Second Euro-mediterranean
Rendez-vous on Energy

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Technology issues for the development of Mediterranean interconnections: present status and perspectives

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TECHNOLOGICAL AND INNOVATION CHALLENGES FOR IMPLEMENTING A MEDITERRANEAN GRID

→ Constructing electrical interconnections through the Mediterranean requires specific technologies:

- Submarine power cables
- High voltage direct current (HVDC) rather than high voltage alternative current (HVAC)
- Deep water cable systems rather than shallow water cable systems

→ This presentation will address the following issues:

- Why HVDC?
  - State of the art of this technology
- Submarine cables
  - State of the art of cable technologies
  - Challenges to implement cable system at depths up to 2500 meters?

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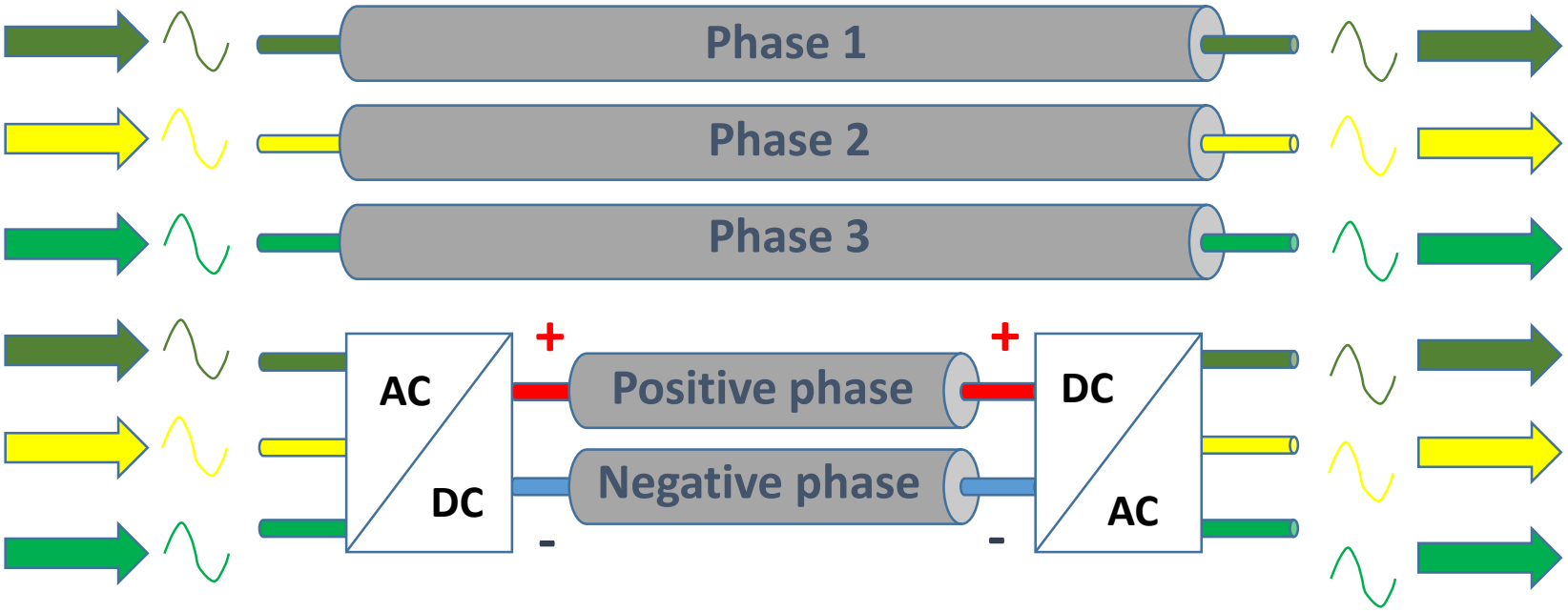
WHY HIGH VOLTAGE DIRECT CURRENT (HVDC) ?

→ For economic reasons : 2 DC cables carry nearly the same power as 3 AC cables of the same design >>> lower cost…



→ … but AC/DC & DC/AC conversion is required at both ends >>> additional cost.

→ HVDC is more appropriate than HVAC for long distance transmission.

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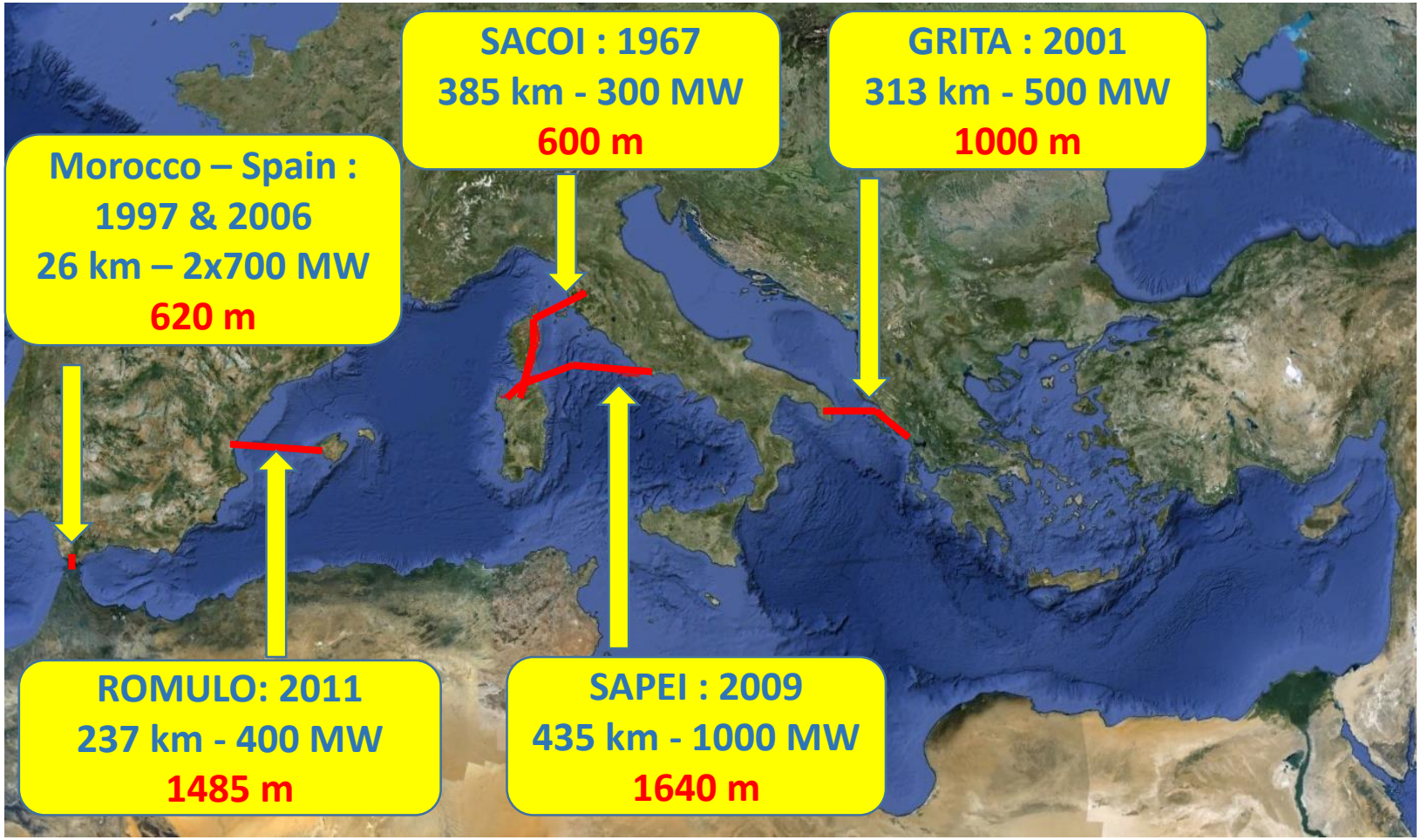
EXISTING SUBMARINE LINKS IN THE MEDITERRANEAN



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AVAILABLE SUBMARINE CABLES FOR HVDC TRANSM

→ Oil filled cables

- Voltage : ±400 kV
  short distance: 60 km
  depth : up to 2000 m

→ Impregnated paper cables (MI)

- Voltage : ±550 kV
- long distance
  depth : up to 1650m
  weight : 50 kg/m for 1000 MW

→ Extruded cables (XLPE)

- Voltage : ±320 kV
  long distance
  depth : up to 400m
  weight : 17 to 34 kg/m for 1000 MW

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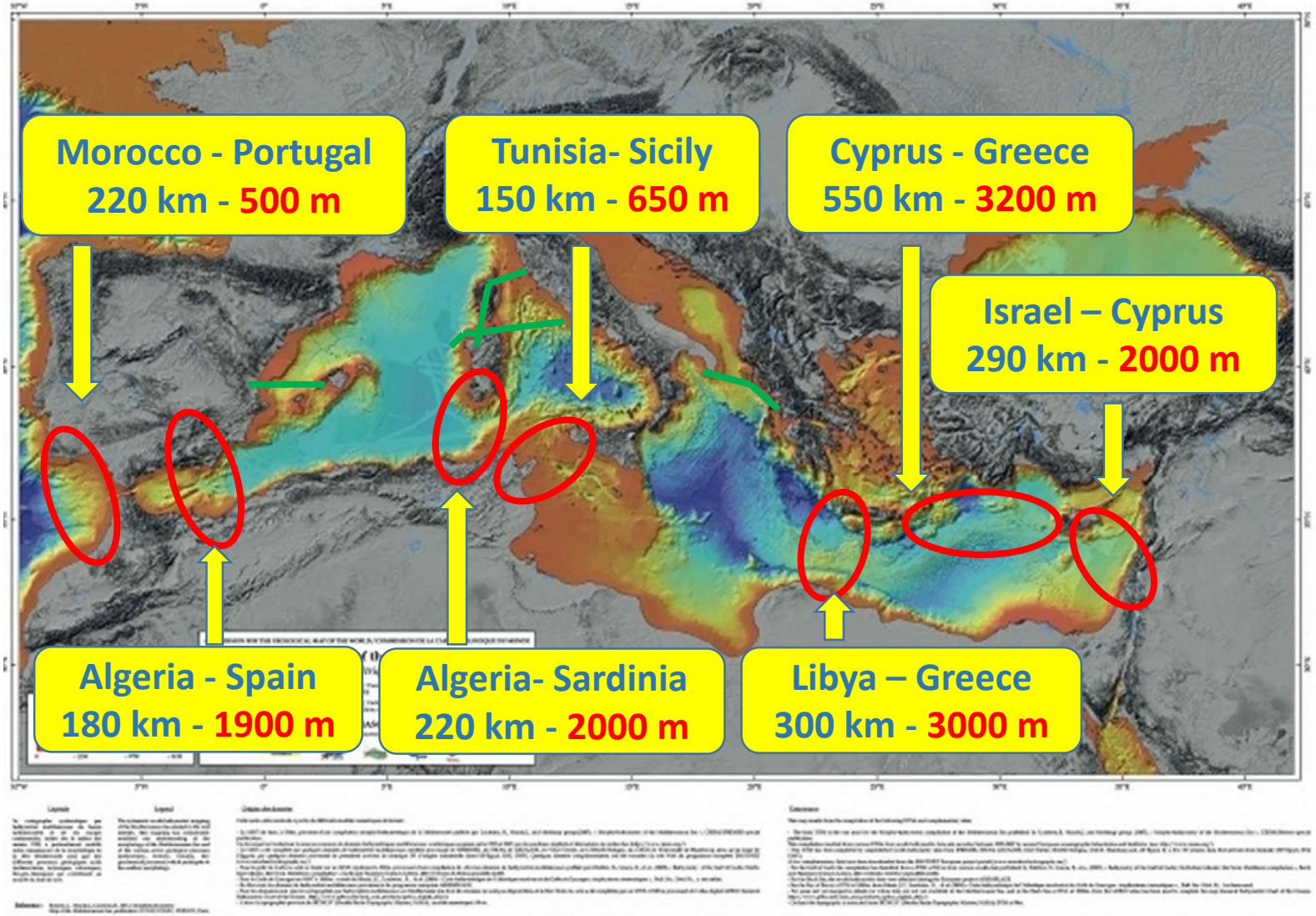
LENGTH AND DEPTH PROFILES OF POTENTIAL INTERCONNECTORS IN THE MEDITERRANEAN



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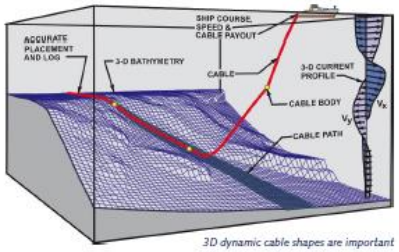
CHALLENGES TO IMPLEMENT DEEP WATER CABLES

→ Technologies for cables and joints for 2500 meters depth

→ Laying and installation of power cables at 2500 meters

→ Operation and maintenance



→ How to manage the risks at the different steps of such projects?

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