



Medgrid, a co-development project for the exchanges of electricity in the Mediterranean basin

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The Background

✦ The EU objectives - the 20/20/20 plan

- % Renewable energy sources (RES), in energy Mix
- % Reduction on CO₂ (GHG) against 1990
- Energy efficiency : % less primary energy in 2020

✦ RES and grid development

- The added-value of transmission & interconnection systems
- The MedRing
- The « SuperGrid »

✦ The Mediterranean Solar Plan (PSM)

- Introduce regulatory framework for development & exchanges of solar power energy in SEMCs

- Promote energy efficiency in SEMCs

- Promote the development of interconnections

- Develop technological cooperation EU- SEMCs

✦ Objectives PSM: 20 GW new RES in 2020

- 20 GW new RES generation to serve the load, first

- 5 GW exported towards EU, investment pay-back

An industrial initiative

- ✦ **A consortium of 20 EU & SEMCs companies (TSOs, generators, manufacturers, financing institutions, investors):**
 - **To design the Mediterranean grid consistent with the exportation of 5 GW from SEMCs to EU**
 - **To study its feasibility: technical, economical & institutional requirements**
- ✦ **To promote technological development and cooperation EU-SEMCs**
- ✦ **No competition with Dii**



Medgrid Associates 8 countries- 4 SEMCs

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ABENGOA



ALSTOM



Rte

Terna



Nexans



INEO Com
GDF SUEZ

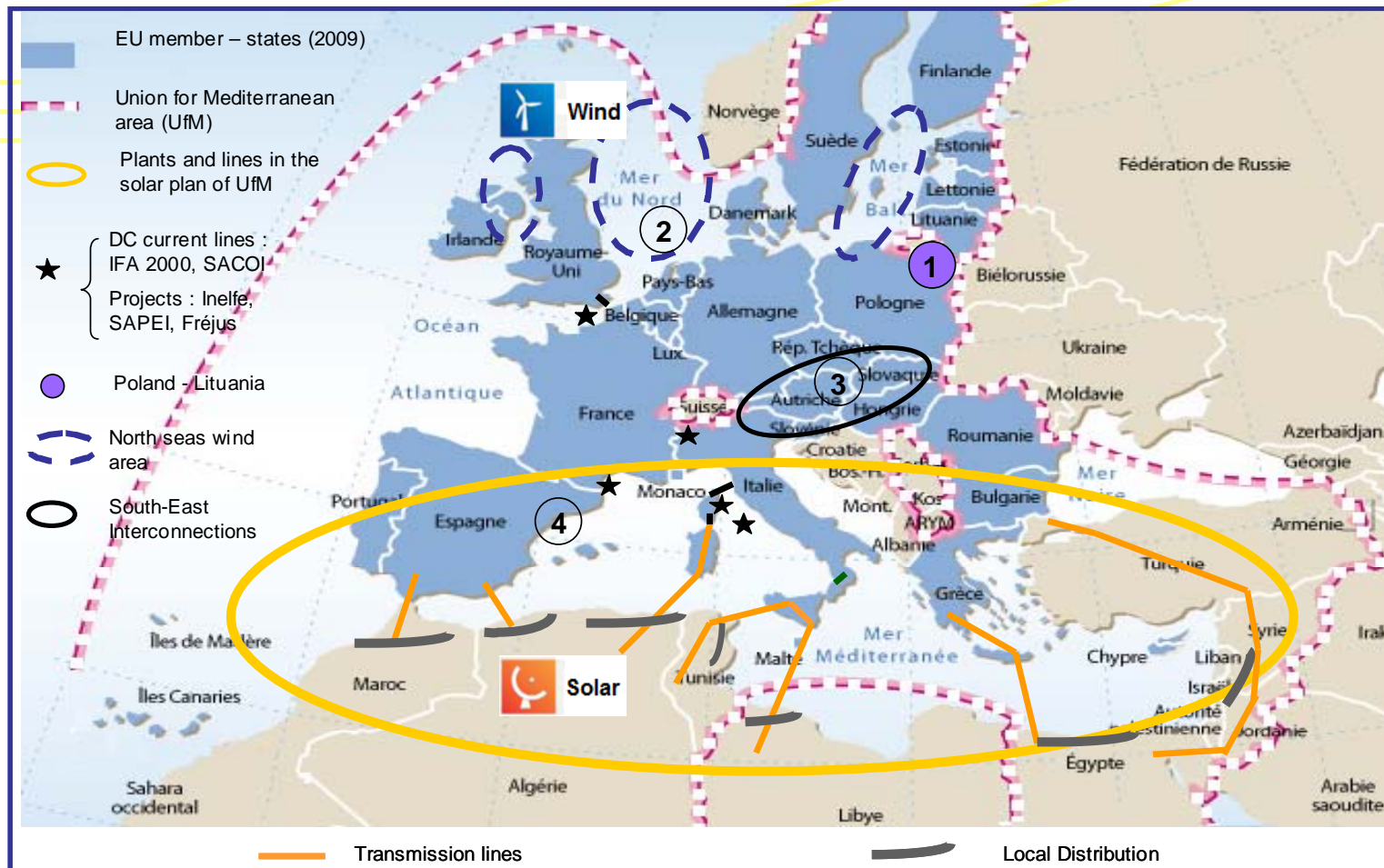


PANMED
ENERGY

SIEMENS



One of the four power infrastructure major strategic projects of the EU





Which grid to export 5 GW?

7

✦ Interconnections of the SEMCs :

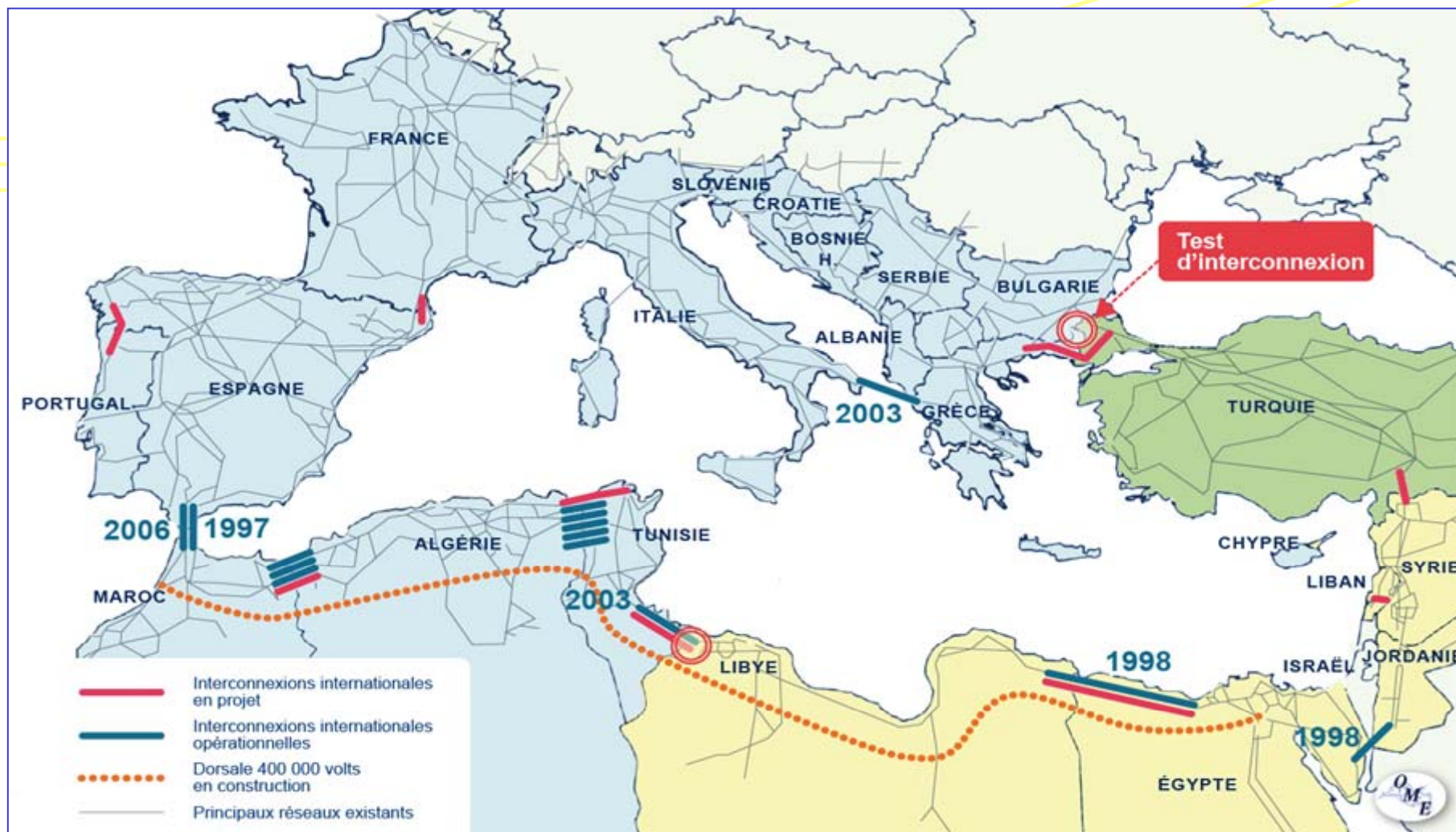
- At least 3 separate blocks today
- How to interconnect them, DC or AC? Which capacity?
- Where the DC stations should be located?

✦ The trans-Mediterranean links:

- Possible feasible routes or main corridors? Capacity?
- Which connection nodes and which reinforcements in the EU side?
- Point to point or multiterminal links?



Medgrid The three sets of interconnected countries

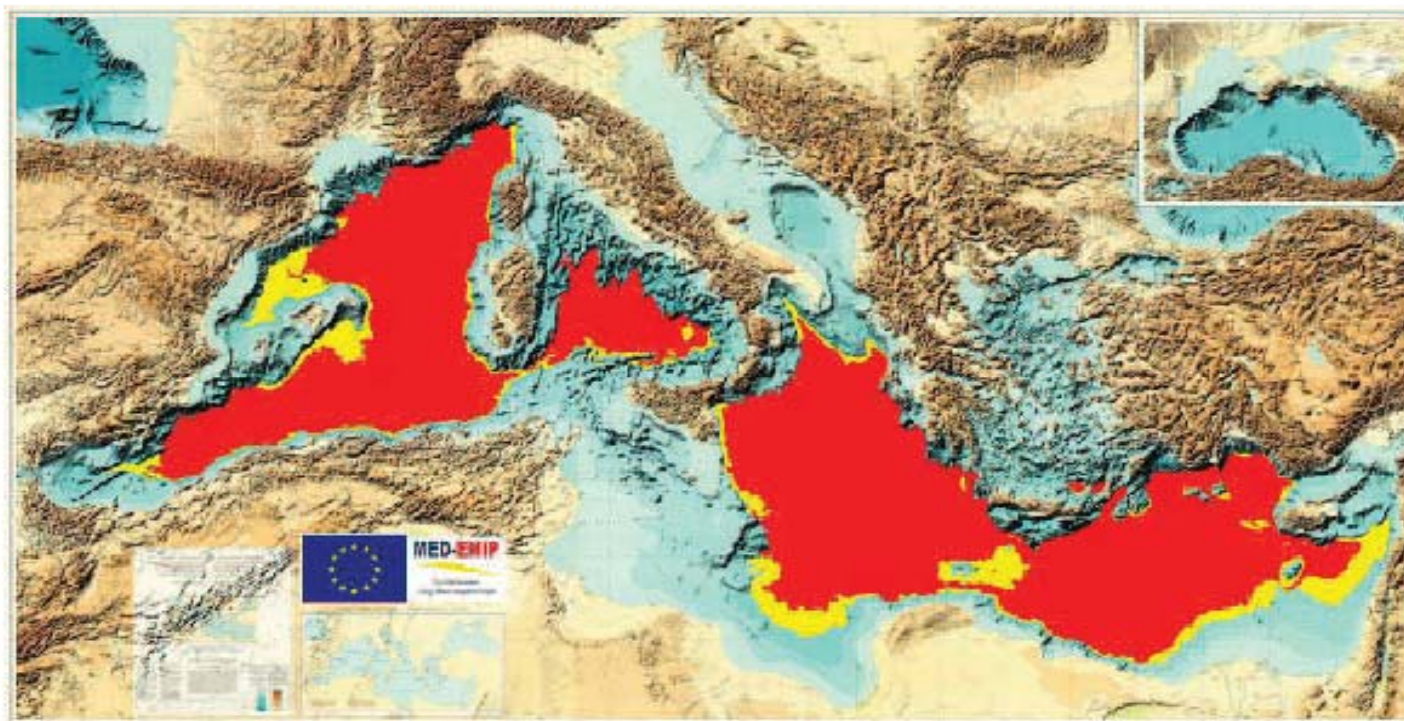


✦ How to design the appropriate grid?

- Load and Generation “profiles” in EU and SEMCs 2020
- Contracts foreseen - RES or other
- Optimize generation to serve load at minimal cost
- Resulting power flows: interconnections between systems
- Feasible routes , cables and overhead lines?
- Optimal capacity of cables and interconnections
- Costs of infrastructures, including induced reinforcements

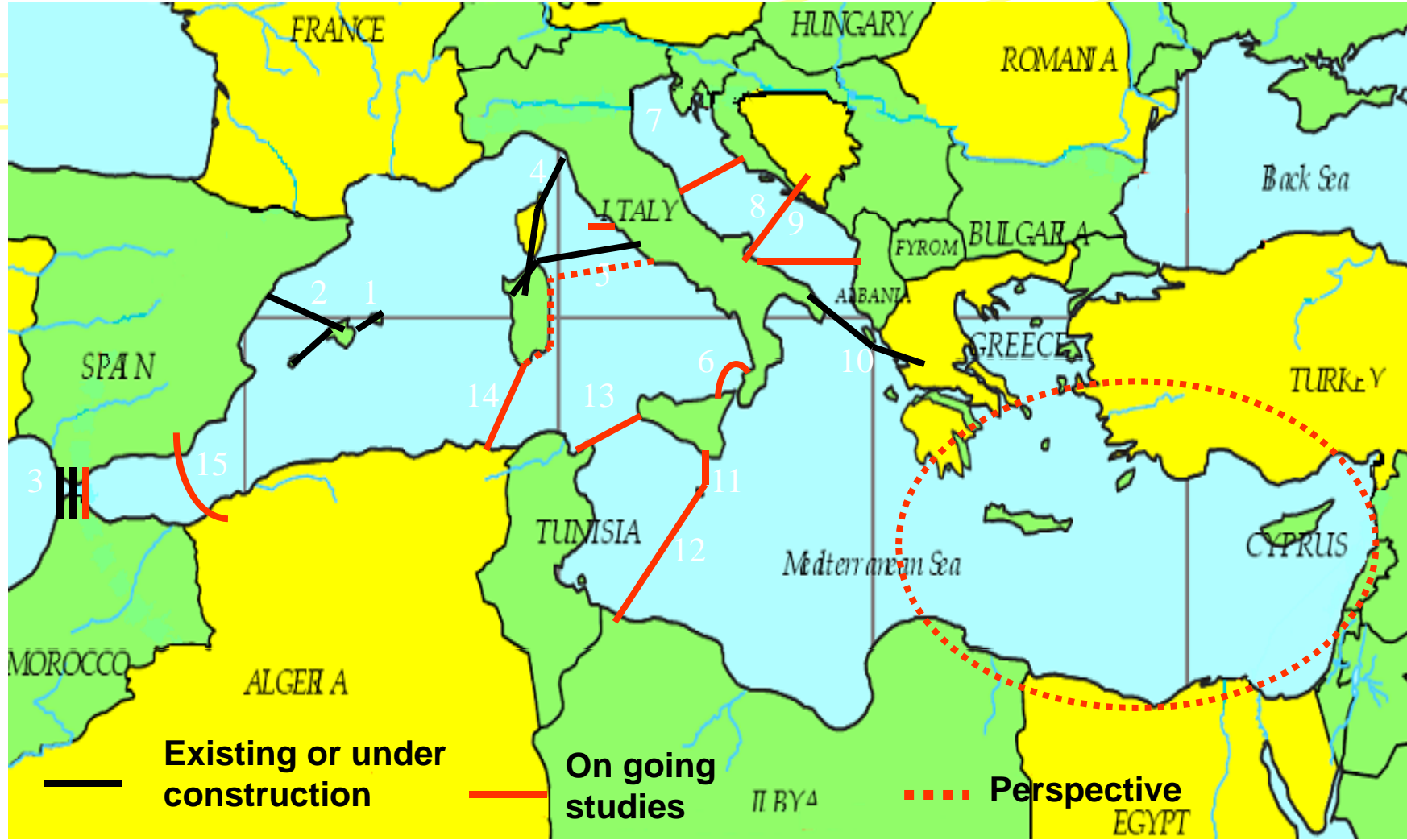
MED-EMIP

North-South corridors crossing the Mediterranean Sea





Existing submarine links and potential transmission projects



Challenges in technologies

✦ Submarine cables: 2 areas of development

- Laying cables in deep waters: today the maximum 1650 m.
- Extruded insulation DC cables / promising with VSC

✦ HVDC conversion: 2 areas of development

- Feasibility of HVDC grids (multiterminal and meshed) instead of point to point
- Voltage source converters (VSC) vs Line Commutation (LCC)

Other Challenges

- ◆ **Make possible exchanges with the EU:** Promote basic regulations in SEMCs
- ◆ **Application of Art. 9**
- ◆ **Possible funding schemes? Impact ?**
- ◆ **Economical analysis: pay-back of the grid investment ? For which tariff of transmission?**
- ◆ **Possible models: merchant lines; socialization of the grid, etc.**

Organization of the work

14

✦ 5 Working Groups each dedicated to a main topic

- Grid MasterPlan 2020
- Economy
- Regulation
- Financing
- Technology

Concluding

- ✦ **Medgrid will define the grid which enables the foreseen 2020 exchanges of green electricity**
- ✦ **The conditions of its feasibility will be analyzed**
- ✦ **The grid will enhance the security of supply of energy for UE**
- ✦ **It makes possible exchanges of peak power, inducing extra savings**
- ✦ **The methodology and tools will be used after the PSM horizon and will help designing the future grid**
- ✦ **In cooperation with SEMCs' partners**



Thank you for your attention

www.medgrid-psm.com

