Interconnections in the Mediterranean Region and the role of Med-TSO

Med-TSO
MEDITERRANEAN TRANSMISSION SYSTEM OPERATORS

Angelo Ferrante – Secretary General

Developing transmission electricity grids, protecting our seas

Palma de Mallorca – 26 September 2017

supported by the EU

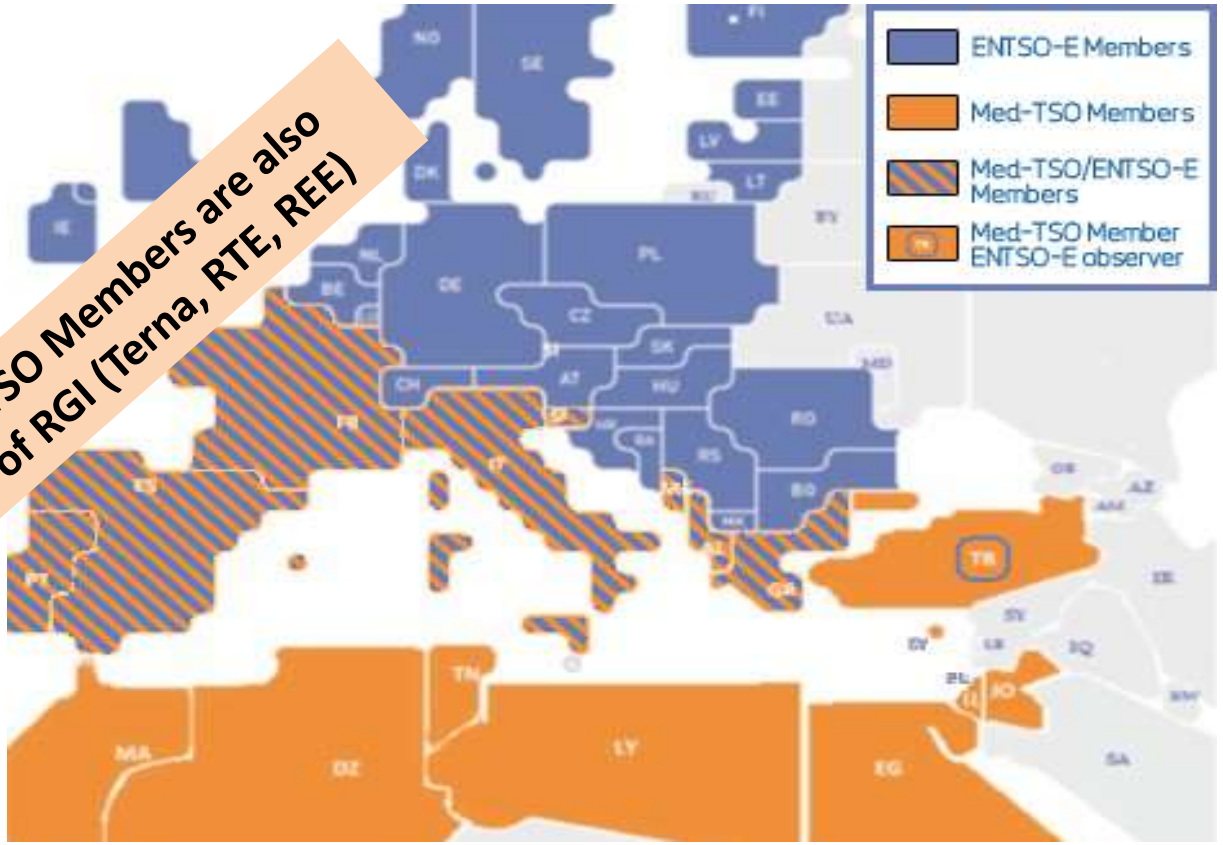
Table of Contents

- The context and the role of Med-TSO
- Cooperation in the Mediterranean Region
- Current and future activities: MPI & MPII

Med-TSO at a glance

Albania - OST
Algeria – SONELGAZ, GRTE, OS
Cyprus – Cyprus TSO
Egypt - EETC
France - RTE
Greece - ADMIE
Israel - IEC
Italy - TERNA
Jordan – NEPCO
Libya – GECOL
Morocco - ONEE
Montenegro - CGES
Palestine - PETL
Portugal - REN
Spain - REE
Slovenia - ELES
Tunisia - STEG
Turkey - TEIAS

Three Med-TSO Members are also members of RGI (Terna, RTE, REE)



- **20** members from **18** Mediterranean countries
- **8,5 million** km^2 ca covered
- About **500 million** of people served
- Almost **544.000 MW** of installed capacity
- Around **400.000 km** of transmission lines
- More than **1600TWh** of electricity consumption

Stakeholders & Partners

European Commission: Med Project is the first step of a Roadmap, need to continue the cooperation with EC (DG NEAR & DG ENERGY)

MEDREG (Mediterranean Energy Regulators): cooperation framework since 2014; to be further strengthened not only in the frame of the REM platform

UfM (Union for the Mediterranean) Consolidate and structure the contribution to the roadmap and work programme of the *REM Platform* (jointly with MEDREG)

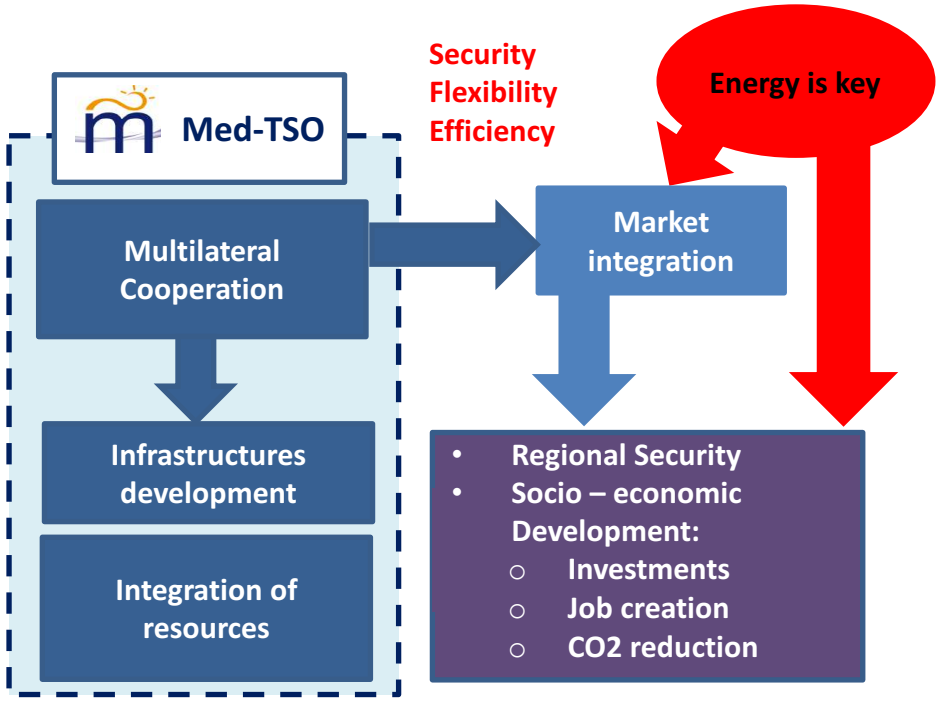
NDAs signed on Feb & Nov 2016 for providing Med-TSO an extract of the **TYNDP data** and market study results

- Preparation and update of a **Joint HV Electricity Grid Map** through an exchange of geographical data between the two Associations
- **Long-term joint cooperation agreement** (to be signed shortly)

Further cooperation ongoing with other regional stakeholders for bridging effectively EU and Arab countries (AUE, LAS, COMELEC, MEDELEC, MEDENER, OME, RES4MED)

The context and our role

- Established in **2012**
- Technical platform that, using multilateral cooperation as a strategy of regional development, facilitates the integration of the MPS and foster security and socio – economic development



Multi-lateral dimension & energy transition

Europe

- load demand stagnation
- huge increase in RES production
- overcapacity

Non EU countries

- average load demand increase of about 5% /yr
- limited financial capabilities (mkt fragmentation

Benefits of new infrastructures fully exploited only in a multi-lateral dimension

Barriers to regional integration

- **Technical**
  - ✓ Med-TSO initiative
  - ✓ Med Project example of cooperation: CTRF + Roadmap, DBMED + Master Plan (rules, methodologies, scenarios), Operation coordination
- **Financial**
  - ✓ first projects as a flying wheel for future investments
  - ✓ Non market-only-driven investments: new criteria and need of appropriate CBA and CBCA (TUN-ITA case)
- **Political/Institutional**
  - ✓ UfM platforms
  - ✓ Med-TSO/MEDREG cooperation

- **Gradual approach**
- **No one-size-fits-all solutions**
- **Sub-regional approach**

Master Plan for Med Interconnections (2013)

- ✓ Launched by the EC under the project "Paving the Way for the Mediterranean Solar Plan"
- ✓ Presented in Brussels on 11 Dec 2013 (UfM Ministerial Meeting)
- ✓ 10-years time horizon (2013 – 2022)
- ✓ **Forecasted Peak-Demand increase** of about **90 GW** (Eastern and Western Mediterranean Countries)
- ✓ Connection of about **150 GW** (**15% RES**) of new **generation capacity**, for a planned investment of **220-250 BEUR in 10 years**
- ✓ New **International Exchanges scenarios**

- ✓ A **realistic set of grid infrastructures**, to be realized according to the NDP of each Country
- ✓ Identification of **33,000 km new HV transmission lines** and assessment of the related investments (about **20 BEUR**)

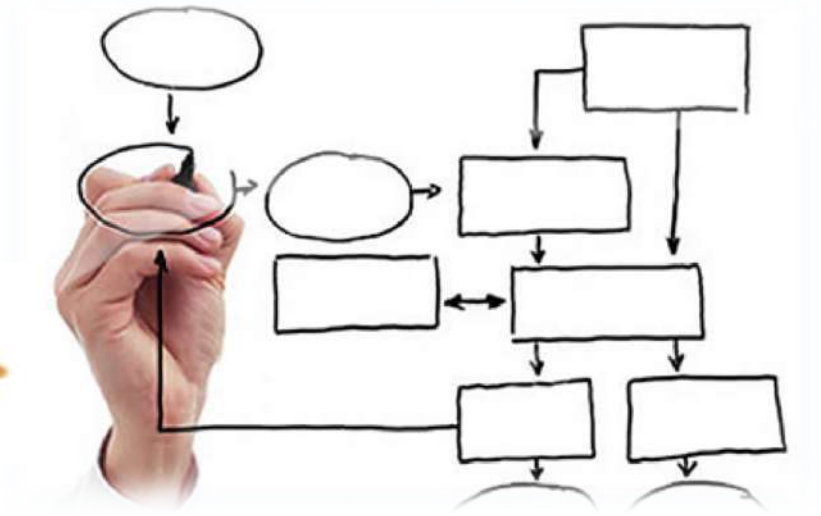
An improved approach: the Med Project

- Interconnections usually neglected in the NDPs: systems as electrical islands /non shared assumptions with the neighbors
- Need for common grounds in planning future integrations (also common grid data and scenarios)
- Med Project gathers data from TSOs (bottom – up approach) and delivers shared methodologies and scenarios for an integrated RDP (benefits / externalities in a regional perspective)
- Data uncertainties from countries facing political and social turmoil (only estimated)
- Analysis of corridors → assessment of benefits (costs estimated by promoters)
- Several agreed snapshots for every corridor, different internal grid models for assessing internal reinforcements

The Mediterranean Project

3-yearly EC-DG NEAR grant (02.2015 – 01.2018)

- **Rules -** common set of basic rules;
- **Infrastructure** - guidelines for Network Planning and implementing a Euro-Mediterranean Electricity Reference Grid;
- **International Electricity Exchanges -** development of a Mediterranean Electricity System;
- **Knowledge Sharing -** establishing a forum among the relevant professionals working
- **Med-TSO Database -** creation of a Mediterranean database



mediterranean project

Upgrading the grid: a game changer for RES Development

- The production of electricity from renewable sources is soaring in the Mediterranean Region (one of the most sensitive regions to climate change in the world)
- This trend calls for a shift of paradigm in order to make the systems able to manage the flows of electricity produced through these sources, naturally affected by variability and unpredictability

Present and future Action Plan of Med-TSO focused on:

- **Increasing the reliability and flexibility of the HV grids,** with particular regards to the cooperation in the Ancillary Services
- **Transferring knowledge and know-how,** to permit a mutual increase of the expertise of the TSOs personnel in managing the challenges of the RES integration into their HV systems

Med Project I deliverable

a) Market and Network Studies

- 2030 scenarios (ENTSOE-like) considering RES growth
- Studies on needed reinforcements and new interconnections for facilitating RES integration

b) Sharing systems services to favor RES integration (study on schemes and possibilities)

- Some non-EU countries have ambitious RES goals but limited electricity markets and smaller conventional generation parks to support such growth → sharing of ancillary services
- Three "ingredients" (RES, interconnectors and sharing resources) appear to be key for supporting significant infrastructural, economic and social development in the Mediterranean region
- sharing ancillary services can be enhanced by market mechanisms, if they exist, but it can be also achieved by specific TSOs agreements even where there is no market
- need to invest in the grids for improving system stability

c) CBA for new projects

- Similar to the ENTSO-E methodology applied at EU level (CO2 reduction, Level of RES integration allowed into the system thanks to the new projects, Environmental analysis)

d) Knowledge Sharing

- Experience of EU Med-TSO members (energy transition to be tackled soon)
- Workshop in Alger on 24-25 October, focused on "Renewable Energy Development and Integration in the Mediterranean Region" (Long-term Energy scenarios and RES development, Regional Cross border Exchanges and System services sharing, RES development National Cases and Experiences on RES integration)

Launching the Med Project II (2018-20)

Objectives

Promote the progressive integration and interconnection of Power Systems and the enhancement of cross-border electricity exchanges in the Mediterranean region by:

1. **increase energy security and reliability**
2. **favor greater RES penetration** by **facilitating their integration** (encouraging cost-effective RES exchanges both on the North-South and South-South axes)
3. **increase the overall system efficiency**
4. **generate economies of scale in investments and operations**

- **Improved platform for Multilateral cooperation**
- **Effective bridge between the Mediterranean TSOs** and other associations in the Region, combining knowledge, work and visibility

Proposed Action Plan 2018-20

Most of the projects deal with submarine HVDC interconnectors

Planning of infrastructure

a) Rolling Mediterranean NDP (MNDP)

Regulation & Power System Rules (in cooperation with MEDREG)

a) harmonization of technical rules and implementation of the zonal approach

b) Transparency, incl. Transparency Assessment Report

Scenarios Adequacy and Market Studies

a) Mid/long-term scenarios and adequacy reports

Grid & Markets integration

a) Business models for investments in interconnections (incl. RES integration)

b) Impact of grid integration on climate change (energy efficiency)

c) allocation of costs and risks for new investments

d) Permitting procedures (assessment report)

Operation of Power Systems

a) Common Web-Platform to gather information on cross-border interconnections;

b) Periodical report on the behavior of the regional PS (operation data and KPIs)

Training and Knowledge sharing

a) Organization of training sessions and regional workshops and events

b) Promote Members interaction with Energy Strategic Projects in the Region

This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of Med-TSO and can in no way be taken to reflect the views of the European Union.