

Dott. Matteo Codazzi
Milano, 30.10.2017

Renewable Energy Development in the Mediterranean Region

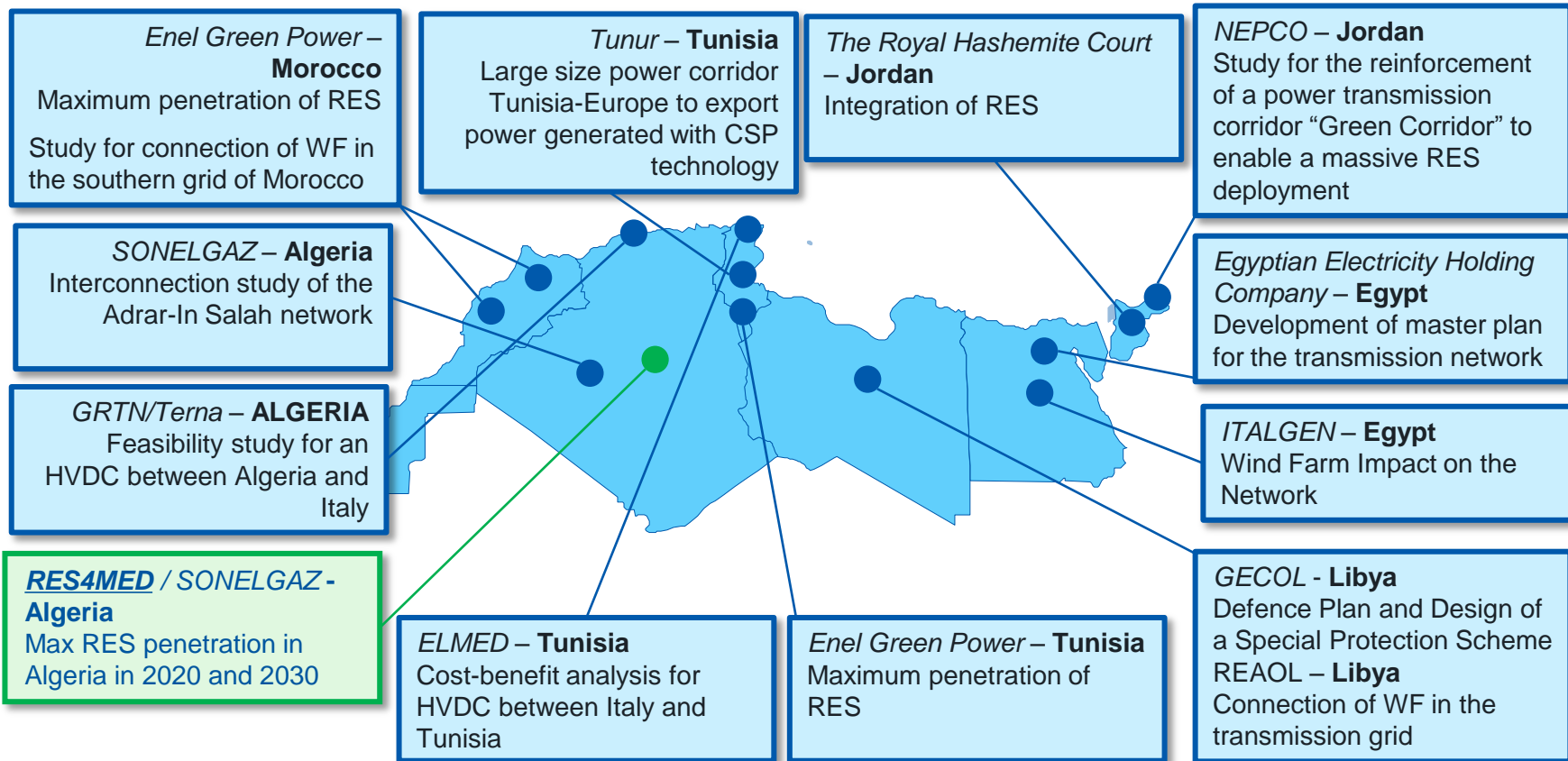
Renewable Energy Investments In The Mediterranean And Beyond

CESI

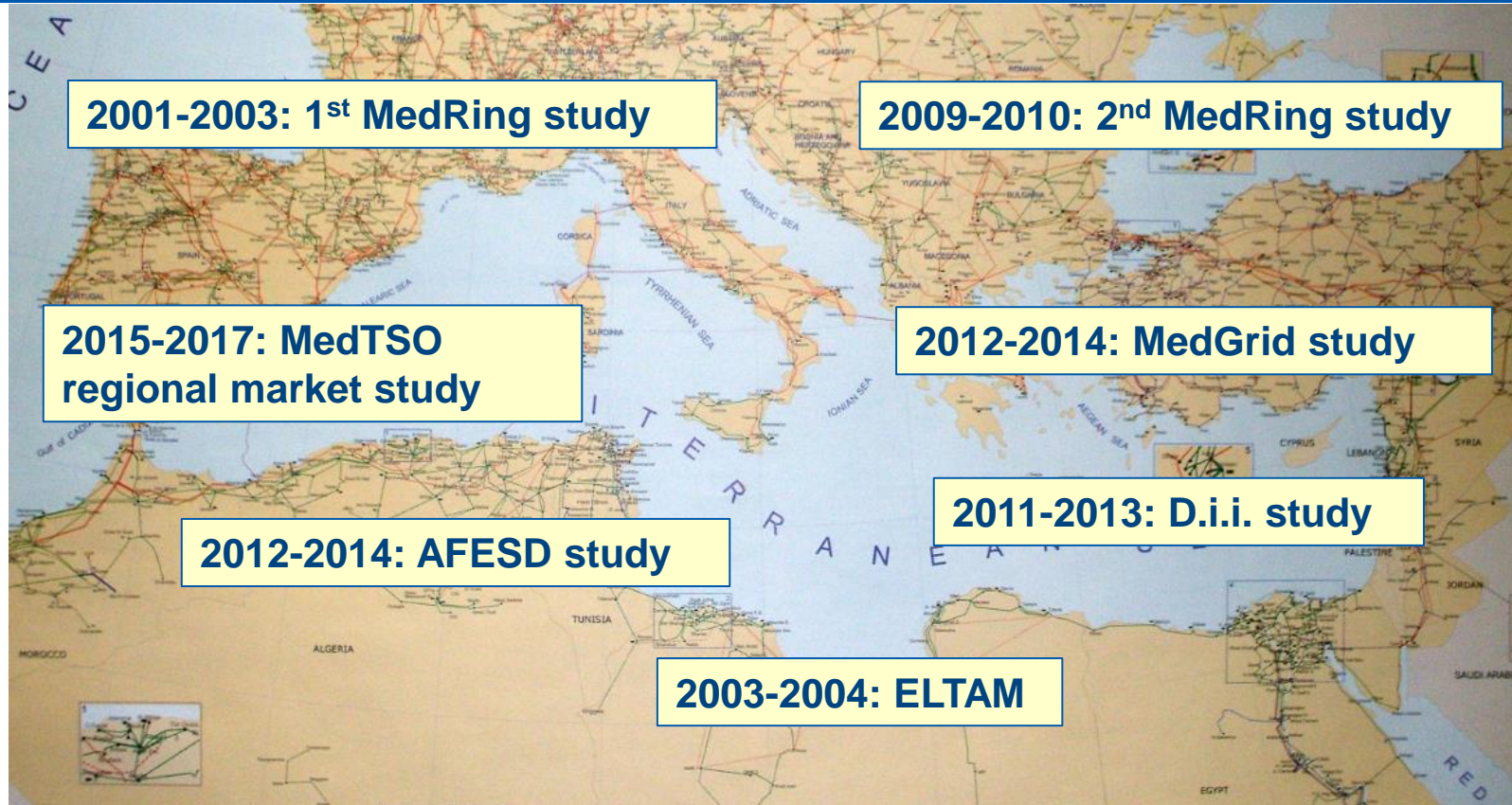
Shaping a Better Energy Future

RES4
MEDI

CESI has a solid track record in RES integration, interconnection planning and system studies in the Region...

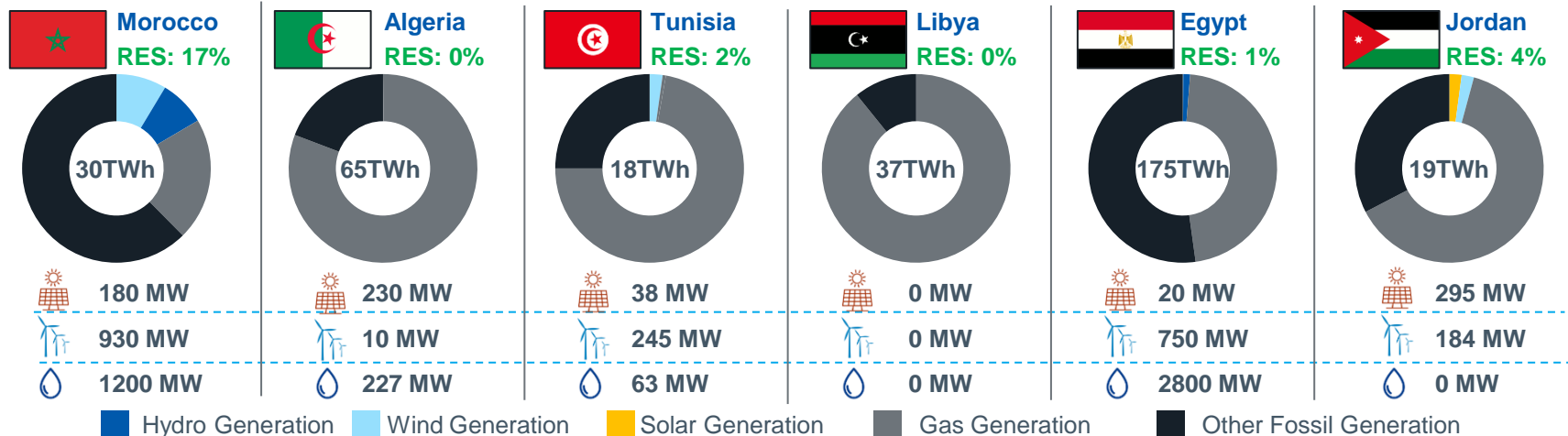
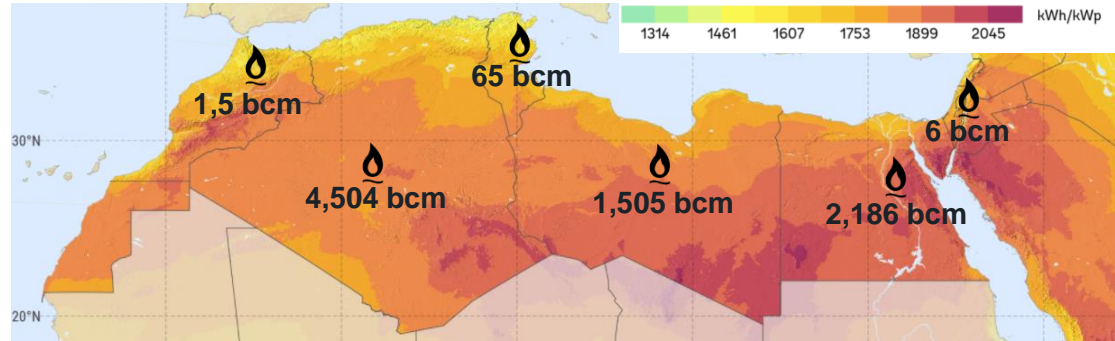


...and carried out extensive bilateral and multilateral system studies assessing the existing and future power system



















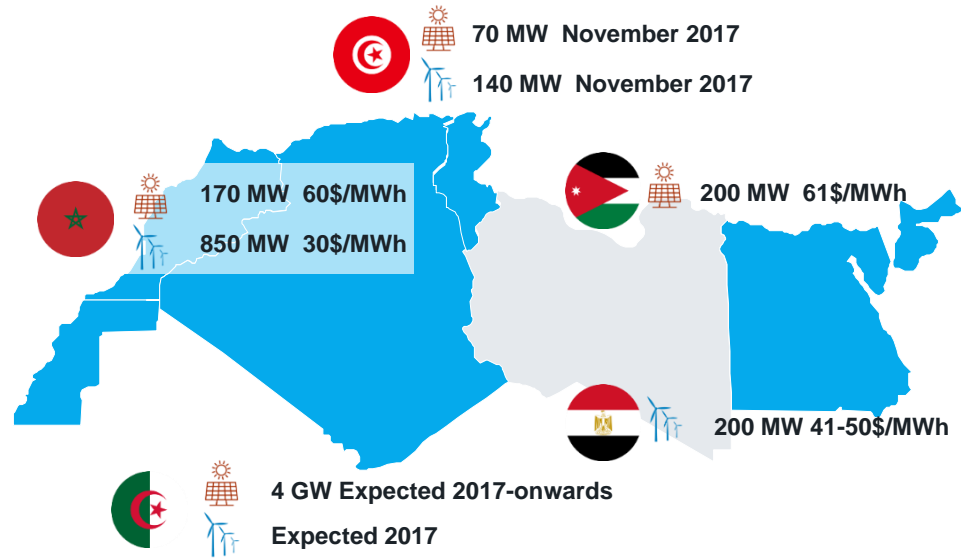
The Region is extremely rich in natural resources but still lays behind in electricity mix decarbonization

- Uneven distribution of NG & oil resources
- Huge Wind and Solar Potential (IRENA estimates ca.200.000 TWh/year)
- Still lagging behind in RES generation deployment



RES support policies are progressively shifting toward competitive auctions attracting investments in new capacity

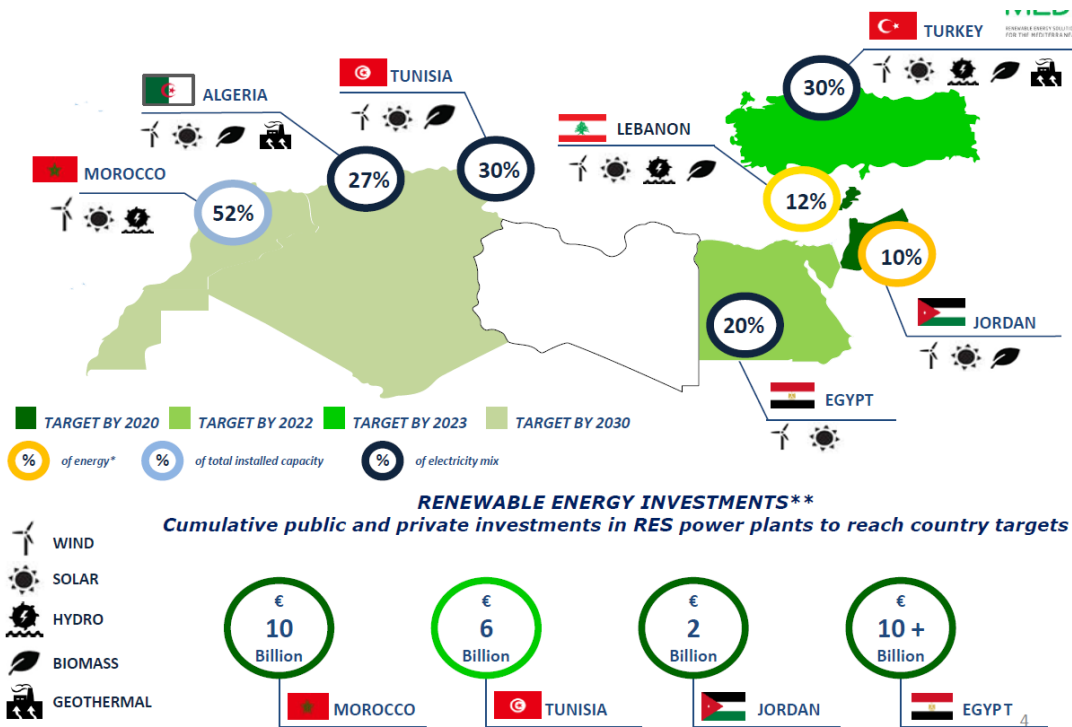
	Competitive Auctions	FiT	Net Metering
 Morocco			
 Algeria			
 Tunisia			
 Libya			
 Egypt			
 Jordan			



Remarkable drop in the LCOE of new solar and wind power plants

Source: Irena

RES Development Plans in the Region are highly ambitious and require strong T&D development to maintain adequacy

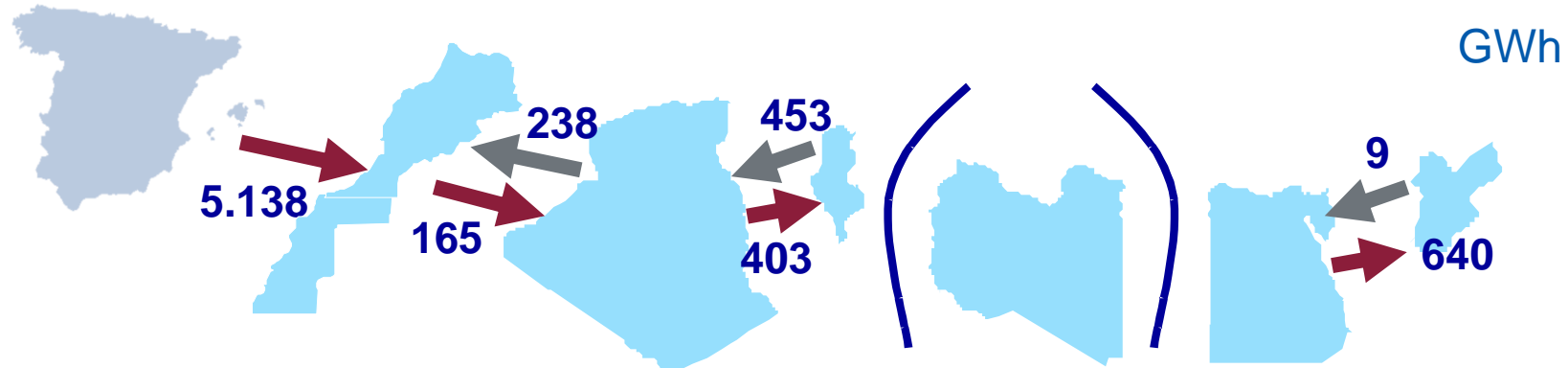


RES penetration Targets in North Africa		
Country	Penetration rate	Target year
Morocco	42%	2020
Algeria	40%	2030
Tunisia	30%	2030
Libya	10%	2025
Egypt	20%	2022
Jordan	10%	2020

- Integration of RES requires strong T&D development
- Need for a clear and stable regulatory framework to support financing in RES power plants

Source: RES4MED

VRES balancing and financial sustainability of investments strictly depend on the creation of a competitive power market



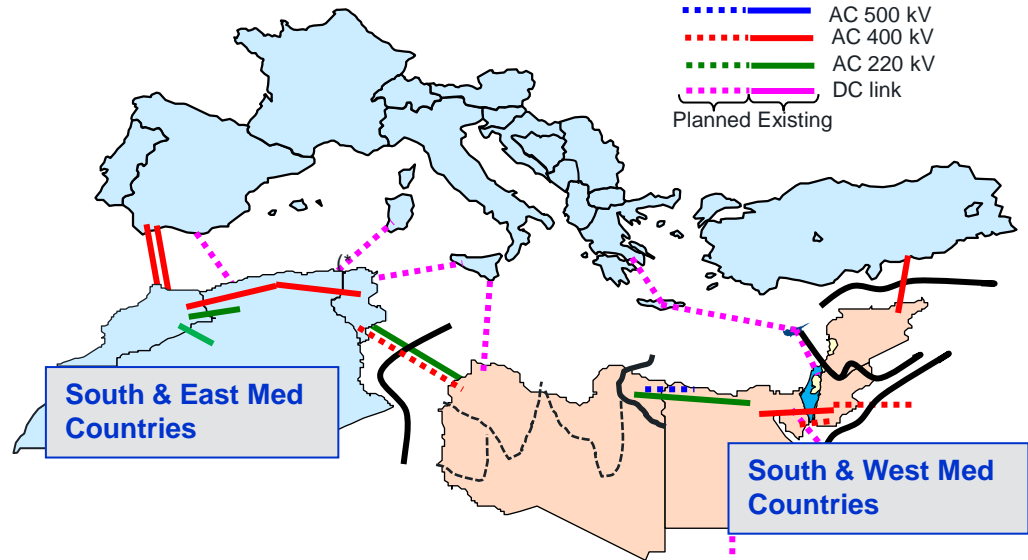
- **Long term commercial agreements** (as Egypt – Jordan) to guarantee investments in electrical infrastructure until proper spot market is established
- **Exploit the existing interconnections** to balance RES variability
- RES balancing and gas flexibility drive **creation of a unified regional power market**
- **Additional transmission capacity will be needed** to comply with ambitious future goals

Electrical integration is a key priority to face the fast demand growth and foster the implementation of RES

Two synchronous power pools:

- ENTSO-E, Turkey, Maghreb
- Mashrek

- **13 cross-border electricity interconnections are currently active** in the North African countries and more are under consideration
- Estimated **investments in HV lines and interconnectors** (33,000 km) by 2025: **≈30 b€** (MEDTSO)
- Potential **exchanges within the interconnected Arab system: 125 TWh in 2030**
- **Benefits** from optimisation of NG and G&T assets: **35 bUS\$ by 2030** (AFESD)



Looking forward: RES development as a key driver to electrify Sahara

- **CESI and Sonelgaz O.S.** together in a major interconnection Project
- **Interconnecting an isolated area in the South of Algeria with the National Grid**
- **RES potential is fully exploited as electricity flows from South to North (ca.1,5 GW)**



First step toward the sustainable electrification of isolated communities in Sahara

