

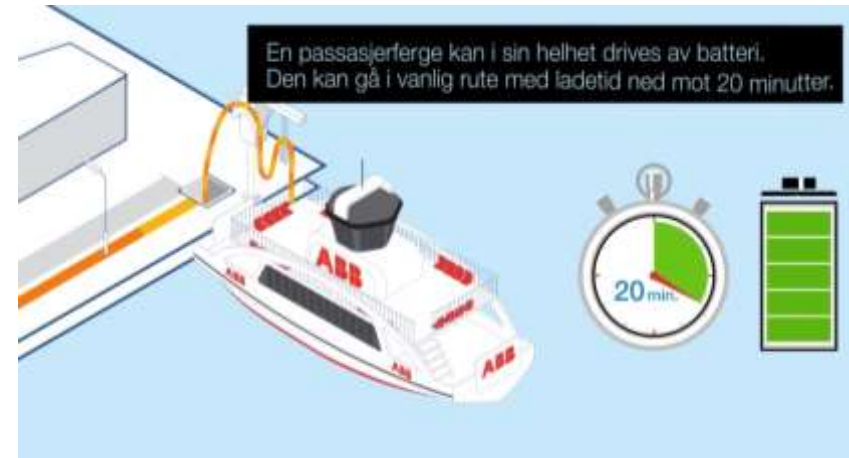


Stian Reite, ABB, Kristiansand - 240816

# Landstrøm Snarveien til bedre luftkvalitet

# Hvem tør ta grepene som monner?

## Person- og kollektivtransport kan bli elektrisk





# Landstrøm er en svært effektiv løsning

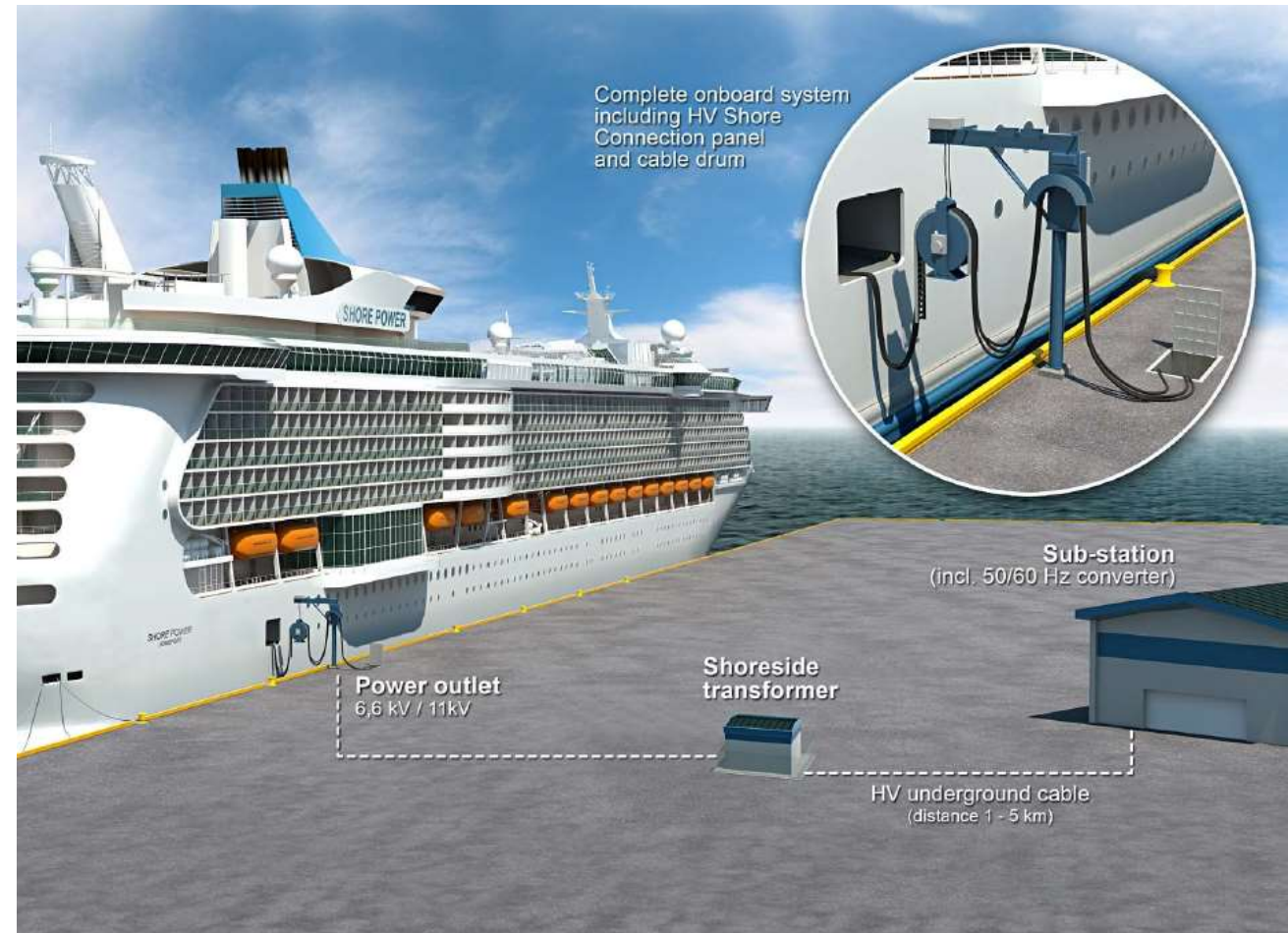
## Konseptet er enkelt

### På fartøyet

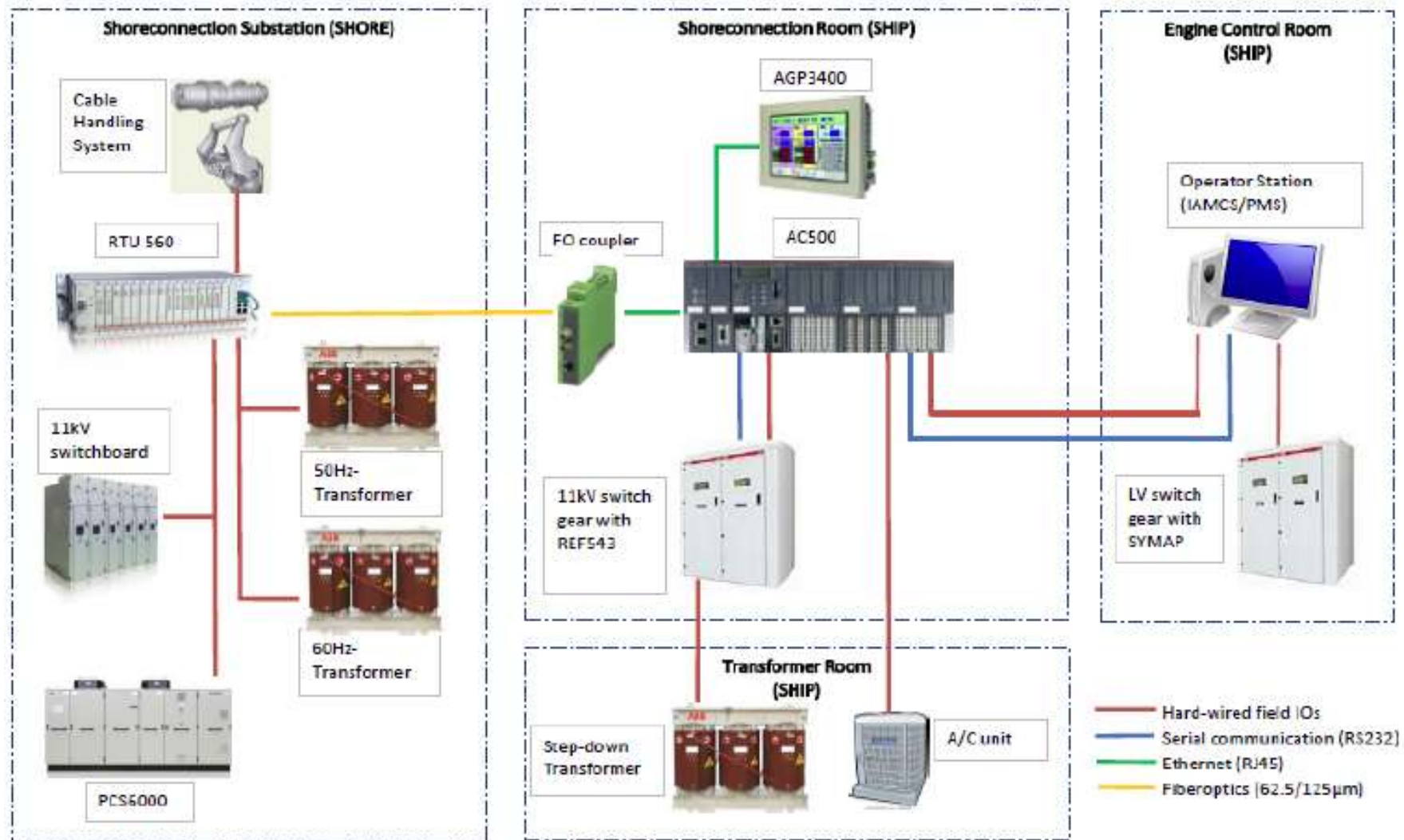
- Tilkoblingspanel
- Transformator
- Kontrollsystem

### På land

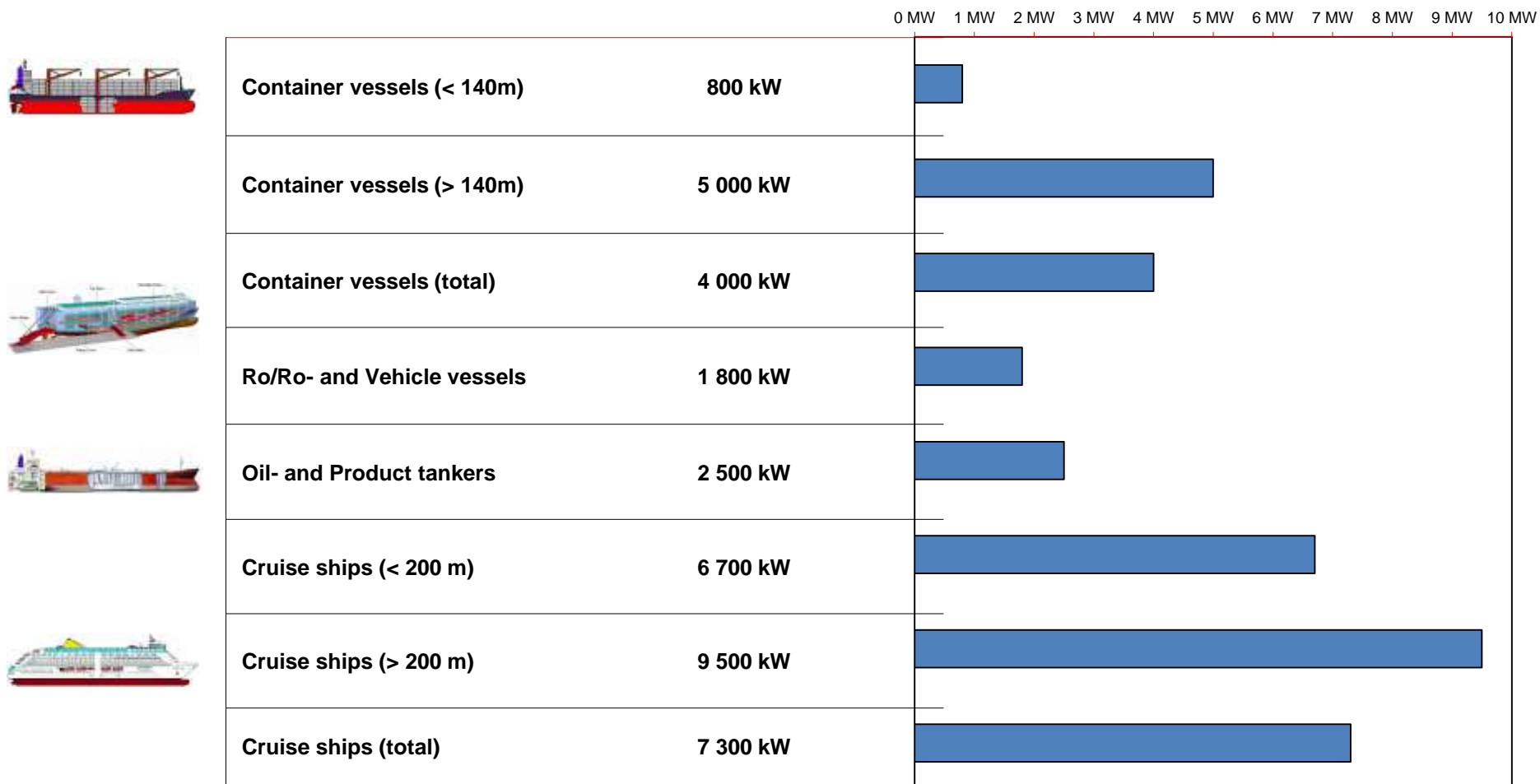
- Transformatorstasjon
- Frekvensomformer (50>60 Hz)
- Kabler
- Plugg og tilkoplingsssystem



# ABB leverer hele systemet

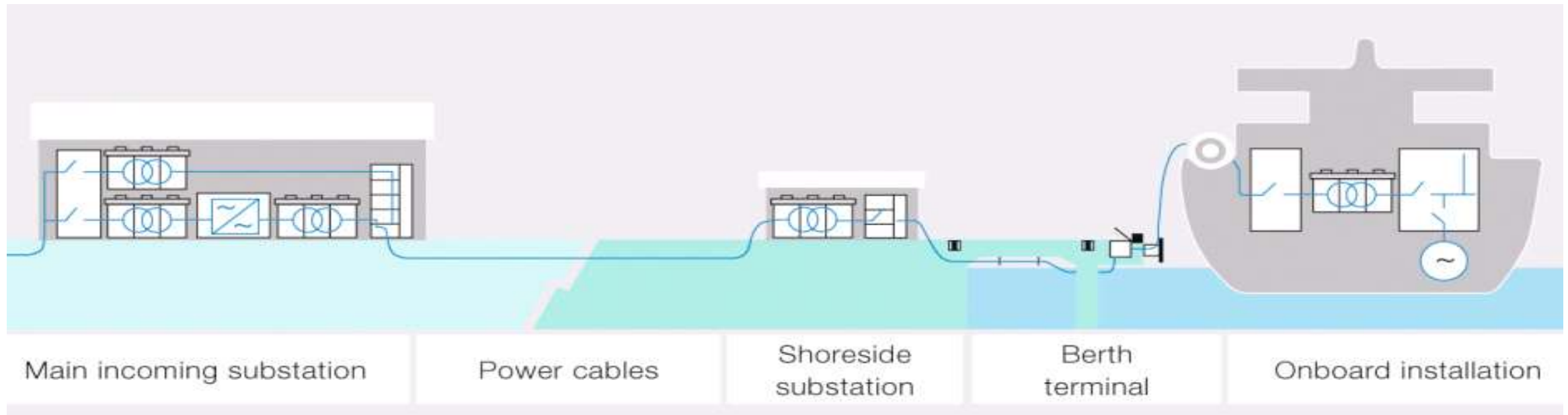


# Effektbehov for ulike typer skip



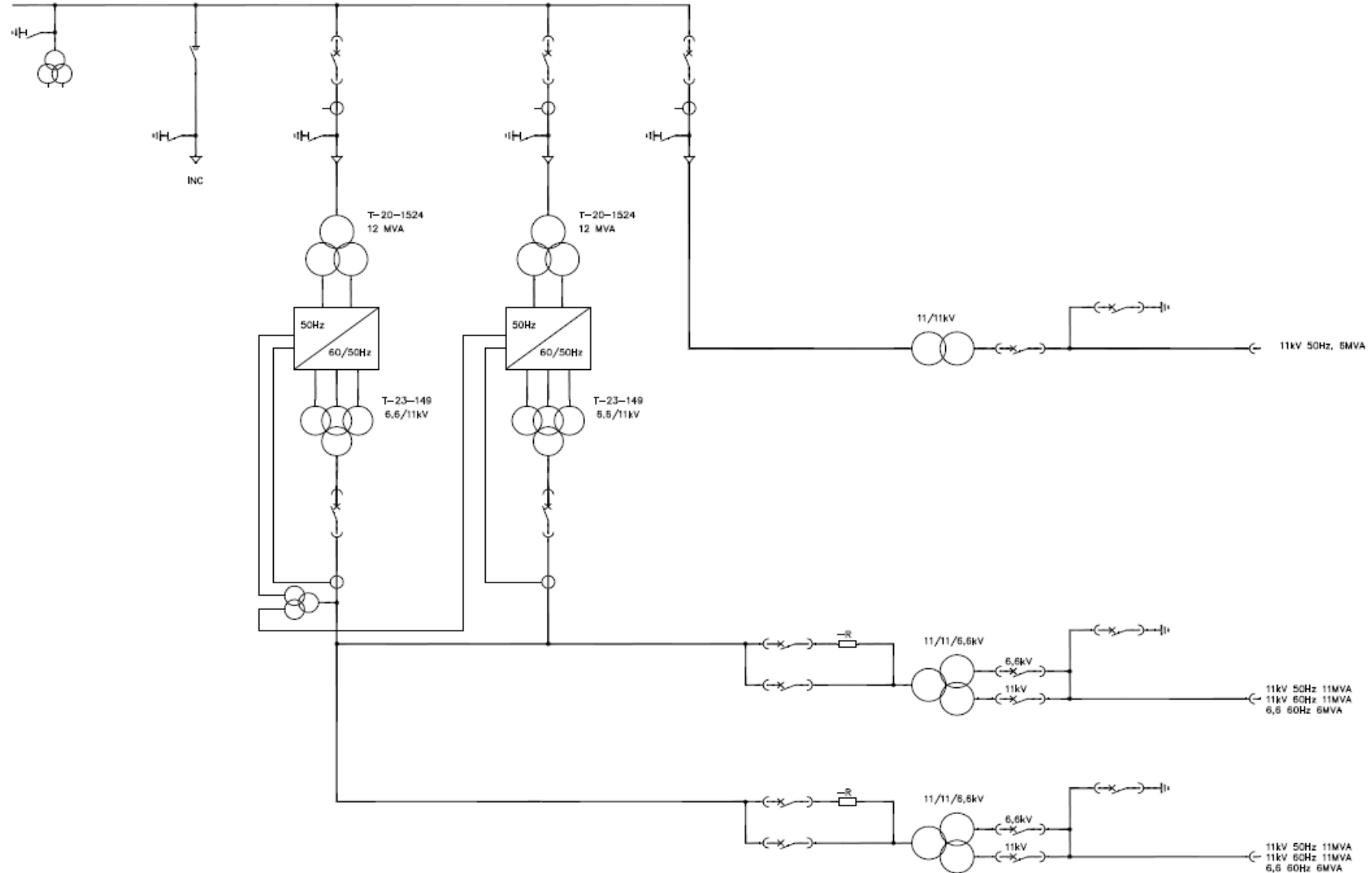
# Landstrøm

## Tekniske installasjoner



# Landanlegg 50/60Hz & 6.6/11kV

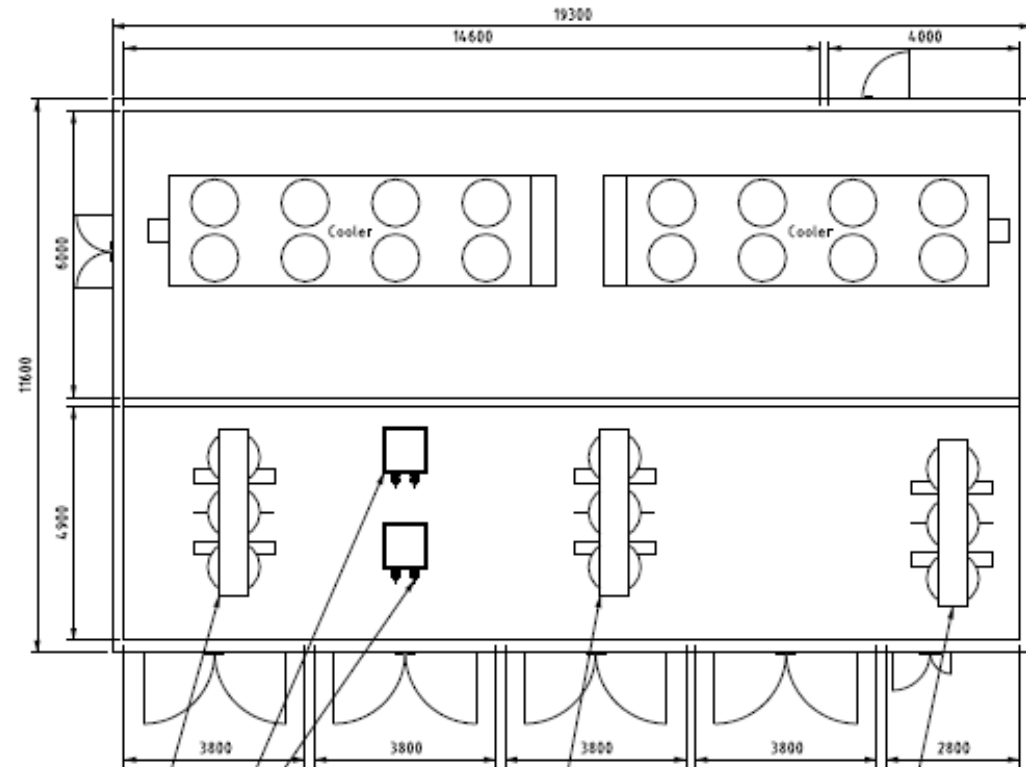
## Sentralisert løsnina



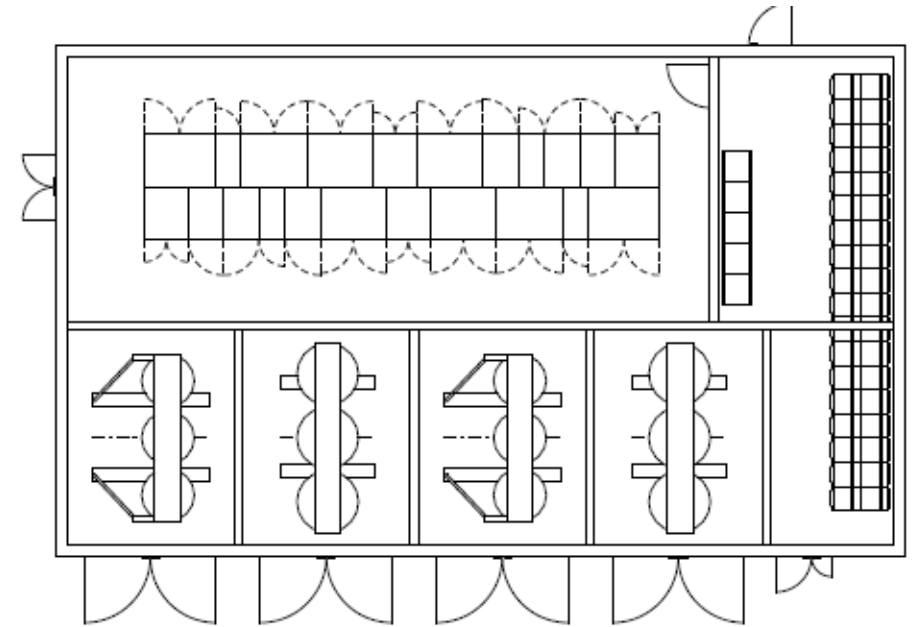
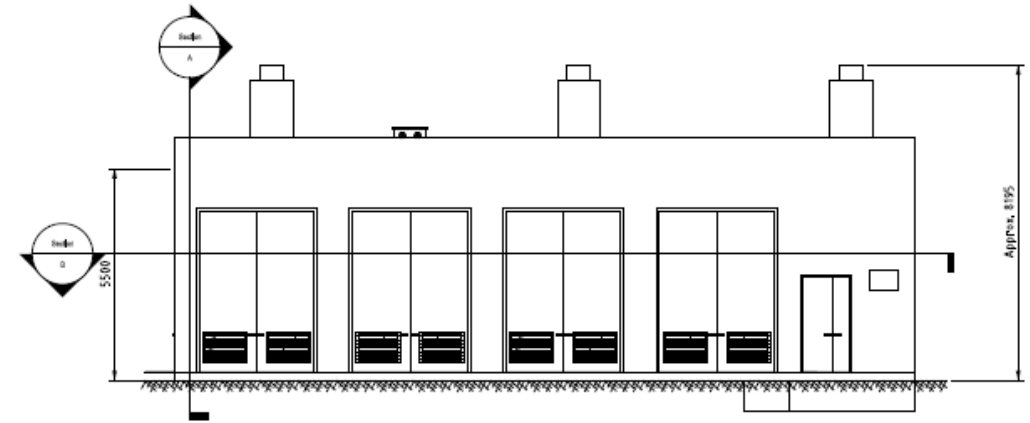
# Landanlegg 50/60Hz & 6.6/11kV

## Sentralisert løsning

- Sentralisert løsning 50/60hz & 6.6/11kV



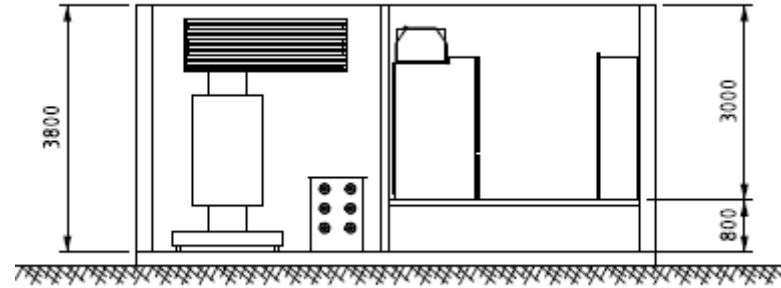
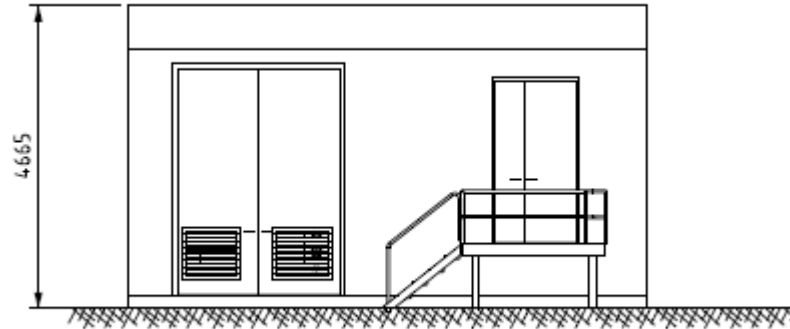
Transformer placed in IPX4D Enclosure  
Resistor placed in IPX4D Enclosure  
Transformer placed in IPX4D Enclosure  
Transformer placed in IPX4D Enclosure



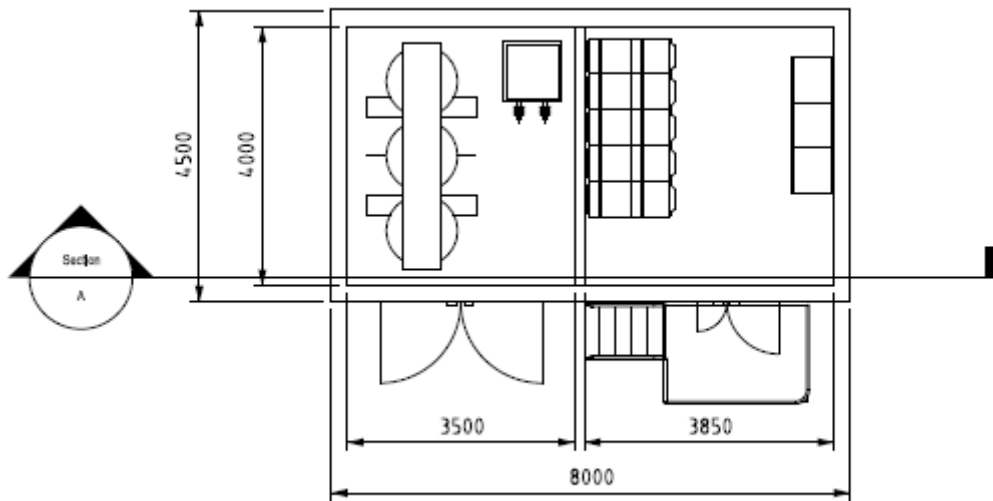


# Landanlegg 50/60Hz & 6.6/11kV

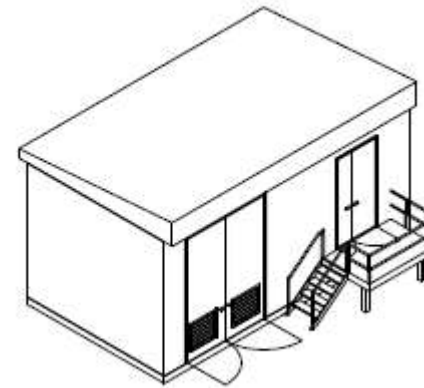
## Sentralisert løsning



Section A

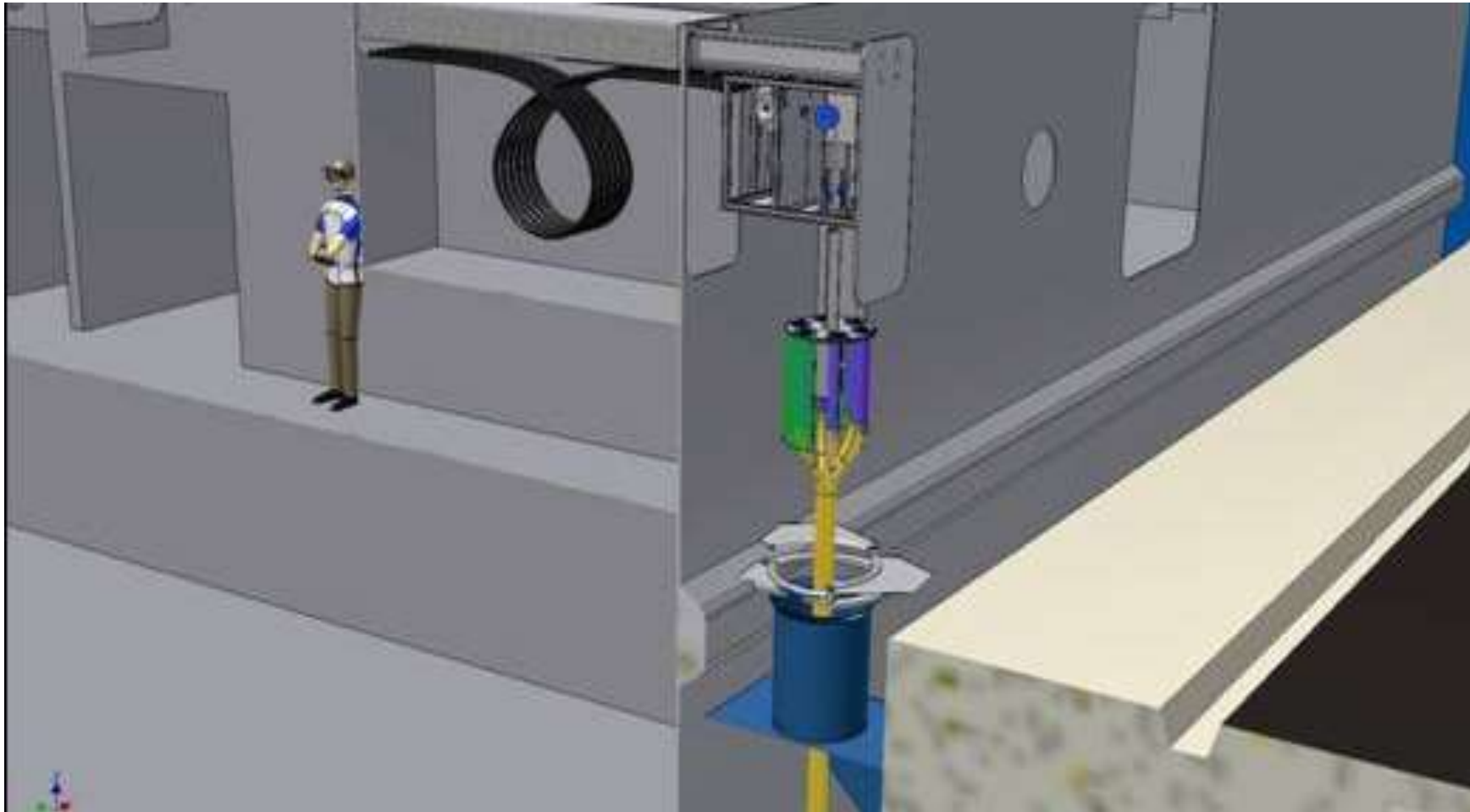


View without roof





# Høyspennings kabelhåndteringssystem For fartøy med faste anløp



# Høyspennings kabelhåndteringssystem på land

## For cruise og ferger





# Port of Ystad, Sweden

## Technical summary

- In 2011-2012 Ystad Port built world largest S2S port with a 50/60 Hz frequency converter, ABB PCS6000.
- Used for ferries travelling to Poland.
- In total 4 connection points.
- A resistance had to be built due to feeding effect was too small, this could have resulted in power failure if not been considered.
- 12 kV, 6,25 MVA solution.



# Port of Gothenburg

## Technical summary

- World first high voltage S2S solution, built in 2000.
- Stora Enso would carry environmentally friendly paper rolls as a "green thread" from the paper mill in Karlstad to European ports, the port of Gothenburg received the award "Clean Marine Award"
- In 2010 the second S2S project was carried out. This project was executed for Stena Line ferries going to Germany.
- The "Stena Line" S2S is 12 kV, 50/60 Hz (ABB PCS6000), 2500 kVA solution. This was later upgraded to 3150 kVA due to new understanding about effect factor,  $\cos(\phi)$ .





# Port of Korsør – Navy Vessels - Denmark

## Navy Vessels - Korsør

### ▪ Project Scope ABB

- MV Switchgear Safe+
- LV MNS distribution panels
- Control system AC500 plc
- Dry type Transformers
- PCS100 Converters
- Shore connection panels
- Installation
- Commissioning & Testing



### ***ABB statement in Press Release:***

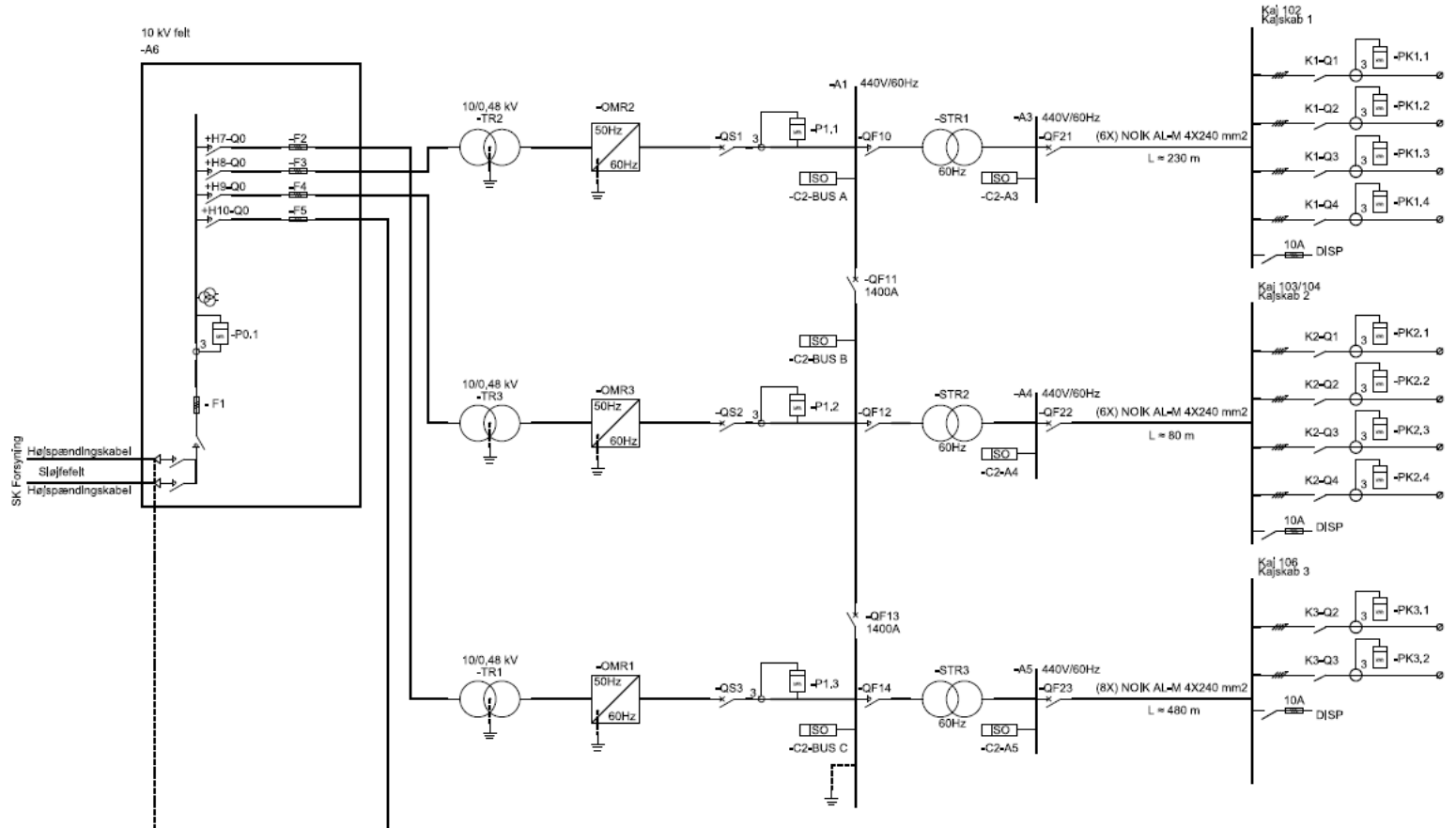
#### **Technical data**

ABB's supply includes an advanced control system complete with all electric equipment, from 10 kV 50 Hz switchgear to the three 440 V 60 Hz quay cabinets. Several low voltage power distribution panels and a large number of transformers are also included. When choosing the solution, the Danish Defence has attached great importance to the efficiency and the supply reliability of the plant. Therefore they selected ABB's new 50/60 Hz static converters, which are based on modular and redundant power electronics with the highest efficiency of the market.

# Port of Korsør – Navy Vessels – Denmark

## Navy Vessels - Korsør

- Single line  
3 x 1000A





# Port of Korsør – Navy Vessels - Denmark

## Navy Vessels - Korsør

- PORT

- Converter building  
3 x 1000A



- Connection panel  
1000A



# Port of Korsør – Navy Vessels - Denmark

## Navy Vessels - Korsør

- **PCS100 Converters**
  - **Mid side view**



# Port of Korsør – Navy Vessels - Denmark

## Navy Vessels - Korsør

- Water front apartments within 500 metres

City-centre





# Hva med annen skipstrafikk? Utslippsfrie havneanløp



noise



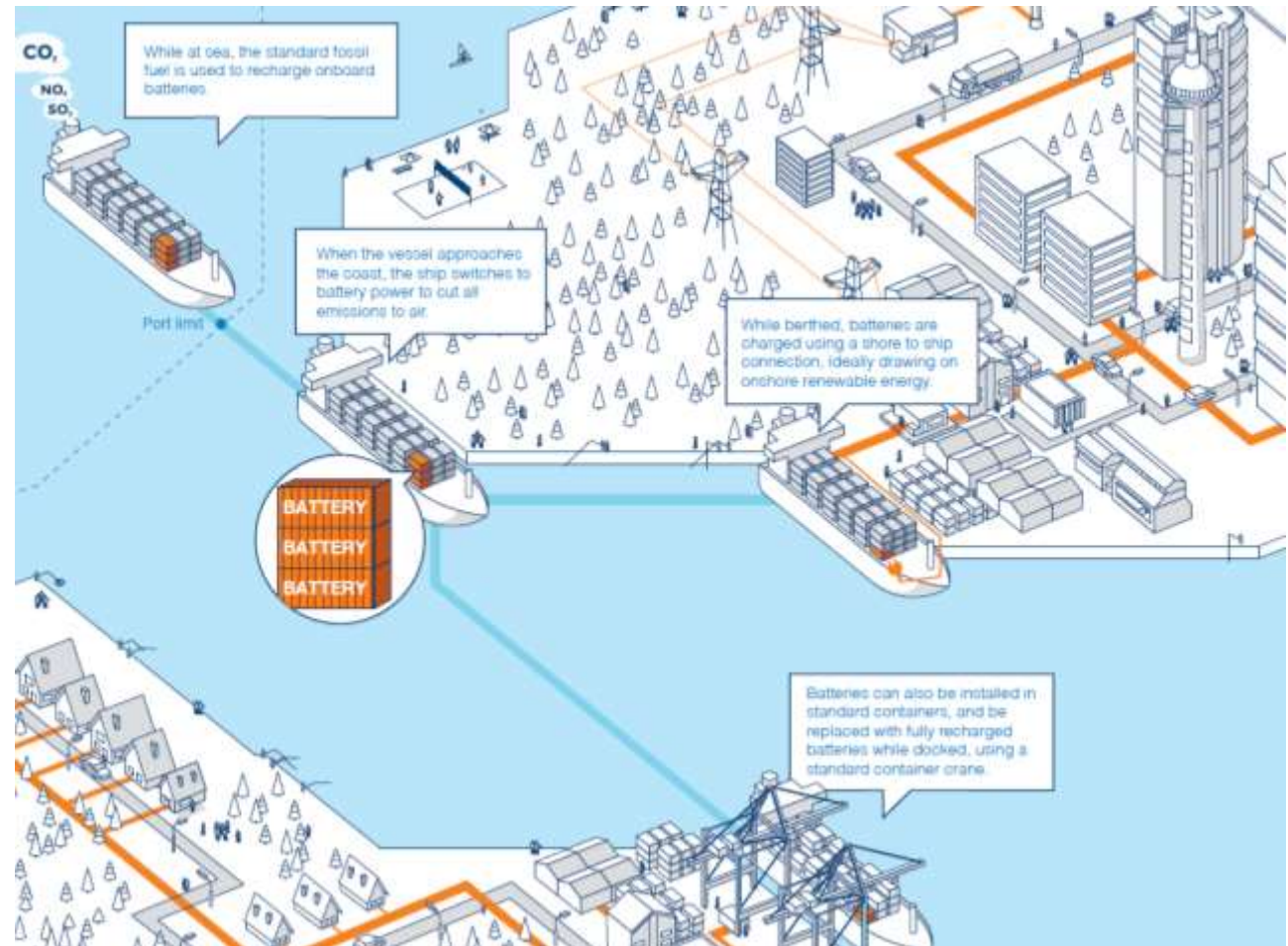
emissions



particles

Eksempel:

- Containerskip 7MW
- Forventet last: 1.5MWh/h
- Størrelse: 2 x teu container





Power and productivity  
for a better world™

