



# Strengthening the Euro-Mediterranean Electric Interconnections

## The Tunisia-Italy Link

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Rachid Ben Daly : CEO- STEG:

Brussels January 6th 2015



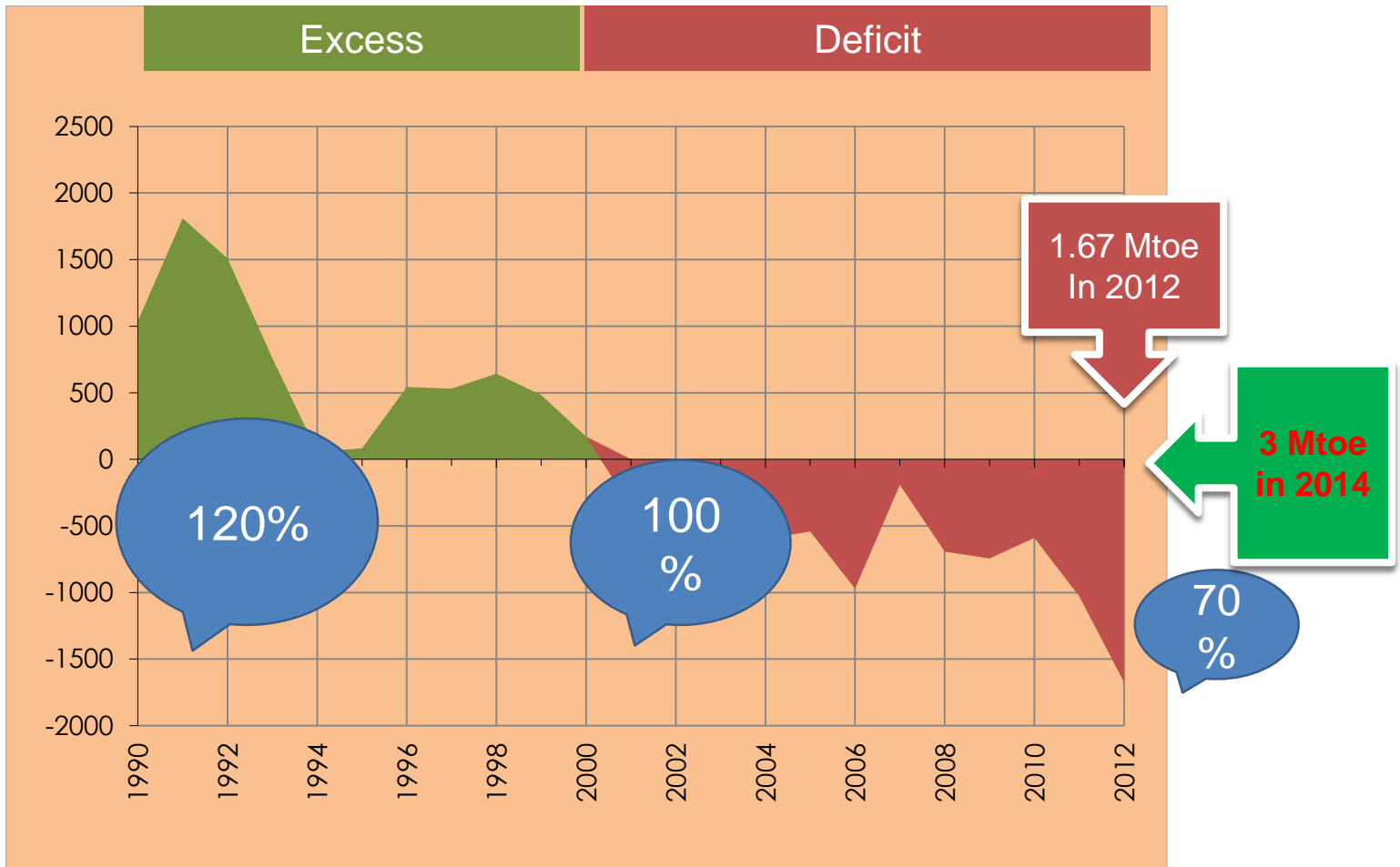
# Outline

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1. Tunisia's Current Energy Context
2. Tunisia's 2030 Energy Strategy
3. Existing Electrical Interconnections
4. Tunisia – Italy Interconnection Project:
  - \* *Some Key Dates*
  - \* *Economic Aspects*
  - \* *Potential Benefits*
  - \* *Perspectives of the projet*



# Primary Energy Balance





# Main features of the Tunisian Energy Context



- Structural deficit in the energy balance since 2000.
- Increasing demand for the electrical energy at an average yearly rate of +5% and a rapid increase in the peak demand.
- A total reliance on natural gas for producing electricity (98%).
- Steady decline in the local natural resources (oil and natural gas)
- Volatility in energy prices
  - Need for a switch to a new **energy model** that guarantees:
    - security of supply and
    - diversification of the energy sources.



# Tunisian Energy Strategy (2030)

**1-** Intensify domestic hydrocarbon exploration & production (including unconventional resources)

**2-** Promote and enhance Energy Efficiency (reduce Energy Intensity by 2.5% per annum)

**3-** increase share of Renewable Energy in the Electrical Energy Mix (up to 30%)

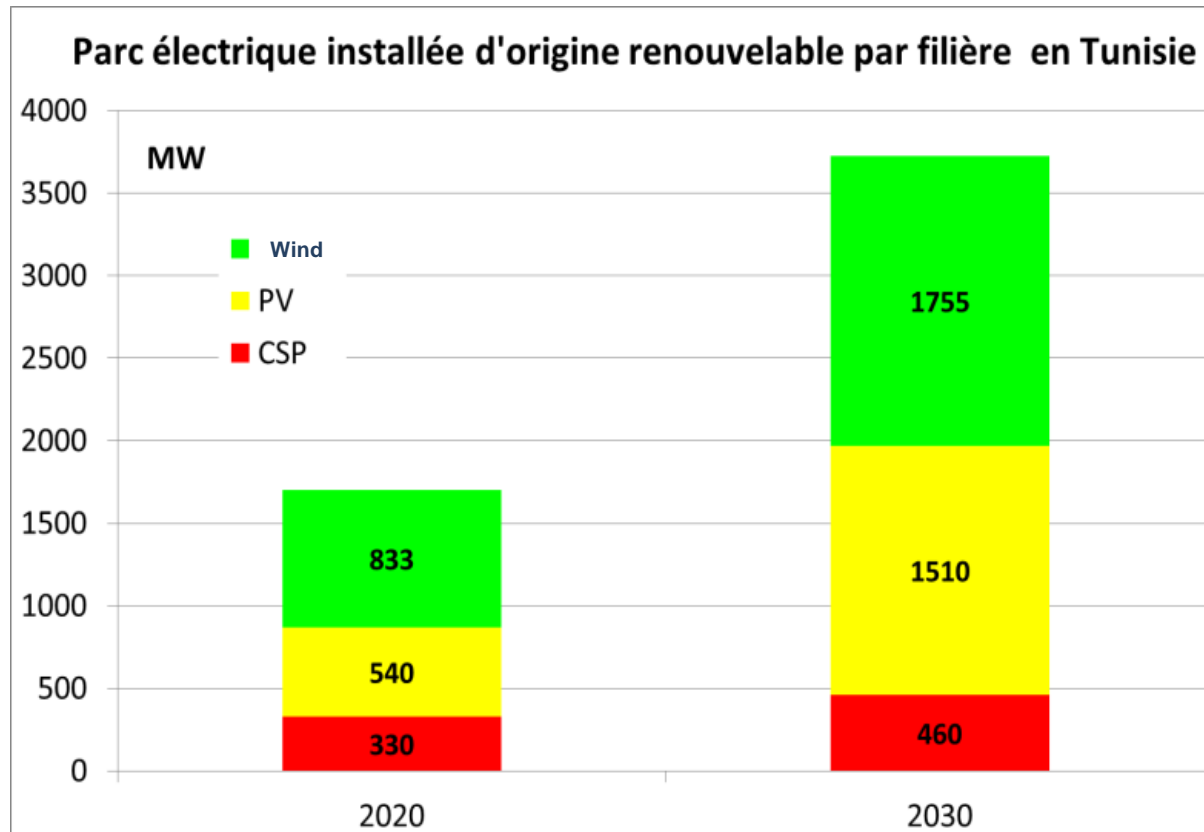
**4-** Reinforce interconnection with neighbouring countries and southern Europe (electricity and gas)



# Tunisian Solar Plan Targets

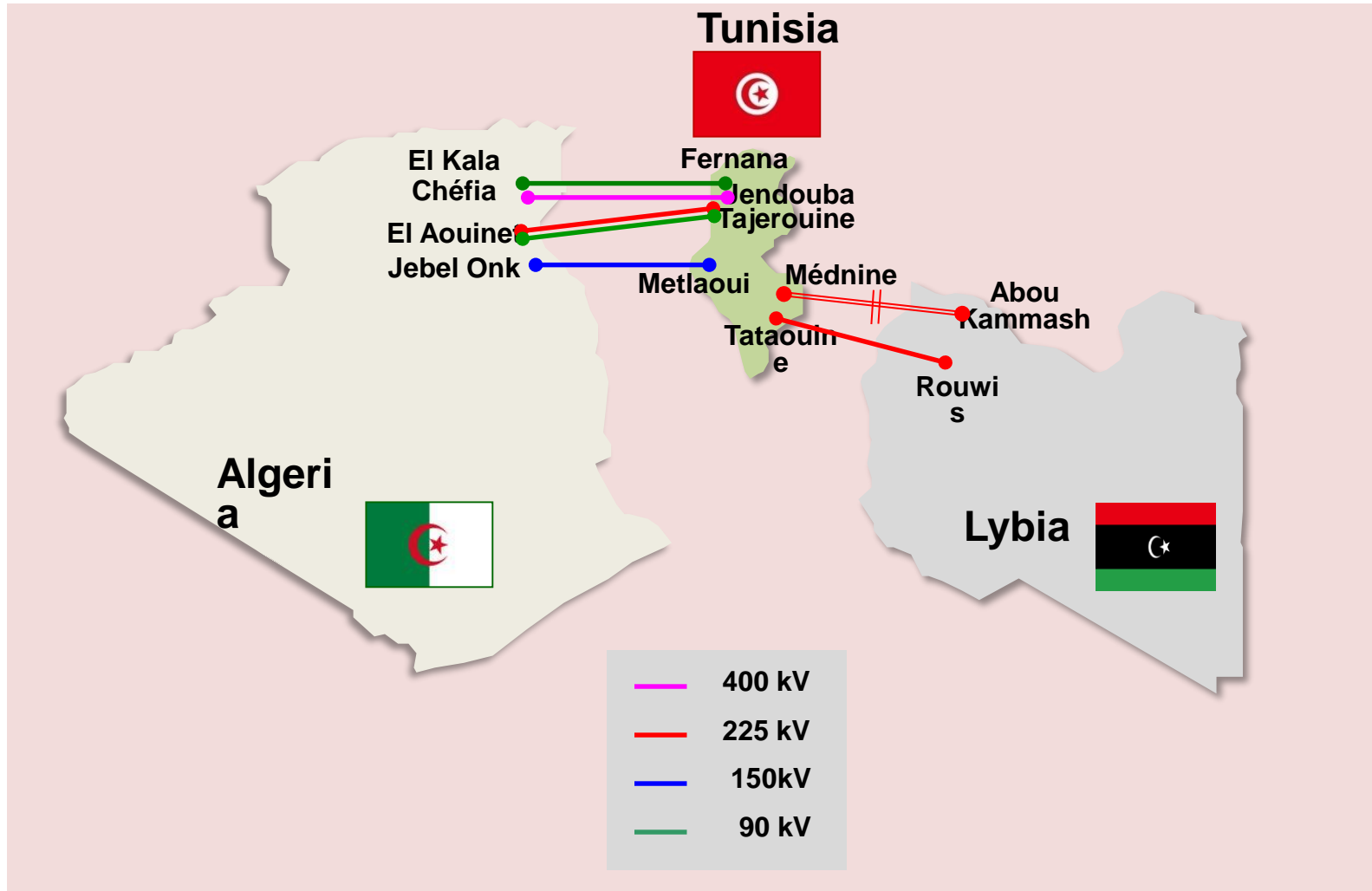


- National target for 2030 : **30 %** Renewable Sources (3700 MW)





# Existing Interconnections





# Existing Interconnections



## a) Interconnections Tunisia – Algeria

Lines	voltage (kV)	Capacity (MVA)	Start –up date
Tajerouine - El Aouinet	90	76	1952
Fernana - El Kala	90	86	1956
Metlaoui - Jebel Onk	150	178	1984
Tajerouine - El Aouinet	225	267	1988
Jendouba - Chéfia	400	1 070	2014

## b) Interconnections Tunisia – Lybia

Line	Voltage (kV)	Capacity (MVA)	Start up date
2 x Médnine - Abou Kammash	225	2*267	2005
Tataouine - Rouwis	225	267	2005





## Actual operating constraints



- Interconnections with Algeria used primarily as a common stand-by facility.
- Limited exchange with Algeria: ~1,5 TWh in both directions during the period 2009-2013, at an equivalent of only 34 MW –as permanent power exchange.
- Interconnection with Algeria useful for accelerating the restart following the 31/8/2014 blackout
- Interconnections with Libya in a non synchronous mode.
- Operating as an extended supply grid for the western part of Libya  
↳ the current Exploitation of the existing interconnections is very limited and should boost the exchange of the electrical energy by taking advantage of the potential synergies between the 3 countries (week ends, different peak demands and load profiles etc).



# Interconnection Project: Tunisia-Italy



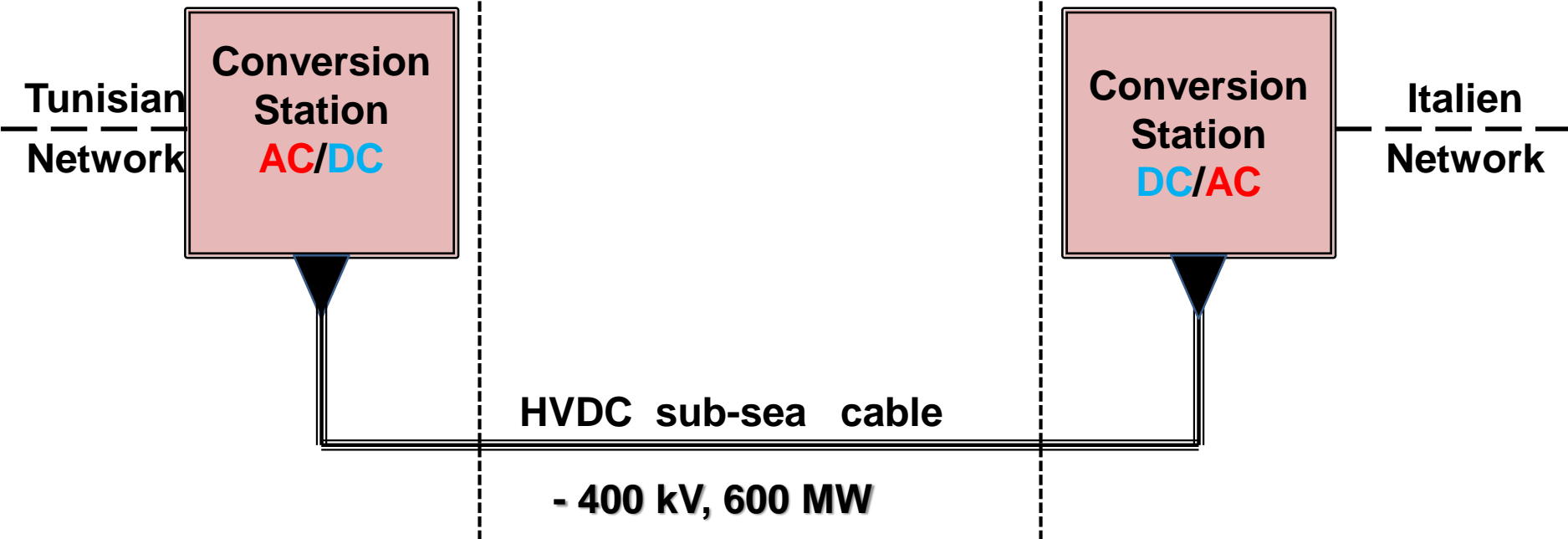


# Interconnection Project: Tunisia-Italy

Tunisia (Haouaria)

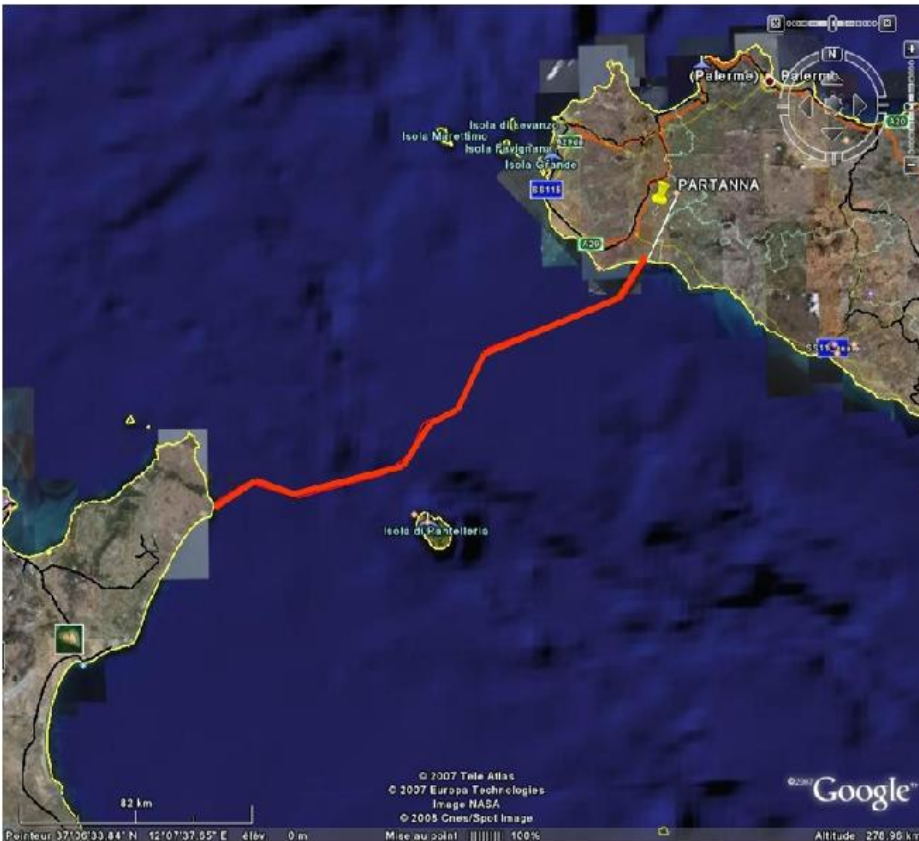
Mediterranean sea

Partanna (Sicily)





# Interconnection Project: Tunisia-Italy

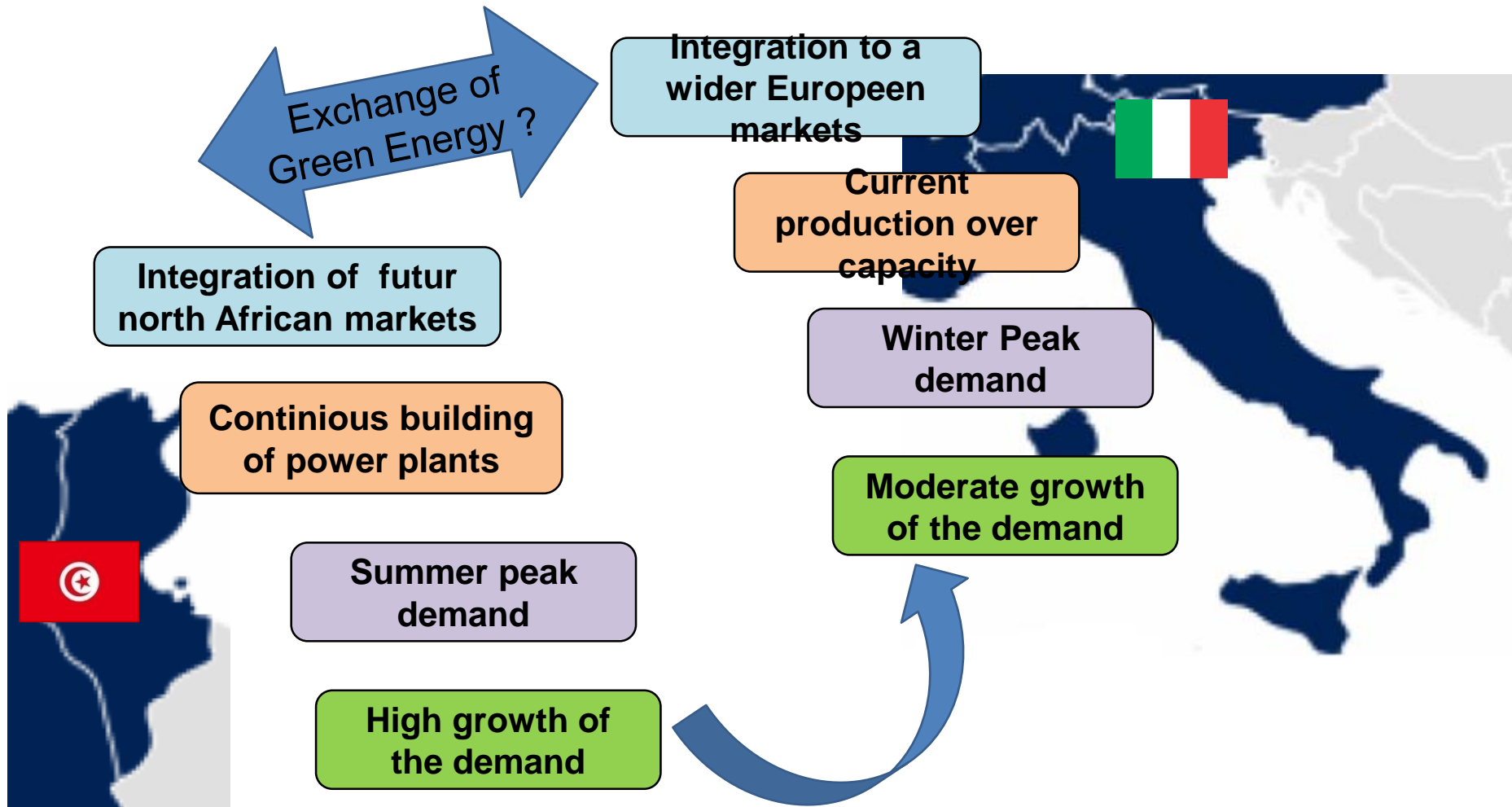


## Objectives:

- ✓ Enhance the electrical networks' stability
- ✓ Promote power exchange
- ✓ Materialise complementarity between north and south
- ✓ Better integration of Renewable Energy
- ✓ Reduce CO2 emission by increasing share of Renewable Energy



# Interconnection Project: Tunisia-Italy





## Some key dates 1/2

- **1990** : preliminary study (STEG-ENEL) regarding:
  - The Opportunity for a power plant rated 4 x 335 MW at Haouaria (north of Tunisia),
  - Export of 3x335 MW to Italy and 335 MW to Tunisia.
  - Installation of a sub sea HVDC cable (Haouaria – Sicily).
- **2003 - 2004** : Cooperation Protocoles respectively between:
  - The Italien and Tunisian Gouvernements, for promoting the energy exchanges .
  - STEG & TSO for the feasibility study of the sub sea interconnecting electrical cable.



## Some key dates 2/2

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- **September 2005** : Recommendation from the Tunisian- Italian technical committee for a 1200 MW power plant at El Haouaria (Tunisia ) and a sub sea interconnection cable rated at 1000 MW between the Tunisian and the Italian electrical systems.
- **June 2007** : Joint Declaration of the Italian and the Tunisian ministers and a Memorandum of Understanding between STEG and TERNA, for the development of this project.
- **April 2009** : Creation of the joint company ELMED Etudes (50% STEG / 50% TERNA), with the role of assistance the partners in the preparation of the tender documents for the project.



## Current Status



- **Difficulties in the project implementation:** shifting to a more simple approach consisting in abandoning the 1200 MW power plant and retaining the sub sea interconnection HVDC cable rated at only 600 MW co-financed by both countries.
- **August 2014 :** a market feasibility study launched by ELMED Etudes, to study the Cost Benefit Analysis of the revised project according to the ENTSO-E approach.
  - ↳ The results of this study will serve as support for both governments and STEG /TERNA for the forward decision regarding this strategic project.





## Economic Aspects (ongoing studie



- Determination of the level of electrical energy exchange between both countries while optimizing the actual production means and considering the forecasted growing demands and the development plans for future electrical production.
- Validate the economic viability of the project expected to come on stream in 2020.
- Frame work of the study : Interconnected Europe (33 countries) + Tunisia (and north africa).
- Estimated cost of the project : 300 to 400 M€.
- Economic evaluation for two horizons : 2020 and 2025.
- Estimated project duration: 4-5 years.



# Potential Benefits of the Project



- Develop and boost the electrical energy exchange (commercial and back ups) between Tunisia and Italy and the North Africa and Europe hence introducing a better **flexibility** and improving system **efficiency**
- Creation of the technical conditions for a better integration of the north african and european electrical markets.
- Strengthening and bettering the **reliability** of the Tunisian electrical system.
- Ensure and Enhance the energy supply **security** (conventionnel and renewables).
- Postpone potential investments for base and stand by plants



## Perspectives of the Project

- The Tunisian Italian Interconnection is a **Project of strategic importance** to both countries and to the northern and southern sides of the mediterranean sea
- Close the loop with the existing Intrconnections between Morocco and Spain and allows real integrated electrical systems
- Possibility of doubling the rated capacity (600 to 1200 MW).
- Possibility of considering the project as a “**Project of common Interest by the European Commission**”.
- Possibility to integrate the project into the development of mediterranean interconnections plan by MED-TSO.

*Thank you for your attention*

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