

# SCHNEIDER INNOVATION AT EVERY LEVEL

Life Is On | **Schneider**  
Electric





# Schneider Electric, the Global Specialist in Energy Management and Automation



**€26.6Bn**

FY 2015 revenues

**~ 5%**

of revenues devoted to R&D



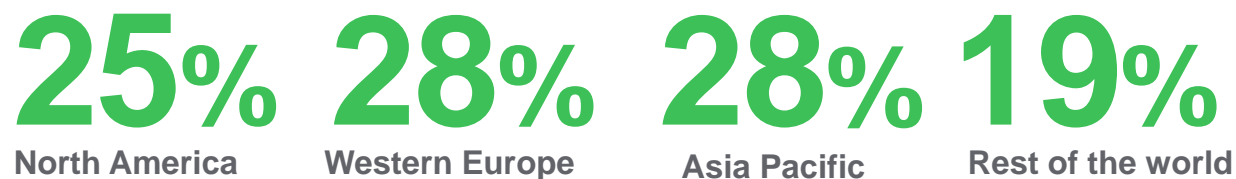
**~160+**

people in 100+ countries

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## ...with Balanced Geographies



## ...with Diversified End Markets



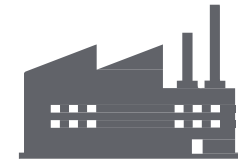
Datacenter & Networks



Building



Infrastructure



Industry

14%

34%

25%

27%

FY 2015 Revenues





Our technologies ensure that  
**everywhere, for everyone and at every moment.**

# Life Is On

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**Schneider**  
Electric



Energy is the base of life.

# Life Is n

when Energy is on.....

We ensure energy is on by making it

- **Safe**
- **Reliable**
- **Efficient**
- **Sustainable**
- **Connected**

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**HOMES**



**BUILDINGS**



**DATA CENTERS**



**INDUSTRIES**



**GRID**





Historical  
presence in  
Morocco  
More than 60  
years...

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**120** Employees



**300** Customers



**19** Official Distributors



**11** Panelbuilders



**7** Alliance SI



**2** Licensed MV/LV Kiosks



**60** IT partners



**300** Retailers



**180** Specifiers



# Success Stories

## Renewables : Cegelec Morocco - Wind Farms of Haouma, Fom El Oued & Akhefenir

22 substations equipped cell FLUSARC 36 KV (Ex-Areva) + 2500 KVA transformer, supplied by Wind Turbine SWT-2393, (Wind Farm in Fom El Oued - 50 MW)

22 substations equipped cell FLUSARC 24KV (Ex-Areva) + 2500 KVA transformer, supplied by Wind Turbine SWT-2393, (Haouma of Wind Farm - 50 MW)

Akhfenir Wind Farm (100MW): Contract CNC Control.

## Transportation : ALSTOM Transport - Casablanca Tramway

Schneider Electric Medium Voltage (MV) cells provide the electrical power to the 23 sub-stations. Programmable Automation Control (PAC) for starting the trams and Uninterruptible Power Supplies (UPS) to serve as backup power in the event of unanticipated power outages. Schneider Electric software solutions : Plantstruxure architecture allows for the hardware solutions to be modular and scalable, which in turn allows for higher cost savings.

## Utilities : RADEEM - BCC of Meknes

Retrofit of substations

Automate grid management

Monitor grid status in real time

Quickly re-power sensitive customers

Services :

Technical solution co-design and set-up

Data transfer from previous system

Audit, test, commission & staff training

Equipments:

30 MV/LV transformers

40 default detectors

Remote control system

Construction of the control center building



*Wind farms*



*Tramway de Casablanca*



*BCC of Meknes*



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# Success Stories

## MMM : OCP - ODI : Owner Direct Investment

SE Morocco / Egypt signed a contract for a project of MCC and VV for 4 complex chemical fertilizer.

Each ODI has 4 workshops-energy-sulfuric-phosphoric fertilizer

Needs :

- 17 OKKEN panels constituting 300 columns
- 4 Supervisors SCC 17 PLCs
- 180 enclosures, starters, drives

The same equipment will be provided on four other projects are in total:

1200 columns MCC-16-68 supervisors PLC cabinets -720 VV starter



Office Cherifien des Phosphates : Jorf Lasfar

# Success Stories

## MMM : OCP - Energy Management

Design, supply and installation of an Energy system management of electrical exchanges between ONE – MP – IMACIDE - PMP and BMP :

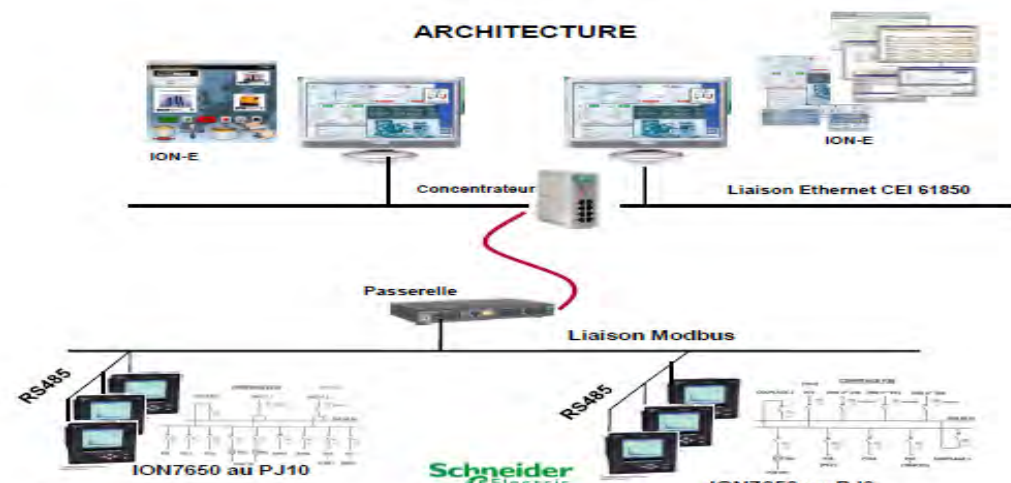
22 ION 7650

ION-E redundant , CEI61850 & 60870 -5-103 Communication Protocol

Installation, Commissioning & Training



OCP Jorf Lasfar





# Success Stories

## Utilities : RADEJ : Substation turnkey project

MV Cells, Energy automation

## Building : Tour Maroc Telecom

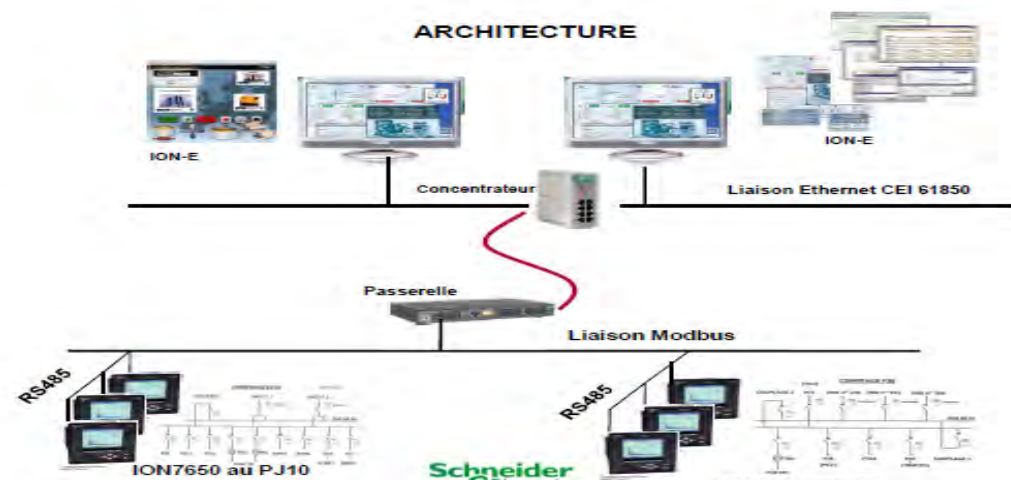
BMS, VDI, Cameras

## Water : Suez Environment -Treatment station Sidi Barnoussi

Speed drive, PLCs, CMS, MV, LV

## Building : OCP - Benguerrir University : Green city

Prisma, transformers, MV Cells



# Success Stories

## Utilities : ONEE - Kenitra Thermal - Power MV Switchboard renovation

Contractual scope of Supply

Retrofits of :

22 x MV Circuit breakers Magrini  
17,5KV – 800A

22 x Protection relays Schlumberger  
by Sepam

Installation, Commissioning

Integrated solution thanks to SE Italy  
(Ecofit)





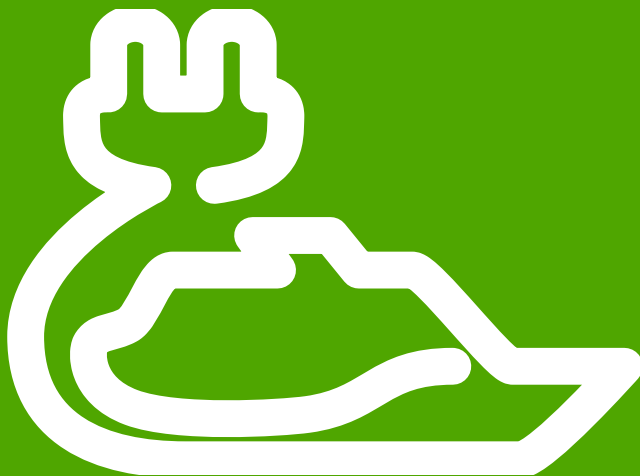
Shore connection solutions

# Benefits and practical examples

Matthieu NADAUD

Regional Commercial Director, Shore Connection solutions

Tanger, April 2016



[www.schneider-electric.com/shore-connection](http://www.schneider-electric.com/shore-connection)

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Trend : the airports yesterday, the ports tomorrow





# Shore connection principle

Cut off the auxiliary engines and  
rely on shore power

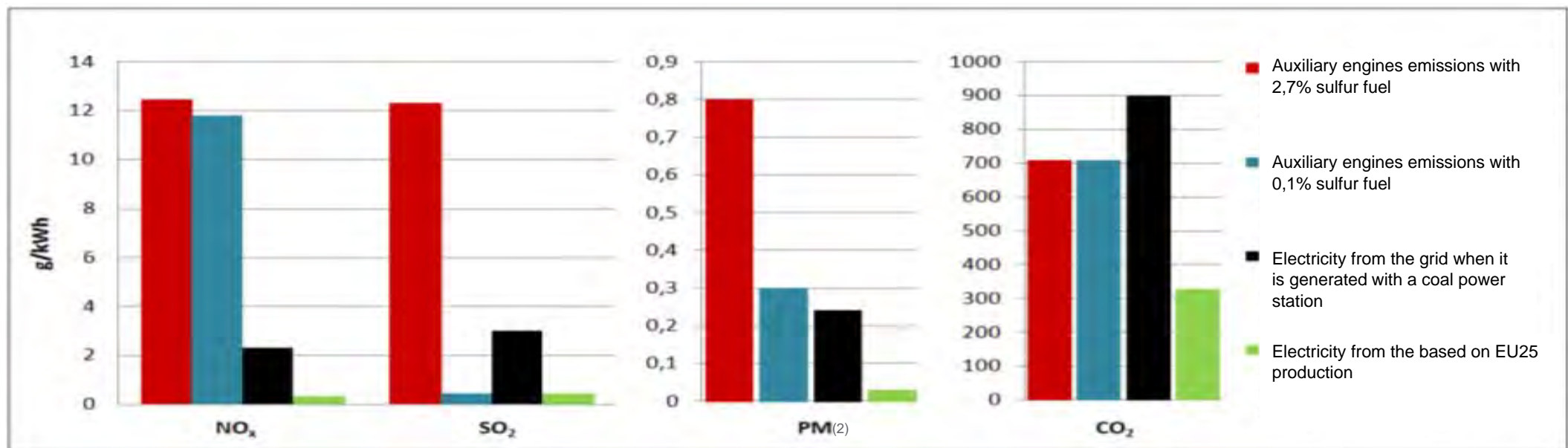
The electrical power is  
out of scope



# Benefit on air pollution



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



Source : Entec UK Limited, 2005, p.13 et Cousins, 2011,p.31  
(2) Particulate matter



## ... 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

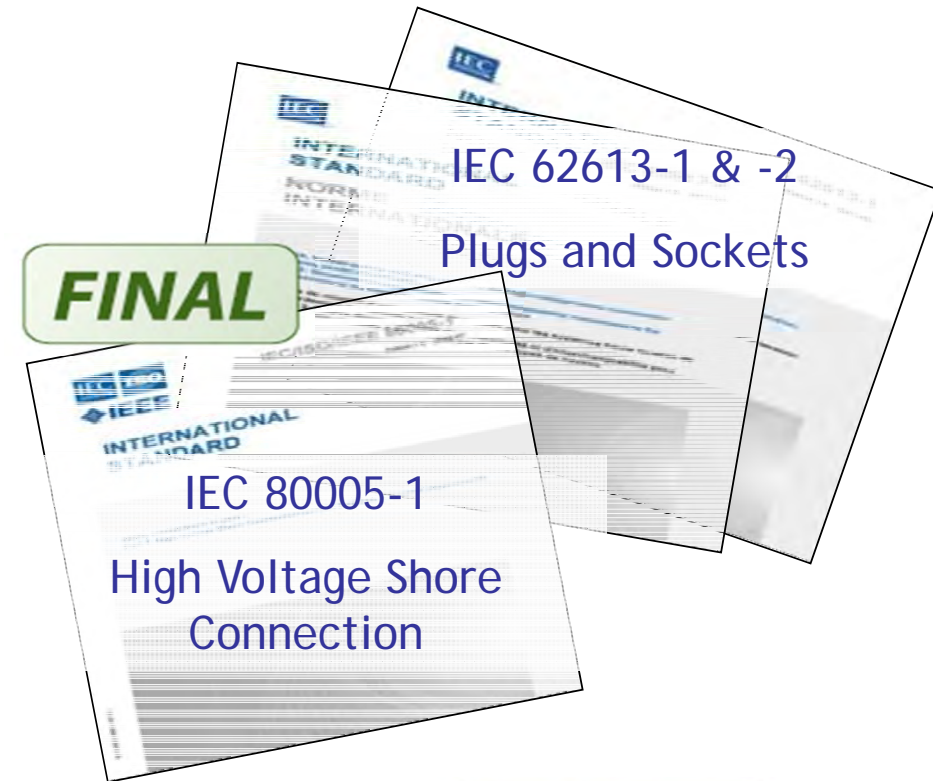
# Status of the standards

## Main Standard :

IEC / ISO / IEEE 80005-1, HVSC  
IEC / ISO / IEEE 80005-2, Com. Protocol  
IEC / ISO / IEEE 80005-3, LVSC

## Plugs & Sockets outlets

IEC 62 613, Plugs & Sockets Outlets



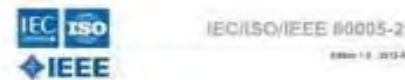
PUBLICLY AVAILABLE  
SPECIFICATION  
PRE-STANDARD

**PAS**



IEC 80005-3

Low Voltage Shore Connection



IEC 80005-2

Communication protocol  
between shore and ship

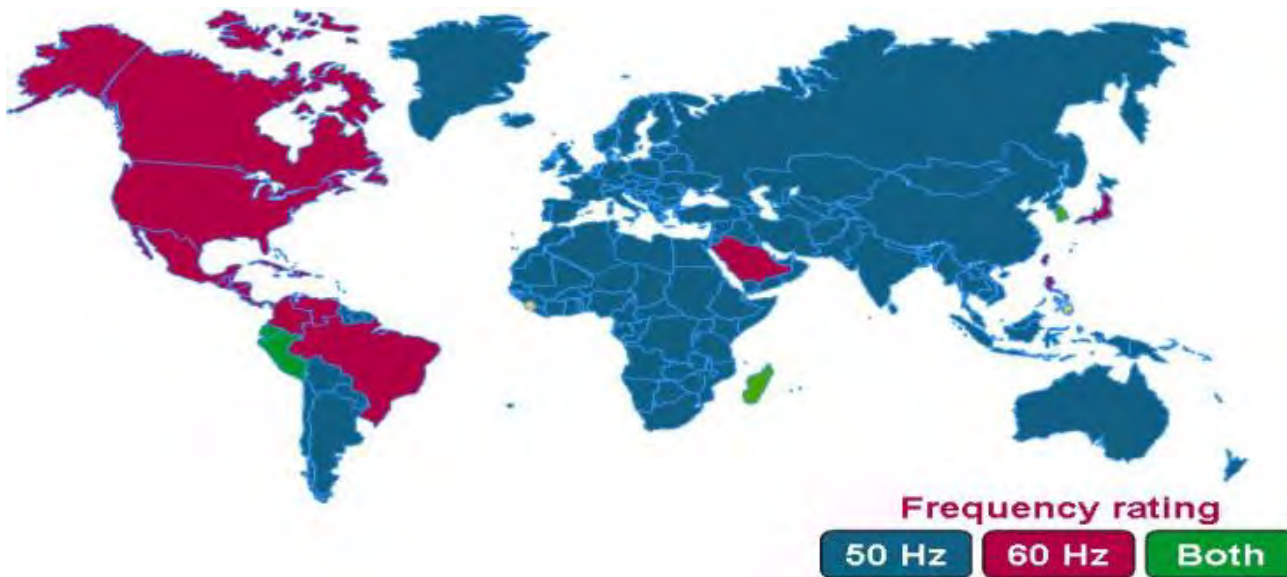
**DRAFT**

\*PAS Publicly Available Specification ,



# Focus on the power adaptation. Why such a need ?

## Frequency



## Voltage

Type	Max. power	Voltage	Nr. of cables
Ferry, Cargo	6,5 MVA	11 kV	1
Tanker	11 MVA	11 kV	3
Cruise ship	20 MVA	6,6 or 11 kV	4
Container ship	7,5 MVA	6,6 kV	2

# ShoreBoX Concept



All-in-one system that **can be moved** in case of port reconfiguration

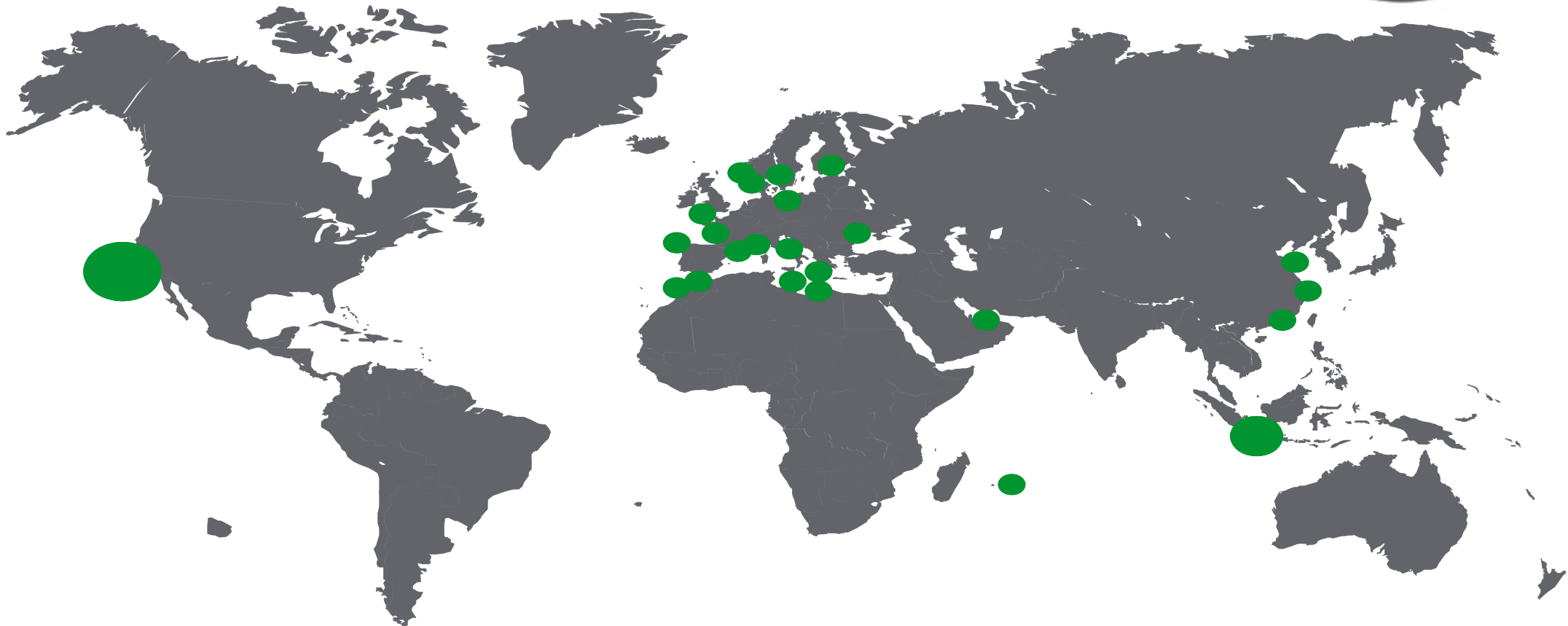
Quickly installed and commissioned for **a minimized disturbance** of port activity

**Extendable** by paralleling ShoreBoXes

Manufactured and tested in a **controlled factory environment**



# Schneider Electric worldwide references



# Future Kalibaru Container Terminal

- Existing port does not have the capacity to host the increasing sea freight volumes
- Development of the new **KCT** (Kalibaru Container Terminal) **started in March 2013**
- Future capacity **13 M 20-foot containers / year**
- First phase is scheduled for **completion in late 2017**
- When fully operational, it will be the **country's largest industrial port** and the **3<sup>rd</sup> in South East Asia**



- **New green, modern port** in South Asia
- First phase includes **9 berths equipped with Schneider Electric 5-MVA shore connection systems**
- **2<sup>nd</sup> and 3<sup>rd</sup> phases will equip berths** with shore connection as well





# Moroccan Port (Casablanca & Tanger)



The ShoreBoX leaving the factory beginning of January 2014

During the commissioning, end of January 2014



The ShoreBoX in operation

# Containership terminal at Port of Riga



Berth under construction



2 2MVA ShoreBoX shipped from France



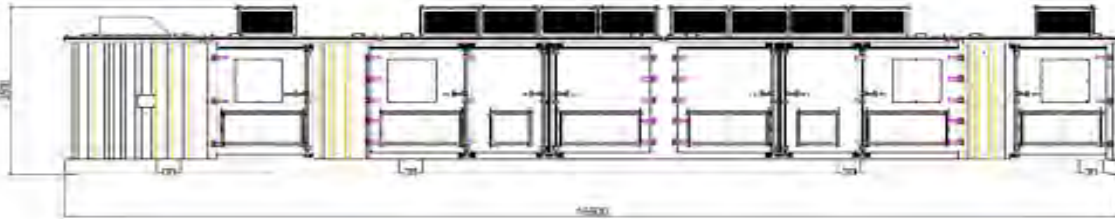
<https://www.youtube.com/watch?v=XmVkmi2UowM&feature=youtu.be>



# Navy ship connection at Port of Toulon



ShoreBoX™



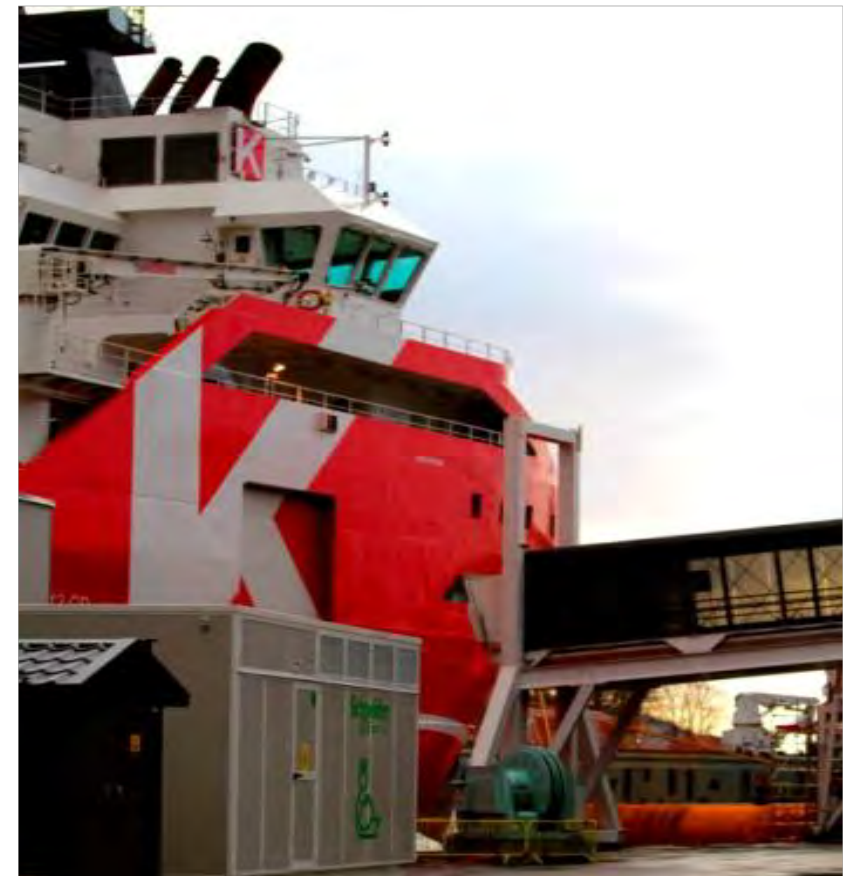
- Operational mid 2015.
- 2x ShoreBoX MV-> MV 4MVA with frequency conversion
- 2 types of ships connected  
BPC 2,2MVA & FREMM 1,2MVA



# OSV connection at Port of Bergen



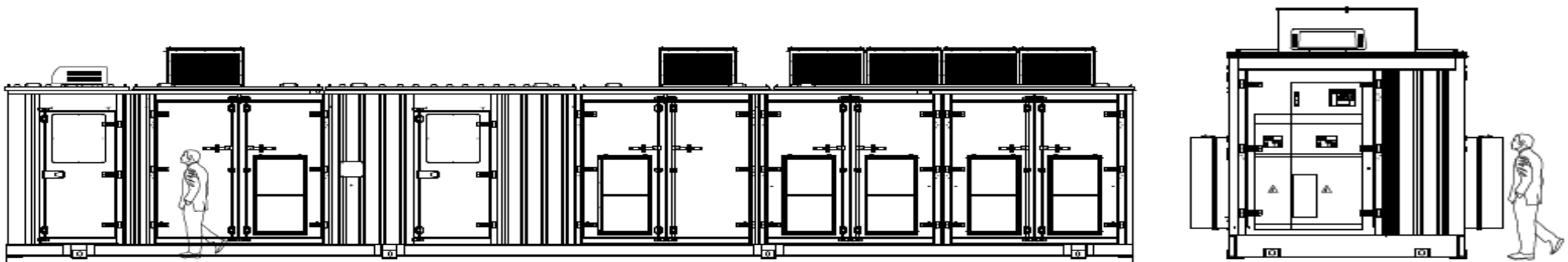
- Facility to provide electricity to Offshore Supply Vessels (OSV) at berth in the North Sea zone (ECA zone). OSVs are often required to stay at berth for long-time periods, especially during winter season where sea's meteorological conditions tend to be more critical.
- Operational middle of 2015. Several more to come
- ShoreBoX MV-> LV 1 MVA with frequency conversion
  - 3 Cables
  - 2 output: 440V or 690V
  - Frequency: 50 or 60hz





# Fincantieri Ancona

2 MVA MV/LV ShoreBoX to power a cruise vessel under construction  
Operational mid 2015



# Port of Marseille

Three ferry berths equipped with Schneider Electric equipment





# Strategic USA's largest container port

The California-based port is the 3rd largest in the world



## Needs

- Succeed as the first US shore connection site
- Comply with strict Californian regulations
- Be the US reference port
- Ensure energy management through an energy management information system

## Our solution

- Green: 95% per vessel call reduction of hotelling emissions of DPM, NOx and SOx
- Compliant: meeting Shore Power System and UL standards
- Open: committed to providing shore power infrastructure to all container, cruise, and liquid bulk terminals



# Ship retrofit for Shore Connection

## Example of realization - France

- Shipowner: CMN
- Ship type: Ferry operating between France & Corsica
- Scope: 3 ships
- Model: SE in partnership with STX Service. Ordered in 2014, Operational end of 2015.



Piana



Girolata



Kalliste

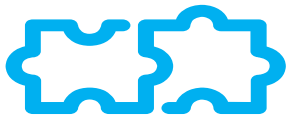




# Conclusions



**Shore connection is a reality today**, installed and available in many terminals and ports worldwide, and in many vessels.



The **technology** is mature.



**The regulatory and normative frames are set**, and push for the integration of this technology in the years to come.