

# Current innovations and solutions for effective port operations



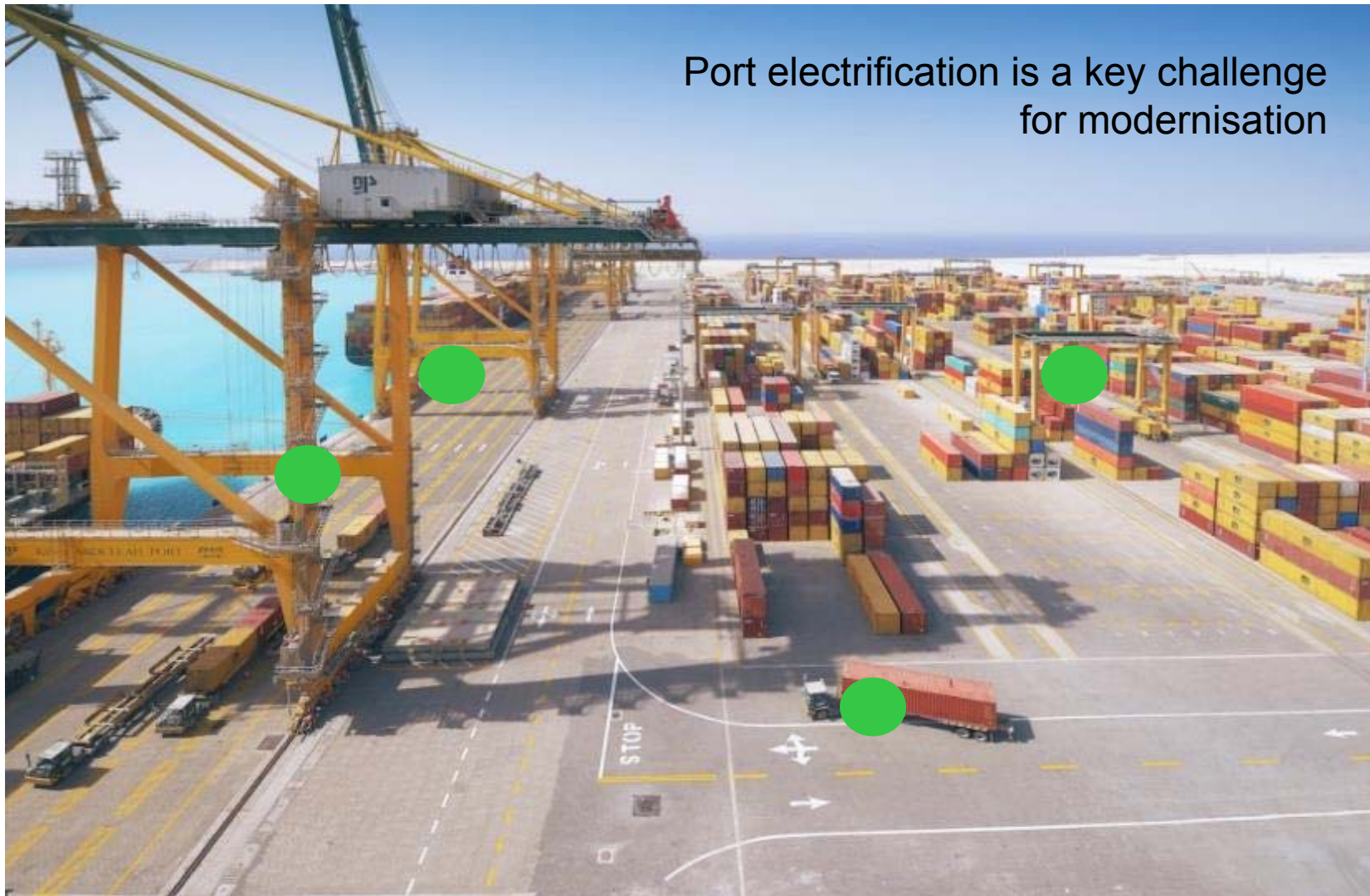
Matthieu NADAUD

**Schneider**  
Electric

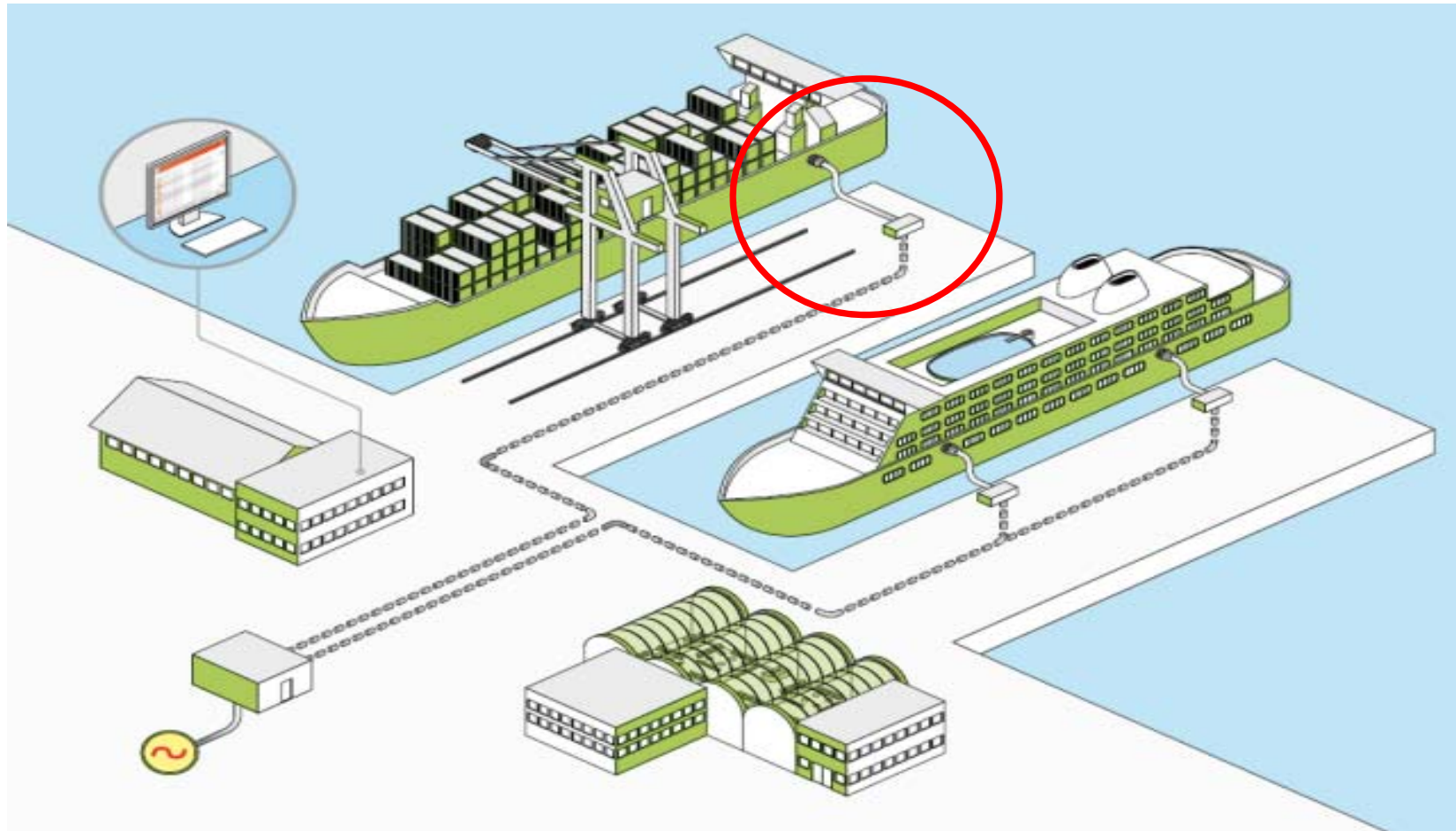
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Port electrification is a key challenge for modernisation



## Focus on cold ironing

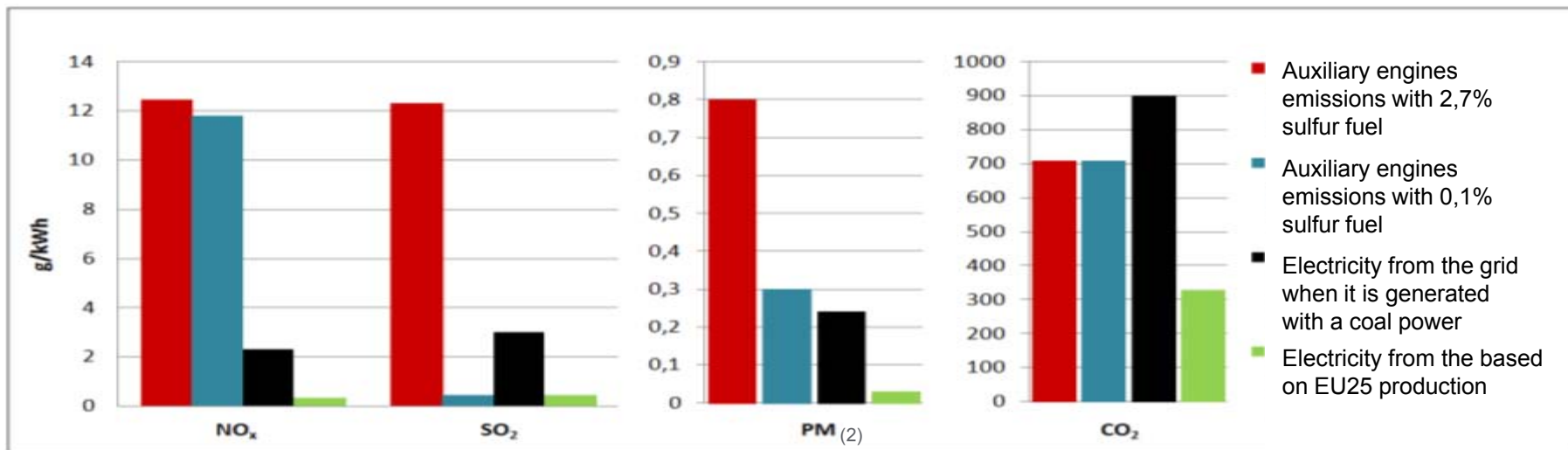




# Benefit on air pollution



Land-produced electricity is always less pollutant than burning bunkering fuel



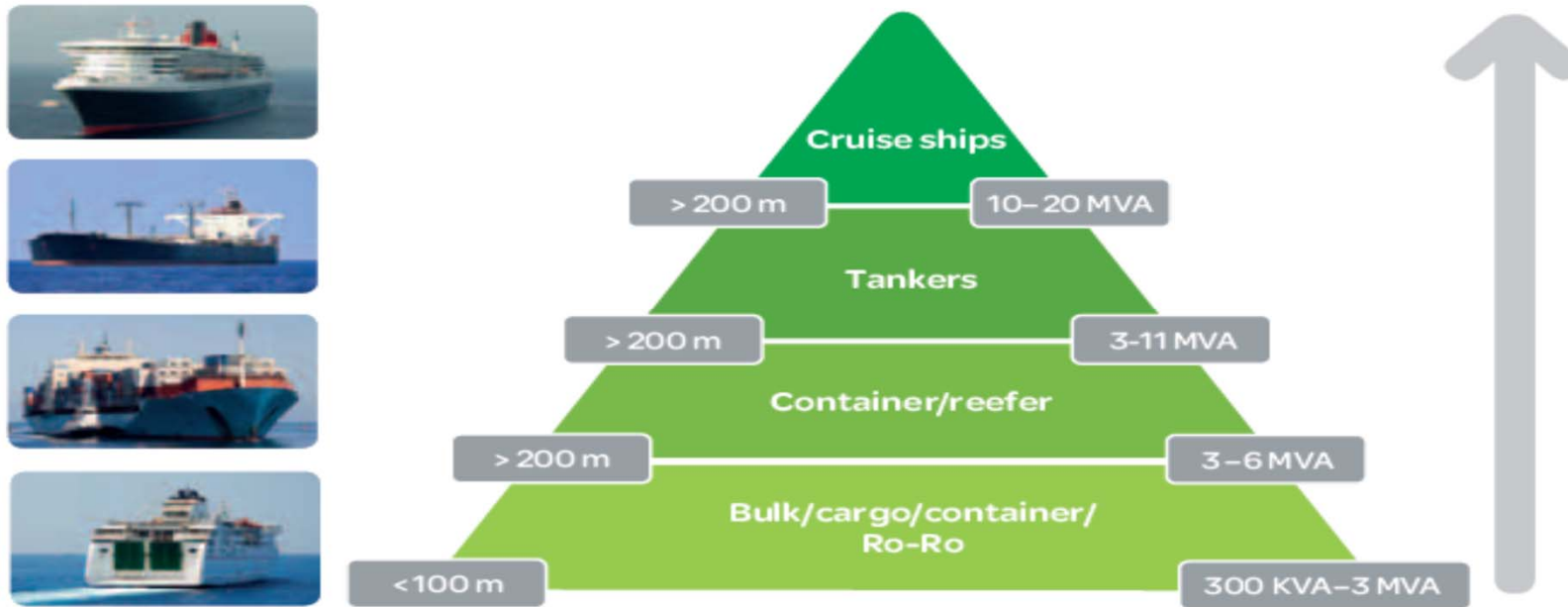
Source : Entec UK Limited, 2005, p.13 et Cousins, 2011, p.11

... but not only

- It is compliant to mandatory **regulations** for ships and shore
  - MARPOL VI, ECA Zones
  - Local regulations (EU directives 2003/96/EC, 2005/33/EC, California CARB, China MoT)
  - ...
- It reduces **noise and vibration** pollution
- It Achieves **operational savings** for ships (fuel and maintenance)
- It can be a **new revenue** for port entities
- It is **interoperable** throughout the world

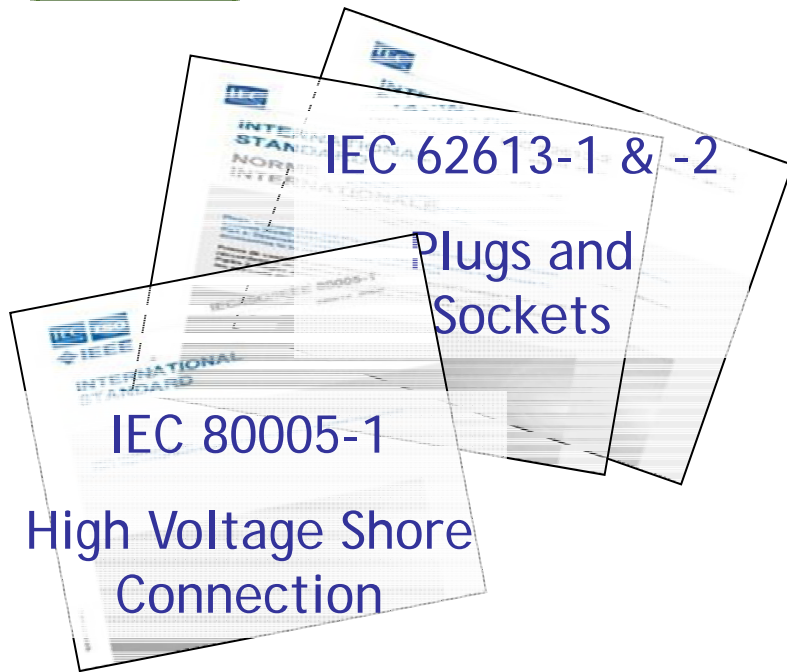


# Power demand



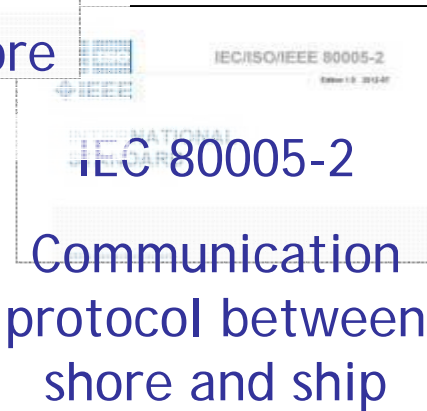
# The standards are on place

**FINAL**



**PAS**

PUBLICLY AVAILABLE  
SPECIFICATION  
PRE-STANDARD

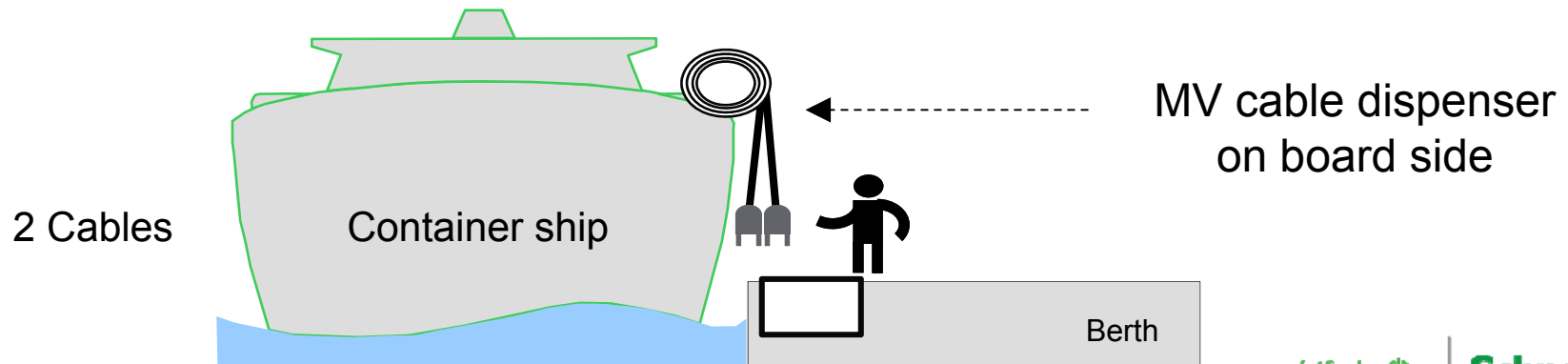
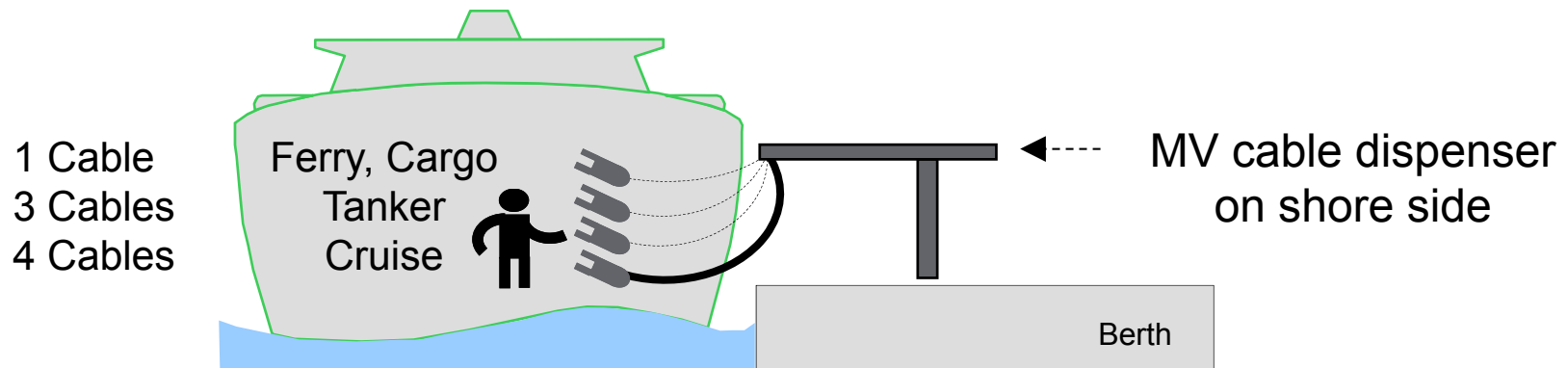


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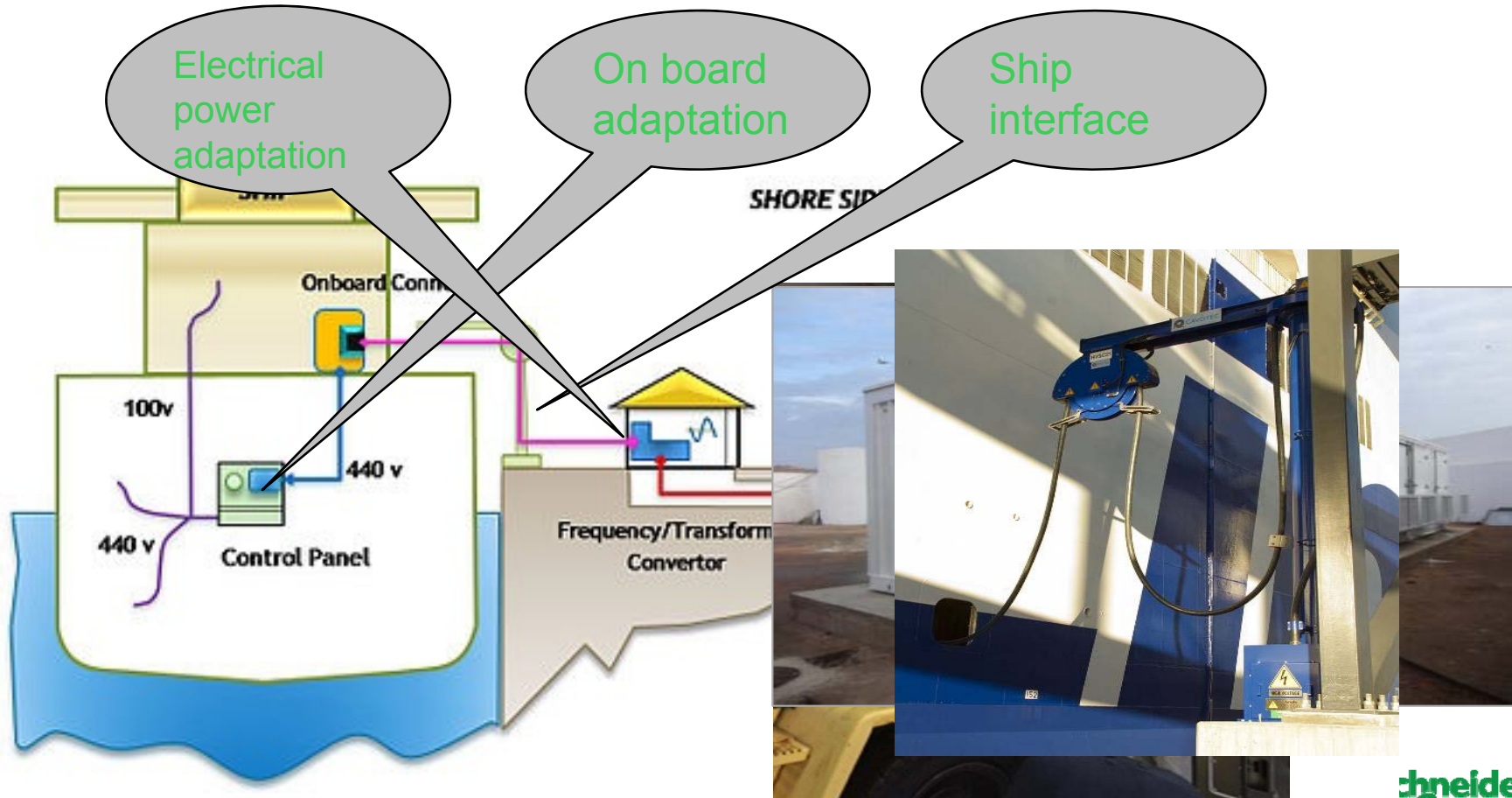


## Two main cable interfaces



In short:

	Vessel type					
	Container	RORO Ferry	Cruise	Navy	Various small	FSU
Voltage	6,6KV	11KV	11KV 6,6KV	6,6KV 11KV 440V	440V	6,6KV
Nb of cables	2	1	4	1 to 4	1 to 4	2 to 3
Max power	7,5MVA	6,5MVA	20MVA	~10MVA	1MVA	~10MVA
Frequency	60Hz	50/60Hz	60Hz	50/60Hz	50/60Hz	60Hz
Cable	Onboard	Onshore	Onshore	Case by case	Onshore	Onshore
Cable managt	AMP & pits	Crane	Crane	Case by case	Case by case	Case by case



# PERSPECTIVES

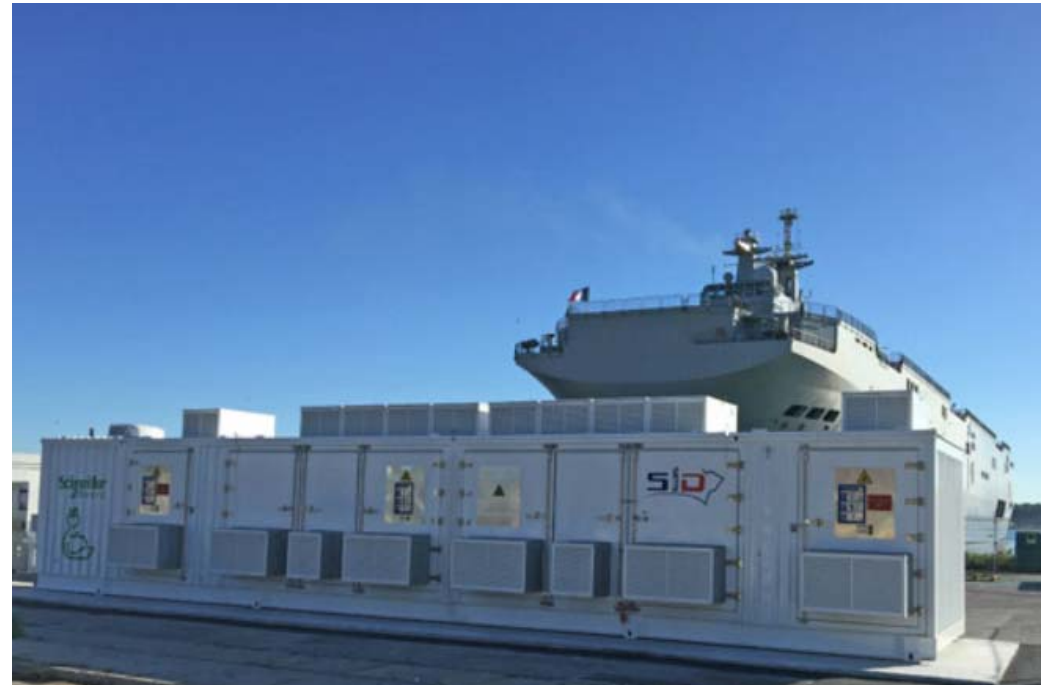
# Navy

Most navy vessels are shore powered at berth

Replace old rotating system



by modern static technology.



Increased efficiency

Easier and cheaper maintenance

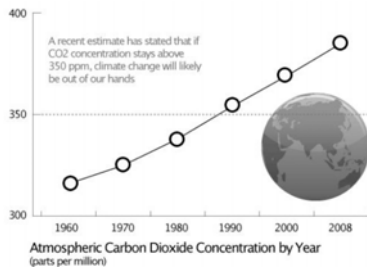


# Container ship

Launched in the US (California, 2007)

Reduce air pollution  
in port

50% (2014)  
80% (2020).



Many ships are equipped

Shore power has started worldwide  
(Indonesia, Latvia...)

Several projects are under study.

Importance to include pits in new berth  
design.



A new service in port

Easy to launch pilot projects

## Cruise ship

Launched in the US (California, 2007)

Reduce air pollution/noise/vibration

All new cruise ships are equipped

Many shore power initiatives throughout the world.

Limited by high power demand



A real benefit for passengers health and confort

Situated close to urban area

## Small ships

A large number of ships stay at berth for long period of time

Reduces air pollution and increases auxiliary engines lifetime.

Onshore Vessels

Tugs

River boats



A reduced investment for high benefit

## Shipyards

**Need electrical power during vessel construction and testing**

Replace diesel generators by shoreside power systems

Reduces air pollution / noise / vibrations for workers.



A reduced investment for high benefit

Need for a mobile unit

# FSU

The Floating Storage Unit is shore powered.

High berthing time rate.

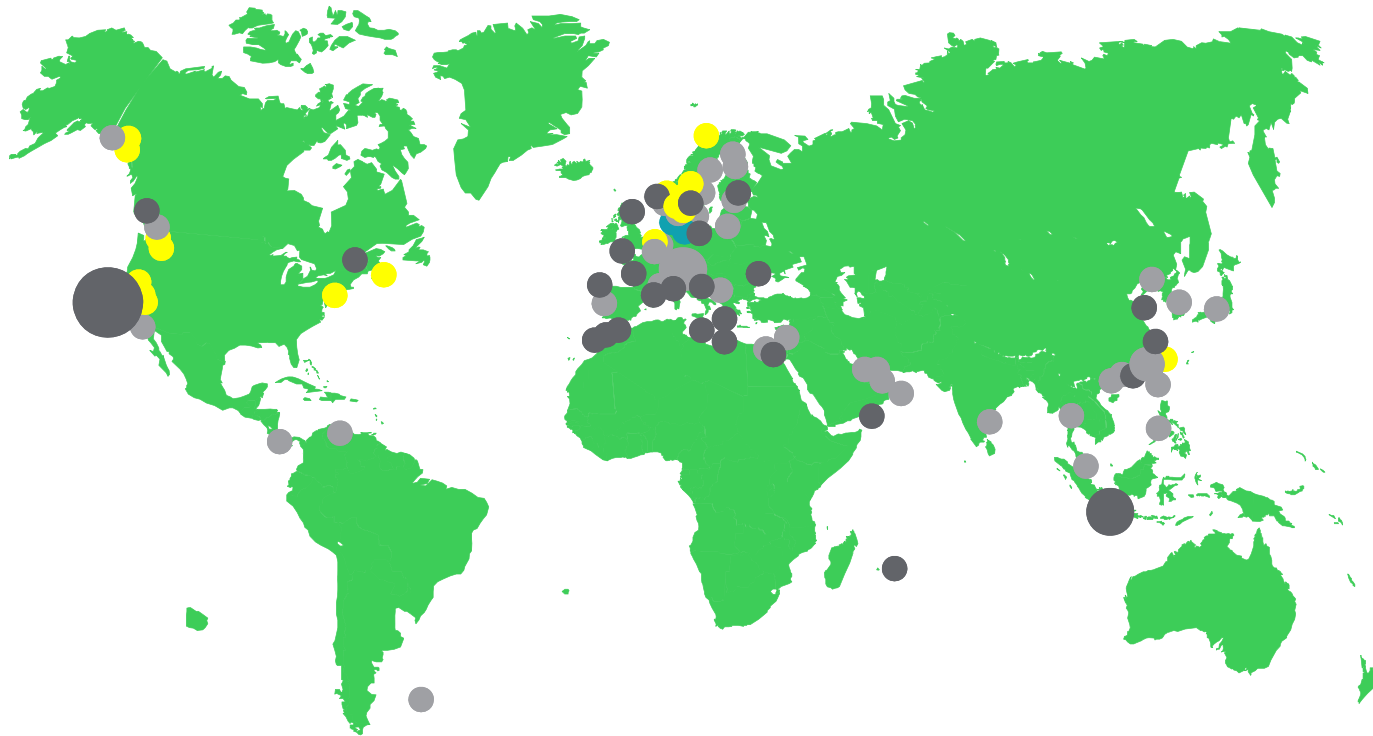
Medium power required (up to 10MVA)



The static technology perfectly fits with such demand.



## Existing shore connection units



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Thank you !



**Matthieu NADAUD**

**France**

**+33(0)6 30 25 12 28**

**[matthieu.nadaud@schneider-electric.com](mailto:matthieu.nadaud@schneider-electric.com)**