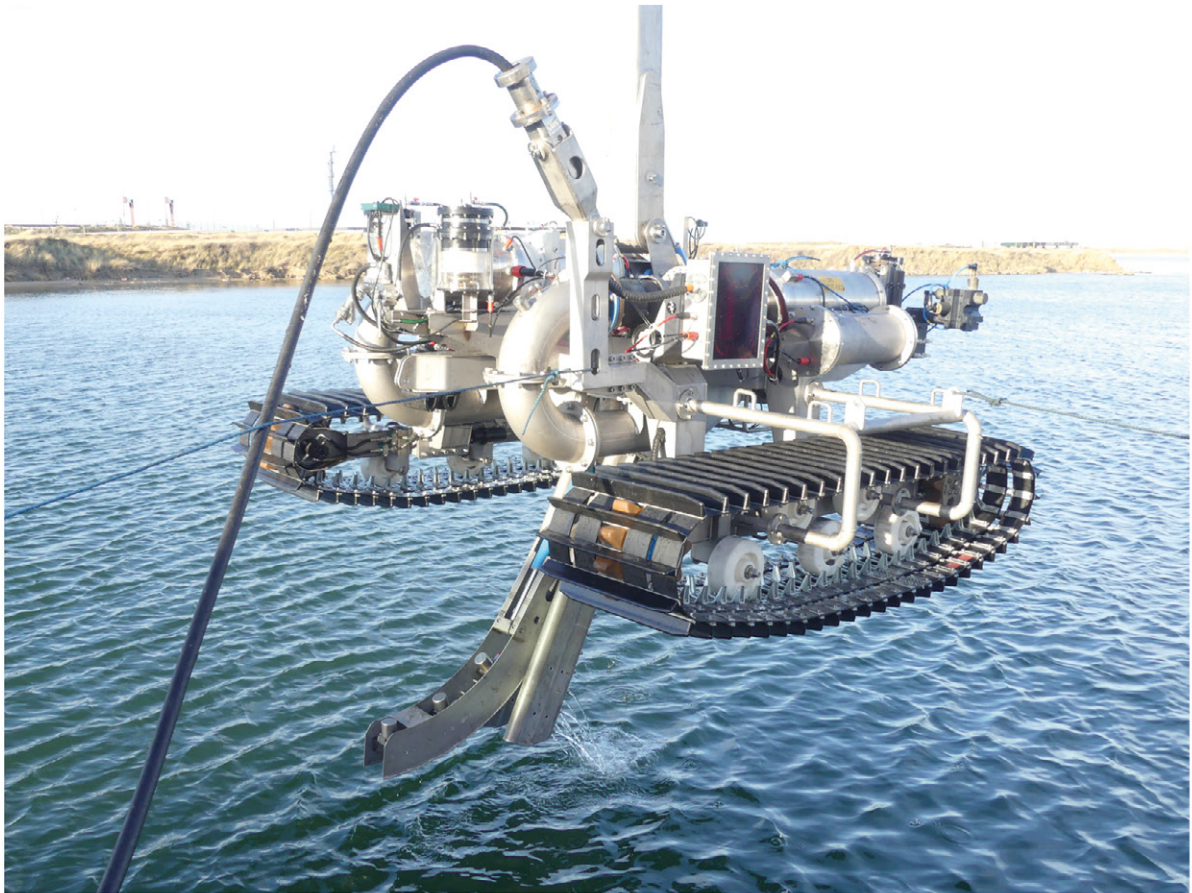
THE GLOBAL INFORMATION NEWSLETTER FOR THE WHOLE SUBMARINE CABLE INDUSTRY



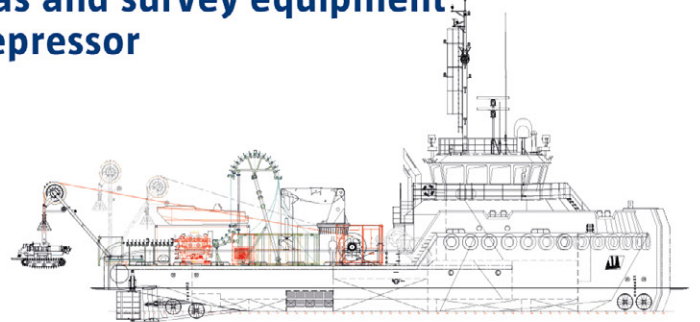
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CABLE LANDING OPERATION OF
ELLALINK IN FORTALEZA, BRAZIL

EllaLink

Submarine Cable installation & Protection World-Wide Renewable, Telecom, Interconnections & Oil & Gas TO MOBILE DIVERLESS SUBSEA JETTING CRAWLER



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Twin Jet Legs with instrumented Depressor
Trenching speed up to 4 km / day
TO MOBILE Track record since 2009**



Welcome to the January 2021 issue of SubCableNews – Issue No. 223

We sincerely hope that you all have entered 2021 healthy and full of energy to make this a good one, or at least a better one than 2020.

As you can see, we have revamped the Newsletter slightly and hope you like the new look.

We are all still fighting the virus and the restrictions associated with this, especially the offshore people in our industry. Even if I repeat myself here again, but I want to thank all the offshore personnel worldwide in our industry and beyond, for their continuous effort and work.

EllaLink, the transatlantic cable linking South America with Europe, has made a brilliant start – two cable ships are working, one from Brazil towards Portugal, the other one from Portugal towards Brazil.

Even though Google and Facebook are planning huge Africa submarine networks, rumours were confirmed that Maroc Telecom is involved in a private submarine fibre optic cable system being currently installed from Morocco to Gabon.

The last continent, Antarctica, might also be connected in the near future, according to plans revealed by Remi Galasso, founder and Chairman of Datagrid New Zealand.

The BritNed Interconnector is currently undergoing a repair operation (we hope this had

nothing to do with Brexit), whilst the COBRACable is up and running again.

Chinese and South Korean cable manufactures are getting increasingly busier and are entering slowly other markets abroad (i.e. ZTT wins tender for two 155kV-AC offshore connections in Germany).

In our Special Report section Ciena's Steve Alexander will enlighten us with his network predictions for 2021.

Rogério Mariano, Director of Network Edge Strategy at Azion Technologies is presenting us a comprehensive report about submarine cables in Brazil – Past, Present and Future.

In an interview, Charlotte Strang-Moran, ELECTRODE Project Lead at ORE Catapult is providing further background to this important project and the need for the industry to engage with this research.

As usual, you can read the latest news about Offshore Wind Farms, Interconnectors, submarine telecom, wave and tidal systems in this issue.

Take care and stay safe.




Editor

EDITOR

Eckhard Bruckschen
eb@subcablenews.com

PUBLISHER

Subcablenews Ltd.,
17 Church Lane, CB24 8SN. UK
+44 (0) 1954 250479
info@subcablenews.com

ADVERTISING DIRECTOR

Anja Schmorleiz
advertise@subcablenews.com

SUBSCRIBER SERVICES

Anja Schmorleiz, Walther Bruckschen
service@subcablenews.com
www.subcablenews.com

GRAPHIC DESIGN

Appleton Design
jon@appleton-design.co.uk

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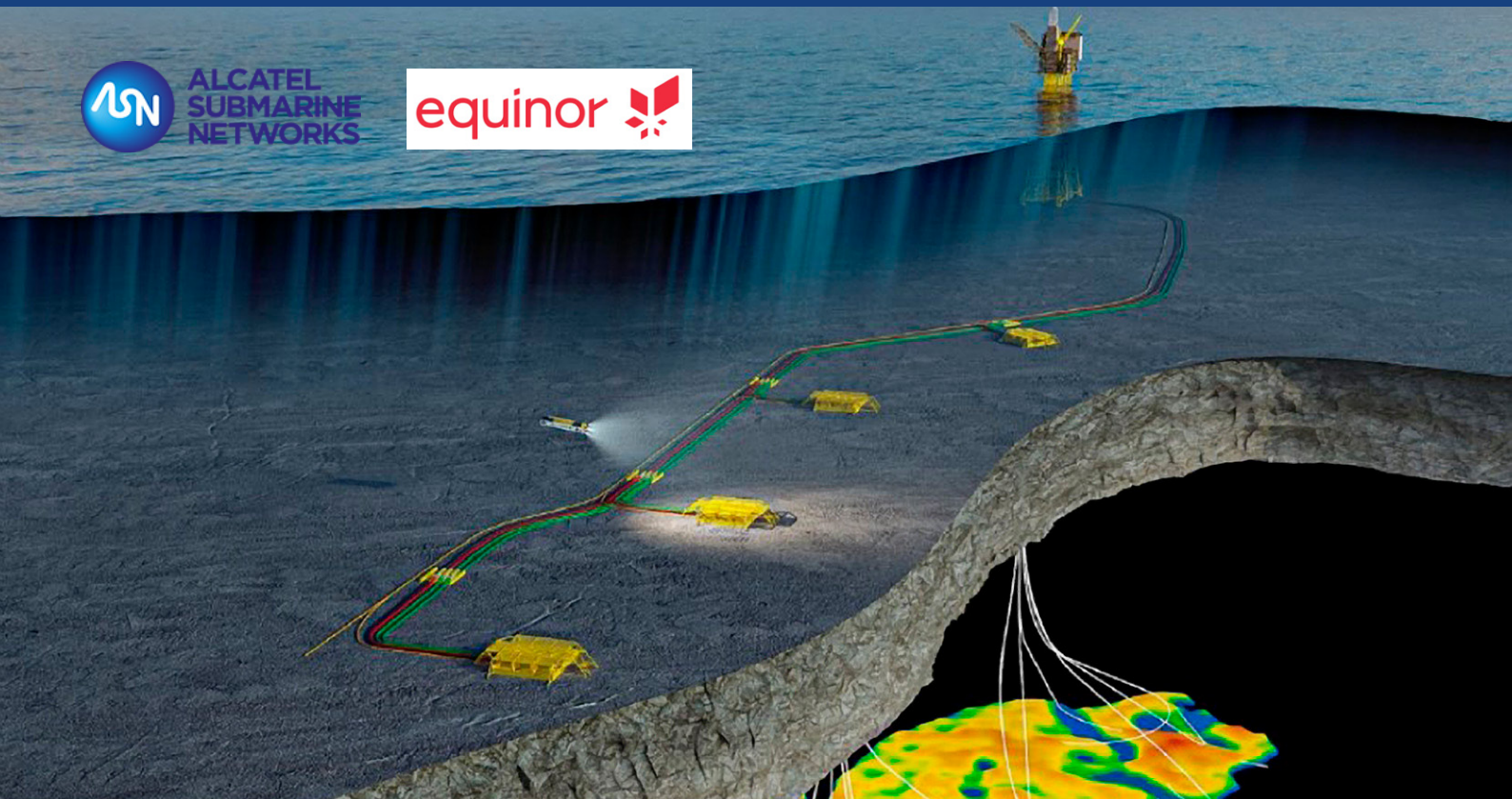
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Norway

Alcatel Submarine Networks signs contract with Equinor to build DC/FOTM subsea control infrastructure for Breidablikk

ASN DC/FOTM will provide independent high electrical power and fiber connectivity to the Subsea Production System.

Equinor and Alcatel Submarine Networks (ASN) have signed a new contract for the roll out of the submarine cable for subsea control infrastructure for Equinor's Breidablikk field development.

The Breidablikk field is located on the Norwegian Continental Shelf and will be a subsea development tied back to the Grane platform.

DC/FOTM solution to be deployed on Breidablikk, is based on standardized products, whatever the project configuration, saving risks, costs and lead time. DC/FOTM, qualified and co-developed with Equinor, is contracted on several Equinor projects.

The standalone DC/FOTM, lean cable infrastructure, highly reliable will offer

power and coms from Grane to four 6-slots subsea templates. The system may be further extended, from the same riser slot, to connect additional templates or Underwater Intervention Drone (UIDTM) subsea docking stations qualified by Equinor.

The contract is subject to the approval by the Norwegian government of the plan for development and operation.

Alain Biston, President of Alcatel Submarine Networks said: "We are pleased to work in close cooperation with Equinor on DC/FOTM projects. Our innovation capabilities will help Equinor and the rest of the industry to make offshore operations more efficient, more reliable and easily expandable when new wells are drilled. The Breidablikk project gives us the opportunity to demonstrate that DC/FOTM is now a mature technology which meets key Oil & Gas Companies current requirements."

ABOUT ALCATEL SUBMARINE NETWORKS (ASN)

Alcatel Submarine Networks, part of Nokia, leads the industry in terms of transmission capacity and installed base with more than 650,000 km of optical submarine systems deployed worldwide, enough to circumnavigate the globe 15 times. From traditional Telecom applications to Content and "Over-The-Top" Service Provider infrastructures, as well as to offshore Oil and Gas applications, ASN provides all elements of open and turnkey global undersea transmission systems, tailored to individual customer's needs. An extensive Services portfolio completes its comprehensive offering for the submarine business, including project management, installation and commissioning, along with marine and maintenance operations performed by ASN's wholly owned fleet of cable ships.

Norway

Alcatel Submarine Networks signs contract with Equinor to build a DC/FOTM subsea control infrastructure for Northern Lights CO2 transport and storage project



ASN DC/FOTM will provide independent high electrical power and fiber connectivity to the subsea CO2 injection wells.

Equinor and Alcatel Submarine Networks (ASN) have signed a new contract for the roll out of the submarine cable for subsea control infrastructure for the Northern Lights project.

The standalone DC/FOTM, lean cable infrastructure, highly reliable and delivering high-power over long distances, will connect the Oseberg A platform, to the Aurora injection well, first of a series. The system is ready to be further extended, from the same cable, whatever the distance, to connect additional templates as the volume of captured CO2 will be increased.

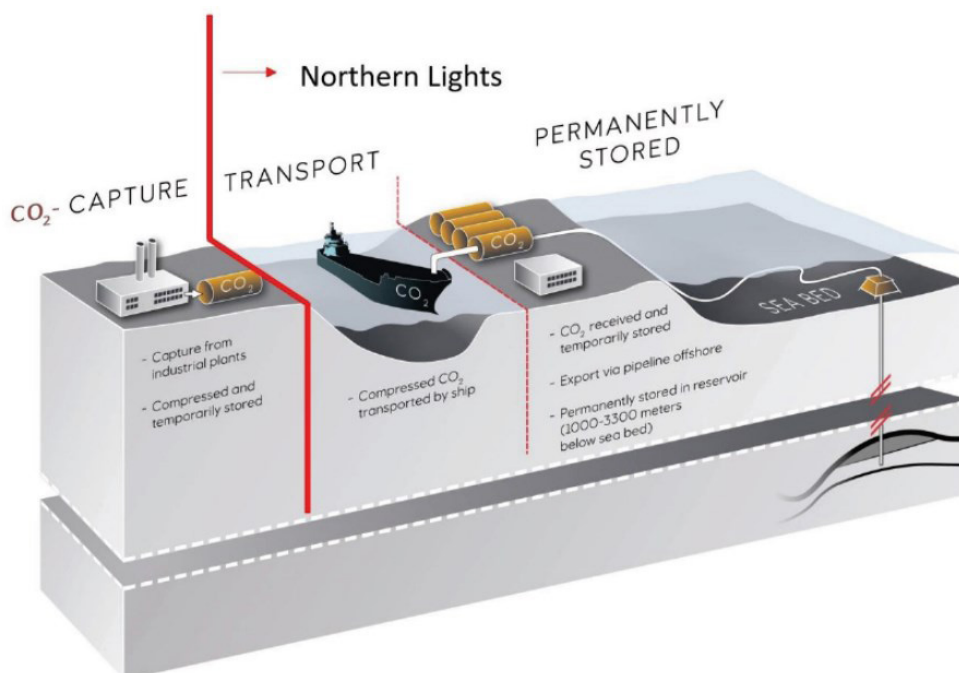
DC/FOTM solution to be deployed on Northern Lights, is based on standardized products, whatever the project configuration, saving risks, costs and lead time. DC/FOTM, qualified and co-developed with Equinor, is contracted on several Equinor projects.

The Northern Lights project is part of the Norwegian full-scale carbon capture and storage (CCS) project “Langskip (Longship),” supported by the Norwegian government. The project will initially include capture of CO2 from Norwegian industrial capture sources. The Northern Lights project comprises transportation, receipt and permanent storage of CO2 in a reservoir in the northern North Sea.

Alain Biston, President of Alcatel Submarine Networks said: “We are pleased to work in close cooperation with Equinor on DC/FOTM projects, and especially for green applications participating to control climate change. Our innovation capabilities will help Equinor to be a pioneer for the capture of CO2 in offshore reservoirs. This project gives us the opportunity to leverage submarine network technologies to develop new green subsea applications.”

ABOUT ALCATEL SUBMARINE NETWORKS (ASN)

Alcatel Submarine Networks, part of Nokia, leads the industry in terms of transmission capacity and installed base with more than 650,000 km of optical submarine systems deployed worldwide, enough to circumnavigate the globe 15 times. From traditional Telecom applications to Content and “Over-The-Top” Service Provider infrastructures, as well as to offshore Oil and Gas applications, ASN provides all elements of open and turnkey global undersea transmission systems, tailored to individual customer’s needs. An extensive Services portfolio completes its comprehensive offering for the submarine business, including project management, installation and commissioning, along with marine and maintenance operations performed by ASN’s wholly owned fleet of cable ships.





The potential look of the floating solar pilot plant (Courtesy of Moss Maritime)

Norway

Equinor to test floating solar pilot in rough waters of Norway

Norwegian energy major Equinor, in collaboration with Saipem company Moss Maritime, plans to build and test a pilot floating solar plant off Frøya in Norway in the late summer of 2021.

The project is set to become the world's first pilot plant for floating solar power in rough waters, according to Equinor.

The company has filed an application with the Norwegian Water Resources and Energy Directorate for a plant planned to measure 80 m x 80 m, and tower less than 3 metres over the sea surface.

The purpose of the pilot plant is not primarily to see how much energy it can produce, but how the weather conditions affect the plant, Equinor noted.

The Norwegian coast and continental shelf are world-class when it comes to oil, gas and wind, but when it comes to sun, other regions offer better conditions. As a test area, Frøya is still very suitable.

According to the plans, the pilot will be tested for minimum one year.

Hanne Wigum, head of the Equinor technology unit focusing on wind and solar power, said: "The municipality of Frøya has been a good collaboration partner for us. We have reached

an agreement with the grid owner, allowing the electricity that is produced to enter the power grid on Frøya. In addition, the nearness to our research centre in Trondheim, and the expertise possessed by the Sintef and NTNU research institutions, represent an advantage for us".

Frøya mayor, Kristin Furunes Strømskag, said: "It is very exciting that Frøya has been chosen as the host municipality for the testing of new renewable energy sources, such as solar power. With our natural conditions, we are a good location for a full-scale pilot plant within research and development".

The pilot plant will be an important milestone for Moss Maritime as well, which already performed model testing on its innovative floating solar park earlier in 2020, which could be used for the collaborative project with Equinor. Worth noting, Moss Maritime is part of Saipem's XSIGHT division.

Alexander Thøgersen, vice president for engineering at Moss Maritime, said: "We have been working on this concept for the past three years, most recently through our partnership with Equinor, and the concept has been substantially matured, both technically and economically.

"The floating pilot plant will be an important step on the road towards technology commercialization, and an important arena for further development and optimization of the concept".

This is the third research project that Equinor is involved in. Equinor is already involved in a project off Sri Lanka, where a concept in calm waters is being tested to decide how to produce as much energy as possible.

In addition, Equinor is involved in a project in the Netherlands where different floating solar power concepts are being tested on a lake. This provides important knowledge about the resilience and predictability of production under rougher conditions than in other current production sites for floating solar power, Equinor said.

"We choose to perform several research projects in parallel because of the rapid growth within renewable energy. This enables us to acquire optimal knowledge about this as early as possible", Wigum said.

According to Equinor, the company has not made any decision on the production of power from floating photovoltaic panels, besides the research projects.

Norway - UK

Successful testing of the North Sea Link installations in Suldal

For the first time, Statnett's new converter station in Suldal has been connected to the Norwegian electricity grid. The system has therefore passed its first test. The North Sea Link is a high voltage subsea interconnector between Norway and England. The interconnector is under construction and will be completed in 2021.

– We have tested the electrical systems in the station to determine whether the station and the connections to the Norwegian central grid are functional. This is an important milestone for the North Sea Link Project, and we are really pleased that the test was successful, says Thor Anders Nummedal, Project Director for Statnett's North Sea Link.

Some corrections had to be made along the way, and new tests were performed until everything was checked and approved. There was set aside four weeks for the work, which then took less time than expected.

– It exceeded all expectations, and we finished two weeks ahead of schedule, Nummedal states.

The tests were performed by Hitachi ABB Power Grids, while Statnett were the operations managers.

A CHALLENGING YEAR

2020 has been a challenging year in many ways for the North Sea Link Project. The COVID-19 pandemic has created problems, both for cable laying and for installation work in the stations.

The project team has done a great job to manage the project with COVID-19



North Sea Link

restrictions both on land and at sea. It's a huge achievement to deliver the project without any significant delays during the pandemic, and we must credit both our contractors and the project team's proactive and constructive management of the contractors, says Nummedal.

Hitachi ABB Power Grids have completed work on the converter plant in Suldal, and will continue testing of the link in 2021. Construction will continue on the corresponding plant in Blyth on the British side. There, testing is planned to begin in the spring of 2021.

240 KILOMETRES OF SUBSEA CABLES WILL BE LAID IN 2021

The interconnection between Norway and the UK will be established

through two parallel high voltage direct current (HVDC) cables. Each measuring approximately 720 kilometres. The major part of the link will be made of subsea cables with a total 1440 kilometres installed during the project.

Approximately 270 kilometres of subsea cable were laid in 2020, from Hylsfjorden in Suldal, Rogaland and out through the fjords to the North Sea. This work continued throughout the summer months. An additional 240 kilometres of subsea cable will be laid in 2021, before the Norwegian manufactured cables from Nexans are connected to the cables manufactured by Prysmian on the British side. Two thirds of the cable from the British side have been laid since 2018.

Sweden

Cloudberry and Downing sign sale deal for Swedish lake wind farm

Cloudberry Clean Energy and Downing LLP have signed the share purchase agreement (SPA) for the construction and ownership of a 100 MW nearshore, shallow-water wind farm in Lake Vänern in southern Sweden.

In September 2020, Cloudberry acquired Scanvind2 AS, the holding company of the Rewind Vänern offshore wind project. A few months later, the Norwegian company entered into an exclusivity agreement with Downing for the construction and ownership of the 100 MW project.

After commissioning, Cloudberry will own 20% of the project.

The total expected sales value of the project is around NOK 300 million,

subject to actual costs and that the final investment decision is made.

Around NOK 100 million will be paid at the expected financial close this year, and the remaining purchase price will be paid after project commissioning in the second half of 2023.

"We are very pleased to cooperate with such an experienced infrastructure investor as Downing. The project partnership is an important step towards fulfilling Cloudberry's growth ambitions within shallow water wind power. It also shows our ability to realise significant value from our large pipeline of projects under development," said Anders Lenborg, Cloudberry CEO.

The 100 MW wind project in Lake Vänern is close to existing infrastructure and the partnership has commenced the work with project design solutions and procurement.

The current development plan states that the wind farm will comprise 16 turbines, with expected construction start in 2021/22.

Cloudberry also announced plans to develop 2,500 MW of offshore wind power in Sweden by 2030 based on a development portfolio of freshwater and Baltic Sea shallow water projects.

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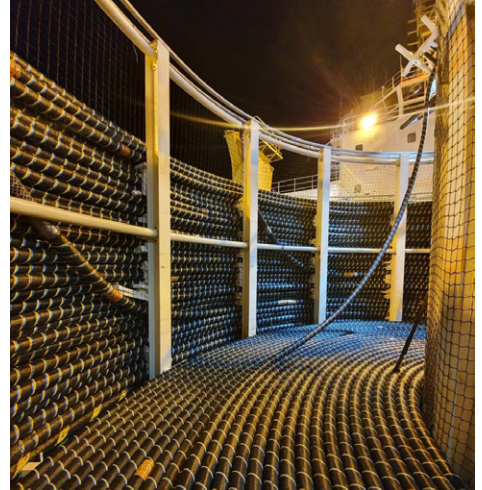
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Denmark

Load out of Kriegers Flak cables

First job for JDR and their load out team in 2021 (11/01/2021), Danish Kriegers Flak batch number 3, spooling to vessel 57.5km of subsea power cable.



Denmark

Six answer call to build Thor offshore wind farm

The Danish Energy Agency has pre-qualified a total of six consortia and companies to participate in the tender for the Thor offshore wind farm.

The applicants include Ørsted, Vattenfall, a consortium of Total and Iberdrola, as well as Thor Wind Farm I/S, owned by RWE Wind Holding A/S and RWE Offshore Wind A/S.

Other pre-qualified applicants are a joint venture of SSE Renewables Offshore Windfarm Holdings Limited and Thor OFW K/S, which is owned by Copenhagen Infrastructure IV Thor OFW ApS and Andel Holding A/S; and Swan Wind P/S, which is a joint venture between Eneco Wind B.V. and European Energy A/S.

The Danish Energy Agency had received a total of six applications to pre-qualify for the project, meaning that every application submitted met the established criteria for financial and technical capacity.

Thor will have a capacity of between 800 MW and 1,000 MW and will be located in the North Sea at a distance of a minimum 20 kilometres from the shore.

The shortlisted developers now have until mid-March to submit their preliminary bids, and the negotiation process is set for the following month.

In August, Danish Energy Agency will publish revised tendering conditions and call for final bids. The period for final bids will be open until November and the winner will be announced in early December.

Denmark plans to have the grid connection for the Thor offshore wind farm ready by 1 January 2025.

The offshore wind farm must be fully built and connected to the grid by 31 December 2027.

The Thor concession winner will carry out the installation of the offshore wind farm, including the offshore substation



and the grid connection from the offshore substation to the substation on land.

A license for the electricity production and authorisation will be granted for 30 years with the possibility of a five-year extension, if allowed under the applicable regulation.

The concession owner of the Thor offshore wind farm will receive subsidies in the form of a price premium for a 20-year period. The subsidies will be granted in accordance with a Contracts for Difference-scheme designed for this tender.

Thor is the first project to be tendered of the three large-scale offshore wind farms that the Danish government decided to establish before 2030, as part of the Energy Agreement signed in 2018.

The second is the Hesselø project in Kattegat, an up to 1.2 GW offshore wind farm which is also expected to be commissioned by 2027.

The third wind farm will be built as part of Denmark's energy island project.

Denmark

Danish Energy Agency approves Vattenfall's Vesterhav duo

The Danish Energy Agency has approved Vattenfall's construction plans and the environmental assessment for the Vesterhav Syd & Nord nearshore wind farms. This means that Vattenfall can now initiate further work with the projects.

"The Danish Energy Agency's permits are good news for the green transition and the goal of a fossil-free society in Denmark. The Danish Energy Agency has carried out a thorough review of our environmental assessment and the

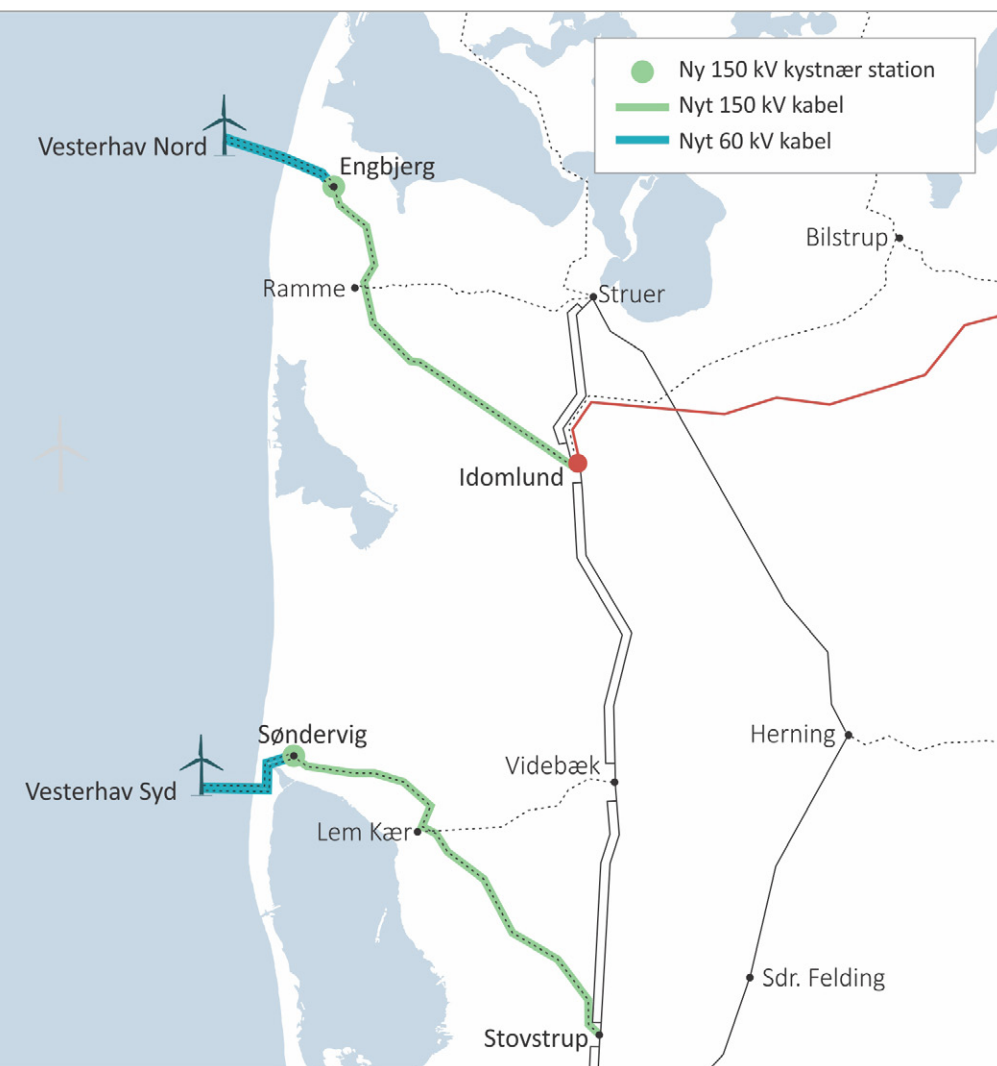
consultation responses from the public consultation. We are satisfied that, on the basis of this, they have given the green light to the projects," says Jacob Nørgaard Andersen, Vattenfall's director in Denmark.

"At the same time, we see the permits as a signal that the initiatives we have had great focus on – and will continue to work with – namely to ensure consideration for the local community as well as the environment and nature, have been positively received."

Among the biggest initiatives has been a completely new set-up design for the two offshore wind farms, maximising the turbines' distance to the coast within the area that the Danish state has designated for the parks. For Vesterhav Syd, this means that the turbines will be located approximately nine kilometres from the coast. For Vesterhav Nord, the northernmost turbine is positioned about eight kilometres from the coast.

In addition to the location of the turbines, Vattenfall wishes, if the Danish Transport, Building and Housing Agency approves it, to install a radar system that reduces the light markings on the turbines at night. Approval of the radar system must be given by the Danish Transport, Building and Housing Agency before the end of Q2 2021, so that the radar system can be included in the best possible way with the other processes on the projects.

Vesterhav Nord will have a capacity of 180 MW and will consist of 21 SG 8.0-167 DD turbines, each with a rated power of 8.4 MW. Vesterhav Syd will have a capacity of 170 MW and will consist of 20 turbines. Combined, the projects will supply electricity equivalent to the annual consumption of 350,000 Danish households. Vattenfall secured permits for the two Vesterhav wind areas in 2016 for 47.5 øre/kWh (€63.8/MWh). The two offshore wind farms will increase Danish electricity production from wind turbines by approximately 10 percent.



Denmark

Meet VindØ – The world's first energy island

The VindØ consortium has revealed its vision of the world's first energy island.

The VindØ consortium comprises two of Denmark's largest pension funds, PensionDanmark and PFA, and Denmark's largest utility company, Andel.

The artificial island, made of submersible concrete boxes, is to be built in the Danish part of the North Sea, around 100 kilometres from land.

The island is to be established by 2030, at the latest, and connect 3 GW of offshore wind.

Over time, the island will connect 10 GW offshore wind and host energy storage and Power-to-X as well as accommodation, O&M facilities, and HVDC converters for transmission and interconnectors.

The consortium is assisted by the green infrastructure investment company, Copenhagen Infrastructure Partners (CIP).



As previously reported, Denmark plans to develop two energy islands, one in the Baltic Sea and one in the North Sea. The energy island in the Baltic Sea would have a capacity of 2 GW by 2030.

Feasibility studies have started to determine if the artificial energy island in the North Sea could be located in an area at least 60 kilometres west of Thorsminde on Denmark's west coast.

The final decision on the location of the energy island and the accompanying wind farms is expected by Spring 2021.

The Danish Energy Agency and Energinet have begun preparations for the detailed studies of the seabed and the impact of the islands and offshore wind turbines on the environment. The studies are expected to be completed in 2024.

Prior to that, the government had issued an offshore wind map identifying the zones where the wind farms which would be connected to the energy islands could be developed.

Poland

OWC to work on Polish offshore wind project

Baltic Power, a subsidiary of Polish energy company PKN Orlen, has appointed Offshore Wind Consultants (OWC) as technical advisor for its 1.2 GW offshore wind development in the Baltic Sea.

OWC will support PKN Orlen during the development of the project by the assurance of comprehensive technical advisory services.

This includes the provision of technical information, analysis and

recommendations regarding issues related to both the project and the market, but also engagement in revision and verification of project deliverables.

OWC's Polish office, which started operations in May 2020, will lead the company's work on the project.

"This technical advisory contract with OWC in Poland is confirmation that PKN Orlen is delivering on its promise to engage local businesses. We are

proud to be engaged for such a major project," said Lukasz Sikorski, head of OWC in Poland.

PKN Orlen, through Baltic Power, holds a license to build wind farms in the Baltic Sea with a maximum total capacity of up to 1.2 GW.

The proposed area covers approximately 131 km² and is located some 22 km off Choczewo and Łeba. The plan is to begin constructing the wind farm in 2024.

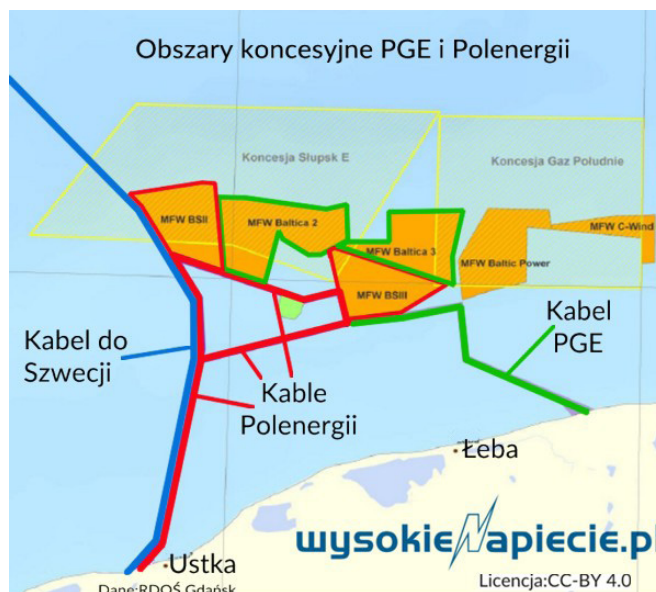
Poland

Polish projects gain grid greenlight

Two offshore wind projects located in Polish Baltic Sea have obtained the grid connection agreements. Both agreements were signed on 23rd December 2020 with the Polish TSO Polskie Sieci Elektroenergetyczne S.A.

The 1,498 MW Baltica-2 project is being implemented by PGE Baltica from PGE Polska Grupa Energetyczna. PGE has already secured a grid connection agreement for the sister project Baltica-3 for a maximum of 1,045 MW. Commissioning of Baltica-3 is expected from 2026, with Baltica-2 coming online by the end of 2030.

The 350 MW FEW Baltic II is being developed by RWE Renewables. The project is located 55 km offshore in water depths of 30-50 metres. Site investigations have been successfully finalized. The geophysical and geotechnical surveys have been executed by Polish contractors. If successfully developed, the project will deliver power for 350,000 households.



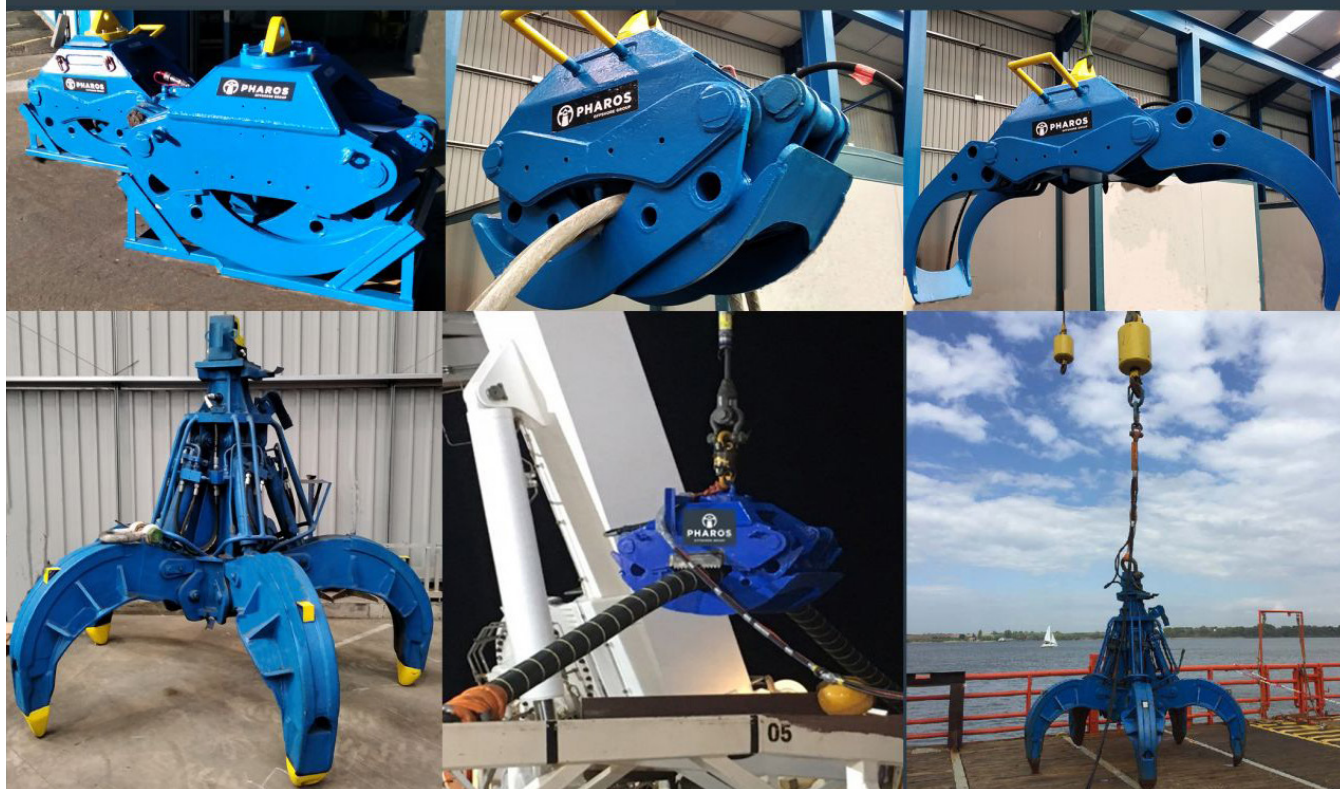
Baltica-2 & Baltica-3 projects

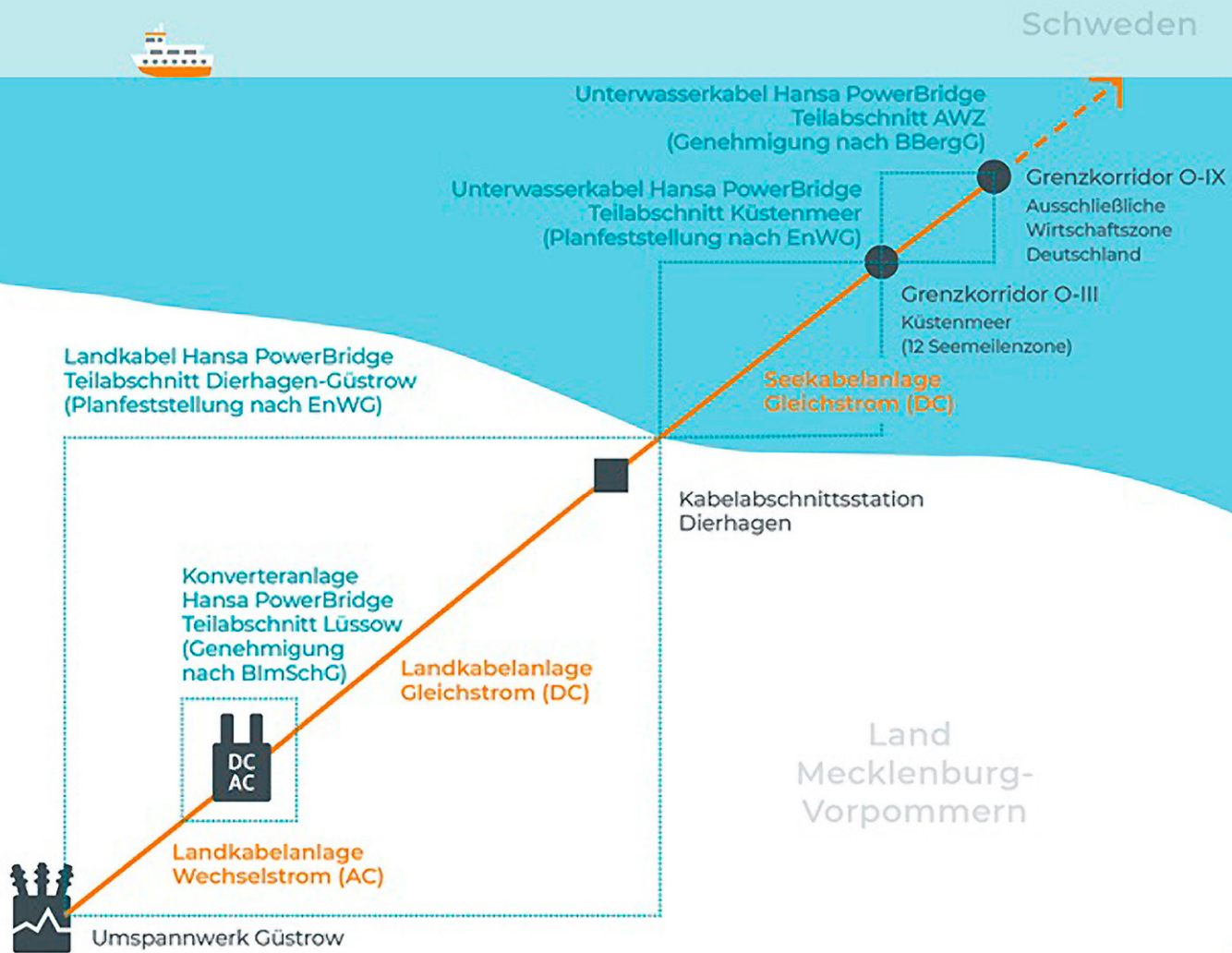
The Government plans to launch a Contracts for Difference (CfD) to support 5.9 GW of offshore wind capacity next year. Additional support phases are expected to be launched in 2025 and 2027, both 2.5 GW, leading to a long-term goal of 11 GW by 2040.



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All application documents for the sea cable and land cable have been submitted in 2020. The last milestone is the preparation of the application documents for the converter system.

Germany - Sweden

Permit process for Hansa PowerBridge takes next step: application submitted for planning approval of onshore route



2020 reaches its end with the submission of the permit application for the 70-kilometre-long onshore route of the German-Swedish interconnector Hansa PowerBridge. For the subsection between Dierhagen and Güstrow, 50Hertz submitted the application documents to the permit authority, the Ministry for Energy, Infrastructure and Digitalization of Mecklenburg-Western Pomerania, in late December.

The Hansa PowerBridge is planned as a 300-kilovolt high voltage direct current (HVDC) line that will technically enable the transmission of electricity between the planned grid connection points in Hurva (Sweden) and Güstrow (Germany) across the stretch of about 300 kilometers.

The German part of the project, for which 50Hertz is responsible in the approval, consists of an offshore cable route of approximately 105 km (EEZ and coastal waters), a cable section station in Dierhagen, an approximately 70 km long land cable route and a converter planned in Lüssow with a connection to the substation in Güstrow.

The application documents for the sea cable and land cable have now been submitted in full to the various approval authorities in 2020. Now, the permit documents for the converter system near Güstrow are being prepared and will be submitted in 2021.



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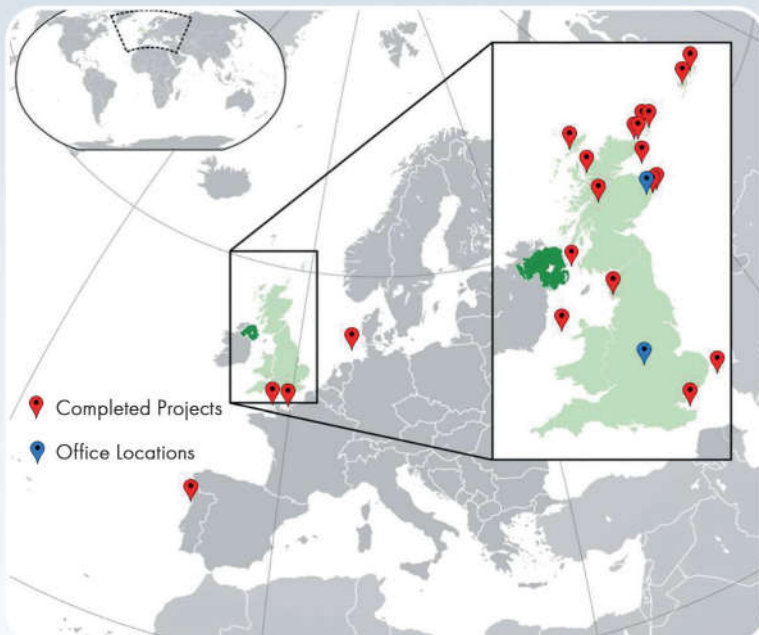
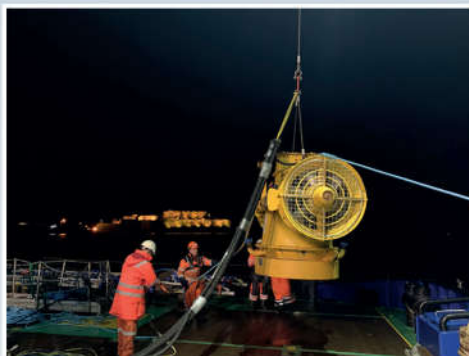
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Germany - Denmark

Combined Grid Solution completely connected to the grid

Since yesterday (15.12.), the interconnector Kriegers Flak - Combined Grid Solution (KF CGS) in the Baltic Sea is completely in operation. The trial runs were successfully completed, recently restart tests after a simulated power outage on both the Danish and the German side. This means that an additional 400 MW of capacity in both directions is now available for electricity transfer between the zone Denmark East and the German bidding zone.

The new interconnector will enable the cheapest forms of generation in both countries to cover electricity demand. For the first time, KF CGS will be able to transport offshore wind power and provide transmission


ENERGINET


capacity for cross-border electricity trading in a combined technical facility. This is an important step for the future offshore wind energy use in the North and Baltic Sea. The two

German wind farms Baltic 1 and Baltic 2 are integrated into KF CGS. The commissioning and integration of the Danish wind farm Kriegers Flak is planned for 2021.



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Germany

Contract awarded for advanced cable connecting wind farm and converter station at sea



- TenneT uses the further developed 1,200 square millimeters cable conductor cross-section offshore the first time
- Cable with 100 kilograms per meter enables more efficient single connections
- Three-phase current cables will connect wind farms with TenneT's converter platform HelWin beta and DolWin kappa
- ZTT wins tender for this two 155kV-AC offshore connections

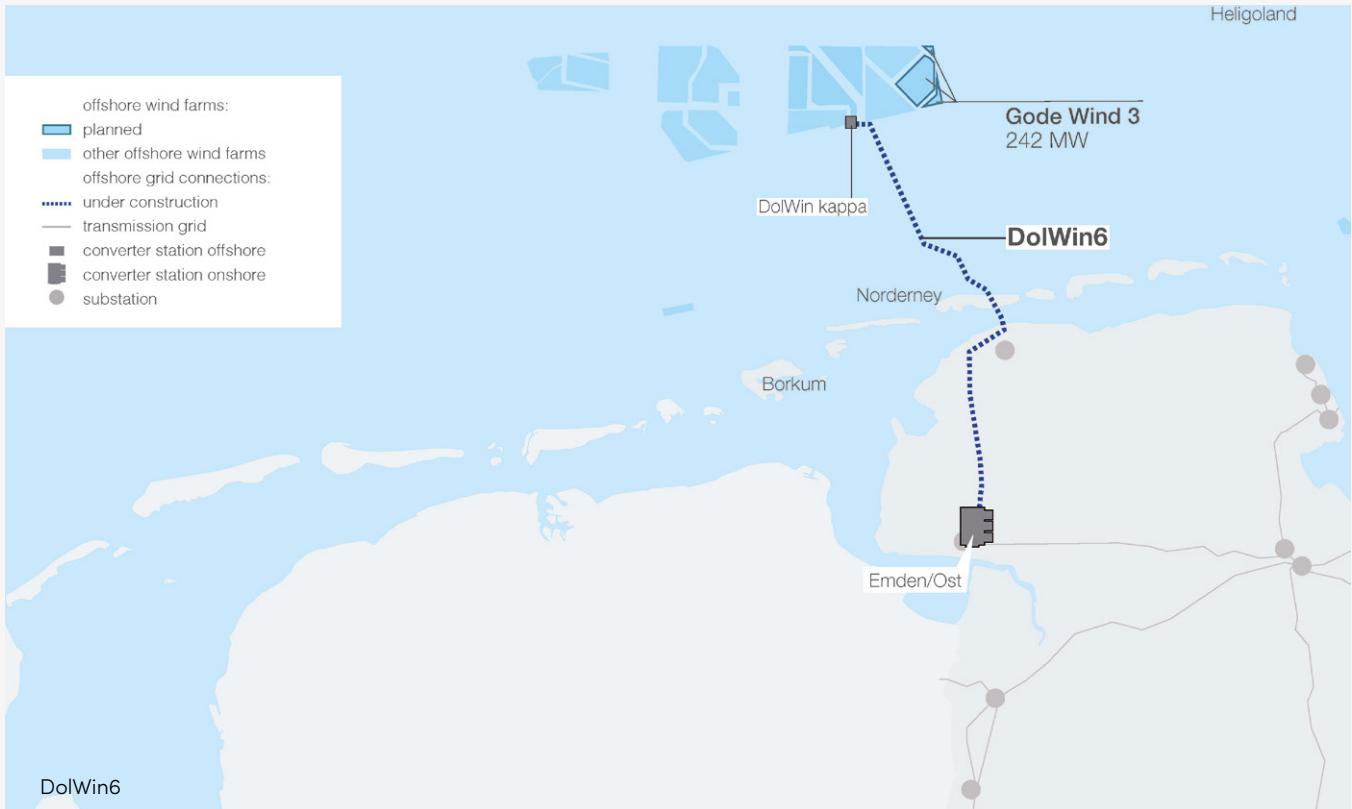
To transport the electricity from offshore wind farms to land wind power produced off the German North Sea coast is transmitted from two wind farms to one TenneT converter platform each (HelWin beta and DolWin kappa). There the three-phase current is converted into direct current and transported to the converter station on land where to convert the electricity back into three-phase current and fed into the extra-high voltage grid via the neighbouring transformer station. The produced offshore electricity is collected in a transformer station platform before TenneT takes over at the offshore converter station with a 155-kilovolt three-phase cable. Global subsea cable manufacturer Zhongtian Technology Submarine Cable Co., Ltd [ZTT for short] has been commissioned for both wind farm connections of five and 16 kilometre respectively. The cable systems will be produced at one of its manufacturing base in Nantong/ China and then transported to Europe. The laying itself will be carried out by the subcontractor asso.subsea (Greece). The first cable laying is planned for summer 2022 to connect Kaskasi II wind farm.

Two cable systems with a conductor cross-section of 630 square millimeters will be used to transmit 342 megawatts on the five-kilometer long route between the wind farm's transformer station and HelWin beta. Using the HelWin2 grid connection, the electricity is transported over 130 kilometers to



FACTS AND FIGURES HELWIN2

- in operation since June 2015
- 130-kilometer high-voltage direct current (HVDC) transmission connection with a maximum capacity of 690 megawatts
- 45 kilometers of land cable, 85 kilometers of sea cable
- Network connection point: Büttel



FACTS AND FIGURES DOLWIN6

- 90 kilometer high-voltage direct current (HVDC) transmission connection with a maximum capacity of 900 megawatts
- 45 kilometers of land cable, 45 kilometers of sea cable
- Network connection point: Emden/East
- Completion of the network connection planned for 2023

the land station in Büttel (Schleswig-Holstein) and fed into the extra-high voltage grid. For the cable laying that will follow in the summer of 2023, TenneT uses the first time the advanced three-phase cable with a conductor cross-section of 1,200 square millimeters, which will transport the almost 242 megawatts from the Gode Wind 3 wind farm via just one cable system. Various cables and pipelines to be crossed pose a particular challenge, and the route, which is over 16 kilometers long, also runs through the Gode Wind 1 wind farm, which is already in operation. Gode Wind 3 is connected to the extra-high voltage grid via DolWin kappa and the associated DolWin6 grid connection in Emden/East (Lower Saxony).

With its operational grid connection projects in Germany and the Netherlands, TenneT provides offshore wind capacities of 8,532 megawatts. Currently TenneT is implementing seven further offshore grid connection projects in both countries.

ABOUT TENNET

TenneT is a leading European grid operator (Transmission System Operator (TSO)). We design, build, maintain and operate the high-voltage electricity grid in the Netherlands and large parts of Germany and facilitate the European energy market. We are committed to providing a secure and reliable supply of electricity, today and in the future, 24 hours a

day, 365 days a year and to playing our role in driving the energy transition. We transport electricity over a network of approximately 23,500 kilometres of high-voltage connections, from wherever and however it's generated, to over 42 million end-users while keeping electricity supply and demand balanced at all times. With close to 5,000 employees, we achieve a turnover of 4.1 billion euros and a total asset value of EUR 23 billion. TenneT is one of the largest investors in national and international onshore and offshore electricity grids. TenneT makes every effort to meet the needs of society. This will require us all to take ownership, show courage and connect with each other.

Germany

N-Sea and SeaReenergy finish offshore job for TenneT

N-Sea Renewable and Utilities Services (N-Sea RUS), part of N-Sea Group, based in Dordrecht and Aberdeen, as part of a consortium with SeaReenergy Offshore Holding GmbH & Cie. KG based in Hamburg and Den Haag have successfully completed a project to engineer, supply and install a retrofit subsea cable protection system (CPS) for an HVDC grid connection.

SeaReenergy provided engineering services, developed the installation procedure, and assisted in obtaining the necessary approvals. N-Sea were responsible for the project management, procurement and installation of the CPS, including the supply of equipment, project personnel and vessel chartering. The retrofit installation needed to be performed subsea by divers under difficult weather conditions but as efficient as possible, in order to minimize downtime of the client's grid access system. SeaReenergy field engineers were present during the complete offshore operation in order to support the successful installation in accordance with the manufacturers, clients and BSH requirements.

The project required a collaborative way of working with the operator to ensure the correct solution was found and to secure the assets integrity before the winter season. Thereby, the consortium faced further challenges such as very short preparation time and various COVID-19 restrictions and repercussions. Moreover, the installation had to be performed during running operations to minimise the shutdown time. The consortium was able to manage these difficulties successfully.



Johann Philipp, Head of Engineering of SeaReenergy, commented on the project: "We are pleased to have been able to successfully complete the retrofit of the cable protection system together with our consortium partner N-Sea. It has been a challenging project due to the tight schedule for engineering, fabrication and installation works. In these circumstances the consortium's history and past project experience proved to be of great value to the client."

Dale McDonald, Operations Manager of N-Sea Group, endorses this statement: "We are very proud to again demonstrate our abilities to work with our clients and find the correct solutions, in challenging circumstances. The way in which N-Sea and our Consortium Partner SeaReenergy were able to react to our Clients needs, is testament to our shared vision for a "first time right" way of working. It is the full intention for N-Sea and our partners, to continue to cement this effective way of working, which is benefiting our clients and making a real change in the industry."

ABOUT SEAREENERGY

SeaReenergy is an independent provider of comprehensive services for all offshore wind industry stakeholders. The company is involved in the

whole value chain from T&I concepts to installation and operation & maintenance. Founded in 2010, it offers consulting and engineering services as well as offshore marine services, QHSE services, and the full range of offshore professionals.

Due to its extensive experience with major offshore projects and its dedicated team of experts, SeaReenergy is uniquely positioned in the offshore wind industry, making it the preferred partner for key players in the market.

ABOUT N-SEA

N-Sea is an integrated subsea service provider. The company offers a wide range of survey and IMR services to civil contracting communities and the energy sector, focusing on the international oil and gas and renewable industry.

N-Sea meets its clients' needs. How? By providing effective and cost-efficient solutions for subsea assets and infrastructure, taking into account a safe environment.

The company delivers subsea: from installation to decommissioning, from inspection through to maintenance management, it helps assess the state of subsea assets and provides the necessary service throughout their entire lifecycle.

Germany

RWE receives planning permission for Kaskasi offshore wind farm

- Kaskasi is the first offshore wind farm which has been approved based on the new wind at sea law by the German Federal Maritime and Hydrographic Agency
- Offshore construction work will start in Q3 2021
- Planned to be fully operational in 2022

“We naturally have a special connection to our home market Germany. In the period from 2020 to the end of 2022, we will be investing around one billion euros net in expanding renewables in Germany. A large part of that will be allocated to our Kaskasi offshore wind farm. I’m delighted that the BSH has now given the green light by granting planning permission to build our sixth wind farm off the German coast.” – Sven Utermöhlen, Chief Operating Officer Wind Offshore Global at RWE Renewables

For RWE’s offshore wind farm Kaskasi the green light has been confirmed: Beginning of December, the German Federal Maritime and Hydrographic Agency (BSH) granted planning permission for the 342-megawatt wind farm. This makes Kaskasi (official name: Kaskasi II) the first offshore wind farm in Germany receiving planning permission under the new wind at sea law, following a successful participation in the auction held under the so called interim system.

A component of the permit are pilot wind turbines at which innovative technologies will be tested. The wind farm is set to go online in summer 2022. After full start of commercial operation in Q4 2022, Kaskasi will be able to supply the equivalent of around 400,000 households per year with green electricity.

The decision to invest in the Kaskasi offshore wind farm, which will be built 35 kilometres north of the island of Heligoland, was made in early 2020.



Suppliers for the main components have already been selected and some have already started fabrication. The wind farm will comprise of a total of 38 wind turbines (type: SG 8.0-167 DD). Each turbine will have an installed capacity of up to nine megawatts (MW). The wind turbines will be installed on monopile foundations. The offshore work is set to start in Q3 2021. RWE will use the “vibro pile driving” installation method, which is an efficient alternative to the conventional method of hammering monopiles into the seabed. This improved installation method could reduce installation time and noise emissions during construction.

In addition, innovative collars will be mounted at three selected foundations. The “Collared Monopile” was designed based on a patent developed by RWE and will be installed to improve the structural integrity of the entire foundation. This underlines RWE’s vision of taking a leading role in promoting innovation and technology.

RWE PLANS FURTHER GROWTH IN OFFSHORE WIND

Kaskasi is RWE’s sixth wind farm off the German coast: The company operates the offshore wind farms Nordsee Ost (295 MW) and Amrumbank West (302 MW), also off the coast of Heligoland, as well as Arkona, which has an installed capacity of 385 MW (RWE share 50%) and is the largest offshore wind farm in the Baltic Sea. In addition, RWE holds shares in the wind farms Nordsee One and Alpha Ventus.

RWE Renewables is the world’s second-largest operator of offshore wind farms and the foundation for further growth has also been laid: In addition to Kaskasi in Germany, the company is currently constructing the Triton Knoll offshore wind farm off the British coast, with an installed capacity of 857 MW (RWE share: 509 MW). This wind farm is set to start commercial operations in Q1 2022. Overall, the company has a development pipeline of offshore projects of over seven gigawatts – not including tenders the company is considering on top.

Germany

EIB Nods to Arcadis Ost 1 Loan

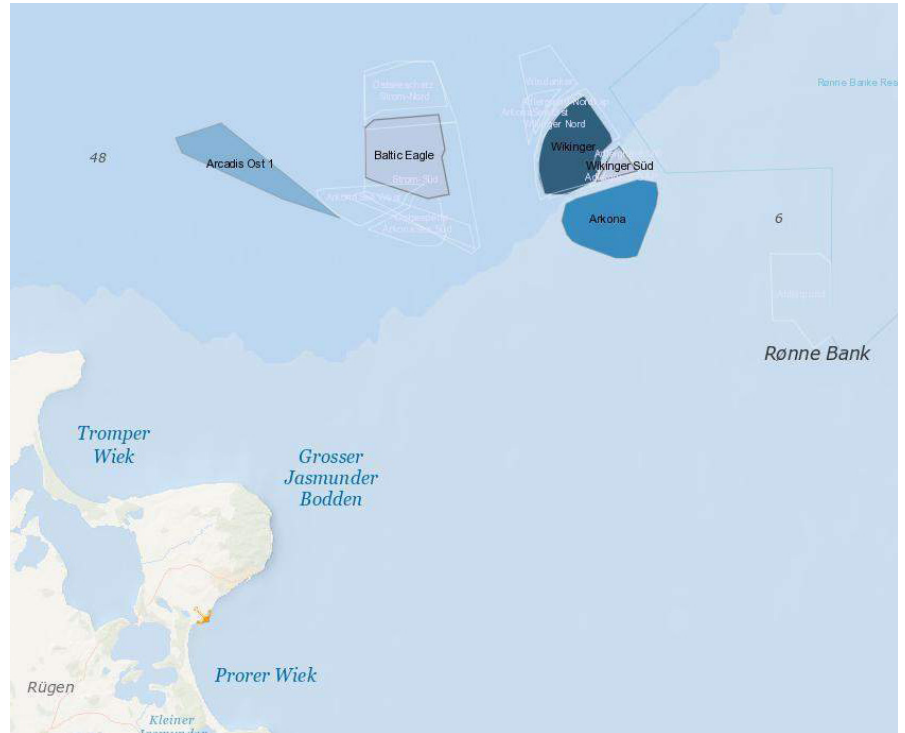
Offshore wind developer Parkwind has secured a loan from the European Investment Bank (EIB) for the construction of the 257 MW Arcadis Ost 1 wind farm.

The amount approved is €450 million.

Located some 19 kilometres off the island of Rügen in the German Baltic Sea, Arcadis Ost 1 will comprise 27 MHI Vestas V174-9.5 MW wind turbines and an offshore substation, all installed on monopile foundations.

The wind turbines are scheduled to be installed at the site from June 2022 onward using a new floating turbine installation method, an industry's first.

The turbines will be installed using a floating installation vessel to assemble the turbine components, which will be located onboard the deck, as well as a dummy tower.



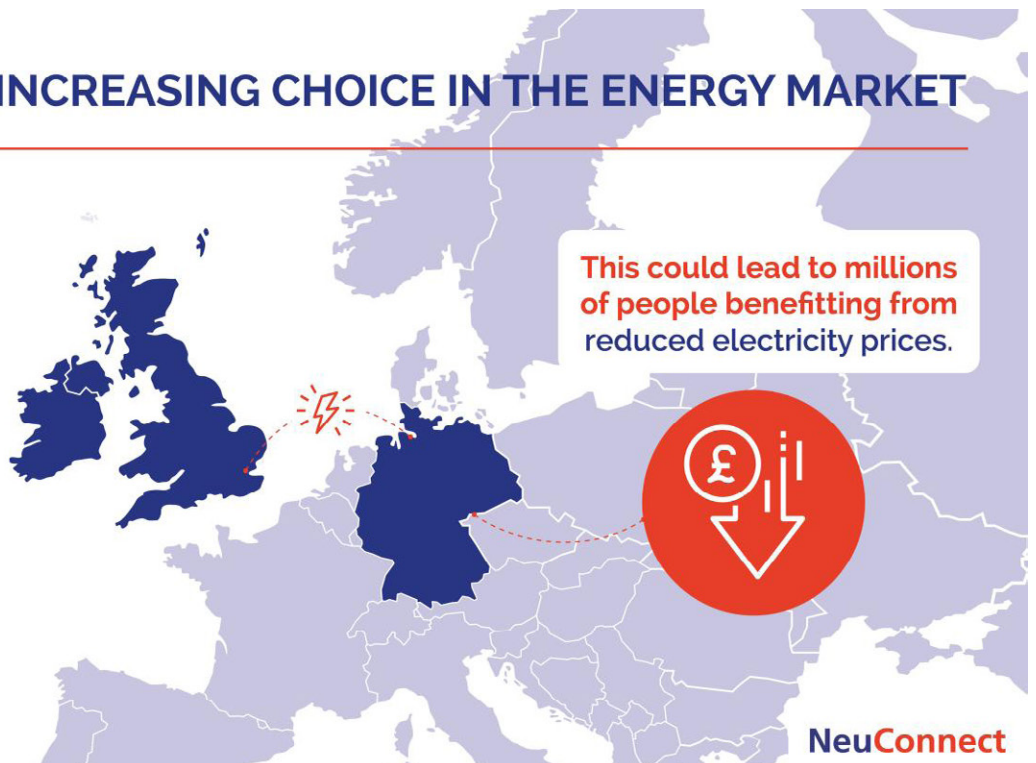
Arcadis Ost 1 offshore wind farm (Source: 4COffshore)

The first step will be lifting the turbine tower onto the pre-installed turbine foundation, after which the nacelle will be lifted onto the dummy tower and the blades will be attached.

Arcadis Ost 1 is slated for commissioning in 2023. The wind farm is Parkwind's first offshore wind project in Germany.

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Germany

Fraunhofer IWES Wraps Up Survey in Baltic Sea

Fraunhofer IWES has conducted a boulder detection and geohazard survey of 50 turbine locations and the associated OSS at the Baltic Eagle offshore wind project for Iberdrola.

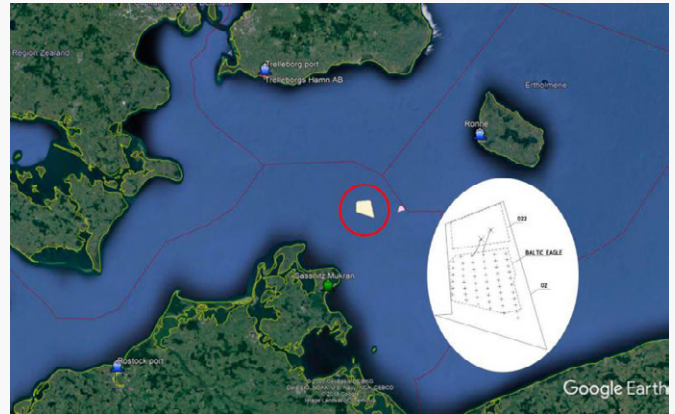
The three-week measurement campaign took place in October and November 2020 using the novel proprietary Manta Ray G1 system developed by Fraunhofer IWES for data recording.

The acquired data is currently being interpreted at the institute, with the goal of completing the project by the end of April.

According to Fraunhofer IWES, the Manta Ray G1 is developed for the purpose of diffraction imaging and the localization of point diffractors within marine sediments.

The system operates on the principle that objects within the seafloor act as point diffractors when illuminated by a signal source. The recording of the resulting acoustic diffractions and accurate processing of the diffracted energy allow localization of the original diffraction, i.e., the boulder in the sediment.

“Fraunhofer IWES is supporting Iberdrola in de-risking the monopile foundations planned in Baltic Eagle by deploying



its proprietary boulder imaging technology,” said Benedict Preu, Head of Department Sub-surface Investigations at Fraunhofer IWES.

“Tasks like these showcase our ability to provide tailored solutions for the challenges posed by offshore site investigation. As such, we are making a major contribution to supporting the wind energy industry to overcome the limitations of state of the art technology.”

Located 30 kilometers off the coast of the Rügen island, Baltic Eagle will comprise 52 MHI Vestas V174-9.5 MW turbines.

Iberdrola plans to have the 476 MW offshore wind farm delivered and installed in 2022 and 2023.

Germany

Trianel Windpark Borkum opens tender for CPS work

Trianel Windkraftwerk Borkum has issued a tender for subsea works on the cable protection systems (CPS) and bolt exchanges at diffuser plates at the Trianel Windpark Borkum project in Germany.

The selected company will be in charge of installing 20 preventive CPS retrofits, four corrective CPS retrofits, as well as bolt exchange at six steel plates.

The installation phase is limited to 30 days with the option of extension by two times per one week.



The contract will start on 1 May and is planned to end on 31 December. It is set out to be a one-year contract, with the option to be prolonged for one more year – second campaign in 2022.

The deadline for submitting applications for the tender is 11 February by 12:00 local time.

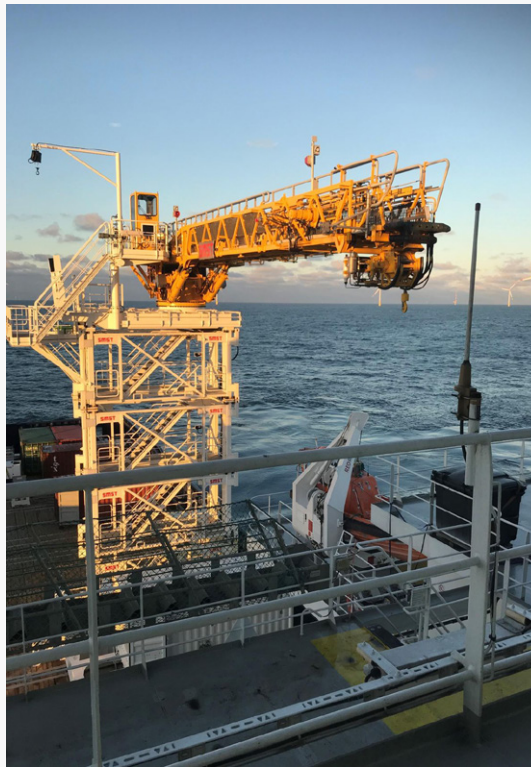
The 200 MW Trianel Windpark Borkum comprises 40 Adwen 5 MW turbines which have been operational since 2015.

The project owner recently commissioned the project's second phase, which features 32 Senvion 6.2 M152 turbines.

Germany

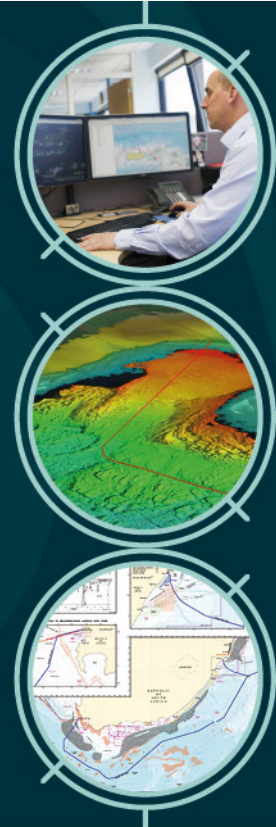
Cable Replacement work almost complete

The work is nearing completion at DanTysk offshore wind farm, where Global Offshore and CWind are working collaboratively to provide cable replacements, termination and testing, and cable pull-in services for Vattenfall. Their 70 square kilometre wind farm in the North Sea generates 288mw per year, supplying 400,000 households with climate-friendly electricity.



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North Sea

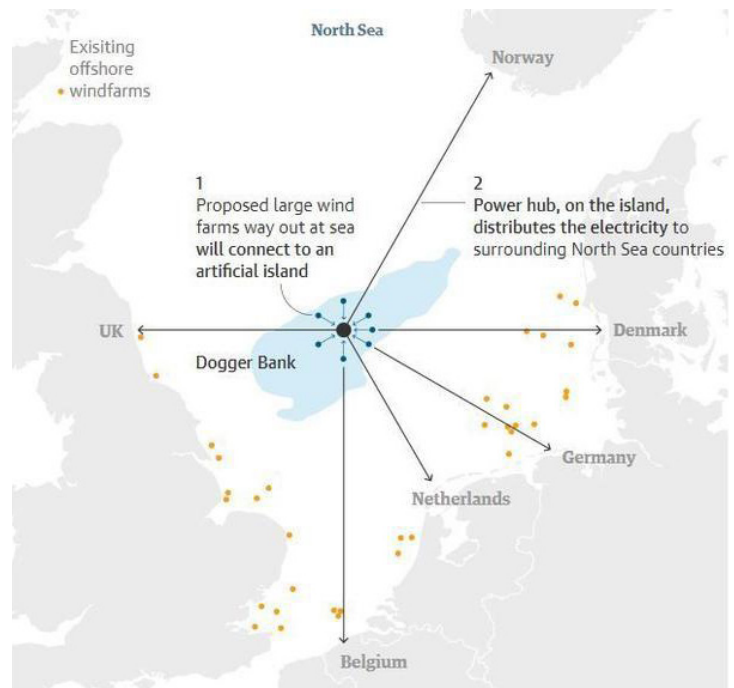
The Netherlands and Denmark explore opportunities for offshore energy hub together

The Netherlands and Denmark have signed an agreement of intent in which they agree to have TenneT, Gasunie and Energinet carry out further research into a joint energy hub in the North Sea.

“Denmark is an important partner for the Netherlands when it comes to climate and energy. Both countries are ambitious in the field of CO2 reduction. Denmark and the Netherlands are neighbours in the North Sea and are connected both literally, via the Cobra cable for the transport of electricity, and figuratively, by the shared commitment and ambitions for wind energy at sea,” says Minister Wiebes (Economic Affairs and Climate). It is clear that the Netherlands could benefit from closer cooperation with Denmark. Opportunities include increasing interconnection capacity for security of supply, possible synergy with our national plans for offshore infrastructure in the north of the Netherlands and possible hydrogen opportunities in the Groningen/ Eemshaven region.

In June 2020, Minister Wiebes signed a Memorandum of Understanding (MoU) with Danish Minister Jørgensen of Climate, Energy and Utilities in which various energy policy themes were identified in which we would like to work closely together. An important theme is cooperation in the field of offshore energy hubs in the North Sea. Such ‘hubs’ are landing facilities in the sea (via an artificial sand island, a platform, or another physical form) for offshore wind farms, from which energy can be transported to different countries in the form of electrons or even, after electrolysis, in the form of (hydrogen) molecules.

Manon van Beek, CEO TenneT responds: “Energy will increasingly become a cross-border business and cooperation across the borders of organisations and countries is the key to a successful energy transition. In this context, we are already realising cross-border offshore projects and many more opportunities lie ahead. Offshore wind will undoubtedly become the new powerhouse of North-West Europe, a region that is perfectly connected via the North Sea. And it will only be in a European context that we can and will make optimum use of every electron generated at sea. Intensive cooperation between TSOs, governments and other bodies involved – across borders – must be the rule in order to ultimately achieve a European sustainable energy system.”



Ulco Vermeulen, Executive Board Gasunie: “Large-scale production of wind energy in the North Sea is the basis for making the entire energy system more sustainable. Intensive cooperation between gas and electricity companies from different countries around the North Sea is crucial to achieve a new sustainable energy system with as favourable a cost level as possible. This MoU is a useful step in the right direction. It is a compliment that both TenneT, Gasunie and Energinet have the confidence of the Dutch government to contribute to this as ‘knowledge leaders’”.

It has been agreed that additional analyses will be carried out by TenneT, Energinet and Gasunie on the joint development of an energy hub in the North Sea for connecting offshore wind farms. On the basis of these analyses, a decision must be taken by the Netherlands and Denmark before 2022 as to whether it is appropriate to continue this cooperation. TenneT, Energinet and Gasunie are already partners in the North Sea Wind Power Hub consortium. This consortium has been working for years on concept development and research into artificial islands at sea on which several large transformer substations can be built to connect offshore wind farms.

Read more at www.northseawindpowerhub.eu.

North Sea / Baltic Sea

The Danish Minister for Climate, Dan Jørgensen has signed declarations with the Ministers in Germany and The Netherlands on Energy Islands

The declarations are an important step towards fulfilling the political intention that the energy islands must be connected to countries other than Denmark. The declarations also mark the beginning of Energinet's work of maturing and developing international connections in collaboration with TSOs in the cooperation countries with which agreements has been concluded.

"In Energinet, we are excited that Denmark has now signed declarations with Germany and the Netherlands on energy islands", says Hanne Storm Edlefsen, Vice President of Energinet: "The two energy islands in the North Sea and the Baltic Sea can only be realized through strong international cooperation, so the declarations are a very important step towards the establishment of energy islands, which is a vital next step for large-scale offshore wind power and thus for the green transition in Europe and the world."

With the two declarations, the countries will be working together to carry out a number of complex studies of how energy islands and offshore wind power can be expanded and, not least, how international interconnections from the islands can connect the energy systems of the countries with each other. The use of electricity from offshore wind to hydrogen and green fuels is also a key issue in the declarations.

The European Union's energy and climate objectives are mentioned in both declarations as the basis for the cooperation, including the objective

of climate neutrality in 2050 and the European Offshore Renewable Energy Strategy. In the declaration with Germany, the Danish political decision to establish an energy island in the North Sea and one in the Baltic Sea in 2030 is also specifically noted. In the declaration with the Netherlands, the responsibility for analyses and studies is explicitly given to the Danish and Dutch TSOs, TenneT, Gasunie and Energinet. The work will be anchored in the international consortium North Sea Wind Power Hub, where the three TSOs since 2017 have cooperated on the development of a realistic concept for artificial energy islands in the North Sea in accordance with the so-called 'Hub-and-spoke concept'.

"Danish politicians have paved the way with the decision to implement energy islands. However, I think everybody is agreed that energy islands that are only connected to Denmark are not sufficient to power the massive upscaling of renewable energy we need in Europe. That's also why it is good news that the ministers for energy and climate in Denmark, Germany and the Netherlands have signed these two declarations. Even though the declarations are not yet binding, it is still an important door which is now opening up on the road to energy islands that are connected to more than one country, says Hanne Storm Edlefsen, and continues: "We look forward to the continued cooperation with the North Sea Wind Power Hub and our good TSO colleagues in Germany and the Netherlands."

At the end of November, the Danish Minister for Climate, Energy and Utilities, Dan Jørgensen, gave Energinet order to carry out preliminary studies to the two energy islands in the North Sea and the Baltic Sea, respectively. The order from the minister includes, among other things, that Energinet must mature and develop international connections in collaboration with TSOs in the cooperation countries with which agreements are made.

5 KEY ELEMENTS IN THE TWO DECLARATIONS.

1. The declaration with Germany covers the Baltic Sea and the North Sea as hubs for offshore wind power and energy islands.
2. The declaration with the Netherlands covers hubs in the North Sea and analyses must be made with a view to 'realization of a first joint project in 2030 or as soon as possible thereafter'.
3. The purpose of the declarations is to investigate and assess options for the countries' cooperation on common energy hubs for the mutual benefit of both countries.
4. Studies under the declarations cover issues such as the distribution of RE-shares and costs, the design of the electricity market, the technology options for the electrical systems, Power-to-X, etc.
5. The declarations are political declarations of intent on objectives and measures and are not legally binding.

North Sea

8-month North Sea campaign complete

MDL has completed a multi-project campaign in the Norwegian and UK Continental Shelves with an international contractor.

The campaign commenced in May and covered installation of umbilicals and flexible jumpers in 3 different fields on both sides of the North Sea. In total 12 reels of product were installed.

MDL Third-generation Reel Drive System (RDS) was used for the SURF deployment across all scopes, mobilised onboard a single vessel for the length of the campaign.

MDL's unique RDS – the most compact system of its kind in the market thanks to the integrated MDL Track and Cradle System – had made a comeback to the client's vessel, where it had been previously used offshore Libya and in the UKCS.

In the final project of the campaign – completed in December – the RDS was complemented by the MDL TTS-2/140 Series Tensioner to form a horizontal lay spread. In client's anticipation of overlapping scopes on this project due to weather conditions, MDL mobilised a second spread, compatible with a new vessel, within 48 hours of client enquiry.

Alexander Wilson, MDL BD Manager, said: "Returning customers are always a good sign, while returning vessel and equipment pairings are a sure way of reducing project costs. Using historic vessel and equipment integration data simplified the engineering scope in the planning stage on

the first project of this campaign, with the returns multiplying across the remaining scopes.

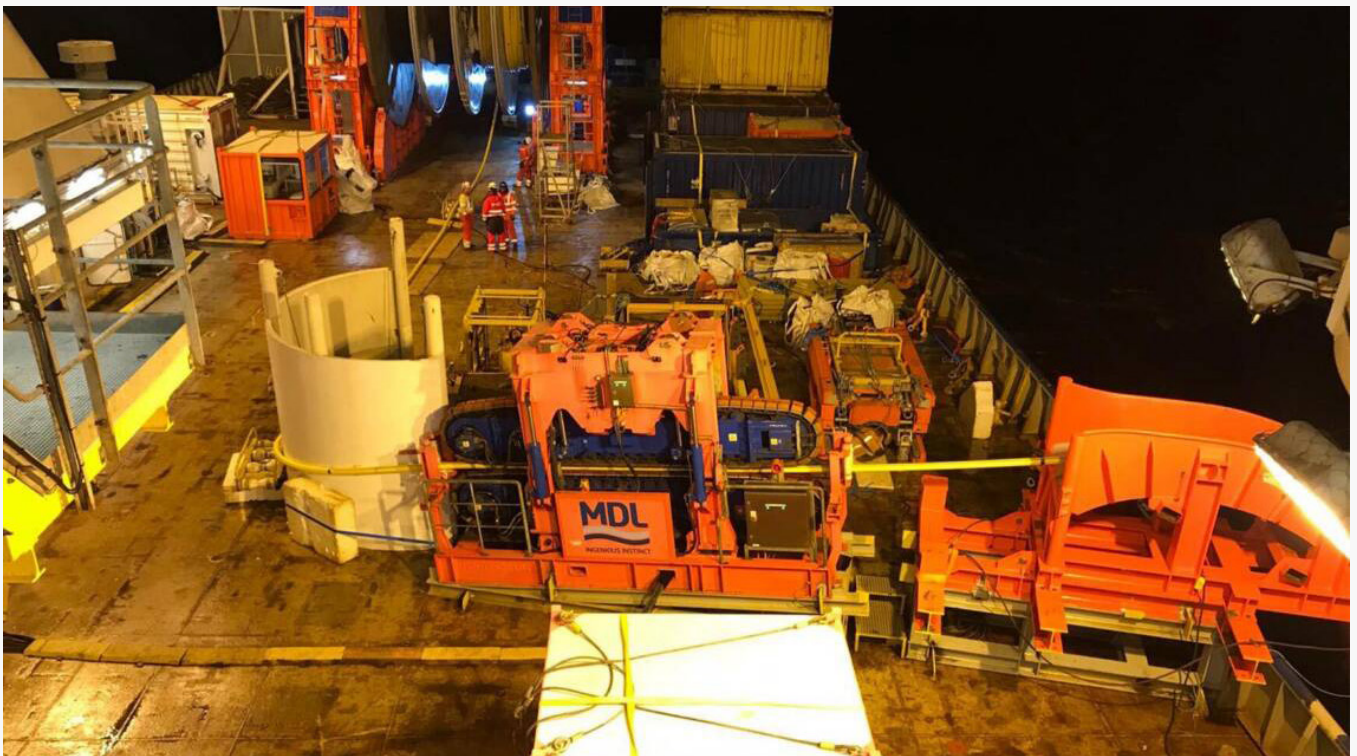
"Further savings were achieved by keeping the system on board the vessel in-between projects, which cut out all the engineering, personnel and quayside costs associated with mobbing and demobbing of equipment.

"While these are always welcome benefits, planning of the campaign in this way helped alleviate the logistical challenges posed by the pandemic.

"This is just one example of how our partnership approach to provide client support helps us find time and cost savings on every mission – so important, especially in such challenging times like today.

"With the looming winter, the last project was probably the most challenging from a planning perspective. The customer had a concern about how the weather would affect the installation and considered fast-tracking the operations by deploying a second installation vessel simultaneously with the original solution. Within 48 hours of that enquiry we had a complete spread compatible with the new vessel ready to be mobilised, a Project Engineer appointed, and offshore team briefed with regards to the scope and quarantine plans.

"While this spread was not in the end required, I believe our response demonstrated our commitment to solving customer's challenges swiftly and safely – without cutting corners."



The Netherlands – Denmark

COBRACable back in operation on January 8

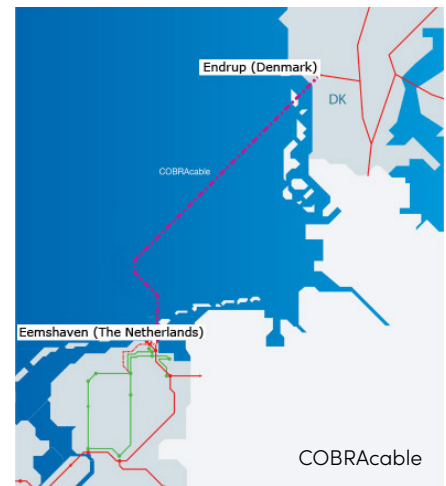
The COBRACable is planned to be back in operation on January 8, at 12:00. The COBRACable directly connects the Dutch and Danish electricity networks since 2019 but was out of operation due to a failure in the cable since the end of September. The repair operation has been successfully performed. This re-enables the import and export of renewable electricity between Denmark and the Netherlands via the 325 kilometres long submarine interconnector.

Since the end of September TenneT has been working hard to get the COBRACable up and running as soon as possible after a failure in the cable was discovered. The last few weeks, a team has been working at a vessel at sea. The cable was cut at a depth of 40 metres on the seabed and lifted. On both sides of the cut cable, the cable was measured 200 metres long to find the exact fault location.

The piece of cable where the fault has been located was removed. A new piece of cable has been installed and reconnected to the cable. The last few days, the cable has been successfully tested and laid back, buried two metres deep in the seabed. The COBRACable connection is back in operation on Friday 8th, which means that the 700 MW connection can be used again to transport electricity between Denmark and the Netherlands.

ABOUT COBRACABLE (COPENHAGEN-BRUSSELS-AMSTERDAM CABLE)

COBRACable is a 320 kV, 700 MW HVDC submarine power cable pair between Eemshaven, the Netherlands and Endrup near Esbjerg, Denmark. The cable is jointly owned by Energinet.dk and TenneT. Its purpose is to improve the European transmission



grid and thus increase the amount of variable wind power in the system while improving supply reliability.

The interconnector has a length of 325 kilometres (202 miles), consists of two parallel cables each with a diameter of 13 cm (5.1 in) and includes fiber-optic communication. The connection has been designed in such a way as to enable the connection of an offshore wind farm at a later stage. This contributes to the realisation of a sustainable international energy landscape, a key aim of the European Union.

The Netherlands

Inter-Array Cable Installation Starts at Windpark Fryslân

Van Oord has started installing inter-array cables at the Windpark Fryslân nearshore wind farm in the IJsselmeer Lake, the Netherlands.

The installation work started in December, as planned, a spokesperson for Windpark Fryslân said.

The inter-array cables will first come to shore at the wind farm's own transformer station at Breezanddijk on the artificial island of Breezand.

From there, the two cable circuits will be installed and run to Bolsward, where the energy from the wind farm will be delivered to TenneT's Frisian high-voltage grid.

Windpark Fryslân is being built in the Frisian part of the IJsselmeer and has an installed capacity of 382.7 MW.

The wind farm will comprise 89 Siemens Gamesa turbines which are expected to be commissioned in 2021.



Inter-Array Cable Installation Starts at Windpark Fryslân
(Source: Windpark Fryslân)

The installation of the monopile foundations was completed in December. The turbine installation is scheduled to start in March.

Siemens Gamesa and Van Oord are constructing the wind farm through the Zuiderzeewind consortium on behalf of Ventolines.

Van Oord is responsible for the design, manufacture, and installation of the monopile foundations and cables, as well as the delivery of the equipment to install the turbines.

Once operational, Windpark Fryslân will become the largest wind farm in the world situated in inland water.

Belgium

Ineos buys Northwester 2 offshore wind power

RWE Supply & Trading and Ineos have entered into a long-term Power Purchase Agreement (PPA) for the Northwester 2 offshore wind farm in Belgium.

RWE signed a long-term PPA with project developer Parkwind last year with plans to sell the electricity and guarantees-of-origin to its large industrial and municipal customers.

Under the terms of the new ten-year agreement set to begin in 2021, Ineos will purchase 198 GWh of green electricity per year generated by Northwester 2.

The PPA represents around 25% of the electricity generated by the 219 MW wind farm.

According to RWE, thanks to the PPA, Ineos will reduce its carbon footprint in Belgium by 745,000 tonnes of CO2 during the term of the agreement.

"This agreement with RWE is another important step as we further reduce our carbon emissions from our energy consumption in Belgium," said David Thompson, CEO of Ineos Trading.

"Combined with our earlier agreement in September, the deals reduce our carbon footprint by nearly 2 million tonnes of Carbon Dioxide."

Northwester 2 comprises 23 MHI Vestas 9.5 MW turbines located some 50 km north-west of Oostende. It was commissioned in May.



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Belgium

Belgian offshore wind farms generate 6.7 TWh of electricity in 2020

Belgian offshore wind farms generated 6.7 TWh of electricity in 2020, which represented 8.4 per cent of total electricity consumption in Belgium, or the electricity consumption of around 1.9 million families.

Eight offshore wind farms are currently operational in the Belgian North Sea, with a total installed capacity of almost 2.3 GW. This includes Northwester 2 and SeaMade, on which the construction was completed in 2020.

The 219 MW Northwester 2 offshore wind farm was commissioned in May and the last wind turbine on the 487 MW SeaMade was installed in November.

The first wind turbines off Belgium's coast were installed at the C-Power (Thornton Bank) offshore wind farm in 2009.

As of this year, the eight Belgian offshore wind farms will together produce around 8 TWh of electricity annually and will be able to cover 10 per cent of the total electricity demand in the country, the Belgian Offshore Platform (BOP) said.

According to the BOP, offshore wind farm construction in Belgium is now expected to hit a standstill for a few years, until the tender procedure for new developments in the more western Princess Elisabeth Zone kick things off again.

"Wind energy at sea is a particularly important cornerstone of the sustainable energy transition in Belgium," said Hugo Canière, Secretary-General a.i. of the Belgian Offshore Platform. "Given the great importance of offshore wind energy in the European Green Deal and the European recovery policy, it is now more than ever time to speed up the further development of this technology, which can generate green electricity on a large scale and at the same time offer interesting economic opportunities, also in Belgium".

France

TIGER surveys Morbihan tidal site off France

The teams from Université Bretagne Sud (UBS) and Morbihan Hydro Energies have carried out a series of hydrodynamic measurement campaigns and environmental characterisations of the Morbihan site in Brittany, France.

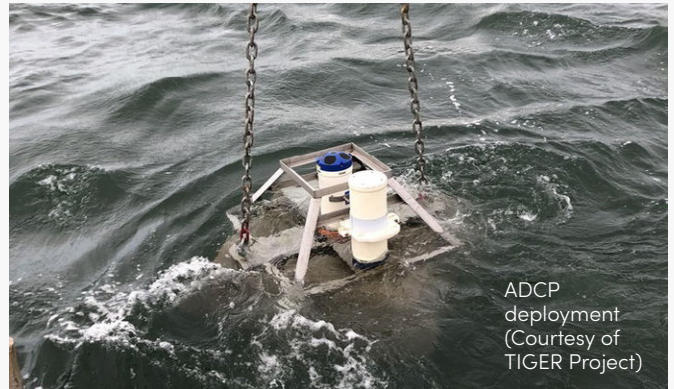
UBS and Morbihan Hydro Energies, along with Alpha & Co, deployed an Acoustic Doppler Current Profiler (ADCP V50) to collect currents and wave data over a period of six weeks starting in May 2020.

The measures of the ADCP deployment will be used to validate hydrodynamic modelling of Sabella D8 turbines that will be installed on the site as part of the €45.4 million Tidal Stream Industry Energiser Project (TIGER) project.

According to the information on project website, Sabella plans to deploy two 250kW D8 turbines at Morbihan site in 2022.

Also, from June until mid-November 2020, the UBS team carried out two measurement missions on the intertidal zone of the landing site of the experimental tidal energy project in Morbihan, in Arzon Municipality.

The main objectives of these two missions were to obtain information on morphological and altimetric characterisation, sedimentary characterization, and inventory of the fauna and flora on the site.



The information gathered will strengthen the environmental knowledge on the site, according to TIGER.

Furthermore, this initial environmental characterisation will provide elements for the Morbihan Data Centre and constitute the baseline for the environmental monitoring of the site that will be set up following the installation of the two turbines at Morbihan.

Led by the UK's Offshore Renewable Energy (ORE) Catapult, TIGER project comprises 19 partners from across the UK and France spanning turbine developers, ocean energy demonstration sites, research organisations, as well local and regional authorities.

The project aims to accelerate the growth of tidal stream energy by installing up to 8 MW of new tidal capacity at sites in and around the English Channel region, thus driving innovation and the development of new products and services.

France

RTE issues tender for grid insurance at floating trio

French transmission system operator RTE Réseau de Transport d'Electricité has issued a tender seeking insurance for the grid connection works of three floating offshore wind pilot projects.

The first lot of the tender concerns the subscription of one or more construction all risks policies relating to the grid connection works of the Groix Belle Ile, Eoliennes Flottantes du Golfe du Lion (EFGL) and EolMed projects.

The second lot is for the subscription of one or more third-party liability policies for the grid connection works, while the third lot is for the environmental impairment liability.

The duration of the contract is two years. It may be tacitly renewed for further periods of 12 months following the initial 24-month period.

The deadline for submitting applications for the tender is 5 January 2021 by 12:00 local time.

The 28.5MW Groix & Belle-Île pilot will comprise three MHI Vestas 9.5 MW turbines installed about 22km from the French coast.

The EFGL and EolMed projects will each feature three MHI Vestas 10 MW turbines. The pilots are expected to be built in 2022 and 2023, respectively.

France

French floater sets out schedule for success

The 30 MW Gulf du Lion floating wind farm off the coasts of Leucate and Le Barcarès in France has obtained its final administrative authorizations. Following this milestone, developer Les Eoliennes Flottantes Du Golfe Du Lion SAS (LEFGL) and transmission operator RTE released a schedule for the wind farm's construction and commissioning.

With this news, the pilot project in the Gulf du Lion has become the first floating wind farm in the Mediterranean to be fully authorized. Authorization procedures, including public consultation and crowdfunding, have been in the works since 2017.

The €215 million wind farm is majority owned by Ocean Winds (80%), in a consortium with the Banque des Territoires. In early 2021, the developers will establish a Technical Monitoring Committee, to oversee the main stakeholders. Engineering and financing/contractual arrangements with key partners are ongoing. The final investment decision (FID) is expected in Spring 2021.



Next Autumn will also see the beginning of works on the underground cable connections. RTE is planning to create a 20 km underwater and underground electrical connection at 63,000 volts. This will involve directional drilling, to allow underground cables to pass without the need for trenching.

In Summer and Autumn 2022, the floating foundations will be constructed, the turbines will be assembled, and all will be installed in the site. The subsea cable will also be laid in that time.

LEFGL anticipates commissioning the wind farm in early 2023.



IFA2 Interconnector

UK - France

LOC France completes its role on the IFA2 Interconnector Installation

LOC France, a subsidiary of LOC Group, the premier international marine and engineering consulting firm, is pleased to announce that, under a contract won in 2017 with RTE and National Grid, it has completed the provision of Marine Warranty Survey (MWS) services for the cable transport and installation operations for the IFA2 Interconnector, between the UK and France.

Whilst the project was managed from LOC France, the execution was a collaborative effort between LOC teams in both Paris and London. LOC's engineering, design and analysis arms, Longitude Engineering and Innosea, also contributed to the project.

Longitude provided a range of technical analyses to support the mobilisation of the construction vessels used and the cable transport and installation operations.

Innosea, the Group's technical engineering and support services consultancy, provided engineering studies related to the mooring design for the cable.

The IFA2 is a joint project between RTE and National Grid. It is the second interconnector running between the UK and France, with a total length of 204km and a high-voltage link capacity of 1GW. The interconnector will contribute to the redistribution of low-carbon energy between both countries.

As stated by RTE: "IFA2 will help RTE and National Grid to cope with the growth of electricity exchanges between France and UK, by increasing the cross-border capacity of 50%. This project will promote the complementarity of existing and future offshore production facilities on both sides of the Channel and the North Sea."

This project follows other collaborations between LOC France and RTE, France's leading electricity transmission operator. LOC's Paris team currently supports RTE on other renewable energy projects with a range of services at different project stages, including working as 'owners

engineer' on a current offshore wind development.

Hugues Delanoue, Managing Director at LOC Paris, commented: "LOC France was delighted to have been part of such a prominent international project in accelerating initiatives towards net-zero targets on carbon emissions.

This project is a good reflection of the broad range of project services we can provide at different project stages, through close co-operation with other branches of LOC Renewables.

LOC has significant experience in supporting subsea interconnector projects at different stages of a project, with expertise in MWS, early engineering consulting for marine operations, transportation and installation of subsea cables, mooring design consulting, Cable repair work, vessel design for O&M vessels and acting as owner's engineer. The Group continues to consolidate its leadership position in the offshore wind and wider renewables sector."



CROSSLAKE FIBRE

UK - France

Crosslake Fibre Selects Hexatronic for CrossChannel Submarine Cable Project

Crosslake Fibre took another step forward in its latest cable project: a system across the English Channel that will connect Slough, UK and Paris, France with dark fibre. Crosslake Fibre, the developer and operator of telecommunications networks in North America and Western Europe, has selected Hexatronic Cables & Interconnect Systems AB of Sweden to supply the high-fibre-count submarine fibre optic cable.

"We are very pleased to support Crosslake Fibre, a repeat customer, in its innovative build across the English Channel," states Henrik Larsson Lyon, Chief Executive Officer of Hexatronic Group. "Hexatronic has a broad submarine cable offering and this agreement with Crosslake further demonstrates our capabilities to provide cost-efficient, market leading solutions," adds Lyon.

The new fibre infrastructure has been optimized to create the shortest path between the two data centre hubs, providing users with an enhanced technical solution and materially lowering operating costs. With the continued increase in bandwidth demand further accelerated by the COVID-19 pandemic, subsea cables have never been more critical to the functioning of the backbone of the Internet.



CrossChannel Fibre Project

"We are excited to deliver new, much-needed connectivity across the English Channel as part of this historic project to connect the critically important data hubs of Slough, UK and Paris, France," states Mike Cunningham, Chief Executive Officer of Crosslake Fibre. "Hexatronic's double armoured, 96 pair cable provides us with an optimal solution for a high-performance cable."

CROSSCHANNEL FIBRE PROJECT FACTS:

- Submarine length of 150km
- Designed for physical diversity and lower latency
- Fewer amplification points delivering significant capital and operating benefits
- Marine Survey completed in 2020
- Ready-For-Service (RFS) date in Q4 2021
- Complete project funding in place by Tiger Infrastructure Partners

For additional information, www.crosslakefibre.ca.

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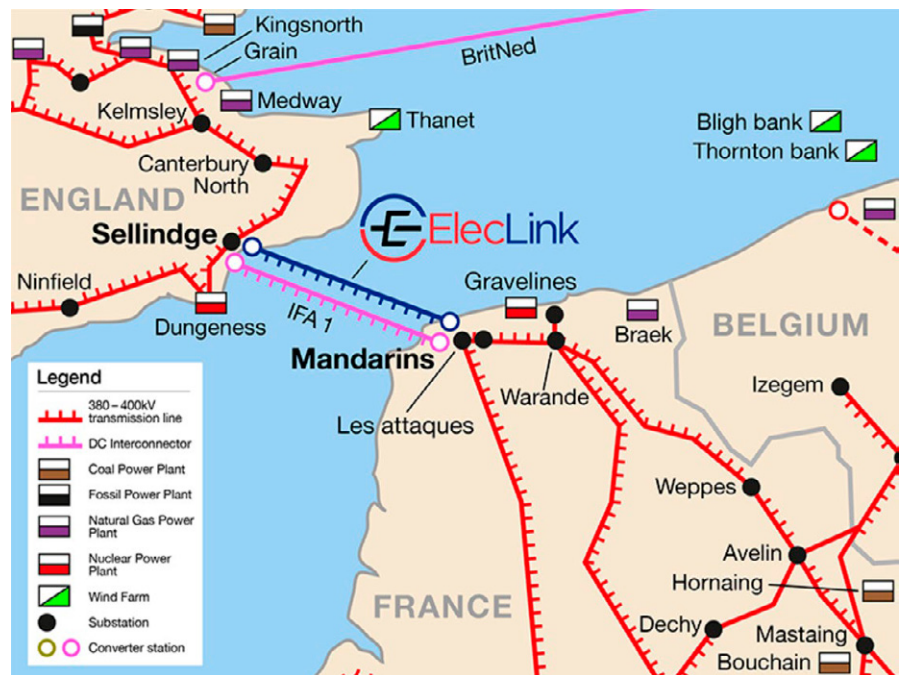
1GW ElecLink Received Major Approval from IGC

The Channel Tunnel Safety Authority, Intergovernmental Commission (IGC), has agreed to the ElecLink cable pull through the Tunnel. This new development will allow the completion of the construction phase of the proposed HVDC interconnector, and completion of converter stations in Folkestone and Peuplingues, now connected to the National Grid and RTE networks respectively.

The decision follows the authorisation obtained in October 2020 to carry out connection tests between the converter stations and the high voltage national networks.

The cable installation is scheduled to commence in February 2021, and will be finished in summer 2021. The cable pull will take place during scheduled maintenance nights in the north rail tunnel.

'This decision is the result of in-depth and rigorous work by our teams, who produced extremely detailed safety studies, as well as the excellent quality of dialogue and the trust established with the IGC and its committees. ElecLink will contribute to the robustness of European supply



and to the energy transition: our shareholders, our state regulators and all of our partners look to the future with each step forward in the project,' Yann Leriche, Getlink's Chief Executive Officer, commented.

The 65 km long ElecLink will connect France and UK electricity systems

through the Channel Tunnel. There will be no lay and burial of the link. The cable will be laid by a specially commissioned train.

The proposed 320 kV link is scheduled for commissioning in mid-2022.

UK - France

UK Government publishes a new energy white paper

The UK Government has published a new White Paper on energy together with a study by Aurora Energy Research showing the impact that interconnectors can have on decarbonisation of the energy system. The White Paper encourages the development of new interconnectors and the decarbonisation study shows an optimal capacity of 4 to 8 GW between the UK and France by 2030.

UK – The Netherlands

Unplanned Outage

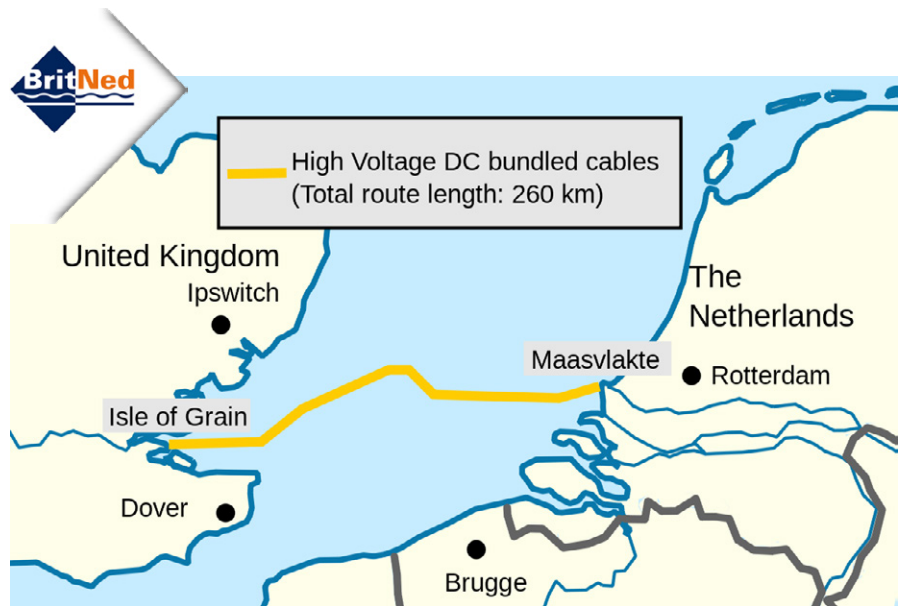
The following has been reported on the BritNed website:

"We experienced an unplanned outage on 8th December 2020 at 14:03 CET. Since that time we have confirmed that we have experienced a cable fault. Investigations into the cause and location are ongoing. We have updated our estimated return to service time to 1 February 2021.

In accordance with REMIT requirements, BritNed have communicated a return date of 1st February 2021 on the ENTSO-E Transparency Platform.

We will share further information once it is available and apologise for any inconvenience this may cause."

The preparations for the repair of the BritNed Interconnector are ongoing



BritNed Interconnector

(status 08/01/2021) – a Danish company has been contracted to cut and seal the cables before the cable repair vessel will be onsite and execute the repair operation. Sources have stated that the repair vessel will be mobilised on the 09th/10th of January 2021.

ABOUT BRITNED DEVELOPMENT LIMITED

BritNed Development Limited is a joint venture between transmission system operators TenneT and National Grid and operates the subsea electricity link between Great Britain and The Netherlands, commissioned in 2011.

UK - Denmark

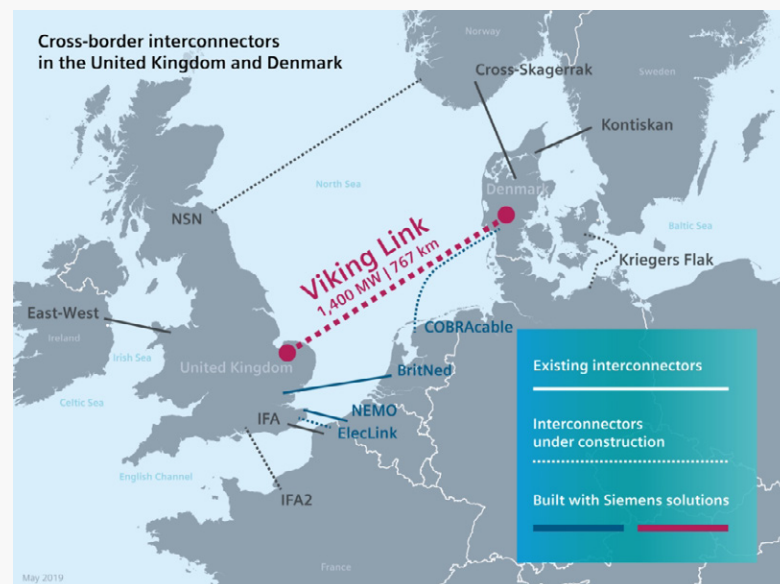
MT Højgaard and Bravida chosen to build Danish converter station

Viking Link are pleased to announce the chosen suppliers to deliver the Danish converter station.

MT Højgaard will deliver the external construction of the converter station and Bravida will deliver the internal installation works, including all services.

The two contracts have a combined value of approximately €38m.

Aligned to Siemens converter system specifications, the exterior and interior of the building is designed by Rambøll, with decorations made by artist Luciano Pezzoli. MJ Eriksson have been carrying out preparatory works on the site since August 2020 ready for the structural works to begin. MT Højgaard began ground and foundations construction works on 23rd November 2020 and Bravida are due to start the installation works shortly. "After 6 years of planning and preparation, it will be exciting to get started with the construction, and we look forward to seeing the plans



finally come into shape", says Arne Hartwigsen, sub-project manager for Civil Works in Revsing.

The converter station building is scheduled to be completed in June 2022, after which Siemens will deliver and begin the installation of the internal system.

UK

SSEN Distribution to proceed with replacement cable between Skye and Harris

Scottish and Southern Electricity Networks (SSEN) Distribution has today (17/12/2020) confirmed its decision to proceed with the replacement of the 33 kilovolt (kV) cable which runs from Ardmore, Skye to Beacravik, Harris following the recent subsea cable fault on 16 October.

Following analysis of procurement, cable manufacture and licensing considerations, it is expected that the replacement cable will be energised and operational by end August 2021. The replacement 33kV cable, which will provide increased capacity of between 8 and 10MW compared to the existing link, is expected to arrive in the UK in late May.

In reaching this decision, SSEN Distribution worked with SSEN Transmission to undertake a whole system analysis of a range of technical options for the cable replacement. Following extensive consideration, including engagement with local stakeholders and affected parties, the decision in favour of a 33kV replacement has been made to protect against further security of supply risk to customers on Lewis and Harris and to limit environmental and community impacts.

Detailed analysis of alternative solutions, including a new 132kV link, presented replacement timescales of February 2023 at the earliest, leaving customers and communities exposed to undue risk over three winters as well as being unable to resume renewable electricity export. The decision to proceed with the replacement at 33kV also avoids up to 200,000 tonnes of CO2 emissions from the back-up stations during the timescale projected for larger cable option.

Mark Rough, Director of Customer Operations, SSEN Distribution, said: "Faced with considering replacement options in an emergency scenario, we've had to balance the opportunity to progress whole system solutions with the need to restore Lewis and Harris to normal supply and generation conditions in reasonable timescales, limiting impacts where possible.

"We recognise from our engagement with the community there are a range of views about the optimum solution, each with its own trade-offs. In exploring options, it became clear that the conditions and timescales related to a larger solution posed a number of challenges which could not be reconciled without leaving customers and network users exposed to significant risk.

"Our priority as distribution network operator remains to ensure a safe and secure supply of electricity to homes and businesses on the islands whilst limiting any risk to supply wherever possible. Today's decision supports that outcome."

Whilst SSEN acknowledges recent calls from some stakeholders for a larger capacity cable to be installed and ringfenced for community renewable schemes, it is important to note that this is not permitted under industry rules and regulations. Any additional capacity must be allocated in line with the contracted position of developers on a first-come, first-served basis and network operators cannot discriminate between ownership models or technologies.

Separately, SSEN Transmission has confirmed that it remains committed to take forward a transmission link to the Western Isles with its progression remaining subject to regulatory approval. This, in turn, requires sufficient levels of renewable electricity generation on the Western Isles to demonstrate commitment to take projects forward, in line with Ofgem's expectations.

Community developers with a significant interest in connecting are therefore encouraged to make a formal application to secure their place in the queue to connect, which will support the investment case to take forward the link.



JULIAN RAWLE
CONSULTING

UK

SSEN taps NBO for new Skye and Harris subsea cable

Ningbo Orient Cable (NBO) said it has secured a contract from Scottish and Southern Electricity Networks (SSEN) Distribution to manufacture the cable for the Skye – Harris subsea cable replacement project.

SSEN recently confirmed its decision to proceed with replacement of the 33kV cable which runs from Ardmore, Skye to Beacravik, Harris.

Specifically, On 16 October SSEN received an alert to a fault on its network which temporarily interrupted power supplies to 13,600 customers on Lewis and Harris.

Investigations confirmed a fault on the 32-kilometre cable around 15 kilometres from the shore on Skye.

Based on the depth of the water at the fault location (over 100 metres), SSEN ruled out the repair option, and went for a full cable replacement.

SSEN expects that the replacement cable will be operational by end August 2021.

The replacement 33kV cable, which will provide increased capacity of between 8 and 10MW compared to the existing link, should arrive in the UK in late May.



The decision to proceed with the replacement at 33kV also avoids up to 200,000 tonnes of CO2 emissions from the back-up stations during the timescale projected for larger cable option.

In addition, NBO said that a special cable design will be applied for the condition with water depth of 200 metres.

This is the first submarine cable project the company based in the port of Ningbo in China's

southeastern Zhejiang province has ever won in Europe.

The deal will bolster the company's collaboration with global mainstream electricity suppliers and overseas general contractors, accelerate its exploration of the international market and help consolidate its lead in the undersea cable market, the statement added.

Ningbo Orient Wires & Cables will provide cables worth GBP9.14 million (USD12.27 million).

UK

Leask Marine wraps up London Array task

The Orkney-headquartered Leask Marine has completed infrastructure project work at the London Array offshore wind farm in the UK.

The work included diver supported cable cleaning and bend stiffener installation.

It was carried out by the MV C-Odyssey and crew together with a Leask Marine commercial dive team.

London Array comprises 175 Siemens SWT-3.6 turbines installed over 20 kilometers off the Kent coast on the outskirts of the Thames Estuary.

The 630 MW offshore wind farm began producing power in 2012 and was fully commissioned in 2013.

It is a joint venture of RWE which holds a 30% share, Ørsted and global investor Caisse de dépôt et placement du Québec each holding a 25% share and Masdar with 20%.





UK

Morlais Demonstration Zone
(Courtesy of Menter Môn)

Morlais tidal scheme lines up for North Wales Growth Deal boost

Anglesey tidal energy project, Morlais, is set to become one of the first projects to benefit from the proposed £240 million North Wales Growth Deal.

The North Wales Growth Deal has taken a significant step forward this week as partners formally approved the five programmes that make up the £240 million deal, according to Menter Môn.

In late 2017, a partnership that included the six North Wales councils, business partners, colleges and universities, formally launched the North Wales Growth Deal.

The proposals would enable investment of £1.3 billion in the North Wales economy from a growth deal investment of £328 million capital, and £55.4 million revenue. That's a return of £3.40 for every pound spent, according to the North Wales Growth Deal partnership.

Anglesey tidal energy project, Morlais, could be among those first projects to benefit from the deal, according to the Anglesey social enterprise Menter Môn that is running the project.

Subject to approval from Welsh Ministers, the project is set to get underway as soon as 2021, bringing major economic opportunities to the island.

Gerallt Llewelyn Jones, a director with Morlais, said: "This really is good news and a potential significant boost to our efforts to secure funding to make the project a reality. Subject to our business case, Morlais could receive £9 million from the Deal which will be a match to unlock a further £26 million from the Wales European Funding Office (WEFO).

"Ensuring local benefit is the most important driver behind Morlais. It has the potential to create at least 100 new jobs in the first ten years, with many more in the supply chain across north Wales. Much work remains to be done, but the agreement could go a long way to making sure we can bring this plan to fruition. We're grateful to the support we've had so far from government in Cardiff and London as well as our partners across many sectors.

To remind, a public planning inquiry into the Anglesey tidal stream energy project has been launched early in December 2020 as part of the process to secure the permission for the scheme.

"An important aspect of the Growth Deal is ensuring we can build a sustainable economy; this is especially true as we face the challenge of rebuilding after COVID19. With increased focus on tackling climate change – both Westminster and Welsh governments have made it clear that carbon reduction is a priority. Tidal energy is low carbon and reliable, and our aim with Morlais is to play our part in generating clean electricity and using our resources wisely", Jones concluded.

If all the necessary consents are given to develop Morlais, construction and operation will happen in phases. Work on land is expected to start in 2021 and work offshore in 2023.

The project is part funded by the European Regional Development Fund through the Welsh Government and has also secured funding for consent and development from the Nuclear Decommissioning Authority and the Isle of Anglesey County Council.

UK

Work on 19km of cabling gets underway in Angus

Work to install 19km of underground cabling which will connect the £3bn Seagreen Wind Farm to the national grid is underway in Angus.

It marks a major milestone in the construction of the 1,075MW 114-turbine development 27km off the coast of the county, which when operational, will power up to 1.3m homes throughout the country.

Once finished, the cabling will reach from where the project makes landfall in Carnoustie to a new dedicated substation currently under construction in Tealing.

The vital cable installation work is being delivered by global cable manufacturer Nexans and is scheduled to be completed by summer next year.

When complete, Seagreen – a joint venture between SSE Renewables and Total – will be Scotland's single largest source of renewable energy, providing a significant contribution to Scotland's net-zero ambition.

Onshore Electrical Infrastructure Project Manager, Steven Reid from SSE Renewables is responsible for the cable installation project. He said: "It's great that this work is underway and to see

the Seagreen Wind Farm becoming a reality. Everyone on the project including our colleagues at Nexans and our other sub-contractors have worked hard to get to this stage.

"We're extremely grateful to all who live along the route for their co-operation and understanding and look forward to delivering the 19km of cabling safely and with the least amount of disruption possible."

Nexans Project Manager, Scott McCreadie said: "We're very proud to see the months of good work during the planning and pre-construction phases of the Seagreen project finally coming into fruition.

"We are looking forward to the construction phase of the works and remain committed to delivering the project as safely and efficiently as possible, whilst maintaining minimum disruption to surrounding areas."

Leader of Angus Council, Councillor David Fairweather visited one of the locations along the route of the cable installation. He said: "This stage in the project marks a big step towards the delivery of the Seagreen Wind Farm which is important to the Angus economy both in terms of jobs but

also because of the benefits that the projects will bring to local communities.

"I'm very grateful to the people of Angus for their patience and co-operation during the cabling work and I am confident that safety is the top priority for both the Seagreen project team and the team at Nexans.

"I'll be following the progress of the Seagreen Wind Farm project closely and look forward to seeing the benefits which have been created across Angus coming to fruition."

Seagreen Wind Farm Project is supporting a £1.8M community benefit fund which will be divided between six Community Councils in Angus. £30,000 of this fund was recently released early to support projects in each of the areas with their immediate response and recovery from the effects of Covid-19.

The project is also supporting an education programme which will give over 3,000 children in Dundee and Angus the opportunity to learn about STEM (Science, Technology, Engineering and Mathematics). The programme is the first part of a £400,000 STEM programme focused on supporting STEM based skills development in Dundee and Angus.



Pictured from left to right - Steven Reid from SSE Renewables, Scott McCreadie from Nexans, Councillor David Fairweather - Leader of Angus Council, Maurice Dee, one of the workers from the cable installation team from Seagreen Project subcontractor Roadbridge

UK

Hornsea Three Offshore Wind Farm Granted Consent

The Secretary of State for Business, Energy and Industrial Strategy, Alok Sharma, has announced today, 31st of December 2020 that consent has been granted for the Hornsea Three Offshore Wind Farm.

Duncan Clark, Head of UK Region, said: "We are delighted to confirm that Hornsea Three offshore wind farm has been granted consent by the Secretary of State for BEIS. This determination is the culmination of a thorough and rigorous process which ensures that the project can deliver much needed clean energy at scale for the UK, whilst ensuring the potential environmental impacts of the project are minimised. We've worked closely with key stakeholders to develop a robust compensation plan focused on the implementation of onshore artificial nesting structures specifically designed for kittiwake. The unique compensation plan for Hornsea Three demonstrates that the industry can continue to deliver on the Government's offshore wind ambition of 40GW by 2030 in a sensitive and environmentally responsible way and we would like to thank Shoney Wind for providing specialist knowledge on kittiwake artificial nesting towers. We'd like to thank everyone involved in the project to date and for the productive discussions, feedback and comments that have helped shape and refine our proposals.

"Climate change remains a very serious threat to our environment and habitats and there is an ever pressing need to act. Once complete, Hornsea Three could provide clean power to over 2 million UK homes and offset over 128.2 million tonnes of carbon dioxide over its lifetime. It will make a significant contribution towards meeting the UK's net zero commitments and in the crucial fight against climate change. We will now be reviewing the full



Hornsea Project Three

Development Consent Order and will continue to work closely with stakeholders and local communities as we take the project forward."

The full documentation on the decision can be viewed at the Planning Inspectorate website: <https://infrastructure.planninginspectorate.gov.uk/projects/eastern/hornsea-project-three-offshore-wind-farm/>



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UK

VolkerInfra completes onshore cable installation for Hornsea Two

VolkerInfra, along with its client, Ørsted, has recently celebrated a major milestone for what will become the world's largest offshore wind farm.

The onshore cable works have now been installed for Hornsea Two, which is currently undergoing construction, 89km from shore. Reinstatement works are expected to continue on the ground until mid-2021.

VolkerInfra has installed a total of 350,000 metres of cable over 39km of Lincolnshire land, reaching from the wind farm's landfall point at Horseshoe Point, to North Killingholme.

Mark Robinson, VolkerInfra senior operations manager said: "We're delighted to have reached a significant milestone on this highly strategic project for our client Ørsted. The team has successfully completed the installation of three 220kV circuits along

the 39km onshore cable route for the Hornsea two wind farm. The route runs from the coastal section at Horseshoe Point in Tetney, to the substation site in North Killingholme, and was delivered ahead of schedule. Well done and thank you to everyone involved."

Luke Bridgeman, deputy director for Hornsea Two at Ørsted, said: "Our teams have persevered relentlessly throughout this pandemic, for which we are deeply thankful. They have maintained a clear focus on collaborative behaviours, ensuring that the works were delivered with the highest standards of safety and within the original project programme."



Having been installed over a two-year period, the cables will ultimately carry green energy, which has been generated offshore, up to the connection point to the national grid.

Once complete in 2022, Hornsea Two will host 165 8MW offshore wind turbines, generating a total of 1.4 GW of clean energy. The offshore wind farm will have the capacity to provide electricity for well over 1.3 million homes in the UK.

David Morgan, senior project lead at Ørsted said: "It has been a difficult year to deliver a project of this scale but VolkerInfra has been a great partner to tackle this challenge with."

UK

Community energy groups call on SSE to rethink the subsea cable replacement

Following meetings with SSE and Ofgem community energy companies on Lewis (Galson, Horshader, and Point and Sandwick) have issued the following joint statement. Community Energy Scotland is also a signatory to the statement. The statement reads:

"We are extremely disappointed with SSE's announcement that they are not going to upgrade the cable between

Harris and Skye, and also with the way in which the decision was made without proper consultation or scrutiny.

"SSE previously indicated that they would brief us fully on the pros and cons of a like for-like replacement versus a bigger cable and that they would allow us to have a say before making their final decision. SSE did hold a meeting with local

generators yesterday but there was no consultation.

"They simply announced that they had already taken a decision and that it was their prerogative to do so. The fact that they actually issued their press release announcing the decision while the meeting with local generators was still in progress speaks volumes for their regard to community opinion.

UK

Hornsea Project One's transmission assets worth over £1 billion



The Office of Gas and Electricity Markets (Ofgem) has published the Final Transfer Value of the Hornsea Project One wind farm's offshore transmission assets. The Authority has assessed the economic and efficient costs which ought to have been incurred in connection with developing and constructing the Transmission Assets, and values the assets at £1,174,931,778.

Ofgem does not expect any further changes to the Assessed Costs. However, it will not finalise the Final Transfer Value until the Authority has determined to grant an offshore transmission licence to the successful bidder.

Last year, Ofgem named Diamond Transmission Partners as the preferred bidder for the offshore transmission system at the Hornsea Project One offshore wind farm. Diamond Transmission Partners is a consortium of Mitsubishi Corporation and Chubu

Electric Power. Diamond Transmission Partners will be responsible for transmission of electricity from this wind farm to the UK's onshore National Electricity Transmission System.

Developed by Danish energy giant Ørsted, Hornsea Project One is the world's largest offshore wind farm to date. It is located in the North Sea off the east coast of England. The site consists of 174 Siemens Gamesa Renewable Energy. SWT-7.0-154 turbines, spanning across an area of 407km², all of which have been installed. The site was fully commissioned at the end of 2019 and is anticipated to power over one million homes in the UK.

The transmission assets for Hornsea Project One have been tendered under the sixth tender round of Ofgem's OFTO regime which saw around £2 billion of transmission assets being tendered.

Ofgem also announced that it has opened a consultation regarding amendments to Hornsea Project One's offshore transmission licence. Proposed modifications includes adding a contingent event revenue adjustment mechanism (the CEA mechanism). In summary, the CEA mechanism is a bespoke pass-through item for this Licence. It allows the Authority to adjust the Potential Licensee's revenue entitlement should costs and/or expenses arise in the event that the Potential Licensee has been required by the Secretary of State to increase the size of its security in respect of its decommissioning programme to account for the payment of VAT.

Any representations or objections to the proposed modifications must be made via email only due to the ongoing COVID-19 restrictions on or before midnight at the end of 4 February 2021.

UK

Falck Renewables and BlueFloat Energy team up for ScotWind

Falck Renewables, through its UK subsidiary Falck Renewables Wind Ltd (FRWL), and BlueFloat Energy have formed an alliance to jointly apply for one or more seabed leases in the Crown Estate Scotland's ScotWind leasing round for offshore wind projects.

FRWL has been active in the United Kingdom since 2003. The company has ten wind farms around Scotland from Kilbraur in Sutherland to Assel Valley in South Ayrshire and has its operational headquarters in Inverness. It pioneered the co-operative ownership approach to wind farm development at its Boyndie Wind Farm and supports local investment, with co-operatives owning a stake in seven of its wind farms.

Founded by a team of floating offshore wind experts, BlueFloat Energy has extensive knowledge and experience in executing floating offshore wind projects. The same team developed WindFloat Atlantic, the first floating offshore wind project worldwide to secure project finance.

BlueFloat is backed by 547 Energy, the renewable energy investment platform of Quantum Energy Partners. 547 Energy partners with entrepreneurs with a focus on the clean energy economy. Quantum Energy Partners is a provider of private equity capital to the energy industry, having managed together with its affiliates more than \$17 billion in equity commitments since inception.

FRWL managing director Richard Dibley, said: "We have over 15 years of experience of working closely with local communities and the supply chain to deliver wind farms which share their economic benefit as widely as possible with the communities around them.

"This new project will marry our community-focused approach to developing onshore wind projects with the BlueFloat team's impressive track record of delivering floating offshore wind projects. We are very much looking forward to developing new offshore wind projects that really benefit Scottish communities and

manufacturers, providing jobs and economic prosperity."

BlueFloat Energy's CEO Carlos Martin said: "We are thrilled to collaborate with such a strong local player as Falck Renewables. We have very complementary strengths and competences, which puts us in a unique position to successfully deliver floating offshore wind energy projects in Scotland.

"By leveraging our experience of developing and executing the WindFloat Atlantic project in Portugal, the BlueFloat Energy team is able to bring insights into the key challenges and complexities of floating wind project development, financing and execution. Having Falck Renewables onboard with their unique set of capabilities, skills, and keen focus on community engagement, gives us great confidence that we can tailor our expertise to local requirements in Scotland."

UK

Scotland Reveals BT Fibre Broadband Rollout for R100 LOT 1

After a long delay the Scottish Government (SG) and BT (Openreach) have finally signed a rollout contract for LOT 1 (North Scotland and the Highlands) of the £579 million Reaching 100% (R100) project, which will see "superfast broadband" speeds of 30Mbps+ reaching many more rural premises (mostly via gigabit FTTP).

Last year Scotland awarded two out of its three contracts under their R100 project – Central (LOT 2) and Southern (LOT 3) – to BT (Openreach). Meanwhile the decision to hand the LOT 1 deal to BT (here) ended up being stalled by a legal challenge from rival bidder Gigaclear (here).

Thankfully the legal disputes was finally resolved in August 2020 (almost a year later) after the provider agreed to a confidential settlement with the Scottish Government. The decision meant that the Government could move forward with signing

the LOT 1 contract, which it needed to do before the end of 2020 in order to avoid another delay due to the end of existing state aid rules.

LOT 1 DETAILS

LOT 1 is the largest one and is valued at £384m. Under the procurement process this was said to reflect about 100,000 remote premises across the Highlands and Islands, Angus, Aberdeen and Dundee. The contract also specified 9 mandated areas where 25% of premises must be able to get speeds of at least 100Mbps (on a Gigabit-capable connection).

The contract will also involve the laying of 16 new subsea fibre optic cables, which aims to ensure "future-proofed, resilient connections in all island local authorities," although it doesn't provide a list of those routes.



UK

Ofgem Selects Preferred East Anglia ONE Transmission Operator

UK energy market regulator Ofgem has named Transmission Capital Partners the preferred offshore transmission owner (OFTO) for the 714 MW East Anglia ONE offshore wind farm.

Transmission Capital Partners is a consortium of Transmission Capital Partners Limited Partnership and International Public Partnerships Limited.



Prior to becoming a successful OFTO bidder, Transmission Capital Partners needs to establish the necessary arrangements to provide offshore transmission services for the project, including having all relevant contractual, funding, regulatory and operational arrangements ready for the transfer of the transmission assets and the grant of the offshore transmission licence.

The company will also have to put in place a bilateral agreement with the

holder of a co-ordination licence to provide transmission services for the project; accede to the System Operator – Transmission Owner Code; and resolve any other matters which Ofgem determines are necessary in relation to the project.

Located 43 kilometres off Suffolk, East Anglia ONE comprises 102 Siemens Gamesa 7 MW turbines which were fully commissioned in July 2020.



UK

ScotWind offshore wind leasing round opens for applications

Crown Estate Scotland has opened the application window for the ScotWind seabed leasing round for offshore wind projects.

From today, 15 January 2021, registered developers are able to apply for seabed rights to build Scotland's next generation of offshore wind farms.

The closing date for submitting applications is 31 March.

Opening the application window follows Marine Scotland's publication of its Sectoral Marine Plan for Offshore Wind Energy outlining the areas suitable for development.

Crown Estate Scotland has now made available to applicants' final technical details of the application requirements, including provisions reflecting the Sectoral Marine Plan, which will enable them to make informed applications.

"Today is an important milestone in the development of ScotWind Leasing, and we are looking forward to receiving applications and continuing to work with all interested groups over the coming months," said John Robertson, Head of Energy and Infrastructure at Crown Estate Scotland.

"Over the last three years, we've engaged extensively with industry and other interested groups about the goals and ambitions of ScotWind Leasing. This has helped ensure a robust and clear process that can successfully deliver the projects of the future and play a big role in Scotland's net zero ambitions."

Crown Estate Scotland launched the ScotWind leasing round in June 2020, inviting investors and developers to register interest in obtaining an option agreement which can lead to the signing of leases.

UK

CIP to sell Beatrice stake to TRIG and Equitix

Copenhagen Infrastructure Partners (CIP) is selling its 35 per cent stake in the 588 MW Beatrice offshore wind farm to The Renewables Infrastructure Group (TRIG) and funds managed by Equitix Investment Management Limited.

TRIG has exchanged contracts with CIP to acquire an equity interest of 17.5 per cent in the project. Funds managed by Equitix Investment Management Limited are acquiring the remaining 17.5 per cent stake from CIP, according to TRIG.

The Beatrice offshore wind farm is located approximately 13 kilometres off the north east coast of Scotland and comprises 84 Siemens 7 MW turbines which utilise direct drive technology. The project has a 15-year maintenance agreement in place with Siemens.

Developed by SSE plc, the wind farm has been in operation since 2018.

The project's CfD subsidy fixes the price received for all power generated until 2034, with indexation to inflation. Debt financing on the project is fixed rate and fully amortising within the subsidy period.

The investment, which is subject to regulatory and lender consents, which are expected to be received in the coming weeks, will be financed from a drawdown of TRIG's recently renewed revolving credit facility.

TRIG's co-shareholders in Beatrice will be SSE plc (40 per cent), funds managed by Equitix Investment Management Limited (17.5 per cent), and Red Rock Power Limited (25 per cent).

"We are pleased to have the opportunity to invest in this high-

quality project developed by SSE, who are a leading generator of renewable electricity in the UK," Richard Crawford, of InfraRed Capital Partners, said.

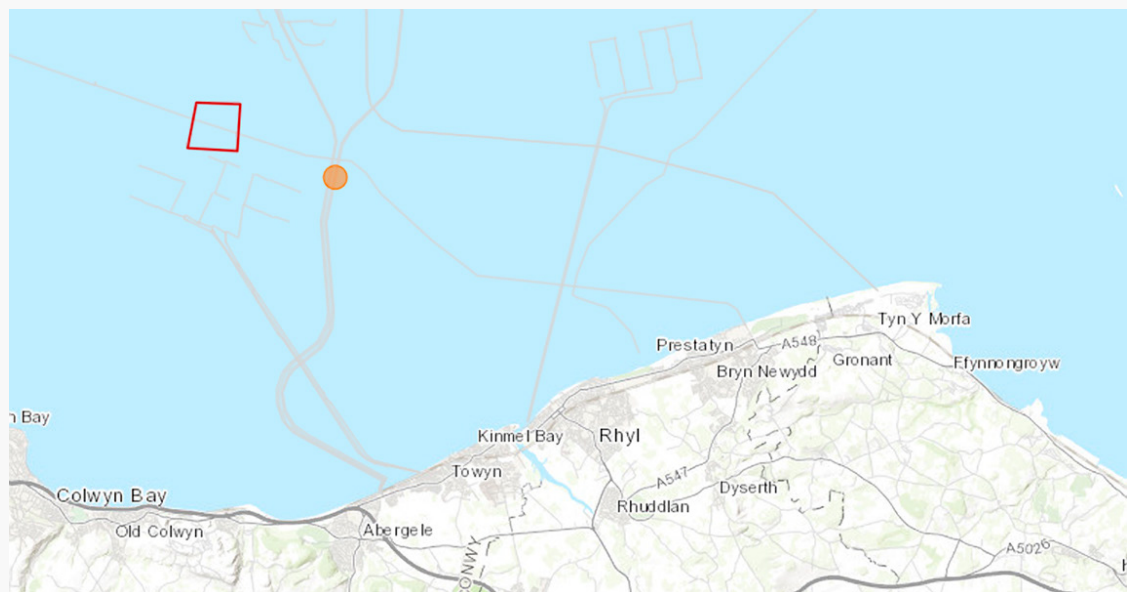
"As investment Manager, InfraRed seeks attractive opportunities for TRIG that increase the robustness of the portfolio, helping to deliver sustainable returns to shareholders from a diversified portfolio of renewables infrastructure. This major acquisition represents a continuation of this investment strategy and will be the Company's third investment in a UK offshore wind farm and its 5th in the offshore wind sector."

Following the completion of the transaction, Beatrice will represent approximately 12 per cent of TRIG's investment portfolio.

UK

Export Cable Repair ongoing

Briggs Marine Contractors has been contracted by Gwynt-Y-Mor OFTO to undertake a repair to the SSE3 export cable due to a power core fault. These operations will commence 05/01/2021 until the 28/01/2021 using the vessel DP2 Jack up installation vessel, Blue Tern and the multi-purpose support vessel, Zwerver. Additional support will be provided by the Crew Transfer Vessel, Icen Defiant.



Export Cable Repair Location – Gwynt-Y-Mor

UK

Subsea cable damage caused Westray broadband outage

An emergency subsea cable repair ship had to be dispatched in efforts to resolve a broadband outage in Westray.

A damaged cable approximately 8km off the Mainland was the cause of the outage.

Openreach confirmed, on the 16th of December, that a ship is expected to set sail from the Isle of Portland tomorrow and reach Orkney by Sunday in order to undertake repairs.

Meanwhile, engineers were working to provide a radio link to the island, which will provide some broadband service to around half the island's households.

An Openreach spokeswoman said: "Our emergency response team has arrived on Mainland and we're following COVID precautions recommended by the council before heading to Westray to provide emergency wifi.

"We're sorry about this disruption to service. Residents and businesses can seek further advice from their broadband providers."

On the 22nd of December 2020 the repair of a damaged subsea cable which has disrupted broadband service on Westray was progressing.

The cable ship CS Sovereign arrived on schedule in the early hours of 21st of December 2020, and picked up the Westray end of the cable. It then recovered around 300 metres of damaged cable, in a position approximately eight kilometres off the Orkney mainland. The damaged cable has caused a loss of broadband services on Westray. Phone and mobile phone services are not affected.



The CS Sovereign pictured from Evie, looking towards Westray.

Openreach said that for safety reasons, the ship, which travelled to Orkney from Portland in south of England, moved further out to sea overnight before resuming work this morning.

The spokesman added: "Subsea cable repairs are very complex and time consuming and we expect the work to take several days. All going well, the subsea team hope to start testing the route on Christmas Day or Boxing Day, subject to sea and weather conditions.

On the 29th of December 2020, broadband was restored in Westray.

Openreach confirmed that the cable ship which was sent to Orkney to repair the damage has now completed its work.

The company apologised for the loss of service and thanked customers in Westray for their patience.

SUBMARINE CABLE EXPERTISE

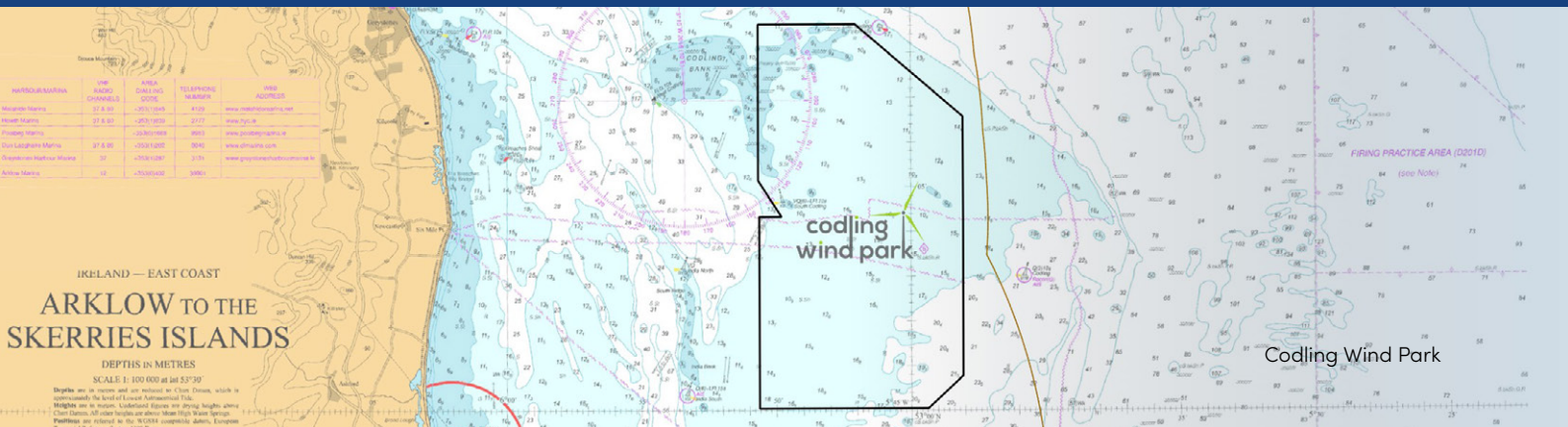
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Ireland

Scoping report issued for Irish offshore wind farm

Codling Wind Park Ltd has issued the scoping report for the offshore elements of the Codling offshore wind project in Ireland.

The report, sent to 78 consultees, sets out the approach that will be taken to the development of the Offshore Environmental Impact Assessment Report (EIA).

The purpose of the scoping report is to engage with regulators, statutory and non-statutory consultees as part of the EIA process, inviting them to provide

relevant information and comment on the proposed approach being adopted in relation to the offshore elements of the project.

This is to ensure that a robust EIA report is submitted in support of the eventual application for planning consent.

A similar scoping report for the onshore elements of the project is also being developed and will be finalized in the coming months.

The 1 GW Codling Wind Park is being developed by a joint venture

partnership between Fred Olsen Renewables and EDF Renewables. It is spread across two sites, one of which, Codling 1, is consented.

In May 2020, the Irish government designated seven offshore wind projects as relevant and put them on a fast-track through the new marine planning regime. One of the selected projects is Codling 1 and 2.

Subject to the consenting process, the developers anticipate that the wind farm will be constructed in the mid-2020s.

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SUBCOM

TECHNOLOGY LEADER, DRIVING TOWARD TRANSOCEANIC PETABIT CAPACITY

Portugal

WESE project carries out WaveRoller monitoring off Portugal

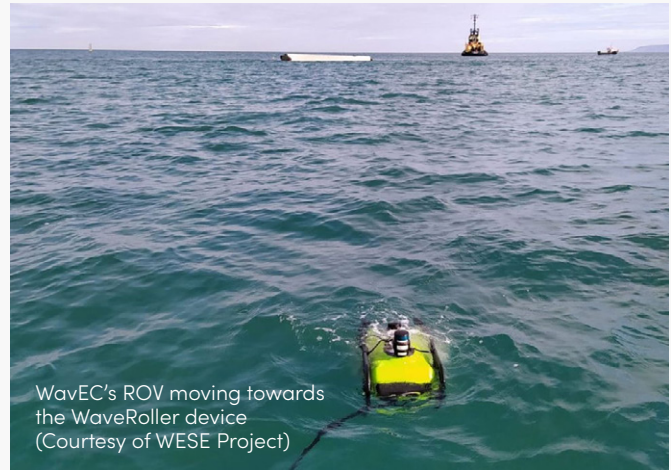
WESE project has completed an environmental monitoring campaign for the WaveRoller wave energy device deployed off the coast of Portugal.

Following the monitoring plans developed earlier in the project, a two-day monitoring campaign was undertaken by WavEC Offshore Renewables around the WaveRoller device from the Finnish developer AW-Energy in Peniche.

On the first day, 16 October 2020, acoustic monitoring was performed simultaneously to the decommissioning of WaveRoller – for maintenance purposes – to assess the noise emitted during the activities.

Underwater sound emissions were monitored by means of static underwater measurements for a period of 9-10 hours.

Static measurements consist in the deployment of a passive acoustic sensors moored in a specific location and for a long period of time. Salinity and water temperature profiles were performed as complementary data of underwater noise measurements, according to Wave Energy in Southern Europe (WESE) project.



WavEC's ROV moving towards the WaveRoller device (Courtesy of WESE Project)

On the second day, 17 October 2020, an ROV campaign was undertaken for the seafloor integrity monitoring to allow evaluating possible alterations of the seafloor by the presence of the device and by mooring cables.

WavEC's ROV was used to collect videos – each about 30 minutes long – along five transects/areas near to the WaveRoller. It included the device and its foundation, mooring cables and the electrical cable.

The analysis of the data collected will support the development of models for the analysis of potential cumulative pressures and environmental impacts of future larger scale wave energy deployments.



Events

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Spain - Algeria

ALVAL/ORVAL Cable System in Service

The Alval / Orval fiber optic submarine cable system (connecting Algiers and Oran to Valencia in Spain) is finally operational and its effective commissioning will allow Algeria to have, in the long term, a capacity of up to up to 40 Terabits, nearly 20 times the country's current needs, thereby significantly improving internet speed.

This system, which was to be launched in December 2019, was only put into service on December 31, 2020 due to "financial, legal, administrative and technical constraints".

The new system should make it possible to "efficiently" manage the flow of internet entering and leaving Algeria, the transfer of DATA while increasing the speed and the flow of information to Algeria, but also the connection capacities to home and in businesses, according to the Ministry of Post and Telecommunications.

Orval / Alval reinforces the two other submarine links passing through Annaba, including Medex with a capacity of up to 2 Teras, and a third Alpal 2 cable passing through Algiers via Palma Di Mallorca (Spain) with a speed of 85 Gigas, deemed "insufficient".

The Alval (Algiers-Valencia) and Orval (Oran-Valencia) fiber-optic submarine cable precisely links the national communication network, from El Djamilia station in Algiers and that of Oran, to the European network, at the city of Valencia. Its length exceeds 770 km of optical fiber under the sea.

With a lifespan of 25 years, this cable provides a very large available transmission capacity (up to 40 Terabits / s), nearly 20 times the current needs of Algeria (by the end of 2020, this capacity had reached 2.4 Tera, compared to January 2020 when it was 1.7 Tera).



ALVAL/ORVAL Cable System

According to the website of the Ministry of Post and Telecommunications, the Alval / Orval cable has 4 pairs of optical fibers connecting the three stations. It will initially deliver 3x100 Gigabits / s per fiber pair and can scale up to 10 Terabits / s per fiber pair, for a total of 40 Terabits / s, using the latest technology at 100 Gb / s for each length of wave.

The total length of the submarine cable is 800 km, of which 770 km were laid under the sea. The system has nine repeaters, with 4 pairs of fibers, manufactured especially for the Orval / Alval system, as well as two units. connection, one of which was installed in the open sea and the other remains in reserve.

The Orval / Arval project was registered under the ORSEC plan as part of the security of the national communication network, following the incident that marked it during the 2000s, when Algeria had only one route international fiber optic communication.

This project makes it possible to effectively double and protect (redundancy in the event of a natural disaster) the two submarine links Algiers-Palma (Alpal2) in the center and Annaba-Marseille (SMW4) in the East, to offer a variety of

points of international landing and increase the capacity of the historical operator Algérie Télécom in the field of communications and broadband Internet.

At a cost of 27 million dollars, Arval / Orval is the first submarine system managed "100% by Algeria, providing total independence to the country", in particular with the creation, in 2016, of Algeria Telecom Europe in Spain in order to represent Algeria in the implementation of the system and its economic exploitation.

As a reminder, in March 2015, Algeria signed a contract with the Alcatel Submarine Networks (ASN) Group for the construction of the Orval fiber optic link. A contract was also signed with IT International Telecom Marine SRL.

In August of the same year, the supervisory ministry signed a notification of agreement for Algérie Télécom (AT) authorizing it to join the Orval project through the implementation of the Alval project, financed from AT's own funds.

The laying of this submarine cable, the development and installation of all the equipment of the two stations of Oran and Algiers began in December 2015, to be finalized in June 2018, according to the supervisory ministry.

Malta – Gozo

Second fibre optic cable inaugurated between Gozo and Malta

The official launch of the second fibre optic link between Gozo and Malta, has been welcomed by the Gozo Business Chamber, as well as the signing of an agreement between the three telecom operators on the operation of this link.

The Prime Minister Robert Abela together with the Minister for Energy, Enterprise and Sustainable Development Miriam Dalli and the Minister for the Economy and Industry Silvio Schembri, inaugurated the second fibre optic cable this morning, with the Prime Minister saying that it will “connect Gozo with the rest of the world and continue to create more quality work.”

He stressed that “Gozo must be the showcase of the digital core. A centre from which we can carry out this economic transformation of our country. But this is only the first step. I want Gozo to be like Malta – the best in Europe.”

The Government said that has also considered setting up the Gozo Fibre Optic Cable Ltd company, which has been entrusted to operate and maintain the new end-to-end link.

It said that this company negotiated and successfully concluded an agreement with three telecommunications operators in our country.

Dr Abela thanked Malta Enterprise, led by Kurt Farrugia, for their commitment to Gozo and for the hard work done to complete this project successfully, Gozo Fibre Optic Cable Ltd led by Mr Mario Galea who was among those who strongly believed in this project and to Electra and Orange for the work they have carried out in this new infrastructure.

Minister for Gozo Clint Camilleri said that this second fibre optic cable between Malta and Gozo will help attract more investment in Gozo related to gaming and the internet and will make Gozo accessible to the rest of the world.

The Minister for the Economy and Industry Silvio Schembri stated that “as a Ministry, we firmly believe that this investment will strengthen the competitiveness of the island of Gozo so that it can attract new investment that will lead to the creation of new jobs in Gozo.”

Minister for Energy, Enterprise and Sustainable Development Miriam Dalli said that “with strong connectivity between Malta and Gozo, both businesses directly related to technology and other sectors essential to the quality of life will benefit. These include health, education, manufacturing and the creative industries, among others.”



Gozo Fibre Optic Cable Chairman Mario Galea said that through the opening of this cable, business opportunities will be opened up in the digital economy, remote gaming, digital niches, nomads and in many sectors that require the support of digital transmission.

Malta Enterprise said this is an important part of the Government’s economic vision, that “with innovation we will attract more companies to Gozo.”

It went on to say that it had a vision for the second fibre-optic link to Gozo and “worked to make this vision a reality.”

It has now become much easier for new companies to operate through this Gozo connectivity that will also benefit other sectors essential to the quality of life of Gozitans, such as health and education, Malta Enterprise said.

The GBC, in its statement said that it had advocated the proposal of a second fibre optic cable for a number of years. “Seeing this proposal being implemented is an important milestone, which will ensure and secure the development of certain economic sectors on the island.”

The importance of this second fibre optic link lies in the fact that it will be providing ease of mind to those willing to invest in the digital sector in Gozo, the GBC said

It stressed that the pandemic has shown the importance of diversifying the Gozitan economy, which is over-reliant on certain economic sectors such as tourism.

The Chamber pointed out that the second fibre optic link also complements another important investment, which is the Digital Innovation Hub in Xewkija.

The Chamber concluded by saying that it believes that this second fibre optic link will help to attract companies in the digital sector to set up business in this Hub, creating an ecosystem of businesses in this sector, which will also impact positively local economic operators.

Italy

CIP invests in 250 MW floating wind farm in Italy

Copenhagen Infrastructure Partners (CIP) has invested in the development company 7 Seas Med, which has been developing a 250 MW floating wind project off the coast of Italy, in the Sicily Strait.

CIP, Nice Technology and 7 Seas Wind Power have joined forces to develop the wind farm, for which 7 Seas Med already filed a concession request, according to Green Giraffe, which

acted as sole financial advisor to 7 Seas Med to raise equity and develop the 250 MW project.

As reported in July, 7 Seas Med requested a 30-year maritime state concession in the Sicilian Channel. According to the application document, the wind farm would comprise 25 wind turbines with an individual capacity of 10 MW, installed on semi-submersible TetraSpar floating foundations.

The project, called Hannibal and valued at EUR 740 million, is anticipated to enter the construction phase in 2023.

CIP's involvement in the 250 MW development has been reported earlier in Italian media, which said that the project was being developed by Copenhagen Offshore Partners with assistance from CIP.

Italy

Italian govt adds Santo Stefano to islands fibre project

The island of Santo Stefano, in the municipality of Ventotene, has been added to the list of 'white areas' that will receive state support for deploying fibre broadband. The decision was approved at the latest meeting of the Ultra Broadband Committee (Cobul), following a proposal from Minister for Technological Innovation and Digitization Paola Pisano, who leads the committee.



Greece - Italy

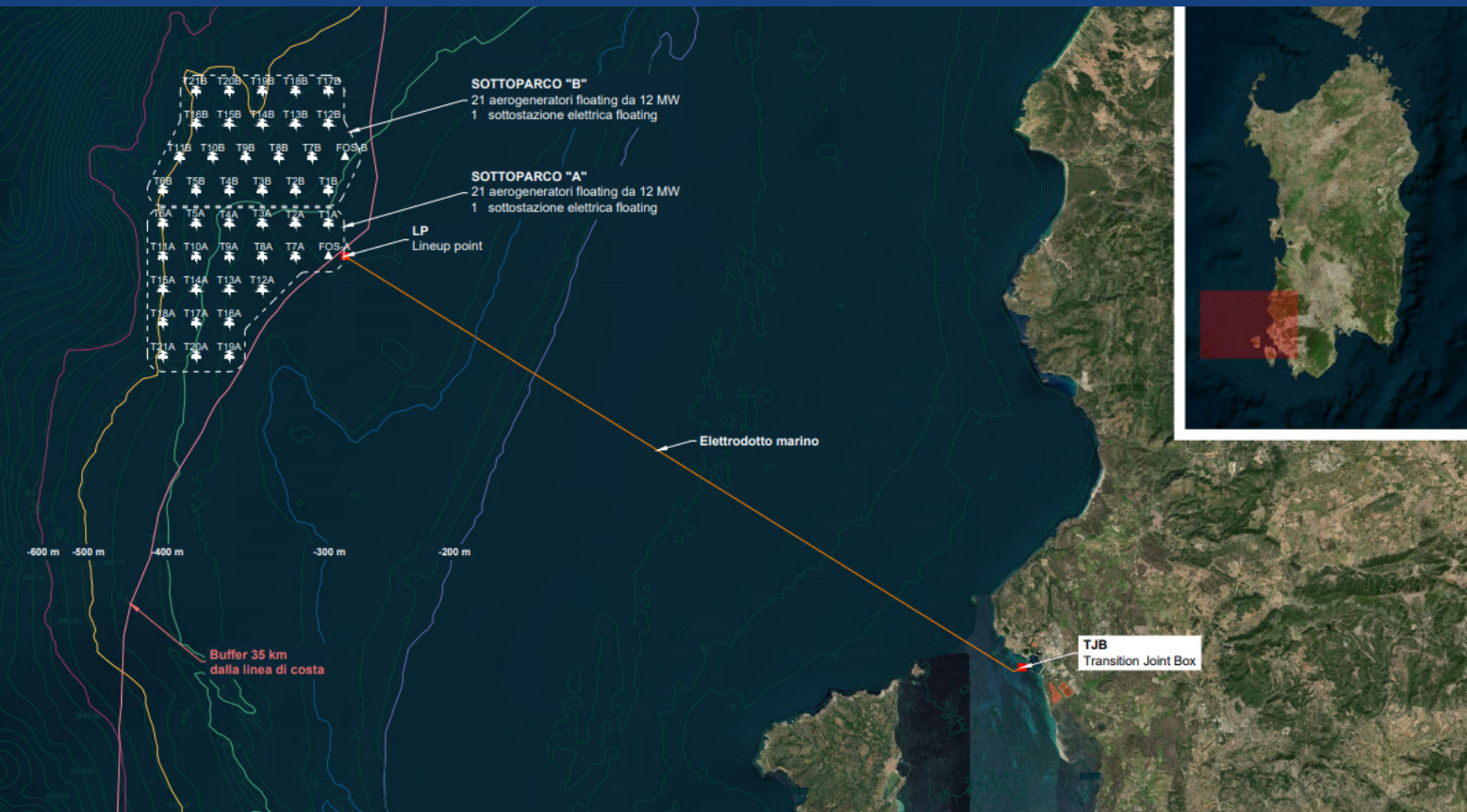
Greece eyes new power cable with Italy by 2031

Greece and Italy will be looking to build a new undersea power interconnector with up to 1GW capacity by 2031, according Greek grid operator IPTO's 2022-2031 preliminary development plan presented recently.

IPTO and its Italian counterpart Terna will "examine the alternative solutions for the development of a new submarine interconnection between the Greek and Italian systems, while at the same time the possibility of utilising existing infrastructure will be explored," said an official statement.

According to IPTO estimates, the new power cable capacity would range between 500MW and 1,000MW. The two countries are currently connected via one 500MW undersea cable which enabled the launch of day-ahead market coupling last December.





Italy

Plans Revealed for 42-Turbine Floating Wind Farm Offshore Sardinia

Milano-based Ichnusa Wind Power srl has applied with the Port Authority of Cagliari for a 30-year concession to build and operate an export cable connection for a floating wind farm off the west coast of Sardinia.

According to the project's application documents, Ichnusa Wind Power plans to construct a wind farm, Sardegna Sud Occidentale, comprising 42 floating wind turbines some 35 kilometers off the coast of the San Pietro island.

The developer is seeking permission to construct underground and subsea ducts for the 220 kV export cable on the west pier of the port of Portovesme, the Municipality of Portoscuso, Sardinia, to connect the wind farm with an existing onshore substation.

The concession would also cover the export cable route beyond the territorial waters.

The Sardegna Sud Occidentale wind farm will feature turbines with a rated capacity of 12 MW and have a total capacity of 504 MW.

The wind turbines will be connected to the floating offshore substation via a 66 kV inter-array cable system. The project is reportedly valued at around EUR 1.4 billion.

Ichnusa Wind Power has also submitted the Environmental Impact Assessment project documentation with Italy's Environment Ministry.



Greece

Crete- Peloponnese Interconnection: The largest subsea AC cable in the world has been electrified

- A historical success for IPTO and the contractors.
- IPTO successfully electrified the first subsea cable linking Crete to the mainland power grid, which is also the largest subsea AC interconnection in the world.

The completion of the 24-hour test electrification signifies a historical success for the Operator and the contractors, as they faced up to the significant technological challenges with effectiveness and technical efficiency, transcending – to a considerable extent – what has been achieved so far in similar international projects.

It is noted that the eastern circuit of the interconnection, that was electrified, consists of the following subprojects:

- Submarine cable with a length of 132 km between Chania, Crete and Neapoli, Lakonia (Contractor: PRYSMIAN),
- Underground cables with a length of 42 km in Crete and Peloponnese (Contractors: HELLENIC CABLES S.A. and FULGOR S.A.),
- New substation in eastern Peloponnese and upgrading of the existing substation in Chania (TERNA S.A.).

The power link of Crete and Peloponnese is called the “interconnection of the records” as it is:

- The longest AC cable interconnection in the world (174 km).



Interconnection of Crete with Peloponnese (Courtesy of ADMIE)

- The longest submarine high voltage interconnection in the world with a triplex cable of XLPE isolation (132 km).
- The deepest submarine high voltage interconnection in the world with a triplex cable of XLPE isolation (at a depth of 1,000 m.).

The project also entails important management difficulties, as the new interconnection extends from Megalopolis all the way to Chania and Heraklion, Crete, including a total of eight towns in its design. In this respect, IPTO consulted with local bodies and authorities aiming to mitigate potential nuisances and search for optimal solutions, such as undergrounding of transmission lines, where possible.

The project has a total budget of 356 million euros and is being implemented with the co-financing of Greece and the European Union as well as a loan from the European Investment Bank (EIB).

Mr. Kostis Hatzidakis, Minister for Environment and Energy stated: “The test electrification of Crete-Peloponnese interconnection means that crucial infrastructure, not only for

Crete but for the country in general, is just one step away from its completion. It is a milestone for the planning of island interconnections, as they are truly “green” projects with an exceptionally positive environmental and socio-economic footprint. That is why the Ministry of Environment and Energy supports the acceleration of these projects, which will also be financed by the Recovery Fund.”

Mr. Manos Manousakis, President and CEO of IPTO, commented in this regard: “The first interconnection of Crete with the mainland system is a reality. After the completion of the trial electrification we can definitely say that the “energy exclusion” of Crete is now lifted. We are very satisfied about the fact that we managed to electrify the “interconnection of the records”, precisely two years after the signing of the relevant contracts. We accomplished it thanks to the devotion of our employees, despite the adversities and the technical challenges. With the timely implementation of emblematic projects, IPTO meets the challenge of electric interconnections in defiance of the pandemic crisis.”

Greece

Cyclades interconnection phase four launches cabling call

The fourth phase of the Cyclades Interconnection project is advancing with cabling tender for Santorini – Naxos power link now up for grabs.

It includes the design, supply and installation of a simple installation of underground and underwater cables of 150kV AC circuit, for the interconnection of Santorini with the National Electricity Transmission System (ESMIE) on the island of Naxos.

The fourth phase of the project will also see interconnection of the islands of Folegandros, Milos and Serifos.

The project has an estimated value of 100 million euros excluding VAT and the contracting authority is IPTO.

Final call to apply has been set for 29 January 2021.

The tender will go electronically, through the “sourceONE” system of electronic tenders of the company cosmoONE on behalf of A.D.M.I.E.

The fourth phase should wrap up in 2023–2024 with the estimated cost of about 380 million euros.

CYCLADES INTERCONNECTION

The project development has four phases. The first phase, which connects the island of Mykonos with the mainland, includes the connection of Syros island with Lavrio (on the Greek mainland), and with the island of Tinos, as well as the Syros–Paros and Syros–Mykonos connections.

The second phase includes the installation of submarine cables between Naxos–Mykonos and Naxos–Paros, as well as the construction of a closed type substation (GIS) in Naxos.

It also includes the upgrade of the existing cable connection of Evia – Andros and Andros – Tinos, completed in early 2020.

The third phase entails a second underwater cable linking Lavrio with Syros.

The fourth and final stage of the power interconnection of the islands of Cyclades includes connecting the islands of the South and West Cyclades, such as Serifos, Milos and Santorini.

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Greece

Terna Energy gets green light to expand wind power portfolio in Evia

Terna Energy is developing 18 wind power plants of an overall 360 MW in Karystos on Evia island. The endeavour is worth EUR 585 million. It includes a future undersea cable of 69 kilometers leading to Attica.



Bulgaria

Bulgaria bets on offshore wind as post-2030 power source

In line with the EU strategy on offshore renewable energy, Bulgaria is planning a fivefold increase in its installed capacity from wind resources between 2030 and 2050, according to the draft "Sustainable Energy Strategy to 2030 with a horizon of 2050".

According to the strategy, Bulgaria's wind installed capacity will be around 950 MW in 2030, which is slightly more than current levels. Hence, an increase to 4500 MW installed capacity by 2050 is related to planned investments in offshore wind, a technology that Bulgaria is not currently utilising.

This planned increase in electricity production using wind sources (from the current level of 1450 GWh to 16,660 GWh) will place this technology alongside nuclear and biomass/EfW in terms of importance by 2050. According to the draft strategy, all electricity produced by wind sources in Bulgaria will be utilised domestically.

The strategy closely follows recent EU policies for offshore renewable energy and the Union's ambitious energy and climate targets. The key policy is the Commission's EU strategy on offshore renewable energy (COM-2020-741, 19 November 2020) that assesses the potential contributions of this sector and proposes ways to support its long-term sustainable development.

From today's installed offshore wind capacity of 12 GW, the EU's objective – considered both realistic and achievable – is to reach an installed capacity of at least 60 GW in offshore wind and a 1 GW capacity in ocean energy by 2030, with plans to expand its installed capacity from 40 GW to 300 GW by 2050.

Across the EU, the Commission's strategy predicts that the installed capacity of offshore wind will increase five times between 2030 and 2050.

The EU supports the idea that the Black Sea offers natural potential for offshore wind (using bottom-fixed and floating technology) and localised potential for wave energy with regional cooperation already supported by the Common Maritime Agenda for the Black Sea. One of the priorities of the Black Sea strategic research and innovation agenda is to stimulate emerging blue economy sectors, such as offshore wind and wave technology.

In addition, the EU high level group for Central and South Eastern Europe Energy Connectivity (CESEC) could also foster regional cooperation initiatives in the Black Sea.

To reach the goal of large-scale deployment of offshore renewable energy technologies in the EU by 2050, an estimated investment of EUR 800 billion will be needed, of which two thirds will be used to fund the associated grid infrastructure and a third will be devoted to offshore generation.

Yearly investment in onshore and offshore grids in Europe over the decade to 2020 have amounted to around EUR 30 billion, but need to increase to above EUR 60 billion over the next nine years and then increase further after 2030. Private capital is expected to provide the bulk of this investment.

After adopting this Sustainable Energy Strategy, Bulgaria will need to undertake significant legislative reforms in order to keep up with these ambitious plans.

Greece – Cyprus – Israel

Cyprus President Anastasiades reiterates his full support to EuroAsia Interconnector

Prioritises the promotion of Projects of Common Interest of the highest importance for the European Union.

The President of the Republic of Cyprus, Mr. Nicos Anastasiades, has reiterated his “full support” to the project of greatest importance EuroAsia Interconnector during his address delivered at the “8th Energy Symposium 2020” in Nicosia, organised by the Institute of Energy for South-East Europe (IENE) and the communications conferences company Financial Media Way.

In his speech, the President briefly explained the energy strategy of the Republic of Cyprus, which is based, on the basis of a comprehensive strategic planning, with the aim of:

- lifting the energy isolation of Cyprus, through the mutually beneficial cooperation with countries of the greater neighbouring region;
- the development of an internal energy market and the gradual transition of Cyprus to green energy and a “cyclical economy”;
- the utilisation of hydrocarbon resources within the Republic’s Exclusive Economic Zone.

“One of our most important goals in the internal energy sector is none other than the opening of the competitive electricity market estimated at the end of 2021 / beginning of 2022.”

“In relation to the pillar of lifting the energy isolation of Cyprus, I remind you that the promotion of Projects of Common Interest of the utmost



Energy Minister Ms. Natasa Pilidou, speaking at the 8th Energy Symposium

importance for the European Union was set as a priority.”

The first PCI that the President referred to is: “The electricity interconnection of Israel, Cyprus and Greece, through a submarine power cable, known as the EuroAsia Interconnector, which will essentially be the interconnected ‘electricity highway’ that will connect Asia with Europe.”

“Beyond that, we also provide full support to the EuroAfrica Interconnector, which will connect Cyprus with Egypt and Greece.”

Speaking at the 8th Energy Symposium, Energy Minister Ms. Natasa Pilidou referred to the strategic aspirations of the Republic of Cyprus, such as ensuring the energy supply of Cyprus, the transition to clean energy, based on the objectives of the EU “Green Deal” targets, the creation of a competitive energy market and the utilisation of domestic Renewable Energy Sources (RES).

The Minister of Energy also referred to the importance of the EuroAsia Interconnector, an EU Project of Common Interest, which will connect the electrical systems of Israel, Cyprus and Greece, through a submarine cable.

As the developers of the PCI 3.10 EuroAsia Interconnector, which is implemented according to strict timeframes with the aim of its timely implementation by December 2023, we welcome the practical support expressed once again by President Nicos Anastasiades and Energy Minister Natasa Pilidou.

We remain faithful to our commitments both to the Republic of Cyprus for the lifting of the energy isolation of Cyprus as the last non-interconnected EU Member State, and to the European Commission, which acknowledges the 2,000 megawatt project as a ‘Project of Common Interest’ of utmost importance and eligible for financing from the European Fund “Connecting Europe Facility”.



EuroAsia Interconnector

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Egypt – Cyprus – Greece

President Anastasiades reiterates his full support to EuroAfrica Interconnector Egypt-Cyprus link

Prioritises the promotion of Projects of Common Interest of the highest importance for the European Union

The President of the Republic of Cyprus, Mr. Nicos Anastasiades, has reiterated his “full support” to the project of greatest importance EuroAfrica Interconnector during his address delivered at the “8th Energy Symposium 2020” in Nicosia, organised by the Institute of Energy for South-East Europe (IENE) and the communications conferences company Financial Media Way.

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lifting the energy isolation of Cyprus, through the mutually beneficial cooperation with countries of the greater neighbouring region;

the development of an internal energy market and the gradual transition of Cyprus to green energy and a “cyclical economy”;

the utilisation of hydrocarbon resources within the Republic’s Exclusive Economic Zone.

“In relation to the pillar of lifting the energy isolation of Cyprus, I remind you that the promotion of Projects of Common Interest of the utmost importance for the European Union was set as a priority.”

“We provide full support to the EuroAfrica Interconnector, which will connect Cyprus with Egypt and Greece via a submarine cable, which will essentially be the interconnected ‘electricity highway’ that connects Africa and the Middle East with Europe.”

Speaking at the 8th Energy Symposium, Energy Minister Ms. Natasa Pilidou referred to the strategic aspirations of



EuroAfrica Interconnector

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We remain faithful to our commitments both to the Republic of Cyprus for the lifting of the energy isolation of Cyprus as the last non-interconnected EU Member State, and to the Government of the Arab Republic of Egypt, which acknowledges the 2,000 megawatt project as the interconnected ‘electricity highway’ that connects Egypt, the Middle East and Africa with Europe through Cyprus.



Egypt

Telecom Egypt provides Google with a TransEgypt meshed solution and Mediterranean capacity to Europe

Telecom Egypt, Egypt's first integrated telecom operator and one of the largest subsea cables operators in the region, signed an agreement with Google to provide Google with the first of its kind layer three meshed solution on multiple Telecom Egypt's redundant and resilient Egypt crossing network infrastructure. As part of the agreement, Google will also be provided capacity on Telecom Egypt's Mediterranean submarine cable, TE North. The project is expected to go live in the first half of 2021.

This mesh project connects several cable landing stations in the Red and Mediterranean Seas over diverse routes and will increase the reliability of Google's international transit traffic, providing an elevated level of robustness. Telecom Egypt's network can reroute traffic as needed in less than 50 milliseconds, and will also offer high quality availability features with an SLA portal.

Adel Hamed, TE's Managing Director and Chief Executive Officer, commented: "It is our sincere pleasure to work with Google and support its mission to increase the reliability of its traffic regionally. This agreement comes in line with our strategy to solidify Egypt's position as an eminent digital hub that connects continents using Telecom Egypt's resilient, multi-routed, and low-latency mesh network that spans the Mediterranean Sea, crosses Egypt, and extends to Singapore."

Seif Mounib TE's VP for International & Wholesale, commented: "We are delighted with our cooperation with Google that came in result of our continuous efforts to upgrade our network. Despite the hardships brought about by the global pandemic in 2020, we succeeded to enhance our international IP transit infrastructure, to better serve our global customers.



This year, we built two landing stations connected over diverse terrestrial routes, bringing the total to 10 stations in the Red and Mediterranean Seas, and 10 terrestrial crossing routes across Egypt."

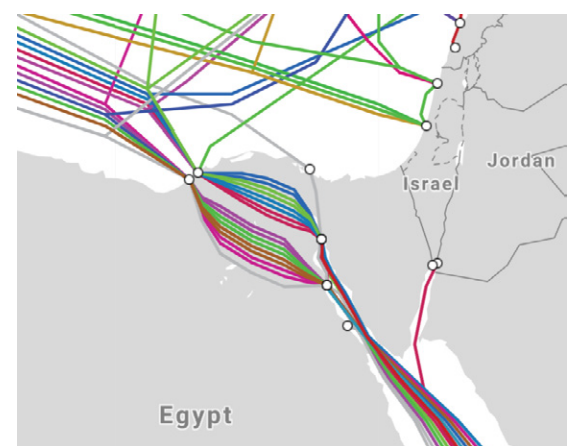
Mark Sokol, Senior Director of EMEA Infrastructure at Google Cloud, said: "We are pleased to have signed this agreement with Telecom Egypt, as it will enhance Google's global network resilience via Egypt and we look forward to a continued mutually beneficial engagement."

Hisham El Nazer, Google Egypt's Country Manager, said: "With internet penetration accelerating rapidly in Egypt, enhancing the capacity of transit traffic will unlock significant usage potential. We thrive to offer our users a better experience through improved connectivity in Egypt, and across the globe."

Telecom Egypt offers the global telecom community access to abundant international capacities with the lowest latency and the shortest, most efficient protected path from Africa and Asia to Europe, building on Egypt's distinctive geography at the heart of the world, and Telecom Egypt's continuous and extensive network revamps. The company's advanced infrastructure and its capabilities has

led it to become the partner-of-choice for many international telecom players over the years.

Additionally, Telecom Egypt is working on multiple layers of its infrastructure diversity, such as establishing new subsea landing stations and crossing routes as well as investing in new subsea systems and solutions that will cater for the wave of global demand for international capacities. To maintain the high level of service availability, Telecom Egypt has developed its mesh network solutions that span the Mediterranean Sea, cross Egypt, and extend all the way to Singapore.



Submarine/Terrestrial Cables going through Egypt (www.submarinecablemap.com)

Portugal – Nigeria – Democratic Republic of Congo – Saint Helena – South Africa

Google to land its new R2.2 billion cable in Melkbosstrand near Cape Town

"Google's new cable will land at Melkbosstrand, shoring up our positioning as Africa's tech hub," says Wesgro CEO Tim Harris.

Google is investing R2.2 billion into an undersea fibre optics cable in Cape Town that will provide high-speed internet to the rest of South Africa.

It will link to its new cable that stretches from Portugal.

The cable has 20 times more capacity than the one currently linking Europe with South Africa.

Google's investment came on the back of the recently held Presidential Investment Summit at which numerous other multinational companies have also pledged investments.

Kieno Kammies interviewed Tim Harris, CEO at Wesgro about Google's investment.

They also spoke about the Amdec Group dropping about R2 billion on Cape Town's Foreshore.

"Google's deal is a great one... a major infrastructure play... the new cable will land at Melkbosstrand..." – Tim Harris, CEO – Wesgro



Equiniao Cable System



Cape Town's Table Mountain

"This announcement by Google shores up our positioning... as Africa's tech hub." – Tim Harris, CEO – Wesgro

"The Foreshore is a frustrating space... strategically well-positioned... but, historically... a fairly sterile space personified by apartheid-era architecture... The Amdec deal... is pretty innovative... unlocking the street-level economy, even as they build this extraordinary structure above it... with uninterrupted views of the ocean... a multi-billion rand boost to the central city..." – Tim Harris, CEO – Wesgro.

Gambia

ACE cable system repaired

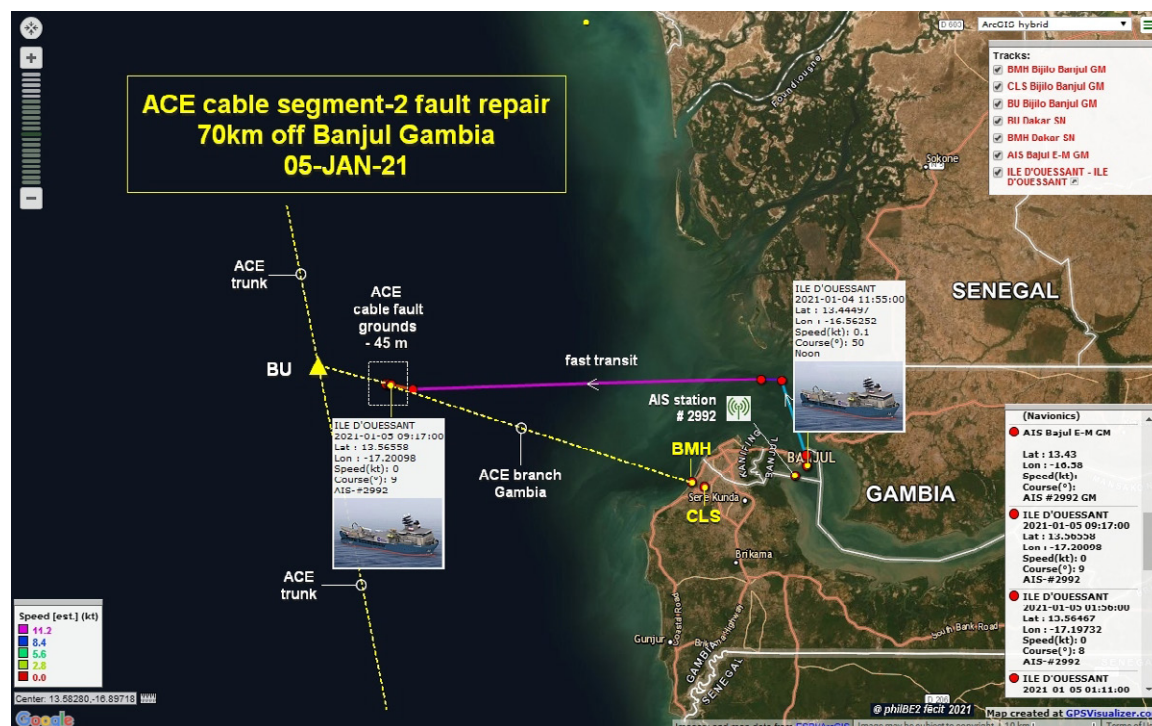
On the 08th of January 2021, Gambia Submarine Cable Company (GSC) revealed that the ACE cable system experienced a fault on 1 January 2021, thus impacting internet services in Gambia. Lamin Jabbi, GSC managing director, said: 'We have an immediate measure which is to make sure we

have a ship on the ground [and] that ship will be arriving at the site on Monday [4 January] to actually do the reconnection to the trouble area.' According to Jabbi, the disruption has affected a number of other countries that are also connected to the ACE cable: 'The problem is not on our

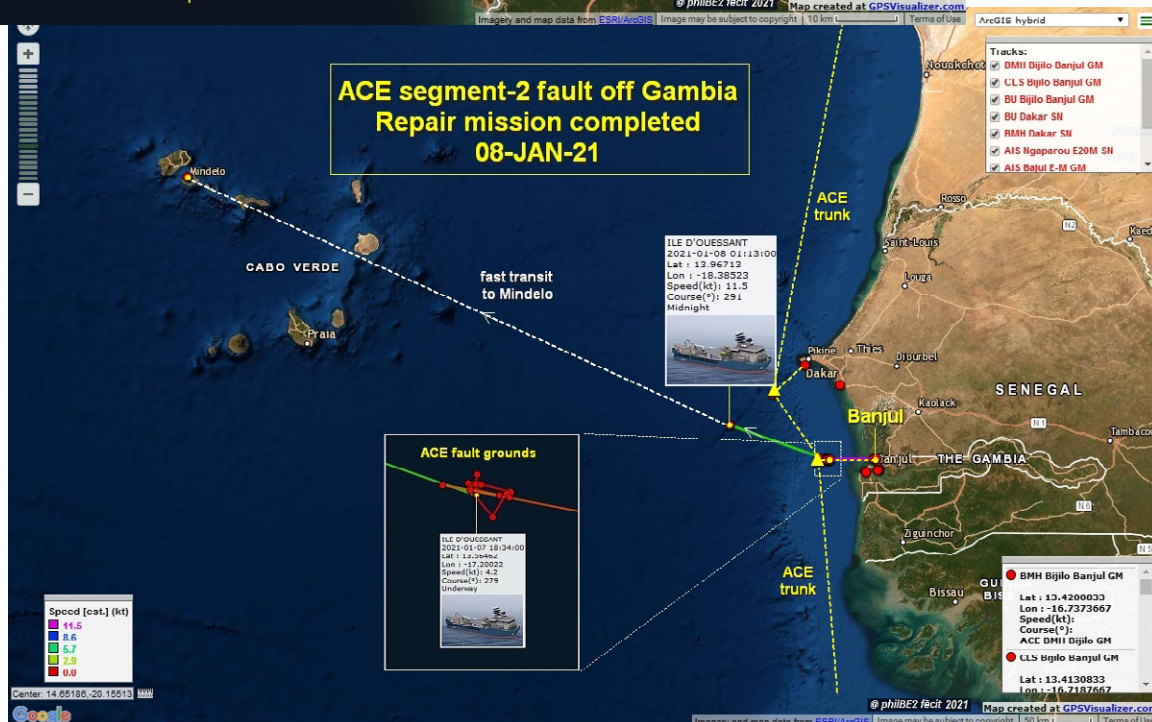
coastal part here. There is nothing wrong with our system.'

The cable repair vessel "Ile d'Quessant" was onsite on the 05th of January 2021.

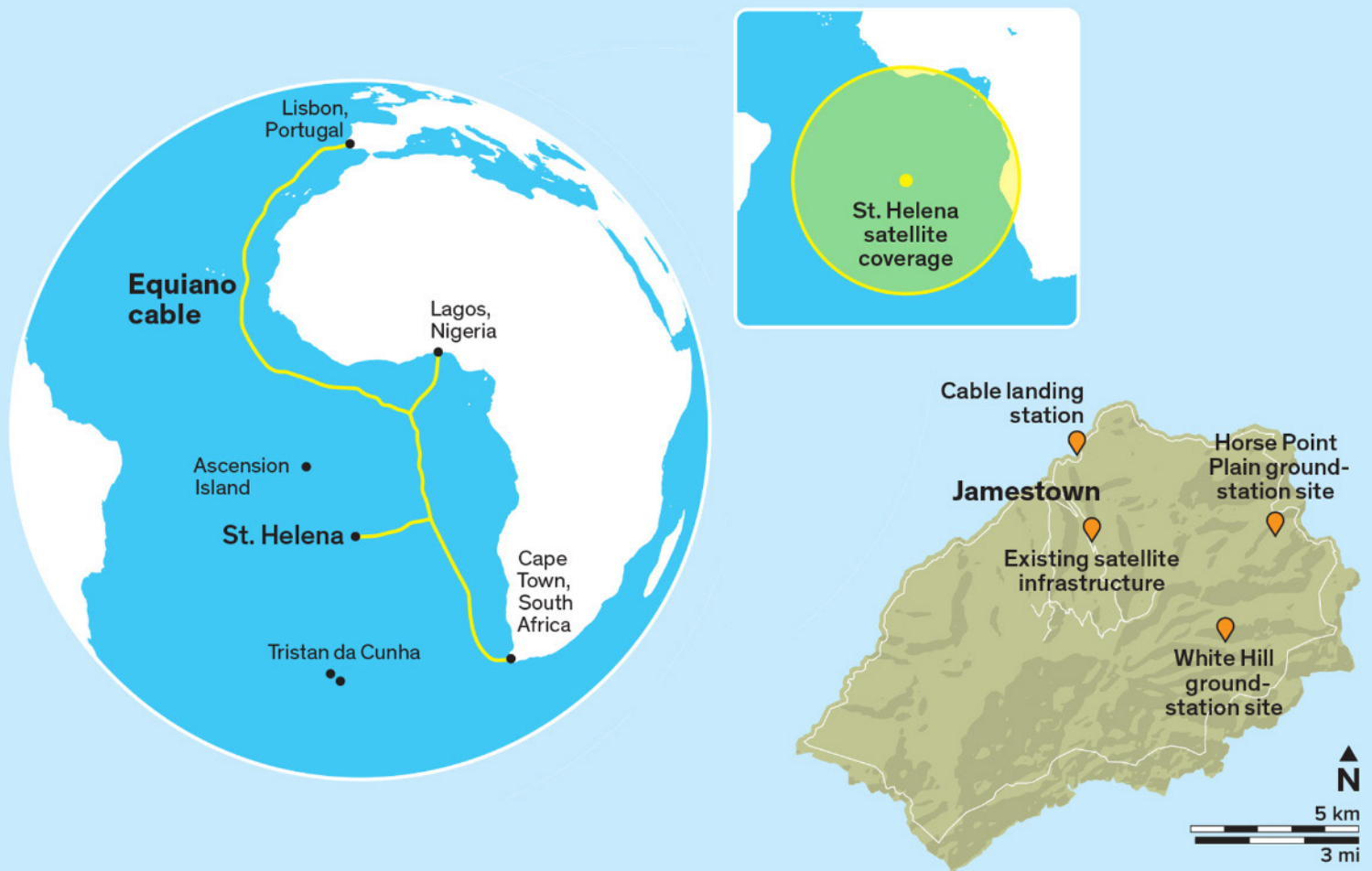
On the 08th of January 2021 the repair mission was already completed.



05/01/21 - CS "Ile d'Quessant" at repair grounds (@philBE2 on twitter)



08/01/21 – Cable Repair completed



Map of St. Helena;
Illustration: Chris Philpot

St. Helena

St. Helena's New Undersea Cable Will Deliver 18 Gbps Per Person

Satellite operators salivate over access to Google's Equiano cable, but the island's telecom monopoly stands in the way.

Since 1989, the island of St. Helena in the South Atlantic has relied on a single 7.6-meter satellite dish to connect the island's residents to the rest of the world. While the download and upload speeds have increased over the years, the roughly 4,500 Saints, as the island's residents call themselves, still share a measly 40-megabit-per-second downlink and a 14.4-Mbps uplink to stay connected.

But come April, they will be getting quite an upgrade: An undersea cable with a maximum capacity of 80 terabits per second will make landfall on the island. That's a higher data rate than residents can use or afford, so the island's government is looking to satellite operators to defray the costs of tapping into the cable's transmissions. However, an incumbent telecom monopoly, and the outdated infrastructure it maintains, could turn the entire project into a cable to nowhere.

Laying an undersea cable to an island with fewer than 5,000 inhabitants is

obviously a terrible business idea. Someone has to pay for the seafloor route surveys, the manufacturing and laying of the fiber-optic cable and other hardware, and the ongoing operational costs. St. Helena, part of the British Overseas Territories, was able to pay for its cable only because the European Union's European Development Fund granted the island €21.5 million in 2018 for that exact purpose.

St. Helena signed a contract with Google in December 2019 under which it would pay for a branch off the Equiano cable, which Google is currently laying from Portugal to South Africa. All that remained was finding someone to use and pay for the bulk of the data once it was flowing to the island. The minimum bandwidth that can be delivered by a single wavelength over the cable is 100 gigabits per second, still too much for St. Helena.

In recent years, several companies have begun launching low Earth orbit (LEO) satellite constellations to provide broadband service, with SpaceX's Starlink being perhaps the most prominent example. Like any communications satellite, these connect users who can't tap into terrestrial networks, whether because of distance or geography, by acting as a relay between the user and a ground-station antenna elsewhere that connects to an Internet backbone. The roughly 150-kilogram satellites in LEO constellations offer lower-latency connections compared with those of larger satellites up higher in geostationary orbits, but the trade-off is that they cannot see nearly as much of Earth's surface. This limitation means the satellites need a scattering of regularly spaced ground stations to complete their connections.

The scheme also creates ocean-size problems in maintaining coverage for airplanes, ships, and islands. These can connect directly to a LEO satellite, but then there needs to be a connection from the satellite to Earth's terrestrial networks. Hence the need for a ground station with access to a long-haul cable. "It's critical to find places where there's a little bit of land," says Michele Franci, who is in charge of operations at the LEO satellite company OneWeb, one of the companies interested in building on the island. "Without anything, there will be a hole in the coverage."

St. Helena is one of the few little bits of land in the South Atlantic. So, when OneWeb learned of the proposed Equiano cable, the benefits of having a ground station on the island became apparent. "Without that cable, it would not have been a feasible option," Franci says. OneWeb filed for bankruptcy in March 2020 but has been bought jointly by the British government and the Indian telecom company Bharti Global.

Christian von der Ropp, who launched a campaign in 2011 to connect St. Helena to an undersea cable, sees ground stations as the ideal way to offset the cable's operating costs. With OneWeb and other companies that have expressed some level of interest such as SpaceX and Maxar paying for the bulk of the throughput, Saints can siphon off the bit of data they need to conduct business and stay in touch with family and friends working off-island.

But von der Ropp, a satellite-telecom consultant, does foresee a last-mile problem in bringing high-speed connections to Saints, and he blames it on the island's telecom monopoly, Sure. "They are terribly exploiting the islands," von der Ropp declares. Pay-TV packages can cost £40 per month, which is a lot on an island where the average monthly income comes to about £700. Sure also charges up to 600 percent premiums for any data usage that exceeds the amount in a subscriber's plan. Von der Ropp says Sure's infrastructure is insufficient and that Saints would experience throttled connections in the last mile. However, Christine Thomas, the chief executive for Sure's operations on St. Helena, says that Sure's prices have been approved by the island government. Thomas also says that the company has invested £3 million in building out the island's infrastructure since 2013 and recognizes the need for further upgrades to match the cable's throughput.

Sure's current contract with the St. Helena government runs through 31 December 2022. While the cable spur off the Equiano cable to St. Helena will land on the island in April, it will not carry data until early 2022, when the entire cable is completed. The island's government is currently drafting new telecom regulations and exploring the possibility of issuing a license to a different provider after Sure's term expires.

Meanwhile, von der Ropp, along with island resident Karl Thrower, who worked on communications infrastructure in Europe before moving to the island, plans to create a nonprofit service provider called Saintel as an alternative to Sure. The two propose that Saintel build new millimeter-wave and laser-link infrastructure to provide high-speed connections from the cable's endpoint and fund it in part by offering its network as a test bed for those technologies.

Despite an entrenched monopoly and poor infrastructure—not to mention the coronavirus pandemic, resulting in severely restricted travel to the island for preliminary cable and ground-station work—St. Helena can act as a model for how to connect other remote islands. OneWeb's Franci notes that building ground stations on St. Helena will also improve satellite connections for the island of Tristan de Cunha, about 2,400 kilometers to St. Helena's south. And other parts of the world's oceans need coverage, too: For example, there are large gaps in LEO coverage below the 45th parallel south that could be plugged by islands with ground stations.

"The places that used to be isolated and not really part of the mainstream now become relevant," Franci says. While St. Helena will be as remote as ever, at least it will no longer be isolated.



Morocco – Cote d'Ivoire – Togo – Benin – Gabon

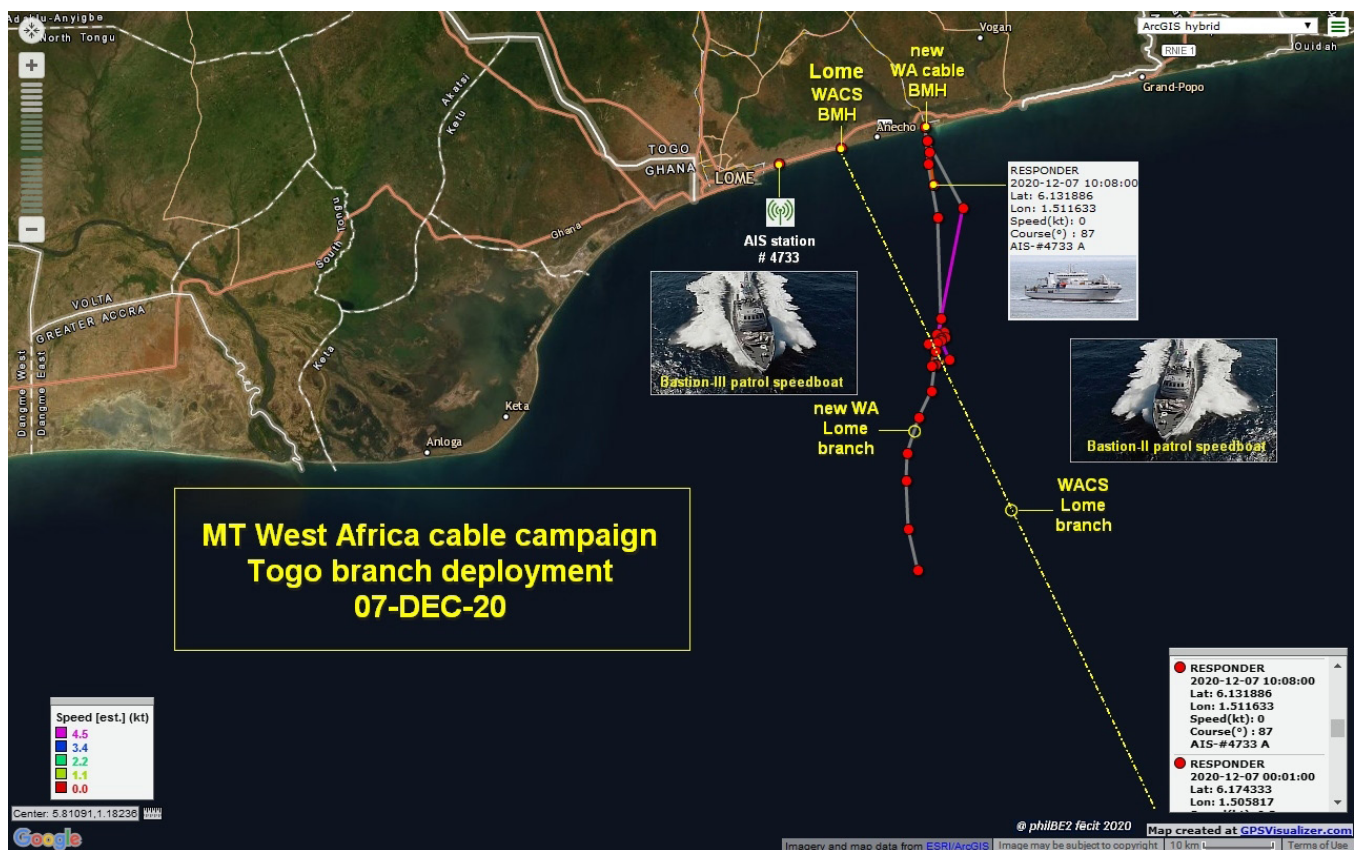
Private Cable System “WAF” being installed

Rumours were confirmed on the 07th of December, that Maroc Telecom was deploying a private cable system along the West African coast, connecting Morocco with Cote d'Ivoire, Togo, Benin and Gabon. The system is approximately 8,200 km long and was manufactured by Alcatel Submarine Networks. The installation started beginning of December 2020, using two vessels, the CS Responder (SubCom) and the CS Teliri (Orange Marine).

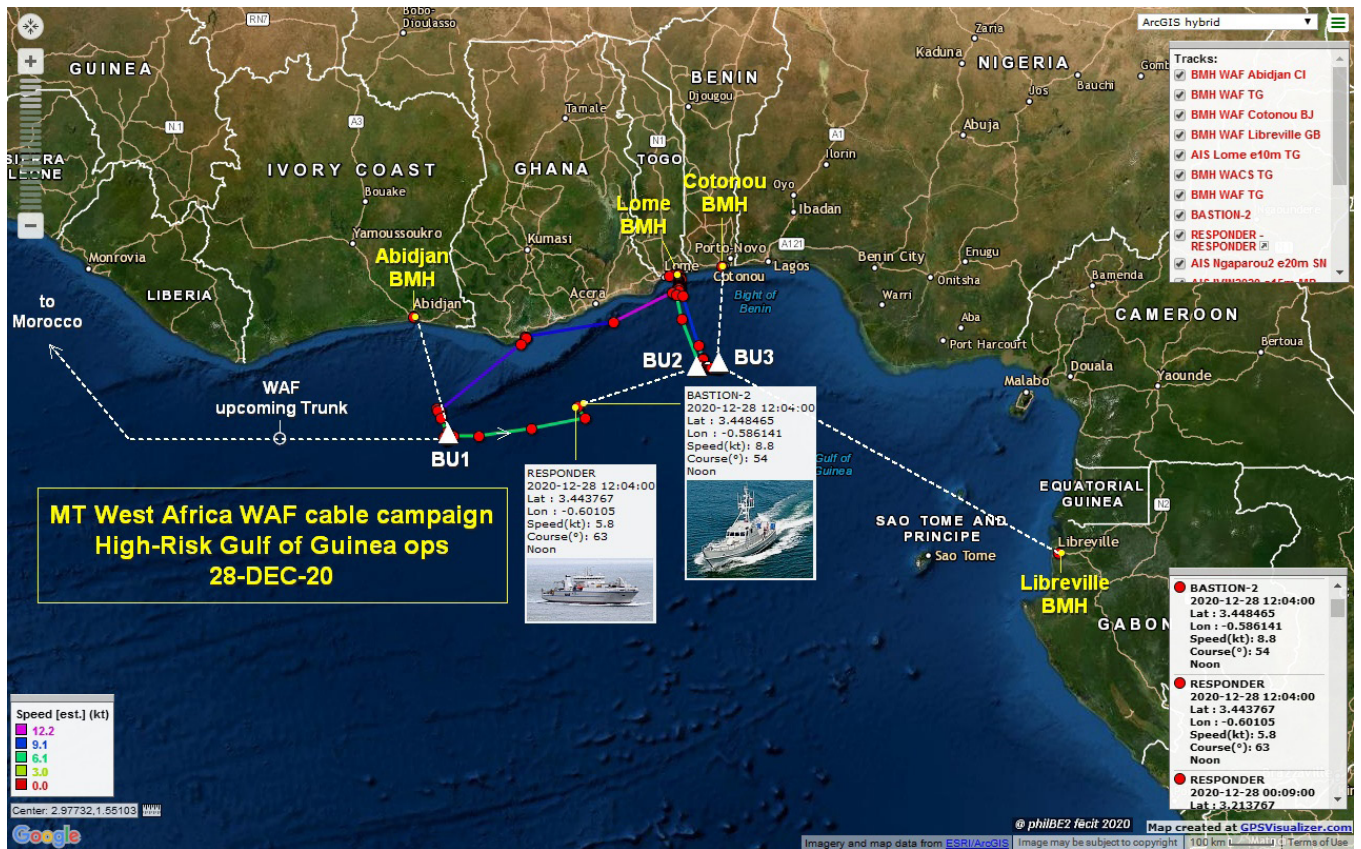
On the 07th of December 2020, the CS Responder installed the Togo branch from Lome BMH.

The CS Teliri started offshore Morocco and deployed the cable along the West African coast.

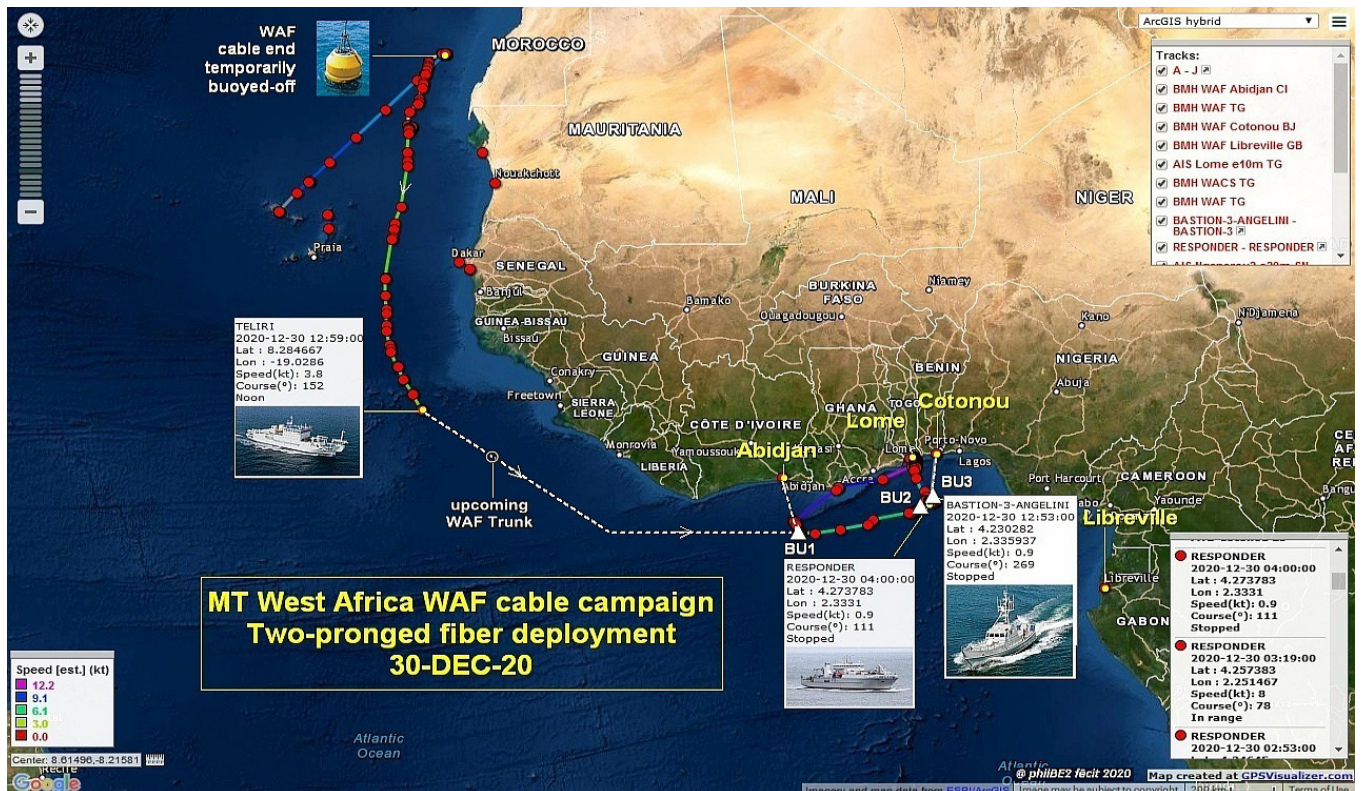
The CS Responder operated with assistance of patrol speedboats in the Gulf of Guinea to deploy the branches to the relevant countries to be connected.



07/12/20 – Togo branch deployment (@philBE2 on twitter)



28/12/20 – CS Responder deployment of BU1 to BU2 (@philBE2 on twitter)



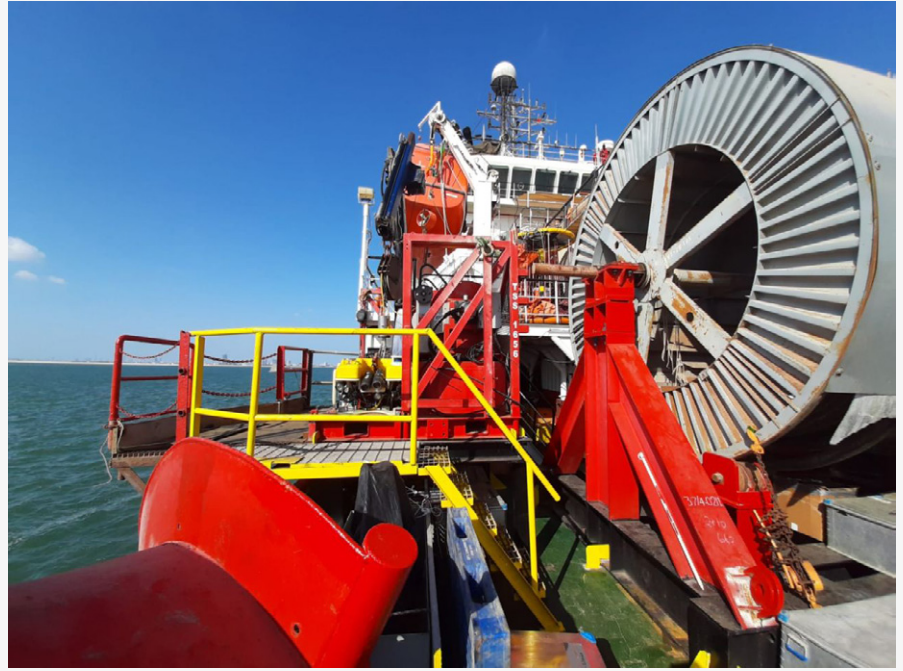
30/12/20 – CS Teliri on route to BU1; CS Responder deploying BU2 (@philBE2 on twitter)



Middle East

Cable Repair Project Award

DPII "CCC Maritime 2" alongside the CCC jetty in Abu Dhabi, mobilised and ready to sail to for a cable repair project in the Middle East. CCC (UWE)



has mobilised company-owned marine, diving, ROV, survey and cable repair teams and equipment to undertake the project.



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- Transformer Design, manufacturing, Life Cycle and Performance
- Overhead Lines and Insulated Cables
- HVDC and FACTS technology
- Renewable Energy and Nuclear Power of the Gulf States
- Smart Grids
- Asset Management for Power Systems

Deadlines:

- Receiving of Abstracts: 10th February 2021
- Notification of Abstract Acceptance: 15th March 2021
- Receiving Full Papers: 30th June 2021
- Receiving Presentation: 20th September 2021

Contact us for more information:

Eng. Wesam S. Al-Anqar
Manager, GCC CIGRE
Email: gccpower2021@cigre-gcc.org



Turnkey Solutions for Submarine Cables



India

World's largest floating solar project to start in MP by 2023

The world's largest floating 600 MW solar energy project to be constructed at Omkareshwar dam on Narmada river in Khandwa district of Madhya Pradesh will begin power generation by year 2022-23. The estimated investment in this project stands at Rs 3,000 crore, said an official release quoting the state's new and renewable energy minister Hardeep Singh Dang.

The International Finance Corporation, World Bank and Power Grid have granted in-principle consent for providing aid for the said project development.

The primary feasibility study of the project has been completed in collaboration with the World Bank. The project is likely to begin power generation by year 2022-23, the minister said.

Dang said that the work of transmission line route survey will begin from the project area to Khandwa sub-station by power grid this month.

Tender for the study of environmental and social impact of the project area is also being issued. Madhya Pradesh Power Management Company has agreed to purchase 400 MW power from the project, he said.

The project will have floating solar panels of 600 MW power generation capacity in the backwaters of Omkareshwar dam. It is estimated that in 2 years, the project will start providing cheap and good quality power.

Electricity will be produced in about 2000-hectare water area by installing solar panels in the dam. Solar panels will float on the surface of the water in the reservoir, the release said.

When the water level of the dam is low, it will automatically adjust upwards and downwards. Strong waves and floods will have no effect on them. The sun's rays will continue to produce electricity, it added.

2020 Factsheet



6,207km

telecom cable installed



856km

telecom cable ploughed



650

crew transferred



35.2km

high-voltage power
cable installed



23

repairs completed
within 26 weeks



9,640m

greatest water depth
of installation

India – Andaman & Nicobar Islands

NEC completes submarine cable system for BSNL connecting Chennai, India and the Andaman & Nicobar Islands

NEC

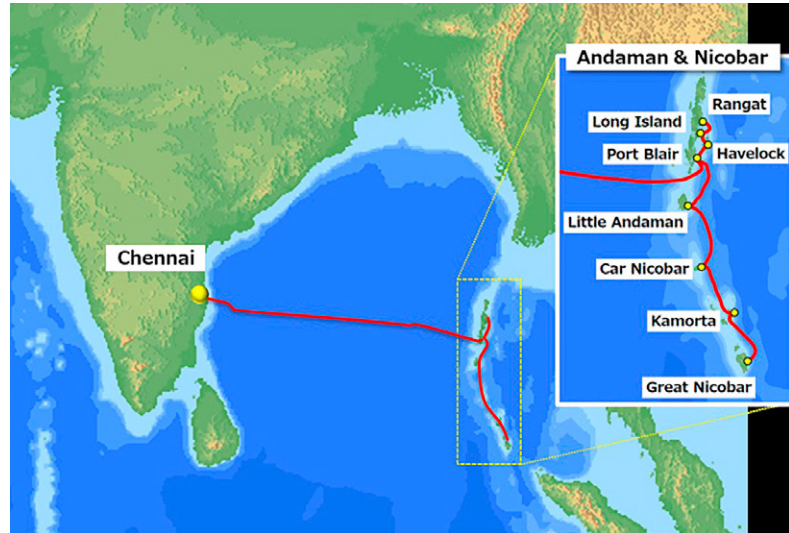
NEC Corporation India (NEC India) today, 18th of December 2020, announced the successful completion of the flagship optical submarine cable system connecting Chennai, India and the Andaman & Nicobar Islands (A&N Islands) for Bharat Sanchar Nigam Limited (BSNL), a Government of India Enterprise. NEC Corporation (NEC, TSE: 6701), the parent company of NEC India, manufactured the optical submarine cable and provided technical assistance during the turnkey implementation.

Commenting on the successful completion of the project, Aalok Kumar, President & CEO, NEC Corporation India said, "Completion of this important project marks a major milestone in NEC's journey of partnering with the Government of India to realize their vision of a truly connected India. NEC has been steadfast in its commitment to deliver excellence in innovation in all our areas of operation and this project is a testament to our unwavering dedication. We are hopeful that the internet connectivity will open a wide range of opportunities for the people on the islands."

Spanning approximately 2,300km with 100Gb/s optical waves, the cable system connects Chennai to Port Blair and the islands of Havelock, Little Andaman (Hutbay), Car Nicobar, Kamorta, the Great Nicobar Islands, Long Island and Rangat.

"I believe that our mission is to help connect people and nations all over the world, making it possible for individuals to access data and information universally," said Atsushi Kuwahara, General Manager, Submarine Network Division, NEC. "I am proud to have completed this important project in cooperation with BSNL and NEC Corporation India, and look forward to seeing this cutting edge system contribute to a brighter society and the advancement of opportunities throughout the A&N Islands."

The cable system provides the A&N Islands with ample bandwidth for supporting voice and data connectivity that enable the implementation of e-Governance initiatives, such as the establishment of new enterprises and e-commerce facilities. The system is expected to assist educational institutes in the sharing of knowledge and will play a significant role in driving the "Digital India" vision, a campaign launched by the Government of India to ensure that Government services are made available to citizens electronically.

**ABOUT NEC CORPORATION INDIA**

NEC is a leader in the integration of IT and network technologies and brings more than 100 years of expertise in technological innovation to provide solutions for empowering people, businesses and society. Headquartered in Japan, NEC started operations in India in the 1950s, accelerating its growth through the expansion of business to global markets. NEC in India expanded its business from telecommunications to public safety, logistics, transportation, retail, finance, unified communication and IT platforms, serving across governments, businesses as well as individuals. With its Centre of Excellence for analytics platform solutions, big data, biometrics, mobile and retail, NEC in India offers innovative new services and solutions for India and global markets. NEC operates across India with offices in New Delhi (head office), Noida, Mumbai, Chennai, and Bengaluru. For further information please visit: www.in.nec.com.

ABOUT NEC CORPORATION

NEC Corporation has established itself as a leader in the integration of IT and network technologies while promoting the brand statement of "Orchestrating a brighter world." NEC enables businesses and communities to adapt to rapid changes taking place in both society and the market as it provides for the social values of safety, security, fairness and efficiency to promote a more sustainable world where everyone has the chance to reach their full potential. For more information, visit NEC at <https://www.nec.com>.

Maldives – Sri Lanka

\$22m Maldives Sri Lanka Cable lands in Hulhumalé

On the 16th of December 2020, the Maldives-Sri Lanka Cable (MSC), has successfully landed in the Maldives, connecting the coastal areas of Colombo to Hulhumale'. This cable is a system composed of a Wavelength Division Multiplexing (WDM) subsystem and an 863-kilometer fibre optic cable.

The MSC is being deployed as per a tripartite agreement between Dhiraagu Plc, Ooredoo Maldives Plc and Dialog AXIATA Plc, for the transport of international traffic and to further enhance the telecommunication infrastructure of the region. It is equipped with Huawei Marine Networks' high-output titanium housing repeaters deployed to a water depth of 3,700m to provide a reliable regional telecommunications network.

Interconnected to domestic networks, the increased capacity would greatly strengthen the digital ecosystem within the country and support the growing digital transformation needs of people and businesses.

"I would like to thank both Internet Service Providers for their continuous commitment in strengthening the digital eco-system of the country. As we mark an important milestone, I am confident that with the successful completion of this project we are paving the way to further strengthen the digital infrastructure of our island nation and increase diversity," stated Minister of Communication, Science and Technology Mr. Mohamed Maleeh Jameel.

Since the development of the ongoing pandemic, communities and businesses are digitizing their services to create a safer environment and continue everyday lives, which has



Landing Operation of MSC cable in Hulhumale'

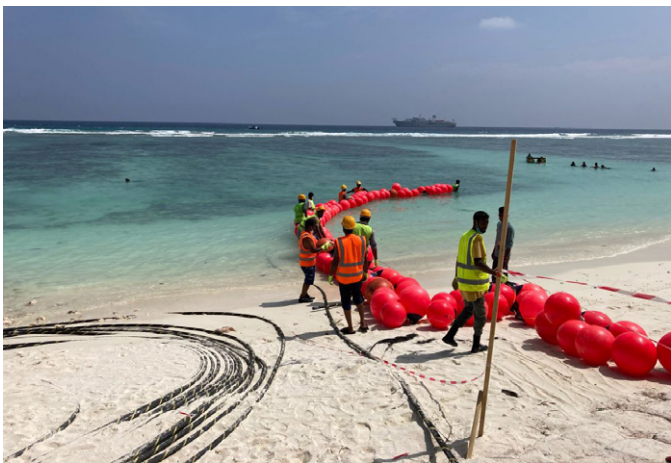
increased the need and demand for even higher quality internet services.

This USD 22 million project aims to support the growing need of local communities and businesses, to realize the benefits of this digital age. The project will also support and increase the network readiness

to provide revolutionary 5G services throughout the nation, which will connect the people of the Maldives to groundbreaking new technologies and pave the way for innovation, ultimately building the foundation for socio-economic development across the nation.



Landing Event of MSC Submarine Cable in Hulhumale'



MSC Cable System



Philippines

SCiP cable system installation ongoing

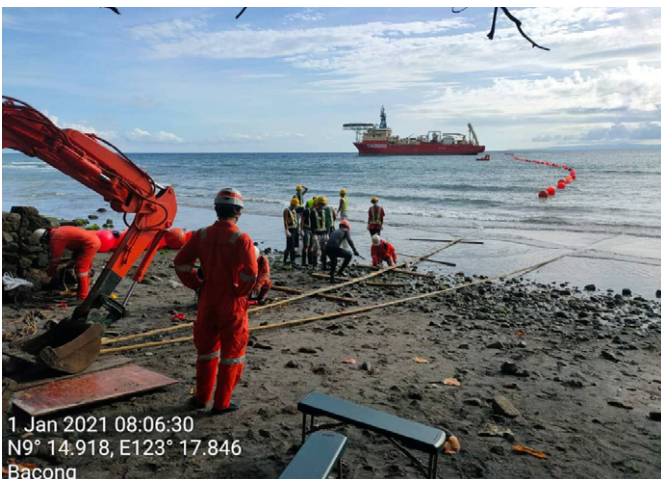
The CS Fu Hai (SBSS) and the CLB Cable Orchestra (Optic Marine Group) are continuing the installation of Dito's domestic submarine cable network called SCiP (Submarine Cable in Philippines).



22/12/20 – CS Fu Hai landing SCiP cable at Allen (@philBE2 on twitter)



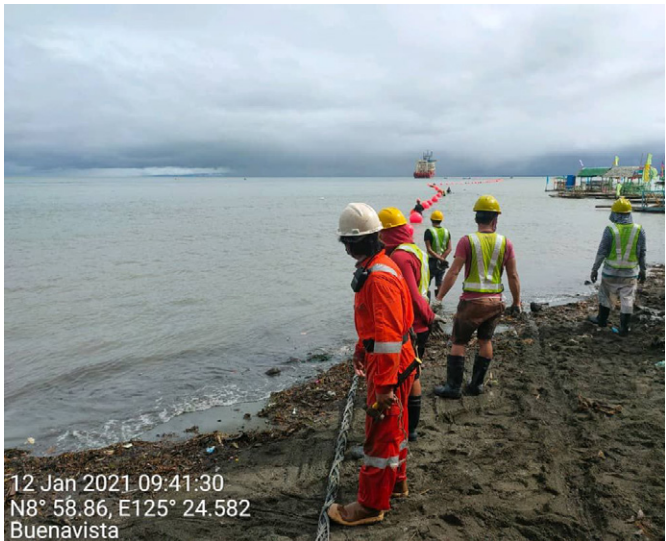
23/12/20 – CS Fu Hai landing SCiP cable at Matnog (@philBE2 on twitter)



01/01/2021 – Direct shore-end landing for SCiP Segment 1.7 at Dumaguete



01/01/2021 – Direct shore-end landing for SCiP Segment 1.7 at Dumaguete



12 Jan 2021 09:41:30
N8° 58.86, E125° 24.582
Buenavista



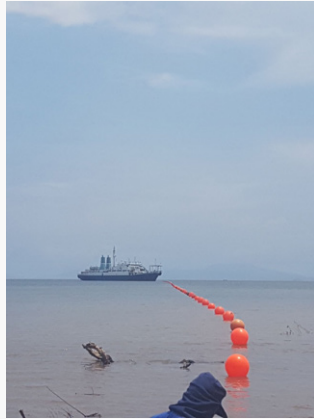
12 Jan 2021 09:51:08
N8° 58.865, E125° 24.581
Buenavista

12/01/2021 – Cable landing SCiP Segment 1.8 at Buenavista

Indonesia

Cable system installed

The Cable vessel “Pacific Guardian”, operated by PT Sarana Global, has recently installed a cable system from Sape, West Nusa Tenggara to Labuan Bajo, East Nusa Tenggara and from Ende, East Nusa Tenggara to Kupang, East Nusa Tenggara in Indonesia.



Vietnam

Two international undersea optical cables, IA and APG, have problems

Two international undersea optical cable lines IA and APG – cable lines that make up the majority of Internet connection capacity from Vietnam to international – have encountered problems.

According to the announcement, the Intra Asia – IA undersea cable line had a problem at 12:52 a.m. on January 1, the first day of the new year 2021. The cause was determined by a cable error on segment 1, away from the terminal station at Singapore’s cable line at about 49 km. The problem affects all connection capacity for the Singapore direction.

Meanwhile, at 6:45 am on January 9, the Asia Pacific Gateway – APG undersea cable had a problem on the S3 branch, interrupting information in the direction of connecting to Hong Kong (China), Japan.

It is known that the APG cable route has the investment of major carriers in Vietnam such as VNPT, Viettel, FPT Telecom, and CMC Telecom and is considered to be a cable route that contributes to a stable and large capacity transmission line. Currently, Internet service providers in Vietnam have not received the plan to repair and troubleshoot two sea cables IA and APG.

However, immediately after detecting the incident, Internet service providers in Vietnam transferred traffic to other marine cables, including AAG, AAE-1 and SMW3, combined with the outbound terrestrial cable, to ensure connectivity for users. However, during peak hours, the use of international services such as Facebook, Messenger, Instagram ... may still be slightly affected.



Intra Asia Cable System (TGN-IA)



Asia Pacific Gateway (APG)



CALL FOR PAPERS

2021 Virtual Plenary of the International Cable Protection Committee (ICPC)

Conference Title:	2021 Plenary of the International Cable Protection Committee
Conference Dates:	19 th – 20 th May 2021
Deadline for Abstracts:	12 th February 2021
Conference Format:	Live panels, interviews and pre-recorded presentations

Beyond the Global Pandemic – The Critical Role of Submarine Cables

The International Cable Protection Committee (ICPC)

The ICPC is a non-commercial, non-profit international community of interest comprising over 170 Member organisations from over 60 countries who are active in the critical activities of regulating, operating, building, securing and maintaining submarine cable infrastructure.

ICPC Members take care of over 90% of the world's submarine telecoms cable infrastructure, and an increasing number of international submarine power cables.

Important Dates

- The cut-off date for abstract submission is Friday 13th February 2021.
- Decision notification to presenters by Friday 12th March 2021.
- Pre-recorded presentations to be submitted by 30th April 2021.
- Abstracts can be submitted online by [clicking here](#).

Pre-Recorded Presentations

Pre-recorded presentations should be a maximum of 30 minutes long.

The ICPC will evaluate all abstract submissions based on content, relevance and quality.

Presenters will be requested to upload a narrated presentation. By submitting an abstract, you are agreeing to support this format.

Overt marketing presentations will not be accepted. However, one slide stating the presenter's affiliation and its activities can be included.

Presenters of selected subject matter may also be invited to participate in live panel sessions or interviews.

CONFERENCE TOPICS

- **Critical Infrastructure:** *New challenges in installing, maintaining and protecting submarine cables during the global pandemic and in the post-pandemic era*
- **Reliability and Security:** *How science, engineering, survey and planning developments enhance the reliability of submarine cable systems. Securing critical international infrastructure by working with authorities, stakeholders and other seabed users*
- **Resilience:** *Protecting the interests of international telecommunications and power cable system users through collaboration, innovative design and diversified routing*
- **Sustainability:** *Advancing science, technology, law, manufacturing, installation and repair so submarine cables remain neutral to benign in the marine environment*

The ICPC Plenary attracts global attendance and provides valuable opportunities to exchange ideas on the planning, installation, operation, protection and maintenance of cables, to learn from colleagues facing similar challenges, and to get up-to-date with environmental and legal aspects of submarine cables. The Plenary Agenda includes presentations, round tables and interviews.

Attendance: The ICPC Plenary is a closed event, with virtual attendance by ICPC Members, selected speakers and invited guests. Due to COVID-19, the 2021 Plenary format will be a two-day live virtual event comprised of live panel discussions, roundtables and interviews. The most pertinent and emerging topics facing the submarine cable industry will be discussed through engaging dialogue, questions, and answers. Pre-recorded presentations will be hosted on the dedicated Plenary website for on-going attendee viewing during and after the Plenary event.

More information on the ICPC can be found at: www.iscpc.org



Windpower Data and Digital Innovation Forum which is schedule to take place on the **17th - 18th February, 2021** will give industry leaders and experts the tools and solutions to stimulate their business and the opportunity to learn about the latest digital innovations and practices.

Kristian Holm / Manager, Wind Turbine Technology / **Equinor ASA**
Digitalization – A Practical Approach

Mercedes Irujo / Head of Wind Energy Innovations / **Acciona**
Windbrain®: Acciona Condition Monitoring Platform

Michael Wilkinson / Global Segment Leader, Energy Digitalization / **DNV GL - Energy**
Digital Twins for Wind Turbines: Practical Applications and Examples

Joris Peeters / Head of Digitalization / **ZF Wind Power**
Data and Predictive Analytics to Improve Drivetrain Availability and Reduce Operational Costs

Kentaro Indo / General Manager of Operation Analysis and Asset Optimization / **Eurus Energy**
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Vietnam

PNE presents plans for 2-GW offshore wind farm in Vietnam

German renewable energy company PNE AG discussed with the Binh Dinh Provincial People's Committee (PPC) its plans for an up to 2-GW offshore wind farm in Vietnam.

Construction of the first phase, of 700 MW, can start as soon as 2024. The

technical survey for the project is to begin next year.

In a statement, the PPC said the company wants to install between 154 and 166 wind turbines off the coast of the province. The total investment is estimated at USD 4.8 billion (EUR

3.9bn), of which around USD 1.6 billion for the pilot phase of the project.

To facilitate the offshore wind project's implementation, PNE suggested that it should be included in Vietnam's national power development plan.

Taiwan

Taiwan launches new earthquake, tsunami monitoring system

A undersea earthquake and tsunami monitoring system was officially launched in Taiwan on Thursday, 31st of December 2020, enabling the authorities to provide early warnings to the public in case of seismic hazards.

In November, the country completed a 735-kilometer undersea cable monitoring system that stretches from Yilan County in the northeast, southeast into the Pacific Ocean and back around Eluanbi in Pingtung County, Taiwan's most southerly point.

The network is expected to provide an additional warning of at least 10 seconds in the event of an earthquake and 20-30 minutes for tsunamis, according to the Central Weather Bureau (CWB), which is part of the team that propelled the project.

Speaking at the system's inauguration ceremony, President Tsai Ing-wen (蔡英文) praised the network as being part of the government's forward-looking infrastructure development plan that was launched in 2017, which covers a wide range of projects aimed at building the infrastructure the country will need for its development over the next three decades.

The system can issue advance warnings, which can help to prevent loss of life and damage to property, Tsai explained.

According to the CWB, there are nine underwater seismic stations reaching a maximum depth of 5,554 meters, while the cable reaches a depth of 5,796 meters, the bureau said.

Minister of Transportation and Communications Lin Chia-lung (林佳龍), who was also at the event, said that another 800-km undersea cable similar in nature is currently in the works.

This project, which will include undersea cables stretching from southern Taiwan to its southwestern corridor near the Manila Trench, is expected to take place between 2021 and 2024, the CWB said, highlighting the fact of its importance, as this oceanic trench is associated with frequent earthquakes.

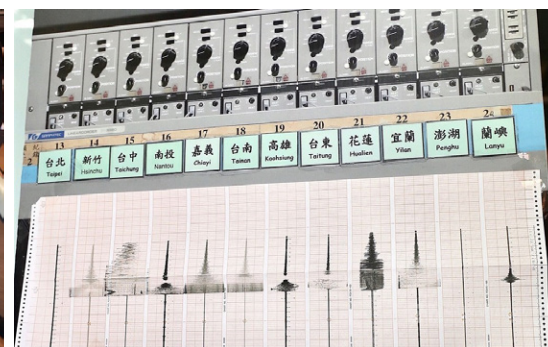
According to the bureau, this 800-km monitoring system will be designed to monitor seismic activity in the Manila Trench.



President Tsai Ing-wen (蔡英文, center) / CNA photo Dec. 31, 2020



President Tsai looks at a model scale of the undersea cable network / CNA photo Dec. 31, 2020



Seismometer in the Central Weather Bureau

Taiwan



Rotech Subsea secures 2nd phase cable trenching contract at Taiwan OWF & is contracted to supply additional spread of equipment for new campaign

Subsea trenching and excavation pioneer, Rotech Subsea, has secured a contract for a second phase of vital infrastructure works at a state-owned wind farm in offshore Taiwan – and at the same time has secured a commission to supply an additional spread of equipment for a wholly new campaign for the same client which will run concurrently.

With another campaign in the country set to commence in early 2021, the company will execute three campaigns simultaneously in Taiwan as well as completing an umbilical post trenching scope offshore Melbourne, Australia.

INTER-ARRAY & EXPORT CABLE TRENCHING

Aberdeen-based Rotech Subsea completed an initial scope of work at the Taiwan site in Q2/3, 2020 which saw its state-of-the-art TRS1 suspended jet trencher carry out an inter-array and export cable trenching scope for a major long-term tier one client.

The scope of work consisted of burying a total of 21 cables – four export and 17 array – to client specification of 2.1m DoL. The project was completed in two stages. The TRS1 tool was selected by the client due to its unparalleled technical and performance capabilities resulting in increased productivity and a reduction in total project costs.

The subsea spread of equipment was mobilised for the two-stage scope of work on the Willem De Vlamingh and Grand Canyon II, deployed using the ships' cranes to water depths ranging from 8–29m LAT.

Stage one of the project was a success with four export and 17 array cables



buried with ease. Soil conditions were soft sands, however, large sections of stiff clay with strengths up to 80kPa were experienced. Despite this, the TRS1 excelled and lowered the cable with two passes at an average rate of 4m/min reaching speeds up to 10m/min in some sections.

"The second phase of this project is set to commence in early 2021 with the client having already requested to keep the TRS1 tool on stand-by in Taiwan to ensure its availability," said Director of Subsea, Stephen Cochrane. "It's fantastic that the client has also requested another TRS1 for an additional campaign which will run concurrently.

"We are delighted to secure this follow-on work and new campaign, which firmly establishes us as the method of choice for cable trenching in the region. Our experience and

performance in these scopes mean we are now seeing more and more that our Suspended Jet Trenchers are being chosen as a primary method for trenching, over other contact trenching systems and ploughs. Because of the enhanced capabilities of the RS tools they can provide deeper and narrower trenches than ever before, with trenching speeds more than double that of competing Mass Flow Excavation tools."

Rotech Subsea's in-house research, development and engineering team has created a suite of 14 tools that has established Rotech Subsea as market leader in providing non-contact Controlled Flow Excavation (CFE), Suspended Jet Trenching technology and related subsea services. The dedicated in-house R&D team continue develop their technology, with further game changing enhancements to CFE due to be unveiled in 2021.

Taiwan

Rotech Subsea continues making strides in Asia with another major Taiwan scope



Rotech Subsea has clinched a contract for a follow-on phase of sandwave clearance and seabed levelling work at a state-owned Taiwan offshore wind farm. The scope of works will bring the number of active jobs for the subsea excavation pioneer in the Asia region to four when it commences in March 2021.

In Q3 2020 Rotech Subsea mobilised its state-of-the-art TRS2 Controlled Flow Excavation (CFE) and Suspended Jet Trenching tool, setting sail from Aberdeen to Taiwan. There, the TRS2 completed a sandwave clearance scope for a new client won on the back of Rotech's unrivalled European track record in renewables.

After the vital infrastructure works at the state-owned wind farm was successfully completed the client requested to retain the equipment on stand-by in the region to ensure its availability for potential second phase work early in 2021. That second phase of work has now been confirmed, with work set to commence in March.

The initial scope of works saw Rotech Subsea provide its TRS2 CFE tool to complete sandwave clearance operations at the offshore wind farm. Phase 1 of the works was carried out in late 2020 with the recently announced second phase set to kick off in early 2021.

The TRS2 was selected by the client because of its high volume output performance. The tool was mobilised on the Topaz Installer operating in water depths of 5-10m.

Phase 1 was a success. The tool was used to carry out 25 grid line excavations, lowering the seabed to allow vessel access to the work site during spring tides. The sections to be levelled varied in height ranging from 0.4 to 18m. Rotech Subsea carried out excavations at speeds of between 4m/min and 10m/min.

FOUR 2021 ASIAN ENGAGEMENTS AND COUNTING FOR ROTECH SUBSEA

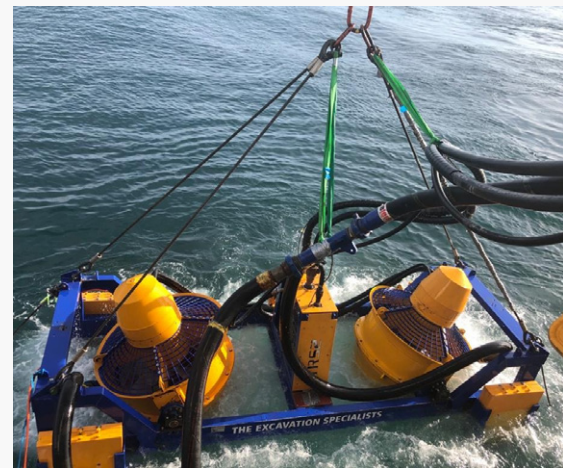
The new contract win came on the back of Rotech Subsea's December 2020 announcement that it had been engaged for a follow-on scope at another state-owned offshore wind farm in Taiwan- where its TRS1 suspended jet trencher had been deployed in Q2/3 2020 to carry out an inter-array and export cable trenching scope for a major long term tier 1 client. Rotech Subsea has also been engaged on another wholly new scope in Taiwan for the same client as well as mobilising for a recently won umbilical post trenching scope offshore Melbourne, Australia.

"We have gained real traction in the Asian market in the last 12 months," said Director of Subsea, Stephen Cochrane. "In common with four other tenders we have recently won in Asia, our state-of-the-art tools were selected for this phase 2 sand wave clearance work over other tools available in the region due to the safe, non-contact method and productive trenching speeds.

"In recent years we have seen the RS range of Controlled Flow Excavation (CFE) and Suspended Jet Trenching tools become the method of choice for IRM scopes. Increasingly our Suspended Jet Trenchers are being chosen as a primary method for trenching, over other contact trenching systems and ploughs due to our teams' unrivalled experience and our tools' unrivalled performance.

"The enhanced capabilities of our RS tools mean they can provide deeper and narrower trenches than ever before, with trenching speeds more than double that of competing Mass Flow Excavation tools."

Rotech Subsea's in-house research, development and engineering team



has created a suite of 14 tools that has established Rotech Subsea as market leader in providing non-contact Controlled Flow Excavation (CFE), Suspended Jet Trenching technology and related subsea services. The dedicated in-house R&D team continue develop their technology, with further game changing enhancements to CFE due to be unveiled in 2021.

Rotech Subsea's patented RS technology provides capabilities not available through traditional mass flow excavation. They offer solutions in controlled flow trenching, excavation, burial / backfill, deburial and seabed debris clearance for: Cable array and export, trenching / deburial; Cable joint burial / IRM; Pipeline trenching / deburial; Backfilling for cable / pipeline protection; Jack-up leg / spud can clearance; UXO deburial / access; Freespan correction / seabed rectification; Harbour / pontoon seabed clearance; Sand wave clearance / cable and pipeline route clearance; Umbilical and flowline trenching / deburial; Salvage deburial / access; Access to subsea structures / IRM / decommissioning; Drill cuttings removal; Cable / pipeline umbilical recovery; Rock removal / relocation; and Rock dump dispersal.

Taiwan

Taiwan's Chunghwa Telecom to invest in three new undersea cables

SJC2 submarine cable to enhance connectivity among East and Southeast Asian countries

Taiwanese telecommunications giant Chunghwa Telecom said Thursday (Dec. 17) that it is planning to invest in three new undersea cables, including one that can enhance connectivity between North and Southeast Asia.

As the number of international over-the-top service providers in Taiwan continues to increase, the country's importance to the Asia-Pacific network has also grown. In April, Google received approval to use a portion of a 12,875-kilometer undersea cable connecting Taiwan and California to serve users throughout the Asia-Pacific region.

Chunghwa said it is hoping to expand its investments in undersea cables by participating in the construction of three new routes in the next three years. One of them, the Southeast Asia-Japan 2 (SJC2) cable, will span 10,500 km and connect 11 cable landing stations in Singapore, Thailand, Cambodia, Vietnam, Hong Kong, South Korea, Japan, Taiwan, and China.



SJC2 cable to connect Singapore, Thailand, Cambodia, Vietnam, Hong Kong, South Korea, Japan, Taiwan, and China. (Source: Chunghwa Telecom)

According to the company, the SJC2 cable will consist of eight fibre pairs with an initial design capacity of 144 Terabits per second. Construction is expected to be completed by the end of next year (2021).

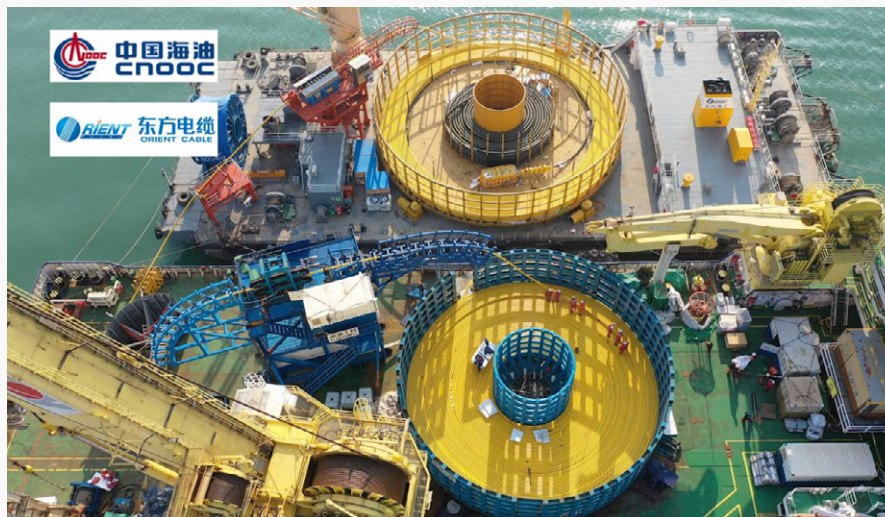
Chunghwa said it currently has 27 submarine cables across the globe, including 12 that landed in Taiwan. It also boasts 57 internet points of presence in 15 countries as well as eight overseas internet data center locations.

China

Liuhua 29-2 umbilical all set for installation

The Liuhua 29-2 deep-sea SPS umbilical is ready for installation, following the recent delivery by Ningbo Orient Cable (NBO).

The umbilical system has been loaded into China National Offshore Oil Corporation (CNOOC) HYSY 285 vessel.



This is the first deep-water static umbilical project (800 meters water depth, 9 super duplex SS tubes) which realise the production localisation in China after the 23-kilometre gas field static umbilical project (200m water depth, 9 super duplex SS tubes) in 2018 delivered by NBO.

Liuhua 29-2 is located in the South China Sea, with an average water depth around 800 metres. It is also the third deep-water offshore platform development for CNOOC.

Specifically, NBO delivered 15.8 kilometres of umbilical for the project.

After completion, the project could serve the gas use of 10 million families yearly, helping to reduce carbon footprint.

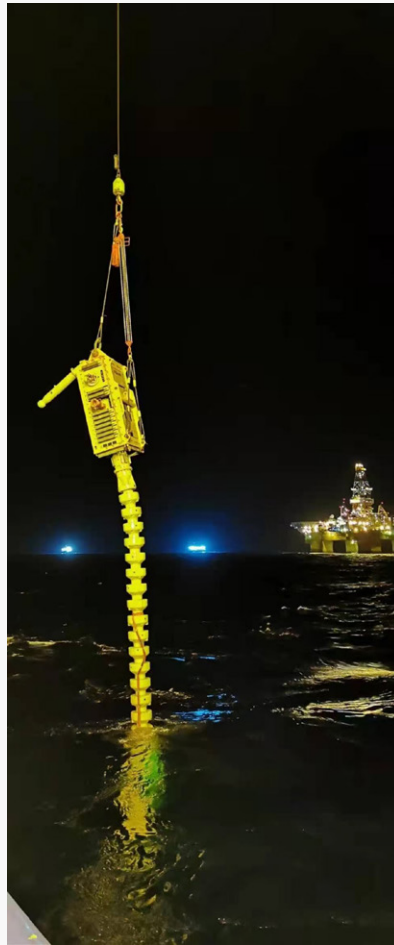
China

Cable installation completed

On the 12th of January 2021, the Liuhua 29-2 deep-sea SPS umbilical, manufactured by Ningbo Orient Cable was installed by the China National Offshore Oil Corporation HYSY 285 vessel.

NBO delivered 15.8 kilometres of umbilical for the project.

Liuhua 29-2 is located in the South China Sea, with an average water depth around 800 metres. It is also the third deep-water offshore platform development for CNOOC.



China

Fuqing Haitan Strait offshore wind farm begins producing

The Fuqing Haitan Strait offshore wind project in China has begun producing power.

The wind farm features 22 MingYang MySE7.0-158 turbines with a rated power of 7 MW and a rotor diameter of 158 meters.

The 300 MW wind farm is being developed by China Huadian Corporation and is the company's first offshore wind project.

It is located near the shore off the northeast part of Longgao peninsula, Fuqing county, where the average annual wind speed is 9.2m/s.

MingYang Smart Energy installed the first typhoon-proof turbine at the project in September.

China

SBSS completed Export cable installation

On the 25th of December 2020, the SBSS cable barge, Fu Yong 6, successfully completed her first 220kV export cable installation in the Guoneng Dafeng offshore wind farm.



China

Ørsted brings in CDPQ and Cathay PE as investors in the Greater Changhua 1 Offshore Wind Farm

Ørsted has today, 28th of December 2020, signed agreements with a consortium comprising global institutional investor Caisse de dépôt et placement du Québec (CDPQ), and Taiwanese private equity fund Cathay PE, who will be acquiring a total of 50 % ownership share of Ørsted's 605 MW Greater Changhua 1 Offshore Wind Farm. CDPQ will be the majority owner among the two new partners.

The Greater Changhua 1 site is part of the 900 MW Greater Changhua 1 & 2a Offshore Wind Farm, which Ørsted is currently constructing and expects to finalize in 2022.

As part of the agreement, Ørsted will construct the Greater Changhua 1 Offshore Wind Farm under a full-scope EPC contract. Ørsted will also provide long-term operations and maintenance (O&M) services from its O&M base at the Port of Taichung.

Martin Neubert, Executive Vice President and CEO of Ørsted Offshore, says: "I'm delighted to welcome our long-term partner CDPQ and Cathay PE in Greater Changhua 1. It's encouraging to once again see institutional investors playing an important role in the transition to renewable energy and low-emission economies. Today's announcement also marks a milestone in successfully applying our partnership farm-down model in Asia-Pacific for the first time."

The total sales price for the Greater Changhua 1 Offshore Wind Farm comprises the acquisition of a 50 % ownership share and the commitment from the partners to fund 50 % of the payments under the EPC contract for the wind farm which includes both the generation and transmission assets. The total value of the transaction is approximately TWD 75 billion (approx. DKK 16 billion) which is to be paid during 2021 and 2022.

Emmanuel Jaclot, Executive Vice-President and Head of Infrastructure, CDPQ, says: "This investment in Taiwan, which represents an attractive market for CDPQ, allows us to further diversify our presence in Asia. As an investor with vast experience in renewable energy, we seek this kind of greenfield opportunity to contribute to the transition toward a low-carbon economy. Working alongside our long-term partner, Ørsted, and experienced local investor, Cathay PE, we are proud to support the Greater Changhua 1 Offshore Wind Farm project, which will supply clean power to over 650,000 Taiwanese families."

Jeff Chang, Chairman, Cathay PE, says: "We are delighted to team up with CDPQ to invest alongside Ørsted in the

Greater Changhua 1 Offshore Wind Farm project. This landmark transaction represents an important milestone in Taiwan's energy transition towards a low-carbon future and fits perfectly with Cathay PE's investment mandate to invest in high quality energy infrastructure projects alongside world class partners."

Matthias Bausenwein, President of Ørsted Asia-Pacific, says: "We're looking very much forward to working with our new partners in the consortium and supporting Taiwan's energy transition, not least through a strong collaboration with the financial sector in Taiwan. Bringing long-term infrastructure investors and Taiwanese banks into Greater Changhua 1 is another milestone for the Taiwanese market, underlining its pioneering role in the Asia-Pacific region. While bringing in partners, Ørsted remains fully committed to constructing and operating the project during its lifetime."

The investors' 50 % stake in Greater Changhua 1 will be funded through a combination of equity and senior long-term debt facilities from 15 international and Taiwanese banks and 2 Taiwanese life insurance companies as well as 5 export credit agencies providing lending and guarantees.

The divestment is subject to regulatory approval from the Taiwanese authorities.

The information provided in this announcement does not change Ørsted's previous financial guidance for the 2020 financial year or the announced expected investment level for 2020.

FACTS ABOUT ØRSTED'S OFFSHORE WIND PROJECTS IN TAIWAN

The Greater Changhua 1 site accounts for 605 MW of the 900 MW Greater Changhua 1 & 2a Offshore Wind Farm which Ørsted has started constructing and expects to complete in 2022.

With a total capacity of 900 MW, Greater Changhua 1 & 2a will be able to supply around 1 million Taiwanese households with green power.

Greater Changhua 1 & 2a will be located 35-60 kilometers off the coast of Changhua County.

In June 2018, Ørsted was awarded the right to build another 920 MW offshore wind in Taiwan at its Greater Changhua 2b & 4 sites. The Greater Changhua 2b & 4 projects are to be built in 2025, subject to grid availability and Ørsted taking final investment decision on the projects in 2023.

Ørsted is also the co-owner of Taiwan's first commercial-scale offshore wind farm, Formosa 1, which was extended from a capacity of 8 MW to 128 MW in 2019.

ABOUT ØRSTED

Ørsted's vision is to create a world that runs entirely on green energy. Ørsted develops, constructs, and operates offshore and onshore wind farms, solar farms, energy storage facilities, and bioenergy plants, and provides energy products to its customers. Ørsted ranks #1 in Corporate Knights' 2020 index of the Global 100 most sustainable corporations in the world and is recognised on the CDP Climate Change A List as a global leader on climate action. Headquartered in Denmark, Ørsted employs 6,120 people. Ørsted's shares are listed on Nasdaq Copenhagen (Ørsted). In 2019, the company generated revenue of DKK 67.8 billion (EUR 9.1 billion). For more information on Ørsted, visit orsted.com.

ABOUT CDPQ

Caisse de dépôt et placement du Québec (CDPQ) is a long-term institutional investor that manages funds primarily for public and parapublic pension and insurance plans. As at June 30, 2020, it held CAD 333.0 billion in net assets. As one of Canada's leading institutional fund managers, CDPQ invests globally in financial markets, private equity, infrastructure, real estate and private debt. For more

information, visit cdpq.com, follow us on Twitter @LaCDPQ or consult our Facebook or LinkedIn pages.

ABOUT CATHAY PRIVATE EQUITY

Cathay Securities Investment Trust (Cathay SITE) is the largest domestic asset management firm in Taiwan. Since FSC's approval of Securities Investment Trust Enterprises to conduct Private Equity Funds business in August of 2017, Cathay SITE established a wholly owned subsidiary – Cathay Private Equity Ltd. Co. – to serve as the General Partner, begin its fundraising activities and appoint the Private Equity Investment Team of Cathay SITE to manage the Fund. "Cathay Sustainable Private Equity Fund Limited Partnership" was launched in December 2018, the first fund with an LP structure raised in Taiwan that focuses on infrastructure and "Five-Plus-Two Innovative Industries." The Fund invests 100% of its capital domestically, targeting key industries in Taiwan's sustainability development: Circular Economy (e.g., reuse of waste), Renewable Energy (e.g., solar and wind power), and the "Five-Plus-Two Innovative Industries" (e.g., IoT, long term care, new agriculture) supported by the government. All investments are environmentally sustainable, follow long-term trends, and fulfill necessities. The Fund expects to provide stable returns over long periods, suitable for long-term capital investments for insurance companies or retirement planning.

N B O

Deep Sea Umbilical
and Dynamic Cable Systems Solution Provider

RIENT 东方电缆
ORIENT CABLE

China

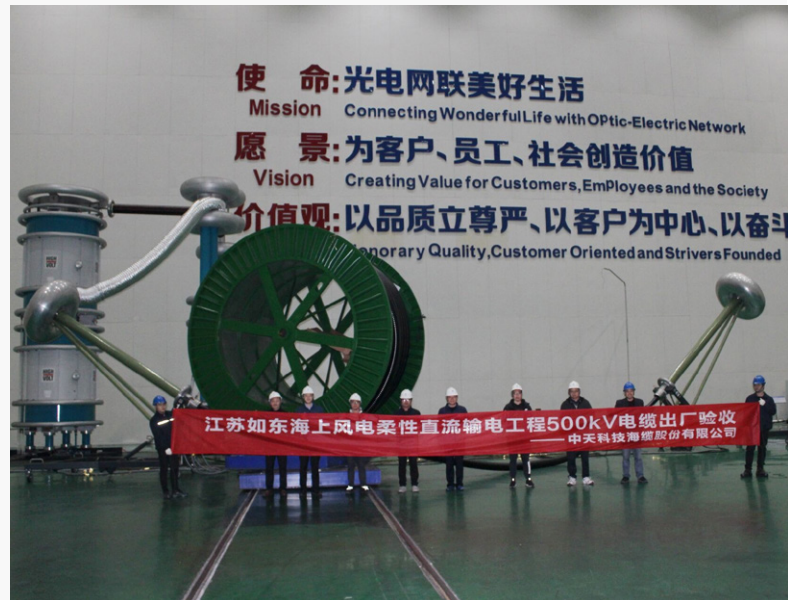
ZTT 500kV AC-DC Bi-characteristic EHV High Flame-retardant Cable, Successfully Passed Factory Acceptance

Recently, the 500kV AC-DC bi-characteristic EHV cable for Jiangsu Rudong Offshore (H6, H8 and H10) Wind Power Flexible DC Transmission Project supplied by ZTT Submarine, successfully passed factory acceptance.

Such ultra-high voltage (UHV) high flame-retardant cable with both AC and DC characteristics is both featured with high-quality characteristics of UHV AC cable and capable of withstanding DC working conditions, passing joint acceptance of China Three Gorges New Energy (Nantong) Corp., China General Nuclear Power Group New Energy Nantong Co., Ltd., Jiangsu Safe & Intelligent Transmission Engineering Technology Co., Ltd. and other organization in one-time manner.

ZTT Submarine, as the supplier of this project, conducted a series of researches on the structural design, performance and process on 500kV AC/DC bi-characteristic cables, and verified the rationality of cable structure and process through tests and effectively controlled the production process to ensure the quality stability of cable products. And high-quality, high electrical performance and flame-retardant sheath materials were used for outer sheathes met the requirements of bunched class a combustion tests upon the testing of authority, and products were found to have high flame-retardant property.

ZTT Submarine, as one of first individual Chinese manufacturing champion companies, extended and applied core R&D technology and process control of large-section, large-length and ultra-high voltage DC cables of high-voltage submarine cable system to offshore power cable system, laying a solid foundation for successful development of 500kV AC-DC bi-characteristic cables and successful pre-factory acceptance.



ABOUT ZTT GROUP

ZTT Group, a global and leading manufacturer is active in the research development, design, production, supply, and installation complete with a wide product range in telecom, energy, renewable energy and marine system.

ZTT was listed on the Shanghai Stock Exchange (Stock Code 600522.SH) on Oct 24, 2002. ZTT has broken through the US\$8.89 billion marks in revenue in 2019. A truly global company whose products are shipped to 147 countries. ZTT stronghold comprises 58 overseas branch offices, 6 registered subsidiaries, 89 plants (inclusive of 7 overseas plants), 7 research & development centers and over 16,000 employees.

China

Yangjiang Nanpeng Island offshore wind farm fully connected

The Yangjiang Nanpeng Island offshore wind project in China has been fully connected to the grid.

MingYang Smart Energy installed the last of its 73 MySE5.5MW hybrid-drive turbines at the 401.5 MW wind farm at the end of November.

According to the company, just from 1 to 16 December the team achieved a record of completing the commissioning of 36 turbines.

The first turbine was installed at the site off the Guangdong Province in July last year and the first batch

of turbines began operating in October.

Project developer China General Nuclear Power Corporation (CGN) also awarded MingYang with Red Coral Award for its contributions to the construction of the offshore wind project.



China

HMN Tech Announces SDM 16FP Wet Plants Complete Acceptance Test in H2HE system



HMN Tech announced that the first 16 fibre pair repeated system, Hainan to Hong Kong Express (H2HE), has completed manufacturing acceptance tests. The system, featuring a substantial design capacity of 96x200Gbit/s channels or 19.2Tb per fibre, will commence marine installation in March 2021, with a Ready For Service (RFS) date in Q2 2021.

HMN Tech's space division multiplexing technology (SDM) solution, incorporating 16 fibre pair high-performance repeaters, high-flexibility branching units and a new cable design, is the culmination of an extensive research and development programme and is now qualified for deployment throughout the globe.

The 700km H2HE system is proceeding on schedule with all terminal equipment manufacturing also completed. Once operational, it will provide a low latency, high-speed connection between Hainan, Guangdong and Hong Kong, facilitating the development of the regions' digital economy.



"Leading technological innovation remains a primary focus and core competence of HMN Tech," stated Ma Yanfeng, Vice President of Sales & Marketing, "This industry-first commercial application of our 16 fibre pair SDM solution is a significant milestone for both HMH Tech and the wider submarine network community'.

China

ZTT delivered 75 km HVDC cable

Seventy-five (75) km ± 400 kV HVDC submarine cable passed the FAT and was delivered to site in early January 2021. It is the second cable in first circuit of the HVDC cable system used in H6, H8 and H10 offshore wind farm projects developed by China Three Gorges Corporation and China General Nuclear Corporation in Rudong County, Jiangsu Province. The cable will be installed by ZTT's own CLB Yuanwei 8 equipped with a 6000 tons carousel. It is a great milestone for China's HVDC submarine cable application history.

South Korea

LS Cable & System wins international bid for submarine cables connecting Wando to Jeju

- Turnkey contract from KEPCO for 232.4 billion won of HVDC submarine cables
- Largest submarine cable project in Korea since 2009

On December 17, LS Cable & System (President & CEO Roe-hyun Myung) announced that it had won the 'Jeju 3-connection submarine cable construction project' of Korea Electric Power Corporation (KEPCO) with a bid of 232.4 billion won.

This is the largest submarine cable project in Korea following the 'Jeju 2-connection submarine cable construction project' completed in 2009.

With this project, scheduled to be completed in 2023, LS Cable & System will be connecting the 90km distance between Wando in Jeollanam-do and Jeju-do with HVDC (high voltage direct current) cables. LS Cable & System will be fully responsible for the project from the production of submarine cables to construction of all ancillary facilities.

Submarine cables will be routed in two lines to respond to the increase in Jeju's electricity demand for reliable power supply, and at the same time it can transmit renewable energy generated on Jeju-do to the shore.

Unlike AC cables, HVDC (high voltage direct current) cables do not generate electromagnetic waves, and can also minimize environmental damage.

An international competitive bidding was held to select the contractor with LS Cable & System being the final winner. After four failures in bidding, LS Cable & System was finally selected through technical evaluation and other factors. Currently, there are only five companies in the world that can build such a system on a turnkey basis, and LS Cable & System is the only company in Korea with such capability.

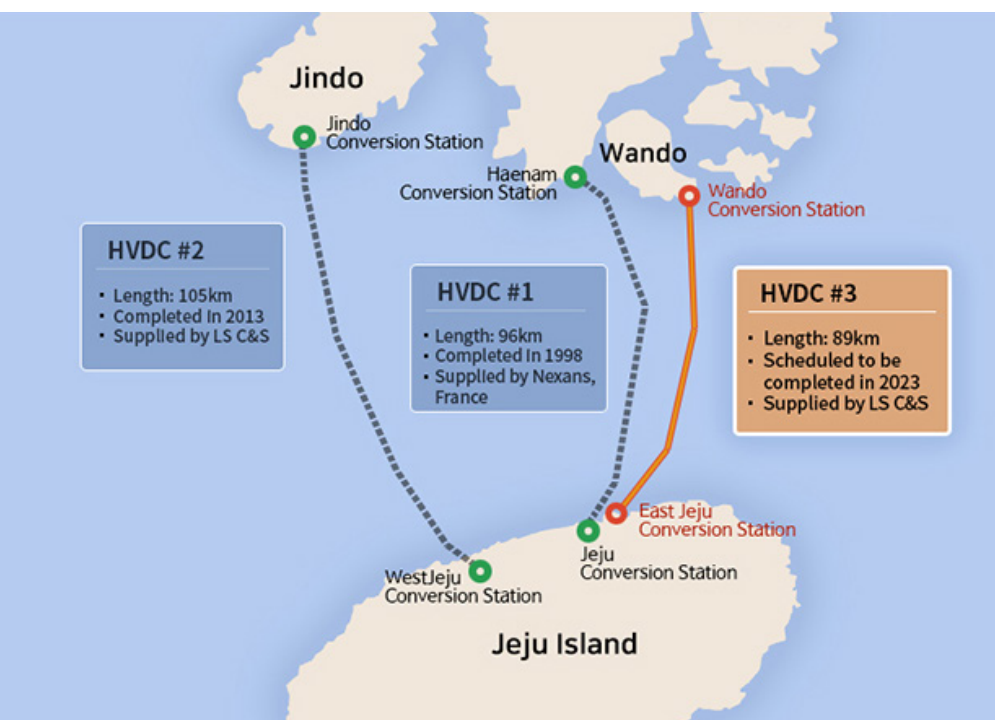


Shipment of submarine cables at Donghae Port near Donghae Business Site, Gangwon-do

President & CEO Roe-hyun Myung said, "When participating in this project, we not only considered the business results, but our responsibility for building-out the national power grid infrastructure as well. We will complete this project successfully, with a strong sense of duty."

As countries around the world strengthen their renewable energy policies, LS Cable & System will be expanding its investments in such technologies by, for example, constructing specialized HVDC factories in Donghae-si, Gangwon-do in 2021. The company also expects that it will contribute to the development of the regional economy and employment through expanding local investment.

During this past year, LS Cable & System has won significant projects in the United States, Middle East and Europe, and, significantly, has entered into a long-term supply agreement with Orsted, the world's leading submarine cable operator. In 2009, LS Cable & System entered the submarine cable industry that previously was entirely dependent on imports. Within 10 years the company established itself as a global supplier by achieving technology independence.



Description of submarine cable construction project for Jeju connection

South Korea

South Koreans sign 2.4 GW offshore wind agreement

South Korea's Doosan Heavy Industries & Construction has signed an agreement with the government of North Jeolla Province to cooperate on the construction of a 2.4 GW offshore wind project.

The project will be developed off the southwestern coast between Gochang County and Buan County, with expected completion by 2028.

Under the agreement, the North Jeolla government will provide administrative support.

South Korea set the goal of reaching 12 GW of offshore wind by 2030 in its Renewable Energy 3020 Implementation Plan announced in 2018.

This July, President Moon Jae-in pledged to expand the country's offshore wind power capacity from the current 124 MW to the set target.

South Korea

South Korea to build world's largest floating wind farm off Ulsan

Korea Hydro & Nuclear Power (KHNP) has signed a memorandum of understanding (MOU) with OW Offshore, a Spanish offshore wind power company, and Kumyang, a Korea renewable energy company to develop a giant floating offshore wind power generation complex off the coast of Ulsan, which the parties involved claim will be the biggest in the world.

Under the agreement, OW Offshore will develop three 500MW complexes with a combined total capacity of 1.5 GW in Korea's exclusive economic zone (EEZ) off Ulsan.

South Korea is currently accelerating the development of a new wind power generation system with an aim of building

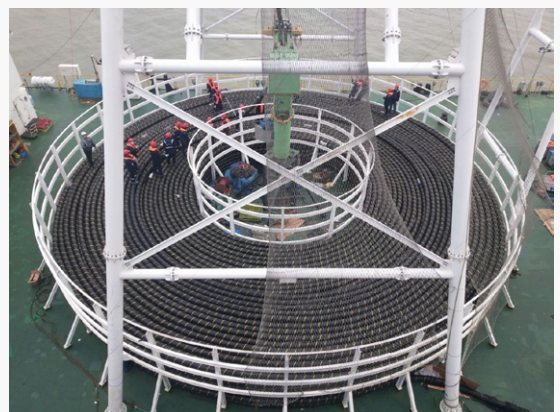


4.6 GW of floating offshore wind farms in the southeast of the country in the coming few years.

South Korea

154 kV cable delivered for solar farm

ZTT Submarine Cable & System just delivered one 154 kV three cored submarine composite cable to the end user in South Korea. The cable will be used for a solar farm project in Southeast part of country, to transmit power generated by the solar farm back to the Korean Peninsula. It is a very challenging project during the COVID 19 pandemic. The cable was produced on time and all tests passed as per the ITP and cable specification.





Floating offshore wind technology is an emerging option for generating power in deeper water further offshore than wind turbines fixed on the seafloor. While there are relatively few large-scale floating wind farms in operation, experts hope floating turbines could greatly expand the scope of offshore wind, generating power more efficiently where winds are stronger, and where turbines are less visible from land.

The **Floating Wind Europe** is gearing up to provide attendees with seminal insights for successful operations within a digitally shifted green energy landscape. The forum will bring together leaders within the Wind and Offshore industries enabling accelerated adoption of floating wind technology globally and will offer the ideal space for networking with industry players; senior managers, decision-makers, and practitioners operating in the industries and making the most of floating wind technologies.

Join us as we gather these experts, practitioners, stakeholders, and leaders from Europe and the rest of the world to discuss the how to achieve cost reduction, explore opportunities for the supply chain, examine the role of innovations and advancement in infrastructure. In addition, various aspects of floating wind will be presented and discussed in several sessions: From market developments to financing possibilities, technical challenges and, policies & legislative actions as well as best practices.

We offer this unique and timely opportunity to participate in the discussion and find solutions that fit your energy delivery goals and responsibilities. It is also an all-in-one place event for those, who want to learn about global trends, upcoming FWOT issues and challenges that can be made into opportunities.

Join **Leadvent Group** as it organizes these game-changing virtual conference on **Floating Wind Europe** on the **10th– 11th March, 2021**. It features – **20+ Exciting Case Study Sessions, 8 Interactive Panel Discussions, Interesting Q & A Session all in 1 Venue!**

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Prices: Enduser (owners & operators) – **EUR 399**; solution/service providers – **EUR 599**

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Japan

Atlantis supplied, Scottish manufactured tidal generation equipment arrives in Nagasaki, Japan ahead of deployment in the Naru Strait

SIMEC Atlantis Energy Limited ("Atlantis") is pleased to announce an important update in delivering Scottish made tidal generation equipment to Japan. The Atlantis designed and built tidal generation system has arrived in Nagasaki harbour, Japan having left Scotland in October. It will now be transported in January 2021 by support vessels to the designated deployment site in the Naru Strait, located between the islands of Naru and Hisaka in the Goto Island chain.

We are pleased and honoured to be working alongside our strategic partner, supported by a consortium of local and international stakeholders, to bring tidal stream energy to Japan. The AR500 tidal generation system will be deployed at the Naru Strait site initially operating at a capped maximum generation output of 500kW, as data collection (performance and environmental) and device validation are undertaken for the client and Japanese regulatory bodies.

Drew Blaxland, Director of ATES Division, commented: "Given the obvious challenges COVID presented during

the turbine building program in Scotland this year and the logistical challenges presented during transit more recently, we have still managed to deliver a turbine quayside in Japan before Christmas. To see this AR500 machine arrive in Japan, a first of its kind here, is a great achievement. Our focus now is in getting the power export cable, foundation and turbine nacelle installed safely, then we all look forward to this Scottish built turbine delivering predictable, sustainable renewable energy for Japan post commissioning."

ABOUT SIMEC ATLANTIS ENERGY

Atlantis is a global developer, owner and operator of sustainable energy projects with a diverse portfolio in various stages of development. This includes a 77 per cent. stake in the world's largest tidal stream power project, MeyGen, 100 per cent. of the 220MW Uskmouth Power Station conversion project and 100 per cent. of Green Highland Renewables, a leading developer of mini-hydro projects.

<https://www.simecatlantis.com/>

Japan

Japan to decommission floating offshore wind test turbines

The Japanese government has decided to remove floating offshore wind pilot turbines off Fukushima due to concerns about profitability, according to the Japanese Wind Power Association

Two pioneering floating offshore wind turbines at a test site off the coast of Fukushima, Japan, are to be decommissioned next year, according to media reports.

The ministry of economy, trade and industry (Meti) has set aside around JPY 5 billion (\$48 million) to remove the two Hitachi turbines – a 5MW unit and a 2MW one – and accompanying substation, according to the Tokyo Shimbun.

It is decommissioning the turbines because they are unprofitable due to their low availability, the Japanese Wind Power Association (JWPA) stated.

A 7MW Mitsubishi turbine, also installed off Fukushima, was decommissioned in June.



The 2MW Hitachi test turbine on a floating platform off Fukushima

The turbines were installed at a test site near the old Fukushima Daiichi nuclear power plant, which was devastated by a tsunami in 2011.

Japan had a rethink of its energy strategy following the 2011 nuclear disaster, shifting its focus to renewables – although progress in exploiting its vast coastline for offshore wind has been slow.

New prime minister Yoshihide Suga recently unveiled an ambition to reach carbon neutrality by 2050, which the JWPA believes would require 130GW of wind power capacity by mid-century, including 90GW of offshore wind.

The government launched the country's second offshore wind auction at the end of November, with four sites available off Akita and Chiba prefectures. Each site is expected to support 300–350MW of offshore wind capacity, and the tender is due to end at the end of May 2021.

Meti had launched a tender for a floating offshore wind project off Nagasaki prefecture in June.

Developers including Iberdrola, the Green Investment Group, Equinor, Aker Solutions, RWE, Sumitomo, Northland Power and Shizen Energy are among a long list of partnerships targeting Japan's nascent offshore wind market.

Samoa – American Samoa

ASH Cable retired

AST Telecom (BlueSky), American Samoa Hawaii Cable and Samoa American Samoa Cable have notified the FCC that the American Samoa–Hawaii segment of the American Samoa–Hawaii (ASH) cable system was retired and taken out of commercial service, effective 16 July 2020.

The Samoa–American Samoa segment remains in service. This remaining portion of the system will now be known as the Samoa–American Samoa (SAS) cable system.



Samoa – American Samoa (SAS) Cable System

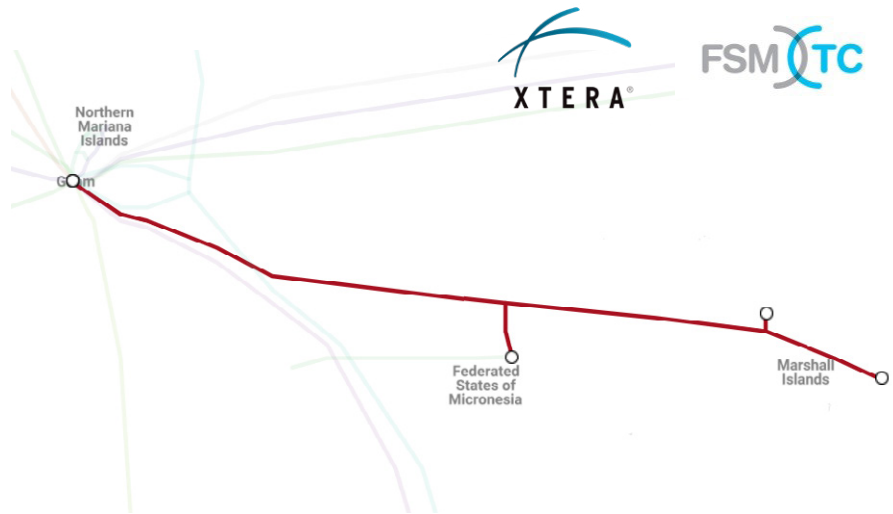
Federated States of Micronesia – Guam – Marshall Islands

FSMTC Awards Contract to Xtera to Upgrade Hantru-1

Xtera, Inc., a provider of innovative subsea fiber optic solutions, announces a new contract with FSM Telecommunications Corporation (FSMTC). FSMTC is the premium telecommunications service provider for Pohnpei, Kosrae, Chuuk, and Yap in the Federated States of Micronesia. The contract will upgrade the Hantru-1 Submarine Cable System between Pohnpei and Guam to enable FSMTC to meet the growing demand for broadband services.

Xtera's® contract with FSMTC provides new capacity using Xtera's Nu-Wave™ Optima Submarine Line Terminal Equipment (SLTE) with state-of-the-art coherent technology. Xtera's equipment makes it possible to upgrade existing submarine systems with the latest photonic technologies. Xtera's solution offers seamless integration with the existing equipment and enables a significant capacity increase of the submarine cable, not only at much lower cost per wavelength than the original installed equipment, but also with enhanced functionality.

"The upgrade of Hantru-1 with Xtera's technology makes it possible to extend the system far beyond its original design capacity," said Fredy Perman, Chief Executive Officer of FSMTC. "This upgrade will enable us to continue to offer an expansive service portfolio to address the ever increasing customer demand for broadband services."



Hantru-1 Cable System

Keith Henderson, Chief Executive Officer of Xtera, comments, "We are extremely proud to have been selected by FSMTC to upgrade Hantru-1. It further demonstrates the value of Xtera's technology and engineering to significantly increase capacity on pre-existing systems in a very cost-effective way."

ABOUT FSMTC

FSMTC is a public Corporation established under Title 21 of the Code of the Federated States of Micronesia, governed under FSM laws. FSMTC operates in accordance with the highest standards in all relationships with customers, suppliers, the environment, and the community. Our vision is to provide the best possible modern, cost-effective telecommunications services by consistently satisfying the

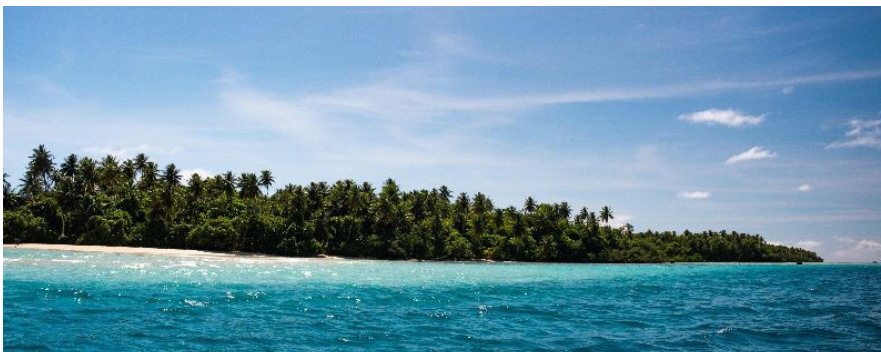
realistic expectations of our customers and stakeholders.

ABOUT XTERA®

Xtera is an innovative provider of subsea systems and telecoms technology. We supply both unrepeated and repeated networks, delivering traffic directly in-land between data centers and cities. Xtera consistently challenges industry norms and creates unique solutions that are tailored to each individual customer whether that be for the provision of a full system, an open architecture design or individual network elements.

Xtera's turnkey project management expertise and system integration capability is offered in conjunction with solid industry partnerships and provides customers with the confidence that Xtera will design, build and commission submarine cable solutions that deliver high performance end-to-end capability. Post-delivery and acceptance, our specialist team are on hand 24 hours a day to provide technical support to system operators.

For more information please visit www.xtera.com or contact info@xtera.com



Federated States of Micronesia – Nauru – Kiribati

U.S. senators Cruz, Rubio warn Pacific ally on Chinese bid for undersea cable project

Prominent U.S. lawmakers warned a Pacific ally that China risked undermining the security of a sensitive undersea cable project if a cut-price, state-backed bid wins a tender process overseen by development agencies, a letter reviewed by Reuters shows.

A Chinese foreign ministry spokesman today, 23rd of December 2020, rejected the accusation as lies.

In the letter dated Sept. 18, Republican senators Ted Cruz and Marco Rubio told the Federated States of Micronesia (FSM) that China could leverage its way into the project to wage “campaigns of espionage and

geopolitical coercion”. Beijing recently imposed symbolic sanctions on both Cruz and Rubio.

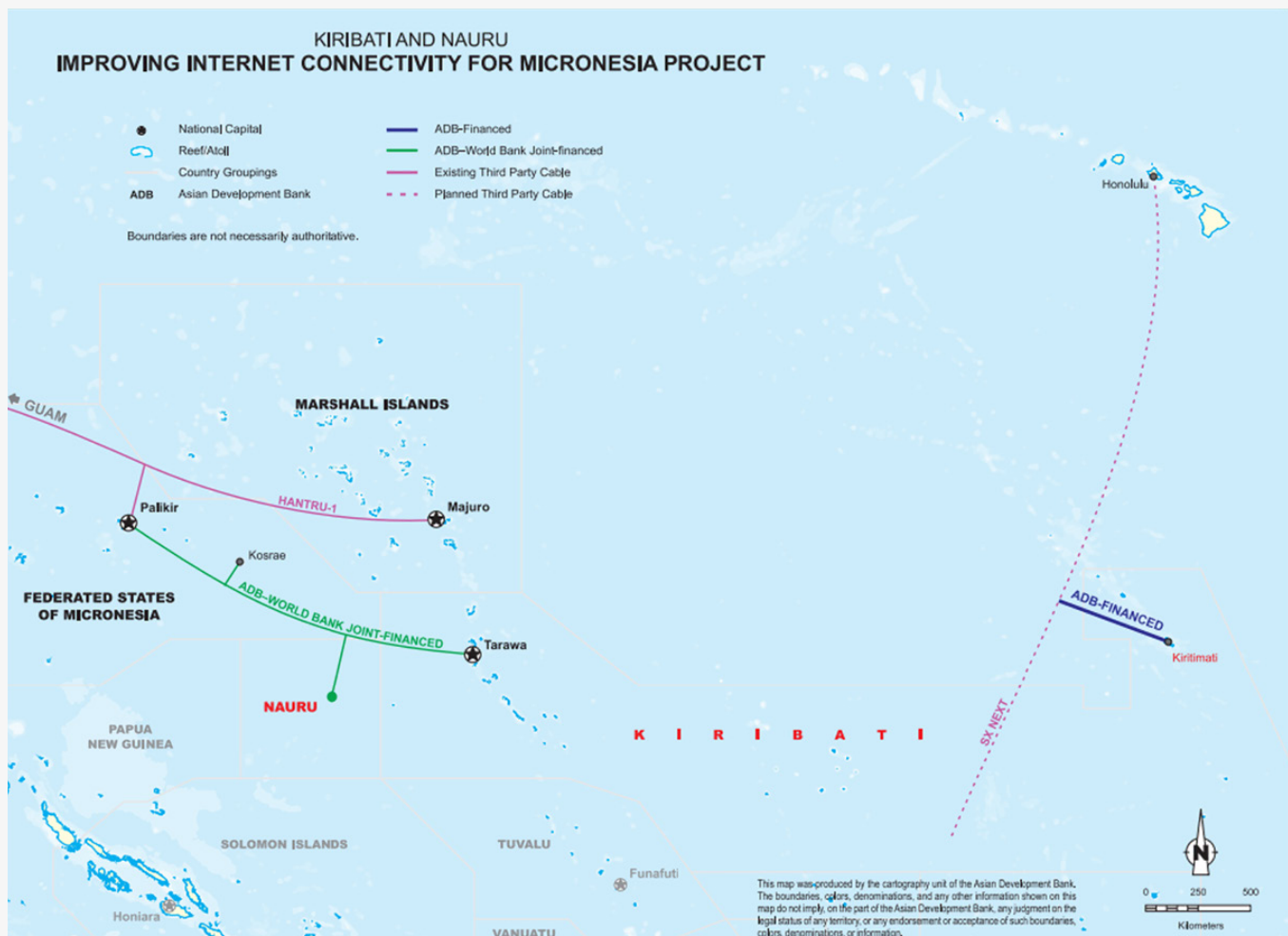
Reuters reported that Huawei Marine, recently divested from Huawei Technologies Co Ltd and now majority-owned by another Chinese firm, submitted bids priced at more than 20% lower than two rivals for the \$72.6 million project funded by the World Bank and the Asian Development Bank (ADB).

Washington has pressed governments around the world to squeeze Huawei Technologies Co Ltd out of supplying critical infrastructure, alleging the company would hand

over data to the Chinese government for spying, a charge consistently denied by the company.

The cable project is designed to improve communications to the remote Pacific island nations of Micronesia, Nauru and Kiribati, although it has reached an impasse at the bid assessment stage, two sources with direct knowledge of the project details told Reuters. All parties involved have input on the selection of the tender winner.

The people with knowledge of the situation declined to be identified because of the sensitivity of the project.



East Micronesia Cable Project (Source: Asian Development Bank)

Following Reuters' report, Chinese foreign ministry spokesman Wang Wenbin said that the United States was smearing Chinese companies.

Another ministry spokesman, Zhao Lijian, told a news briefing in Beijing that Cruz and Rubio are people "without a shred of political credibility" and who have "seized any opportunity to oppose China and fabricate lies so as to score political points by smearing China."

Zhao also cited unidentified Danish news reports that allege the United States spied on the Danish government by tapping on data from fibre optics cables passing through Denmark.

"The world sees through clearly the U.S. tricks of smearing others while glorifying itself," Zhao said.

Huawei Marine and its new majority owner, Shanghai-listed Hengtong Optic-Electric Co Ltd, did not respond to Reuters' questions. Huawei Tech Investment Co retains a small stake in Huawei Marine, company filings show.

The interjection by Cruz and Rubio builds on earlier communiques sent to Pacific nations by U.S. embassies warning against awarding Huawei Marine the contract.

Signed by Cruz and Rubio, the letter said that awarding Huawei Marine the contract would "deeply complicate relations between our countries and hinder the ability of U.S. diplomats and personnel to interact with your government."

"The Chinese Communist Party subsidizes companies such as Huawei to ensure they

are able to undercut all competitors, and then uses infrastructure installed by those companies to advance the CCP's campaigns of espionage and geopolitical coercion," the letter said, referring to the Chinese Communist Party (CCP).

Cruz's office did not respond to questions. Rubio's office could not be immediately reached for comment outside business hours.

The U.S. State Department said in a statement to Reuters that Huawei and its current and former subsidiaries, including Huawei Marine, posed "economic and national security risks".

Under the Compact of Free Association, a decades-old agreement between the United States and its former Pacific trust territories, Washington is responsible for Micronesia's defence.

Palau

NEC concludes contract to supply the Palau Cable 2 (PC2) optical submarine cable

NEC Corporation announced the signing of a contract with the National Submarine Cable Utility Belau Submarine Cable Corporation (BSCC) of the Palau Republic (Palau) for the Palau Cable 2 (PC2) optical submarine cable construction project. PC2, with a total length of approximately 110km, will connect Palau with a large-capacity submarine optical cable that connects Southeast Asia and the U.S. mainland. This cable is scheduled to be completed at the end of 2022.

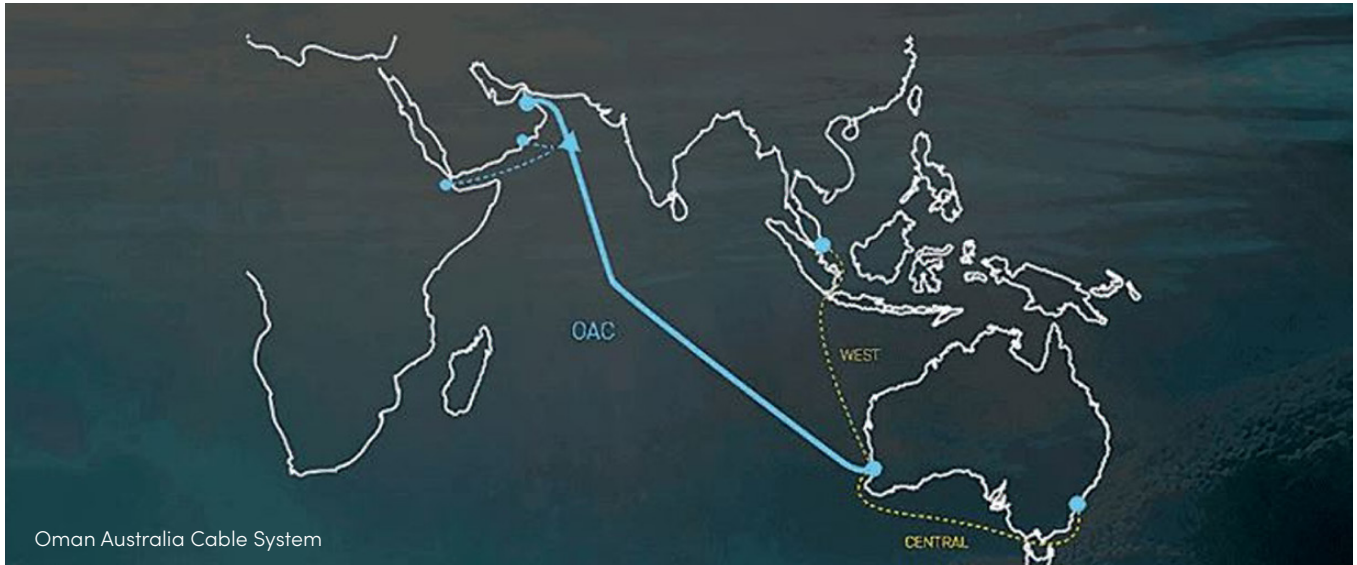
PC2 adopts the latest optical wavelength multiplexing transmission system of 100 gigabits per second (100Gbps), and as an addition to the first optical submarine cable laid by NEC in Palau in 2017, ensures the redundancy of Palau's network, realizes highly reliable communications, and responds to the increasing demand for communications, thereby contributing to further economic development in Palau.

This project is being implemented under a buyer's credit (export finance) loan agreement by the Japan Bank for International Cooperation (JBIC) and Sumitomo Mitsui Banking Corporation (SMBC) with BSCC. The loan portion from SMBC is insured by Nippon Export and Investment Insurance (NEXI). Additional financing is being provided by the United States Government and the Australian Infrastructure Financing Facility for the Pacific (AIFFP).

NEC has been a leading supplier of submarine cable systems for more than 50 years, and has built more than 300,000 km of cable, spanning the earth nearly 8 times. NEC is well-established as a reliable partner in the submarine cable field as a system integrator that provides all aspects of submarine cable operations, including the production of optical submarine repeaters and optical submarine cables, as well as coordinating ocean surveys and route designs, cable installation, training and delivery testing. The company is particularly strong in the Asia-Pacific region, including Japan, where NEC subsidiary OCC Corporation, is capable of producing submarine optical cables that can withstand water pressure from 8,000 meters beneath the sea.

ABOUT NEC CORPORATION

NEC Corporation has established itself as a leader in the integration of IT and network technologies while promoting the brand statement of "Orchestrating a brighter world." NEC enables businesses and communities to adapt to rapid changes taking place in both society and the market as it provides for the social values of safety, security, fairness and efficiency to promote a more sustainable world where everyone has the chance to reach their full potential. For more information, visit NEC at <https://www.nec.com>.



Australia

DXN to build \$1.1M landing station for APX Partners

• Contract marks DXN's 10th cable landing station deal

Data Exchange Networks (DXN) has kicked off 2021 by winning a \$1.1 million contract with APX Partners to build a cable landing station.

DXN will design, prefabricate, build and install the fully engineered station and supply the modules as part of the deal.

The station is expected to be built by April 2021 this year, with DXN then providing a year of support services following its completion.

The contract marks DXN's 10th cable landing station deal, the publicly listed company told shareholders.

"The global market for subsea cables continues to grow as critical capacity is pulled forward by operators to deliver low latency, high-capacity services," said CEO Matthew Madden.

"Our team have amassed a lot of experience in building and deploying cable landing stations and we are proud to have been selected for this project."

APX is the Australian subsidiary of subsea fibre cable infrastructure group Sub Co, which was founded by Australian entrepreneur Bevan Slattery, also the founder of NEXTDC, Superloop and Megaport.

The DXN deal comes four months after it won a contract with Connected Farms to supply data centres for up to 15 sites across Australia.

Under the agreement, the modular data centre provider will supply prefabricated solutions, with the first order being placed for two sites in Queensland and New South Wales for about \$1 million.

Australia

AUSTEn delivers tidal energy mapping data for Australia

The Australian Tidal Energy (AUSTEn) team has made publicly available tidal energy datasets from two sites in Tasmania and the Northern Territory to help assess Australia's tidal energy resource and its potential contribution to the future energy mix.

A new currents, waves and CTD data, obtained during the campaigns in Banks Strait, Tasmania, and Clarence Strait, Northern Territory, have been made publicly available through the AODN Portal, the AUSTEn team informed.

It is available for researchers and industries alike to further investigate the energy resource potential of these sites and/or validate their ocean and hydrodynamic models.

The AUSTEn project, initiated in 2017 and completed in September 2020, was co-funded by the Australian Renewable Energy National Agency (ARENA) and established to assess the technical and economic feasibility of tidal energy sites in Australia.

The project successfully developed the inter-linked deliverables which include a national Australian high-resolution tidal resource assessment (~500 m resolution), feeding into the Australian Renewable Energy Mapping Infrastructure (online resource atlas).

Also, the team delivered focused case studies at the Banks Strait, Tasmania, and the Clarence Strait, Northern Territory for energy extraction, involving field based and high-resolution numerical site assessments, as well as in-situ environmental measurements and observations.

The AUSTEn team also developed technological and economic feasibility assessment for tidal energy integration to Australia's electricity infrastructure, including consideration of important issues such as grid integration, and competitiveness against existing and new sources of generation, intermittency and farm design.

Case studies at six key sites also outlined opportunities for adding tidal generation to the energy mix, according to the project team.

The project was led by the Australian Maritime College, University of Tasmania in partnership with CSIRO and

the University of Queensland, industry partners SIMEC Atlantis Energy (Scotland), Sabella (France) and Mako Tidal turbines (Australia), and international collaborators, Acadia University (Canada) and Bangor University (United Kingdom).

The outcomes of this project are highly beneficial to the emerging tidal energy industry, the strategic-level decision makers of the Australian energy sector, and the management of Australian marine resources by helping them to understand the resource, risks and opportunities available, and overcoming current barriers to investment by increasing the competitiveness of tidal energy against other forms of ocean renewables, according to AUSTEn.

Detailed field and numerical studies for the two sites have been delivered, providing tidal project developers a head start in commissioning their site prior to deployment of their technology.

Further case studies were developed showing the potential of tidal energy in Australia's energy mix, AUSTEn team noted, adding that the final report of the project will be available on the ARENA portal.

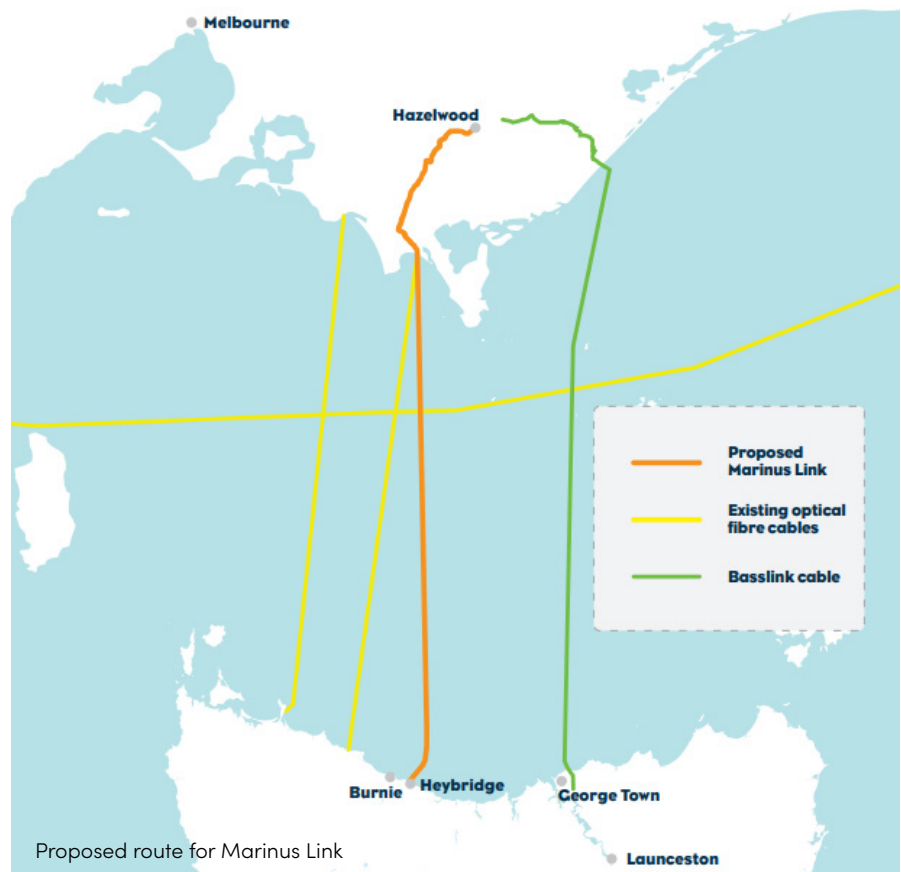
Australia - Tasmania

Marinus Link route options report overview

The Route Options Report Overview describes the proposed route for Marinus Link including the location of the converter station site in Tasmania.

TasNetworks is pleased to have reached agreement with the Burnie City Council to purchase the Old Tioxide Site in Heybridge as a potential site for the Tasmanian Converter Stations for Marinus Link.

Both Governments have also agreed to continue to support Hydro Tasmania's Battery of the Nation initiative and TasNetworks welcomes the news that Lake Cethana is the preferred Pumped Hydro Energy Storage site to progress as part of a final feasibility assessment.





Australia - Tasmania

State and Federal agreement delivers for Project Marinus

TasNetworks has welcomed the news that Marinus Link will receive further support to complete the Design and Approvals phase, as part of a historic agreement between the Tasmanian and Australian Governments announced today in Northern Tasmania.

TasNetworks CEO, Lance Balcombe and Project Marinus General Manager, Bess Clark joined the Prime Minister, Scott Morrison and the Tasmanian Premier, Peter Gutwein and Tasmanian State and Federal Energy Ministers at an event today.

"Today's announcement will see Marinus Link progress to an investment decision. It recognises Marinus Link's important role in a transforming National Electricity Market. The project will create thousands of jobs and put downward pressure on electricity prices," TasNetworks CEO, Lance Balcombe said.

"The MOU will see the project receive an additional \$132.9 million to complete the current Design and Approvals phase. This includes \$93.9 million from the Commonwealth and \$39 million from the Tasmanian State Government" Mr Balcombe said.

A Memorandum of Understanding (MOU) agreed by the Tasmanian and Commonwealth Governments involves a jointly-owned Special Purpose Vehicle (SPV) being established by 1 July 2021 to deliver the remainder of the Design and Approvals phase for Project Marinus. The SPV will provide the governance and oversight to guide the project to a final investment decision in 2023-24.

"The MOU announcement further confirms the value of Project Marinus as critical to supporting a rapidly transforming National Electricity Market (NEM) by delivering low-cost, reliable and clean energy to electricity customers, Mr Balcombe said.

"We look forward to working with The Tasmanian and Australian Governments under the MOU arrangements as this important national infrastructure project progresses through the Design and Approvals phase." Mr Balcombe said.

The announcement coincides with the release of the Marinus Link Route Options Report Overview which is open for consultation ahead of further engagement with communities and landowners in Tasmania and Victoria in the coming weeks and months.

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Tasmania

Wave Swell Energy's 200kW wave unit nears completion

Australian-based company Wave Swell Energy (WSE) has made significant progress on the construction of its wave energy device that will be deployed off Tasmania early in 2021.

A 200kW demonstration unit, still under construction, will be installed just south of the Port of Grassy on King Island.

The substructure of the device was built at the Southern Marine Shiplift, while WSE has been building the super structure of the device on TasPorts land at the Port of Bell Bay.

In mid-December 2020, the superstructure and the substructure have been joined together, WSE said, adding that all major components are now in place as work continues on the internal parts of the device.

TasPorts' Executive General Manager Corporate Affairs, Kate Dean, said TasPorts was pleased it could play its role in bringing the two structures together.

Dean said: "TasPorts' tug Wilga and workboat Carrington recently undertook an impressive nine-and-a-half-hour voyage to tow the 740-tonne substructure of the device from Southern Marine Shiplift, up the Tamar River to the Port of Bell Bay.



WSE unit being towed for final fit-out
(Courtesy of Wave Swell Energy/Rob Burnett)



WSE unit at Bell Bay (Courtesy of Wave Swell Energy/Rob Burnett)

"Once WSE completes the construction of the unit dockside, TasPorts will then play a critical role transporting the almost 1000 tonnes of equipment on its 40-hour journey across the Bass Strait, from Bell Bay to King Island".

Tom Denniss, WSE Co-Founder and Executive Chair, said these milestones are important steps towards their vision.

Denniss said: "We have really valued the support from all of the Tasmanian suppliers, such as TasPorts, that we have worked with to see the project get to this stage.

"Through this collaboration we have been able to see incredible levels of expertise and excellence delivered by these local businesses".

Denniss added that once at King Island, WSE will work with Hydro Tasmania to deliver energy generated by waves into the island's existing grid, which is currently powered by wind, solar, and diesel generators,

"We believe this will see King Island become the first location in the world with a power station that operates on three different types of renewable energy.

"Longer term, we expect to provide large scale grid connected electricity. Waves are a highly predictable, reliable and a virtually infinite resource. We aim to make wave energy a complementary base load power source that provides a meaningful contribution to the global energy mix", concluded Denniss.

WSE's technology is based on the oscillating water column (OWC) concept.

The OWC is an artificial blowhole consisting of a chamber that is open underneath the waterline.

As waves pass the OWC, the water rises and falls inside, forcing the air to pass by a turbine at the top of the chamber, which in turns generates electricity.

Tasmania

Wave Swell Energy deploys UniWave200 off Tasmania

Wave Swell Energy (WSE) has deployed its UniWave200 wave energy device offshore Tasmania, marking a significant milestone in ocean energy development for Australia.

The 200kW unit has been installed at Grassy Harbour on King Island on the morning of January 10, 2021, following a 40-hour transit across the Bass Strait from the TasPorts facilities where it was assembled.

The unit is now sitting on the seabed in its planned location, approximately 100 metres from shore, in 5.75 metres of water depth.

The commissioning phase will take place over the coming weeks, with the device expected to be connected to Hydro Tasmania's hybrid grid during the first quarter of 2021.

The King Island project, supported by the Australian government through the Australian Renewable Energy Agency (ARENA), will seek to demonstrate the technical and commercial viability of the UniWave200, and validate its efficiency, survivability, and accessibility.



UniWave200 unit in Grassy Bay on King Island (Courtesy of Wave Swell Energy/ARENA)

"After a flawless 40-hour transit from Tasmania, the unit is now sitting proudly in Grassy Bay on King Island. Countless hours of hard work have gone into this project to get to this stage, and we'd like to thank all those involved in the project from its inception up until now.

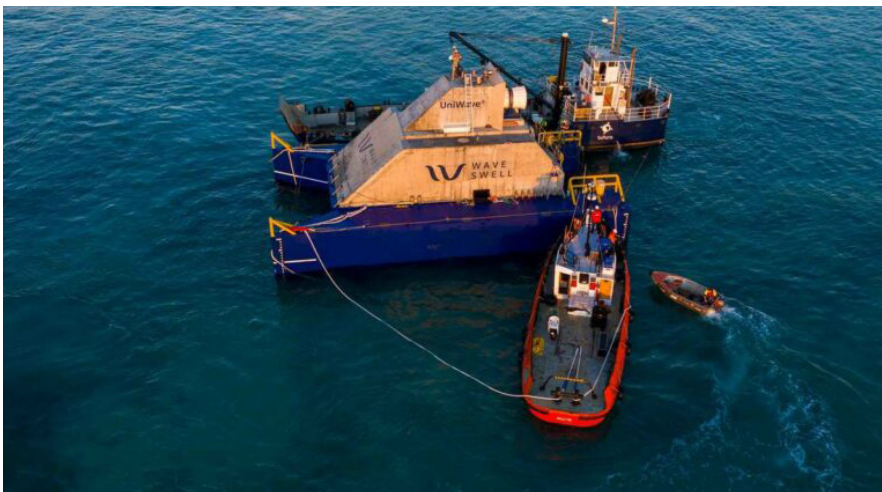
"Commissioning of the unit will begin shortly as we approach the connection to the King Island power grid, making it the first power station in the world to simultaneously generate energy from three renewable resources; wave, wind, and solar", WSE said on social media.

Wave Swell Energy's technology is based on the well-established concept of the oscillating water column (OWC). The UniWave200 device is partially submerged as it sits on the seabed, with an opening on one side to allow the movement of the waves in and out of the chamber.

The design of the UniWave200 has been modified from a bi-directional turbine which rotates in two directions, to a unidirectional turbine which rotates in one direction only, which is expected to result in a simpler and more robust design with high energy conversion efficiency and lower costs.

There are no moving parts below the water which means maintenance is only ever required to be performed on the easy-to-access areas of the device.

Welcoming the announcement, the Wave Energy Research Centre (WERC), a research centre within the University of Western Australia, said: "This marks a significant milestone in ocean energy development for Australia, and its success will give confidence, accelerate more research and development (R&D) towards commercial projects and trigger investment in the entire sector".



UniWave200 device during deployment operation (Courtesy of Wave Swell Energy/ARENA)

Australia – New Zealand – Antarctica

Datagrid plans \$500m hyperscale DC and two new subsea cables

Datagrid New Zealand has announced plans to build a new \$500 million (A\$700 million) hyperscale data centre in South Island, New Zealand.

The new facility, to be located in North Makarewa in Southland, will enable tech giants like Google, Amazon, Apple, Facebook and Microsoft, to serve close to 20 million customers across eastern Australia and New Zealand.

The project has already garnered input from Meridian Energy which will deliver 100MW of power from its 800MW Manapouri hydro scheme to the Datagrid site.

Galasso said Datagrid wants to emulate Iceland's success in attracting data centre builds, taking advantage of the South Island's cooler climes and proximity to renewable energy generation.

Due to agreeable weather in the region, with an average annual temperature of 9.8 degrees, Datagrid's cooling overhead would be halved.

"We will save 15% of the power, which means we will save 15% of the cost," said Galasso.

Once operational in 2023, Datagrid will become the country's first hyperscale facility with a footprint of 40,000 sqm and can be built in 10,000 sqm tranches. US data centre design company Aecom has been appointed as the project's technical consultant and the site will reportedly only need 25 staff to operate.

Previous data centres have been considered in the past but fell flat due to the lack of international connectivity, Datagrid plans to get around this with the development of two new subsea cables.

The first will be a 2900km system connecting Invercargill, New Zealand to Sydney and Melbourne, Australia.



The cable itself is designed to have four fibre pairs on the Invercargill to Sydney leg. Between Sydney and Melbourne, the cable will have 16 fibre pairs, and 13 ms latency.

The second will connect to Hawaiki Cable's landing point at Mangawhai Heads, north of Auckland. It will then have onward connectivity to Auckland, Wellington and Christchurch.

There is also the potential for branch cables to the Chatham Islands, to connect not only its citizens but also the Rocket Labs' satellite-tracking station, as well as to Stewart Island and the US and New Zealand bases in Antarctica.

The plan is for the subsea cables to land along the 26km stretch of Oreti Beach, just outside Invercargill.

"We are talking to fishermen because we need to ask for a two nautical mile-wide zone where they could not anchor or do any trawling, to protect the cable," said Galasso.

Of the \$500 million price tag, \$100 million has been allocated to the construction of the two cables and the remaining \$400 to be spent on the new hyperscale data centre.

Still in the early stages of development the project is still contingent upon the securing of one of the big US cloud companies coming onboard as an anchor tenant. According to Galasso talks were taking place soon and "hopefully within the next 12 months we will sign an anchor tenant and then confirm the project".

The project also plans on being funded through a combination of equity and debt from infrastructure investors in New Zealand once an anchor tenant is secured.

"Obviously if we can't raise 100% in New Zealand, then we will go to Australia and the US," added Galasso.

Both Galasso and Dick plan on financing the project's preparatory work themselves.

"The whole project needs quite significant funding from the various parties that will be involved. There is huge interest in the project, but it is early days," said Dick.

Galasso said the cable system is expected to enter service in 2023.

New Zealand

Harbour Crossing Line upgrade

Aurora Energy is installing two new submarine cables between Port Chalmers and Portobello to replace the ageing overhead line and submarine cable.

The project is due to start in October 2020, with work undertaken in stages. The Harbour Crossing Project is due for completion in October 2021.

The project will be undertaken between Port Chalmers and Portobello and replace the lines between Port Chalmers, Portobello, Quarantine and Goat Island.

Aurora Energy are removing the high voltage line that crosses Otago Harbour from Port Chalmers to Goat Island, Quarantine Island then to Portobello and replacing the overhead line with a submarine cable. The overhead line supplies power to the northern end of the Otago Peninsula and the upgrade is necessary to maintain a reliable power supply to 728 customers on the Peninsula, including the customers on Quarantine Island.

The existing line was originally installed in 1959 and is due for replacement. They will be replacing the existing six

pylons with a 11kV submarine cable. A new power supply will also be provided to the customers on Quarantine Island.

As a part of this project an additional 11kV submarine cable is being installed as a replacement for the existing Port Chalmers 3 submarine cable which was installed in 1947.

As well as replacing ageing assets, this project also addresses public safety risks associated with end of life towers and conductor and enables continuation of a secure electricity supply to Portobello by replacing a 1947 submarine cable.

The option to replace the overhead line and submarine cable on a 'like for like' basis but analysis concluded that the lowest overall cost solution was to install two submarine cables, while also delivering visual amenity value for the local community.

While the focus is on replacing ageing assets, the new submarine cables will also improve the view along the pristine stretch of coastline and ensure the current reliability to the Portobello community.



Eckhard Bruckschen, Managing Director/Editor, Subcablenews Ltd.

Ryan Wopschall, Founder and Principal, Wopschall Consulting, LLC

"The ageing infrastructure in the Atlantic needs to be replaced at a greater pace, as the traffic demand is substantially increasing in the years to come. Collaboration between OTTs, IIPs, Tier1 telco carriers, data centre providers and backhaul network providers will continue to transform the subsea connectivity landscape faster than ever before."

interglobixmagazine.com/edition5



ALCATEL
SUBMARINE
NETWORKS

Two years ago Alcatel Submarine Networks was the first to launch a new product called **SDM₁** By ASN which since then has completely changed the design paradigm for long-haul, high-capacity submarine systems

ASN continues to lead the way,
having captured more than
60% of SDM market
until now



www.asn.com

Alaska

Sumitomo Electric is Awarded Submarine Cable System for the Southeast Alaska Power Agency, Alaska, USA



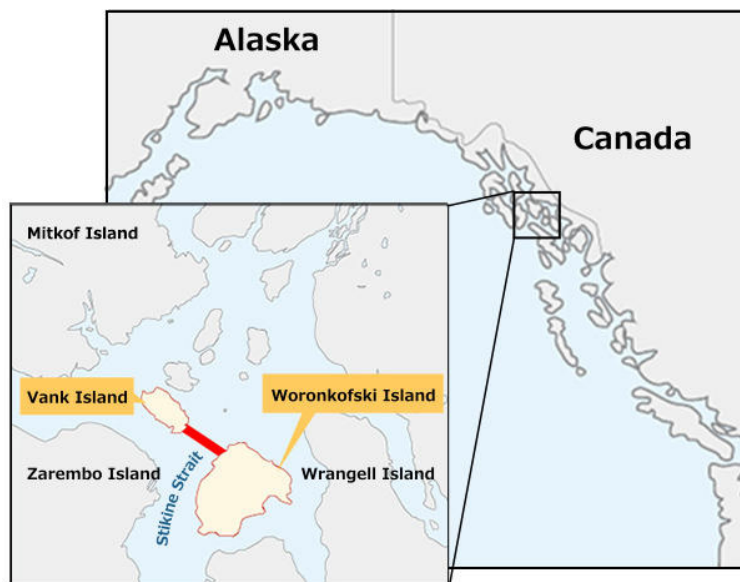
Sumitomo Electric Industries, Ltd. is pleased to announce that it was awarded a contract for the Stikine Crossing Submarine Cable Replacement Project from Southeast Alaska Power Agency (SEAPA) through our subsidiary, Sumitomo Electric U.S.A., Inc.

The purpose of this project is to remove and discard one existing 138kV OF (Oil Filled) submarine power cable and install an environmentally friendly 69kV XLPE (Cross-linked polyethylene) submarine cable with ancillary equipment for a fully functional system in the Stikine crossing (approx. 16,700 feet) between Vank and Woronkofski Islands, near Wrangell, Alaska, USA.

Sumitomo Electric is a leading manufacturer and EPC contractor for high-voltage AC/DC submarine power cables. In 2018, Sumitomo Electric completed a very similar project in relatively close waters for Orcas Power & Light Cooperative, Washington, USA.

This SEAPA project was awarded to Sumitomo Electric through a competitive evaluation bidding process for outstanding quality, reliable track record and sound proposal based on its extensive knowledge as a submarine cable manufacturer and contractor.

The Sumitomo Electric Group will carry out this project soundly with the highest priority on quality and safety, and through constant optimization in project execution



Vank and Woronkofski Islands

gain further experience to capture demand for power grid renewal projects in the US market, which is expected to rise in coming years.

The Group will continue to contribute to the creation of a clean society through the provision of high-quality solutions and the development of products and technologies that meet the needs of customers in the US and other countries that are expanding their investment in renewable energy and HV DC power grids in an effort to decarbonize.

OUTLINE OF SEAPA PROJECT

Owner	Southeast Alaska Power Agency (SEAPA)
Contract Effective Date	November 20, 2020
Contract Main Element	Removal of existing AC 138kV oil filled power cable
	Supply and installation of AC 69kV XLPE submarine cable
Estimated date of completion	October, 2021



Submarine cables being loaded on the ship

Canada

Sustainable Marine gets onboard Canada's ocean energy smart grid scheme

Sustainable Marine Energy has joined a technology partnership, backed by Canada's Ocean Supercluster, to develop a smart electrical grid solution for remote communities using ocean energy generators.

Supported with the funding from Canada's Ocean Supercluster, the Ocean Energy Smart Grid Integration Project brings together engineering consultancy BMT and project partners Sustainable Marine, University of Victoria, Rainhouse, and Turtle Island Innovation.

The project partners will work together to commercialize the integration of ocean energy solutions to help reduce the dependence of diesel power generation in rural communities and increase the opportunity for use of renewable sources of energy.

The Ocean Energy Smart Grid Integration Project will seek to develop a single controller that has algorithms for different communities, whereas currently there is a bespoke design for each community.

With this solution, algorithms are selected and parameterized based on ratings of the equipment. The development of this technology will not only support the greening of energy for communities of all sizes with global market opportunity, but it will also create new economic activity, build capabilities in ocean energy smart grid integration, and create new jobs, according to Canada's Ocean Supercluster.

With a total project value of C\$975,000, the Ocean Supercluster will provide over C\$630,000 in funding for the project, with around C\$340,000 coming from industry partners.

Jason Hayman, CEO of Sustainable Marine, said: "This technology partnership has the potential to address energy challenges experienced by remote and island communities in Canada, and around the world.

"These challenges include economic vulnerability due to the volatility of fuel prices, a lack of supplier diversity, higher likelihoods of disruption, and high carbon footprints.

"The team at Sustainable Marine have demonstrated that we can produce clean and predictable power from tidal streams, and we are looking forward to working with BMT and the rest of team to turn the power we produce into dispatchable power that can displace fossil fuel generation for island and remote coastal communities".



Sustainable Marine's PLAT-I tidal device
(Courtesy of Sustainable Marine Energy)

Darcy Byrtus, President of BMT in Canada, added: "We are excited to partner with Canada's Ocean Supercluster and our teammates at Sustainable Marine to further the development of a smart electrical grid solution for remote communities using ocean energy generators. The Accelerated Ocean Solutions Program of the Ocean Supercluster is providing a unique opportunity to advance a truly innovative system that we believe has the potential to transform energy distribution in remote coastal communities".

The International Energy Agency's Technology Collaboration Programme on Ocean Energy Systems (OES) recently released a report called Ocean Energy in Islands and Remote Coastal Areas, which highlights the market opportunity for ocean energy technologies in remote areas due to the high cost of electricity, as it is often supplied by diesel generators, and where the electricity demand is small, infrastructure such as submarine cables to connect to utility networks cannot be economically justified.

Canada's Ocean Supercluster is an industry-led transformative cluster focused on tackling the shared challenges across ocean sectors through a collaborative program designed to accelerate the development and commercialization of globally relevant solutions, while also building a highly capable, inclusive workforce.

To remind, Canada has in November 2020 made one of its largest-ever investments in tidal energy by awarding C\$28.5 million (€18.4 million) to Sustainable Marine to develop a tidal energy array in Nova Scotia.

The objective of the project is to provide up to 9 MW of predictable and clean renewable electricity to Nova Scotia's electrical grid through Canada's first floating tidal energy array.

Canada

CanArctic Inuit Networks' SednaLink Fibre to eliminate Nunavut and Nunatsiavut Connectivity Crisis by November 2022

CanArctic Inuit Networks unveiled details of 2,104 km fibre optic network between Iqaluit, NU and Clarenville NL which will dramatically improve connectivity in to Inuit Nunangat by November 2022.

CanArctic Inuit Networks will construct a double-armoured, repeatered 4-pair cable with 48Tbps eventual capacity between Iqaluit and Clarenville with four branching units planned in future phases to provide future connectivity to other parts of Baffin Island, Hudson Strait, Nunavik and Kivalliq.

A separate unrepeatereed festoon loop will be constructed by a CanArctic affiliate from the backbone to serve the six Nunatsiavut communities of Nain, Voisey's Bay, Natuashish, Hopedale, Makkovik and Postville,

This challenging and highly specialized sub-sea fibre deployment is backed by a proven team of subsea professionals with proper design, engineering and routing who will ensure project completion on time and on budget ensuring cheaper and more reliable connectivity for Nunavut and Nunatsiavut.

In Alaska, the private sector's successful construction of a subsea fibre network resulted in bandwidth charges being reduced by more than 60% over a three-year period. CanArctic Inuit Networks anticipates achieving similar results for SednaLink – with no requirement for Government of Nunavut capital investment.

This historic Inuit-led initiative to bridge the Arctic digital divide will save Nunavut and Nunatsiavut residents, businesses and governments millions of dollars in internet charges and increase productivity. This fibre network will become an essential component in strengthening Inuit culture and language in Inuit Nunangat and will facilitate improved education and health care delivery while increasing economic development opportunities for northern business.

COO Madeleine Redfern, says "CanArctic Inuit Networks is ready to build this critical piece of Canadian Arctic infrastructure and eliminate Nunavut's dependence upon unreliable legacy satellite and as yet unproven LEO satellite technologies which may become available in the Canadian Arctic at some point in 2023."

"With the co-operation of all levels of government, we should be able to undertake the marine surveys and bury the nearshore cable conduits in August or September this year," said CEO Doug Cunningham, "with the marine installation being completed in early October 2022."



"CanArctic Inuit Networks is ready to build this critical piece of Canadian Arctic infrastructure today," says Madeleine Redfern, chief operating officer for the company. (photo courtesy of CanArctic Inuit Networks)

SEDNALINK BACKGROUNDER:

Capital cost of the backbone between Clarenville and Iqaluit is pegged at \$107 million, inclusive of a dual-fibre approach along separate routes in Frobisher Bay which will ensure network resilience through distinct shore landings at Apex Bay and Tarr Inlet. The design will accelerate expansion from two subsea branching units to communities on Baffin Island and through Hudson Strait to the Foxe Basin and beyond in 2023-24. This second branching unit will also accommodate an interface with an eventual EAUFON fibre landing at Salluit, QC. Preliminary network design and desktop surveys are well underway.

Concurrent with the backbone construction timetable, a CanArctic-affiliated company plans to develop a 478 km unrepeatereed festoon fibre network off the Labrador Coast to serve the Nunatsiavut communities of Nain, Voisey's Bay, Natuashish, Hopedale and Makkovik which are dependent upon limited-capacity microwave.

CanArctic Inuit Networks has made an offer to the City of Iqaluit to purchase the former Iridium satellite station near Apex Bay to serve as its cable landing station and as a carrier-neutral internet exchange. The project has very tight construction timetables in order to design, manufacture, install terrestrial tail ends, and allow civil works to be undertaken at Apex Bay and Tarr Inlet next August and September. Any delay will push back the inservice date and potentially increase the cost to the project.

The eventual EAUFON extension to Salluit will improve network resilience, but as a primary route, the EAUFON is a longer span to competitive downstream terrestrial networks and internet exchange points. The Hudson Bay route also involves three additional ice-prone landing points at Salluit, Puvirnituq and Chisasibi which entail incremental technical risk and insurance costs.

CanArctic's backbone fibre has been designed to be near carbon-neutral, with the primary cable power-feed equipment being sourced with hydro-electric power from the Newfoundland grid. The company is investigating the use of solar power to feed Iqaluit CLS batteries during the summer months.

The theoretical capacity of the CanArctic fibre will be 48 terabits whereas a satellite spot beam covering Nunavut has a capacity of approximately 10 gigabits.

CanArctic Inuit Networks will not determine retail pricing, rather provide neutral wholesale bandwidth to existing carriers, potentially enabling consumer pricing parity with fibered communities in the Yukon and Northwest Territories. Due to the minimal variable costs involved in the operation of a subsea fibre, increased throughput will result in materially lower gigabit unit cost in the future.

In the future, under Phase 2 and Phase 3 CanArctic Inuit Network can extend to other Qikiqanti communities and the planned terrestrial Kivalliq Fibre in Kitikmeot will eventually provide fibre connectivity up to 76% of Nunavut's residents. Redirection of satellite capacity away from fibered communities to satellite-dependent communities will benefit all Nunavummiut.

The network will be named SednaLink to honour the Inuit mythological goddess of the sea and marine mammals.

Canada

Ottawa, Regional Municipality of York to bring broadband internet to Georgina Island, Udora

Ottawa and The Regional Municipality of York investments will bring broadband internet to Georgina Island and the Chippewas of Georgina Island First Nation, in the Regional Municipality of York through a broadband project funded by the Government of Canada and York Region. Construction is expected to be completed in early 2021, with connectivity expected shortly thereafter.



Canada

A proposed Atlantic Loop electricity grid would help reduce greenhouse gas emissions

The federal government's proposed Atlantic Regional Transmission Loop is being presented as a way to fight climate change by getting New Brunswick and Nova Scotia off coal. However, it might also have the unintended consequence of creating a confrontation between the federal government and Quebec or hurting Newfoundland and Labrador's chances of becoming a major exporter of hydroelectricity, or both.

In mid-November, Emera CEO Scott Balfour shared his excitement about the proposed Atlantic Loop during a conference call on the energy conglomerate's third quarter results. If completed, Nova Scotia Power, a subsidiary of Emera, would no longer be reliant on coal after 2029. This will mean that in the space of 25 years, Nova Scotia Power's emissions will have fallen more than 94 per cent, far exceeding Canada's Nationally Determined Contribution target of a 30 per cent decline over the same period.

The Atlantic Loop was mentioned once in the speech from the throne in September as a way for New Brunswick and Nova Scotia to reduce their reliance on coal. The loop as presented is intended to interconnect electricity suppliers in Quebec, Newfoundland and Labrador, New Brunswick and Nova Scotia, thereby improving regional reliability.

A rudimentary version of the loop already exists with interconnections between Quebec and New Brunswick, New Brunswick and Nova Scotia,



(Illustration from "Towards a clean power roadmap for Atlantic Canada," Atlantic Canada Opportunities Agency)

Newfoundland and Labrador and Nova Scotia over the recently completed Maritime Link subsea cable, the Muskrat Falls hydroelectric project and the island of Newfoundland via the Labrador Island Link (LIL) subsea cable, the lines from Churchill Falls to Quebec and a small connection from Churchill Falls to Muskrat Falls.

As is often the case though, the devil is in the details.

Last January, at the Atlantic Premiers' Conference held in St. John's, Quebec Premier François Legault discussed the development of a regional grid with the four Atlantic premiers. Although Legault's proposals were seen as integral to the region's development of renewable electricity, there are a

number of reasons why his vision of a regional grid like the Atlantic Loop is driven by far more than simply increasing sales to the Maritime Provinces.

First, Hydro-Québec is a government-owned public utility. In 2019, Hydro-Québec's dividend paid the province over \$2.1 billion. Second, Hydro-Québec was left looking for a market after its \$1.6 billion Northern Pass transmission line project to send additional electricity to New York was blocked by the Supreme Court of New Hampshire in July 2019. This loss puts Hydro-Québec's plan to double its profits over the next decade into jeopardy. Any electricity sales to the Maritimes would help offset this to a degree.

Third, Hydro-Québec has not lost interest in selling electricity to New England. By increasing capacity to New Brunswick, Hydro-Québec would gain access to existing transmission lines between New Brunswick and New England. In fact, a few days before the Atlantic Premiers' Conference, Hydro-Québec and NB Power signed an agreement "to increase electricity exports to Atlantic Canada and the United States."

But there is another, more troubling, reason Quebec is pursuing a regional grid.

By 2030, Hydro-Québec will be the dominant supplier of hydroelectricity on the Atlantic Loop, responsible for New Brunswick and Nova Scotia meeting their coal reduction targets. Hydro-Québec and the province of Quebec will also be in the position to hinder Newfoundland and Labrador's efforts to become a major electricity provider to parts of Canada and the United States, despite its hydroelectric potential.

Newfoundland and Labrador's proposed 2,250 MW Gull Island hydroelectric project is unlikely to be built in the near future for a number of reasons, including the province's precarious financial situation, Indigenous objections to the project and a lack of customers. As well, Quebec's past objections to federal loan guarantees for the Muskrat Falls generating project means the likelihood of federal support for Gull Island would be problematic.

After 65 years, the Churchill Falls-Hydro-Québec contract will end in 2041, giving Newfoundland and Labrador access to almost 5,500 MW of electrical capacity. Newfoundland and Labrador's challenge will be to find a way of moving Churchill Fall's production out of the province.

Using Churchill Fall's existing transmission lines to Hydro-Québec puts Newfoundland and Labrador at the mercy of Quebec's transmission tariffs.

Newfoundland and Labrador could build a new set of transmission

lines to avoid Quebec, following the existing Muskrat Falls to Nova Scotia route. While this would make a more balanced and reliable Atlantic Loop, the cost could be prohibitive and open to Quebec's objections if the federal government were involved.

In 2010, Newfoundland and Labrador's proposal to reserve transmissions access to the U.S. through Quebec was blocked by Régie de l'énergie, the Quebec energy regulator, despite regulations allowing it to do so. Newfoundland and Labrador could have turned to the federal government for support of the construction of an international power line through Quebec; however, Quebec would have fought this, both legally and politically.

Meeting Canada's greenhouse gas emissions targets should not come down to either a confrontation between the federal and Quebec governments or throwing Newfoundland and Labrador under the bus, or both.



Canada

Hornby/Denman group lobbies for high-speed internet infrastructure

A working group has appealed to rural directors to help bring high-speed fibre optic internet infrastructure to Hornby and Denman islands, which fall within Area A of the Comox Valley Regional District.

The process would involve joining Connected Coast, a consortium to bring improved internet to coastal communities.

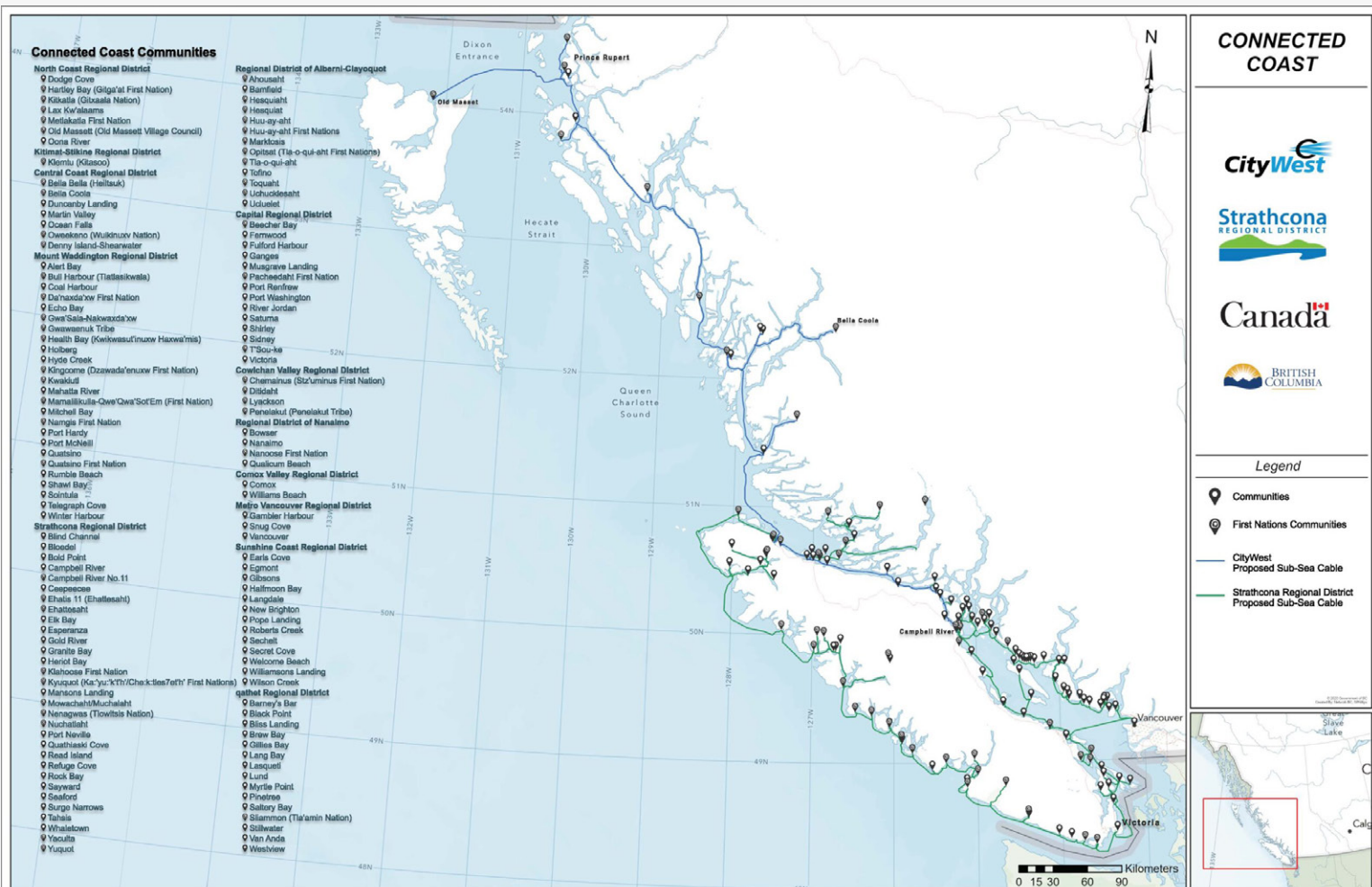
"We're looking for landing sites to subsea cable from Vancouver to Prince Rupert that then circles back around Vancouver Island," Hornby/Denman Internet Committee member Karen Ross said in a Jan. 11 presentation to the Electoral Area Services Committee.

It took a great deal of lobbying to reopen a file that had excluded the islands in an initial application of 152 communities, she added.

"If we get acceptance and get those landing sites, there's now 154. Many of those communities are Indigenous, and the federal funding is supporting rural communities of B.C."

Landing sites would be located south of the Denman and Hornby ferry terminals on Lambert Channel.

A second part of the process involves the installation of 'last mile' infrastructure with fibre optic high-speed service. Last mile refers to the final leg of telecommunication networks



that deliver services to customers. There is a Feb. 15 deadline to apply for federal funds.

The group hopes the CVRD will prioritize delivery of fibre optic to the premise infrastructure.

"The landing sites will be installed spring and summer of 2021," said Ross, noting the difficulty of conducting business on Hornby or Denman when one is kicked off a call. "Phase one is Vancouver to Campbell River. It means that Hornby and Denman will be one of the first communities to get their landing sites. If we're ready to go with our funding and our sponsorship for the last mile, we'll be one of the first communities that could have that last mile infrastructure installed. So, the timing on this is really critical."

A staff report says internet service on Denman and Hornby is below a national standard of 50/10 download/upload speed set by the Canadian Radio-television Telecommunications Commission (CRTC). There may be an opportunity to support improved services through a partnership with the Strathcona Regional District and the

Connected Coast project, which includes undersea fibre running between Denman and Hornby. A partnership with Connected Coast related to the landing sites — before subsea fibre is installed — requires \$142,000 from the community. Installing fibre on the Islands after installing subsea fibre would cost about \$725,000.

EASC directors Daniel Arbour (Area A), Arzeena Hamir (Area B) and Edwin Grieve (Area C) supported a recommendation for a \$142,000 contribution to the SRD and Connected Coast, to be funded by the Denman and Hornby islands community works funds.

Furthermore, the CVRD board is to consider funding beyond a 90 per cent threshold, subject to an assessment of a service delivery model to support broadband connectivity, including public engagement.

Grant funding opportunities exist where an internet service provider may receive up to 90 per cent of the costs to construct a community's last mile infrastructure. In most cases, the community must provide the remaining 10 per cent.



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Nova Scotia

Fundy tidal power project nears finish line

SME — Sustainable Marine Energy has been testing a prototype tidal power harnessing platform at Grand Passage in the Bay of Fundy since 2018.

With the dawn of 2021, the finish line is now clearly in sight for the Pempa'q In-stream Tidal Energy Project, targeted for commissioning in Nova Scotia's Bay of Fundy by the end of the year.

Teams participating in the Spicer Marine Energy consortium are pushing ahead on the project through the winter to deliver Canada's first floating tidal energy array.

Project partner Sustainable Marine Energy (SME) is assembling its new 420-kilowatt PLAT-I 6.40 platform in the town of Meteghan, N.S. this month and within a matter of weeks it will be launched — only two metres of water is required — and installed at the Grand Passage testing site in the bay for troubleshooting throughout the winter and spring.

The next stage, possibly in late spring or early summer, will be construction of the permanent installation at the Fundy Ocean Research Centre for Energy (FORCE) in Minas Passage. Two other platforms will be installed in the next couple of years, though the timetable is still uncertain. Pempa'q's final capacity is slated for nine megawatts delivered to the Nova Scotia grid.

The Bay of Fundy is home to the world's highest tides and Jason Hayman, CEO of SME, has had the opportunity to stand on the catamaran-style platform during the rush of the tide and marvel at its power. At mid-tide, the current in Minas Passage is about four cubic kilometres per hour, the same as the estimated combined flow of all the rivers and streams on Earth combined.

SME has been testing a smaller platform at Grand Passage since 2018. Hayman equated the thrust



to the power of two F-35 jets in full after burner.

"I remember the first time I went on it, you feel it, it is like being on the back deck of a powerful boat. It is humming, it is moving, the water is rushing past," said Hayman. "I remember that day, we said, this is serious, we are on to something here."

SME and a former project rival, Minas Tidal LP, decided to join forces to co-develop their adjacent berths at FORCE and SME is also working with investors Schottel, developer of the turbines on the platform, and Scottish Enterprise.

"We ended up becoming a consortium of the willing and the brave," Hayman said.

The federal government pitched in \$28.5 million in November to support the project. Spicer has a 15-year contract to sell its power to Nova Scotia Power.

FORCE, a non-profit research facility, is another essential player, providing key infrastructure help. It has received financial contributions from the Government of Canada, the

Province of Nova Scotia, the Offshore Energy Research Association and participating developers.

Onshore infrastructure includes a substation and observation centre. Offshore assets include an 11-kilometre subsea cable network and environmental sensor platforms.

The PLAT-I 6.40 will host six tidal turbines that have been designed to flip up like an outboard motor on a powerboat for easy maintenance. The platforms will be anchored to bedrock using a four-point mooring system designed by SME and will be able to spin around the mooring turret, Hayman explains, to align with both the advancing and receding tide each day. Onboard generators will match the power up to the grid frequency and the power will be exported via underwater cable to the shore.

Each step involves new adaptations of technology with SME and its partners having to prove to investors it will all work. Operational learning, through trial and error, is also painstaking. Hayman compared the process to learning to tie a shoe.

"The biggest hurdle was proving we could get something in the tidal flow that would sit there happily," he said. "It is a pretty dynamic situation. We need something that is passive and simple enough that it will sit there happy, in that kind of environment."

The development of the mooring system was also a breakthrough, Hayman said. "Like every starry-eyed tech development company, we felt we invented a better mousetrap when we developed the mooring apparatus," he said.

"We realized very early on that with the huge loads that will be generated, it will need pretty serious mooring and anchors to hold that," Hayman explained, noting its competitors were using anchors that were a "huge chunk of weight."

SME's decision was to bolt the moorings into the bedrock, but the operation would have to be done quickly while the tide was not a factor.

"So we developed what we believe is the first of its kind, a rig and anchor where we can drop it to the seabed, drill in a rock vault as an anchor into the rock and we can do that in less than an hour in 40 to 50 metres of water," said Hayman.

SME is confident its platforms will survive the Bay of Fundy's treacherous climate.

"With nature, never say never," said Hayman. "However, we made it through Hurricane Dorian (2019) without incident. The math says we will survive any hurricane. And these sites are fairly sheltered channels, we are not putting anything in the open ocean."

Massachusetts

Ventolines backs Massachusetts offshore wind project

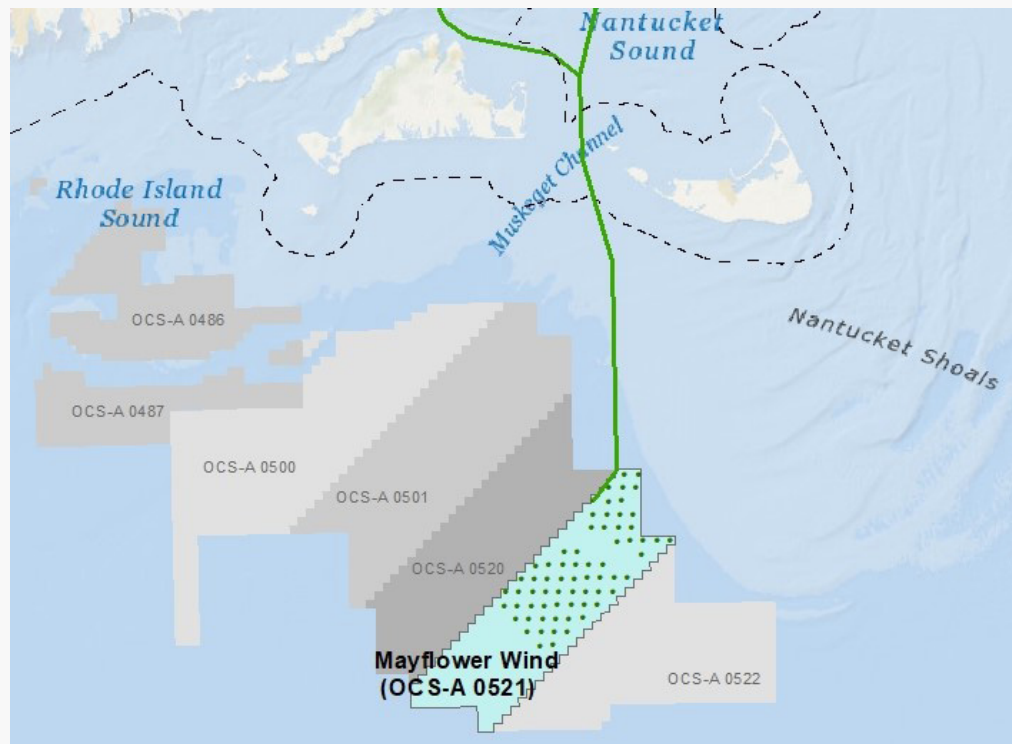
The Netherlands-headquartered Ventolines has signed on as the offshore wind expertise partner for the Mayflower Wind project in Massachusetts.

Ventolines will provide transport and installation expertise on the substation, foundations, inter-array cables, and wind turbines.

The Dutch company has also opened its first U.S. office in Boston with the aim of exploring new opportunities in the local renewable energy market.

Ventolines worked on Block Island, the first U.S. offshore wind project, where it supervised the installation of turbines and advised on asset management.

"We are proud to be part of the team bringing more wind farms and sustainable energy to the U.S.," said Thibaut de Groen, Ventolines' Director of Contracting and Construction. "Our formal entry into the U.S. market is the next logical step in our company's evolution."



Mayflower Wind is being developed by a joint venture of Shell New Energies US and Ocean Winds some 40 km south of Nantucket.

The offshore wind project was chosen by the Commonwealth of Massachusetts in 2019 to supply 804 MW of capacity with the expected start-up in 2025.

The Massachusetts Department of Public Utilities (DPU) issued an order in November approving long-term contracts of Mayflower Wind with the Commonwealth's Electric Distribution Companies.

Canada - US

Towns may get windfall from underwater transmission cable

Good financial news for local governments has been hard to come by this year, but the Essex County towns fronting Lake Champlain could receive an unexpected boost to their budgets in coming years thanks to a massive power cable intended to deliver power from Canadian hydro plants and wind farms to customers in New York City.

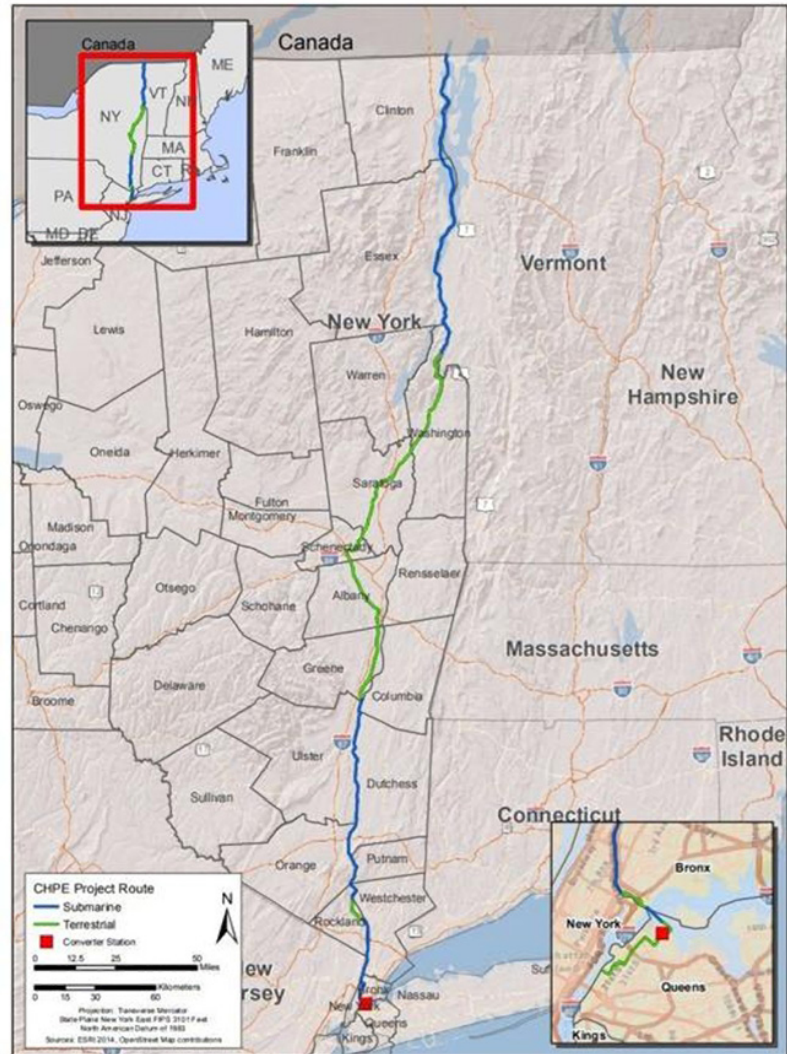
The line, known as the Champlain Hudson Express Project, would be spooled onto the bed of Lake Champlain off to the New York shore. The project proposes a payment in lieu of taxes to the towns, county and school boards, which could add tens of thousands of dollars to budgets where such a sum could make a meaningful difference.

"If the town can benefit from any kind of revenue, we'd certainly be appreciative of it," said Essex Supervisor Ken Hughes. "That's more services we can provide without having to ask more from the taxpayers."

Essex Board of Supervisors Chair Shaun Gilliland said preliminary numbers indicate the 14 lakeside jurisdictions in Essex County would receive \$1.6 million the first year, a payment that would increase to \$6.9 million by the end of the 30-year agreement.

"Renewable energy is a super-high priority with this administration, so there's a big push behind it," Gilliland said.

New York hopes that 70% of its electricity will be generated by renewables by 2030, and has set a goal of being carbon free by 2040.



CHPE Project Route

According to the project's website, "Two five-inch-diameter cables will be placed underwater or underground and run 333 miles from the U.S.-Canadian border, south through Lake Champlain, along and under the Hudson River, and eventually ending at a converter station that will be built in Astoria, Queens." It's projected to be operational by 2025.

The cable will be out of sight and deliver enough power to support 1 million homes.

Eric Howe, director of the Lake Champlain Basin Program, said the project appears to be environmentally sound. "It certainly is possible there will be some short-term impacts from disturbed sediments during installation of the cable, but we do not anticipate long-term impacts," he said.

Transmission Developers Inc., is also proposing an allocation of \$117 million over 35 years to a trust fund for habitat protection in the Hudson River and Lake Champlain.

The project is estimated to cost more than \$3 billion, and "will be one of the largest investments in New York state history and create more than 2,000 jobs during construction," developers say. "From the beginning of construction through the first 30 years of operation, CHPE will deliver \$28.6 billion in economic benefits to New York state."

Lakefront communities are hoping it's true but aren't spending the cash just yet. "I'll believe it when I see it," said Westport Supervisor Ike Tyler. "But things can happen quickly if (Gov. Andrew) Cuomo wants it to happen."

Massachusetts

U.S. Dept. of Interior Withdraws Vineyard Wind's Permit Application

The U.S. Department of the Interior has decided to classify the permit application for Vineyard Wind – the first full-scale offshore wind farm in the United States – as “formally withdrawn.”

According to Bloomberg, which first reported the announcement, the decision could delay the startup of Vineyard Wind by another six to 18 months – in addition to the 17-month delay that Interior already implemented for an expanded Environmental Impact Statement (EIS) review.

The decision follows Vineyard Wind's December 1 request to temporarily halt the permit review so that it could submit changes reflecting a new model of wind turbine that will be used in the project. At the time, Vineyard Wind's backers expected the voluntary pause to add a few weeks to the process and said that it would not have an effect on the overall development timetable. “Taking this step now avoids potentially more federal delays and we are convinced it will provide the shortest overall timeline for delivering the project as planned,” said Vineyard Wind CEO Lars T. Pedersen on December 1. “We intend to restart the BOEM process from where we left off as soon as we complete the final review.”

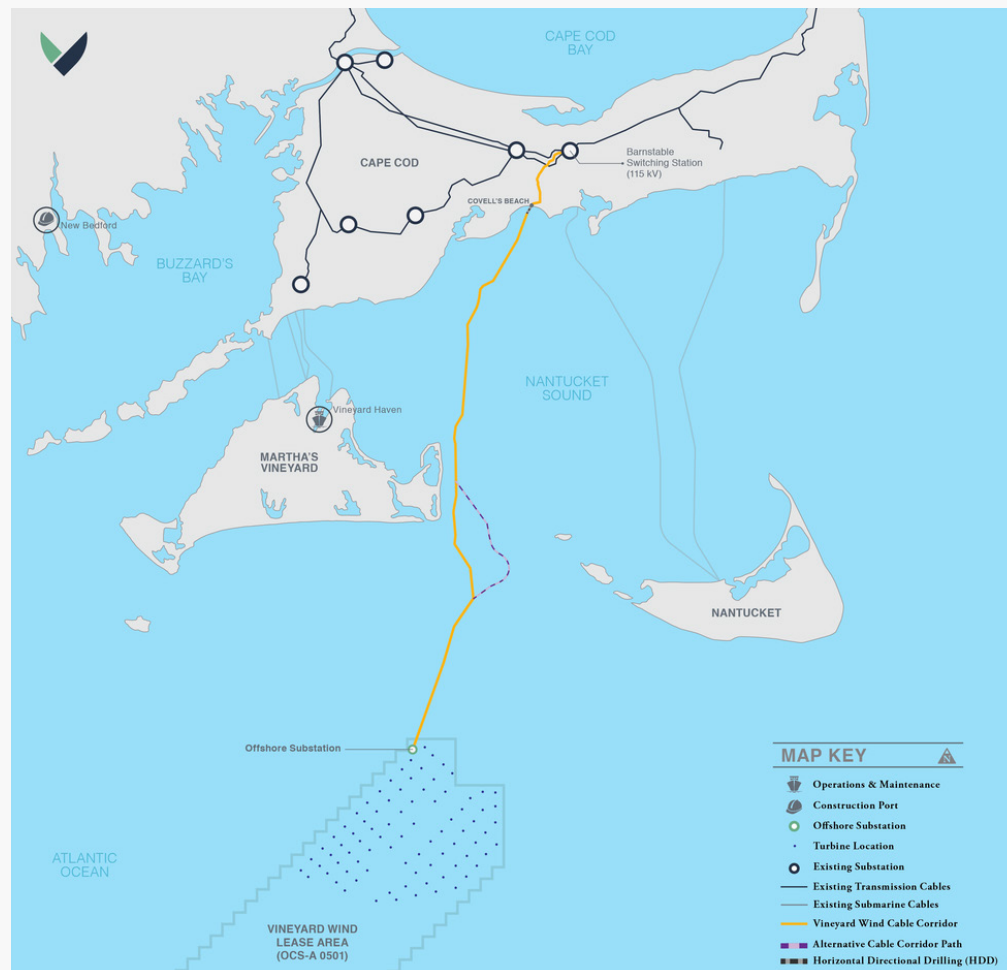
Instead, Interior has opted to treat the Vineyard Wind application as “formally withdrawn,” setting back the start date for project and for the U.S. offshore wind industry as a whole. Last year, Interior's Bureau of Ocean Energy Management expanded the scope of Vineyard Wind's EIS review to consider the cumulative effects of all adjacent offshore wind projects, not just Vineyard Wind. The regulatory process for this first-of-its-kind project serves as a review for the entire industry; until

it receives final approval, many key stakeholders (including many American financiers) are waiting on the sidelines.

BOEM had been expected to issue its final decision on Vineyard Wind's EIS by January 15. The new timetable means that the green light for the project will come under the administration of president-elect Joe Biden, who has endorsed both U.S. offshore wind development and the expansion of Jones Act shipping. When offshore wind begins in earnest off the U.S. East Coast, the U.S. maritime industry stands to benefit from billions of dollars in shipbuilding and operating revenue

for a new class of American-built offshore wind vessels.

In a recent study of opportunities and challenges for the U.S. offshore wind industry, stakeholders told the Government Accountability Office (GAO) that obtaining funding for new, Jones Act-compliant wind turbine installation vessels – which may cost up to \$500 million – has been challenging, in part due to uncertainty about the timing of federal approval for projects. Some of these stakeholders told GAO that if and when Vineyard Wind is approved, investors may be more willing to move forward with vessel investments.



Location of the Vineyard Wind development (courtesy Vineyard Wind)

Block Island

Pivotal moment for cable reburial project

For many months now, crews contracted by Orsted and National Grid have been busy working on the reburial of a portion of their two undersea electric transmission cables, one that goes out to the wind farm, and one that connects Block Island to the mainland. The cables were not originally installed at the desired depth of six feet and had become exposed in areas due to shifting sands.

While workers were visible constructing a 3,500-foot conduit that stretched the entire length of Crescent Beach from Baby Beach to Scotch Beach, what else they were doing has been somewhat of a mystery.

Islanders and visitors have witnessed two liftboats, the M/V Ram XV and the M/V Ram VII, off the shore of Fred Benson Town Beach and other support vessels in Old Harbor, as well as tons of equipment, supplies, and trailers in the parking lot of the beach.

It turns out that crews from JT Cleary have been busy drilling a tunnel under the sea floor from just north of the Beach Pavilion, under the dunes, and out to a pit near the liftboats.



Using a process known as horizontal drilling, workers drilled the tunnel, expanding it with reamers to the desired circumference. The tunnel in places is 30 to 40 feet under the ocean floor. Town Facilities Manager Sam Bird told The Block Island Times that geologically speaking, the drill was cutting through glacial till, which includes large rocks, rubble, and seams of clay and sand.

On Thursday, Jan. 7, crews floated and towed the conduit from the beach out beyond the liftboat and then pulled it back to shore through the tunnel. The operation, which started at 8 a.m. was slated to take 16 hours, and went off without a hitch, although it had been delayed a couple of days for “adverse sea conditions.”

This phase of the project, the pullback of the conduit, was a complex operation involving several assist boats, dozens of workers and several machines on the beach. To start, the head of the conduit was lifted and floated into the water at a slight angle to the beach. It was attached to a tow line connected to the Berto Miller and ever-so-slowly tugged out to sea.

Meanwhile, workers, placed all along the length of the pipe, gently lifted it and inched the conduit along the beach towards the water, trying not to bend it. As they did, one of the support vessels got between the conduit and the beach to help guide it out.

Now that the first conduit has been installed, workers will start the process all over again – this time for the National Grid cable, which will require a somewhat shorter tunnel. Once the cables have been drawn through the conduits, they will be spliced onto the existing cables in the pit offshore. During that process, which will take place later this spring, power from the cable will be shut down and the Block Island Power Company will revert to its diesel generators to supply the island with electricity.

A microwave tower is being installed to supply broadband during the time of the outage.



Rhode Island

BOEM releases draft EIS for South Fork offshore wind farm

The U.S. Bureau of Ocean Energy Management (BOEM) has published a Draft Environmental Impact Statement (EIS) for the South Fork offshore wind farm and will open a 45-day public comment period on 8 January.

After the public consultation period, BOEM will address all received comments and publish a Final EIS, which is expected to be done in August, with the environmental review and permitting process anticipated to be completed in January 2022.

The South Fork Draft EIS incorporates the expanded cumulative scenario and analysis of future offshore wind development from the Supplement to the Draft EIS for the Vineyard Wind 1 project. To remind, Vineyard Wind in the meantime temporarily withdrew its Construction and Operation Plan (COP) to tweak the plans after the inclusion of GE's 13 MW Haliade-X wind turbines into the final project design.

For the South Fork project, the COP is under review at BOEM, after first being submitted in 2018 and updated a few times last year. The updated COP comprises changes to the lease boundaries and the turbine layout to address navigational safety issues raised by the commercial fishing industry.

Just like for the Vineyard Wind, the South Fork Draft EIS discusses a transit lane alternative that puts a 4 NM transit lane through the project site, which has been developed in response to the Responsible Offshore Development Association (RODA) layout proposal from 3 January 2020. For the Vineyard Wind project, transit lane alternatives with 4 NM lanes raised concerns with the developers in the Massachusetts/Rhode Island Wind Energy Area, who signed a Joint Developer Agreement Layout. The layout utilises a standard and uniform configuration with 1x1 NM spacing, which is in compliance with U.S. Coast Guard navigational safety requirements.

A 4 NM transit lane within the South Fork site could relocate or eliminate some of the wind turbines and relocate the offshore substation. However, in South Fork's Draft EIS, this alternative to the developer's 1x1 NM proposal is deemed as potentially having a similar effect as the original proposal would.

"Although the Transit alternative would reduce the number of WTGs and their associated inter-array cables, which would have an associated reduction in impacts from construction and installation, O&M, and conceptual decommissioning, BOEM expects that the impacts resulting



South Fork Offshore Wind Farm

from the alternative alone would be similar to the Proposed Action and range from negligible to minor", BOEM states.

"In context of other reasonably foreseeable environmental trends and planned actions, BOEM also expects that the Transit alternative's incremental impacts would be similar to the Proposed Action (with individual IPFs leading to impacts ranging from negligible to moderate). The overall impacts of the Transit alternative when combined with past, present, and reasonably foreseeable activities would therefore be the same level as under the Proposed Action: moderate".

Once the EIS is finalized, BOEM will use the findings to inform its decision on whether to approve South Fork Wind's proposed project.

"BOEM remains committed to a permitting process that reduces potential conflicts with other important uses of the ocean, such as fishing, while establishing a strong foundation for wind projects moving forward", said BOEM Acting Director Walter Cruickshank. "The feedback provided by our many stakeholders will help inform the Final Environmental Impact Statement and provide invaluable insight to decision makers".

The South Fork project, developed by Ørsted and Eversource, would comprise up to 15 wind turbines installed around 30 kilometres (19 miles) southeast of Block Island, Rhode Island, and some 56 kilometres (35 miles) east of Montauk Point, New York. The output of the wind turbines to be used would be between 6 MW and 12 MW.

The lease for the project site was awarded to Deepwater Wind, the company that developed the first U.S. offshore wind farm off Block Island. Deepwater Wind was acquired by Ørsted in 2018.

New York

Equinor selected for largest-ever US offshore wind award

Today, 13th of January 2021 Equinor was selected to provide New York State with offshore wind power in one of the largest renewable energy procurements in the U.S. to date.

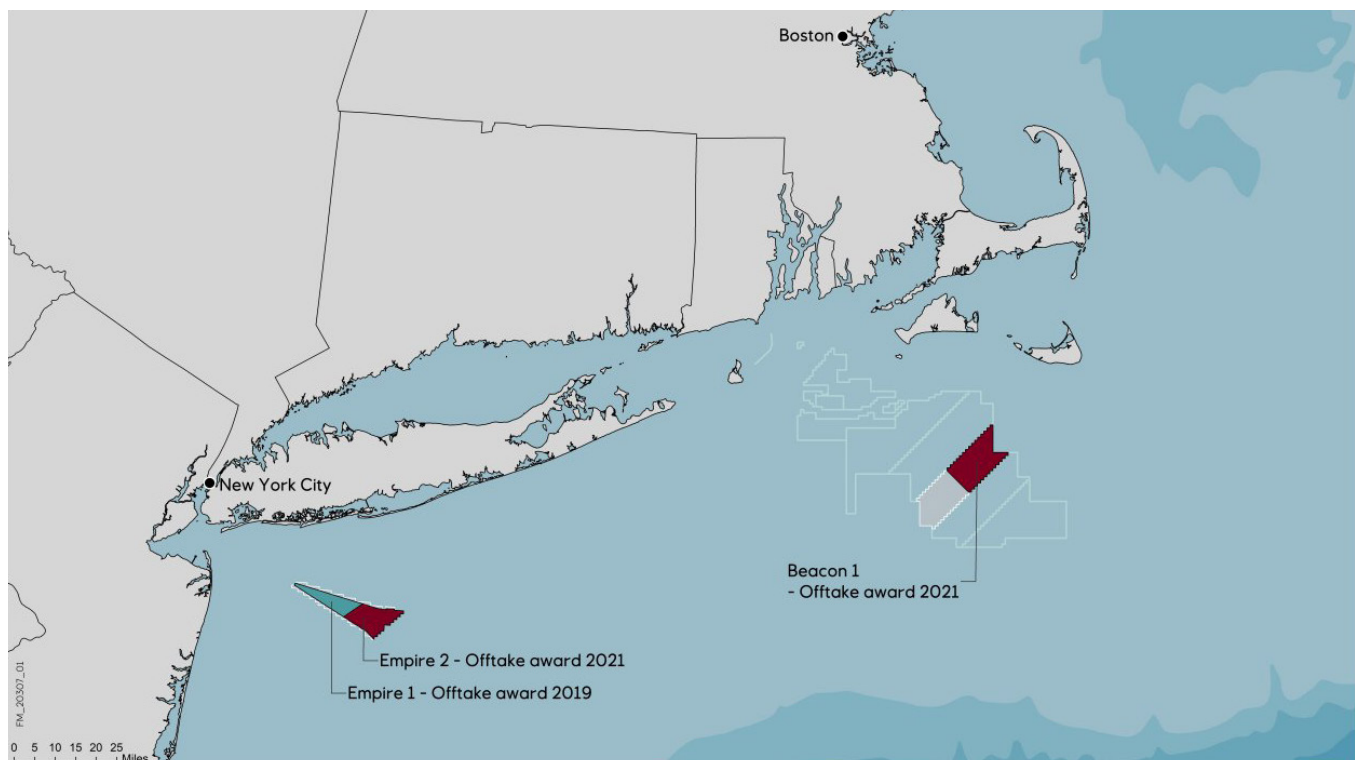
Under the award, Equinor and incoming strategic partner bp will provide generation capacity of 1,260 megawatts (MW) renewable offshore wind power from Empire Wind 2, and another 1,230 MW of power from Beacon Wind 1 – adding to the existing commitment to provide New York with 816 MW of renewable power from Empire Wind 1 – totalling 3.3 gigawatts (GW) of power to the State. The execution of the procurement award is subject to the successful negotiation of a purchase and sale agreement, which the partnership looks forward to finalizing together with the New York State Energy Research and Development Authority (NYSERDA).

As part of the award by NYSERDA, the companies will partner with the State to transform two venerable New York ports – the South Brooklyn Marine Terminal (SBMT) and the Port of Albany – into large-scale offshore wind working industrial facilities that position New York to become an offshore wind industry hub.

“These projects will deliver homegrown, renewable electricity to New York and play a major role in the State’s ambitions of becoming a global offshore wind hub. The U.S. East Coast is one of the most attractive growth markets for offshore wind in the world. The successful bids for Empire Wind 2 and Beacon Wind 1 represent a game-changer for our offshore wind business in the U.S. and underline Equinor’s commitment to be a leading company in the energy transition. These projects will also

create value through economies of scale and support our strategic ambition of becoming a global offshore wind major,” says Anders Opedal, CEO of Equinor.

“Together, Equinor and the State of New York will create a robust offshore wind supply chain capable of manufacturing, assembling, and staging these projects at scale. As Equinor works to expand its renewable energy presence across the United States and the globe, New York’s leadership clearly illustrates the transformative benefits of offshore wind on climate goals and economic activity alike. We are looking forward to developing Empire Wind and Beacon Wind together with local authorities, communities and our incoming partner bp in growing this new industry,” says Siri Espedal Kindem, President of Equinor Wind U.S.



Taken together, these offshore wind projects will help the State's economic rebound and strengthen disadvantaged communities while helping the State achieve its nation-leading renewable energy goals.

ABOUT SOUTH BROOKLYN MARINE TERMINAL (SBMT)

Equinor will invest in port upgrades to help transform SBMT into a world-class offshore wind staging and assembling facility and become the operations and maintenance (O&M) base both for Equinor and other project developers going forward.

SBMT will be one of the largest dedicated offshore wind port facilities in the United States at approximately 73 acres, with the capacity to accommodate wind turbine generator staging and assembly activities at the scale required by component manufacturers.

ABOUT PORT OF ALBANY

Equinor will combine forces with established wind industry companies Marmen and Welcon at the Port

of Albany to help the port become America's first offshore wind tower and transition piece manufacturing facility, where it will produce components for Equinor's projects.

The site, located in the State's Capital Region, stands to become a go-to destination for future projects to source offshore wind towers, transition pieces, and other manufacturing components for many years to come as offshore wind continues to grow along the East Coast.

ABOUT THE ASSETS

Empire Wind is located 15–30 miles southeast of Long Island and spans 80,000 acres, with water depths of between 65 and 131 feet. The lease was acquired in 2017 and is being developed in two phases (Empire Wind 1 and 2) with a total installed capacity of more than 2 GW (816 + 1,260 MW).

Beacon Wind is located more than 60 miles east of Montauk Point and 20 miles south of Nantucket and covers 128,000 acres. The lease was acquired in 2019 and has the potential to be

developed with a total capacity of more than 2.4 GW. This first phase will have an installed capacity of 1,230 MW.

In September 2020, Equinor and bp announced that they formed a strategic partnership for offshore wind in the U.S., and that bp will be a 50 percent partner in the Equinor-operated Empire Wind and Beacon Wind assets on the U.S. East coast. The transaction is expected to close in early 2021.

ABOUT EQUINOR

Equinor is developing into a broad energy company, building a material position in renewable energy. Equinor now powers more than one million European homes with renewable offshore wind from four projects in the United Kingdom and Germany. Equinor commissioned the world's first floating offshore wind farm in 2017 off the coast of Scotland. In the U.S., Equinor holds two lease areas, the Empire Wind lease area located approximately 20 miles south of Long Island, and the Beacon Wind lease area that lies 60 miles off the coast of Long Island.

Virginia

Dominion Energy files COP for 2.6 GW Virginia offshore wind project

Dominion Energy has submitted a Construction and Operations Plan (COP) to the U.S. Bureau of Ocean Energy Management (BOEM) for the 2.6 GW Coastal Virginia Offshore Wind (CVOW) project.

The COP includes information about the construction, operations and conceptual decommissioning plans for the wind farm to be installed within a 112,800ha area located 27 miles off the coast of Virginia Beach, as well as about onshore and support facilities.

BOEM will now review the COP for approximately two years.

Pending approval by the State Corporation Commission, the CVOW commercial project is on track to commence construction in 2024 and be completed in 2026.

Earlier this year, Dominion Energy completed the construction of CVOW's first phase – the two-turbine pilot project located adjacent to the commercial lease area.

Located some 43 km off the coast, the 12 GW project is meant to provide the operational, weather, and environmental experience needed for the 2.6 GW development.

North Carolina

Avangrid Renewables Submits Construction and Operations Plan for Kitty Hawk

Avangrid Renewables, a subsidiary of AVANGRID, Inc., submitted a Construction and Operations Plan (COP) to the federal Bureau of Ocean Energy Management (BOEM) on Friday, December 11th for the first phase of the company's wholly owned Kitty Hawk offshore wind project.

The COP also includes the findings from an economic impact study (EIS) conducted by the Public Strategy Group, which anticipates substantial economic and employment benefits to result from the construction of Kitty Hawk's multiple phases between 2021 and 2030.

"We're proud to be the first to submit a federal permit for a commercial scale offshore wind project in Virginia and the Carolinas," said Bill White, Avangrid Renewables' head of U.S. offshore wind. "Kitty Hawk Offshore Wind will deliver clean energy to customers in the region and significant economic

benefits and quality jobs for decades to come."

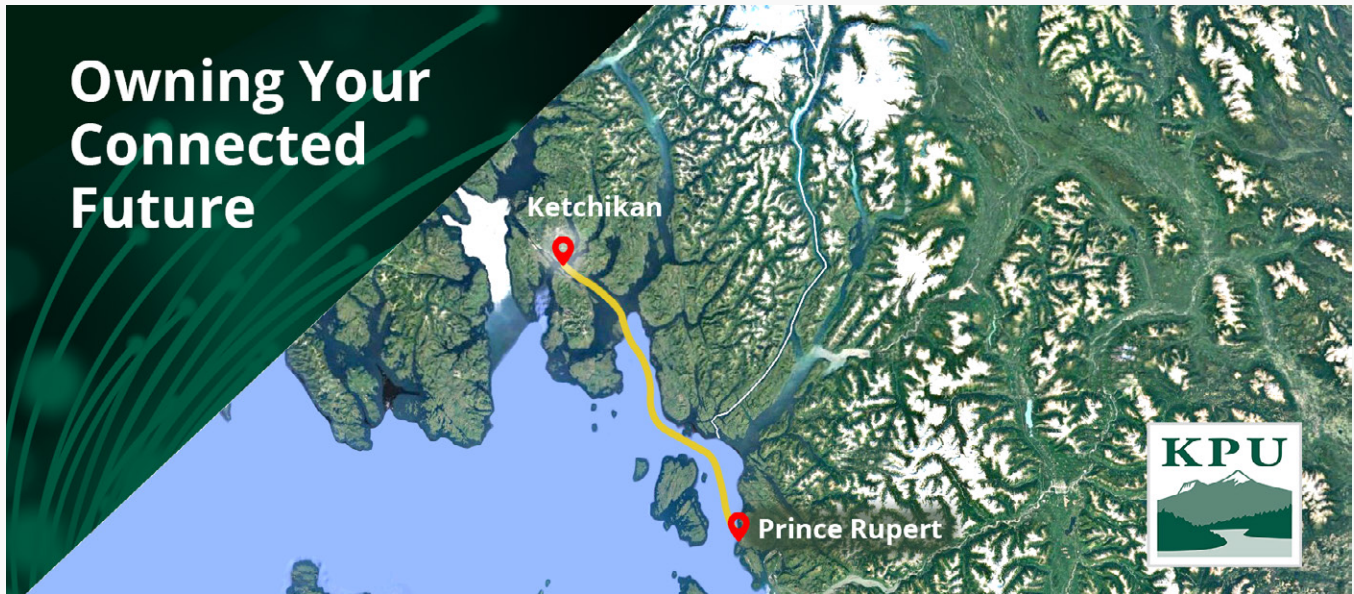
"The offshore wind industry presents tremendous opportunity to the Hampton Roads region," said Doug Smith, president and CEO of the Hampton Roads Alliance. "I look forward to working with Avangrid Renewables as they develop the Kitty Hawk Offshore Wind project and deliver substantial economic benefits to the Hampton Roads region."

The EIS found that the project will drive significant economic activity and employment opportunity in the region. Kitty Hawk Offshore Wind is expected to generate \$2 billion in economic impact between 2021 and 2030, and to create nearly 800 jobs in Virginia and North Carolina, with nearly 600 of those in the Hampton Roads region which includes southeastern Virginia and northeastern North Carolina.

Kitty Hawk is a proposed offshore wind energy project to be built approximately 27 miles from the Outer Banks in the Kitty Hawk Wind Energy Area (WEA), designated by the U.S. Bureau of Ocean Energy Management (BOEM). The commercial lease for the 122,405-acre WEA was awarded to Avangrid Renewables by BOEM in 2017.

The first phase of the project, anticipated to begin construction as soon as 2024, will have the capacity to generate approximately 800 MW of electricity. Once complete, Kitty Hawk is projected to have a generation capacity of up to 2,500 MW, or enough to power approximately 700,000 homes. The construction and operation of the project is expected to create hundreds of jobs and represent hundreds of millions of dollars of direct investment in Virginia and Hampton Roads.





KetchCan1 Submarine Fibre Cable System

US - Canada

Alaskan Service Provider Deploys Infinera XTM Packet Optical Platform to Enhance Broadband Services

Infinera announced that KPU Telecommunications, a local provider of residential and business communications services owned by the city of Ketchikan in Alaska, deployed Infinera's XTM Series to enhance broadband service connectivity for end-user customers. The XTM solution enables KPU to offer flexible optical and packet-based high-speed services while cost-effectively powering high-speed 200G optical transport over its 167-kilometer-long unamplified undersea fiber cable connecting the city of Ketchikan to mainland terrestrial destinations.

KPU operates one of the most robust fiber-to-home local networks in Alaska, with service offerings spanning residential high-speed internet, digital cable TV, voice services, and high-speed services tailored to the needs of small, medium, and large enterprises. The high level of flexibility of the XH800, an ultra-low-latency packet aggregation device within the XTM Series, enables KPU to support reliable 1 gigabit (1G), 10G, 25G, 100G, and 200G transport connectivity to meet growing customer bandwidth demands now and into the future. The Infinera solution included Network Operations Center (NOC) services, delivering an operational assurance model that supplements KPU's strong in-house operations team.

"The rich feature set of the Infinera solution combined with exceptional service and support laid the foundation for a strong technology partnership that is yielding benefits for all of our customers in Ketchikan," said Ed Cushing, Division Manager, KPU Telecommunications. "In addition to the

plug, play, and walk away experience, we were extremely pleased with all aspects of the deployment and Infinera's ability to meet key milestones in the face of exceptionally tight project deadlines and ongoing logistical challenges associated with the COVID-19 pandemic – particularly in light of the requirement to coordinate simultaneous cross-border installations in Alaska and Canada."

"Residents of local communities like Ketchikan have the same growing broadband needs as more densely populated regions, and ensuring reliable, high-capacity transport connectivity is no less critical to local network operators," said Nick Walden, Senior Vice President, Sales at Infinera. "We were excited to take on this new challenge with a new customer and pleased to exceed expectations by delivering a solution that provided the economics, capacity, and future-proofing features KPU required. Our Network Management service worked directly with the KPU team to ensure a seamless operations transition."

ABOUT INFINERA

Infinera is a global supplier of innovative networking solutions that enable carriers, cloud operators, governments, and enterprises to scale network bandwidth, accelerate service innovation, and automate network operations. The Infinera end-to-end packet optical portfolio delivers industry-leading economics and performance in long-haul, submarine, data center interconnect, and metro transport applications. To learn more about Infinera visit www.infinera.com,

Colombia

Hurricane Iota triggers 2nd submarine cable to San Andres

The hurricane Iota has caused severe damage to the Colombian islands San Andres, Providencia and Santa Catalina in November 2020.

The reconstruction of the utilities on these islands has also triggered the necessity of a second submarine cable from the mainland Colombia to San Andres.

The first submarine cable was constructed in 2010, connecting Tolu, mainland Colombia with the island San Andres. The cable is 826 km long.



San Andres Isla Tolu Submarine Cable (SAIT)

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Guyana

Dutch vessel blamed for Guyana subsea cable outage

A Dutch transport vessel has been reported as the cause of the damage to the Guyana Power and Light's (GPL) Demerara River subsea power cable, which occurred late November. The 69kV subsea cable links GPL's Vreed-en-Hoop and Kingston substations and maintains a stable supply of electricity for the coast communities of Guyana.

The cable went offline in November, leaving locals without power. The

cause of the outage has been attributed to the Dutch-flagged transport vessel NLIST DLEP which dropped its anchor in the vicinity of the cable causing damage to the cable, onshore transmission and distribution infrastructure. Repairs got underway, restoring power supply.

This isn't the first time the subsea cable connection has suffered damage since its installation back in 2012. In June and

August 2019, the cable suffered severe damage. It was subsequently restored in October.

As a result of the cable being damaged on multiple occasions, MARAD has issued restrictions aimed at preventing vessels from anchoring close to the cable. Vessel operators are now required not to anchor within 200 metres of the subsea link, in order to prevent similar incidents from occurring.

Brazil

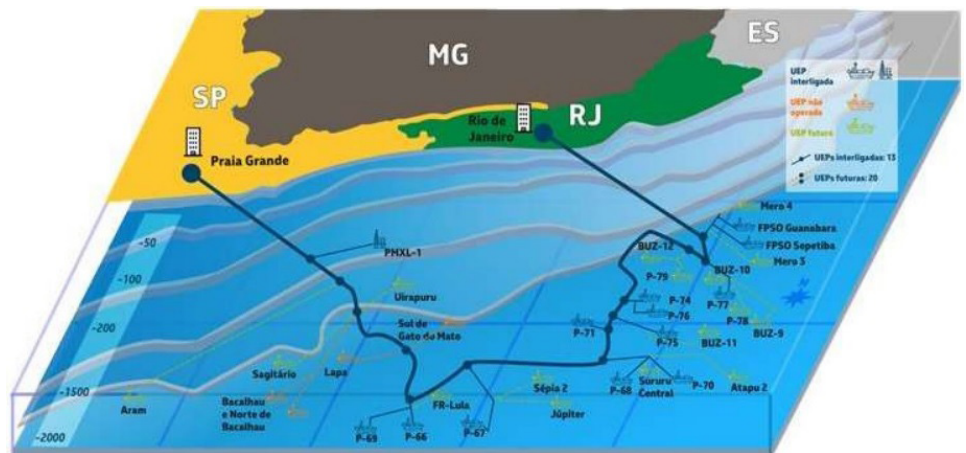
Petrobras launches tender to install offshore fibre optics grid

Petrobras has launched a tender to acquire engineering, procurement, construction and installation services for a fibre optic network connecting oil and gas production units in the Santos basin pre-salt, off Brazil's southeast coast.

The project is designed to interlink 13 platforms and control centres (cable landing stations) to be installed in the Praia Grande and Rio de Janeiro municipalities, in São Paulo and Rio states, respectively.

The production units to be connected are: PMXL-1, in the Mexilhão field; P-66, P-67, P-68, P-69 and P-70, in Tupi; P-74, P-75, P-76 and P-77, in Búzios; P-71, scheduled to produce the first oil in Itapu in 2023; and the Guanabara and Sepetiba FPSOs, which are planned to come online in the Mero 1 and 2 fields in the Libra block in 2021 and 2023.

The fiber optic grid will consist of more than 1,000km of lines, and the federally controlled oil company is already considering expanding it to connect another 20 offshore platforms.



Location of the fiber optic grid. Source: Petrobras

The tender's scope encompasses a geophysical and geotechnical survey, detailed engineering, offshore and onshore installation services, subsea interconnections and pull-ins with the production units, among others.

The company contracted will have to provide offshore vessels to support the operations.

The contract will be for 900 days and interested parties will have between

February 19 and April 20, 2021 to present offers.

Among the possible candidates are Alcatel Submarine Networks (ASN), Subcom, NEC and Prysmian, which specialize in turnkey telecom cable projects.

The deal could be worth US\$100-150mn.

Brazil

The first offshore wind power plant in Ceará should start operating in 2025

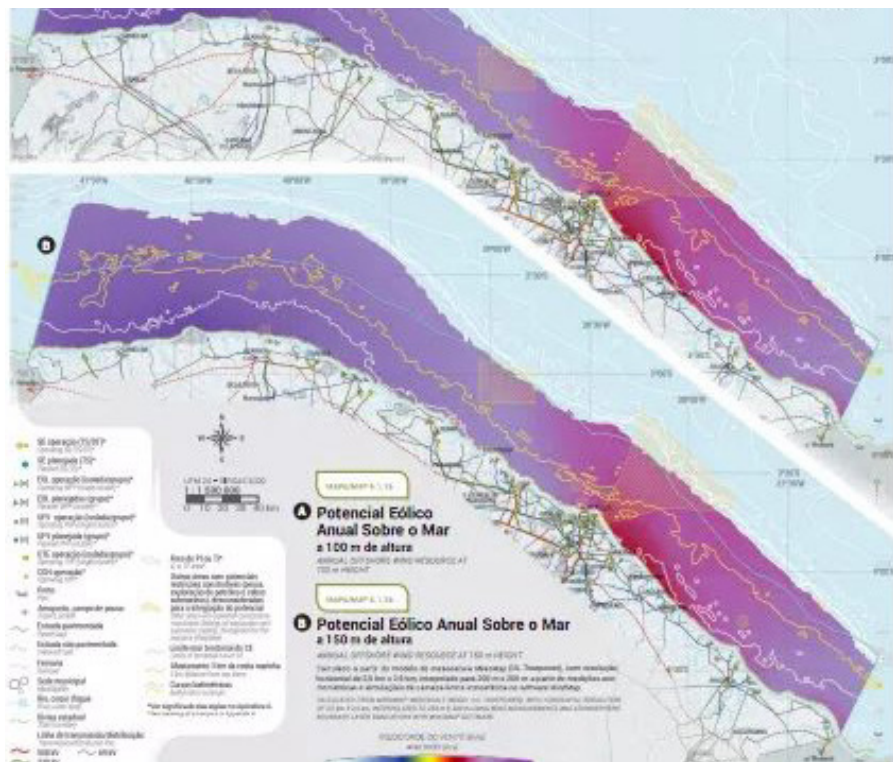
With an investment of R \$ 12 billion, Asa Branca will have 5 GW of installed capacity and will have three extensions in six years. The project may also have complementary investments in an exclusive dock in Porto do Pecém.

A pioneer in renewable energy, Ceará also occupies a central place among offshore wind energy projects, that is, with wind turbines at sea. The first project of this type in the state, called Asa Branca, by Eólica Brasil, will receive an investment of R \$ 12 billion in the first phase and should start operating in January 2025, according to the company's CEO, Marcello Storrer.

Asa Branca is the only offshore wind farm project in Ceará that already has a Subsidy Registration Order (DRO) issued by the National Electric Power Agency (Aneel), a document that authorizes the production of electricity.

The plant will be installed on the coast of Pecém and will have an installed capacity of 5 gigawatts (GW) in the first phase, distributed in 60 wind turbines. After the delivery of the first block, the plant will be expanded three times, once every two years, totalling four blocks and 10 GW of capacity. The value of the investment is repeated with each expansion.

As they are projects built in the sea, so that they can cause environmental impacts, offshore wind farms are subjected to a long evaluation process both by the Brazilian Institute of Environment and Renewable Natural Resources (Ibama), and by the Secretariat of Aquaculture and Fisheries, National Secretariat of Ports and Aquatic Transportation (SNPTA), Navy and Aeronautics, in addition to Aneel itself.



Storrer details that, with the exception of environmental licenses, all other authorizations have already been granted to the Asa Branca project. The protocol with Ibama, led by Ramboll Brasil, an environmental consultancy, is in preparation for the environmental impact study, which should be ready in a year.

We are investing a lot to have the perfect study and obtain approval as soon as possible", explains the executive. After the granting of the prior license by Ibama, the plant installation study project will be carried out, which will also be analyzed, only then will the construction of the park begin.

FINANCING

The general manager of Eólica Brasil also reveals that the resources for the construction and installation of the Asa Branca plant will also come from the group's own income, but mainly from the resources of the energy purchase and sale contracts.

Taking into account that it is a new renewable energy matrix in the country, it also defends an incentive program by the Federal Government,

as happened with onshore wind, solar and biomass energy through the Source Incentives Program. Alternativas de Electricidad (Proinfa), which benefits entrepreneurs without corporate ties with generation, transmission or distribution concessionaires for contracting energy.

"This contracting model can occur with the distributors themselves as buyers. Then, the difference between the Settlement Price for Difference (PLD), which is the average amount disbursed by distributors to pay generators, and the incentive price will come from of the Energy Development Account (CDE)", explains Storrer about how cheap offshore wind energy should be.

However, he points out that the government's positive signal for this will only come with the presentation of the program by the private sector itself.

In addition to the plant, Eólica Brasil also negotiates with Porto do Pecém and the State Government the construction of an exclusive terminal for offshore projects. This is because the towers must be pre-assembled on land and then taken to the

sea. According to the company's general manager, the area would have at least 50 hectares and should be built with its own resources, an investment of US \$ 200 million. "Despite being our initiative, the pier would be open to other marine plants that need it," he points out.

The agreement was confirmed by the State Secretary for Economic Development and Labor, Maia Júnior. "We are analyzing the necessary elements. The memorandum is being executed through legal advisors so that the prosecutors can authorize

the celebration. We are interested in creating favorable conditions," she says. She also reveals that the administration of the dock would be on behalf of the Port of Pecém itself in partnership with a private entity that has an interest in the operation.

Chile

SUBTEL awards the University of Chile the preparation of the "Study of Synergies of Digital Projects in South America"

The public tender includes a maximum budget of USD 125,000 and is part of the Technical Cooperation Execution Agreement, signed between CAF and the MTT.

The Subsecretariat of Telecommunications (SUBTEL) awarded the Faculty of Physical Sciences and Mathematics of the University of Chile the preparation of a new study that will analyze the synergies that the "Transoceanic Cable" project will have with other digital projects in the region. This public tender includes a maximum budget of USD 125,000 and is part of the Technical Cooperation Execution Agreement, signed between the Andean Development Corporation (CAF) and the Ministry of Transport and Telecommunications (MTT).

"It is of great interest for both SUBTEL and CAF to analyze how the development of regional networks will be promoted, the emergence of new data-intensive industries, and the strengthening of the scientific and research industry thanks to the development of the Transoceanic Cable, an initiative that will connect South America with the Asia-Pacific region", indicated the Undersecretary of Telecommunications, Pamela Gidi.

The regulator received a total of six offers to participate in the tender, which were presented by Bluenote Management Consulting Colombia SAS, Zagreb Consultores Limitada, KPMG Consultores Auditores SpA, Faculty of Physical and Mathematical Sciences of the University of Chile, EY Consulting Chile SpA and Telecom Advisory Services, LLC.

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Guyana

Guyana powered up again with Chinese help

A team of technicians from Ningbo, East China's Zhejiang province, played a vital role in the resumption of the power supply in Guyana, offering a helping hand to people in the South American nation.

Mark Phillips, prime minister of The Co-operative Republic of Guyana, expressed his gratitude to China for the team's help in restoring electricity in the capital of Georgetown.

The undersea cable under the Demerara River in Guyana, which was built by Chinese-funded enterprises and put into use in 2012, was damaged by anchors on 27th of November 2020.

This is the only 69kV undersea cable in Guyana. It is the key connecting cable between the two major power plants in Guyana and most users in the country.

The damage occurred less than one month before Christmas and the peak of electricity consumption in the country was rapidly approaching.

The cable was damaged for a similar reason in June 2019. Orient Cable in Ningbo provided the connector, and the restoration effort was highly recognized by Guyana back then.

Upon receiving notice from the Ningbo Foreign Affairs Office, Orient Cable in Ningbo quickly set up a special working group comprised of Liu Ming, the leader of cable repair in Guyana in 2019, and two other technicians.

At the same time, the foreign affairs department of Ningbo launched green channels for their passport handling, overseas mission approval, vaccination, and epidemic prevention materials allocation so the team set off for Guyana on the 09th of December 2020.

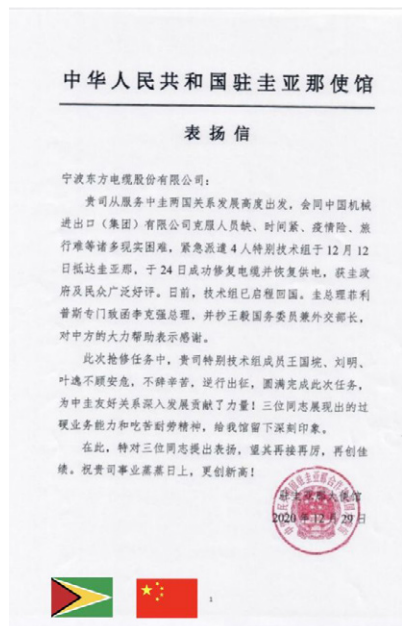


It took the team more than 70 hours to travel through South Korea, the Netherlands and Panama, finally arriving in Guyana on the 12th of December 2020.

The cable was successfully repaired on the 24th of December 2020. Power in parts of the capital was restored. At that time, it had been only 23 days

after the Ningbo team received the request for the rescue mission.

Cui Jianchun, China's ambassador to Guyana, hailed the emergency repair mission. "This exemplifies the friendship between the two countries and China's people-centred approach in promoting the development of bilateral relations."





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Brazil – French Guyana – Cape Verde – Madeira – Portugal – Spain

EllaLink's transatlantic submarine cable has already anchored in Portugal

The state-of-the-art fiber optic cable that connects Portugal and Latin America has already arrived in Sines.

The system should be fully operational in the second quarter of 2021, making Portugal the new gateway to Europe to an unprecedented level of international connectivity.

EllaLink announces today, 06th of January 2021 that its next generation low-latency submarine cable system has already anchored in Sines, from where the connection to Latin America will be established. It is expected to become fully operational in the second quarter of this year, providing an unprecedented level of international connectivity between the two continents, which will reach Europe through Portugal.

With this operation with an investment of 150 million euros, pointed out as one of the big bets for the Portuguese Presidency of the European Commission, EllaLink will open a "corridor" for the transmission of data between the two continents, providing new opportunities to the European market. In addition to the first direct high-speed submarine cable connection between Europe and Latin America, the EllaLink system also includes several land routes that link strategic Data Centers in Lisbon, Madrid, Marseille, São Paulo, Rio de Janeiro and Fortaleza in partnership with Equinix and Interxion.

Over the past few decades, the consumption of digital products has triggered the need for connectivity



Eurico Brilhante Dias, Portuguese Secretary of State for Internationalization

between countries and continents, from simple voice transmission to the real-time transmission of streaming videos, and all future applications that will be possible thanks to the implementation of 5G worldwide. These applications require less latency, that is, the lesser time that information takes to pass on the network, from users to Data Centers and platforms. Applications are so sensitive to latency values that these have become an essential factor for the digital world.

By creating the shortest direct route between Europe and Latin America, avoiding passage through third countries, EllaLink reduces latency by 50% compared to the current infrastructure, reaching a real value of less than 60ms between Portugal and Brazil.

The state-of-the-art technology used in the EllaLink system guarantees high quality access to telecommunications services and applications, through a direct, high-speed connection with very low latency. This will be beneficial not only for all telecommunications platforms, but also for services in the Cloud, access to content, all types of digital businesses and even the gaming industry.



EllaLink Cable System



During the first months of 2021, EllaLink will strengthen its network so that it can be operational by the end of the second quarter. Connections are planned to the island of Madeira and Cape Verde, but also to Marseille, which will allow for increased connectivity with Africa, Asia and the Middle East. Other potential points of connection with Mauritania, Morocco,

French Guiana and the Canary Islands are already in view.

Philippe Dumont, CEO of EllaLink: "It is with great pride that we witness today the arrival of the cable in Portuguese territory. Over the past two years we have been working very closely with different entities that made possible, and supported from the get-go, the arrival of the cable and the installation

of EllaLink in Portugal. This cable connection strengthens the ties created and EllaLink will continue to contribute to international development, also boosting the location itself through the digital transformation of companies and organizations in Portugal. "



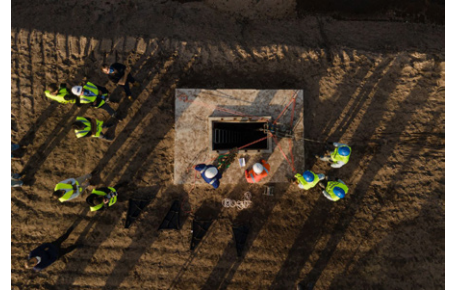
EllaLink – Sines landing infrastructure (@philBE2 on twitter)



Vasco de Gama CLS



CS "Ile de Sein" off cable landing point at Sines



BMH at Sines

Eurico Brilhante Dias, Portuguese Secretary of State for Internationalization: "The arrival of the submarine telecommunication cable EllaLink inaugurates a new economic era in this region. EllaLink not only brought us a very important submarine cable in the global context, but also the possibility of a broader partnership in which, together, we will continue to develop a data center hub and cable mooring stations here in Sines. Thanks to this joint effort and with the important support of other partners, such as Sines City Council, we're now

launching the Sines Tech – Innovation and Data Center Hub, which offers Sines excellent conditions to welcome the major international players in telecommunications and the digital economy."

ABOUT ELLALINK

EllaLink is an advanced optical platform offering secure high capacity connectivity on a unique low latency transatlantic route serving the growing needs of the Latin American and European markets. The EllaLink network directly connects Brazil and Europe, linking the major hubs of São Paulo, Rio de Janeiro and Fortaleza with Lisbon, Madrid and Marseille.

The EllaLink System is being built with state-of-the-art coherent technology initially offering 72Tbps of capacity over four direct fibre pairs between Europe and Brazil. The landing sites in Fortaleza (Brazil) and Sines (Portugal) have been secured and EllaLink is scheduled to be Ready for Service in Q1 2021. EllaLink is a privately funded and independent company committed to providing products and services on a Carrier Neutral and Open Access basis. Margueritell, a pan-European equity fund active in the renewables, energy, transport and digital infrastructure sectors, is the main shareholder of EllaLink. For more information visit ella.link

Brazil – French Guyana – Cape Verde – Madeira – Portugal – Spain

EllaLink lands Europe-South America cable in Brazil

On the 14th of December 2020, EllaLink completed anchoring in Fortaleza, Brazil for the submarine cable system connecting Europe and South America.

According to the company, the maritime cable installation activities in Fortaleza will continue over the coming months. In all, there will be about 6,000km of undersea cable running from Fortaleza to Sines in Portugal.

The cable is expected to be activated in the second quarter of 2021.

The announcement of the Fortaleza anchor by the private group responsible for the project comes

days after Brazilian communications minister Fábio Faria 'officially announced' the cable at a press conference in Brasília.

However, the system is not new, and the Brazilian government is not directly involved. In fact, the country's authorities rejected the opportunity of taking part previously.

EllaLink is a privately funded and independent company whose main shareholder is Marguerite, a pan-European equity fund active in the renewables, energy, transport and digital infrastructure sectors. The manufacture and deployment of the



Landing buoy of EllaLink in Fortaleza, Brazil



CS "Ile de Brehat" – Shore-end Operation

cable system is being carried out by Alcatel Submarine Networks.

The project was conceived some eight years ago and was announced in 2017, having undergone various delays throughout this period – part of which were due to the Brazilian government's decision to pull out of forming a JV through state-run telco Telebras to co-finance the project.

Facing financial difficulties and with other, more pressing priorities, the Brazilian authorities decided to drop out of the project.

THE NETWORK

Overall, including its terrestrial networks, the Ellalink cable will be 10,000km long.

Sections of the system will also link to Morocco and Mauritania in Africa; the archipelagos of Madeira, the Canary Islands and Cape Verde islands; and to inland Europe in Spain (Madrid) and France (Marseille).

In Lisbon, the cable will connect to Equinix's Lisbon datacenter and from there to Madrid, where EllaLink will be connected to two datacenters, Equinix MD2 and Interxion MAD 2/3.

From Madrid, the system will go through various terrestrial routes that include gas pipelines and optical ground wire (OPGW) power lines to Interxion's MRS3 datacenter in Marseille.

According to EllaLink, the cable is the first to directly connect Latin America to Europe with high-capacity fiber optic cables. Digital businesses, cloud services, financial services, entertainment media and games systems, among others, are expected to benefit most from the new route.

"The EllaLink submarine cable system consists of a direct route between Portugal and Brazil that results in a Round Trip Delay (RTD) of less than 60ms, less than half the RTD of systems that travel between the two continents via North America" said Diego Matas, chief operating officer (COO) at EllaLink.

DEPLOYMENT

The cable system will be installed by two separate Alcatel Submarine Networks vessels: the Ile de Brehat vessel will operate in Brazilian waters, while Ile de Sein will install the rest of the system from Sines in Portugal.

EllaLink is landing in Fortaleza because the Ceará state capital is a popular and convenient cable landing point, as well as being one of the closest points in Brazil to Europe, the company said.



EllaLink Cable System

US - Spain

Infinera, Facebook achieve 700-Gbps per wavelength transmission on MAREA submarine cable

In a “hero experiment” scenario, a production version of an ICE6 module enabled wavelength transmission of 700 Gbps over 6,640 km. Under conditions designed to better mirror actual deployment conditions, the ICE6 still achieved 650 Gbps.

In a blog posted today, 12th of January 2021, Infinera reports on a high-speed transmission trial of its ICE6 coherent engine on Facebook’s MAREA transatlantic submarine cable. In a “hero experiment” scenario, a production version of an ICE6 module enabled wavelength transmission of 700 Gbps over 6,640 km. Under conditions designed to better mirror actual deployment conditions, the ICE6 still achieved a per-wavelength transmission rate of 650 Gbps. Both results are records for transmission across an undersea cable, Infinera asserts.

The 650-Gbps represents a total system capacity of 28 Tbps, according to Infinera Director of Solutions Marketing Geoff Bennett (who authored the blog) and Senior Vice President of Marketing Robert Shore. That capacity is fully in the C-Band, Bennett pointed out; C+L-band deployments are best suited to transpacific routes due to a combination of factors involving system length and the number of amplifiers required. The achievement was aided by the fact that MAREA uses cutting-edge large-area, low-loss optical fiber type based on a pure silica core. A short amplifier spacing of 56 km helps boost optical signal-to-noise ratio as well.

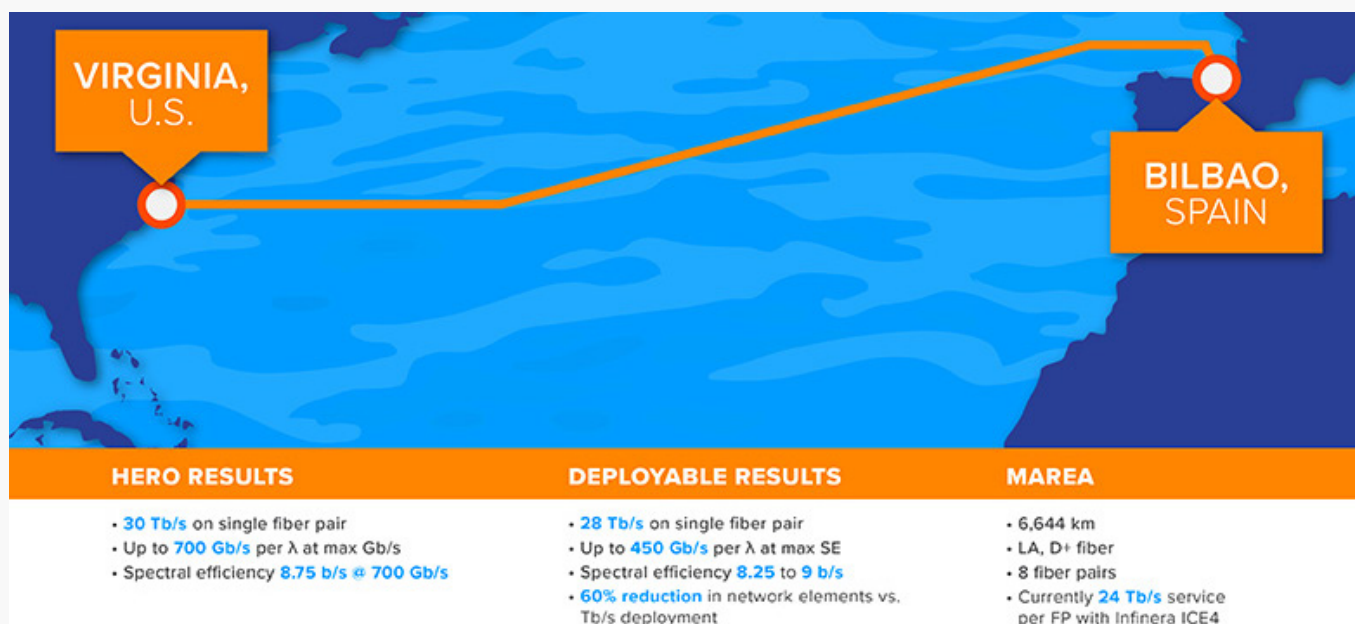
In the blog, Dr. Steve Grubb, global network optical architect at Facebook, praised the results of the demonstration, noting that MAREA’s current capacity is a bit more than 24 Tbps. “The

great thing about ICE6 is that...the higher data rate per wave, the better the cost per bit – and that includes the fact that we need fewer transponders that consume less rack space and less electrical power,” Grubb is quoted as saying. “The 28-Tbps option with ICE6 reduces the network element count by 60% vs. the boxes previously required for 24 Tbps...That’s a huge improvement, especially in cable landing stations where real estate and power are often at a premium.”

Bennett and Shore hesitated to speculate whether Facebook will deploy ICE6 on MAREA, which still has unlit fiber. However, the performance improvements uncovered in the demonstration are “too much to ignore,” Shore stated.

With the ICE6 finally in production, Shore noted that Infinera’s engineers have improved the performance of the coherent engine since its initial demonstrations. He estimates that Infinera has enhanced the ICE6’s capabilities by 50% to 60% during that time.

Shore and Bennett said that the company’s current quiet period ahead of releasing its most recent quarterly results precluded them from saying whether ICE6 modules are not only in production but shipping. Meanwhile, word of further trials on undersea networks may be forthcoming. The two Infinera sources referenced a completed trial in the Pacific that Infinera is seeking permission to disclose publicly. The company also would like to test ICE6 on a submarine network architected with space-division multiplexing (SDM). They mentioned Dunant as a potential target for such an exercise.



Infinera conducted demonstrations of both ‘hero’ and ‘deployable’ performance of the ICE6 on the MAREA cable network. (Source: Infinera)

TELXIUS



Derio Communications Hub (Source: <https://telxius.com/network/interactive-map/>)

US – Spain – UK

Telxius to land the Grace Hopper Subsea Cable at its Derio Communications Hub in Bilbao

Google's Grace Hopper cable to connect from the US to the UK and Spain through the Telxius infrastructure

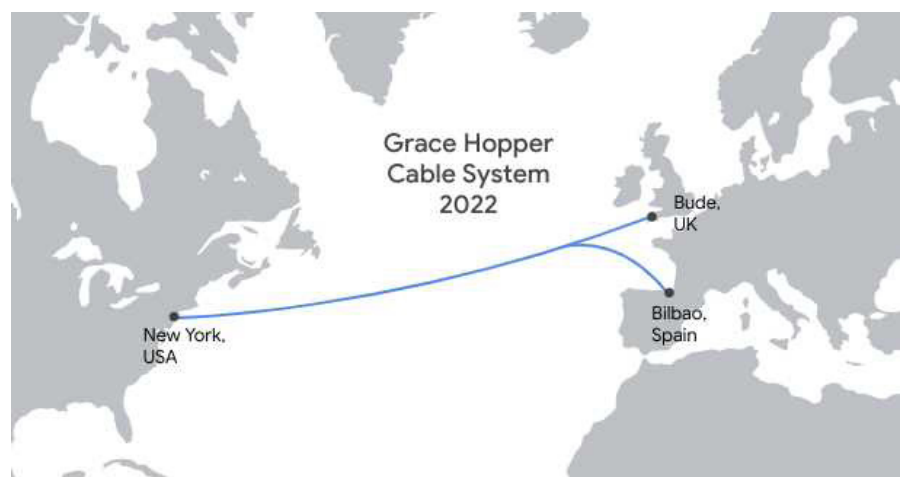
Telxius, the leading neutral telecommunications infrastructure operator with an extensive portfolio of towers and submarine cable, has announced today, 16th of December 2020 that the company will provide landing and colocation services for Google's new subsea cable, Grace Hopper. The cable will connect the US to Spain and the UK once completed in 2022. This new expanded collaboration between Telxius and Google will allow Google to connect the new cable to the Telxius Cable Landing Station (CLS) in Sopelana, Spain, and leverage the rich interconnection and advanced transmission capabilities of the nearby Derio Communications Hub.

"After several successful collaborations on Google's subsea cables, such as Dunant, Junior and Tannat cables connecting South America, North America and Europe, we are thrilled to be undertaking this new expanded project with the team at Google," says

Enrique Valdés, VP of Sales, Telxius, Northern Region, Cable Business. "At Derio, Google along with its customers and users will have access to top quality IP, capacity and colocation services and will be uniquely positioned to connect to the rest of Europe and beyond."

Google users and Google Cloud customers will indirectly benefit from Derio Communications Hub, a carrier neutral purpose-built infrastructure

that has been designed to ensure that every hyperscaler, cloud and/or content provider benefits from its cutting-edge colocation services and its high interconnection capacity, being able to connect securely and dynamically into other markets. Furthermore, the Derio facility is a 100% renewable energy building with free cooling, featuring Tier III specifications and offering up to 4 MW of power.



Grace Hopper Cable System

US – Ireland - UK

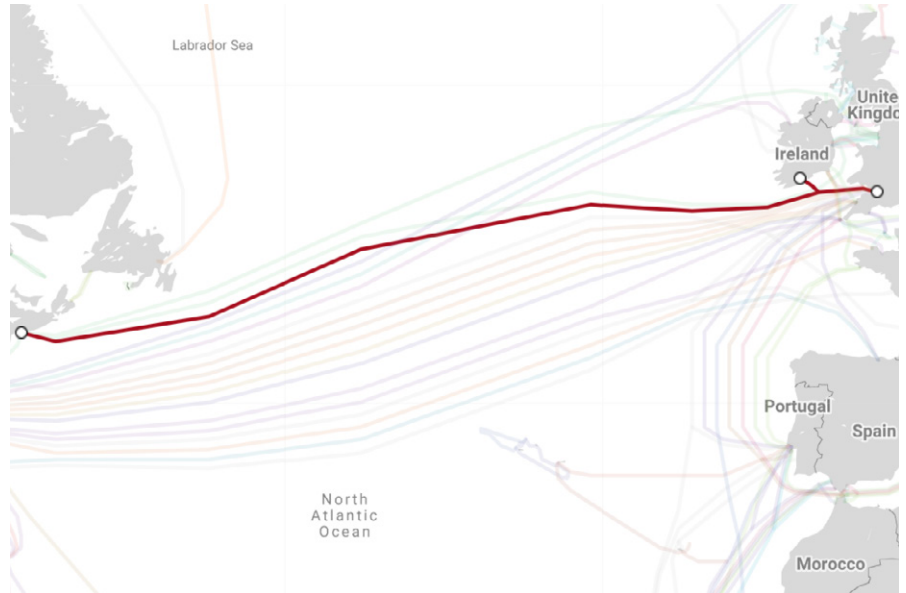
Subsea cable firm must pay \$3m for lost connection

- Hibernia Express says ship's anchor severed transatlantic connection

The Irish arm of Susquehanna International (SIG), a global quantitative trading firm or quat trader, has petitioned a New York court to confirm a near \$3m (€2.5m) arbitration award made to the company against Dublin-based transatlantic cable business Hibernia Express.

The award was made by the International Centre for Dispute Resolution following an outage on the Hibernia Express cable between February and March 2019.

High-speed connections are hugely important for many financial companies where rapid execution of transactions such as share trading can provide a significant competitive edge to the firms and their clients.



GTT Express (ex Hibernia Express) cable system

US – Canada – Ireland – Northern Ireland - UK

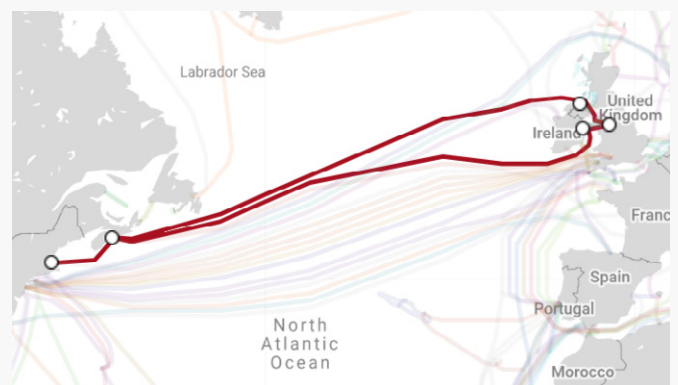
Application under review

The Federal Communications Commission (FCC) has been notified that the Committee for the Assessment of Foreign Participation in the United States Telecommunications Services Sector is reviewing an application for the transfer of control of Interoute from GTT Communications to Cube Telecom Europe BidCo Limited (BidCo).

The FCC stated that once responses to the Committee's initial request for information are completed, the 120-day initial review period will begin.

The application seeks a consent to the transfer of control due to the sale of Interoute to BidCo; a consent to the transfer of control for the submarine cable landing licence for the GTT Atlantic cable system; and a grant of international global resale and facilities-based Section 214 authority to Interoute. Interoute will not directly hold international Section 214 authority at the time of closing of the deal but will be operating under the international Section 214 authority of its parent company (which will not be sold to BidCo).

The GTT Atlantic system connects the US (via a landing station at Lynn, Massachusetts) with Herring Cove (Nova Scotia, Canada), Dublin (Ireland), Coleraine/Portrush (Northern Ireland) and Southport (the UK).



GTT Atlantic Cable System

Interoute will only own and control the US portion of the GTT Atlantic, specifically, the Lynn cable landing station and associated equipment and the wet plant in US territorial waters. The remaining segments of the Atlantic Cable are owned by GTT foreign affiliates, control of which will be transferred to I Squared.

The applicants are seeking an expedited review and approval to enable timely consummation of the entire transaction, which the parties are targeting for 1 April 2021.

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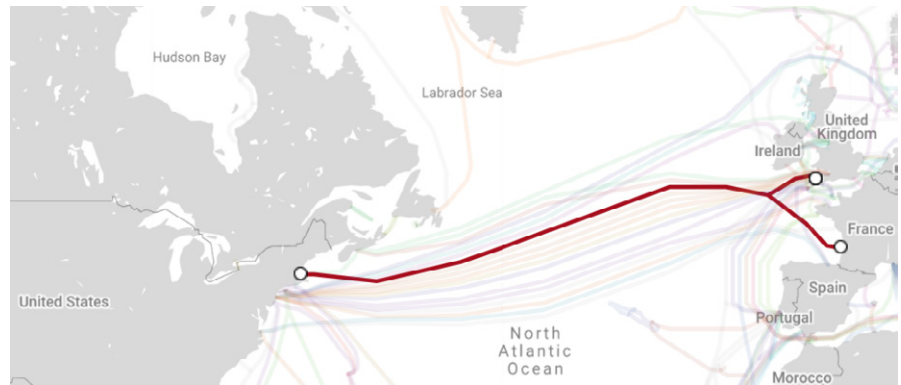
ISO9001:2008 Certified

US – France – UK

Amitie application under review

The Federal Communications Commission (FCC) has been notified that the Committee for the Assessment of Foreign Participation in the United States Telecommunications Services Sector will perform a 120-day review of an application filed by Edge Cable Holdings (Facebook), AquaComms, Cable & Wireless Americas Systems (Vodafone) and Microsoft Infrastructure to land and operate within US territory the Amitie system, a private fibre-optic submarine cable network connecting the US, the UK and France, to be operated on a non-common-carrier basis.

The Amitie system will consist of three segments: Segment 1.1 will connect Lynn, Massachusetts with a branching unit in the Atlantic Ocean between



Amitie Cable System

the UK and France; it will have 16 fibre pairs, each having a design capacity of 20.1Tbps using current technology, and a length of 5,276km.

Segment 1.2 will connect Bude (UK) with the branching unit via twelve fibre pairs, each having a design capacity of 20.1Tbps and a length of 645km.

Segment 1.3 will connect a new landing station in Le Porge (France) with the branching unit via twelve fibre pairs, each having a design capacity of 20.1Tbps and a length of 871km.

Orange Group will serve both as the France landing party for the system and will own a portion of the system extending twelve nautical miles from the French shore; the company will grant to the applicants and their affiliates dark fibre IRUs on that portion of the system. The applicants intend to commence commercial operations of the Amitie system by Q1 2022, therefore seeking a timely grant of a cable landing licence (no later than 31 July 2021) in order for the construction activities to proceed on schedule.

St. Thomas – St. Croix – Aruba – Venezuela – Colombia – Panama – Ecuador – Peru – Chile

Pan American to be retired

In a Public Notice dated December 10, 2020, the U.S. Federal Communications Commission (FCC) reported that the Pan American Cable System would be retired.



Pan American Cable System

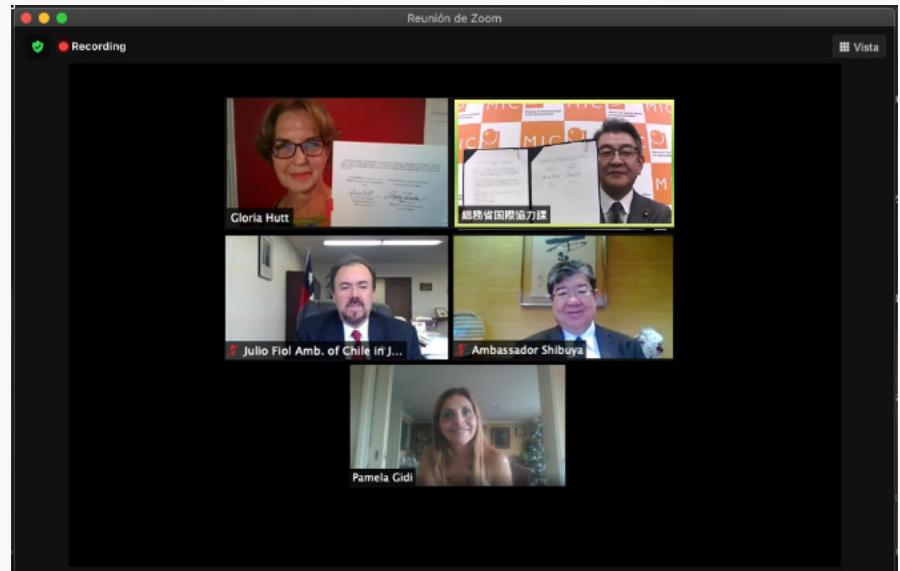
Chile – New Zealand – Australia

Chile, Japan sign Collaboration Memorandum to strengthen technical exchange on Information and Communication Technologies

The agreement, which deals with eleven telecommunications-related issues, covers two strategic issues such as the Asia-South America Submarine Cable and the deployment of 5G networks.

The Chilean Ministry of Transport and Telecommunications (MTT) and the Ministry of Internal Affairs and Communications of Japan (MIC) signed a Collaboration Memorandum (MOC) to strengthen technical exchange on Information and Communication Technologies (ICT).

This agreement, which deals with eleven telecommunications-related issues, covers two strategic issues such as the Asia-South America Submarine Cable and the deployment of 5G networks. In this line, for the former, collaboration with the ICM has been given since the start of that project and is currently maintained with the exploration of the transport of data from Australia to Asia through existing infrastructure. For its part, in the area of 5G, the MTT, through the Undersecretariat of Telecommunications (SUBTEL), has expressed to the ICM the desirability



of having examples of the use of this technology in productive applications that can be replicated in Chile.

"If we want to face well the different challenges that the new digital age proposes we have to learn from the experiences of other markets, who through their knowledge can contribute so that the national telecommunications sector continues to grow, benefiting all citizens," said Minister of Transport and Telecommunications Gloria Hutt.

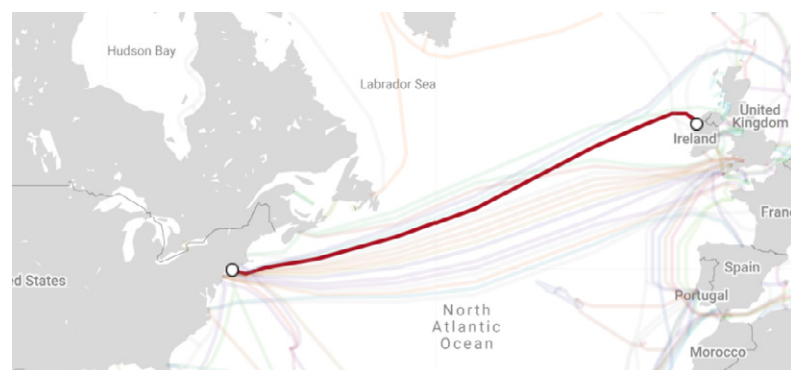
Meanwhile, the Undersecretary of Telecommunications, Pamela Gidi, stated that "for Chile to consolidate its position as a regional Digital Hub, it has to enhance the entire telecommunications ecosystem so that sectors and citizens can benefit in a real and comprehensive way from new technologies such as the future 5G network."

It should be noted that to date a fruitful collaboration between the TCM and MIC has been developed, so the MOC is an endorsement and extension of this one.

US – Ireland

Landing licence to be modified

AquaComms has requested that the FCC modify the cable landing licence for the AEConnect-1 cable linking the US and Ireland in order to reflect revisions to the security mitigation arrangements negotiated with the Department of Homeland Security (DHS). The new letter of assurances (2021 LOA) replaced the 2014 LOA (negotiated with the DHS in October 2014), effective January 2021.



AEConnect-1 Cable system

Europe – Middle East – India

Cinturion and Partners commence the Trans European Asia System

The terrestrial and subsea open system is the first dual path state-of-the-art system linking Europe, the Middle East and India.

Cinturion Corp Ltd., a provider of scalable, subsea and terrestrial capacity-based network solutions spanning India, the Middle East and Europe, announces it has officially commenced construction of the Trans-European Asia System (TEAS).

The project is set to deploy the most advanced fiber optic technology, bolstering the region's Information and Computing Technologies initiatives supporting bandwidth-hungry data centers and their growing customer base. When completed, TEAS will be the first of its kind open system, offering an information superhighway of over 300 Tbps with new and diverse parallel routes between India, the Middle East, and Europe, bringing advanced features and high-capacity inter-links throughout the region.

The system consists of two diverse connections across the Mediterranean Sea continuing with two diverse paths inter-linking the Middle East, with multiple routes across the Arabian Peninsula, and a route through the Gulf of Aqaba and the Red Sea. The first new dual path system of its kind provides geographically diverse routes terminating in India. TEAS will enable new services with its unique optical capabilities to support modern Data Center deployments, bringing broadband and low latency access to European, Middle East and Indian markets. When complete, TEAS will offer individual fiber ownership to a broad range of customers. Total subsea and terrestrial network segments consist of over 19,000 Kms with a System Ready for Service date expected in 3Q2023.

Cinturion has partnered with local in-country licensed service providers along its route to establish landing sites with commitments that include carrier neutral facilities offering Open Access System rights to enable customers the utmost flexibility in hardware and software selection. Fiber owners will have full flexibility of their network transmission equipment to support network demands and be able to upgrade network transmission equipment as required. The state-of-the-art system is designed leveraging technologies that provide the most advanced network security. Additionally, owners of fibers on the system will benefit from uninterrupted connectivity with tens of Terabits of throughput capacity, through diverse routes across land and sea between India, the Middle East and Europe.

Cinturion has contracted DRG Undersea Consulting, an experienced submarine engineering and project management company, and BTC Networks to provide services for the terrestrial network design and supply featuring the latest technology solutions. Cinturion's experienced management team has worked in all regions covered by TEAS. Such experience delivers a safe and reliable advanced system with valuable features, including an advanced Remote Fiber Testing System (RFTS) for fault prevention and fast remediation.

TEAS is a completely new build, introducing advanced infrastructure buried underneath secure rights of ways e.g., GCCIA high voltage distribution network, and utilizes the latest large core fiber optic glass technology that will enable future product developments capable of supporting the additional growth of advanced data services throughout the



Cinturion and Partners Commence the Trans European Asia System

Middle East region. The homogenous fiber throughout the TEAS network allows for end-to-end lighting with uninterrupted network symmetry. TEAS will deliver the lowest latency and highest resiliency along its corridor, features critical to emerging demands of 5G, IoT and large cloud and content providers. The high capacity and advanced features of TEAS are being implemented at an opportune time for enhancing communications within and outside the Middle East.

Commenting on the project, Mr. Greg Varisco, CEO of Cinturion, notes: "The TEAS project is being implemented to fulfill the demand for Open Access systems with fiber connectivity bridging India, the Middle East and Europe. This network will provide much needed high capacity, fiber optic offerings to countries needing access to low latency route diversity and improved route resiliency throughout the region. TEAS will provide exceptional end-to-end capabilities not requiring any regeneration and allow for a higher degree of inter-connectivity among system participants. The system significantly increases the availability of inter-region, inter-data center connectivity as compared to the traditional consortium systems provided by carriers."

ABOUT CINTURION

Cinturion Corp. Ltd. with its key management having a long history of involvement in the

development and implementation of submarine telecommunications cable systems, is focused on the development of new fiber-optic networks utilizing the latest submarine cable systems coupled with the latest terrestrial technology for greenfield or underserved markets.

The strength of Cinturion comes from its diverse and experienced members profile that includes senior management, technical, financial, project management, systems engineering and sales, representing all the core elements required for successfully implementing major international fiber-optic systems. www.cinturioncorp.com

ABOUT DRG UNDERSEA CONSULTING

DRG Undersea Consulting (DRG) is an advisory firm specializing in guiding clients through their investment in and development of international telecom infrastructure, with an emphasis on undersea fiber optic networks. Our team, established in 1999, has supported clients who are planning, procuring and managing the construction of new undersea networks in every region of the world. DRG is currently active with projects worldwide, including both transoceanic cables connecting continents across the world's largest oceans and regional cables across smaller seas. DRG also continues to counsel investors across the globe by performing vital technical, commercial and market due diligence on their prospective international undersea investments and acquisitions. www.drguc.com

ABOUT BTC

For more than three decades, also known as BTC Networks has successfully played a primary role in the development of today's information and communication technology systems throughout Kingdom of Saudi Arabia and Middle East countries. BTC is recognized for its ability to introduce and integrate the latest global communication advancements made available.

When communication seemed limited, we introduced the first Digital PABX, first Video Conferencing and the largest Data Network in the Kingdom. As a result, we take pride in playing a direct role in connecting millions of people together. Today, we are acknowledged as one of the largest integrated CIT solution providers in the Middle East with branches in Saudi Arabia, Egypt, Lebanon, Jordan and Iraq. Our success depends on our unwavering commitment, internal organization and resources, excellent time management and expert personnel. btcsites.com

US – Ireland - Denmark

Pro forma assignment approved

FCC has approved the pro forma assignment of an interest in the Havfrue cable landing licence from America Europe Connect 2 Limited (AEC2) to AquaComms Americas.

AEC2 is a party to the supply contract with the Havfrue system supplier SubCom. To simplify and streamline its operations, AEC2 executed (along with the other Havfrue owners) a Certificate of Commercial Acceptance with SubCom, effective 12 November 2020, providing among other things that AquaComms Americas would take title to the US-territory portion of AEC2's interest in the Havfrue system.

The transaction did not result in a change in ownership of entities; pre-/post-consummation, all of the asset-owning entities have remained wholly owned, direct or indirect subsidiaries of AquaComms Designated Activity Company and ultimately controlled by the 2013 Bake Family Trust.



AEC-2 Cable System

France – Egypt – Djibouti – Somalia – Pakistan – Seychelles – Kenya

Interxion: A Digital Realty Company Collaborates with PCCW Global to Deliver Submarine Cable Gateway to Europe

Interxion: A Digital Realty Company (NYSE: DLR) and leading European provider of carrier- and cloud-neutral colocation data centre solutions, has signed an agreement with PCCW GLOBAL to locate the Pakistan and East Africa Connecting Europe (PEACE) subsea cable system's termination and interconnection equipment in Interxion's MRS2 data centre in Marseille, France. The collaboration will enable low-latency access to over 160 connectivity providers along with multiple content, cloud, gaming and video streaming platforms.

The high-speed, 15,000km PEACE subsea cable system will offer high capacity, low-latency routes connecting China, Europe and Africa. In addition to France, the cable will land in Malta, Cyprus, Egypt, Djibouti, Kenya, Pakistan and other countries and regions with onward terrestrial connectivity to China.

The PEACE cable will be the fifteenth subsea cable system to land in Marseille, further enhancing the value of Network Hubs deployed on PlatformDIGITAL®, Digital Realty's global infrastructure solution, in the region as enterprises seek greater resiliency and performance for interconnecting global workflows. The collaboration represents a strategic expansion of both PlatformDIGITAL® and Console Connect, PCCW Global's Software Defined Interconnection® platform. Both platforms enable new and existing customers to deploy and manage hybrid IT services quickly and efficiently.

Console Connect is available to Interxion customers at MRS1, MRS2 and MRS3, providing them with instant access to a global ecosystem of cloud, SaaS, UaaS, IX and IoT partners, as well as extended coverage to more than 400



PEACE cable system

data centres in 47 countries worldwide. Interxion customers in Marseille can also access Console Connect's new Internet On-Demand service, which offers high-performance internet access on-demand across PCCW Global's leading Tier 1 IP network.

Interxion's Marseille campus is one of the world's leading digital hubs for intercontinental data traffic with a thriving community of numerous connectivity providers, digital media and cloud segments along with local and global enterprises, providing customers a strong foundation to execute their digital transformation strategies and scale globally.

"Interxion's fluid interconnection environment in Marseille enables the PEACE subsea cable to efficiently service the needs of the vibrant community of interest on the campus, while extending the system's reach to additional markets such as Frankfurt and Paris," says Sameh

Sobhy, Managing Director, Middle East, Turkey and Africa at PCCW Global.

"Selecting the right data centre in Europe for the PEACE subsea cable to interconnect with is a critical component to ensure the project's commercial success. We know that with Interxion we have made the right strategic decision," says Sun Xiaohua, Chief Operating Officer of the PEACE Cable International Network Co. Ltd.

The PEACE system will provide the most direct and high-capacity route from Asia to Europe. These features, combined with exceptionally low latency, are vitally important for a wide array of commercial and consumer applications. Moreover, PEACE deploys a state-of-the-art "system within a system" configuration that gives each party the required flexibility to design its own subsystem with reconfigurable bandwidth for different points over the lifetime of the cable.

"This collaboration with PEACE and PCCW Global not only solidifies Marseille's future as an intercontinental hub with access to state-of-the-art communication services, but also affords Interxion's global customer base entry into new markets and the ability to connect their often geographically dispersed infrastructure in close proximity to the connected community via PlatformDIGITAL®," says Mike Hollands, Senior Director, Market Development at Interxion.

"The PEACE cable is well placed to meet the burgeoning exchange of data and video traffic between Europe, Africa and Asia, enabling enterprises to extend their global workflows and efficiently execute their digital transformation strategies."

ABOUT INTERXION: A DIGITAL REALTY COMPANY

Interxion: A Digital Realty Company, is a leading provider of carrier- and cloud-neutral data centre solutions across EMEA. With more than 700 connectivity providers in over 100 data centres across 13 European countries, Interxion provides communities of connectivity, cloud and content hubs. As part of Digital Realty, customers now have access to 49 metros across six continents. For more information, please visit www.interxion.com.

ABOUT DIGITAL REALTY

Digital Realty supports the world's leading enterprises and service providers by delivering the full spectrum of data center, colocation and interconnection solutions. PlatformDIGITAL®, the company's global data center platform, provides customers a trusted foundation and proven Pervasive Datacenter Architecture PDx™ solution methodology for scaling digital business and efficiently managing data gravity challenges.

Digital Realty's global data center footprint gives customers access to the connected communities that matter to them with more than 280 facilities in 49 metros across 24 countries on six continents. To learn more about Digital Realty, please visit digitalrealty.com or follow us on LinkedIn and Twitter.

ABOUT PCCW GLOBAL

PCCW Global is a leading international communications service provider, offering the latest mobility, voice and data solutions to multinational enterprises, telecommunications partners, cloud and application service providers. With a network footprint reaching over 3,000 cities in 160+ countries across 5 continents, our truly global coverage combined with local on-the-ground knowledge has helped us build best-in-class global connections linking Africa, the Americas, Asia Pacific, Europe and the Middle East. Our network supports a

portfolio of integrated communications services including connectivity, applications, and tailored solutions integrated and orchestrated by the Console Connect on-demand digital Software Defined Interconnection® platform, one of the first global platforms to fully automate switching and routing of all communications for seamless interconnection. To learn more about PCCW Global, please visit pccwglobal.com.

ABOUT PEACE CABLE INTERNATIONAL NETWORK CO., LTD

PEACE Cable International Network CO., LTD, founded in 2018 and registered in Hong Kong. PEACE aims to be leading international submarine cable system operator. PEACE submarine cable system, connecting Asia, Africa and Europe, provides an open, flexible and carrier-neutral services for its customers. PEACE is targeted for completion in 2021. When complete, the high-speed PEACE cable system will offer the shortest routes from China to Europe and Africa, interconnecting three of the world's most populous continents whilst at the same time dramatically reducing latency, delivering a superior connectivity experience which will be ideal for a vast array of commercial and consumer applications. To learn more about PEACE Cable System, please visit peacecable.com.

US – Denmark – Germany – The Netherlands – France – UK – US

TAT-14 retired

On the 15th of December 2020, the TAT-14 transatlantic cable system connecting the United States to the UK, France, The Netherlands, Germany and Denmark was powered down. The cable system has been retired and will be recovered during 2021.



TAT-14 Cable System

Guatemala – Ecuador – Peru – Chile

Pacific Cable system installation ongoing

SubCom continued the installation of the Pacific Cable system for America Movil and Telxius.

The CS Decisive installed the first segment from Puerto San Jose, Guatemala to the BU1, offshore Guayaquil, Ecuador from the 22/11/2020 to the 25/12/2020.

After a week stopover in Guayaquil, Ecuador, the CS Decisive started the shore end operation at Salinas on the 02nd of January 2021.

After the landing operation the CS Decisive laid the cable branch back to the trunk end buoyed off earlier.



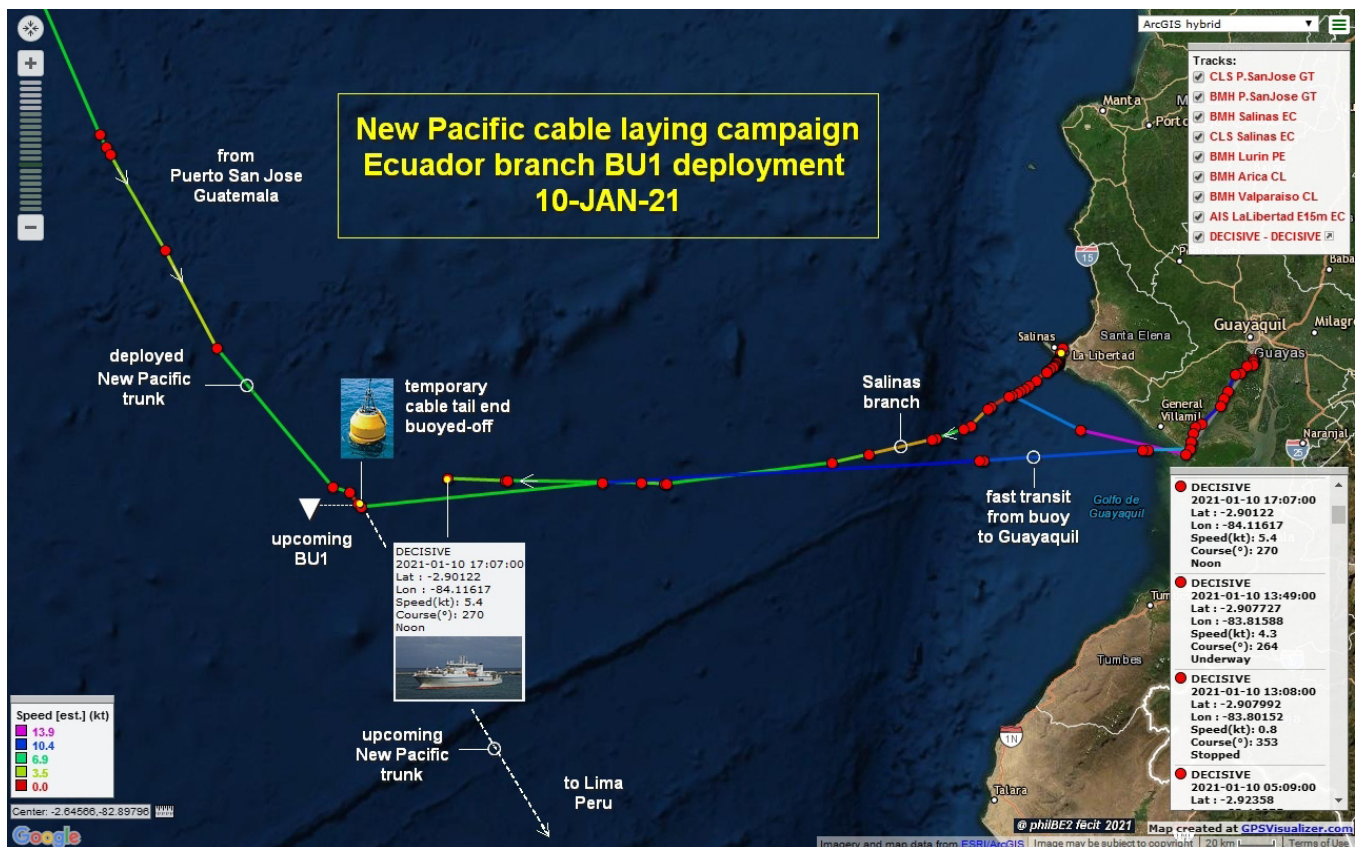
Pacific Cable System



26/12/20 – Cable installed from Guatemala to BU1 (@philBE2 on twitter)



02/01/21 – Cable landing operation at Salinas, Ecuador (@philBE2 on twitter)



10/01/21 – Ecuador branch BU1 deployment (@philBE2 on twitter)



NETWORK PREDICTIONS 2021: Ciena's Steve Alexander

by **Steve Alexander**, CTO, Ciena

2021 WILL TAKE INVESTMENT TO THE EDGE

5G networks are primed to deliver faster web browsing and video streaming with reduced latency, both very appealing for consumers. But 5G can do so much more once networks have matured. Advanced 5G services like rich AR and VR, cloud gaming, telemedicine, and Industry 4.0 (the connected manufacturing revolution), all require highly reliable networks that can deliver low latency as well as higher bandwidth – but also high levels of intelligence.

For these services to take off, networks must continue to get faster, closer and smarter, utilizing automation intelligence and software to deliver on the hype of these exciting services. A part of building faster, closer and smarter networks is to build out the edge, where we need up to five times more data centres than are available today.

There is already heavy investment in building out edge data center sites to bring the cloud closer to users and this investment will continue at pace in 2021. The carriers know they need to continue to focus on building out their edge infrastructure in these smaller data center sites, leveraging edge cloud capabilities which will mean that services can be processed closer to users, improving user experience and delivering on the bold promises of 5G.

HITTING NEW NETWORK REQUIREMENTS WILL BECOME AUTOMATIC

Carriers know the demands we are placing on networks show no signs of slowing as our lives become more digital and distributed. That means network rollout will continue at pace, but networks must now be built to adapt on their own. Carriers have already taken steps to make this happen, but in 2021, we will start to see even more use of software and analytics to improve the way optical networks function.

Advanced software capabilities will redefine how network providers engineer, operate and monetize their optical networks. These software solutions were originally focused on extracting more value from existing network assets. In 2021 will see these software solutions play a key role in new network builds, giving CSPs the ability to fine-tune, control and dynamically adjust optical connectivity and capacity.

Software will also give greater visibility into the health of the network via real-time link performance metrics and increased, end-to-end photonic layer automation. By utilizing the latest advanced software solutions, providers can monitor and mine all available network assets to be able to instantly respond to new and unexpected bandwidth demands and allocate capacity across any path in real time – a function which will become increasingly important year-on-year.

INCREASING DIGITAL INCLUSION WILL BE KEY TO CONTINUED REMOTE WORKING

This year has demonstrated how important connectivity is for people to stay in touch, shop and work remotely to keep our economy moving. It has also proven crucial to the continued education of students. There is a growing desire to maintain this flexibility even once Covid restrictions are lifted, but this is only possible if you have the connectivity and capacity.

In 2021, we'll see rural connectivity and digital inclusion initiatives move higher up the political agenda, and solutions like low-orbit satellite connectivity will come to greater prominence. The solution that maximizes ultimate capacity is still scaling fiber based broadband, but we know this can be a challenge in rural areas, so will require a nudge from policy makers to get things moving.

If countries want to stay at the forefront of the digital economy, they must break down the barriers to rural connectivity and invest in fixing the last-mile problem. They must also continue supporting digital inclusion programmes that grant students access to technology and tools. Incentives and initiatives from the government, and an ongoing review to ensure that networks are using the most effective equipment suppliers, are certainly ways to help.





ENHANCED REALITY WILL STEP FORWARD AS THE FIRST KILLER USE CASE FOR 5G

Almost as soon as talk of 5G networks first started, so too did questions about what the killer app for the new standard will be. 2021 might not be the year we get the definitive answer to that question, but it will be the year in which enhanced reality (AR and VR) applications take a step forward. However, it may not be consumer-centric services that light the path, but instead, enterprise use cases could lead the way.

I think it's safe to say that all of us have grown weary of online team meetings this year, and 'zoom fatigue' has become a very real thing. Next year I predict we will see more instances of AR and VR being used as collaboration tools, helping remote teams regain some of the 'live' element of working together. These services will initially need to run over combinations of home broadband, in building Wi-Fi, 4G and 5G networks. They will ultimately open the door to more commercial AR and VR services over 5G networks and WiFi 6 further down the road. The quality of those networks will take these enhanced reality applications beyond a fun, short-term gimmick into being a viable and valuable service offering.

WEBSCALERS AND TELCOS EXPAND THEIR COLLABORATIONS TO IMPROVE OUR CLOUD EXPERIENCE

One of the biggest trends of 2020 has been the partnerships that have been forged between telecoms carriers and some of the the hyperscalers. There's no doubt this will continue and grow well beyond 2021, but as networks become increasingly more software centric there is an opportunity to improve the delivery of new services and applications to the users.

From the perspective of a WebScale operator, service provider networks often appear to be a patchwork quilt of various vendors and technologies. The suite of Internet protocols allows this complexity to be abstracted up to a set of globally uniform IP addresses and this has served us fantastically well. At the same time, service provider networks look largely opaque to the cloud and consequently it is hard to guarantee a user the cloud experience that is desired. To deliver next generation service more collaboration between cloud and network is required. Making the network adaptive through the use of intelligent software allow coordination between service provider networks and the cloud and will enable a generation of AR and VR-based immersive services and applications.

Steve Alexander is Ciena's Senior Vice President and Chief Technology Officer. He has held a number of positions since joining the Company in 1994, including General Manager of Ciena's Transport & Switching and Data Networking business units, Vice President of Transport Products and Director of Lightwave Systems.

SUBMARINE CABLES IN BRAZIL

Past, present and future

By **Rogério Mariano**, Director of Network Edge Strategy at **Azion Technologies**

Submarine cables in Brazil follow practically the same trajectory as submarine cables worldwide, both in the historical part where their structure was born from telegraph cables, and in the current development part.

When a submarine cable arrives in a country, many companies with multinational operations follow it, normally a country's GDP increases by 2% or 3% in the years following the arrival of the submarine cable being a subject that addresses: information science, optics not linear, electrical engineering, materials science, engineering practices, project management, maritime expertise, high standards of reliability and hard business.

Brazil currently has more than fifteen submarine cable systems and four landing points, in addition to a new and promising river cable project in the Amazon basin (perhaps the largest in the world in this genre) and also new cable projects connecting oil platforms.

The purpose of this article is to show a current and future overview of Brazilian systems.

THE HISTORY OF BRAZILIAN SUBMARINE CABLES

In Brazil, the first submarine cable was part of the first Brazilian telegraph line. It was opened in 1857 and connected Saude Beach in Rio de Janeiro with the city of Petrópolis. The line had a total length of 50km, being 15km of submarine cable. The first international cable connection was made in the same year, with Portugal, having been concluded by means of a contract with the British Eastern Telegraph Company. The connection with Europe was the result



Brazil Telegraphs Cables 1863 – Source: Arquivo Nacional do Brasil

of the entrepreneurial spirit of Irineu Evangelista de Souza, Baron of Mauá, who participated in the organization and financing of the installation of the submarine cable. In 1893 the English company South American Cables Ltd installed an underwater cable in Fernando de Noronha. Subsequently, in 1914, the concession of this cable was transferred to France. A second submarine cable in Fernando de Noronha was launched by Italcable Italians in 1925. After that Brazil definitely entered the modern telecommunications era until today.

THE CURRENT SCENARIO IN BRAZIL

Brazil has consolidated itself as a large and important international hub, ten new systems worth a cumulative amount of US \$ 1.5 billion were implemented between 2014 and 2021 in Brazil. A notable feature of the recent growth in cable construction is the breadth and depth of its geographic

scope and has added an average of 34 % of annual capacity on the main submarine cable routes in Brazil.

Telecommunications companies are no longer the main interest in building submarine cables – now, they are hyper-scale cloud companies and large content providers. This drastic change did not occur over decades, but only in the last few years and this has also influenced the Brazilian market, especially in terms of wholesale. In addition, the improved cable technology reduced project costs, increasing efficiency and capacity as SDM (Spatial Division Multiplexing). An emerging model allows cable operators to land cables directly inside neutral data centers, where their customers have private connections close to the various ecosystems. The interconnection power that this allows is beginning to be exploited in Brazil effectively.

The current Brazilian interconnection ecosystem consists of four Landing Points (Fortaleza, Santos, Salvador and Rio de Janeiro), five incumbent operators (Claro, Oi, Telefonica, TIM and Algar), five submarine cable operators (Telxius, Globenet, Sparkle, Angola Cables and Seaborn), thirty-three Internet Exchange Points (IX.br), more than seven thousand ISPs and a dozen Neutral Datacenters, in addition to the Brazilian users (~134 million users). Specifically, in the cable market, today the sale occurs through Indefeasible Right of Use (IRU), sale capacity, Spectrum Sharing, O&M. Some submarine cable operators in Brazil also offer other services such as rent, wasted fiber, IP Transit, remote peering and colocation.

Adding all the "Potential Capacity" of the submarine cable systems in force in Brazil, today we have something close to ~610Tbps. This is a metric stipulated based on the premise if all owners of cable systems in force in Brazil installed all the equipment available at the ends of their respective cables. To give you an idea, the global bandwidth of the Internet has increased by 35% from March-2020 so far compared to 26% of the entire year 2019. This growth was driven in large part by the response to the COVID-19 pandemic. The global bandwidth is now at 618Tbps.

THE BRAZILIAN GOVERNMENT AND SUBMARINE CABLES

Today 134 million people in Brazil have Internet access. Although the number of users and online services used has increased, differences in income, gender, race and regions in Brazil still persist. The information comes from a survey carried out in 2019 by the Regional Center for the Development of Studies on the Information Society (Cetic.br), linked to the Internet Steering Committee in Brazil. According to the study, 74% of Brazilians accessed the internet at least once in the last three months. Another 26% remain disconnected. Submarine cables played a fundamental role in this growth, but still show challenges to the inclusion of more Brazilians, especially those of low income.

Directing towards the submarine cable market, the relationship today is intrinsically linked to the governmental regulatory process, for licensing and permissions in three spheres: Brazilian Navy, IBAMA, which is the Brazilian environmental regulatory body, and ANATEL, which is the national telecommunications regulatory agency.

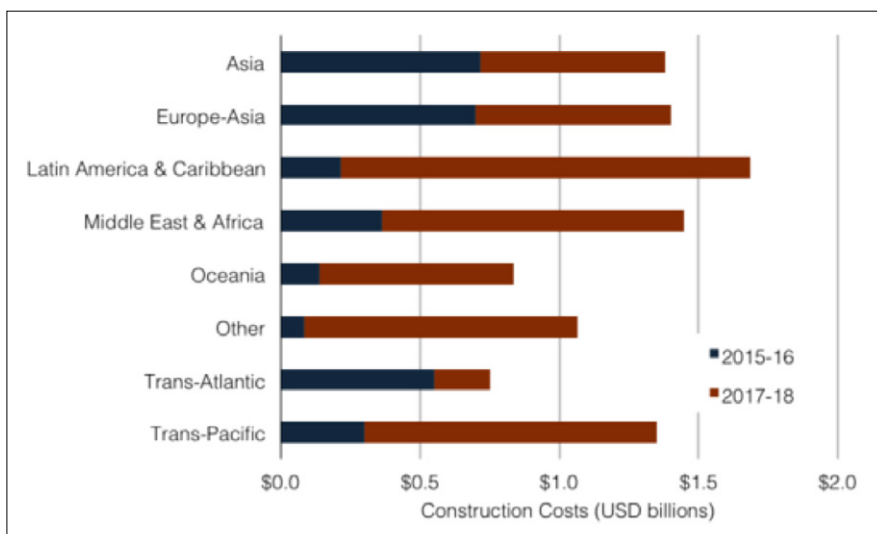
The most recent involvement of the Brazilian government with the submarine cable market was in 2014 by entering the EllaLink project's

Joint-Venture. In 2018 the participation was exchanged for an Indefeasible Right of Use (IRU) that today is undefined. Furthermore, the Brazilian government is involved in the project of a submarine fluvial system in the Amazon region that is in progress.

But today, for example, there is no public policy in Brazil that favours the increase of interconnection, such as the creation of special zones for landing points, datacentres, inputs for optical fibres or that generates authorizations faster, less costly, or incentive for remove almost completely tax on equipment, create special banking rules to finance investments in Telecom and subsea systems, make CAPEX go down with equipment, make OPEX go down (labour costs) and mainly generate greater legal security.

An interesting point is that the Indefeasible Right of Use (IRU) does not clearly exist in Brazilian legal legislation, lawyers are constantly consulted to create legal structures that provide greater security to those who cannot lose access and use of cables. In short, the government of Brazil could really pave the way and be a true supporter of the submarine cable market that certainly the private sector would foster more interconnection and make Brazil a hub as attractive as Marseille in France, Egypt, Mumbai, Hong Kong, Singapore, Japan and the Iberian Peninsula.

On the other hand, there is a perception that there is a low probability of new systems being launched in Brazil without the participation of over-the-top companies (OTTs). Also, the "flow" of Internet traffic via submarine cables arriving in Brazil in the last few years will depend mainly on the construction of backbone and backhaul in cities not yet covered in the interior and the emergence of new regional routes that meet a more nationalized traffic profile.



Source: TeleGeography

CURRENT SYSTEMS IN BRAZIL

Today, Brazil has sixteen submarine cable systems in force, six of these systems are at the end of their useful life until the year 2026, the country maintained an average annual lit-capacity capacity of sixteen percent, slightly below the global trend.

Over-the-top companies (OTTs) are interested in the Brazil-USA route, added several high-capacity systems so far in 2021 that have increased total capacity along this route. Typically, OTT providers partner with traditional telecom operators that add this capability to the general market. However, now OTTs are beginning to build cables entirely for their own use like Google's JUNIOR cable between Rio de Janeiro and São Paulo. It is not clear whether Google will one day monetize these cables for exclusive use in the Brazilian market. Although no



Source: TeleGeography

system is planned for 2022, it is worth remembering that cables such as SAEx (SAEx International Ltd) and ARBR (Seaborn and Telecom Argentina) have

not left the paper, but there is still time for some to be announced, as submarine cable systems normally have a two-to-three-year development period.

Cable	Brazil Landing Station	RFS	EOS	Length (Km)	Owner	Design Capacity (Tbps)	Fiber Pairs	Wavelength Per Fiber Pair	Capacity Per Wavelength (Gbps)
BRASIL FESTOON	14 cities from Northeast to Southeast in Brazil	1996	2021	2.543	Claro	-	-	-	-
ATLANTIS-II	Fortaleza and Rio de Janeiro	1999	2024	13.100	Consortium (including Claro Brazil)	0.16	2	8	40
AMERICAS-II	Fortaleza	2000	2025	8.373	Consortium (including Claro Brazil and Sparkle)	10	12	-	40
SAM-1	Fortaleza, Salvador and Santos	2001	2026	24.140	Telxius	19.2	4	48	100
GLOBENET	Fortaleza and Rio de Janeiro	2001	2026	22.690	Globenet	9.2	4	-	200
SAC	Fortaleza, Rio de Janeiro and Santos	2001	2026	15.983	Lumen and Telecom Italia Sparkle	4.84	4	30	40
AMX-1	Fortaleza, Rio de Janeiro and Salvador	2014	2039	17.800	Claro	50	-	100	100
MONET	Fortaleza and Santos	2017	2041	10.556	Consortium (Antel, Google, Algar e Angola Cables)	60	6	100	100
SEABRAS-1	Santos	2017	2042	10.750	Seaborn	72	6	120	100
TANNAT	Santos	2017	2042	2.000	Consortium (Antel, Google e Uruguayan Government)	90	6	-	-
JUNIOR	Rio de Janeiro and Santos	2017	2042	390	Google	-	8	-	-
BRUSA	Fortaleza and Rio de Janeiro	2018	2043	11.000	Telxius	160	8	135	100
SACS	Fortaleza	2018	2043	6.209	Angola Cables	40	4	100	100
SAIL	Fortaleza	2018	2043	6.000	CamTel and China Unicom	32	4	80	100
MALBEC	Rio de Janeiro and Santos	2020	2045	2.500	Globenet and Facebook	-	6	-	-
ELLALINK	Fortaleza and Santos	2021	2046	9.300	EllaLink	72	4	120	150

Brazil – List of current cables

DOMESTIC SYSTEMS PLANNED IN BRAZIL (2021-2024)

ATLANTIX LITORAL CABLE SYSTEM

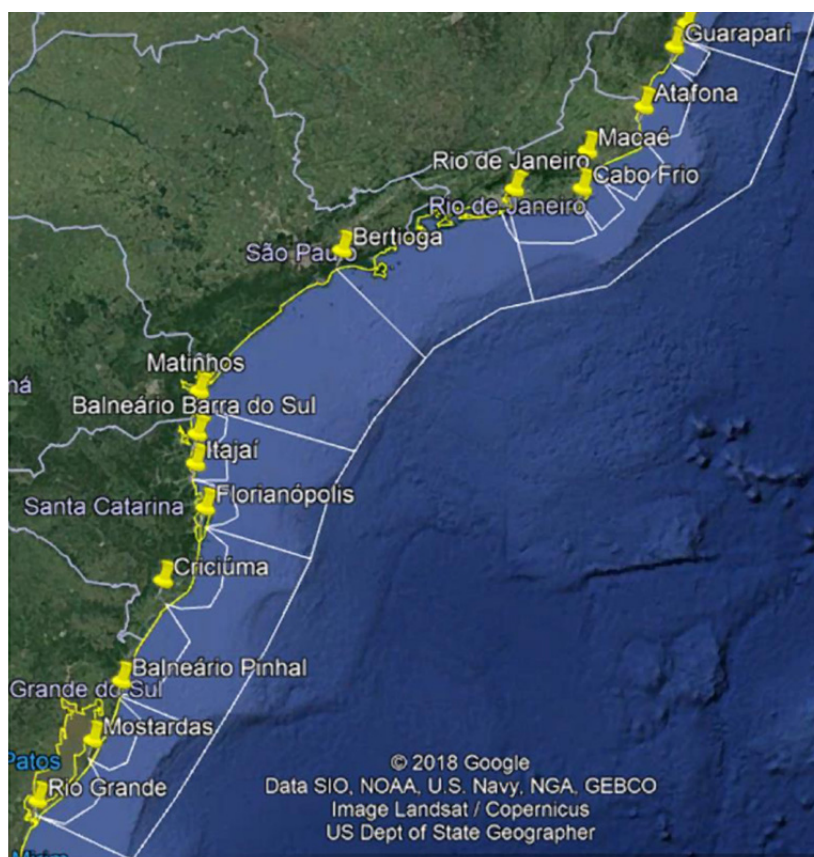
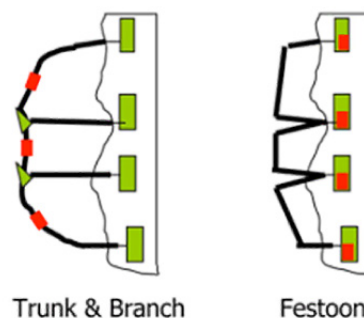
This submarine cable belongs to the Comexcomm Marine company, it is currently at the desk top study level and has the RFS planned for 2024. Basically, it is a cable of more than 7,000km using two combined technical modalities (Festoon + Trunk & Branch), covering thirty-two cities located on the Brazilian coast and a city in French Guiana (Cayenne). 6,280km offshore (Trunk), 2,733km via 14 branch units (Branch).

The system features are:

- 24 FPs in the Festoon system with 48 lambdas of 200G per FP with a capacity of 9.6Tbps per fibre pair
- 16 FPs in the Trunk & Branch system with 128 lambdas of 400G per FP with a capacity of 51.2Tbps per fibre pair
- The total capacity of the system is 819 Tbps and tends to fill the gap left by the current Brazilian Festoon system, which ends its useful life in 2021.



Atlantix Litoral Cable System





Source: RNP

INTEGRATED AND SUSTAINABLE AMAZON PROJECT - PAIS

The Integrated and Sustainable Amazon Program is a project maintained by several departments of the Brazilian government, with public resources for its execution. In addition to serving the entire North Region, there are ongoing understandings for connecting this PAIS network to the cables that connect to Peru, from Tabatinga (Amazon Basin); and French Guiana, from Macapá city. The project plans to build more than 6,000 km of fibre along the entire Amazon River, linking Tabatinga (on the border with Peru) to Macapá and Belém, with branches to Roraima, Rio Branco and Porto Velho.

The route would also be complemented by a connection to French Guiana and another to the

Peruvian Amazon, up to Iquitos, which would be developed in partnership with these countries.

This is a project that originated in 2014 and is now under survey, an optical fibre route made through cables in the Amazon river beds: Negro, Solimões, Madeira, Purus, Juruá and Rio Branco, adding a total of about 6,000 km, by directly connecting 80 municipalities and serving a population of approximately 9.2 million inhabitants.

This is an extremely complex environment to build submarine cables. For the route survey, for example, an interferometric system must be used to provide high-resolution bathymetry and riverbed imagery, 2-10kHz resonant sub-bottom profiler, overhauser magnetometer, sediment grabber and a multiparameter probe for physical and chemical water analysis (temperature, oxidation reduction potential, pH, dissolved

oxygen, electrical resistivity, total dissolved solids, salinity and velocity). The survey vessel must consist of a specific vessel and ample space to operate all the equipment, which apart from the towed magnetometer, used to pinpoint Petrobras pipelines and Eletrobras cables, all survey spread was mounted over the side. This is not a simple thing to build, it is actually a challenging one.

PETROBRAS BASIN PRE-SALT SUBMARINE CABLE

This is a project that was born in 2009 and after many political, technical, comings and goings has now finally been delivered to the market for execution (Turnkey). The project consists of the implementation of telecommunications infrastructure, capable of providing connectivity to the oil platforms, through the optical fibre interconnection between the Santos Basin Pre-salt platforms and the control centres in



Source: Petrobras

The industry's challenge today is the erosion of the prices and how to meet the new low-latency demand, especially for streaming services and games.

But there are many challenges in the submarine cable industry – Brazil has still a kind of hangover due to the sale of Padtec Submarine to IPG Photonics, where much of the national intellectual capital in submarine cable systems has been lost.

Submarine cable systems should continue to serve Brazilian society, where means can be generated so that Brazil's interconnection ecosystem can take better advantage of existing submarine cables in addition to wholesale and have a development in digital inclusion.

A scenario needs to be created in Brazil where Brazilian researchers are allowed to help lowering the costs of the terminals and find a way with the international submarine cable community to lower the costs of Wet Plant reducing the costs of the material, aiming at the reduction of the maritime costs since the high costs of the cables and the long duration of the project limit the ubiquitous connectivity.

the Petrobras buildings, which will still be defined in the municipalities of Praia Grande and Rio de Janeiro. The mesh will be composed of a network repeated by: a Trunk Optical cable in a ring connecting the Balneário do Maracanã Beach – Praia Grande Beach in Santos (São Paulo) to Praia da Macumba – Recreio Beach – Rio de Janeiro with 833km with two fibre pairs and two Beach Manholes and will interconnect 13 platforms of the Santos Basin pre-salt and forecast for 19 future platforms. In addition to the length of the trunk of the Optical Mesh, there will be a total of 208km of optical cables for the branches and 13 Optical Umbilicals, totalling approximately 58km, which connected the oil platforms to the mesh. There will be one branching unit per platform with OADM and white mate. The RFS for this project is estimated to be in 2024. Another interesting point in this Petrobras project is the possibility of renting the idle network through spectrum-sharing to further reduce costs. The winning consortium will be able to rent space on this fibre network to other companies that need connectivity, data, such as exploration probes, ships in general, etc. The contract will be for 20 years.

CONCLUSIONS

Today, Brazil's submarine cable systems have an overall capacity of more than + 600Tbps, when adding current international systems and planned domestic systems.

Rogério Mariano is Director of Network Edge Strategy at Azion Technologies, graduated in Mechatronic Engineering from UGF and founder of Brazil Peering Forum – BPF (<https://wiki.brasilpeeringforum.org>), he was Chairman of LACNOG (Latin America and the Caribbean Network Operators Group), at ICANN (Internet Corporation for Assigned Names and Numbers), he was a fellow of ICANN 54 in Ireland. He was a student at the Brazilian School of Internet Governance (EGI.br) and at the OAS SSIG – South School on Internet Governance (Washington, DC), graduated and Alumni at the Optical Society Submarine Cable School – Subsea OFC (Polvijärvi, Finland), he is currently a member of the GPF (Global Peering Forum) program committee and has an MBA in Mobile Communications. He has 20 years of experience in Network-Scale, CDN, Centralized Traffic Engineering and is specialized in Edge Strategy, Submarine Cables and Interconnections.



Interview

Charlotte Strang-Moran, ELECTRODE Project Lead at the Offshore Renewable Energy (ORE) Catapult

ORE CATAPULT RECENTLY ANNOUNCED THE ELECTRODE INITIATIVE, TO COLLECT DATA OF THE OFFSHORE WIND INDUSTRY WITH REGARDS TO SUBMARINE CABLE FAILURES. WHAT IS BEHIND THIS INITIATIVE AND WHY SHOULD IT BE IN THE INDUSTRY'S INTEREST TO SIGN UP FOR THIS?

For many years, ORE Catapult has been conducting research into cable failures as well as commercial testing and validation of cables at our UKAS-accredited facility in our National Renewable Energy centre in Blyth. ELECTRODE grew out of these projects and conversations with our industry partners, both at the operator and supply chain levels.

The common observation is that finding solutions to cable failures has been hampered by a lack of accurate, trended data on the causes and efficacy of maintenance and repair strategies across the wider industry. When failures occur, that knowledge stays within the individual company and is not collated into a regularly maintained central database as is seen in the oil and gas industry.

Cable failures represent a significant cost and downtime burden to our industry – a single failure is capable of causing millions in lost revenue. The urgency is only compounded when you consider that the cables network is on the brink of radical transformation in the coming years: as we move to floating wind platforms (dynamic cables), add high-voltage direct current (HVDC) cables to the mix, and potentially an introduction to new offshore grids connecting multiple systems.

We know we can innovate our way towards greater reliability, just as we have solved engineering challenge after challenge since offshore wind began. But without good data we are tilting at unknowns. ELECTRODE will address this by allowing the industry to share cable failure data across a variety of parameters in an anonymised and commercially comfortable way.

While the industry has been eager to see such a system set up, the biggest hurdle in submitting data has been concern about its high commercial sensitivity. The SPARTA portfolio, a similar system but looking collating offshore wind performance SCADA data, has already been managed by ORE Catapult for several years, becoming a trusted source for operators when formulating future strategy. Today, SPARTA's trend analysis covers 98% of the UK's installed offshore wind capacity, with overseas players poised to join the fold too.

We're confident that we will achieve a similar rate of sign-up for ELECTRODE: the initiative comes very much as the request of industry, particularly through our main funder the Offshore Wind Innovation Hub (OWIH). Over the past months, we have consulted widely with stakeholders in shaping the platform to their needs.

Once we are ready to launch this coming spring, we expect that the trended data will become a goldmine for UK researchers and businesses in the race to develop the solutions and technologies of

the future, as well as providing vital evidence that asset operators can use to refine their own procedures and inform their strategies.



CATAPULT
Offshore Renewable Energy**HOW WILL THE DATA BE COLLECTED, ANALYSED, AND SHARED? WHAT MAIN PARAMETERS MUST BE PROVIDED TO MAKE THIS DATA COLLECTION WORTHWHILE?**

There will be two tiers of membership of the ELECTRODE programme. In Tier 1, owner/operators will contribute data (which is automatically anonymised at the point of input) and have access to data provided by other unidentified

owner-operators. The supply chain, installation, insurance industry and academics will be in Tier Two and will be able to access trended analysis for their own market and underwriting insights.

Trend analysis will also be shared in a regularly published review in a similar format to our SPARTA portfolio reviews which are released annually.





Through our consultations with industry, we have pinpointed the data that we will need to track in order to provide a comprehensive picture on failures and address their areas of most urgent concern. The topics of most interest will include the annual failure rate per kilometre of cable and per component; mean time between failures; effectiveness of monitoring and repair approaches and the use of new technologies in addressing failures.

The crucial point is that we will capture faults across the whole cable system, including the terminations and joints and classifying the data as granularly as possible to cable type. The granularity of the data will be depicted by the size of the data set and the capability to do so anonymously. A wider industry insight into fault location will provide useful and important data for mapping and hotspot determination that could support condition monitoring tools and aid O&M decision making on what monitoring equipment is best suited.

As with our SPARTA platform, we will need to cover a minimum percentage of the UK (and overseas) installed offshore wind capacity for the data to be meaningful and to ensure anonymity of the sites and organisations participating. Likewise, we will ask that each operator that signs up agrees to submit data for a minimum of five years in order to ensure the consistency of data collection.

WILL SO-CALLED “LESSONS LEARNT” ALSO BE COLLECTED? TOGETHER WITH THEIR MITIGATION MEASURES?

Through our portfolio reviews, we will present expert analysis of the trended results, a kind of regular compilation of ‘lessons learnt’ if you will.

Industry insight from collated details such as repair procedures, or monitoring systems will be provided to the industry in the form of ‘most commonly used’ technology or procedure. This will not single out any site or company but will describe for example, ‘the most commonly used condition monitoring technology’.

ORE Catapult is stating that the data will provide a more accurate trend analysis and the effectiveness of the methods used to monitor, detect, and respond to cable failures. Can you further elaborate on these results and why these will assist to reduce the current failure rates?

Reducing failure rates is one goal of this data-sharing exercise. We believe that by plugging the gaps in knowledge ELECTRODE will also help operators and developers reduce the cost of failures when they do occur and find more cost-effective, faster methods for restoring a cable to operational capacity. With this, we can anticipate reductions in insurance claims, and our database will provide the vital evidence needed to drive those reductions too. I also see this data driving improvements of standards and procedures for the different stages of a cable’s lifespan such as installation and repair.

Ultimately, disseminating the lessons learned across the life cycle of an asset will lead to innovative solutions. Industry-wide collaboration and the sharing of data can provide operators with the knowledge they

need to set ambitious innovation pathways and technology developers will have the basis to innovate solutions for early detection and preventative maintenance.

SUBMARINE CABLE FAILURES COULD BE CAUSED BY THE INSTALLATION CONTRACTOR, ANOTHER THIRD PARTY, OR IT COULD BE A MANUFACTURING DEFECT. WILL THIS DIFFERENTIATION ALSO BE ANALYSED IN THE ELECTRODE INITIATIVE?

Root causes such as installation errors, third party damages, or defects from manufacturing can be used to trend cable failures and can provide the industry with better insight into where investment or innovation is required to improve subsea cable performance.

Although it is hugely beneficial to collect root causes, there is uncertainty around the accuracy of reported root causes. Underlying factors may not necessarily be understood or shared and thus the root cause collected has potential to be inaccurate.

As the root causes will be collected direct from owners it is advantageous to record if they are assumptions or result from root cause analysis. We will be collecting root causes where possible, and as we do, we will take the described considerations into account.

WILL THE COSTINGS OF CABLE FAILURES BE ANALYSED AS WELL?

We hope to consider the following cost related metrics, but of course it is all reliant on how much information owners will be able to provide us:

- Lost Production across different cable related incidents
- Downtime due to various cable related incidents
- OPEX Cost of Repair and Replacement

ELECTRODE

Transforming subsea cable failure rates in the offshore wind industry

WHAT KIND OF INNOVATIONS CAN THE INDUSTRY EXPECT AS A RESULT OF THIS INITIATIVE?

A company that we often quote when talking about potential innovations is an SME we have worked with for many years, Synaptec. By accessing our industry knowledge and networks under the Innovate UK-funded REACTION project, they were able to develop Refase, a light-speed cable fault detection system which reduces the risk of cable damage through accurate and detailed modelling.

Having the world's first and most comprehensive intelligence on the market will give UK companies like this one a crucial first-mover advantage for future products and services.

We can also expect to see a greater motivation for innovators from outside of our sector to turn their attention to cable failure too. With accurate data on the issues that face the network, they will have greater confidence that their investment in developing technologies will really meet market needs.

I have in mind developers of condition monitoring systems, artificial intelligence (AI) and machine learning (ML) innovators and the application of technologies from other sectors for predictive maintenance for cables. Installation techniques are another area ripe for refinement and innovative thinking.

At a time when we have unprecedented backing for green economic development and a pressing need for economic recovery too, the opportunity to join the offshore wind cables supply chain is a compelling one. With good data, this subsea world is the oyster for UK SMEs!

Charlotte Strang-Moran, ELECTRODE Project Lead at the Offshore Renewable Energy (ORE) Catapult

Charlotte joined ORE Catapult in January 2018 as a Graduate Electrical Engineer after completing her BEng Hons in Electronic and Electrical Engineering at the University of Strathclyde, Glasgow. In her current role as Electrical Engineer, Charlotte is actively involved in the delivery of a number of projects in different disciplines within the electrical infrastructure team, specialising in subsea cable failure and improving technology reliability.

Since joining ORE Catapult, Charlotte has assumed the role of primary lead on the development of the cable management tool as part of the O&M Centre of Excellence programme and now is the primary lead on the ELECTRODE project.

Subsea cables are a big deal for the UK

£65 billion per year –

the estimated economic value of UK subsea cables for energy and telecommunications.

6,000 km of subsea cables

connect our offshore wind turbines to the grid. Laid end-to-end that would stretch from London to central Siberia.

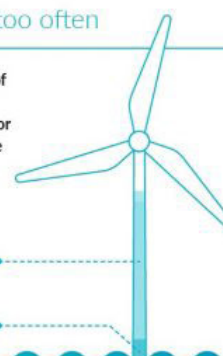


But things go wrong too often

Subsea cables make up just 10% of the initial cost of building an offshore wind farm, but account for 75-80% of insurance claims by the offshore wind industry.

75-80% of insurance claims

10% of initial cost



The cost ratio between on and offshore cables claims can reach 1:10 due to offshore logistics and weather conditions*



*According to Allianz (February 2020)

And they're very expensive to fix

Repairing a single failed export cable can cost as much as

£12.5 million

The average downtime is 38 days (inter-array cables) and 62 days (export cables) from the recorded failures that we hold – that's millions of £s in lost revenue

38

62

x £M lost



46% installation



15% faults in cable design



8% external damage



31% manufacturing



*Data taken from the operational phases of offshore wind farms

Better knowledge and prediction will ensure faults are not left to become failures BUT the cable supply chain needs more evidence on cable failures.



All players – designers, manufacturers, installers, technology developers, asset managers, operators and insurers – are crying out for this vital trended data.



ORE Catapult's ELECTRODE is a proactive approach to pioneer industry-wide anonymised sharing of cable failure data.





Technical pioneer for an offshore grid in the Baltic Sea
- the Combined Grid Solution CGS. Photo: Jan Pauls

50Hertz

TSOs agreed to strengthen cooperation for the future of offshore grid in the Baltic Sea

The TSOs of the Baltic Sea Region responsible for maintaining and developing the transmission systems agreed today to start the preparation work for the establishment of a cooperation for the Baltic Sea offshore grid.

The intended purpose of the cooperation titled "Baltic Offshore Grid Initiative" is to develop common planning principles for Baltic Sea offshore energy network, enable the consideration of the Baltic Sea offshore grid in the ENTSO-E Ten-Year Network Development Plan and perform studies that support the common vision for the offshore grid in the Baltic Sea region. The initiative should contribute to the CO₂ reduction and to the development of an environmentally friendly energy system for the future.

The EU Member States bordering the Baltic Sea signed the Baltic Sea Offshore Wind Joint Declaration of Intent On the 30th of September 2020. The cooperation started by the States envisions commonly planned wind production areas that would enable to

maximize the potential of wind as an energy source.

The signing TSOs have recognized that the Baltic Sea region has the potential to make a significant contribution towards green energy policy goals by means of offshore wind development and cross-border electricity transmission. An offshore grid will be part of the solution to harness the potential but lots of radial connections will also be needed.

Study on Baltic offshore wind energy cooperation under BEMIP has analysed the Baltic Sea potential that exceeds 90 GW. The total energy amount that could be produced is 325 TWh/year.

A carbon neutral society in the future can be enabled through closer cross-border cooperation, information exchange and further development of studies for a possible offshore network. Offshore investments are substantial, need comprehensive studies and common understanding and require political support from the European Commission and member state governments.

The TSO-s signing the Memorandum of Understanding (MoU) for the Baltic Offshore Grid Initiative are Fingrid from Finland, Svenska kraftnät from Sweden, Energinet from Denmark, 50Hertz from Germany, Elering from Estonia, AST from Latvia, Litgrid AB from Lithuania. Statnett from Norway will participate as an observing party.

50Hertz CEO Stefan Kapferer, who co-signed the MoU: "Offshore wind energy in the Baltic Sea is indispensable if Europe is to achieve its stricter climate target plans. We must therefore also exploit all existing potential off the German Baltic coast. The agreement between Germany and Denmark on closer cooperation on offshore grids is very welcome. It is now important to improve the legal and regulatory framework as quickly as possible so that the necessary infrastructure for the generation and transport of electricity can be built. In any case, the transmission system operators of the Baltic Sea countries intend to vigorously drive this development forward."

AFR-IX Telecom

Barcelona CLS finishes works at the beach

Barcelona Cable Landing Station, the future international station for submarine fiber-optic cables promoted by AFR-IX Telecom, has finished the works carried out on the Sant Adrià de Besòs Beach.

BARCELONA CLS FINISHES WORKS AT THE BEACH

These works that started in October, culminate the first preparatory phase to accommodate the submarine fiber-optic cables that will arrive during the first quarter of 2022. The cables will land in what will be an open digital neutral port that will strengthen the positioning of Barcelona as a technological hub in Southern Europe. In just three months, Barcelona CLS finishes works at the beach so the infrastructure has been installed. From this infrastructure submarine cables can emerge from the seabed and follow their course underground to be able to connect with the landing station building, located on the street Ramón Viñas. Once the works have been completed, the appearance of the

beach shows again its initial state without any alterations.

A DIGITAL NEUTRAL PORT THAT WILL CONNECT BARCELONA WITH THE WORLD

Barcelona Cable Landing Station is the first international landing station that is built in Catalan territory. The landing station will make Southern Europe the gateway and link of high-capacity fiber optic submarine cables from Asia, Africa and the Mediterranean that want to connect with the US by the fastest route.

This infrastructure aims to be the reference digital neutral port in the Mediterranean, allowing the arrival of cables without restrictions. In this way, a single landing station will be the point of arrival of multiple cables, optimizing resources and preventing the proliferation of buildings.

Currently, Marseille receives most of submarine fibre-optic cables of the Mediterranean, where there is a clear saturation. The need for other landing station such as Barcelona CLS is clear.

The location chosen is perfect for this project: it has excellent connections to all fiber-optic networks in the country, either road and railway connections, it doesn't have physical limitations for the entrance of the cables, which will be buried 2 meters deep in the coast, they will not emit any kind of radiation and Sant Adrià coast is less eroded than other areas of Barcelona.

ABOUT AFR-IX TELECOM

AFR-IX telecom is a telecommunications operator founded in 2013 based in Barcelona, which provides Internet and data services to companies and operators in Africa. Currently, in addition to the Barcelona office, AFR-IX telecom has 12 offices in Africa (Senegal, Niger, Nigeria, Sierra Leone, Ivory Coast, Ghana, South Africa, Cameroon, Burkina Faso, Equatorial Guinea, Republic Democratic Republic of the Congo and Mali), two in the United States (Delaware and California) and another in the United Kingdom. See location here.



Ashtead Technology

Ashtead bolsters management team

Subsea services firm Ashtead Technology has appointed a chief financial officer (CFO) and five managers for newly created roles across its international team.

Ashtead said the appointments underline the company's strategic growth plans to strengthen its position in the global offshore energy market and build on its recent success in new and emerging markets, including in offshore wind and decommissioning.

Ingrid Stewart assumed the new CFO position this week, bringing 23 years of corporate finance experience to the Aberdeenshire headquartered business which employs 170 people around the world.

Stewart spent eight years with EnerMech Group as corporate development director. Prior to this, she was a member of the senior UK management team at Simmons & Company International, becoming the investment bank's first ever female corporate finance director in 2009.

A specialist in subsea construction, IMR and decommissioning services, Ashtead Technology has acquired five businesses since 2017.

In her new role, Stewart will work with the senior team

to position the company for further growth and further leverage existing capability.

The new Aberdeenshire based managerial hires across Ashtead Technology include Lili Hughes, as group QHSE manager, Stephen Booth as decommissioning BD manager and asset integrity project manager Michael Gibson.

In addition, Mark Vela has joined as US operations manager in Houston, and Dan Davies has taken up his new role as NDT market manager within the company's inspection solutions team in Bedfordshire, England.

Ashtead Technology CEO, Allan Pirie, said:

"Ingrid's substantial corporate finance and energy industry experience will make a significant contribution to our growth ambition as we further integrate and invest in our global operations to support the increase in business in offshore wind, decommissioning, and oil and gas.

"Bolstering our management team in the UK and the US will ensure we are well equipped to support our clients as we navigate the current challenges and capitalise on the opportunities presented by the energy transition and the blue economy."

ATN International, Inc.

ATN International, Inc. announced agreement to acquire Alaska Communications

US telecoms group ATN International has beat private equity investors to buy Alaska Communications.

Massachusetts-based ATN put in an all-cash agreed bid of US\$332 million for the company, beating a previous offer from Macquarie Capital and GCM Grosvenor, worth just \$300 million.

ATN will acquire the Alaska company in association with its financial partner, Freedom 3 Capital, the company announced. ATN said it will operate and consolidate the new entity and Alaska Communications through its majority ownership stake.

Michael Prior, chairman and CEO of ATN, said: "This investment and merger allows us to enter a new market with many

similar characteristics to our existing operations in the US and elsewhere. Further, it aligns with our strategy to leverage the broad capabilities of our operating platform to enhance and augment leading providers of facilities-based communications services in distinctive markets."

In a conference call after the deal was announced, Prior said: "We are enthusiastic about the prospect of entering this new domestic market and working together with the Alaska Communications team to provide industry-leading products and services to customers. We view Alaska Communications, and the nature of this transaction, as an excellent strategic fit for ATN."

ATN's existing investments include rural US wireless company Commnet, business operator Choice Wireless and Choice Broadband, as well as in-building wireless company Geoverse. Its investments include Guyanese incumbent operator GT&T and Australian infrastructure company Stilmark.

Prior said: "ATN has a long history of enabling its subsidiaries to gain and maintain strong market positions by investing in high quality infrastructure, the latest technologies and creative solutions to give customers a superior experience."

In the conference call he said: "Alaska Communications employs approximately 600 people and operates over 157,000 miles of fibre network, has approximately





7,000 fibre to the home locations, and nearly 900 fibre-fed commercial and government buildings.”

Alaska Communications president and CEO Bill Bishop, who took over in 2019, welcomed the deal as “an exciting opportunity”. He said: “ATN has extensive telecommunications expertise, a strong track record of successfully investing in and operating capital-intensive businesses and has a strong financial position highlighted by its net cash position.”

In November Bishop had welcomed the proposed Macquarie/GCM deal with similar enthusiasm. It represented “an exciting opportunity to enhance our financial position and expand our resources to better serve our customers”, he said then.

Macquarie and GCM would have taken Alaska Communications private. ATN is Nasdaq-listed, but Alaska Communications would be a private company after the deal closes, expected in the second half of the year.

ATN’s market cap is \$708 million, implying the Alaska deal will represent a significant increase in its valuation.

ATN said the transaction has fully committed debt and equity financing

and is not subject to any condition with regard to financing. It is, of course, subject to the approval of Alaska Communications’ stockholders, regulatory approvals and other customary closing conditions.

ABOUT ATN

ATN International, Inc. (Nasdaq: ATNI), headquartered in Beverly, Massachusetts, invests in and operates communications, energy and technology businesses in the United States and internationally, including the Caribbean region, with a particular focus on markets with a need for significant infrastructure investments and improvements. Our operating subsidiaries today primarily provide: (i) advanced wireless and wireline connectivity to residential and business customers, including a range of high speed internet services, mobile wireless solutions, video services and local exchange services, and (ii) wholesale communications infrastructure services such as terrestrial and submarine fiber optic transport, communications tower facilities, managed mobile networks, and in-building wireless systems. For more information, please visit www.atni.com.

ABOUT FREEDOM 3 CAPITAL

Freedom 3 Capital invests in companies at inflection points. We help middle-market companies address strategic growth opportunities by delivering unique capital solutions. Our investment process provides F3C the flexibility to tailor investment structures to the industry dynamics, the company’s specific requirements and the management team and owners’ long-term business objectives. Beyond the value of our capital, we believe our private equity approach to credit investing creates valuable, lasting partnerships with stakeholders and management teams. F3C is currently investing out of Fund 4 with offices in New York and Kansas City.

ABOUT ALASKA COMMUNICATIONS

Alaska Communications (NASDAQ: ALSK) is the leading provider of advanced broadband and managed IT services for businesses and consumers in Alaska. Alaska Communications operates a highly reliable, advanced statewide data network with the latest technology and the most diverse undersea fiber optic system connecting Alaska to the contiguous U.S. For more information, visit www.alaskacommunications.com or www.alsk.com.

Baker Hughes

Baker Hughes launches engageSubsea for remote inspections

Baker Hughes has launched engageSubsea remote – an extension of the engageSubsea platform for remote inspections, and offshore operational and technical support.

engageSubsea remote serves as an equipment inspection tool, technical support and operational management platform, and is designed to drive operational excellence and increase capital productivity for offshore oil and gas operators, according to Baker Hughes.

Providing access to real-time information on equipment status and location enables users to manage equipment portfolio more effectively and efficiently by increasing safety and reducing time and cost

engageSubsea remote has already been proven in live deployments, including customer sites in the Norwegian Continental Shelf (NCS), offshore operations and Baker Hughes services facilities around the globe.

These deployments saw time to first-time fix improve by 80%, while

resolution time improved by 69%, with an average cost savings of 50%. As a result of reduced travel and site visits, carbon emissions were also reduced by 22%, according to Baker Hughes.

ENGAGESUBSEA REMOTE JOINS THE SUBSEA CONNECT SUITE OF TECHNOLOGIES.

The platform can be used in any location, both onshore and offshore, even with a low bandwidth connection.

From the live status of offshore activity planning, to remote management of asset maintenance and sustainability management, engageSubsea remote has been designed to improve all aspects of an operator's inspection process. It is further used to support offshore operations and allows remote support and technical support when required.

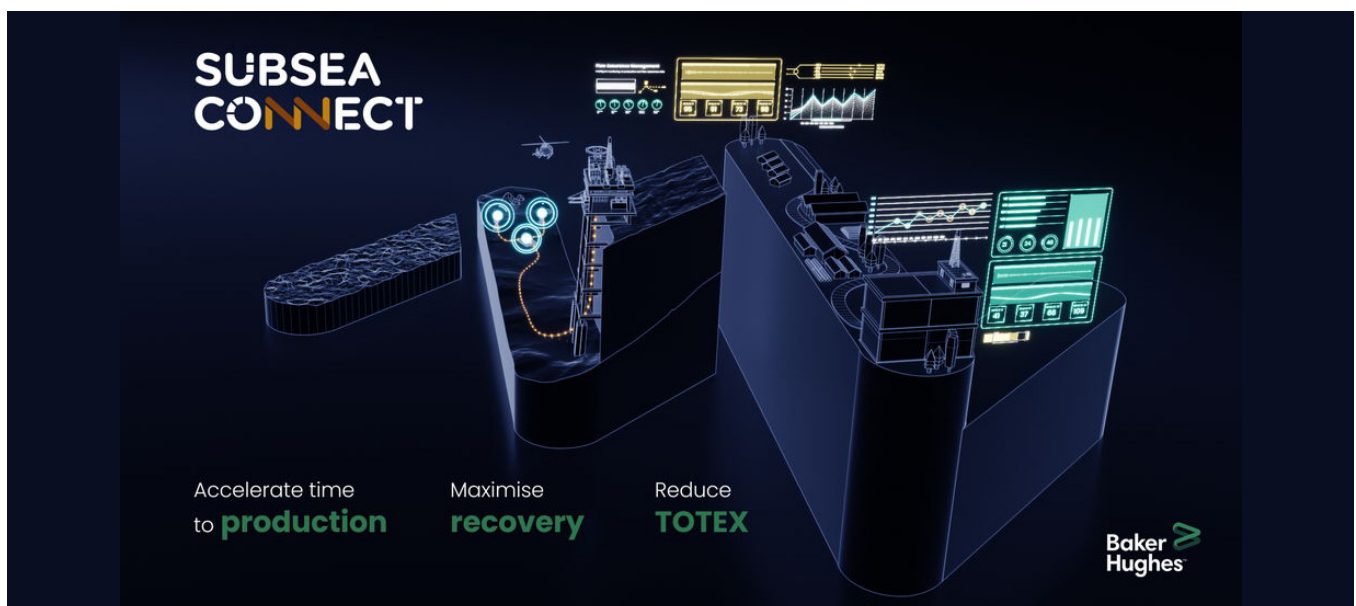
Ben Linke, Vice President of Services and Offshore, Oilfield Equipment at Baker Hughes, said: "We understand our customers' challenges. This sector is under constant pressure to improve performance and reduce costs, but of

course safety must always remain the top priority.

"That's why we developed engageSubsea remote, which is especially valuable in the current environment where travel and site visits are restricted, but inspection work remains critical, engageSubsea can help to bridge that gap while also improving operator efficiency and lowering their carbon footprint.

"Ultimately, this solution is about optimizing offshore operations and reducing unnecessary exposure to risk – whether the pre-existing hazards of offshore work or the current pandemic".

Operators are under increasing pressure to cut costs, reduce rig time and downtime, while improving efficiency and ensuring the continued safety of their operations. COVID-19 has significantly magnified this pressure by tightening budgets further, while limiting travel and site visits during lockdown. Baker Hughes recognizes these challenges and has developed engageSubsea remote in response.



(Courtesy of Baker Hughes)

Bombora Wave Power

Bombora partners up with MOL to explore marine energy options in Japan

Bombora Wave Power has entered into agreement with Mitsui O.S.K. Lines (MOL) to identify marine energy project opportunities in Japan and the neighbouring regions.

Following the completion of a detailed internal technology review of Bombora's mWave wave energy converter by the global marine transport group, MOL and Bombora are now progressing to the second phase of their collaboration.

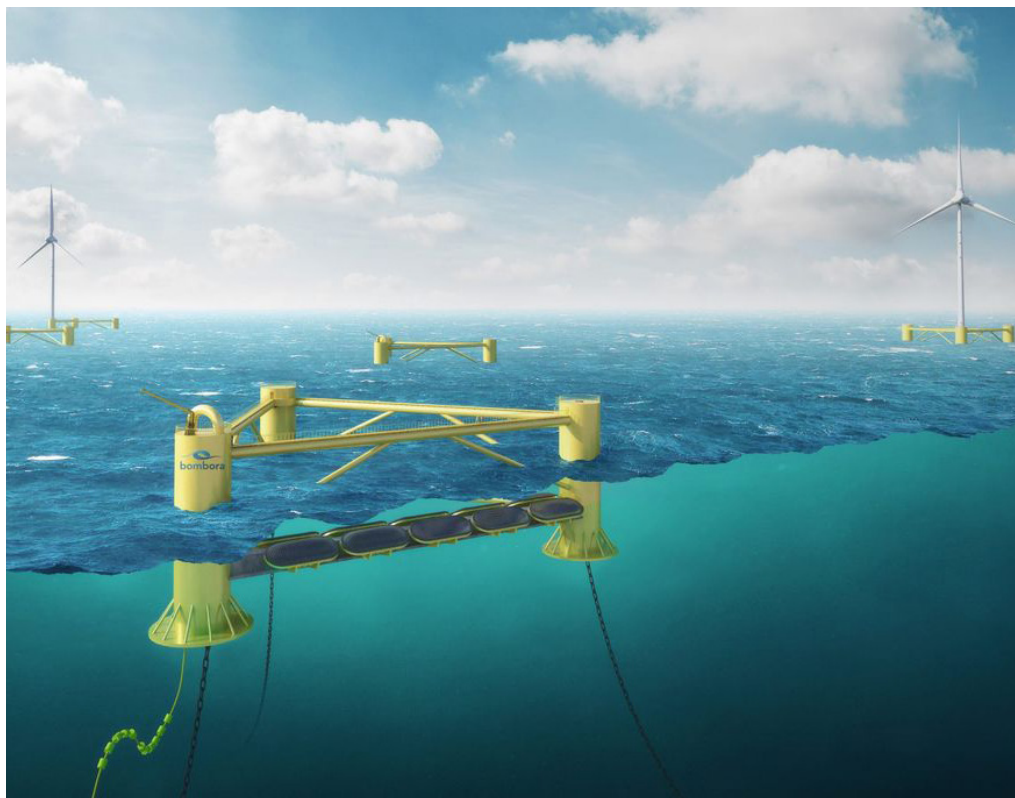
The partnership will identify potential sites for both mWave energy projects and combined wind and mWave energy projects in and around Japan, according to Bombora.

MOL will bring its expertise in maritime consultation, offshore marine operations, and regional industry supply chain knowledge to the joint study. This will match Bombora's mWave technology and project development experience to form a strong working partnership.

Ryota Yamada, Bombora's Development Manager for the Asia Pacific region, said: "We are very pleased to be conducting this strategic site identification project with MOL. The study will seek out opportunities suitable for wave, as well as hybrid wave and wind projects.

"MOL has a clear ambition to expand its sustainable marine operations into the energy sector and are a significant collaboration partner for Bombora on this pathfinder wave energy initiative in Japan. We know that there is excellent wave resource to be found around this coastline. Having a partner with the expertise of MOL alongside us will help progress projects in this region".

MOL operates one of the world's largest merchant fleets and is dedicated to



Bombora's Floating mWave can be co-located or integrated with floating wind turbines (Courtesy of Bombora Wave Power)

minimising the environmental impact of its business activities and reducing its carbon footprint.

The rapidly growing marine renewable energy sector represents a new opportunity for MOL, and it is anticipating significant demand for vessels involved in the construction and ongoing operations across the marine energy sector, the company said.

"With a focus on carbon emission reduction we will work together to find potential development sites for Bombora's mWave to reduce reliance on diesel fuel for island communities. The project will also investigate the broader utility power potential off Japan's Pacific coastline", Yamada added.

Japan aims to install between 30GW and 45GW of offshore wind by

2040 as part of the country's aims to reach carbon neutrality by 2050. The ministry of economy, trade and industry (Meti) also set an interim target of 10GW by 2030.

The Japanese Wind Power Association claims a potential of more than 500GW of floating offshore wind capacity in Japan alone, positioning it as one of the world's most promising and dynamic new offshore energy markets.

The partnership between MOL and Bombora will analyse the opportunity to capitalise on this growth potential by adding wave energy into offshore wind farms to increase energy production.

To remind, Bombora is currently in the final assembly phase of its 1.5MW mWave Pembrokeshire Demonstration Project in Wales with installation scheduled for mid-2021.



Left to right: Rikke Vestergaard, Susanne Nordenbaek, Rune Bråten and Esbjerg Mayor Jesper Rasmussen.

Bulk Data Centers

Bulk marks new connections, facilities in Denmark

In early December, Bulk Data Centers had the pleasure of welcoming the Mayor of Esbjerg, Jesper Frost Rasmussen (V) to Bulk's Denmark Data Center Campus, DK01. The timing of the visit helped to commemorate the connection of the Havfrue subsea fiber cable to one of Denmark's most scalable, flexible and energy efficient data center campuses.

Havfrue is the first subsea cable system in 20 years connecting Denmark with North America. This new fiber route adds diversity to a global network facing increasing congestion and challenges due to aging systems. It is an important part of Bulk's growing fiber network connecting the Nordics with the world's major markets via low-latency and high-capacity fiber. In addition to Bulk Data Centers, the company builds and operates international and intra-Nordic fiber infrastructure that is designed to meet the large-scale data transport needs of the future.

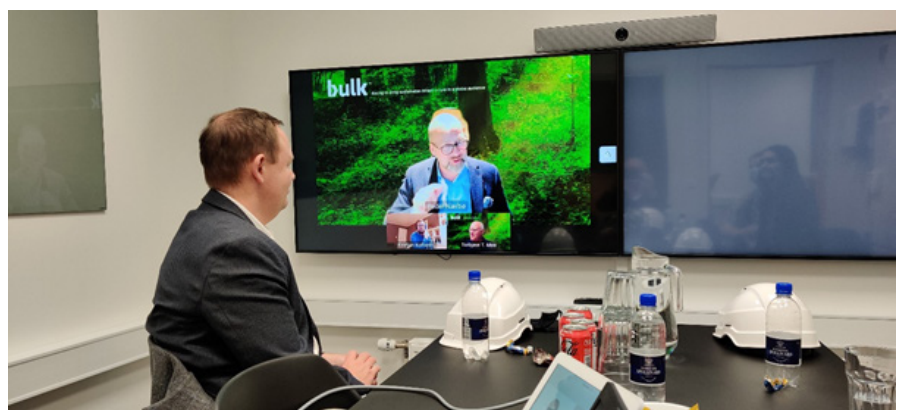
We are pleased with Bulk's successful expansion into Esbjerg and see this opportunity as only the beginning, said Mayor Rasmussen. - We look forward

to developing the relationship even further and together creating even greater awareness around our unique geographical location and hopefully be able to attract more investments from this vibrant economic sector.

Accompanying the Mayor was Esbjerg Municipality Director Rikke Vestergaard, Business Esbjerg CEO, Susanne Nordenbaek and Head of Business, Karsten Rieder. Also joining was CBRE Critical Facilities Manager, Rune Bråten. This was the first time that the

team met with Bulk since 2018, when the company first broke ground at the 50,000 square meter site.

Due to travel restrictions and appropriate caution, the meeting was coordinated remotely with Mayor Rasmussen's team sitting at DK01 and the Bulk leadership dialing in from Oslo, including Bulk founder and owner Peder Nærbø. To help facilitate the meeting, Bulk DK01 staff were pleased and proud to display the company's data center and its capabilities.



Mayor Rasmussen and Bulk's Chairman and Owner, Peder Nærbø, held virtual discussions of their shared passions for sustainable infrastructure and global connectivity. The visit also coincides with the one-year mark celebrating Bulk's highly renewable and sustainable DK01 campus. DK01 leverages nearby wind power to boost data center sustainability.

Topics of discussion included Bulk's vision for the region and shared goals around sustainability and connectivity. Both arenas are mutual passions with each party's aspirations perfectly aligned.

"Our presence in Esbjerg with DK01, now connected with Havfrue, is so important to winning our race to bring sustainable infrastructure to a global audience," said Nærbø. "Mayor Rasmussen and enterprises in Esbjerg and around the world recognize the need to reduce carbon emissions and are seeing this can be done cost effectively at the same time."

Esbjerg is an energy metropole with a vast surplus of renewable wind energy from offshore wind farms along the coast of Esbjerg. These abundant renewable supplies support Bulk's vision to deliver sustainable infrastructure to a global audience. Plans and discussions aimed at reducing the CO2 footprint even further include measures like reusing the heat from the data center to support Esbjerg's district heating system, something that will be a possibility in the near future.



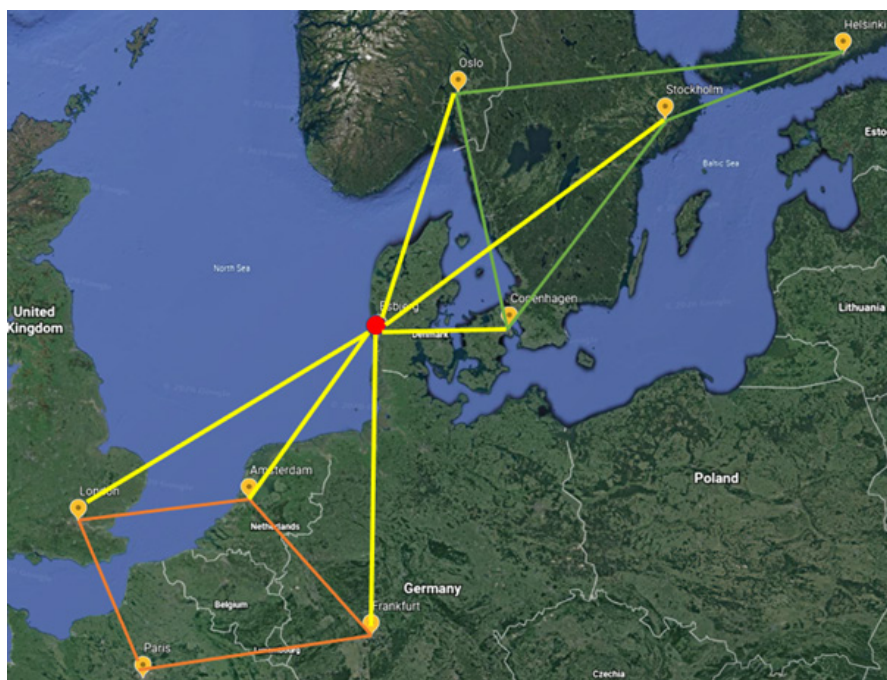
From left: Head of Business, Karsten Rieder, Mayor Rasmussen, Susanne Nordenbaek and Rikke Vestergaard help mark DK01's First Anniversary with a site tour and discussions about a bright future.

DK01 sits just 5,9 ms from Amsterdam, at the landing point for multiple subsea fiber routes, both new and legacy. It is centrally located between the FLAP markets (Frankfurt, London, Amsterdam and Paris) and the COSH markets (Copenhagen-Oslo-Stockholm-Helsinki). It is an ideal location for both an internet exchange and a fiber exchange to handle

traffic among these markets while avoiding bottlenecks in Hamburg and Copenhagen. These advantages are a big part of what is attracting DK01's current and future tenants.

Ensuring the advantages of DK01 benefit local as well as global enterprises is important to the region. To that end, Bulk has signed both Danish and international clients as tenants. It is important for the region that Bulk's presence supports local enterprises seeking state of the art data center capabilities and connectivity to major markets. These are tremendous opportunities to avoid crowded routes that traditionally backhaul through Copenhagen en route to London or Amsterdam, for example.

Despite the unique challenges felt around the world in 2020, this past year has been one of tremendous accomplishments for the Bulk team, for their customers and partners. Powered by the abundance of clean energy resources in the Nordics, Bulk enables and supports some of the world's most important advances in high performance computing, modelling and simulation, research and financial services through modern data centers and world class fiber optic subsea and terrestrial connectivity.



Bulk's Denmark Data Center Campus, DK01 is centrally located in Esbjerg to serve the FLAP and COSH markets, a mere 5,9 ms from Amsterdam.

Bulk Infrastructure Holding AS

Bulk Infrastructure announces strategic partnership with BentallGreenOak

Bulk Infrastructure Holding AS, a Nordic data center, fiber network developer and operator, and logistics real estate developer, announced a new partnership with BentallGreenOak (BGO), a global real estate investment manager, as a strategic partner and investor. BentallGreenOak has committed NOK 1.5 billion (approximately €140 million) to support the future growth of Bulk Infrastructure's core lines of business.

BentallGreenOak joins main shareholders, Bulk Industrier and Geveran, in securing capital for the company's future growth, with a series of capital injections from BGO and existing shareholders that will take place from January, 2021. John Carrafiell, Senior Managing Partner and Co-founder of BentallGreenOak, will join Bulk Infrastructure's Board of Directors, and founder, Peder Nærbø, and his company Bulk Industrier, will continue to work actively within the company and remain the lead investor and Chairman of the Board. Bulk Infrastructure's capital-intensive investments are advancing scalable, sustainable solutions in infrastructure and real estate that are poised to make long-lasting, positive impacts to the environment.

Bulk Infrastructure, in partnership with BentallGreenOak, expects to invest in the continuing development of its N01 Data Center Campus in south Norway. At 3 million sqm (740 acres) and up to 1 GigaWatt of IT power, N01 Campus has the ambition to become the world's largest data center campus powered by 100% renewable energy. This data center campus provides integral access to Bulk Infrastructure's recently completed Havfrue fiber cable, the first trans-Atlantic subsea cable system into the Nordics in almost two decades, providing unparalleled connectivity between Northern Europe and the U.S. Bulk Infrastructure's planned new cable project, called Leif Erikson, between Norway and Atlantic Canada will further improve connectivity, and build on BGO's strong position and history in the Canadian market.

"We want to unlock the potential the Nordics and renewable energy has to offer in sustainable digital infrastructure" says Peder Nærbø, founder of Bulk Infrastructure. "With a top tier international investor like BentallGreenOak in our company, we will enable faster growth and better scale for our opportunities", the founder continues. "This provides us with a great platform for reaching our vision of bringing sustainable infrastructure to a global audience, and to serve the biggest and most demanding customers out there", says Nærbø.

"This partnership with Bulk Infrastructure is a perfect match for BGO", says Senior Managing Partner and Co-founder of BentallGreenOak, John Carrafiell.

"BGO has been focused on the European logistics market since 2013, and, similar to Bulk's own evolution, considers data centers to be a natural extension of the firm's real estate investment strategy. Bulk Infrastructure's commitment to building on the Nordic region's natural advantages to deliver strong economic and environmental performance in real estate and infrastructure is well-aligned with BGO's own investment priorities. We are pleased to be developing exciting new pathways, on behalf of our investors, that deliver performance-driven investment opportunities that also benefit the local economy and maintain a focus on environmental sustainability."

"This partnership provides us with a solid financial platform as Bulk Infrastructure is opportunity rich in all three business areas. As an example, we see opportunities for major capacity add in our three existing Data Center campuses as well as in other Nordic destinations.

Bulk Infrastructure's combination of reliable and cost-effective access to 100% green power from renewable sources, cold climate, stable business environment, and well-positioned fiber optic network, is uniquely situated to attract a significant share of the rapidly growing European and global data center market", says Bulk Infrastructure CEO, Jon Gravråk.

Arctic Securities, Pareto Securities, PwC and Schjødt served as advisors to Bulk Infrastructure on the partnership and BentallGreenOak were advised by Wiersholm and EY.

ABOUT BULK INFRASTRUCTURE

Bulk Infrastructure is a leading provider of sustainable digital infrastructure in the Nordics. We are an industrial investor, developer and operator of industrial real estate, data centers and dark fiber networks. We believe in the value creation opportunity of enabling our digital society to be fully sustainable. Our ambition is to be the go-to player for anyone that wants to leverage the Nordics for data processing requirements of the future. We have a track record of delivering high quality and cost-effective customer solutions with short time to market. Hence our vision: Racing to bring sustainable infrastructure to a global audience.

Bulk Industrial Real Estate maintains a landbank of strategic locations for industrial real estate projects in Norway, Sweden and Denmark. Based on standard designs, we develop, build and operate warehouse buildings, cross dock terminals and other industrial facilities.

Bulk Data Centers delivers strategically located Nordic data centers and a dedication to service excellence that enable customers to reduce costs and environmental impact with ultra-flexible, highly connected and scalable solutions.

Bulk Fiber Networks connects the Nordics with the world's major markets via low-latency and high-capacity fiber networks. We build and operate international and intra-Nordic fiber infrastructure that is designed to meet the large-scale data transport needs of the future.

ABOUT BENTALLGREENOAK

BentallGreenOak is a leading, global real estate investment management advisor and a globally recognized provider of real estate services. BentallGreenOak serves the interests of more than 750 institutional clients with approximately \$50 billion USD of assets under management (as of September 30, 2020) and expertise in the asset management of office, logistics, multi-residential and retail property across the globe. BentallGreenOak has offices in 24 cities across twelve countries with deep, local knowledge, experience, and extensive networks in the regions where we invest and manage real estate assets on behalf of our clients.

In Europe, BentallGreenOak is a leading investment manager with over 50 professionals and \$5.2 billion USD in AUM across debt and equity, with strategies spanning from Core to Value-Add and Development, with its own internalised operating capability. The firm has acquired or developed over 133 logistics assets comprising 4.8 million square meters (52 million square feet) since 2015. BentallGreenOak's investment vehicles have assembled a large and diversified land bank across Europe, currently

owning or controlling 4.4 million square meters of land (capable of building 2.2 million square meters of space) zoned for Logistics, Data Centers and Cold Storage.

BentallGreenOak is a part of SLC Management, which is the institutional alternatives and traditional asset management business of Sun Life.

The assets under management shown above include real estate equity and mortgage investments managed by the BentallGreenOak group of companies and their affiliates.

For more information, please visit www.bentallgreenoak.com

ABOUT GEVERAN

Geveran Trading Co. Limited ("Geveran"), a company indirectly controlled by trusts established by Mr John Fredriksen for the benefit of his immediate family, invested in Bulk Infrastructure in 2018 and currently has an ownership stake of approximately 14%

ABOUT BULK INDUSTRIER

Bulk Industrier AS is an industrial investment company of Norwegian entrepreneur Peder Nærbø (Naerboe). The company focus on investments that create sustainable solutions with scalable impact. Bulk Industrier is the controlling shareholder to Bulk Infrastructure AS where Mr Naerboe conducts his active leadership as a business and industry developer.

N01 Data Center Campus in south Norway. A 3 million sqm (740 acres) and up to 1 GigaWatt of IT power, N01 Campus has the ambition to become the world's largest data center campus powered by 100% renewable energy. On the left, Kristiansand Substation.

Damen Shiprepair & Conversion

Cable Lay Vessel converted

The cable lay vessel "Ile d'Aix" owned by Alcatel Submarine Networks and managed by Louis Dreyfus Armateurs came to the Damen Shiprepair & Conversion yard in Dunkerque for a technical stop of 19 days.

During her stay at the Quay of Panama, the main scope consisted in the demobilization of the freshwater tank to restore the full cable tanks loading capability. To do so, 65 T of scrap steel has been cut-off, extracted and evacuated from the tank. The job has been completed by a deep smoothing and grinding operation, and finally paint applied for a suitable corrosion prevention.

In addition, during her stay, other jobs have been performed like the installation of a new cargo crane, including hydraulic pipping and crane assembly.



DE-CIX

DE-CIX Deploys at Iron Mountain's New Jersey Data Center, Increasing Interconnection Options

Iron Mountain Incorporated, the storage and information management services company, announced that DE-CIX, a world-leading internet exchange (IX) operator, deployed a new switch at its NJE-1 data center in Edison, NJ, expanding their network ecosystems and geographical reach in the New York metropolitan region.

Iron Mountain's NJE-1 customers will now have direct access to DE-CIX's IX platform, enabling connectivity to local peering and cloud services in metropolitan markets like New York, Dallas and Chicago. In addition to local reach, customers will also be able to connect to any of DE-CIX's global IX locations through its GlobePEER remote service. Enterprise, content and financial sector customers will further benefit from having low-latency and low-cost Layer 2 network connectivity options to reach numerous content, cloud and internet service providers.

"We are pleased to welcome DE-CIX to our NJE-1 data center. DE-CIX's physical node further enhances our robust ecosystem, enabling our customers even more opportunities to reach the greatest number of networks available through a single cross connect," said Frank Scalzo, General Manager, Network Strategy and Services for Iron Mountain Data Centers.

"Our new switch at Iron Mountain's NJE-1 data center geographically expands our reach further into central New Jersey, demonstrating the continuation of our commitment to serve the entire New York and

New Jersey metro region," adds Ed d'Agostino, General Manager of DE-CIX North America. "Together we can now provide seamless Layer 2 access to thousands of global networks through a single cross connect, giving customers the ability to manage, scale and expand their network reach more cost-effectively through our platform."

Iron Mountain's NJE-1 is a 26 MW purpose-built data center with a range of services and Uptime Tier III-certified design for documented reliability. With over 18,000 solar modules on its rooftop, NJE-1 has the largest rooftop solar installation of any data center in North America, generating 7.2MW of renewable power. Part of a 40-acre campus, NJE-1 is located 30 miles southwest of New York City and minutes from regional network hubs. This carrier and cloud-neutral data center offers access to 20 network service providers, with industry-leading compliance.

Iron Mountain's data center platform is powered by 100% renewable energy and can support more than 375 megawatts of IT capacity at full build-out. It includes 15 operational data centers across 13 markets and three continents.

ABOUT IRON MOUNTAIN

Iron Mountain Incorporated (NYSE: IRM), founded in 1951, is the global leader for storage and information management services. Trusted by more than 225,000 organizations around the world, and with a

real estate network of more than 90 million square feet across approximately 1,450 facilities in approximately 50 countries, Iron Mountain stores and protects billions of valued assets, including critical business information, highly sensitive data, and cultural and historical artifacts. Providing solutions that include secure records storage, information management, digital transformation, secure destruction, as well as data centers, cloud services and art storage and logistics, Iron Mountain helps customers lower cost and risk, comply with regulations, recover from disaster, and enable a more digital way of working. Visit www.ironmountain.com for more information.

ABOUT DE-CIX

DE-CIX (German Commercial Internet Exchange) is one of the world's leading operators of Internet Exchanges. In total, in its 27 locations in Europe, the Middle East, Asia and North America, DE-CIX provides over 2100 network operators, Internet service providers (ISPs) and content providers from more than 100 countries with peering and interconnection services. The connected customer capacity of all DE-CIX locations worldwide exceeds 70 Terabits. Taken into operation in 1995, DE-CIX in Frankfurt, Germany, with a data throughput of more than 10 Terabits per second (Tbps) and over 1000 connected networks, is one of the largest Internet Exchanges in the world. Further information at www.de-cix.net.



Dynamic Load Monitoring



DLM Monitoring, Logging System for Windfarm Array Cables

Dynamic Load Monitoring (DLM), of Southampton, UK, has manufactured two bespoke monitoring systems that have been installed by dive teams on subsea bend stiffeners at an offshore wind farm. The equipment has been commissioned, with the first round of data due to be collected in March 2021.

The bespoke products were delivered to Darlington, UK-based Subsea Innovation, a manufacturer of subsea equipment, which was challenged by the end user to provide a system to prevent array cables—they connect the site's turbines together—from breaking. Subsea Innovation's Dynamic Bend Stiffener (DBS) is a retrofit assembly that is installed onto turbine cables of an offshore wind farm, which are subject to tidal loads that have been causing the power cables to prematurely fail or reduce in efficiency.

Subsea asked DLM to devise a method to monitor forces on the cables and the movement they experience over time; log the data over the course of a year; and make it periodically accessible. The system comprises three dual axis shear pin load cells, two accelerometers, and a programmable logic controller (PLC). The shear pin load cells are dual axis shear pins that measure forces across two planes in the positive and negative directions. The working load limit (WLL) of each plane is 50kN, in both the positive and negative direction.

Mike Brend, project manager at Subsea Innovation, said: "The DBSs connect directly to the turbine bell mouth and encapsulate the cable at the J-Tube exit, and restrain the cable at the point of failure. The cables are exposed to undesirable bending without a DBS and beyond the expected MBR [minimum bending radius], hence the solution is required to combat such occurrences."

BESPOKE SUBSEA ENCLOSURES

Martin Halford, managing director at DLM, said: "We do regularly put systems together like this for projects, incorporating load cells with other instrumentation and sensors; we probably do two or three projects a year of this kind, but the functionality and use is always different. In this case, we reviewed what off-the-shelf instrumentation and sensors were available, but in the end opted for our recently designed DL-3.0 data-logger, and integrated it into bespoke subsea enclosures."

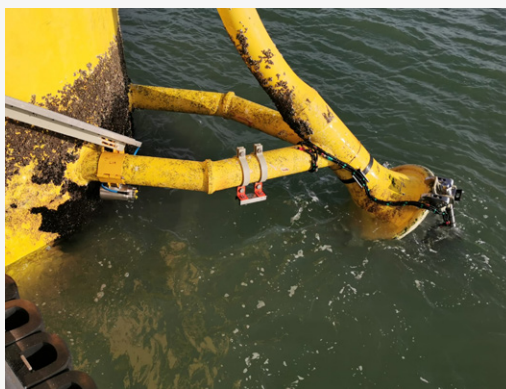
There are eight DL-3.0 data loggers per system (two for each load pin and two for the accelerometers). The logged data is collated and logged again as a package in a PLC enclosure mounted further up on the turbine platform. From this enclosure, there is an ethernet port on the side that enables a user to plug in a PC to download the data periodically when the platform is accessed. Each system also includes a stainless steel subsea junction box.

Halford said: "The development of the new data logger came at the right time as it just so happened that it met both the angular measurement requirements of the system, but also logged this data along with load data. To collate all the information and make it accessible, we decided to use a Siemens [ET200SP] PLC as we have extensive experience using controllers with other offshore projects, noting their reliability and robustness."

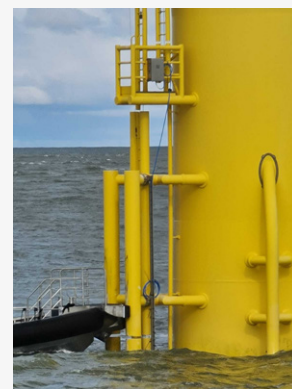
He added: "I love these kind of projects—and our engineers do too. It is really what we are geared up to do as a company and it differentiates us from some of our competitors."



The system comprises three dual axis shear pin load cells, two accelerometers, and a programmable logic controller (PLC).



Subsea Innovation's Dynamic Bend Stiffener (DBS) is a retrofit assembly that is installed onto turbine cables of an offshore wind farm.



The first round of data is due to be collected in March 2021.

DNV GL

DNV GL removes GL from its name as it braces for change

Norway-based classification society DNV GL has unveiled a decision to change its name to DNV, starting from 1 March 2021.

As explained, the move comes after “a comprehensive review of the company’s strategy as it positions itself for a world in which many of DNV’s markets are undergoing fundamental change”.

The present name has been in place since the 2013 merger between Det Norske Veritas (DNV) and Germanischer Lloyd (GL). Following the merger, the company has operated as a fully integrated company for several years now.

“We merged two ... companies with complementary strengths and market positions, and combining the two names was the right solution in 2013. However, it was not a name that rolled off the tongue, and many customers already refer to the company as DNV,” Remi Eriksen, Group President and CEO, said.

GEARING UP FOR ‘A DECADE OF TRANSFORMATION’

The 2020s has been called the decade of transformation or the “exponential decade”, where the pace of the energy transition will be set and where food, health and transport systems will change immensely and digital technologies underpinning industry 4.0 will mature from experimentation into large-scale application.

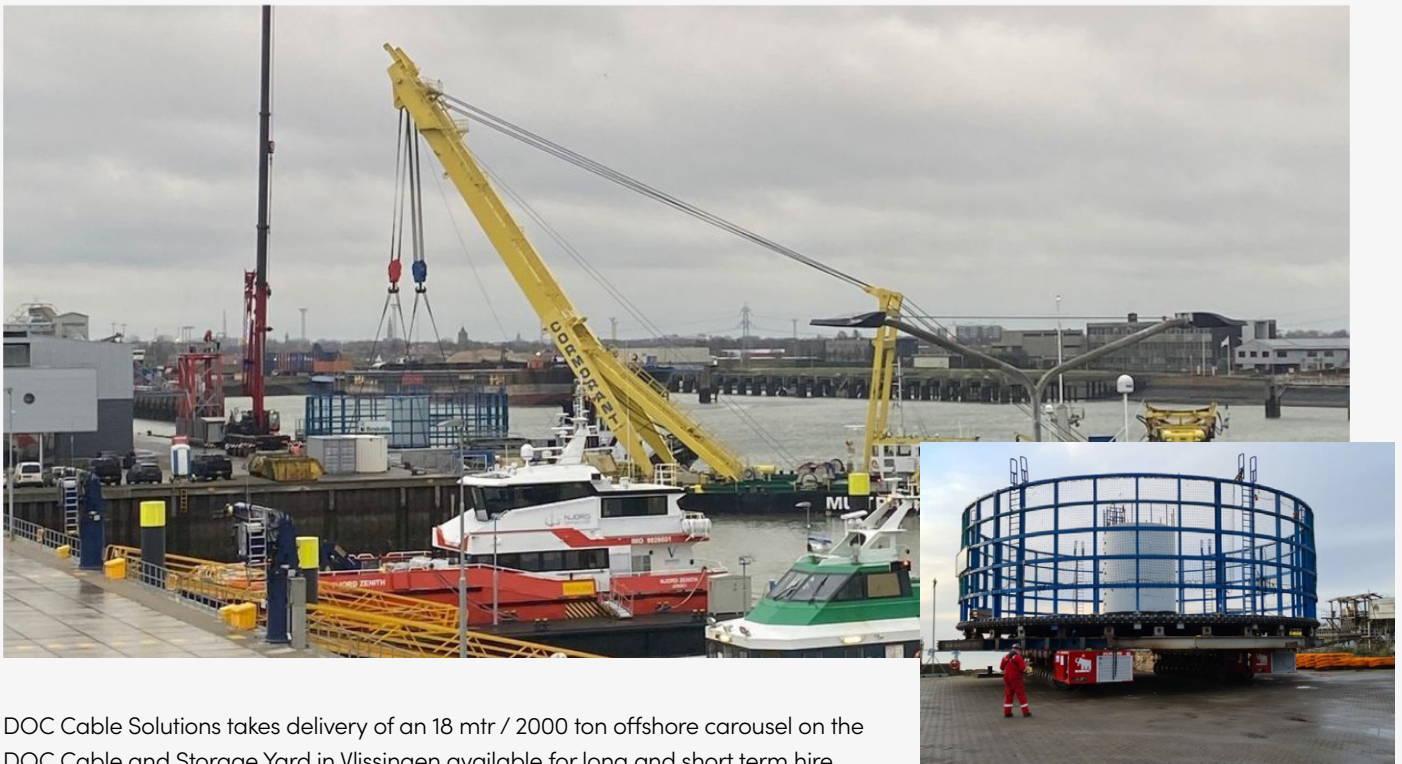
Most importantly, this is the decade where humanity will succeed or fail to deliver on the Sustainable Development Goals (SDGs), according to DNV GL.

As companies take on the complexities of digitalization and decarbonization, they need trust and assurance, the classification society stressed. DNV’s ambition is to shape the future of assurance with more digitalized services and by leading the assurance of digitalization in the form of assuring data, digital twins and digitized processes.

“Our strategy not only positions us for significant growth in a world increasingly in need of a trusted voice, but also positions us to shape the future of assurance,” Eriksen added.

DOC Cable Solutions

2000-ton carousel delivered



DOC Cable Solutions takes delivery of an 18 mtr / 2000 ton offshore carousel on the DOC Cable and Storage Yard in Vlissingen available for long and short term hire.

Econet Global

Econet begins construction of \$100m data centre in Lagos

The Founder, Econet Global and owner of Liquid Telecom, Strive Masiyiwa, says work has commenced on a new data centre facility in Lagos valued at \$100m.

Masiyiwa said the data centre, which would be the largest facility outside South Africa, had been named Africa Data Centre, Atlantic and would be built on five acres of land.

While displaying the architectural design of the data centre made by Trevor Juul in a Facebook post, he said the facility would be powered by solar energy and natural gas.

As part of the investment in Nigeria, he said Liquid's Undersea cables company would land a new high capacity cable into Nigeria next year in partnership with Google.

This, according to him, will make data costs much cheaper and faster.

He said, "This week marked the start of the construction of our first major data centre facility in Lagos, Nigeria. Named the ADC Atlantic, this is a US\$100m investment in the Nigerian economy. In the Data Centre world, this will be the largest facility outside South Africa.

"This cable which is in partnership with Google will also extend all the way to Cape Town, South Africa. We are also going to start laying new fibres in major cities from next year," he said.

He added, "This is our largest investment in Nigeria since the mobile industry started.

Once again, I am kicking off a new revolution in the next phase of technology. What is important is not the data centre but the technologies that will be unleashed in Nigeria because of this infrastructure. That's the big deal here!"

Liquid Telecom had raised \$307m through a rights issue to fund a rapid expansion of its data centre business across Africa.

The rights issue included an additional \$40m from UK development finance institution, CDC Group Plc.

Masiyiwa first invested in Nigerian mobile telecom industry in 2001, after MTN, before selling its shares to Celtel and then Bharti Airtel.

Eelume

Innovation Norway Supports Eelume

Eelume has secured NOK 3 million from Innovation Norway to develop untethered operation for its resident robot Eely500.

GCE Ocean Technology supported the feasibility study in 2020.

Untethered operations is a prerequisite to enable Eelume's subsea robot to carry out the missions and collect the data.

The development goal is to reduce the use of surface vessels needed to carry out inspection and intervention subsea.

Another factor is that a resident underwater drone is available 24/7 and can start a mission immediately regardless of a surface ship and weather and wind conditions.

PRE-PROJECT SUPPORT FROM GCE OCEAN TECHNOLOGY

Last year, Eelume received pre-project funding from GCE Ocean Technology to explore different platforms and solutions for developing and implementing autonomy.

The study took place with Skarv Technologies in Trondheim. The feasibility study has now resulted in a main innovation project with a total budget of close to NOK 12 million.

The next deadline for applying for GCE Ocean Technology pre-project funding is 22 January 2021.



THE GOAL IS AUTONOMOUS RESIDENT UNDERWATER DRONES

When put into operations, the drone must be able to dock, charge and "live" on the seabed for months and perform various types of inspection and intervention missions.

An autonomous subsea resident robot like Eelume's is the industry's first. Having typically 8 thrusters and 1 or 2 joints, the

Eely500 has unique manoeuvring and access capabilities. In addition, this gives the drone redundancy which allows it to operate even if faults occur on one or two thrusters.

The drone has built-in redundancy in the navigation and positioning system in the way that it can navigate based on a combination of inertial navigation, acoustic communication and optical navigation. This requires real-time processing of sensor data, advanced situation understanding and new methods for autonomous control.

It is for the development of system architecture with associated methods and algorithms for this autonomy, that Eelume has been awarded funding from Innovation Norway.

The aim is to take intelligent decisions depending on situations and revise the plan for the mission in real time without human intervention. This is far more demanding and places greater demands on the autonomy of the drone than what applies to today's AUVs.

O&G AND OFFSHORE WIND APPLICATIONS

Advanced, robust autonomy will open up new applications for subsea robots.

While Eelume's robot, and other subsea resident robots, are being piloted and tested within oil & gas, the use of autonomous robots is highly relevant within other sectors such as offshore wind.

In particular for floating offshore wind farms far away from the coast, autonomous subsea robots are of relevance. The needs and usage are about the same within wind as within oil and gas; inspection of cables and pipelines, moorings and also underwater structures.

Finally, the Eelume robot is planned to be piloted and tested in the Trondheim fjord and at the Åsgard field executing pipeline inspection and valve operations.

Etisalat

Etisalat confirms new Group CEO

The new appointment will be responsible for overseeing Etisalat Group's strategic vision for 2021 and beyond

UAE based telecoms giant, Etisalat has announced that Hatem Dowidar has been appointed as the Group's Chief Executive Officer, with effect from the 16th December 2020.

According to an official bourse filing, Dowidar has been confirmed as the permanent Group Chief Executive Officer, having served in an interim capacity since 20th May 2020.

Dowidar replaced former Group CEO Saleh Al Abdooli, who resigned his position earlier this year.

Dowidar first joined Etisalat Group in September 2015 as the company's Group Chief Operating Officer before being promoted to the position of Chief Executive Officer International in 2016.

Dowidar brings a wealth of experience to the role and has accrued three

decades of experience in senior leadership roles – 24 years of which were spent in the telecoms sector.

He brings a vast array of regional experience to the role and already sits on the boards of Etisalat's subsidiaries in Morocco, Egypt and Pakistan.

During his tenure as Acting Group CEO, Etisalat was named as the world's fastest mobile network operator, in an independent study from Ookla.

Ookla recognised Etisalat for being the fastest mobile network operator in the world in 2020 providing its subscribers in the UAE with the fastest mobile speeds anywhere in the world.

Etisalat achieved average download speeds of 115.89 mbps and an overall ranking in Ookla's 'Speed Score' category of 98.78. Etisalat was the only operator to achieve a score higher than 90 as per Ookla Speedtest data.



"This is a milestone achievement and a testament to our relentless efforts towards our strategy and vision to 'Drive the digital future to empower societies,'" Dowidar said at the time.

In addition to his wealth of industry experience, Dowidar also holds a Bachelor's Degree in Communications and Electronics Engineering from Cairo University and an MBA from the American University in Cairo.

ETNO

EU telcos: international connectivity can be a booster for Europe's digital leadership

ETNO, the Association representing Europe's leading telecom operators, welcomes the renewed focus on international connectivity, as per today's announcement by Minister Pedro Nuno Santos at the Telecommunications Council, in the context of the upcoming Portuguese Presidency of the EU.

At a time in which more and more human activities are empowered by connectivity and digitalisation, laying new submarine cables becomes a concrete way to empower businesses and citizens across countries. In addition, it carries positive geopolitical

and industrial significance. More in specific, we believe it will be an essential component of Europe's digital leadership strategy, along with the ongoing work on 5G, cloud, AI and the data economy.

The work to strengthen international connectivity through the development of new cables and the maintenance of the current ones is an incredibly investment-intensive one. In addition, the governance around deployment and operations is complex.

For this reason, we welcome the renewed focus of the Portuguese

Presidency of the EU on the subject and we call for involving European market players and stakeholders in the debate as from its very early stages.

As many big tech companies work on similar projects, a close dialogue between the EU industry and the European institutions can be a tool to identify any specific needs of private-public cooperation on this issue. This will be of help in further coordinating and strengthening the European activities in the field of submarine cables, including making their roll-out smoother and the operations easier.

euNetworks

New full-fibre network to link Cambridge research institutions and enterprises to key sites in the UK, across Europe, and globally

A new way for Cambridge businesses and research institutions to connect to key sites and communities across Europe is now available thanks to Light Blue Fibre, bandwidth infrastructure provider euNetworks, and the UK Innovation Corridor's most advanced data centre, Kao Data.

Light Blue Fibre, which was launched as a joint venture by University of Cambridge and Cambridgeshire County Council in 2019 is now being enabled by euNetworks, which specialises in data-centre-to-data-centre connectivity across the UK and Europe.

Light Blue Fibre delivers over 100km of ducting and wholesale dark fibre in the Cambridge metropolitan area. This network is in place to facilitate high performance computing (HPC) within the education, research, and life sciences communities.

euNetworks will be responsible for delivering the operational and maintenance support necessary to provide both dark fibre and multi-Terabit high speed managed optical services across the Light Blue Fibre asset. These services will be available to all Light Blue Fibre – connected Cambridge campuses, organisations, wholesale internet service providers (ISPs) and partners from early 2021.

euNetworks additionally offers direct fibre connection to Kao Data's campus in Harlow and unique fibre-based routes onward to London, around the UK and across Europe.

These new services enable direct, fast and latest generation connectivity to Cambridge's science and research parks and pave the way for greater high performance computing (HPC) and artificial intelligence (AI) collaboration across Europe. The state-of-the-art Kao Data campus has been built specifically for compute-intensive HPC and AI collaboration.

Professor Ian Leslie, Chair of Light Blue Fibre, says: "This is a very exciting development. Light Blue Fibre is connected into many of the key campus locations in and around Cambridge, offering the ability for campus 5G with Edge computing to gain a new and diverse network for the city. Collaboration with euNetworks and Kao Data will further serve the local community of University sites and campus locations, providing even more opportunities for wider connectivity."

euNetworks' CEO Brady Rafuse, says: "Data centre connectivity is critically important to businesses today, and our network development and new fibre system delivers vital infrastructure to support the many businesses and communities in Cambridge whose connectivity and collaboration requirements continue to grow."

"Our pan-European network directly connects over 440 key data centres in our operating markets – that is, all the major data centres in Europe, as well as key research sites. Our diverse and unique network routes to these locations, together with the solutions offered by Light Blue Fibre and Kao Data, offer a compelling connectivity response for those in the Cambridge community undertaking mission-critical computing."

Kao Data's CEO, Lee Myall says: "Science and research, especially within the life science and bioinformatics sectors, requires localised HPC hardware, low latency and high bandwidths to work with and move enormous datasets and batch files. Having a specialist HPC and AI industrial scale data centre in close proximity to Cambridge, which is connected by Light Blue Fibre and dark fibre directly to their processing points and the wider research network, is a gamechanger."

ABOUT LIGHT BLUE FIBRE

Light Blue Fibre Ltd is a joint venture between the University of Cambridge and Cambridgeshire County Council, to make commercially available both

organisations' existing extensive duct and fibre networks. Offering access to over 100km of ducting and dark fibre on a wholesale basis, both the University of Cambridge and Cambridgeshire County Council have plans to further expand their duct and fibre assets. This private company, wholly owned but the University of Cambridge and Cambridgeshire County Council, is one of the first of its kind in the UK. www.lightbluefibre.co.uk

ABOUT KAO DATA

Founded in 2014, Kao Data develops and operates advanced data centres for high performance colocation. From our hyperscale inspired campus in the heart of the UK Innovation Corridor between London and Cambridge, we provide cloud, HPC, AI and enterprise customers with a world-class home for their compute.

Our Harlow campus – built on the site of Sir Charles Kao's pioneering discovery of fibre optic cable in 1966 – is a development of four state-of-the-art, OCP-Ready®, carrier neutral data centres. When fully completed the 15 acre, +£230m campus will support an ITE load of over 40MW, across 150,000sq ft of technical space – all powered by 100% renewable energy.

Backed by Legal & General Capital and Goldacre – Noé Group, Kao Data is one of the largest campus developments in the UK and represents the future in sustainable, efficient and scalable computing – providing an industry blueprint to develop further best-in-class data centres. www.kaodata.com

Federal Communications Commission

Several pro forma transfers approved

FCC has approved a number of pro forma transfers in control related to an internal restructuring of Verizon which occurred on 30 June 2020 and included the elimination of multiple companies in the Verizon ownership chain, as well as the conversion of certain companies from corporations to limited liability companies.

The FCC gave its nod to the pro forma transfer of MCI Communications Corporation's (MCI's) 13.43% interest in the Japan-U.S. Cable (JUS) system to Verizon Business.

Further, the FCC also approved MCI International Inc's (MCI's) pro forma transfer of its 12.81% interest in the Trans-Pacific Express (TPE) Cable

System to MCI International LLC; the pro forma assignment reflects the conversion of MCII from a corporation to a limited liability company.

Finally, the FCC granted its consent to the pro forma transfer of MFS Globenet's interests in the Challenger Bermuda-1 (CB-1), the Gemini Bermuda and the Southern Cross Cable Network (SCCN).

Federal Communications Commission

Proceedings launched – China Telecom (Americas) Corporation

Federal Communications Commission (FCC) has launched a proceeding to determine whether to end China Telecom (Americas) Corporation's authority to provide domestic interstate

and international telecoms services within the US under section 214 of the Communications Act. The watchdog notes: 'The protection of national security is an integral part of the

Commission's responsibility to advance the public interest, and today's action seeks to safeguard the nation's telecommunications infrastructure from potential security threats.'

Fugro

Verhagen stepping down as Fugro CFO

Netherlands-based Fugro has informed that its chief financial officer (CFO) Paul Verhagen has decided to leave the company.

Verhagen joined Fugro as CFO and also member of the board of management in 2014.

He will step down after the annual meeting of shareholders on 22 April 2021.

He is up for nomination to become CFO and member of the management board at ASM International NV.

"I have truly enjoyed my time at Fugro. Although market circumstances have been challenging during most of that period, we have been able to transform the company and I am proud to have been part of this journey. I have every confidence in the future success of Fugro, supporting the energy transition, climate change adaptation and sustainable infrastructure development," Verhagen said.

As a result, Fugro's supervisory board has initiated the process for the succession of Paul Verhagen.

Fugro

Fugro joins 4S project to improve satellite seafloor mapping

Fugro has joined an EU co-funded research and innovation project to develop a remote solution for global satellite derived seafloor mapping.

The 3-year project, named '4S' (Satellite Seafloor Survey Suite), will develop an online cloud-based solution that will use highly automated earth observation algorithms and workflows to remotely map and also monitor seafloor habitats, morphology and shallow water bathymetry.

Specifically, Fugro will lead the project's business and integration actions, and their hydrographers and Geo-data specialists will evaluate the solution via several use cases around the globe.

4S will leverage artificial intelligence, physics models, as well as satellite and airborne data to derisk marine

site characterisation activities in the shallow water zone by analysing seafloor properties using less personnel and equipment.

The 4S consortium includes experts from the fields of satellite data analytics, hydrography and biology, and is being led by EOMAP, experts in optical remote sensing of aquatic environments.

Other project partners include the Hellenic Centre for Marine Research, QPS, Länsstyrelsen Västerbotten, CNR ISMAR, the Hydrographic Institute and Smith Warner International.

Dr. Knut Hartmann, 4S project coordinator and COO of EOMAP, said: "The aim of 4S is to achieve a seamless integration of satellite-data analytics into marine and coastal workflows. We're combining recent



advances in satellite sensors, data analytics and cloud infrastructure to benefit marine reporting, monitoring and surveying methods."

Dhira Adhiwijna, Fugro's 4S project manager, noted that upon completion, the company will integrate the 4S into its hydrography offering and provide innovative solutions that will also derisk marine site characterisation activities.

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Global Cloud Xchange

GCX successfully completes financial restructuring following regulatory approvals

Global Cloud Xchange ("GCX" or the "Company") announced that effective 31 December 2020, the Company's remaining U.S. regulated businesses and non-U.S. entities have successfully emerged from the Chapter 11 bankruptcy process following receipt of regulatory approvals. This completes the financial restructuring process of all the Company's business entities and follows the prior announcement of emergence from bankruptcy of its non-regulated businesses, which represented a vast majority of the global network and operations, on 15 April 2020.

Through the Company's Plan of Reorganization, the Company reduced debt and gained a more robust capital structure with new financing and ownership to support long-term growth. This provides the Company with a platform to accelerate the introduction of new innovative connectivity solutions to its customers through automation and to drive the adoption of an end-to-end digital experience. In addition, the financial restructuring better positions GCX as a forward-driven enterprise with the ability to generate significant value for its shareholders.

"In completing the financial restructuring process, GCX reaches a significant milestone, emerging as an energized future-focused company offering new solutions for its customers," said Carl Grivner, CEO of GCX. "During the process, there has been no impact on the interactions between GCX and its customers nor any interruptions in the services the Company provides. In fact, we have successfully

added exciting new partnerships and customers throughout this process. As GCX leaps forward, unleashing its new strategy, we believe our significant investments in technology and talent will drive our company into an exciting new era of growth while providing our customers with simplicity, speed, and security. It's an exciting time to be a GCX customer."

Jim Ousley, Chairman of Global Cloud Xchange, added, "This is an important day for GCX as we complete our Plan of Reorganization, and strategically move ahead as a stronger company with the agility to succeed. As a result of full emergence, we are better positioned to capitalize on many of the opportunities we see in our business. I, along with the rest of the GCX management team, are confident in GCX's future and excited about all that we will be able to accomplish as we move forward."

ABOUT GLOBAL CLOUD XCHANGE

Global Cloud Xchange (GCX) offers network services that power digital transformation for enterprises, new media providers, and telecoms carriers. We cover all aspects of cloud-centric connectivity from managed SD-WAN and hybrid networks, to direct Cloud connections and 100 Gbps+ waves. With a pedigree going back 30+ years, GCX are experts in providing connectivity throughout the Emerging Markets Corridor into Asia via the vast GCX subsea network (the world's largest private submarine cable network), with extensions available into more than 200 countries worldwide.

Government of Portugal

Lisbon eyes undersea cable investment to bolster EU tech infrastructure

Portugal's push comes amid growing concerns about EU digital sovereignty and the need to protect critical kit.

Portugal is pushing for a pan-European investment plan to roll out a network of undersea cables and upgrade the Continent's digital infrastructure.

Lisbon plans to present a strategy to shore up and secure Europe's submarine cable network when it takes over the presidency of the Council of the European Union

next month. Portugal has gotten political backing from countries across the bloc for its draft strategy, which would amount to an ambitious, EU-wide industrial plan to increase submarine data connections across Europe and to other continents.

Calling it "the missing pillar" of Europe's digital strategy, the Portuguese government said in a non-binding document that the Commission's digital policies "largely overlooks the external dimension."

"Europe's potential to become a global data manager and digital services provider to the rest of the world risks remaining largely untapped," it added.

The European Union in the past year presented a series of proposals to turbocharge European companies' use of data through so-called data spaces. Germany and France have led the charge to develop Europe's cloud infrastructure via its flagship Gaia-X



project to better compete with U.S. giants like Amazon.

But when it comes to undersea connections, it's often unclear who owns, uses and oversees which lines and how these are subject to control by outside players. World powers like the U.S., China and Russia have clashed over control of these cables. Legacy networks are owned through public and private investments but increasingly, U.S. internet giants Google and Facebook have poured investments into this "backbone" of the internet.

The lack of understanding and control is what's worrying European lawmakers: "Neither the European Commission, nor us, nor other member states have any idea of how much data flows through these cables," said a Portuguese diplomat involved in the drafting.

Lisbon is now working to turn its paper into a joint declaration with support from other EU countries, which it wants to unveil in March, officials involved in the work said.

It would call on EU lawmakers to write a "European Data-Gateway Platforms Strategy" that includes: mapping out how data is flowing in and out of Europe through submarine cables; listing cable systems that need replacement in the coming decade; and proposing a strategy to deal with security and dependency risks, including through a "toolbox" document, much like the one on 5G security that sought to decrease Europe's reliance on foreign suppliers.

TRAFFIC CONTROL

Data flowing in and out of Europe still runs through connections that can fall outside of European jurisdiction, but often is simply unknown, officials warned. "The current overall picture" of submarine cables in Europe "is still a patchy one," the Portuguese paper said.

"Global submarine cables infrastructures have so far been heavily concentrated in the northern hemisphere. To attain European digital leadership, it will be decisive to ensure

new, secure, and resilient submarine cable routes linking the EU also to countries in the southern hemisphere," it said.

The EU has already invested in laying cables connecting the Continent to Latin America. Lisbon is planning to inaugurate its EllaLink cable connection from Sines, Portugal to Fortaleza, Brazil in the first half of 2021.

The strategy document called for new "data gateways" in the Mediterranean and the North Sea.

One issue that's speeding up the work on the strategy: Brexit.

Data flowing in and out of Europe is often coming from the U.S. across the Atlantic — and landing in the United Kingdom first. The end of the U.K.'s transition period this year could see European data flows become subject to another layer of legal and data protection concerns.

Connections to East Africa and Asia also rely almost exclusively on cables crossing Egypt over land and connecting undersea cables from the Mediterranean and Red Sea. The so-called TE Transit Corridor is operated by fixed network operator Telecom Egypt, giving it significant leverage on global data traffic.

The plan could mean a boon to Europe's telecom industry — especially if it comes with EU investments to roll out new connections across the bloc.

"Laying new submarine cables becomes a concrete way to empower businesses and citizens" and "carries positive geopolitical and industrial significance," European telecom industry association ETNO said in a statement.

ABUNDANCE OF THREATS

Underwater data cables have been at the center of intelligence and security work — and spy tales surrounding it — for a long time.

But recent developments have piqued the interest of European officials again. At a meeting in October, NATO

countries' defense ministers discussed how to protect the networks, in part in response to fears that Russia could target these cables for interference.

"It is important to understand that most of these cables are privately owned and it's publicly known where they are. And that makes them potentially vulnerable," Secretary General Jens Stoltenberg told reporters afterwards.

In the U.S., the State Department under Mike Pompeo added undersea cables to its list of technology items that could be vulnerable to Chinese interference.

Keeping Chinese technology out of Western networks would decrease espionage risk and also allow the West to keep control of the global market for this technology, Pompeo said when presenting the U.S. government's Clean Network strategy in August, adding: "We will also work with foreign partners to ensure that undersea cables around the world aren't similarly subject to compromise."

In Europe, lawmakers are working to shore up critical industries like 5G technology, cloud and supercomputing to compete with foreign players — part of the EU's efforts to strengthen "technological sovereignty."

"It is of critical importance that European security and prosperity is not undermined by high-risk owners or suppliers," Portugal's strategy document said, echoing a similar concern about China's dominance in 5G technology.

But for European officials there's another concern to keep in mind: the growing footprint of U.S. tech giants — already in EU regulators' cross hairs for privacy and competition issues — in owning and investing in undersea cables.

"Google, Facebook, Amazon and Microsoft owned or leased more than half of the undersea bandwidth in 2018," the non-profit Mozilla Foundation wrote in its Internet Health Report last year, adding "we can and should demand that the public has a say in the regulation of this critical infrastructure."

Government of Japan

Japan plans up to 45 GW offshore wind power by 2040

Japan plans to install between 30 gigawatts and 45 gigawatts of offshore wind power by 2040 to reduce emissions and meet a target to achieve carbon neutrality by the year 2050.

The plans, if set in motion, would make Japan a global leader in offshore wind as well as makes clear explicit targets for the renewable energy source, which may spur more investment in the sector.

Japan's government passed legislation in 2018 designed to promote offshore wind development, but no major projects have been approved since then and some industry participants say that the rules for investment and regulations are too complicated.

Japanese Prime Minister Yoshihide Suga said in October that the world's fifth-biggest greenhouse gas emitter will aim for carbon-neutrality by 2050, in a major shift in position.

Havila Shipping

Havila secures cash and equipment from DeepOcean charter termination

Oslo-listed Havila Shipping and companies in DeepOcean have signed an agreement about full and final settlement between the parties regarding contract termination for the subsea vessel Havila Phoenix.

The subsea vessel Havila Phoenix has since 2013 served DeepOcean, under a charterparty with firm period until May 2023 with further options.

However, Havila Shipping terminated the charter with DeepOcean on 11 December 2020.

Namely, in November last year, Havila Shipping received a letter from DeepOcean containing information regarding their intension to seek protection under British law for wind up of the UK based activities, including the company that had chartered Havila Phoenix.

After having finalised the project Havila Phoenix was engaged in at receipt of the letter mentioned, and Havila Shipping received no instructions regarding further use of the vessel.

DeepOcean has, as a result of their activities, or lack of activities,



ended up in breach of contractual obligations, including payment default, Havila said earlier.

Havila Shipping also requested payment from DeepOcean Group Holding BV in Netherland under the parent company guarantee issued

to fulfil the chartering company's contractual obligations.

The settlement agreement, executed on Wednesday, includes both cash settlement and acquisition of ownership to A-frame, trencher and ROVs previously owned by DeepOcean.

Hexatronic Cables & Interconnect Systems AB

Hexatronic wins submarine cable orders totalling approximately 50 MSEK



Hexatronic Cables & Interconnect Systems AB, a wholly owned subsidiary of Hexatronic Group AB, has recently signed several agreements regarding fiber optic submarine cable. The total order value amounts to approximately 50 MSEK, which is from existing customers in Europe and North America.

It is planned to be delivered during 2022.

Hexatronic offers system solutions in submarine cables as well as in the complete fiber optic infrastructure, from development and production to delivery.

"Together with the orders we recently announced, we have now won submarine cable orders amounting to 115 MSEK during the month of December. This is a strong recognition for our broad offering in submarine cable" says Henrik Larsson Lyon, Hexatronic's Chief Executive Officer.

ABOUT HEXATRONIC GROUP AB

Hexatronic Group AB (publ) is a group that develops, markets and delivers products, components and system solutions with the main focus on the fiber optic market. Hexatronic offers a wide range of innovative system and product solutions mainly for passive fiber optic infrastructure with global trademarks like Matrix, Viper, Stingray, Raptor, InOne, Drytech™, Lightmate®, Skyline and Wistom®. The Group has its headquarters in Gothenburg, Sweden and has sales offices and/or subsidiaries in Sweden, Norway, Finland, United Kingdom, Italy, Estonia, Latvia, Lithuania, Germany, China, New Zealand, US and Canada. The Group is listed on Nasdaq Stockholm under the ticker HTRO. For more information, visit www.hexatronicgroup.com.

Hexatronic Cables & Interconnect Systems AB

Hexatronic wins submarine cable orders totalling approximately 60 MSEK



Hexatronic Cables & Interconnect Systems AB, a wholly owned subsidiary of Hexatronic Group AB, has recently signed several agreements regarding fiber optic submarine cable. The total order value amounts to approximately 60 MSEK, which is from existing customers in Europe.

It is planned to be delivered mainly during 2022.

Hexatronic offers system solutions in submarine cables as well as in the complete fiber optic infrastructure, from development and production to delivery.

"We are very pleased that customers that we have had for several years

have confidence in us and wants us to continue to deliver submarine cables to them. Together with the orders we announced in December, we have now won submarine cable orders amounting to 175 MSEK in a short amount of time. This is a strong recognition for our broad offering in submarine cable" says Henrik Larsson Lyon, Hexatronic's Chief Executive Officer.

ABOUT HEXATRONIC GROUP AB

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fiber optic market. Hexatronic offers a wide range of innovative system and product solutions mainly for passive fiber optic infrastructure with global trademarks like Matrix, Viper, Stingray, Raptor, InOne, Drytech™, Lightmate®, Skyline and Wistom®. The Group has its headquarters in Gothenburg, Sweden and has sales offices and/or subsidiaries in Sweden, Norway, Finland, United Kingdom, Italy, Estonia, Latvia, Lithuania, Germany, China, New Zealand, US and Canada. The Group is listed on Nasdaq Stockholm under the ticker HTRO. For more information, visit www.hexatronicgroup.com.

Iberdrola

Iberdrola enters Polish offshore wind market

Iberdrola has reached an agreement to acquire a 50% stake in Sea Wind, marking the company's entry into the Polish offshore wind market.

Sea Wind is said to have a seven-project pipeline in the early stages of development that has a potential capacity of up to 7.3 GW.

According to Iberdrola, Sea Wind has an experienced team in offshore wind development and in-depth knowledge of the Polish market.

The companies previously worked together on the development of the Baltic Eagle project off the German coast.

Iberdrola added that with this transaction it is also promoting the creation of an offshore wind hub in the Baltic Sea which would act as the epicenter of offshore services and local content for its projects in Germany, Poland and Sweden.

Back in June, Iberdrola signed a Letter of Intent (LoI) with Enea to jointly develop offshore wind projects in the Polish Baltic Sea with a possible total capacity of up to 3.3 GW.

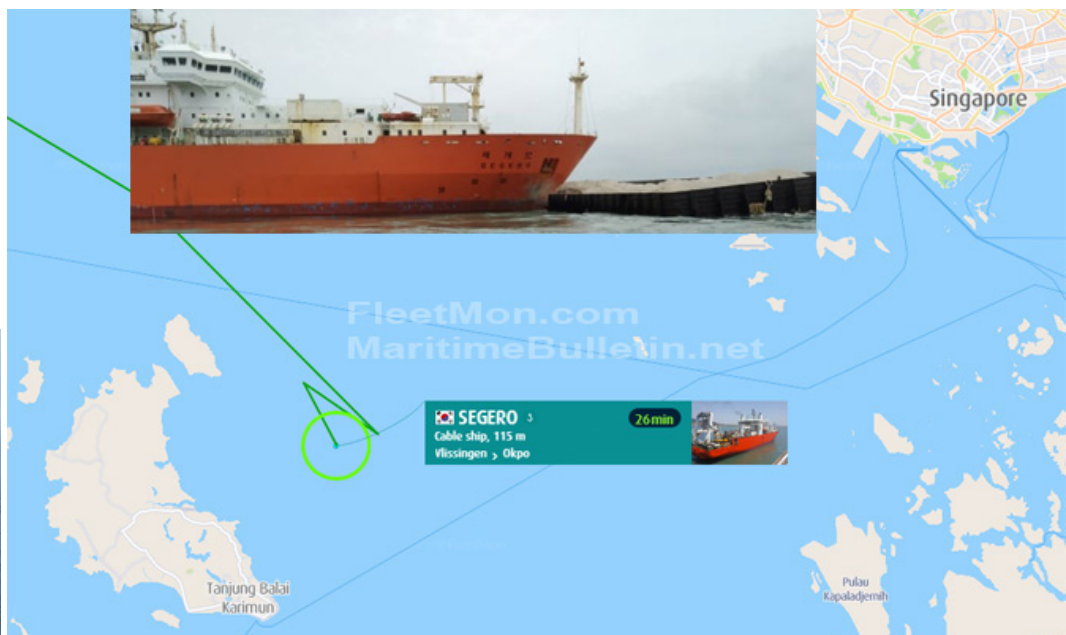
However, a few months later, the two parties decided to terminate exclusive talks on jointly pursuing the Polish projects.

KT Submarine Co. Ltd.

Korean cable laying ship struck 4,000 ton barge in Singapore Strait, both damaged

Cable laying ship SEGERO struck barge loaded with some 4000 tons of granite, towed by Indonesia tug INDAH LAUT 2201 (IMO 8690863), east of Karimunjawa Island, Riau archipelago, Singapore Strait, at around 0330 LT (UTC +7) Jan 14. Ship's bow penetrated barge hull some 3 meters deep. SEGERO is en route from Netherlands to Okpo Korea. SEGERO was also damaged in the collision, as of 1400 UTC she remained in the same area having status of restricted manoeuvrability.

Cable laying ship SEGERO, IMO 9165188, GT 8323, built 1998, flag Korea, owner KT SUBMARINE CO LTD, Busan.



Lightstorm Telecom Ventures

Lightstorm Telecom Ventures Builds High-Capacity Network with Ciena for India's OTT Ecosystem

Lightstorm Telecom Ventures (LTV), an independent and carrier-neutral infrastructure provider in India, has deployed Ciena's (NYSE: CIEN) coherent optics, network management and advanced automation software to serve the country's OTT, data center and cloud providers.

This deployment will transform LTV's metro and long-distance network to support the delivery of low latency and high-capacity digital services. LTV's network covers more than 10,000 kilometers and 60 data centers in five cities, including Mumbai, Bengaluru, Chennai, Delhi and Hyderabad, as well as strategic subsea cable landing stations providing high-capacity connectivity to Mumbai and Chennai.

"Investing in networking solutions and software from Ciena equips our customers with unmatched speeds and programmable network capabilities," said Amajit Gupta, chief executive officer, LTV. "Together with Ciena, we're helping to further establish India as a hub for international connectivity."

With Ciena's portfolio of hardware, software and services, LTV will provide an intelligent and reliable network that can adapt and respond quickly to rapidly changing user requirements. Deploying 600-800 Gbps per wavelength delivers increased capacity to support high-bandwidth content, and a software-driven flexible photonic architecture accelerates service velocity and maximizes the potential of new services.

"Bringing new digital services to India requires an intelligently automated network that can dynamically adapt and scale," said Ryan Perera, vice president and country head, Ciena India. "With an upgraded network, LTV makes Digital India a reality and fuels the next wave of telecom growth."

LTV is using Ciena's 6500 packet-optical platform with Layer 0 control plane, WaveLogic 5 Extreme, Waveserver Ai, Manage, Control and Plan (MCP), and Services as well as Blue Planet Multi-Domain Service Orchestration (MDSO).

ABOUT LIGHTSTORM TELECOM VENTURES

Lightstorm Telecom is an independent, carrier-neutral telecom infrastructure platform focused on delivering India's first cloud connectivity infrastructure. For more information, please visit: <https://lightstormtelecom.com/>.

ABOUT CIENA

Ciena (NYSE: CIEN) is a networking systems, services and software company. We provide solutions that help our customers create the Adaptive Network™ in response to the constantly changing demands of their end-users. By delivering best-in-class networking technology through high-touch consultative relationships, we build the world's most agile networks with automation, openness and scale. For updates on Ciena, follow us on Twitter @Ciena, LinkedIn, the Ciena Insights blog, or visit www.ciena.com.

LOC Group

AqualisBraemar Acquisition of LOC Group completed

LOC is pleased to announce the completion of its acquisition by AqualisBraemar ASA ("AqualisBraemar"). The combined group is a leading global independent offshore energy and marine consultancy firm. It will have a total of 880 employees in 67 offices in 39 countries around the world.

The enlarged Group's strategy is to grow through continued expansion in the rapidly growing offshore renewables industry, and leverage on its position within shipping and oil and gas markets, to support the global energy transition. The Company is targeting 50 percent of its revenues to come from the renewables sector and other sustainability and CO2-reducing activities by 2025.

The combined Group doubles its size within the renewables space, by joining the fast-growing specialist renewable entities of AqualisBraemar's offshore wind consultancy firm, OWC, with LOC Group's Innosea and other renewable focused units.

AqualisBraemar and LOC Group will trade separately until the latter part of 2021. As resolved by the extraordinary general meeting held on 14 December 2020 (the "EGM"), the parent company of the group, AqualisBraemar ASA, will change its name to AqualisBraemar LOC ASA with effect from today.

"This is a great day for both AqualisBraemar and our clients. We effectively double the size of our group, which will benefit our customers through greater capacity, improved geographical footprint and a much more complete skills base. With both companies having similar profiles, it also allows us to maintain our stated ambitious growth targets in support of the global energy transition," says David Wells, CEO in Oslo-listed AqualisBraemar.

"The needs of our clients are rapidly changing. In part this is being driven by the energy transition agenda. This will create opportunity as well as pressure for clients but as a combined entity we can be at the forefront of the industry and are ideally placed to be able to offer the support they need, now and in the future. This is an exciting time for our industries, and I am much looking forward to working with clients to support them through this period of change." Dr R. V. Ahilan, CEO of LOC Group added.

AqualisBraemar is an Oslo-listed group that offers consultancy services to the offshore energy industries, including renewables and oil and gas, plus shipping and

insurance industries. It operates under three brand names: AqualisBraemar, AqualisBraemar Yacht Services, and offshore wind consulting firm OWC.

LOC Group, founded in 1979, is an international marine and engineering consulting firm that operates under four brand names: LOC, Innosea, Longitude and JLA (John LeBourhis). Similar to AqualisBraemar, LOC Group operates within the shipping, oil and gas and renewables sectors.

Further information on the agreement can be viewed in the full announcement released to the Oslo Stock Exchange: <https://aqualisbraemar.com/all-media/news/investor-news/2020/acquisition-of-loc-group-completed/>

MaREI

New project to test the next steps to renewable Supergrids

MAREI AND SUPERNODE COLLABORATE ON SUBSEA SUPERCONDUCTOR RESEARCH TO TRANSFORM LARGE SCALE POWER GENERATION FROM OFFSHORE RENEWABLES

SuperNode and MaREI have launched a collaborative project to facilitate up to 10x faster offshore renewable development globally. The SuperNode concept is focused on providing a single superconductor connection to offshore renewable energy sources. The technology aims to achieve efficient delivery of power back to shore by operating at medium voltage, direct current, and facilitating transmission from energy dense areas offshore to high demand locations via a subsea superconductor.

SuperNode's technology has the potential to transform the electric power transmission industry and move Europe towards its carbon reduction targets for large scale power generation.

The project is jointly funded by SuperNode and a grant from Science Foundation Ireland through the MaREI research centre at University College Cork. The project team of 5

includes 3 positions at MaREI and the creation of 2 new full-time positions within SuperNode.

"This is an early and significant step in developing this game changing technology to enable more renewables. Direct current is the most efficient way to transport energy over distance on the planet. What superconducting cable systems do that other cables do not is allow higher currents and hence more power to flow on a single circuit. This enables very large offshore wind developments to be phased, grouped and networked to deliver more clean energy faster." - John Fitzgerald, CEO, SuperNode

"The entire SuperNode team is very excited to work with MaREI on this challenging engineering endeavour to make significant progress towards delivery of our disruptive, advanced Superconductor technology, potentially a key part of Europe's transition to a low carbon future." - Eoin Hodge, CTO, SuperNode.

"This collaboration with SuperNode on their subsea superconducting disruptive technology has the

potential to revolutionize how we plan for offshore renewable energy grid integration across Europe. It is an exciting opportunity to showcase MaREI's excellence in delivery of ground-breaking marine renewable energy research." - Michael O'Shea, Research Fellow, UCC

The project aims to advance the performance of SuperNode's Subsea Superconducting Cable System design which will lead to the construction of a set of test facilities for the system. The test facilities will enable testing of SuperNode's cable system at its operational temperature of almost -200C and its durability against the forces that it will have to withstand during its construction and 30+ years of operation on the seabed.

Superconducting cables have been operating for several years onshore in places like Essen in Germany and Shingal in Seoul with a larger installation coming online in Munich in the next few years. However, existing onshore superconducting cable systems are not fit for purpose for the offshore environment, nor for the amounts of



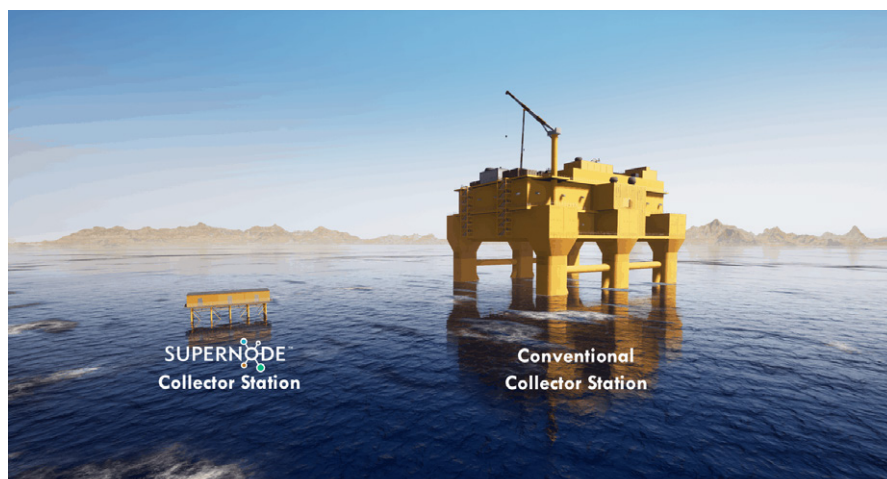
electrical power required to support a renewable grid onshore. To deal with marine conditions and larger flows, accessing the best renewables, SuperNode is developing a new system.

This project aims to improve these superconducting systems by testing physical prototypes to determine their suitability for subsea operation. This will be achieved through a range of numerical modelling and physical testing activities.

The expected benefits of the SuperNode Connection System are:

- Zero energy losses in transmission due to superconductivity;
- Scalability of the overall Connection System to exploit windy zones fully over time with less onshore development;
- Facilitates the streamlined, efficient system for the generation, collection and transferring of offshore renewable power to the grid;
- Smaller footprint, lightweight, cheaper offshore platform for the Collector Station, one tenth the size of current platforms;
- 50% capital costs of transmission compared to today's solution, resulting in a net 20% reduction in the levelized cost of electricity for offshore wind

This project will feed into SuperNode's technology development roadmap and other projects with global partners



in 2021 as they develop the 2GW+ Connection System, a novel technology solution to accelerate the grid infrastructure needed for the energy transition. To decarbonise globally by 2050, it is estimated that up to 2 million giga watt kilometres (GW.km) of new connections will be needed. For comparison, the Celtic Interconnector, which will use HVDC tech to connect Ireland to France, is less than 500 GW.km. Superconducting cables may be the only way to connect enough renewables fast enough.

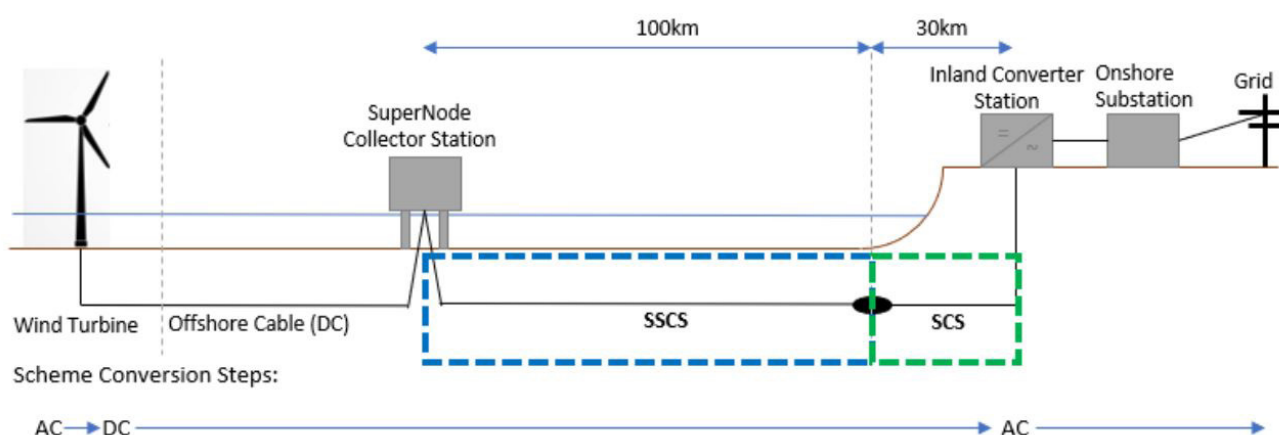
The estimated annual European market for this aspect of SuperNode's cable system is c. €2.5 billion. Based on the estimated number of jobs per billion Euro of manufacturing exports according to figures in Manufacturing 2020[1], this equates to an estimate of c. 13,000 potential jobs across Ireland and Europe.

ABOUT SUPERNODE LTD

SuperNode Ltd is a young Irish company which is developing cutting-edge technological solutions to decarbonise the electricity system. The company views their superconducting transmission products as the key enabling network technology for the renewable energy transition over the next 30 years.

ABOUT MAREI

MaREI is a world-leading Science Foundation Ireland Research Centre for Energy, Climate and Marine, coordinated by the Environmental Research Institute (ERI) at University College Cork. MaREI has over 250 researchers across 13 partner institutes in Ireland working with 75 industry partners focussing on the energy transition, climate action, and the blue economy.



MMT Sweden AB

MMT charts OSV Relume

MMT is pleased to announce that we have executed a strategic contract with Helix Robotics Solutions for the mobilization of a WROV and survey spread onboard OSV Relume. The OSV Relume is currently alongside IJmuiden awaiting completion of the WROV installation. Once completed, the vessel will be available for WROV and other subsea/survey projects. During winter 2020/2021 season, MMT and the owners of OSV Relume, MMSL, will have a 48-hour notification window to ready the vessel to assist Clients and projects throughout Northern Europe. "I am very pleased with the outcome of the agreement with Helix and the fact that we are able to maintain an exceptionally short notice period for potential work throughout the winter season", says Svante Johansson, Chartering Director of MMT.



Motive Offshore Group

Cable handling operation completed

Flowline Specialists Limited and Motive Offshore Group Ltd teams completed a cable handling operation safely in the Middle East. Within 4 days they had 2 of their internally built Bow Cable Engines (BCE's) and a team of 6 operators for 24hrs operations in the UAE ready to transfer 7 km of cable.



Multiconsult

Multiconsult and Argeo form marine survey alliance

Norwegian companies Multiconsult and Argeo have entered into a strategic cooperation to improve quality of marine surveys and increase construction insight of the seabed conditions for large coastal development projects and offshore structures.

The two parties have also invested in a Hugin autonomous underwater vehicle.

The objective for the cooperation is to deliver a digital 3D-model that can follow the life cycle of any ocean space project.

This applies from early-stage development, during operation and to decommissioning and removal, and could result in a significant cost reduction and environmental impact.

The largest benefits will be for construction of offshore wind installations, the aquaculture industry, major coastal infrastructure as well as oil & gas facilities and equipment.

A Hugin autonomous underwater vehicle (AUV) and associated systems developed by Kongsberg Maritime Robotics should help achieve these goals. Argeo will operate this small autonomous submarine robot used for underwater missions.

RISK AND COSTS REDUCTION

The companies' joint digital ocean space initiative should provide new insights into the early phase of project development and enable reduction in

project risk, costs and environmental impact. In addition, the cooperation aims to provide integrated products on mapping and surveys that will minimise project risk related to uncertainty. The cooperation also includes the development of autonomous solutions for the collection of seabed habitat and environmental data.

"Multiconsult has been conducting ground surveys in coastal waters for many years. We have 20 years of experience with year-round operations of drilling boats along the entire Norwegian coast, positioned with both mooring systems and dynamic positioning. The new cooperation with Argeo allows us to offer mapping and



surveys of large seabed areas and establish physical models in 3D that meet the needs of our industry for complete digital modelling,” says Leif Olav Bogen, executive vice president of Multiconsult.

By using seismic surveys and seabed scanning, the two companies believe they can offer complete products that will improve the choice of solutions and in managing the biggest risk factors in large projects.

“This agreement represents yet another important phase in the development of Argeo as a leading ocean space company with a focus on robotics and digital products. In addition to service deliveries and product development together with Multiconsult, we ensure permanent access to our first autonomous subsea system (AUV) to be used in conjunction with our advanced autonomous mapping and



inspection concept – Digital Ocean Space,” says CEO Trond Figenschou Crantz of Argeo.

NJFX

NJFX hires Mike Reverendo as site access manager to oversee safety and security at its CLS colocation campus

NJFX, the only Cable Landing Station (CLS) colocation campus in the U.S offering Tier 3, carrier-neutral data center capabilities, announces naming Mike Reverendo as Site Access Manager for the CLS Campus. In this role, Mr. Reverendo will oversee essential workers coming to and from the NJFX campus following protocols and coordinating with county, state and federal agencies, as well as adhering to CDC guidelines for safety.

“The pandemic has made safe and secure access to critical infrastructure imperative for continuity of business operations, including providing connectivity to some of the biggest names of the internet,” comments Mr. Reverendo. “Because all our customers’ technicians serve an essential role, we facilitate their access to our facility. However, maintaining a strict standard of both safety and security is my goal during this unprecedented time, and beyond.”

Mr. Reverendo brings a diverse background to the role. This includes an internship with the DEA (United States Drug Enforcement Administration) during which he was trained in secure access procedures for sensitive sites. In his new role, he will manage everyone coming to and from the campus, including overseeing requests for access from international essential workers. As part of his efforts going forward, Mr. Reverendo will also focus on cyber security as a priority in supporting NJFX customers with best practices.

“Keeping COVID-19 protocols in mind has made things a bit more complex than usual. But I am confident that we as a company are taking every precaution to make sure everyone comes in as safely as possible and following all state, local and federal CDC guidelines,” adds Mr. Reverendo. “We are



upholding the standards of security that we always have, with an extra layer for the health and safety of our staff as well as those coming to our building.”

Mr. Reverendo will be the point person for NJFX to all security officials, including county, state, and federal, such as the Department of Homeland Security. Over the last year, the world has seen that communications become paramount during global events such as the pandemic, as the entire world made a shift to remote work, school, and leisure. Enabling the connections to make that possible is crucial to our shared connectivity.

As telecommunications continues to be a matter of national security, the role of Site Access Manager is extremely important. “We are thrilled to welcome Mr. Reverendo to the NJFX team and look forward to learning from him as he serves as liaison to the government entities that we must continue to form solid relationships with,” states Gil Santaliz, CEO, NJFX. “He will also receive ongoing training from federal authorities to keep the NJFX facility safe and secure.”

With the new Havfrue/AEC-2 cable Ready for Service as of November 2020, global connectivity grows every day, with each carrier cross-connect in the NJFX Carrier-Neutral MMR (Meet Me Room). Mr. Reverendo looks forward to working with state health officials to determine a timeline for essential workers at NJFX to eventually receive COVID-19 vaccinations. Mr. Reverendo graduated from The College of New Jersey with a degree in Business Administration. He is currently pursuing a master’s degree in criminal justice.

For more information about NJFX, please visit: www.njfx.net.

NKT

NKT commits to the Science Based Target initiative to become a net-zero emissions company



As the first major power cable manufacturer NKT officially signs up for the Science Based Target initiative to become a net-zero emissions company. Already now NKT commits to reducing its own greenhouse gas (GHG) emissions by 5% on average annually in line with the Paris climate agreement to keep global warming to 1.5°C above pre-industrial levels.

Power cable solutions and accessories are vital for the infrastructure supporting the global transition to renewable energy. With an increased electrification of society, NKT plays a key role in providing future generations with clean and renewable energy. Now, the company commits to the Science Based Targets initiative with the aim to set its net-zero deadline as soon as possible, with 2050 as the ultimate close. As an important first step, NKT commits to reduce its CO2 emissions by 5% on average annually.

I am proud that we are the first major power cable manufacturer to commit to this verified and approved method for responsible climate actions, and it is a strong signal to our stakeholders that we are fully committed to accelerate the sustainability journey. Power cables are essential to transition to renewable energy and as it is our company purpose to connect a greener world it is natural for us to take further responsibilities to become a net-zero emissions company, says Alexander Kara, President & CEO of NKT.

DECARBONIZATION ACTIVITIES HAVE ALREADY STARTED

Signing up for the Science Based Targets initiative is a natural next step in the sustainability journey of NKT. Earlier this year, it was announced that the company runs all its power cable plants on electricity from renewable energy sources, reducing CO2-emissions from its annual energy consumption by 66%, or over 48,000 tons compared to 2019. Furthermore, NKT runs several decarbonization initiatives, including reduction of fuel consumption and dedicated projects to increase the energy efficiency of the cable manufacturing. Also, NKT recycles materials such as XLPE and metals from the production of power cables which help reducing emissions from traditional waste management.

The NKT Science Based Targets addresses Scopes 1 and 2 (own impact) and Scope 3 (value chain) emissions. Committing to the 1.5°C ambition also means that NKT joins the 'We Mean Business', a coalition of organizations working with thousands of the world's most influential businesses and investors, catalyzing business action and driving policy ambition to accelerate the zero-carbon transition.



As the first major power cable manufacturer NKT officially signs up for the Science Based Target initiative to become a net-zero emissions company

ABOUT SCIENCE BASED TARGETS

The Science Based Targets initiative (SBTi) is a collaboration between CDP, the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF). The SBTi defines and promotes a clearly defined pathway for companies to reduce their greenhouse gas emissions. Over 1,000 companies have committed to set science-based emissions reduction targets.

ABOUT NKT

NKT connects a greener world with high-quality power cable technology and takes centre stage as the world moves towards green energy. NKT designs, manufactures and installs low-, medium- and high-voltage power cable solutions enabling sustainable energy transmission. Since 1891, NKT has innovated the power cable technology building the infrastructure for the first light bulbs to the gigawatts created by renewable energy today. Headquartered in Denmark NKT employs 3,300 people. NKT is listed on Nasdaq Copenhagen and realised a revenue of EUR 1.3 billion in 2019. We connect a greener world. www.NKT.com.



National Telecom Public Company Limited

Merger set to make new firm third biggest service provider

TOT's merger with CAT Telecom to become one entity called the National Telecom Public Company Limited, or NT Telecom, will be completed on Jan 7, while the mobile telephone and broadband Internet businesses of the two companies will also be combined into one brand, said Digital Economy and Society (DES) Minister Buddhipongse Punnakanta.

"We are planning to rebrand the businesses as either NT Mobile or NT Broadband, which will be officially launched on Jan 7 as well," he said.

"TOT Mobile has more than 180,000 customers while CAT's My has 2.5 million customers. When combined they will become a large telecom company. We expect this new company to compete with and eventually surpass the market's third-biggest player, Total Access Communication [Dtac]," Buddhipongse said.

"The brand combination will not affect existing users. Whether you are using TOT or CAT sim cards, the system will automatically match the roaming services and let you

continue using your mobile phone and mobile Internet with no interruptions," he said.

"As for broadband service, TOT currently has 1.5 million users while CAT has about 300,000. We aim to bundle broadband packages with a mobile plan to attract new users," Buddhipongse said.

"The combined assets of the two will be worth more than 300 billion baht, including over 25,000 telecom poles nationwide, nine international underwater cable systems, six mobile frequency bands, 4,000km of underground cables, 4 million core kilometres of optical fibre cables, 13 data centres and an international telephone system that is accessible from any number in the world," he said.

"The DES will set policies for NT Telecom to undertake new projects with a focus on 5G and satellite technology," he added. "You can expect to see some new services by NT Telecom around February-March next year."

Offshore Renewable Energy Catapult

ORE Catapult's tidal & wave specialist wins SUT award

The Offshore Renewable Energy (ORE) Catapult's wave and tidal sector specialist, Simon Cheeseman, has been awarded the Society for Underwater Technology's (SUT) Lennard-Senior prize for 2020 in recognition of his outstanding individual achievement in the field of marine renewable energy.

Cheeseman is an experienced marine engineer who joined ORE Catapult in February 2014. He is responsible for driving the Catapult's marine renewables strategy and identifying its wave and tidal technology innovation priorities.

He also oversees the organisation's leadership of key strategic EU marine renewables projects, such as the €45.4m Tidal Stream Industry Energiser Project (Tiger), the biggest ever Interreg France (Channel) England Programme.

Commenting on the award, Cheeseman said: "It is a great honour to be recognised by my peers for my work in championing the marine renewables sector in both the UK and Europe. I believe marine renewable energy technologies should be a fundamental part of the future global energy mix, and vital if the UK is to achieve its Net Zero carbon reduction targets.

"I am passionate about supporting the sector's continued development and path to commercialisation. I'd like to take this opportunity to thank the SUT's awarding Committee, those that nominated me, and my colleagues at both the Catapult and in the wider marine renewables sector for their continued support".

The prize is awarded in recognition of Don Lennard, who was the CEO of the Marine Technology Directorate,



Simon Cheeseman
(Courtesy of ORE Catapult)

which supported university research on marine renewables. Don moved to Australia to initiate marine renewables research there.

Previous winners of the coveted award include Orbital Marine's Andrew Scott, SIMEC Atlantis' Tim Cornelius and Chair of the Marine Energy Council, Sue Barr.

Offshore Wind Consultants

Offshore Wind Consultants names APAC head

Offshore Wind Consultants has appointed Tom Whittle to the newly created role of Asia Pacific regional director.

Whittle, previously OWC's country manager in Taiwan, has worked as a project director, project manager and package manager on a number of offshore wind projects in the UK, Europe and Asia, the company said.

The APAC regional director is also OWC's floating wind lead and sits on the floating committee of the World Forum Offshore Wind (WFO).

"With Asia Pacific countries' massive energy transition investment plans in both floating and fixed offshore wind, this is a highly exciting region," said Whittle.

"I am glad that OWC continues its strategy of building up presence and competence close to where our clients have their projects and we look forward to reinforcing our presence in the years to come."

In 2018, OWC opened its first Asia Pacific office in Taiwan. Today, the company also has offices in South Korea and Japan and has been involved in project developments in Vietnam.



Pipeshield

Pipeshield scores record contract

Subsea asset protection expert Pipeshield has secured its largest contract win to date.

The deal will see Pipeshield design, engineer, and manufacture a subsea scour protection solution for a major quay development project.

According to its parent company Tekmar, the contract has a value of more than £4 million (close to \$5.5 million).

Execution and revenue recognition will take place in the current financial year ending 30 September 2021, Tekmar noted.

To remind, Pipeshield also recently secured a contract with Subsea 7 to supply concrete mattresses for a project in the Bass Strait, Australia.



Royal Boskalis Westminster N.V.

Boskalis bolsters market position in subsea services through acquisition Rever Offshore

Boskalis announced the acquisition of all the shares of Rever Offshore's subsea services business ('Rever'). Rever, formally known as Bibby Offshore, offers a broad range of solutions in the area of subsea construction, inspection, repair and maintenance.

Rever has historically operated in the North Sea out of Aberdeen (United Kingdom) and holds a strong track record. Through this transaction, Boskalis will obtain two diving support vessels of which one is fully owned (Rever Polaris) and a second chartered (Rever Topaz). The group employs an onshore staff of around 130 in addition to approximately 220 offshore workers. The 2020 annual revenue is approximately EUR 90 million, most of which is generated through numerous framework agreements. Based on projected cost synergies, the acquisition payback period is expected to be less than three years.

Through this acquisition, Boskalis strengthens its current position in the subsea services market in Northwest Europe, Africa and the Middle East and its capabilities to serve both the traditional oil & gas market and the rapidly expanding offshore wind market. On the important North Sea subsea market, Boskalis is now a solid top three player opening up ample opportunities for operational efficiencies and synergies.

ABOUT ROYAL BOSKALIS WESTMINSTER N.V.

Royal Boskalis Westminster N.V. is a leading global services provider operating in the dredging, maritime infrastructure and maritime services sectors. The company provides creative and innovative all-round solutions to infrastructural challenges in the maritime, coastal and delta regions of the world. With core activities such as coastal defense, riverbank protection and land reclamation Boskalis is able to provide adaptive and mitigating solutions to combat the effects of climate change, such as extreme weather conditions and rising sea levels, as well as delivering solutions for the increasing need for space in coastal and delta regions across the world. The company facilitates the development of offshore energy infrastructure, including renewable wind energy. Boskalis is furthermore active in the construction and maintenance of ports, waterways, access channels and civil infrastructure, thus helping to facilitate trade flows and regional socio-economic development. In addition, Boskalis is a global marine salvage expert and has a number of strategic partnerships in harbor towage and terminal services (Keppel Smit Towage and Smit Lamnalco). With a versatile fleet of more than 700 vessels and floating equipment and 9,600 employees, including associates, Boskalis is creating new horizons around the world.

Saipem

Saipem trials FlatFish subsea drone

Saipem has started the functional tests of FlatFish, the innovative underwater drone for advanced vessel free subsea inspections, based on AI.

According to the company, the vehicle is now going to an extensive sea trial campaign.

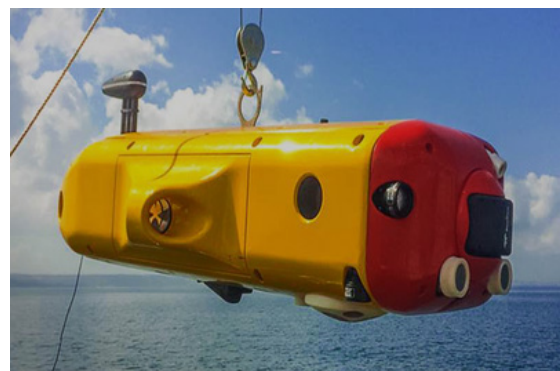
Since March 2018, Shell has been entrusting Saipem with the license to develop the FlatFish technology and qualify it for commercial application.

The FlatFish is a resident subsea autonomous vehicle able to perform complex inspection tasks of subsea assets.

It was previously developed by SENAI CIMATEC in partnership with DFKI over four years, funded by the ANP R&D program and EMBRAPPII.

Saipem will further enhance its FlatFish features with capabilities for risers inspection, data harvesting from subsea sensors, contactless monitoring of the cathodic protection systems and a flying-hanging garage for the launching/recovering and subsea recharging/reprogramming of the FlatFish from offshore platforms.

These further enhancements come thanks to the support of SENAI



CIMATEC which, together with Saipem do Brasil, entered into a contract with Shell Brasil for the development of the aforementioned advanced functionalities for the FlatFish.

FlatFish project entirely takes place in Brazil within the framework of the ANP R&D program, which thus casts the basis for the promotion of Saipem's technological footprint in the country through the creation of a skilled team of engineers highly specialized in subsea robotics.

HYDRONE PROGRAM

In recent years more and more operators have opted for underwater

technologies designed to reduce their dependence on current structures, such as support ships, guaranteeing the remote control of operations with greater efficiency as well as a reduction of CO2 emissions and finally related costs.

To meet these needs, starting from 2015 Saipem has conceived and implemented the Hydrone Program at SONSUB, the center for the development of underwater technologies and equipment of Saipem based in Marghera.

The underwater robotics development program aims to change the paradigm of underwater inspections



and interventions through a fleet of drones and auxiliary latest generation infrastructures that use the latest technologies available on the market. The program includes three products: FlatFish, the Hydrone-R and the Hydrone-W which should complete its test phase in 2021.

Seatronics

Seatronics bags new VALOR ROV orders

Acteon's marine technology specialists Seatronics has received a purchase order for multiple VALOR remotely operated vehicle (ROV) systems.

The award marks a positive step forwards for VALOR to become accepted as an alternative to traditional systems, the Westhill-based firm said.

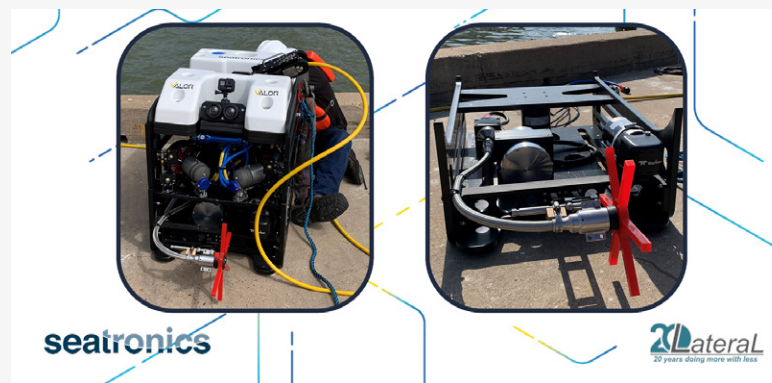
According to Seatronics, the deal has a value of £1.8 million, or approximately \$2.5 million.

The VALOR (Versatile and Lightweight Observation ROV), according to the company, is the lightest yet most powerful observation ROV available.

The standard system is for 300 metres depth. However its platform allows the vehicle upgrade to up to 1000 metres with simple modifications.

Recently appointed Group managing director, Derek Donaldson, stated: "Our goal was to positively disrupt the small vehicle market by providing our clients with a real, cost effective alternative to incumbent systems.

"We wanted to offer our customers a solution that could undertake tasks that would typically be associated with larger platforms, whilst reducing mobilisation costs and not impacting operational capabilities. With VALOR we have that and I am convinced this award will be the first of many in 2021 and beyond."



Seatronics also partnered with Blueprint Lab in June last year to equip the VALOR with electric manipulators.

As a result, the VALOR ROV will now utilise Blueprint Lab technologies as an integrated package.

Specifically, Blueprint Lab manipulators have their use in close visual and non-destructive Inspections, special recovery, and complex autonomous intervention trials.

In addition, Seatronics integrated Lateral's FlexiClean technology for efficient cleaning solutions.

The company believes that this innovation can significantly reduce the time spent cleaning, vital in for example to UWILD projects.

Simec Atlantis Energy

Simec Atlantis changes CEO

Simec Atlantis Energy has appointed Graham Reid as the new Chief Executive Officer (CEO) and a Director, while the outgoing CEO Tim Cornelius will take up a new role within the company.

The changes will be effective from 18 January 2021, and according to Simec Atlantis, Tim Cornelius has agreed to take up a new role as a Senior Adviser to the Group and will consequently resign his position as CEO, effective the same date.

Having delivered more than 5GW of wind, solar and storage projects in previous roles, Reid has been selected by the Board of Directors to build on the successful development history of the company and to use his considerable project management and delivery experience to steer Atlantis through the delivery phase of the Uskmouth Power Station conversion project, the build out of fuel production plants, the expansion of the MeyGen project and the development of further hydro asset opportunities.

In his new advisory position, Tim Cornelius will continue to support the Board and Company on a range of matters, including ongoing relationship management with key stakeholders, customers, and strategic partners.

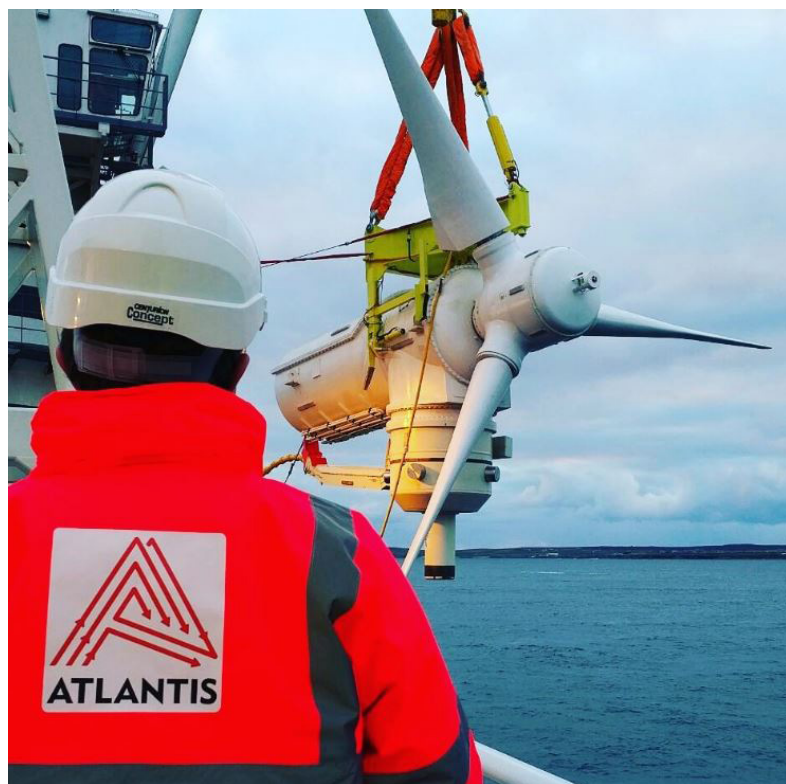
Reid will receive an option award on joining, calculated with reference to the closing price on 8 January 2021. The company will provide further notification of the details of the award in due course, Simec Atlantis said.

John Neill, Atlantis Chairman, said: "Tim is an exceptional entrepreneur and I can understand why he wants to take the next steps in his career. On behalf of the board I would like to thank Tim for his contribution to the Company over the past 15 years and for agreeing to remain as a Senior Advisor to the Board of Directors and mentor to the leadership team.

"We are pleased that we will continue to benefit from his domain knowledge, experience and relationships built up over many years and I would like to wish Tim every success in his future endeavours. I am delighted to welcome Graham Reid and congratulate him on his appointment as the incoming CEO of Atlantis".

Reid is an experienced and highly capable CEO, leader and engineer, with extensive international experience in the energy and infrastructure space.

He was most recently CEO of RES Americas, and prior to that CEO of Arcadis Middle East, a member of Network Rail's project delivery board for the London bridge station project and earlier in his career was the UK Managing Director and an Executive Board member of Hyder Consulting.



Graham Reid, incoming CEO, said: "I am delighted to be joining SIMEC Atlantis at such an exciting time in its growth trajectory. This is a unique opportunity to become part of an exceptional business delivering several first-in-class projects that will make meaningful contributions to a lower carbon economy".

Tim Cornelius, outgoing CEO, said: "For more than 15 years, Atlantis has been a huge part of my life and I owe our investors, stakeholders, staff, current and former directors and the Chairman a debt of gratitude I will never be able to fully repay. I am delighted to continue my involvement with the company as we enter the next exciting phase of our journey – from origination to construction and commissioning.

"Now is the right time to introduce new skills into our leadership team to ensure that we have the right mix of experience in place to deliver on all of our flagship projects and Graham is highly credentialed and vastly experienced in project management and successful project delivery.

"It has been privilege to be a part of the Atlantis journey so far and I very much look forward to being able to continue my association with the wonderful group of people who work there and the inspiring group of stakeholders who support them".

Soil Machine Dynamics

SMD and N-Sea demo new cable and pipeline survey tech

Subsea robotics specialist Soil Machine Dynamics (SMD) has partnered with Dutch subsea contractor N-Sea to prove new subsea technology that could change the future of cable construction.

Namely, the two companies trialed the new high-frequency electromagnetic cable and pipeline survey system, also known as 'ARTEMIS Survey', in live environments in the North Sea in November this year.

According to SMD, during the offshore sea trial on a buried live cable, the data produced by ARTEMIS Survey when compared with pre-existing data successfully proved the location of this power cable, buried to a depth of 2 metres below the seabed and at an overall distance of 4 metres from the cable, in line with offshore survey standards.

SMD believes that this is a significant step-change in the detection performance for unpowered and abandoned cables, a capability which will revolutionise cable construction and maintenance activities carried out during low wind productivity or when cable failures have occurred.

Stephen Wilson, strategic business development Manager from SMD, said: "The live trials were the culmination of a two-year journey to develop this new equipment. Along with our partner Optimal Ranging, the research and development team has focused on applying the unique nature of high-frequency electromagnetic fields to produce an easy-to-use, operationally ready survey system that can be fitted to any ROV. The fact it works on dead or faulty cables, has huge implications for the future of the cabling industry."

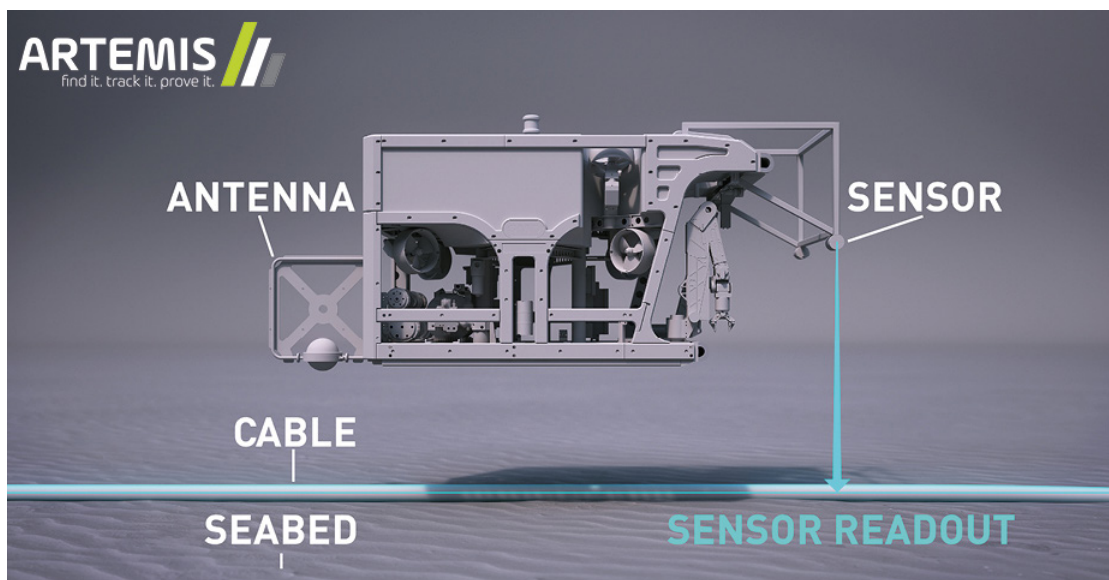
SMD has worked with several early-adopter offshore survey teams to test and improve the system and has now agreed on an ongoing development partnership with N-Sea to test ARTEMIS Survey across its full range of power, telecom cables and pipeline applications.

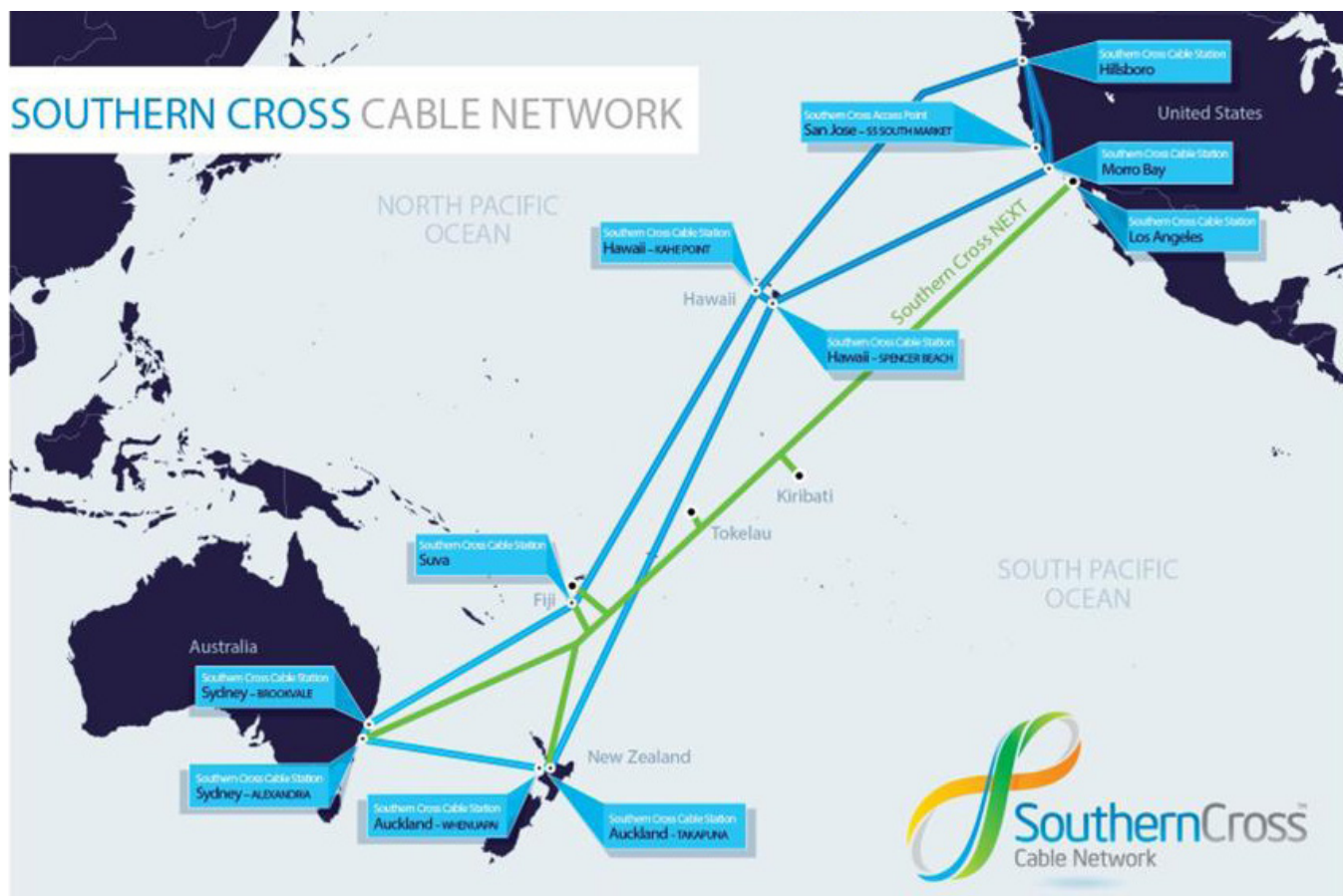
Paul van Waalwijk, managing director of N-Sea, said: "We were an early adopter of the ARTEMIS technology and are proud to have been a part of this journey so far. We completed a trial on a live cable and are excited to continue the exploration, together with SMD and Optimal Ranging. The detection of a buried cable in both horizontal and vertical directions has been one of the biggest challenges in the last decade. This system will disrupt the subsea cable and pipeline survey market."

Once available, surveillance and cable repair companies that have the ARTEMIS Survey system will be able to detect any broken or abandoned cables, without the need for power or tone generation. What's more, this can all be done in real-time and at deeper depths than current technology allows, SMD noted.

Pradeep Pandey, CEO of Optimal Ranging, also stated: "We have a proven record of innovating and delivering sensor systems and software based on modelling and measuring electromagnetic fields. SMD and Optimal Ranging share a common vision and goal of providing solutions to challenging problems related to the offshore utility grid. The breakthrough performance of ARTEMIS is a result of our close cooperation and diligence. We look forward to working together to continue to develop and deliver solutions."

SMD and N-Sea are now seeking asset owners and contractors interested in using this new technology.





Southern Cross Cables Limited

Southern Cross partners SES Networks to enhance connectivity in the Pacific

Southern Cross Cables Limited (SCCL) will use SES Networks' satellite connectivity services to upgrade its Southern Cross cable network.

The Southern Cross cable network, in use since 2000, connects Nukunonu of Tokelau, Kiritimati Island of Kiribati and the rest of the world. However, SCCL is laying a new cable, Southern Cross NEXT, to enhance and eventually replace the existing Southern Cross cable network.

Specifically, SCCL will use SES's O3b constellation of medium earth orbit (MEO) satellites to connect remote stations on the incoming Southern Cross NEXT cable network during its commissioning phase.

"As we work on laying the groundwork to improve connectivity, network resilience and network performance with the incoming Southern Cross NEXT

network, we needed a strong and robust satellite network which could perform at the same level of low-latency, high-availability standards as our incoming next-generation cable network. SES's solution not only fit the bill, but actually far exceeded our stated requirements," said Laurie Miller, CEO of SCCL.

The satellite services provided by SES will ensure that the subsea cable network gets an immediate connectivity boost, as work to upgrade the existing Southern Cross systems and implement Southern Cross NEXT begin.

SES Networks will provide a managed O3b network service to the remote stations, using a satellite terminal that delivers fibre-like performance with a low latency of less than 150ms round trip.

"This cooperation with Southern Cross is of utmost importance because

it truly shows the complementary nature of satellite and undersea cable networks. It is a great example of how the entire network ecosystem can work together to ensure the Pacific region – with thousands of islands and vast open seas in between – remain connected at all times," said John Turnbull, director of Australia and the Pacific region at SES Networks.

"The unparalleled reach of satellites and its ability to be rapidly deployed can complement and augment large-scale terrestrial infrastructure, delivering more connectivity resilience wherever you are, anytime you need it. With demand for connectivity and data consumption growing at an accelerating pace across the Pacific, we believe this hybrid network infrastructure is going to benefit businesses and communities greatly."

Statnett

Hilde Tonne appointed new CEO of Statnett

The Board of Statnett has appointed Hilde Tonne as CEO of the company. Tonne is currently Executive Director and Chief Innovation Officer of the Ramboll Group, headquartered in Denmark. She holds an M.Sc. from the Norwegian University of Technology and Natural Sciences and the RWTH Aachen University in Germany.

We are pleased to have been able to recruit such an experienced leader to one of Norway's important CEO positions. Statnett is in charge of large national tasks and has a pivotal role in enabling the electric future of Norway. Hilde Tonne's background makes her an excellent candidate to lead Statnett into this important phase, says Jon Fredrik Baksaas, Chair of the Board of Statnett.

Hilde Tonne holds an M.Sc. from NTNU and the RWTH Aachen University. She has substantial leadership experience from several sectors and has held positions in Hydro Oil & Energy, Telenor Group and currently Ramboll Group, where she is Executive Director and Chief Innovation Officer. Tonne has held a number of non-executive Board positions, including in the power sector as Board Member of Statkraft and Vattenfall, and Chair of the Board of Hafslund. She is one of the founders of Digital Norway, where Statnett is a member. Tonne is currently Chair of the Board at the Research Council of Norway.

Hilde Tonne's extensive leadership experience and technology insight is an invaluable asset when Statnett takes lead in the move towards a fully electric society. We will facilitate new industries, electrification and security of supply each day all year. This requires strong leadership, and I am confident that Hilde Tonne is the right person to take on this responsibility, says Baksaas.



Hilde Tonne, CEO of Statnett

With her experience as Executive Director at Telenor Group, with the responsibility for industrial development, Tonne has extensive experience in development and operations of critical infrastructure. A total of 17 years of experience from the oil and gas industry ensures valuable insight from the energy sector.

This is a dream job. Being entrusted with leading 1400 competent staff with such an important mission for the society is a privilege. Not only is the supply of electricity a critical function for the community, but the power system is pivotal to enabling necessary transition in facing the climate crisis. Norway is uniquely positioned to take lead in developing an energy system that is instrumental in resolving one of our time's biggest challenges, says Hilde Tonne, incoming CEO of Statnett.

Technology and access to the right competencies are the most crucial factors in succeeding with this important mission. Along with maintaining and upgrading Statnett's array of critical facilities across Norway

and facilitating connection of new industries, digitalization will be a key component towards enabling a fully electric society. I am looking forward to taking the lead and work together with the whole organisation on these issues, Tonne states.

The process of recruiting a new CEO started this fall when current CEO Auke Lont announced that he will be stepping down after holding the position for 12 years.

Auke Lont has delivered impressive results and has through visions and a clear direction taken Statnett and Norway important steps towards an energy system that enables a climate friendly, electric future. He has put Statnett's mission to the core of society and delivered on security of supply and grid capacity to the industries of the future, says Chair of the Board of Statnett, Jon Fredrik Baksaas.

Auke Lont will step down as CEO by the end of January 2021. Hilde Tonne's starting date will be confirmed after New Year.



stc

Launching 3 Mega Data Centers in Riyadh, Jeddah and Al-Madina with SAR 1 billion investment

In presence of HRH prince Mohammed bin Khaled Abdulla Al-Faisal, stc has announced launching 3 Mega Data Centers in Riyadh, Jeddah and Al-Madina, with SAR 1 billion investment. They aim to host telecommunications equipment and digital cloud infrastructure, offering higher availability, more flexibility and faster time to the customer. stc adopted Next Generation build technology through modular and prefabricated solutions, affirming business continuity and service uptime. It also enables stc to optimize future expansions with Grow-On-Demand technology and Quick-To-Market solutions.

The three new Data Centers have been built with over 150 prefabricated modules (PFM's), fully equipped with power, thermal management and IT infrastructure. Providing 10.8 MW of critical IT power (white space ready) expandable to 16.8 MW. Phase 2 of the program already in construction will bring the total Critical IT Power to 40.8 MW. Furthermore, the short-term future will see stc expanding its mission critical white space to more than 105 MW of Data Center IT power across the Kingdom utilizing the same highly resilient model. The new design of the Data Centers has received Tier III Certification for Design & Construction from the global authority "The Uptime Institute" and are fully compliant with local regulations.

These projects represent the first phase of its New Era "Next Generation" Data Centers. Phase1 of this ambitious program is now complete, with new Data Centers in Jeddah and Madinah already online, and today sees stc's 3rd new Data Center being commissioned in Riyadh.

stc has embraced state-of-the-art design and construction techniques, which is set out to advance the Kingdom's Infrastructure architecture. stc's vision is realized through the rapid deployment of multiple cutting-edge Data Centers specifically tailored to meet the ever-increasing requirements of this giant company. This exciting

announcement comes as part of stc's ongoing achievements to enable digital transformation within the Kingdom and further the country's National Transformation Program 2020, in line with the Saudi Vision 2030.

Nasser Al-Nasser the stc CEO stated "Yesterday we announced \$500 Million investment with Ali Baba Cloud and eWTP, and to today we announce investing about SAR 1 Billion in these 3 Data Centers. The successful completion and transformation of stc's mission critical offering, will enable the next step in digital services to be delivered throughout the Kingdom. This first milestone achievement is only the beginning" Haithem M. Alfaraj the stc Senior VP of Technology and Operations stated "stc has reached a major milestone in providing next generation Data Centers, that will meet the current demands for digital infrastructure, with the flexibility to grow and mature with the digital evolution"

stc's current network transformation and new Data Center program will fundamentally change the mission critical hosting space within the region, improving the agility and speed-to-market of the new services being rolled out in support of the Kingdom's National Transformation Program 2020, and the Kingdom's 2030 vision. stc's successful achievement in this program has exceeded all expectations, and STC has already started Phase 2 of the program that will deliver an additional 4 new Data Centers in strategic locations throughout the Kingdom.

stc's major objective is to fundamentally transform the Kingdom's network architecture, moving towards advanced digital software services, and provide resilience enhanced mission critical white space to hosting customers and hyper-scalers. It also aspires to further improve operational efficiencies and scalability, reduce latency, and implement cloud services, artificial intelligence and automation.

Subsea Europe Services

Subsea Europe, Cyprus Subsea Partner Up

Germany-based marine data and equipment firm Subsea Europe Services and marine robotics and autonomous systems Cyprus Subsea Consulting and Services, based in Cyprus, have entered strategic cooperation.

The cooperation will see the two companies share knowledge and services that will simplify the acquisition of high-quality marine data for clients across Europe.

"This is the foundation for matching the extensive autonomous and long-term water column survey experience of Cyprus Subsea and Subsea Europe Service's seafloor surveying expertise to provide a harmonized Hydrography and Oceanography portfolio from a single,

Europe-wide source. Additionally, both companies will share knowledge on the continuing development of autonomous solutions for marine surveying, developments that will help to bring high-quality marine data to more companies and organizations," the companies said in a statement on Wednesday.

The agreement facilitates a new local hub for Subsea Europe Services in the Mediterranean and extends the reach of Cyprus Subsea to Northern Europe.

Both partners will be positioned to provide Gliders, Moorings, and related services from Cyprus Subsea as well as Multibeam Echo Sounders (MBES), including the integrated Hydroacoustic Survey System (IHSS), and ancillary equipment on a rental, sales, or subscription basis from Subsea Europe Services.

Sören Themann, CEO, Subsea Europe said, "Adding Cyprus Subsea to our team of trusted partners brings a new dimension to our activity. While extending our geographical reach is in line with our next day delivery goals, the capability to characterize oceanographic processes in and around hydrographic survey sites will give our clients a more complete picture of their study regions and how they are changing."

Cyprus Subsea Managing Director, Dr. Daniel Hayes, added, "We recently decided to invest in increasing capacity for seafloor surveying and recognized that the complexity of hydrographic survey equipment combined with a lack of accessible expertise are holding back many organizations from collecting the data they need. In the same way our autonomous platforms help users get data painlessly, working with Subsea Europe will solve these problems."

According to the statement released, the combined services portfolio of Subsea Europe Services and Cyprus Subsea includes:

- Open ocean water column biogeochemical & ecosystem monitoring with gliders
- Passive acoustic monitoring of coastal and offshore regions, real time or stand-alone, gliders or buoys
- Wave, current, and water quality monitoring with gliders or buoys
- Pre- / Post-Dredging Surveys and Progress Monitoring
- Object search (anchor chains, tools etc.)
- Cable Route Surveys (incl. depth of burial)
- UXO Surveys
- Data Processing and Evaluation
- Project Management and Client Representation

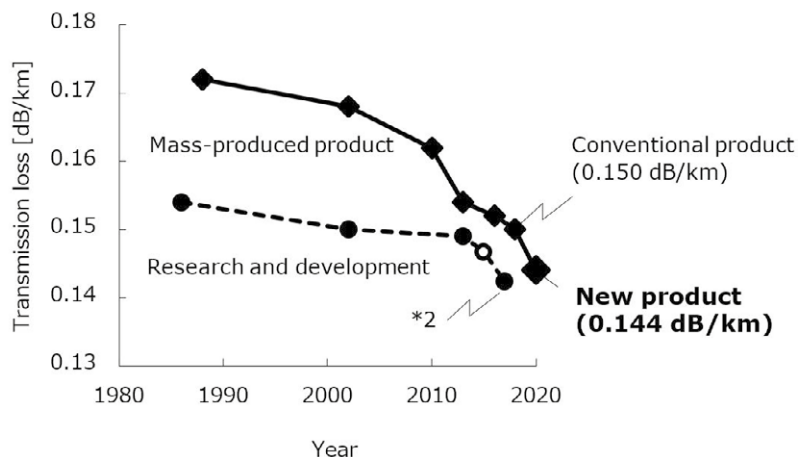
Sumitomo Electric Industries, Ltd.

Sumitomo Electric Succeeds in World's First Mass Production of 0.14 dB/km Ultra-low-loss Optical Fibre



Sumitomo Electric Industries, Ltd. realizes the world's first mass production of an optical fiber having an ultra-low transmission loss of 0.14 dB/km. The company will start its commercial supply in January 2021.

Optical fiber serves as a backbone infrastructure supporting global information and communication society. In order to meet exponentially increase of telecommunication traffics due to explosive expansion of service demands including cloud storages and 5G mobile communication network, it is essential to increase the



History of world records in optical fiber transmission loss
(The symbols of "●" and "◆" represent the records set by Sumitomo Electric.)

transmission capacity of optical communication systems. Therefore, improvement on the optical fiber performance including transmission loss reduction is highly anticipated.

In 1988, Sumitomo Electric, as a pioneer in ultra-low loss fiber manufacture, succeeded in mass production of optical fiber with a transmission loss of 0.17 dB/km as a global first and commercialized this as the pure-silica-core optical fiber "Z fiber™".^{*1} Since then, Sumitomo Electric has continuously developed and launched ultra-low loss fiber technologies and new products.

In 2017, Sumitomo Electric set a world record of transmission loss as low as 0.1419 dB/km as R&D achievement^{*2}. Applying this to mass-production technologies that have been refined through many years of operations, Sumitomo Electric realizes the global first mass production of ultra-low-loss optical fiber with 0.14 dB/km. The company will launch a new Z-PLUS fiber™ 150 having typical transmission loss of 0.144 dB/km at 1,550 nm in January 2021, achieving a

significant reduction in transmission loss from the current 0.150 dB/km product. The applications of the product include the following.

EXAMPLES OF APPLICATIONS OF Z-PLUS FIBER™ 150 WITH A TRANSMISSION LOSS OF 0.144 DB/KM

- Transoceanic submarine optical cable systems^{*3}
- Terrestrial trunk line, such as transcontinental networks
- Transmission lines for quantum cryptography communication
- Sensor applications, such as earthquake detection and fire detection
- Various optical communication technologies that require ultra-low-loss characteristics
- Sumitomo Electric remains committed to contributing to the information and communication society, by promoting research and development of optical fiber.

^{*1} Low-loss pure-silica core optical fibre

Optical fiber that achieves a low transmission loss by applying pure silica (SiO₂) glass to the core area

^{*2} World-record transmission loss: 0.1419 dB/km

Reported on March 22nd 2017 and still regarded as the world best value as of December 18, 2020, at a wavelength of 1,560 nm, see <https://global-sei.com/company/press/2017/03/prs029.html>

^{*3} Advantages of ultra-low loss optical fiber for submarine optical cable systems

For example, transoceanic ultra-long-haul submarine cable systems are equipped with huge number of optical repeaters along the transmission line to amplify the attenuated optical signals. By applying the ultra-low-loss optical fiber newly released by Sumitomo Electric, its signal attenuation can be suppressed. This makes it possible to significantly reduce the number of optical repeaters and remarkably contributes to reducing the overall system cost.

TasNetworks

TasNetworks supports the Tasmanian Renewable Energy Action Plan

TasNetworks welcomes the release of the Tasmanian Government's Tasmanian Renewable Energy Action Plan (TREAP). The TREAP provides the roadmap that will see Tasmania reach the Tasmanian Renewable Energy Target of 200% renewables by 2040, legislated in parliament earlier this year.

"The action plan is great news for Tasmania. It shows the pathway for the State achieving its renewable energy ambitions, with Marinus Link as the key enabling investment to making this vision a reality," Mr Lance Balcombe TasNetworks CEO said.

"It's been big end to the year for renewables in Tasmania. We've achieved 100% renewables, ahead of schedule. We've seen an historic MOU signed by the State and Federal Governments to progress Marinus Link through the Design and Approvals phase earlier this week." Mr Balcombe said.

"We look forward to working with the newly established Renewables Tasmania and contributing to the Government's renewable energy plan for the State, progressing a range of renewable energy projects, and Marinus Link to a 2023-24 investment decision, with the first 750 MW link in service as early as 2028," Mr Balcombe said.

Telecom Egypt

Telecom Egypt and Orange Egypt sign a number of commercial agreements

Telecom Egypt and Orange Egypt signed an amendment to their mobile-to-fixed termination agreement, and an annex to the current agreements extending to 2022 governing international voice services, with the aim of improving their commercial and service quality terms. Additionally, the companies signed another agreement to resolve some pending commercial disputes and develop mechanisms to avoid similar obstacles in the future.

These steps come within the framework of the existing strategic cooperation between the two companies aimed at providing premium services to the Egyptian telecom market.

Adel Hamed, TE's Managing Director and Chief Executive Officer, commented: "We are very pleased to sign these agreements with Orange Egypt as we strive to empower our partners to the benefit of the telecom

sector as a whole. These agreements streamline our relationship with Orange Egypt and grow the business between the two companies further."

Yasser Shaker, Orange Egypt Chief Executive Officer, commented: "Signing these agreements strengthens our long-term relationship with Telecom Egypt as a strategic partner and, on the other hand, helps us continue providing top-grade services to our customers."

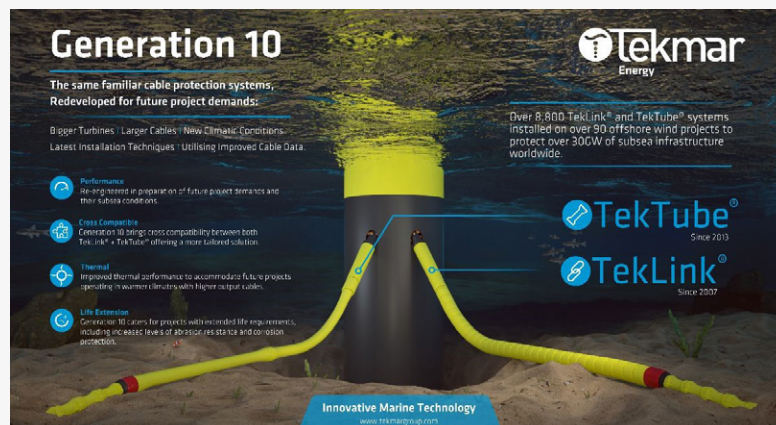
Tekmar Energy

Tekmar Energy's Generation 10 CPS is almost here

Tekmar Energy, a Tekmar Group company, is readying its manufacturing facilities in the North East of England to commence production of Generation 10 cable protection systems (CPS) in early 2021.

Since their launch in 2007 and 2013 respectively, Tekmar Energy has delivered over 8,800 TekLink® and TekTube® systems which are installed on over 90 offshore wind projects to protect over 30GW of subsea infrastructure worldwide.

Generation 10 brings together the latest advancements of these systems which are now cross-compatible and highly configurable in order to meet future project demands, including bigger turbines, larger cables, new climatic conditions, latest installation techniques, and utilising improved cable data.



ABOUT TEKMAR GROUP

Tekmar Group plc is a group of five companies focused on providing market-leading subsea services and technologies to global offshore energy markets. The Group's primary operating companies are AgileTek Engineering Limited, Ryder Geotechnical Limited, Subsea Innovation Limited, Tekmar Energy Limited, and Pipeshield International Limited.



Tekmar Energy

Two new contracts secured

Tekmar Energy has secured two new contracts to supply VBR strings (Vertebrae Bend Restrictors) for subsea projects in India and Australia.

One of the VBR strings will connect to an ROV-activated J-Tube Seal that was supplied by sister company Subsea Innovation earlier this year, further demonstrating Tekmar Group's complementary range of subsea technologies.

The project will be delivered from Tekmar Energy's North East of England manufacturing facility in Q2 2021.

Teledyne Marine

Teledyne Marine rolls out new ultra compact modem

Teledyne Marine has launched its new ultra compact modem (UCM).

Sized at just 60 x 50 millimetres, and weighing in at just 55 grams, the OEM version of the UCM is the smallest acoustic modem that comes from Teledyne Benthos.

The UCM is based on Teledyne Benthos signal processing technology to address the need for reliable wireless underwater acoustic communications onboard the growing number of autonomous micro vehicles and other subsea instruments.

As the size of these micro vehicles continues to decrease, Teledyne Marine has responded with lightweight, low power, sensors and systems to expand the usefulness of these platforms, increasing the number of tasks they can perform.



The self-contained UCM rates to 700 metres; OEM versions are also available with multiple remote transducer options for greater depths.

The UCM boasts increased transmit power resulting in increased range and improved data reliability, as well as a decreased power draw, both of which critical for autonomous vehicles and extended subsea instrumentation deployments.

As with Teledyne's ATM series modems, the Ultra Compact Modem is compatible with the feature-rich UTS-9400 Universal Top Side (UTS), and the soon to be launched CE marked UTS-9500. It is also fully compatible with the NATO Janus underwater communication interoperability standard.

Telstra

Telstra appoints Geraldine Kor to spearhead South Asia's business growth

Telstra, a leading global telecommunications and technology company, announced the appointment of Geraldine Kor as Managing Director, South Asia and Country Managing Director Singapore.

Born and bred in Singapore, Geraldine has more than two decades of experience in both the global and regional technology industry and will oversee Telstra's growth across the South Asian region.

Prior to joining Telstra, Geraldine was Director of Global Alliances and Partnerships for DXC Technology Asia Pacific, where she led strong partnerships with global alliance partners to define Go-to-Market strategies, accelerating digital transformation growth. Geraldine also served as Regional Business Operations Director for Asia and Director of Marketing & Communications at DXC Technology.

A seasoned sales leader within the technology and mobile space, Geraldine also brings experience from her time as Senior Sales Director at HERE Technologies, and Product and Channel Development management with Nokia Mobile Asia Pacific.

In her new role, leveraging her expertise in technology domain and customer market development, Geraldine will be responsible for South Asia markets including India,

Indonesia, Malaysia, Philippines, Singapore and Thailand. She will also be responsible for Telstra's Australian and New Zealand customers expanding internationally.

Oliver Camplin-Warner, CEO, Telstra International, said that Geraldine's appointment underscored Telstra's commitment to connecting businesses and people, helping enterprises in the region to connect to the international digital economy and navigate complex digital transformation.

"The pandemic has accelerated the shift to digital transformation and companies are turning to us to help improve their ICT and security resilience. We believe Geraldine's strong technology background will help our customers to adopt adaptive technologies for their new remote workforces. She is an exemplary professional who embodies excellence and brings with her a variety of skills. Geraldine will use her drive and passion to play a crucial role in our future success," he said.

Geraldine Kor, now Managing Director South Asia and Country Managing Director Singapore, said she aims to build on Telstra's strengths in the region to lead the business at a critical juncture.

"I am very excited to join Telstra and work with this amazing team of people. The current and post-COVID world demands more technology for companies to adapt to the new digital normal. We are committed to helping our clients accelerate their digital transformation and making it easy to do business in the region and beyond."

ABOUT TELSTRA

Telstra is a leading telecommunications and technology company with a proudly Australian heritage and a longstanding, growing international business.

Today, we operate in over 20 countries outside of Australia, providing services to thousands of business, government, carrier and OTT customers. Telstra Enterprise is a division of Telstra that provides data and IP networks

and network application services, such as managed networks, unified communications, cloud, industry solutions and integrated services. Telstra Purple, our new professional and managed services business in Australia, Asia and the UK, brings together people and innovative solutions to define and deliver a clear vision of our customers' transformation journey, network foundation, and the protection they need to thrive.

Telstra's global network includes more than 26 cable systems spanning over 400,000 kilometres, with access to multiple cable landing stations and more than 2,000 points of presence around the world. Our subsea cable network is the largest in Asia Pacific, with access to the most lit capacity not just in Asia, but also from the region to Australia, USA and Europe.

Van Oord

Van Oord orders green cable-laying vessel

Van Oord has ordered a next-generation custom-built green cable-laying vessel. The vessel will be delivered from VARD in Norway and equipped with the latest sustainable technologies. The vessel will be fully operational in 2023.

This investment is part of Van Oord's strategy to strengthen its leading position in the growing offshore wind market. Van Oord has a leading role in the laying and burying of offshore wind power cables. It highlights Van Oord's drive to continuously reinforce its market position by investing in state-of-the-art sustainable technology. Van Oord has a dedicated cable unit to support all its cable projects.

SUSTAINABLE TECHNOLOGY

The new vessel has been designed with the latest sustainable technologies in order to reduce the carbon footprint during operations and port standby. Apart from the possibility to run on bio fuel, this hybrid vessel has future fuel ready engines with built-in flexibility to anticipate e-fuels. It will have a large battery pack, a shore supply connection and a state-of-the-art energy management system. This sustainable set-up will result in a more energy-efficient vessel in order to reduce CO₂, NO_x and SO_x emissions.

Van Oord is committed to reducing CO₂ emissions to become carbon-neutral by 2050, in line with the Paris Agreement. This investment emphasises our commitment to net-zero emissions. — Pieter van Oord, CEO of Van Oord.

We highly appreciate the close and excellent cooperation that has been established between Van Oord and VARD's project teams to enable this innovative vessel within the renewable segment. Our ambition is to contribute

to our customers achievements, through environmentally friendly vessels and technological solutions focusing on safety, sustainability and efficiency performance, and we are looking forward to developing this cable-layer together with Van Oord. — Mr. Alberto Maestrini, CEO of VARD

HIGH WORKABILITY

The new DP2 vessel will be equipped with a below-deck cable carousel and a second carousel on deck, with total cable-carrying capacity of 8,000 tonnes. The vessel will mainly be deployed on inter-array grid and export cables of offshore wind projects. The vessel is also able to install High Voltage Direct Current cables. Van Oord's highly innovative cable trenchers can also be operated from this vessel.

This new vessel is Van Oord's second cable-laying vessel in addition to the Nexus. Its intelligent cable lay control system will be a further evolution from Nexus. It measures 130 metres in length and 28 metres across the beam and will be Dutch flagged.



Vestas Wind Systems

Vestas buys into Copenhagen Infrastructure Partners

Vestas Wind Systems has entered into an agreement with Copenhagen Infrastructure Partners (CIP) to acquire a 25% stake in the company.

Through the investment, Vestas said the aim is to further expand its presence in renewable project development and invest within areas of the renewables value chain that lie beyond its existing activities.

Vestas and CIP will collaborate on certain projects in the early phases of the development cycle, but Vestas stated it will not grant CIP any other preferential consideration as a customer in regards to its development pipeline and/or turbine sales.

Through representation on the CIP board, Vestas will engage in discussions around the strategic direction of CIP, but will not be involved in decision making at fund, investment, or project level, including the selection of wind turbine suppliers.

As part of the agreement, Vestas will invest into a new Energy Transition Fund managed by CIP as an anchor investor, which will focus on nurturing Power-to-X and other technologies that can further increase the deployment of renewables across energy systems.

The transaction is expected to be completed in the first quarter of 2021.

"I am looking forward to Vestas being part of the board of CIP," said Jakob Baruël Poulsen, CIP Managing Partner. "CIP and Vestas have a shared vision for the renewable energy market providing common ground for the strategic direction of CIP, which will continue to create innovative and attractive investment products for investors with a significant contribution to the global climate agenda."

Walker Subsea Engineering

Walker Subsea starts work on renewable energy-powered subsea motor

UK-based specialist engineering firm Walker Subsea Engineering has been awarded funding to develop a novel offshore renewable energy-powered subsea motor.

The motor will be used to drive propulsion systems for marine craft and ROVs, for pumps and compressors on subsea production systems, and generating offshore renewable energy from tidal turbines.

The machine uses the Axial Flux technology platform supplied by AVID Technology.

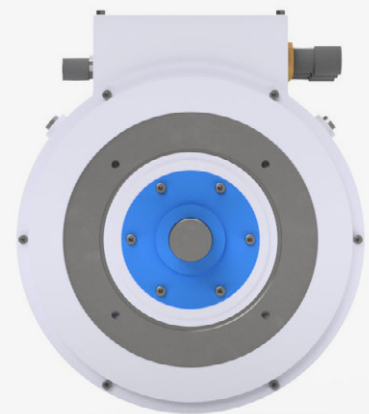
It is designed for operation in up to 1000-meter water depth, producing 200kW peak power output, at a weight less than 150 kilograms. Prototype build is already in progress, while the testing due to begin in the third quarter of 2021.

The project is co-funded by the UK's Innovation Agency, Innovate UK and supported by North Tyneside Council,

with project partners ORE Catapult located in Blyth responsible for testing of the machine in their state-of-the-art facility. The testing scope includes indoor tank-test as well as drydock for complete submersion of the machine in seawater.

North Tyneside Council also assisted Walker Subsea in locating their office at the Swans Centre for Innovation on the banks of The River Tyne in Wallsend. This has enabled the company to recently grow its workforce and recruit two new talented engineers.

Vahid Walker, Technical Director of Walker Subsea: "This is a specialist machine, requiring highly skilled workforce to prepare detailed drawings, calculations and assembly plans. We have already boosted our team with graduates from Northumbria and Newcastle Universities, and will likely require further engineers as we move on from prototype to production".



Walker Subsea Engineering's subsea motor (Courtesy of Walker Subsea Engineering)

Stephen Robertson, Head of Business Development at ORE Catapult, said: "This project demonstrates why the ORE Catapult has such a vital role to play in the UK supply chain development for offshore renewable energy. Supporting local SME's to develop novel innovative hardware is a key driver for ORE Catapult and Walker Subsea is a great example of this initiative in action".

WFN Strategies

WFN Strategies Installs Two New Directors

Experts in Project Management and Quality Assurance, Hernandez and Nielsen Take Roles as Directors.

WFN Strategies, leading engineering and client representation consultancy in the submarine cable industry, has recently installed two new directors responsible for guiding the vision and operations of the company from 2021 and beyond. HECTOR HERNANDEZ and KRISTIAN NIELSEN bring a combined 40 years of consulting experience, as well as rich project management and quality assurance history to the upper ranks of WFN management.

HECTOR HERNANDEZ is a Project Management Professional (PMP™) specialist and possesses more than 20 years' experience and knowledge in submarine cable systems, including Arctic and offshore Oil & Gas submarine fiber systems. He possesses extensive experience in ICT (Information & Communications Technology), including data networking/hosting (Data Centers), information technologies, fiber optic, and wireless networks/services. As Projects Director, he is now responsible for on-going engineering and implementation project supervision and is the primary point of contact with customers.

"2020 was a transformative year for WFN, and we rose to an unprecedented challenge – not only with our client reps in-field but also from an internal logistics angle," said Hernandez. "Tackling management from this new position gives me the toolbox necessary to take this company into the new year with a bang."

KRISTIAN NIELSEN is a Project Management Professional (PMP™) and ISO 9001:2015 and ISO 27001:2013 auditor and possesses more than 13 years' experience and knowledge in submarine cable systems, including Polar and offshore Oil & Gas submarine fiber systems. As Quality & Fulfilment Director, he reviews subcontracts and monitors the clients and vendors, and is the final check on all delivered WFN products. He is responsible for contract administration, as well as supports financial monitoring and in-field logistics. He has worked in-field, at-desk, and everywhere in between.

"The last year threw just about every curveball we could imagine, and then some. We had to adapt to the changing requirements almost daily, and that's one of the amazing things working with WFN," Nielsen said. "The flexibility of working in an agile company like this is hard to match. I am thrilled to be part of the team that will take WFN into the next generation of the submarine fiber industry."

ABOUT WFN STRATEGIES

WFN Strategies (www.wfnstrategies.com) is a leading engineering and client representation consultancy in the submarine cable industry and is based in the heart of the internet in Northern Virginia, United States. WFN Strategies possesses an ISO 9001: 2015 accredited management system and ISO 27001:2013 InfoSec program for the implementation of submarine fiber cable systems for commercial, governmental, and offshore energy companies throughout the world and is a recipient of President's "E" Award for Exports.

Xodus Group

Xodus boosts emissions division to support net zero drive

Energy consultancy Xodus has expanded its emissions team to support clients and the wider energy industry in achieving its net zero goals.

Atmospherics expert Natasha Howlett has joined the company to lead an in-house emissions management division, which will support clients' emissions reduction initiatives around the world.

This new offering will build on Xodus' existing services by including offshore energy assessments, exhaust stack sampling, emissions management and forecasting, ESOS compliance, BAT assessments, gas turbine and compressor performance testing and training packages.

Joining Howlett, will be Christopher Smith and Vicky Milne, who come from energy and emissions consultancy, PI, and boast more than 15 years of dedicated emissions experience between them. Throughout that time, the team has built an extensive international database of emissions data compiled from hundreds of global offshore tests and assessments.

Christina Horspool, UK environment division manager for Xodus, said: "As the global energy industry steps up to its commitment to significantly reduce and improve the management of emissions, we have a clear role to play in enabling our clients to achieve their Net Zero goals."



"We are committed to investing in the very best talent and technology to remain as the go-to energy consultancy of choice and today's announcement reflects just that. The experience of Natasha, Vicky and Chris enables us to provide the industry with unparalleled emissions expertise and services."

As the industry tries to balance challenging economic demands with the need to significantly improve

sustainability, the emissions team will work closely with clients to set priorities internationally.

Natasha Howlett added: "I have admired the ethos and approach of Xodus for many years and it's great to now be part of such an exciting company. As well as our continued support to familiar clients, we are looking forward to establishing a range of new relationships."

ZTT Submarine Cable & System

Innovation Award received

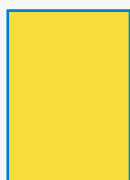
In December 2020, ZTT Submarine Cable & System received the Innovation Award for Electric Power Technology from China Electricity Council for its developed 500kV XLPE Insulated Submarine Composite Power Cable. The single core submarine cable system has been installed and under operation in phase I & II of Zhejiang Zhoushan Power Transmission Project owned by State Grid of China. The longest production length is 18.45 km without any joint. It is a reliable cable solution for long distance and big capacity power transmission.



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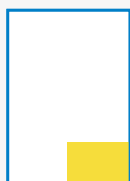
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