



Regional development through Renewable Marines Energies



Agenda

- 1. Key figures for Europe**
- 2. Regional development in Europe (exc. France)**
- 3. Regional development in France**



Offshore Wind in Europe: key figures

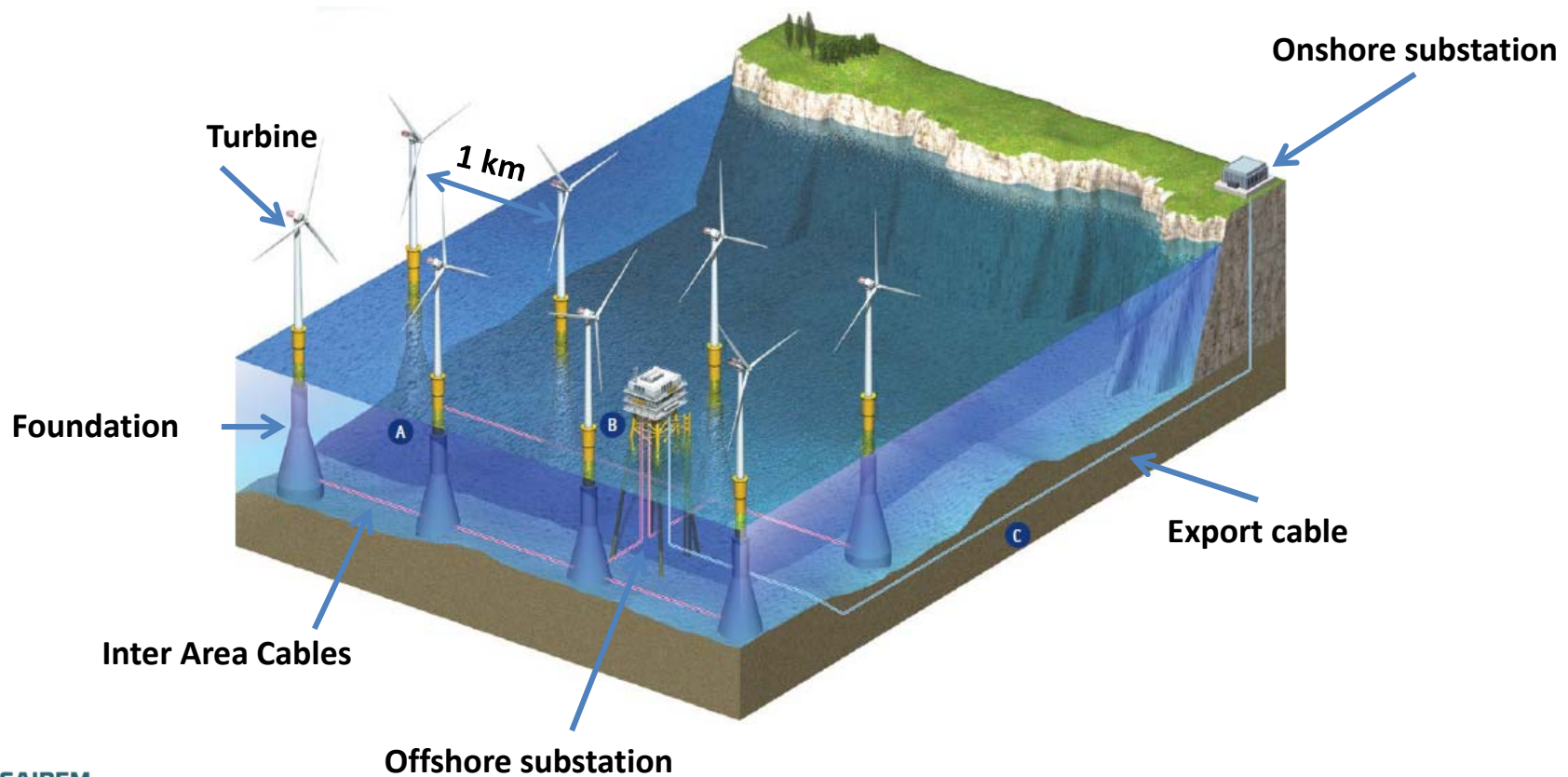
- **Installed capacity end 2016: 13 000 MW (13 GW)**
3600 Wind turbines (80 Farms)
- **Anticipated growth 2017 - 2030: + 57 000 MW (57 GW)**
+ 7000 Wind turbines
500 to 600 turbines / year
- **Reference: Nuclear Power Plant « EPR »: 1 500 MW (1,5 GW)**



Regional development through Renewable Marines Energies

Description Offshore Wind Farm

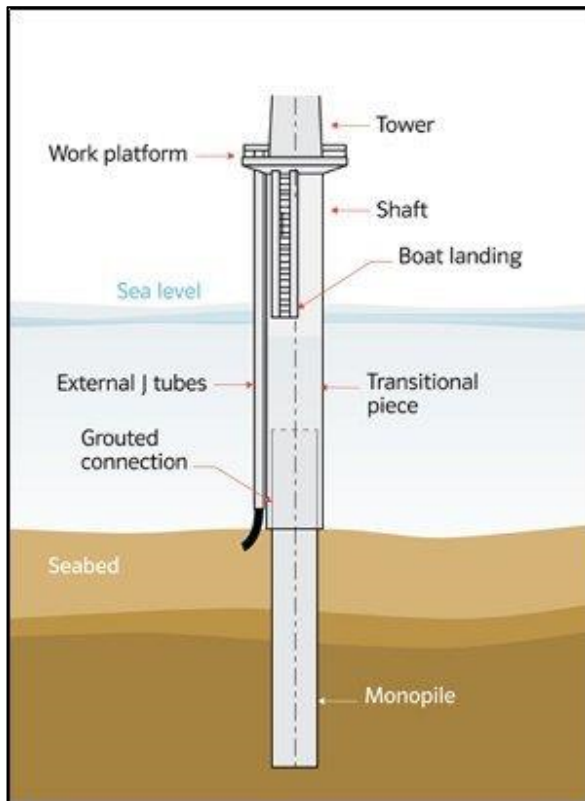
- Typical OWF of 500 MW: 83 turbines 6MW, 62 turbines of 8MW, 50 turbines 10MW



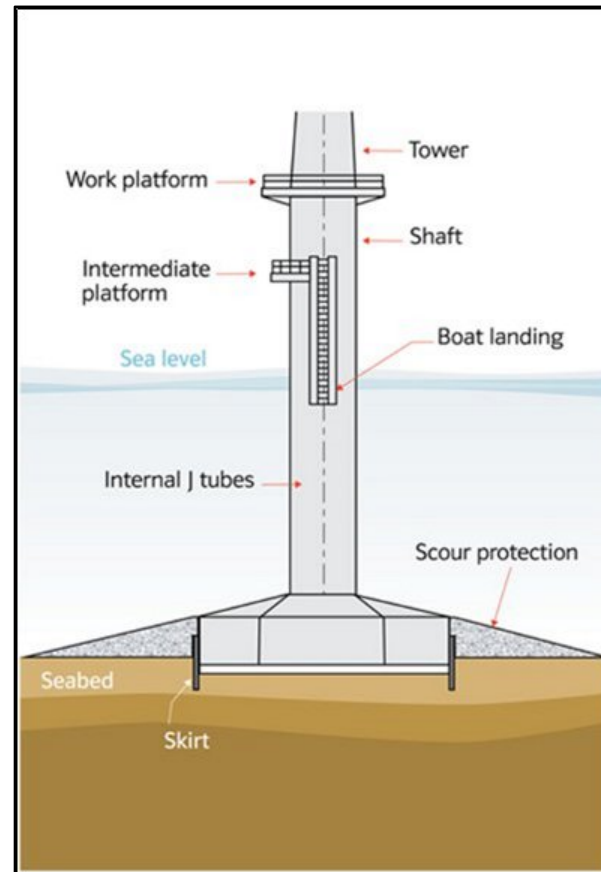


Different types of foundation

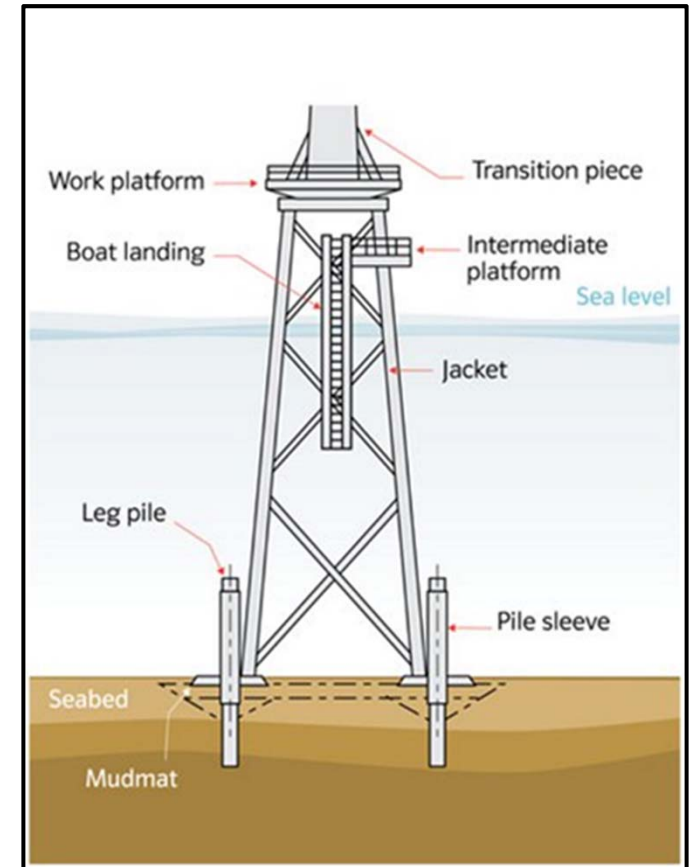
Monopile



Gravity Base Structure



Jacket





Regional development through Renewable Marine Energies



Regional development in Europe

An impressive industrial development has been made alongside the coasts of Europe during the last 10 years via:

- **Existing facilities from the shipbuilding or O&G fabrication industry**
- **Extension and modernization of existing plants**
- **Brand new industrial plants**



Regional development through Renewable Marines Energies

Foundations: Existing shipbuilding or O&G facilities





Regional development through Renewable Marine Energies

Foundations: Brand new plant





Regional development through Renewable Marine Energies

Foundations: Extension of existing plant / Brand new plant





Regional development through Renewable Marines Energies

Substation: Existing shipbuilding or O&G facilities



Harland & Wolf Ireland



Hereema Holland



Babcock UK



Baltic Shipyard Finland



Regional development through Renewable Marine Energies

Logistic base: Existing facility/New facility





Regional development through Renewable Marine Energies

Turbine manufacturing: Existing facility/New facility





Regional development through Renewable Marines Energies

Maintenance: Brand new facilities

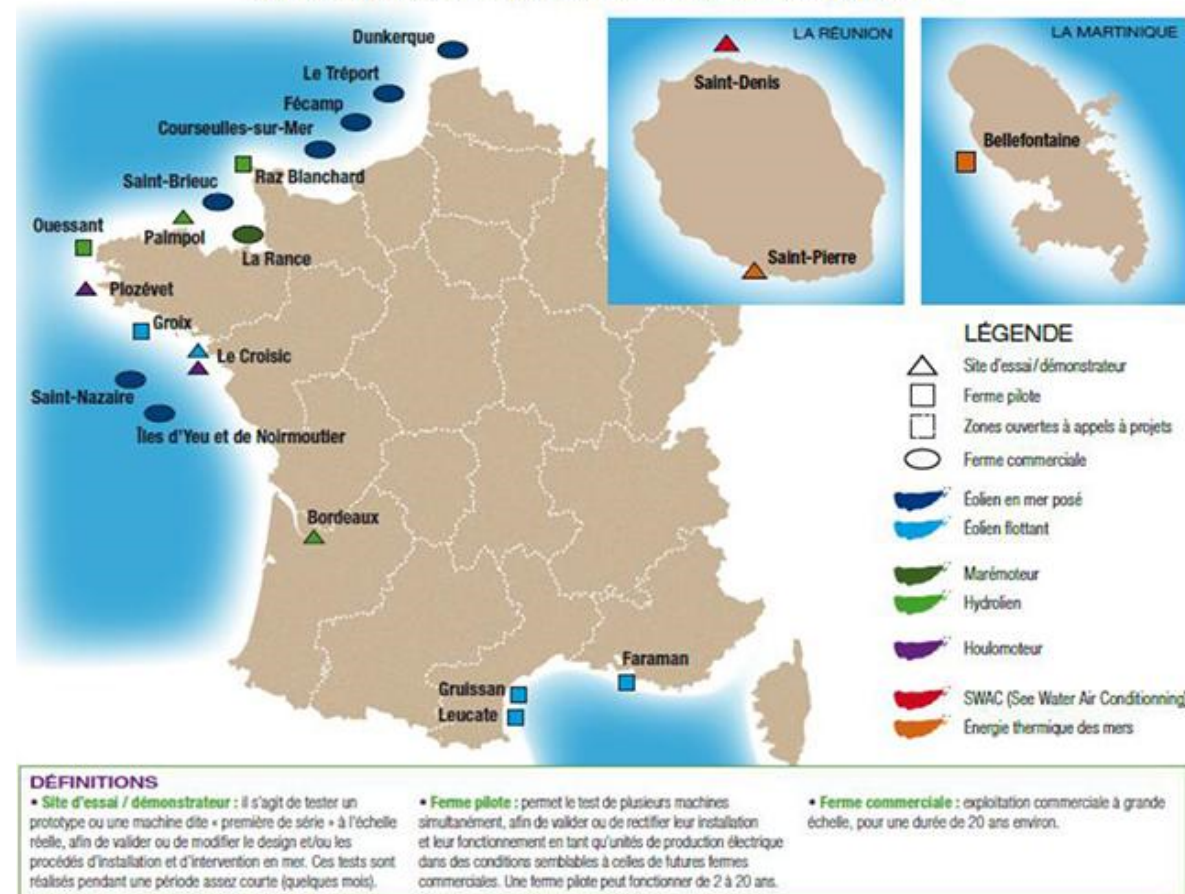




Regional development in France

- Objectives in France for 2030 : about 10 000 MW (10 GW) installed
- The French regions have invest massively into infrastructures to support first the French projects under development and later export in Europe

LES ÉNERGIES RENOUVELABLES EN MER EN FRANCE : PANORAMA DES PROJETS LES PLUS AVANCÉS





Regional development through Renewable Marines Energies

Pays de la Loire: St Nazaire



STX



Alstom



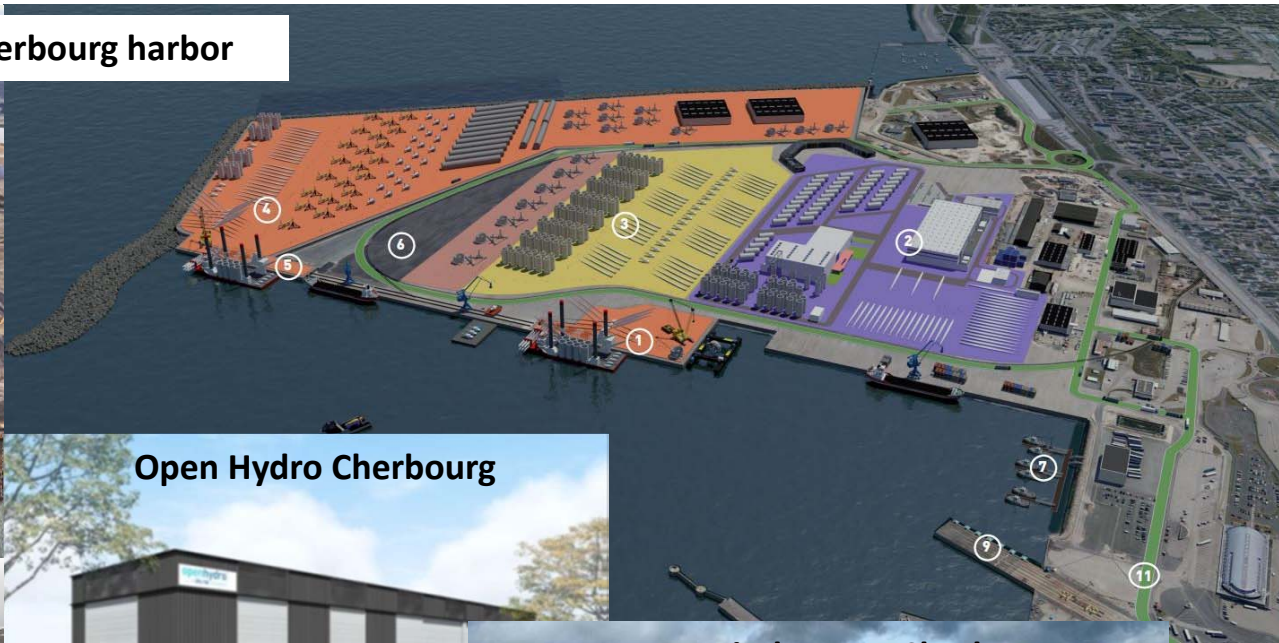
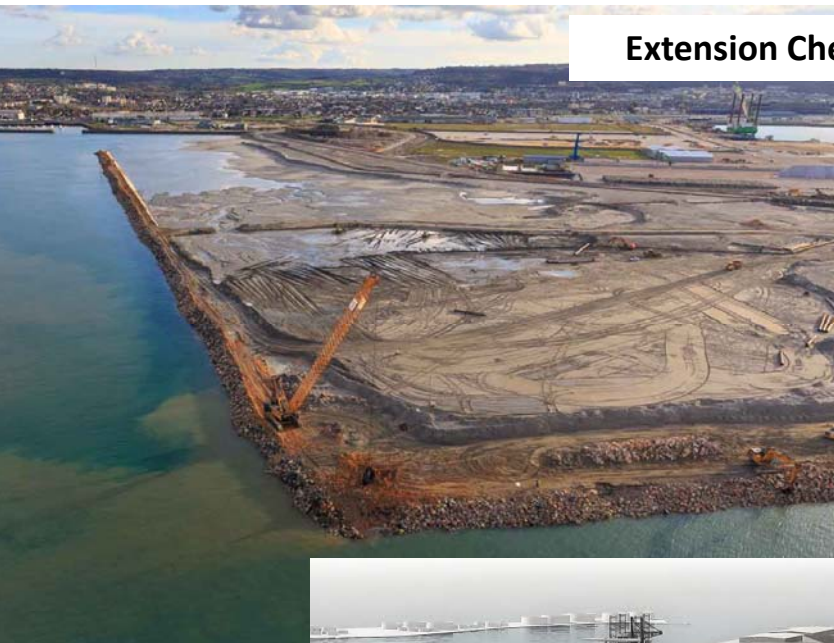
Hub logistic



Regional development through Renewable Marines Energies

Normandie: Cherbourg / Le Havre

Extension Cherbourg harbor



Open Hydro Cherbourg



LM Wind Power Cherbourg



Siemens Le Havre



Regional development through Renewable Marine Energies

Bretagne: Brest



Extension Brest harbor

