



MEDGRID, a co-development project for the exchanges of electricity in the Mediterranean basin (Part 1)

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An industrial initiative...

- ✦ A consortium of 21 companies (transmission system operators, generators, manufacturers, financing institutions, investors) from both rims of the Mediterranean Sea, registered in January 2011.
- ✦ Created to support the implementation of the Mediterranean Solar Plan (20 GW of solar generation in MENA countries, 5 GW exports to Europe in 2020).
- ✦ Complementary to the Desertec Industrial Initiative.



Associates in 2012 (21 + 1 from 9 countries)

ABENGOA



ALSTOM



Atos
Worldgrid



COFELY INEO
GDF SUEZ



Nexans



Prysmian
Group



PANMED
ENERGY



Rte

SIEMENS



Soitec



Terna





MEDGRID missions

5

- ✦ To promote and facilitate the development of power interconnections between Europe and the countries of the South and East of the Mediterranean.
- ✦ To support the actors of the market in the pre-competitive phases and involve stakeholders in Medgrid discussions.
- ✦ To become a reference point bringing together key industry players who will initiate the future North-South interconnections.



MEDGRID vision of the Mediterranean grid

- ✦ The export of renewable energy from the South and East of the Mediterranean Countries (SEMC) to Europe will be one of the drivers of the development of the trans Mediterranean interconnections.
- ✦ The fast growth of the power demand in the SEMC also justifies stronger interconnections with the European electricity system, which offers opportunities for exchanges from North to South and East.
- ✦ The extension of the European transmission grid towards the SEMC will improve the security of supply of the interconnected countries.

Objectives (1/3)

- ❖ Assessing the opportunities for power exchanges based on renewable energy export needs, and for economical exchanges resulting from the generation and demand profiles on both rims of the Mediterranean in 2020 - 2025.
- ❖ Assessing the technical, economical and environmental feasibility of the infrastructures necessary to support the power exchanges, using adequate and properly located transmission capacities.

Objectives (2/3)

- ❖ Proposing a global optimized programme of infrastructure projects for the 2020-2025 horizon, in terms of size, location and timing, for interconnectors and national grids.
- ❖ Assessing the performances and benefits of the transmission technologies to be used for interconnectors in the fields of submarine power cables and Extra High Voltage Direct Current.

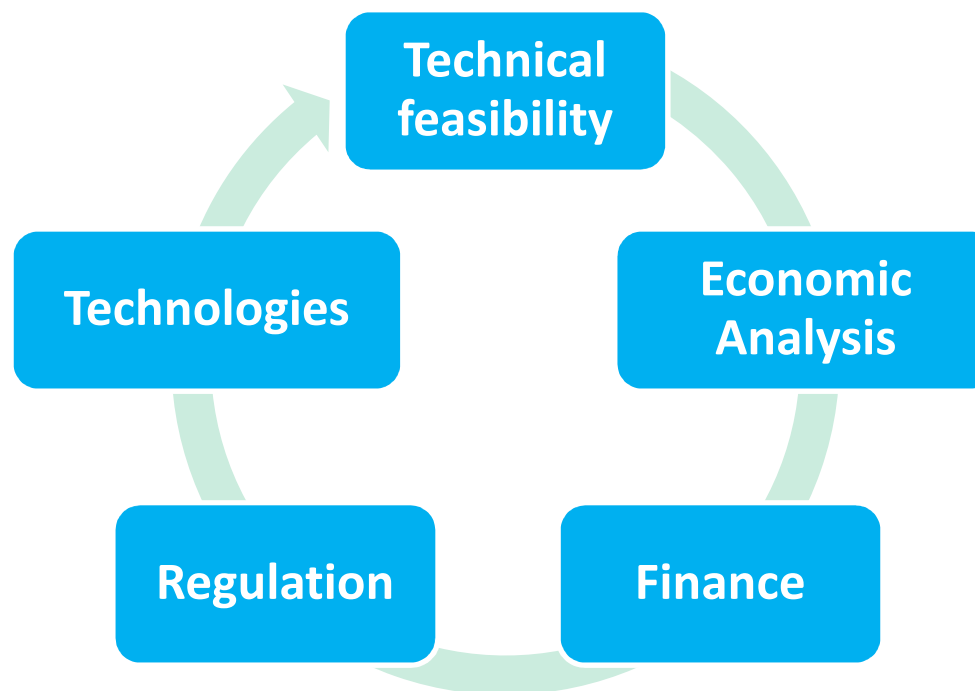
Objectives (3/3)

- ❖ Assessing the necessary minimum changes in the regulatory frameworks of the countries involved, including the European regulations, to allow power exchanges.
- ❖ Proposing business models and financing architectures adapted to the required infrastructures and regulations.

Organisation

Close cooperation with the authorities of the countries involved, the EC, the scientific community, development banks & funds, NGOs.

5 working groups



Technical feasibility studies

- **Corridor approach** : West, Centre and East
- **Study cases**: how to increase the net transfer capacities of each corridor by 1, 2 or 3 GW by 2020-2025
- **Assessment of the technical and environmental feasibility**, including new interconnectors and reinforcements of existing systems

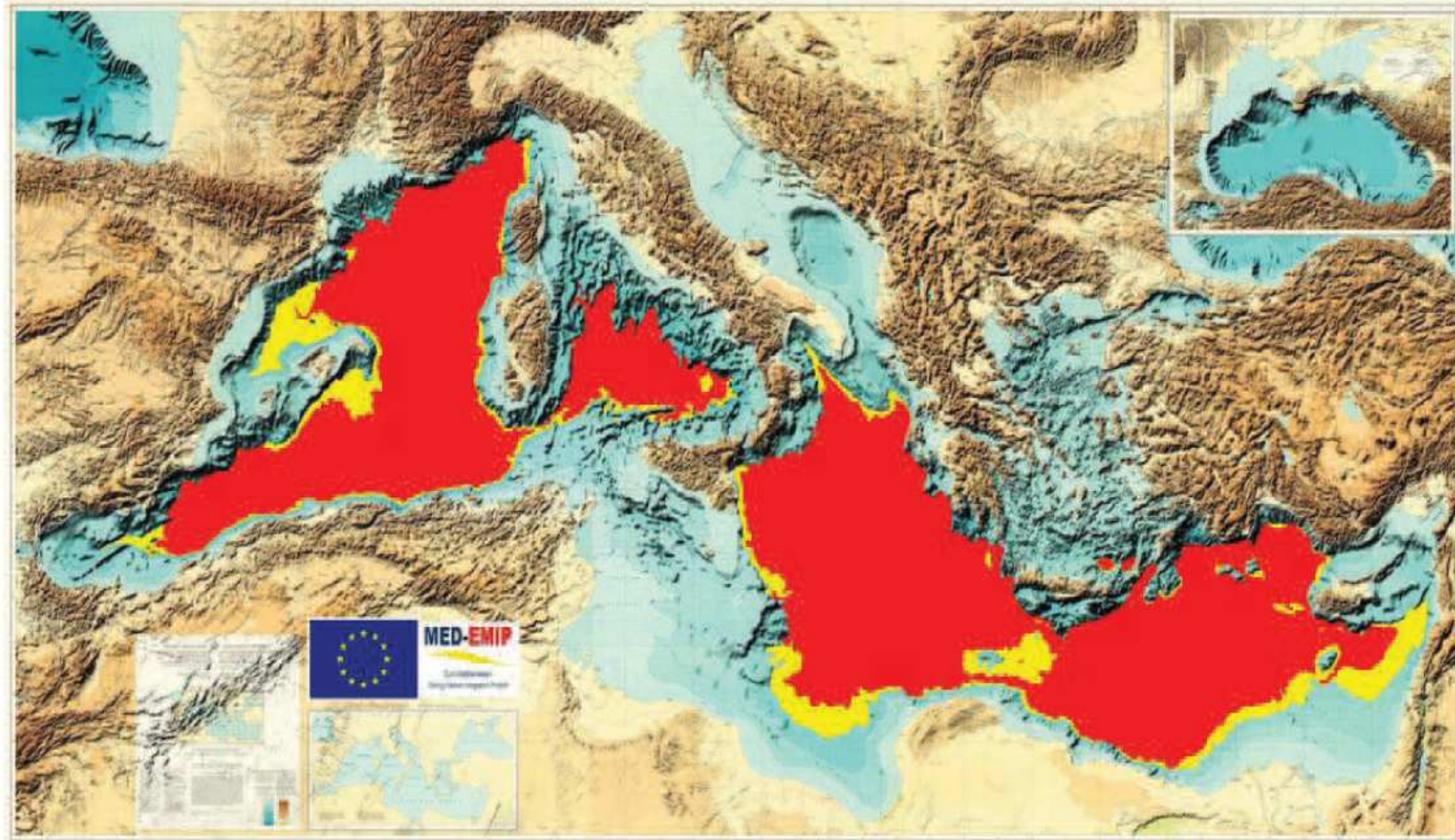


Existing submarine links and potential transmission projects



- Existing or under construction
- On going studies
- Perspective

North-South corridors crossing the Mediterranean Sea



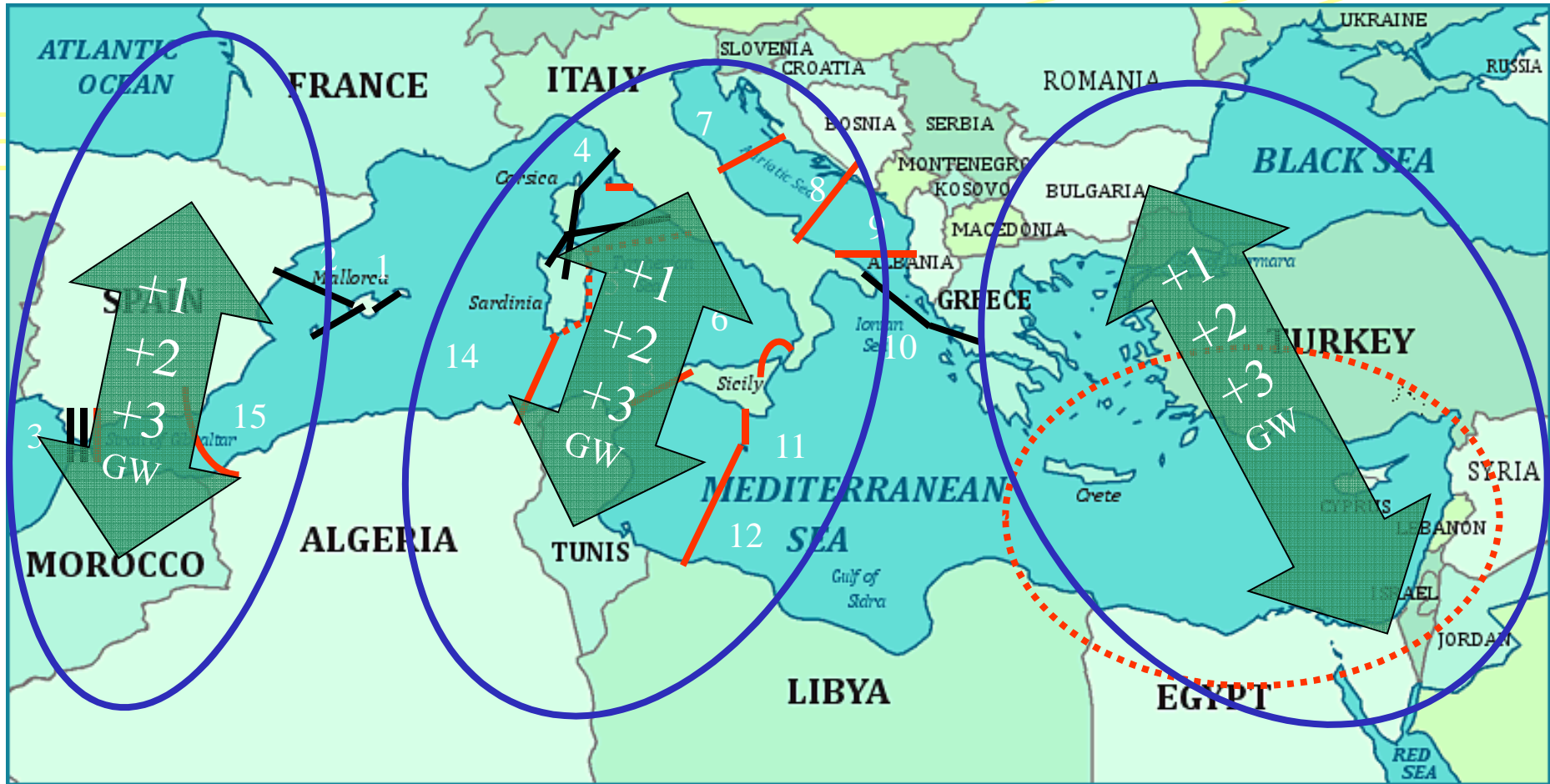
Red painted areas are below 2000 meter depth



This project is funded by the European Union



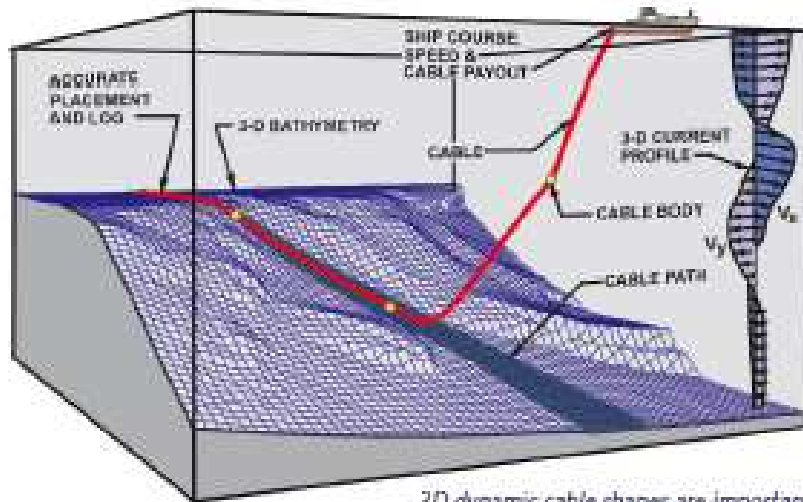
The three Mediterranean power corridors



- Existing or under construction
- On going studies
- - - -** Perspective

- **Awareness** of existing transmission technologies and future trends
- **Infrastructure cost assessment**, for investment and operation
- **Feasibility study** of submarine cable systems for depth of 2000 meters

Submarine HVDC Cables technologies

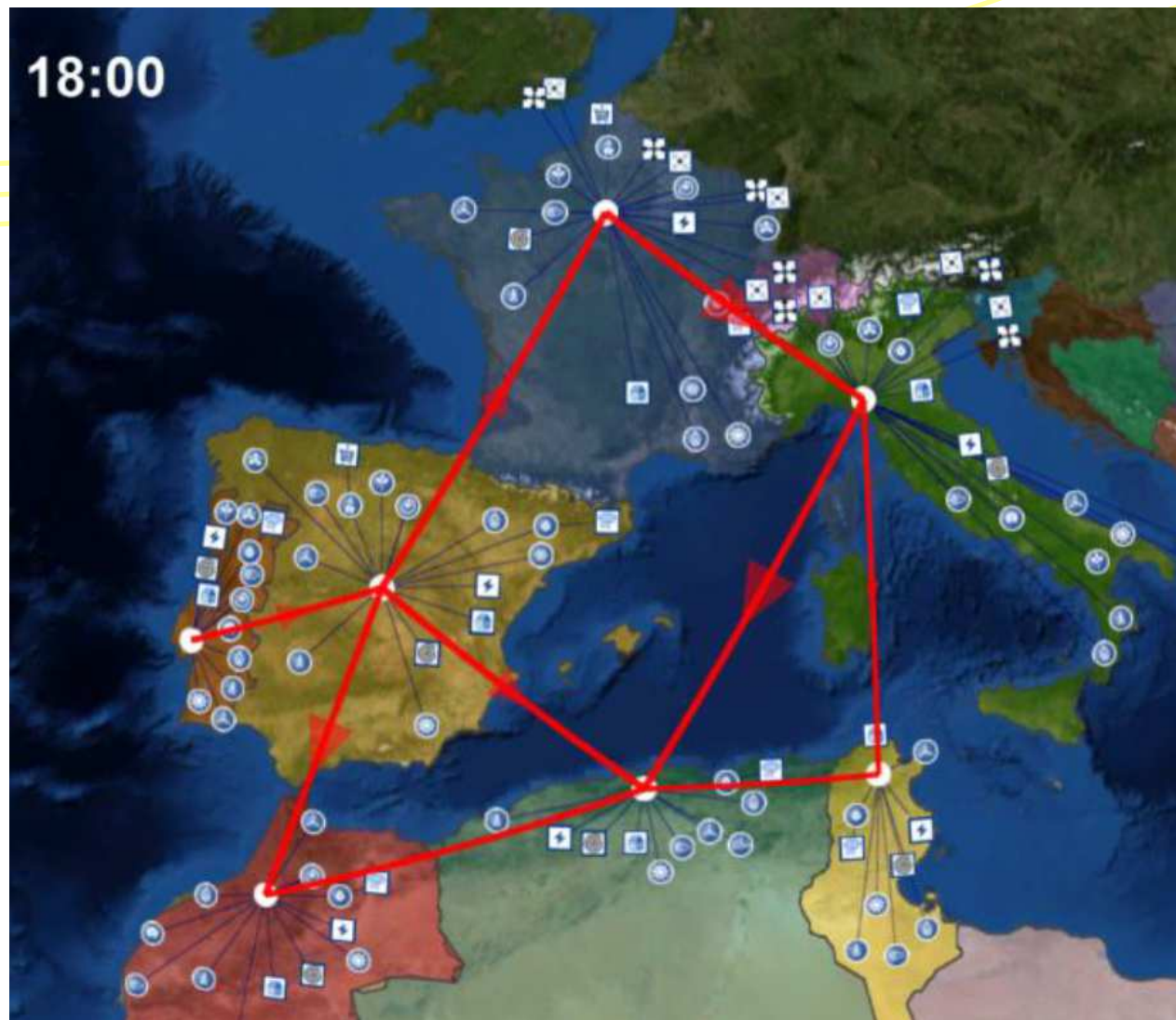


3D dynamic cable shapes are important

Working Group *« Economic analysis »*

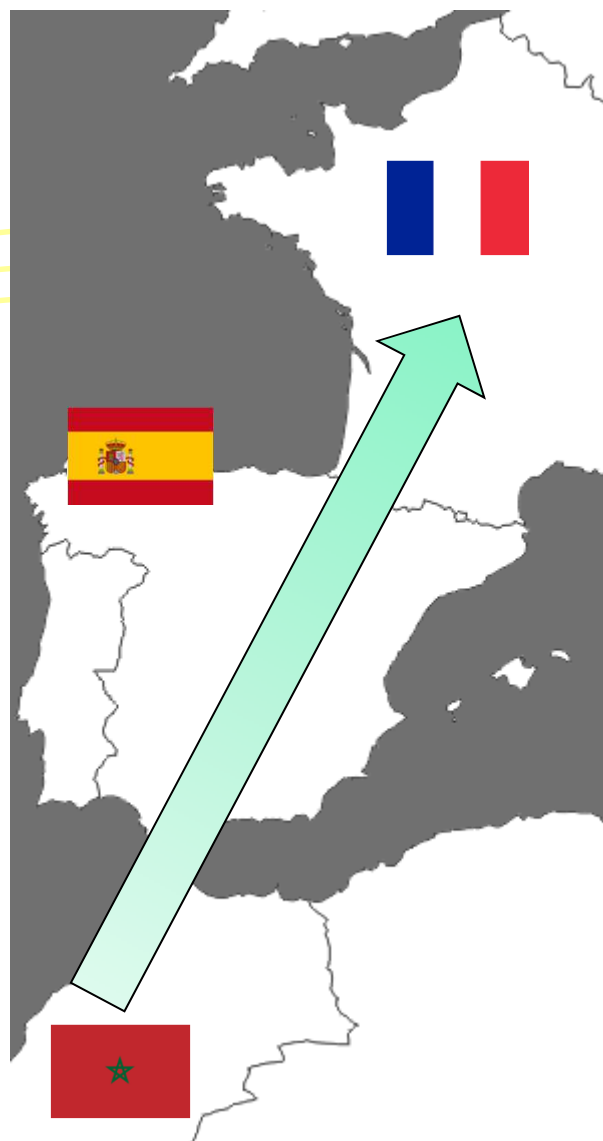
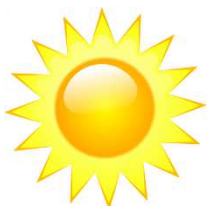
- **General economic and environmental scenarios** for 2020 – 2025 set up.
- **Data collection** of Mediterranean power systems and grid.
- **Simulation tool** to assess potential economic flows between the Mediterranean power systems

Economic power flows simulation tool



- Analysis of existing **regulation frameworks** in the Mediterranean countries and **recommendations** for harmonization.
- **Answers** to European consultations (CEER, renewables, TYNDP, PIC...)
- **Support** to projects of Associates : solar plant with exports from Morocco to France.
- Report on **grid utilization costs** for MA-FR power exchanges.

Solar power
transfer project
between
Morocco and
France



Contracts between stakeholders:

- Generators
- MASEN
- ONE
- REE
- RTE
- Power traders
- Customer
- ...

- **Legal analysis**
- **Recommendations for financing schemes and tools to finance power interconnections in the Mediterranean region:**
 - Regulated vs merchant
 - Need for inter states agreements
 - Long term supply contracts vs groups of buyers
 - Diversification of finance sources
 - Construction of business and financing models

Conclusions

- Design of an economic and environmental analysis model for the Mediterranean system launched in 2011.
- Technical and environmental corridor feasibility studies launched in 2012.
- Global optimization study results expected beginning of 2014.
- Recommendations on regulations for grid investments.
- Business model and finance tools for grid investments.



Thank you for your attention.

www.medgrid-psm.com

