



Project Manager at Port of Gothenburg, Nikol Gulis (on the left), Hans Nyberg (Stena Line) and Knut Johansson (ABB) take a closer look at the shore connection. The cable is operated from the ferry using a crane. The switchgear and earthing switches are also controlled from the ferry by radio.

# Environmental gains at Port of Gothenburg

Greatly reduced carbon dioxide emissions and a much better working environment. ABB's solution for shoreside electricity makes it possible for Stena Line's German ferries to turn off their diesel engines at Port of Gothenburg.

Text Thomas Östberg Photo Anna Renberg





In Europe, there is only one (smaller) facility like this. The shore connection in Gothenburg therefore serves as an important reference facility for ABB prior to the anticipated breakthrough.

In late January, the facility that many hoped would mark the breakthrough for shoreside electricity at ports had its official opening. Large environmental gains can be achieved by turning off auxiliary motors during port visits.

While at port, the German ferries, Stena Scandinavica and Stena Germanica each require 2.5 MW power.

For diesel-generated electricity, this uses about 440 liters of diesel fuel per hour for each ferry.

During a typical ten-hour port visit, a single ship is able to emit 21 tons of carbon dioxide. At Port of Gothenburg, this corresponds to almost 8,000 tons of carbon dioxide emissions per year.

However, in order for a ship to use shoreside electricity, it is usually necessary to change the frequency. On land, the current has a frequency of 50 Hz (except for North America, South America and western Japan, where it is 60 Hz). However, aside from the Baltic fleet (which requires 50 Hz), the required frequency for vessels is 60 Hz.

“By increasing the frequency to 60 Hz, you can get more power from the engines. That is the greatest advantage,” explains Hans Nyberg, Project Manager at Stena Line.

The operations at Stena Line’s German terminal located in central Gothenburg are classified as environmentally hazardous, which means that a permit is required. In order to renew the permit, the shipping company had to choose between producing its own electricity using high-grade fuels, or using shoreside electricity.

### Shore connection – the best option

Stena chose the latter option and then turned to its landlord, Port of Gothenburg, for assistance in setting up a shore connection.

Once studies had been completed, a

procurement process got underway and the winner was Processkontroll Elektriska AB. It then selected ABB as its technical subcontractor.

Planning and design efforts got underway in June 2010 and the special frequency converters, which must not disturb large grids, were immediately ordered from ABB’s factory in New Zealand.

“One of our requirements was that it had to be possible for a ship employee to connect up without any further assistance, and without having to leave the ship. We wanted this person to be able to operate the cable using a crane and even control the switchgear breakers and earthing switches by radio. And that’s what we got,” says a satisfied Hans Nyberg.

For Stena Line, the new solution doesn’t require the company to hire staff on the landward side. And, the working environment has also gotten better in a variety of ways.

“There is a lot of noise, vibrations and emissions when you produce electricity yourself.

Now, we can avoid all that,” says Hans Nyberg.

In Europe, there is only one other facility like this. It is located at Antwerpen. However, it is smaller and its capacity is 0.8 MVA. The Germany terminal has a capacity of 2.5 MVA, which is why it served as an important reference facility for ABB prior to the anticipated breakthrough for shoreside electricity.

One energy-saving detail that ABB is particularly proud of is that the facility is cooled using free cooling.

“Fans suck in air from outside, which then passes through a filter and creates a cooling air flow, instead of using air conditioning or water cooling. This is the first time that this technology is used on such a large scale,” says Project Manager, Knut Johansson.

“there will be more stringent environmental requirements in conjunction with the construction of new harbors and permit renewals for port operations.”

### International interest

Port of Gothenburg, which is highly committed to sustainability efforts, is also pleased to see a trend of lower emissions at the ports.

“We believe that the use of shoreside electricity will increase and we are trying to sign up more of our customers. There has been a great deal of interest in this, both nationally and internationally,” says Nikol Gulils, Project Manager at Port of Gothenburg.

She explains that there will be more stringent environmental requirements in conjunction with the construction of new harbors and permit renewals for port operations.

“Shoreside electricity will be a good option then. Unfortunately, however, there still aren’t any international standards for connections. And, there aren’t any tax exemptions available that would help make the investments profitable. We’re hoping that both standards and tax reductions will be implemented during 2011,” says Nikol Gulils.

## Facts

### Port of Gothenburg

was founded in 1620 and each year, it handles approximately 43.8 million tons of freight and carries 1.68 million passengers.

### Stena Line

is an international transport and travel company with routes throughout Europe. Stena Line has 35 vessels and connections between eight countries. The company has 5,700 employees.

### ABB

The following items were part of the delivery: Frequency converters (two parallel converters, type PCS100 SFC-1250 kVA), transformers, medium voltage switchgear, ventilation equipment, control and safety equipment, construction and design, testing and commissioning.