

LV Shore Connection - Port of Bergen, Norway

ShoreBoX™ solution powers Offshore Supply Vessels



Solution at glance

Complete turnkey ShoreBoX™ offer to connect Offshore Supply Vessels to Bergen's electrical grid. (2014)

- > Specifications: Power: 1 MVA. Voltage: dual 440/690V, Frequency: Conversion 50/60 Hz.
- > Lead time: 6 months

Green



Green energy: 95% emission reduction

Safe



Fully compliant w/ IEC/IEEE 80005-3 standard

Reliable



95% availability, standard product equipment

Efficient



66% Cost savings when compared to fuel

Value to Customer

- > Solution all in one (with std. pieces)
- > Tested and validated before delivery
- > Easily movable
- > Greener solution at berth, 0% CO2

Project Context

The Port of Bergen (Bergen Og Omland Havnevesen, BOH) is the first in Norway to propose a low voltage shore connection facility with frequency conversion. This facility provides electricity to Offshore Supply Vessels (OSV) at berth in the North Sea zone.

Customer environment:

In the framework of European Commission's blue growth, the amount of maritime traffic and sea freight steadily increases in the region. Norway coasts are part of the Emission Control Areas (ECA), or special areas of prevention of air pollution by ships defined by MARPOL 6. Inside this region, the limit established of SOx should be 0.10% from January 2015. As a result, Bergen's government prioritized the project of onshore electricity for vessels.

Customer challenges:

For BOH, the core challenge is balancing sustainable growth and environmental protection. At this port, OSVs are often required to stay at berth for long-time periods, especially during winter season where sea's meteorological conditions tend to be more critical. In such situations, these vessels remain operational and ready to go if required, which generates an important amount of emissions in the port. In addition, Bergen suffers from air quality problems exacerbated by the local topography, which results in temperature inversions.

Customer Facts

#1 Port in Norway
in number of calls

Solution facts

#1 Reference of LV
Shore Connection

Make the most of your energy

Solution implementation

BOH installs a Shore Connection pilot project with Schneider Electric on one of its berths as a preliminary experience. The technical solution proposed is done with a Low Voltage ShoreBoX™ (440V or 690V) of 1MVA of power. The ShoreBoX™ provides electricity at berth to OSVs operating both at 50 and 60Hz.

Solution contains

- ShoreBoX™ including :
 - > 1000 kVA conversion unit 50/60 Hz based on 2 x 500 kVA converters GALAXY 7000 GFC.
 - > 1 transformer with tapplings to provide 440V and 690V and galvanic insulation
 - > One control panel on the ShoreBoX™ including one HMI for ship identification and Power On/Off push buttons.
- 1 motorized cable reel 2 x 30 m

All standard equipment

Solution 100% compliant with standards, including upcoming:

- IEC/ISO/IEEE 80005-3: Utility connections in port - Part 3: Low Voltage Shore Connection (LVSC) Systems – 5 General requirements (Draft Edition).



Solution at glance

Schneider Electric includes in this solution:

- > Delivery on-site
- > Installation
- > Commissioning
- > Operator Training
- > Word Wide Support



Results

Customer benefits with Shore Connection

- > Ships compliant with ECA requirements at berth
- > More attractive green operations zone: respectful of environmental standards and improved working conditions at the port
- > Improved energy management: high accuracy of measures of energy consumed
- > Active support to economic growth and social concerns of the city of Bergen

Customer benefits with ShoreBoX™

- > **Industrialized solution:** Integrated and tested in factory and directly shipped to port
- > **Plug and Play:** Minimum onsite civil work. Fully automated ship connection procedure
- > **Adaptable:** Movable for berth configuration evolution. Right-sized to ship power demand

Annual savings from reducing emissions up to

320K €

connecting OSVs to shore*

21M €

connecting all vessels to shore*

*Derived costs from estimated quantities and external costs of pollutants emitted by ships at the Port of Bergen, Norway. Based on Transportation Research by McArthur, D. and Osland, L. (2013). Ships in a city harbour: An economic valuation of atmospheric emissions.

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