

# OFFSHORE SUBSTATIONS

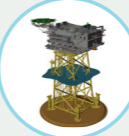

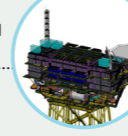



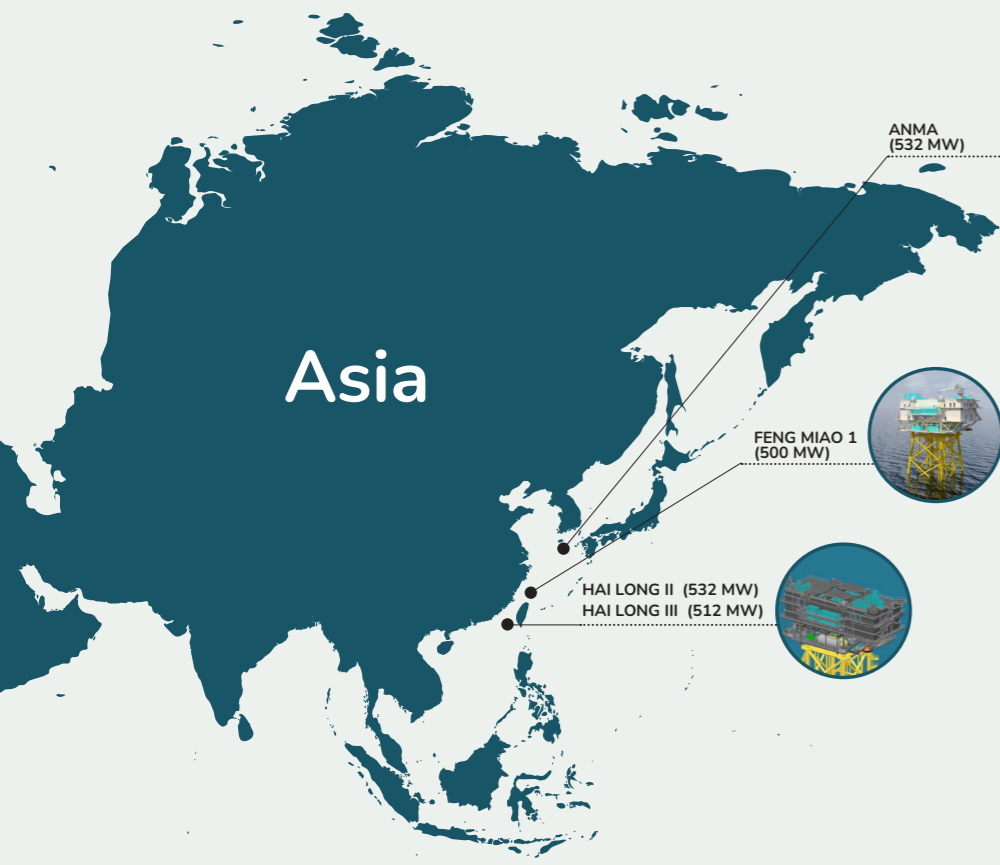
ISC

**DETAILED DESIGNS**  
BY ISC CONSULTING ENGINEERS



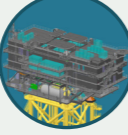


**North America**

- VINEYARD (800 MW) 
- MAYFLOWER (1200 MW) 
- COASTAL VIRGINIA I (880 MW)  
COASTAL VIRGINIA II (880 MW)  
COASTAL VIRGINIA III (880 MW) 
- US Project 















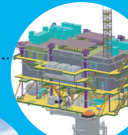












**Asia**

- ANMA (532 MW) 
- FENG MIAO 1 (500 MW) 
- HAI LONG II (532 MW)  
HAI LONG III (512 MW) 



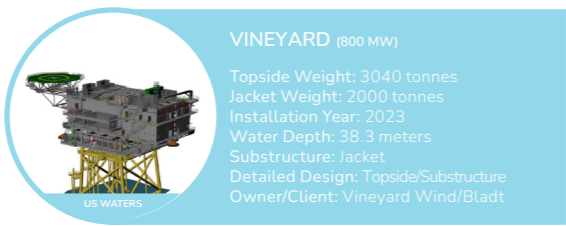
**Europe**

- SIEMENS OTM ALBATROS (112MW) 
- SANDBANK (288 MW) 
- MORAY 01 (316 MW)  
MORAY 02 (316 MW)  
MORAY 03 (316 MW) 
- HORNS REV 2 (209 MW) 
- NORDSEE ONE (332 MW) 
- PRINCESS A MALIA (120 MW) 
- BLIGHT BANK PHASE 2 (165 MW) 
- NORDSEE OST (295 MW) 
- GODE WIND 01 (332 MW)  
GODE WIND 02 (252 MW) 
- LILLGRUND (110 MW) 
- KRIEGERS FLAK KFA (200 MW)  
KRIEGERS FLAK KFB (400 MW)  
KRIEGERS FLAK KFE MODULE 
- NYSTED (166 MW) 
- BALTIC 1 (48.3 MW) 
- BALTICA 2 (1500 MW) 
- BALTIC POWER (1200 MW) 
- ARCADIS OST 1 (247MW) 
- WALNEY 1 (183 MW)  
WALNEY 2 (183 MW) 
- HORNSEA II OSS (1320 MW)  
HORNSEA II RCS 
- WEST OF DUDDON SANDS (389 MW) 
- RENTEL (309 MW) 
- GUNFLEET SANDS (172 MW) 
- NORTHWESTER II (224 MW) 
- NORTHWIND (216 MW) 
- BORKUM RIFFGRUND 1 (320 MW)  
BORKUM RIFFGRUND 2 (450 MW) 
- KASKASI II (342 MW) 



**FENG MIAO 1** (500 MW)  
 Topside Weight: 3.200 tonnes  
 Installation Year: Expected 2026  
 Water Depth: 53-60 meters  
 Detailed Design: Topsides  
 Owner/Client: Semco Maritime/  
 Copenhagen Offshore Partners

Location: Taiwanese Coast



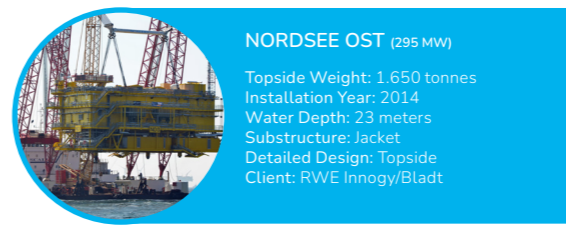
**VINEYARD** (800 MW)  
 Topside Weight: 3040 tonnes  
 Jacket Weight: 2000 tonnes  
 Installation Year: 2023  
 Water Depth: 38.3 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Owner/Client: Vineyard Wind/Bladt

Location: US East Coast



**KRIEGER FLAK KFA** (200 MW)  
**KRIEGER FLAK KFB** (400 MW)  
**KRIEGER FLAK KFE**  
**MODULE** (220/150 KV)  
 Topside Weight: 1.350/1.675/685  
 tonnes  
 Installation Year: 2018  
 Water Depth: 20/31/16 meters  
 Substructure: Concrete Gravity Base  
 Detailed Design: Topsides/Substructure  
 Owner/Client: Energinet.dk

Location: Danish Baltic Sea



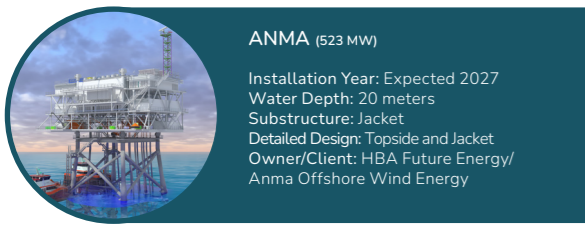
**NORDSEE OST** (295 MW)  
 Topside Weight: 1.650 tonnes  
 Installation Year: 2014  
 Water Depth: 23 meters  
 Substructure: Jacket  
 Detailed Design: Topsides  
 Client: RWE Innogy/Bladt

Location: German Bight



**LILLGRUND** (110 MW)  
 Topside Weight: 670 tonnes  
 Installation Year: 2007  
 Water Depth: 10 meters  
 Substructure: Concrete Gravity Base  
 Detailed Design: Topsides  
 Client: Vattenfall/Bladt

Location: Sweden Oresund



**ANMA** (523 MW)  
 Installation Year: Expected 2027  
 Water Depth: 20 meters  
 Substructure: Jacket  
 Detailed Design: Topsides and Jacket  
 Owner/Client: HBA Future Energy/  
 Anma Offshore Wind Energy

Location: South West of South Korea



**ARCADIS OST 1** (247 MW)  
 Topside Weight: 2.200 tonnes  
 Installation Year: 2022  
 Water Depth: 43.7 meters  
 Substructure: MP/TP  
 Detailed Design: Topsides  
 Client: Parkwind OST GmbH

Location: German Baltic Sea



**TRITON KNOLL 01** (450 MW)  
**TRITON KNOLL 02** (430 MW)  
 Topside Weight: 1100 tonnes  
 TP + Cage: 755 tonnes  
 Installation Year: 2018  
 Water Depth: 27 meters  
 Substructure: MP/TP/Cage  
 Detailed Design: Topsides/MP/TP/Cage  
 Client: Innogy/Siemens

Location: UK North Sea



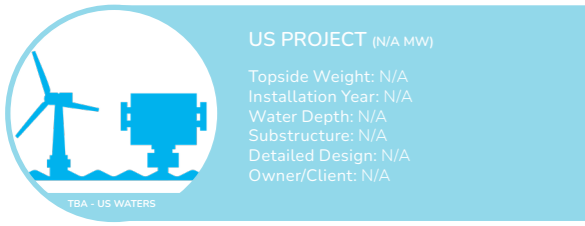
**NORTHWIND** (216 MW)  
 Topside Weight: 1.140 tonnes  
 Installation Year: 2013  
 Water Depth: 20 meters  
 Substructure: Monopile  
 Detailed Design: Topsides  
 Client: Northwind Offshore Energy/Bladt

Location: German Bight



**PRINCESS AMALIA** (120 MW)  
 Topside Weight: 650 tonnes  
 Installation Year: 2007  
 Water Depth: 24 meters  
 Substructure: Monopile  
 Detailed Design: Topsides  
 Client: Eneco/Bladt

Location: Netherlands North Sea



**US PROJECT** (N/A MW)  
 Topside Weight: N/A  
 Installation Year: N/A  
 Water Depth: N/A  
 Substructure: N/A  
 Detailed Design: N/A  
 Owner/Client: N/A

Location: US East Coast



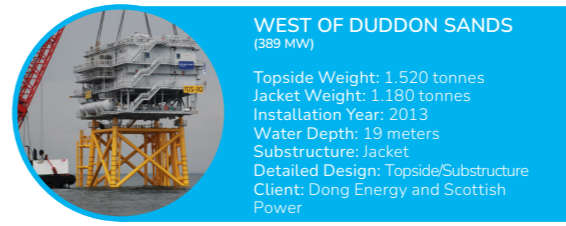
**KASKASI II** (342 MW)  
 Topside Weight: 1.250 tonnes  
 Installation Year: 2022  
 Water Depth: 38.3 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/MP/TP  
 Client: Innogy/Bladt

Location: German Bight



**RENTEL** (309 MW)  
 Transition Piece Weight: 800 tonnes  
 Monopile Weight: 1.100 tonnes  
 Installation Year: 2018  
 Water Depth: 31 meters  
 Substructure: MP/TP incl. Cabledeck  
 Detailed Design: TP/MP/Cabledeck  
 Client: Rentel/STX

Location: Belgian North Sea



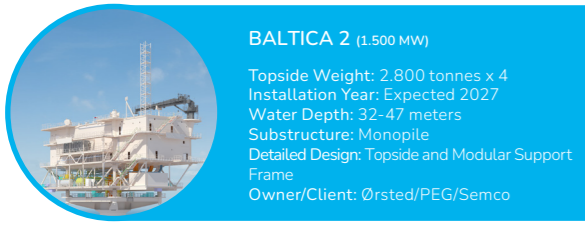
**WEST OF DUDDON SANDS**  
 (389 MW)  
 Topside Weight: 1.520 tonnes  
 Jacket Weight: 1.180 tonnes  
 Installation Year: 2013  
 Water Depth: 19 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: Dong Energy and Scottish  
 Power

Location: UK Irish Sea



**NYSTED** (166 MW)  
 Topside Weight: 670 tonnes  
 Installation Year: 2003  
 Water Depth: 6-10 meters  
 Substructure: Concrete Gravity Base  
 Detailed Design: Topsides  
 Client: Ørsted

Location: Danish Baltic Sea



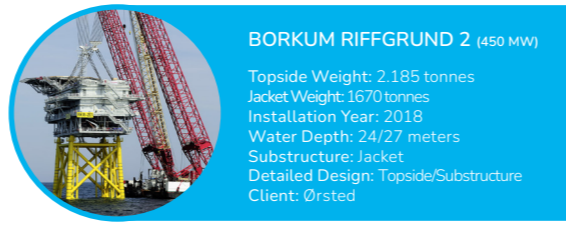
**BALTICA 2** (1.500 MW)  
 Topside Weight: 2.800 tonnes x 4  
 Installation Year: Expected 2027  
 Water Depth: 32-47 meters  
 Substructure: Monopile  
 Detailed Design: Topsides and Modular Support  
 Frame  
 Owner/Client: Ørsted/PEG/Semco

Location: Baltic Sea



**MORAY EAST 01** (316 MW)  
**MORAY EAST 02** (316 MW)  
**MORAY EAST 03** (316 MW)  
 Topside Weight: 1.252 tonnes  
 Installation Year: 2021  
 Water Depth: 22 meters  
 Substructure: Jacket  
 Detailed Design: Topsides  
 Owner/Client: EDP renewables/Siemens

Location: UK North Sea



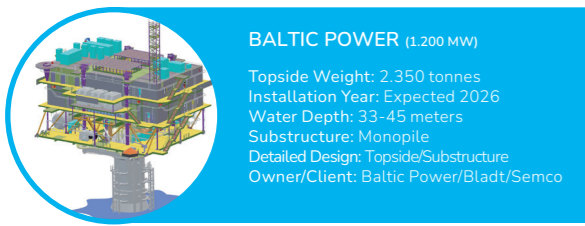
**BORKUM RIFFGRUND 2** (450 MW)  
 Topside Weight: 2.185 tonnes  
 Jacket Weight: 1670 tonnes  
 Installation Year: 2018  
 Water Depth: 24/27 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: Ørsted

Location: German Bight



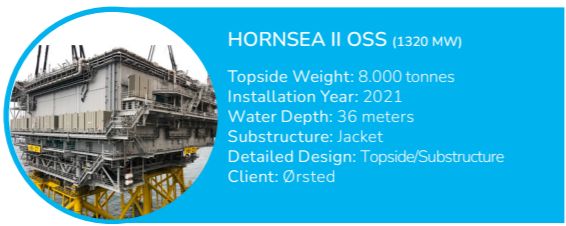
**BORKUM RIFFGRUND 1** (320 MW)  
**BORKUM RIFFGRUND 2** (450 MW)  
 Topside Weight: 1.835 tonnes/ 2.185  
 tonnes  
 Jacket Weight: 1.685 tonnes/ 1670 tonnes  
 Installation Year: 2013/ 2018  
 Water Depth: 24/27 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: Ørsted

Location: German Bight



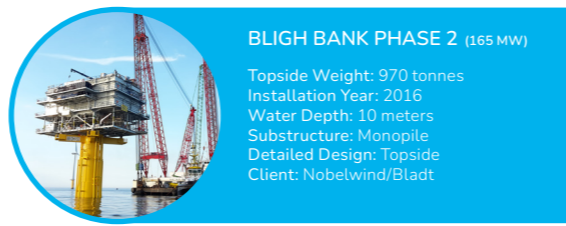
**BALTIC POWER** (1.200 MW)  
 Topside Weight: 2.350 tonnes  
 Installation Year: Expected 2026  
 Water Depth: 33-45 meters  
 Substructure: Monopile  
 Detailed Design: Topsides/Substructure  
 Owner/Client: Baltic Power/Bladt/Semco

Location: Baltic Sea



**HORNSEA II OSS** (1320 MW)  
 Topside Weight: 8.000 tonnes  
 Installation Year: 2021  
 Water Depth: 36 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: Ørsted

Location: UK North Sea



**BLIGH BANK PHASE 2** (165 MW)  
 Topside Weight: 970 tonnes  
 Installation Year: 2016  
 Water Depth: 10 meters  
 Substructure: Monopile  
 Detailed Design: Topsides  
 Client: Nobelwind/Bladt

Location: Belgian North Sea



**BALTIC 1** (48 MW)  
 Transition Piece Weight: 1.100  
 tonnes  
 Installation Year: 2010  
 Water Depth: 18 meters  
 Substructure: Monopile  
 Detailed Design: TP/monopile  
 Client: EnBW/Ballast Nedam

Location: German Baltic Sea



**COASTAL VIRGINIA I** (880 MW)  
**COASTAL VIRGINIA II** (880 MW)  
**COASTAL VIRGINIA III** (880 MW)  
 Topside Weight: 4.000 tonnes  
 Installation Year: Expected 2026  
 Water Depth: 25.8/31.1/28.4 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure

Location: US East Coast



**HORNSEA II RCS**  
 Topside Weight: 1.852 tonnes  
 Installation Year: 2021  
 Water Depth: 32 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: Ørsted

Location: UK North Sea



**SANDBANK** (288 MW)  
 Topside Weight: 2.230 tonnes  
 Jacket Weight: 1.560 tonnes  
 Installation Year: 2016  
 Water Depth: 29 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Owner/Client: Vattenfall/Bladt

Location: German Bight



**WALNEY 1** (183 MW)  
**WALNEY 2** (183 MW)  
 Topside Weight: 1.000 tonnes  
 Jacket Weight: 940/965 tonnes  
 Installation Year: 2010/2011  
 Water Depth: 21/24 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: Dong Energy

Location: UK Irish Sea



**HAI LONG II** (532 MW)  
**HAI LONG III** (512 MW)  
 Topside Weight: 2.800/2.800 tonnes  
 Installation Year: Expected 2026  
 Water Depth: 26.8/30.1 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: Hai Long Offshore Wind

Location: Taiwanese Coast



**NORTHWESTER II** (224 MW)  
 Topside Weight: 930 tonnes  
 Installation Year: 2019  
 Water Depth: 31 meters  
 Substructure: Monopile  
 Detailed Design: Topsides  
 Client: Northwester II/Bladt

Location: Belgian North Sea



**NORDSEE ONE** (332 MW)  
 Topside Weight: 1.890 tonnes  
 Jacket Weight: 1.375 tonnes  
 Installation Year: 2016  
 Water Depth: 29 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: RWE Innogy/Bladt

Location: German Bight



**GUNFLEET SANDS** (172 MW)  
 Topside Weight: 1.155 tonnes  
 Transition Piece: 155 tonnes  
 Installation Year: 2008  
 Water Depth: 15 meters  
 Substructure: Monopile  
 Detailed Design: Topsides  
 Owner/Client: Ørsted

Location: UK North Sea



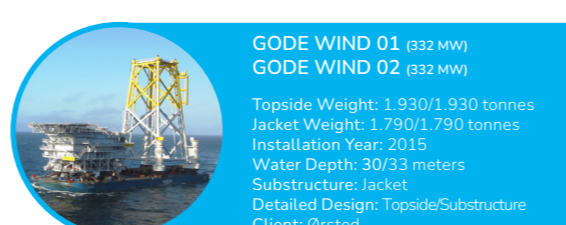
**MAYFLOWER** (1200 MW)  
 Topside Weight: 4.200 tonnes  
 Installation Year: Expected 2024  
 Water Depth: 45 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Owner/Client: Mayflower Wind/BSR

Location: US East Coast



**SIEMENS OTM ALBATROS**  
 (112 MW)  
 Topside Weight: 742 tonnes  
 Installation Year: 2019  
 Water Depth: 39 meters  
 Substructure: Monopile  
 Detailed Design: Topsides  
 Owner/Client: EnBW/Siemens

Location: German Bight



**GODE WIND 01** (332 MW)  
**GODE WIND 02** (332 MW)  
 Topside Weight: 1.930/1.930 tonnes  
 Jacket Weight: 1.790/1.790 tonnes  
 Installation Year: 2015  
 Water Depth: 30/33 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: Ørsted

Location: German Bight



**HORNS REV 2** (209 MW)  
 Topside Weight: 1.238 tonnes  
 Jacket Weight: 798 tonnes  
 Installation Year: 2008  
 Water Depth: 13 meters  
 Substructure: Jacket  
 Detailed Design: Topsides/Substructure  
 Client: Energinet.dk

Location: Danish North Sea

## SERVICES

We provide independent engineering consultancy directly for wind farm owners and developers and EPCI contractors. We are market leaders with more than 50 detailed designs for offshore substations and cooperate with frontrunners worldwide.

### OUR SERVICES INCLUDE

- Feasibility study
- Concept study
- FEED designs
- Basic & detail design
- Workshop drawing
- Assistance with certifications
- Assistance with authority approval  
BSH, Boem etc.
- Offshore assistance  
Skilled staff holding offshore certificates.
- Employer engineer  
Engineering support during detail design, manufacturing and commissioning.  
Development of employers' requirements, philosophies and assistance doing EPC/EPCI contracting.

## ENGINEERING DISCIPLINES

- **Electrical**  
All electrical installations. Cable-ways, earthing and bonding, single line diagrams, power- and light installations, fire alarm systems, auxiliary systems and ATEX area classification.
- **Fire & safety**  
We are cooperating with the client to achieve cost-effective fire & safety design. Chaired hazid and hazop sessions for the client, risk management and studies, fire and explosion risk assesment (FERA).  
Escape, evacuation and rescue analysis (EERA), ALARP register, risk assesments, FOAM and argonite systems.
- **General arrangement**  
We are working with the client to achieve the best platform layout solution: Monopiles, Transition Pieces, Jackets etc.
- **Geotechnical design**  
Design of piles, soil interpretation etc.
- **HVAC**  
Design of systems to maintain the correct conditions for the sensitive platform equipment.
- **Mechanical**  
Working with the client to ascertain the appropriate demands and specifications for equipment lifting and environmental protection.
- **Piping**  
Open drain, bunkering, de-bunkering, seawater cleaning, technical water and sewage systems, sea water systems etc. Isometrics, material lists and stress analysis. Technical specifications and datasheets.
- **Process**  
Process flow (PFD), process & instrumentation diagrams (P&ID), flow calculations, technical specifications and datasheets.
- **Project management**
- **Structural**  
Design of an economical yet robust structure that optimises efficient installation.

## ISC CONSULTING ENGINEERS

We are an engineering services company based in Denmark, where the company was also founded in 1967.

ISC has been providing engineering services to offshore wind projects since we designed the world's first offshore substation, Nysted, more than 20 years ago.

Since then we have successfully undertaken the complete detailed design of 50+ offshore substations. Our portfolio demonstrates comprehensive expertise within the field of offshore substation design, including a broad spectrum of topside layouts as well as jackets, gravity-based, and monopile substructures.

To learn more visit us on  
<https://www.isc.dk/en/services/renewable-energy>



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