A Mediterranean electricity cooperation strategy

Vision and Rationale

Alessandro Rubino

Bari University - Lecturer in Economics

RES4MED - Senior Policy Advisor

Integration of renewable energy solutions in the Mediterranean electricity markets

Milan, November , 27 2014

Table of contents

Part I

Assessing the EU pressure for future Mediterranean energy markets

- *Electricity needs in the Mediterranean region*
- *EU External Energy Policy*
- *Perception Survey – Methodology and results*
- *Policy Implication*
- *Q&A*

Part II

Institutional model

- *Co-evolution between technology and institutions*
- *RES development and the establishment of a Euro-Mediterranean energy area*
  - *Corridor approach | Network expansion | Establishment of a energy free trade area*
- *Policy implications*

Table of contents

Snapshot of Mediterranean countries

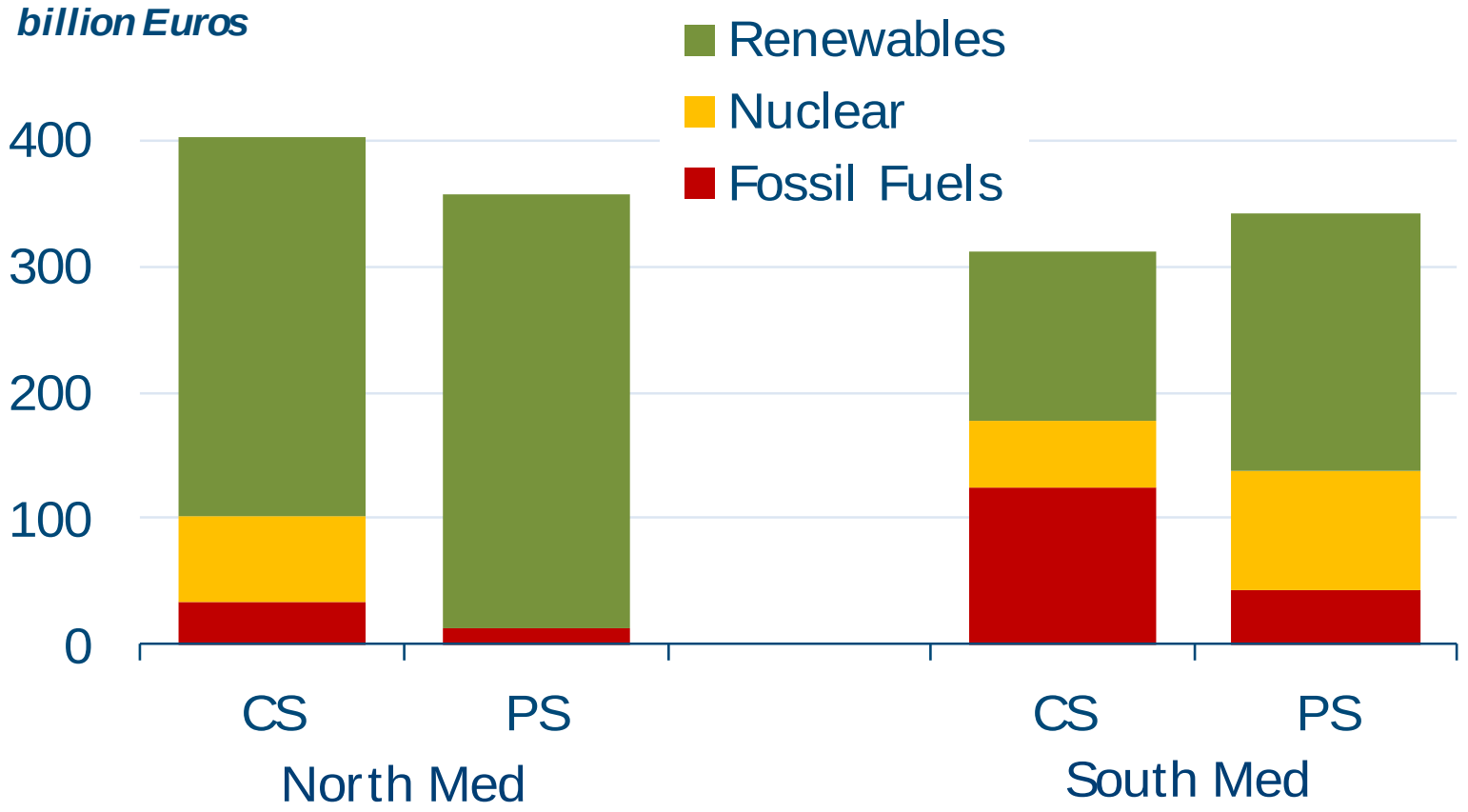
RES4MED
RENEWABLE ENERGY SOLUTIONS FOR THE MEDITERRANEAN

- **7% of world Population; 12% of world GDP**
- **Electricity consumption grew by 2% p.a. in 2003-2013**
- **The projected electricity demand growth is 2%-5% p.a. in 2013-2020**
- **Outstanding untapped RES potential**

	Northern Shore	Southern Shore	Eastern Shore
Population *(mln)*	145	170	96
GDP *(US tn$)*	6.6	0.7	1.2
GDP Growth*	3%	9%	5%
PV Load Factor	10% - 17%	17% - 22%	16% - 21%
Wind Load Factor	20% - 40%	30% - 45%	30% - 45%

Source: IMF Oct 2014, Enerdata, EGP estimates.
Note: Northern Shore area includes Spain, France, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Portugal, Albania, Greece. Southern Shore area includes Morocco, Algeria, Tunisia, Libya, Egypt. Eastern Shore includes Turkey, Syria, Lebanon, Israel, Cyprus, Jordan. * 2013 – 2019 annual growth. Macro data refer to 2013, electricity data refer to 2013

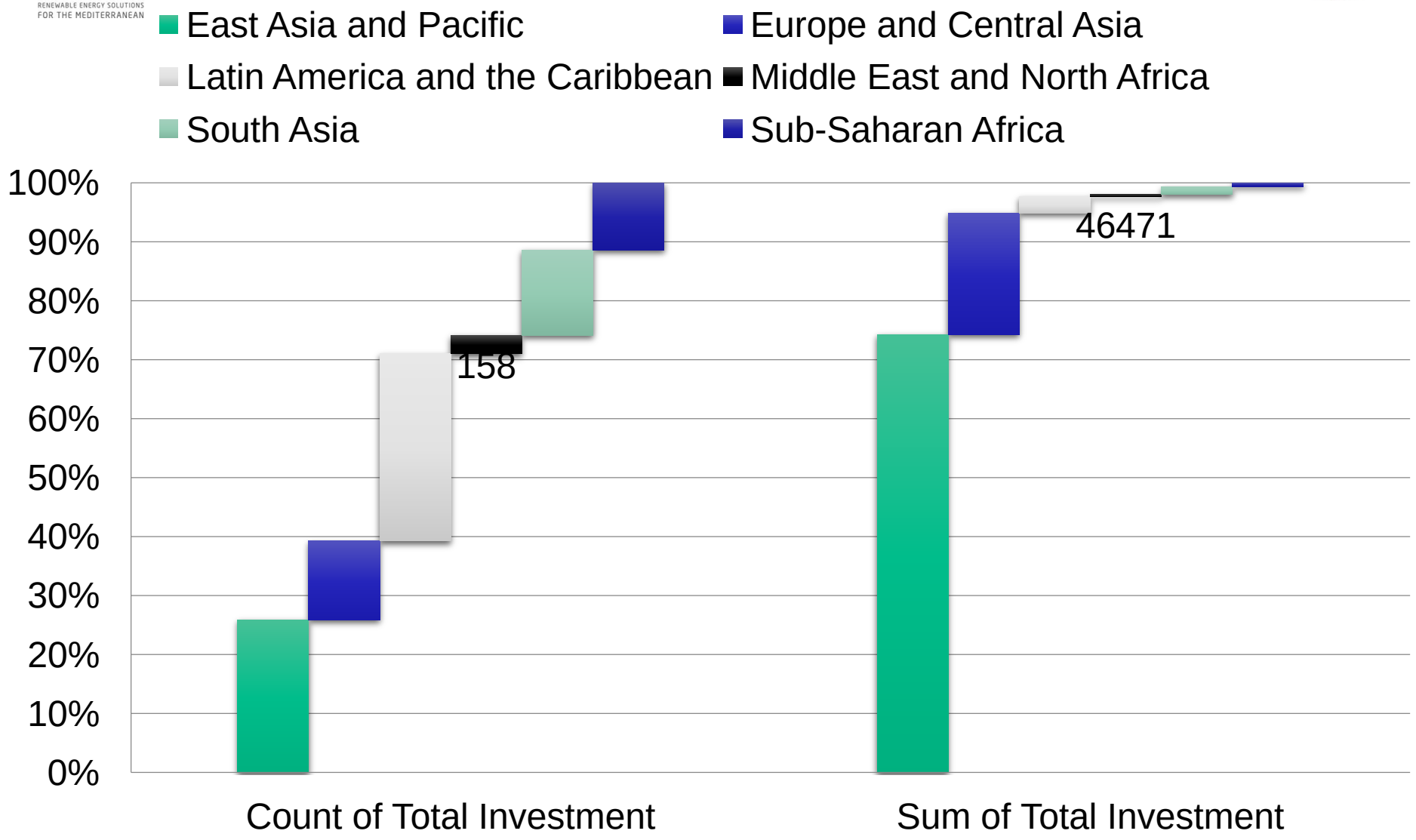
Power Generation Investments



- Over 700 billion Euros will be needed to 2030.
- Spared gas could compensate the additional cost of clean generation technologies.

Global operational PPP investment

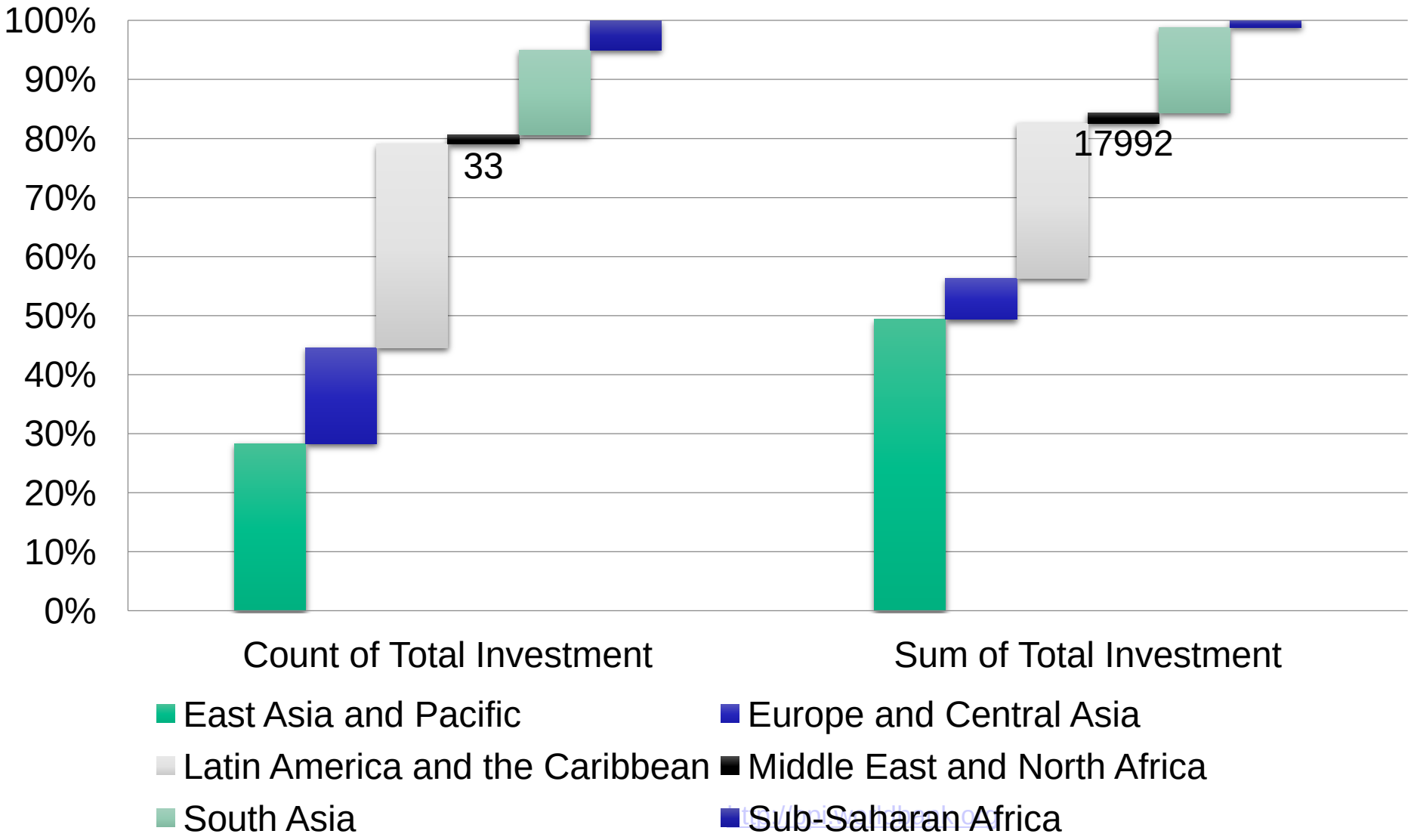
(by region, 1984-2012)



Source: World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org) **Date:** 05/02/2014

Energy operational PPP investment

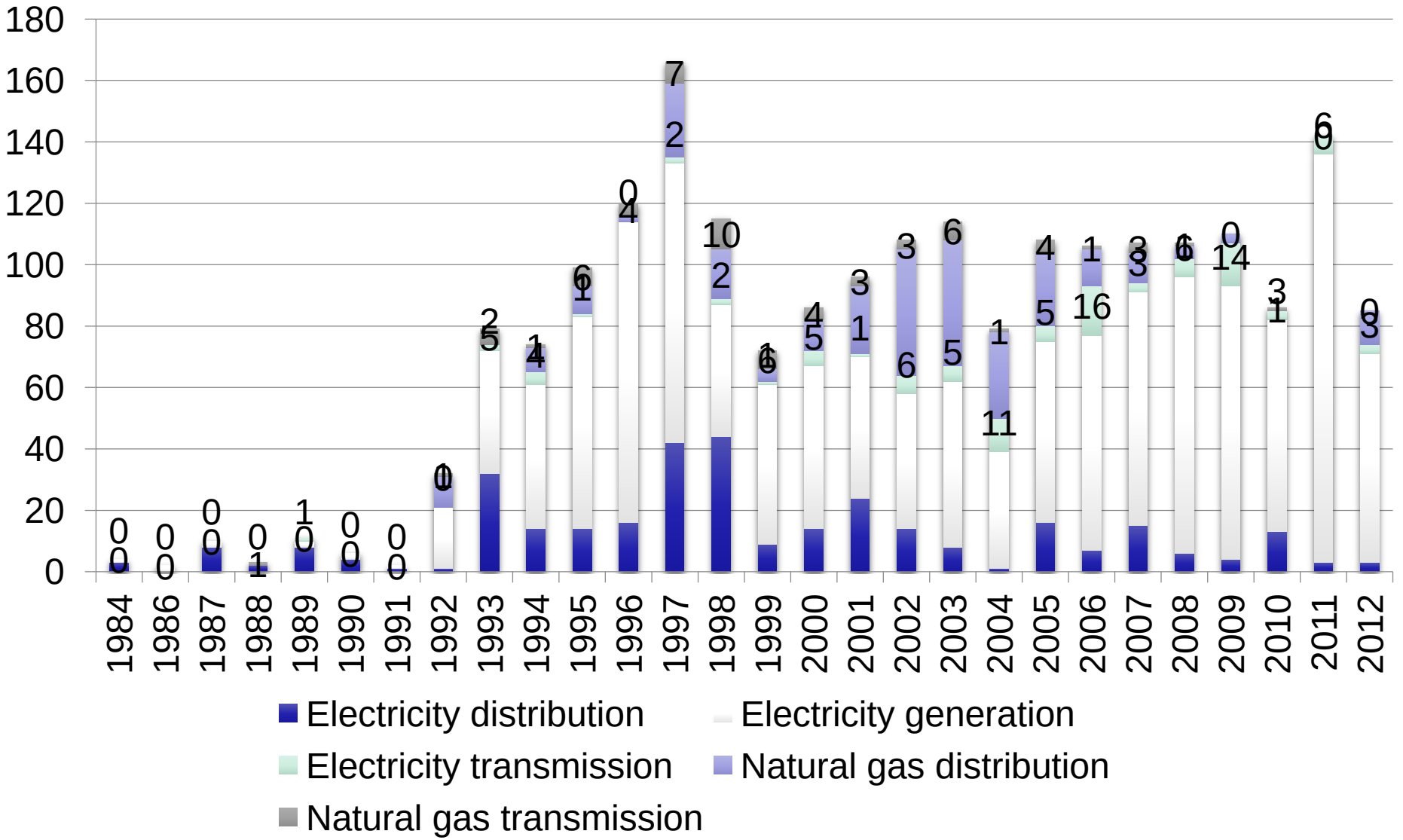
(by region, 1984-2012)



Source: World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org) **Date:** 05/02/2014

Global Energy operational PPP investment

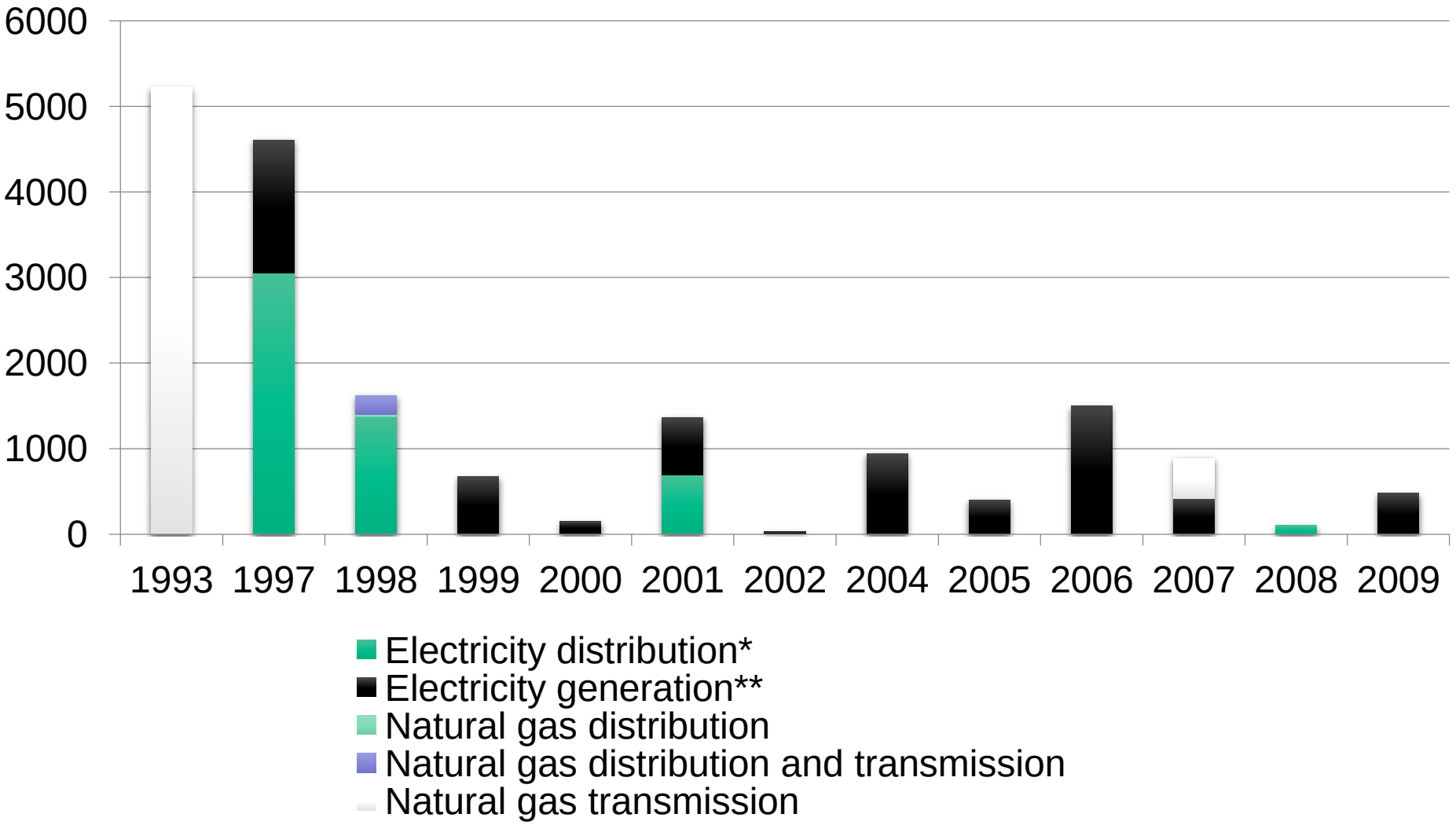
(by segment, 1984-2012)



Source: World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org) **Date:** 05/02/2014

Energy operational PPP investment

(MENA countries , 1984-2012)



***in current US$ millions**

Source: World Bank and PPIAF, PPI Project Database. (http://ppi.worldbank.org) **Date:** 05/02/2014

* Including Water utility with sewerage Investment ** Including Potable water treatment plant

What drives Investment in Energy infrastructures?

1. Support mechanism
   - Provide (at least to some extent) a level certainty on the return on investments
2. Regulatory framework
   - A pre-requisite for investments to take place. Even stronger stimulus when it is carried out within the participation of international agreements (framework)
3. Degree of corruption and political competition is a factor when deciding to enter a market or not. Otherwise contract design is able to protect investors against unduly expropriation.
4. Size of potential market is the most important determinant for investments in energy markets

Table of contents

1. **Assessing the EU pressure for future Mediterranean energy markets**

   - **Electricity needs in the Mediterranean region**
   - **EU External Energy Policy**
   - **Perception Survey – Methodology and results**
   - **Policy Implication**

Cooperation framework in the region

EU External Energy Policy toward its Mediterranean neighbourhood

- Characterised by Normative Power (Manners 2002)
- Mix of different instruments
  - Promotion of cooperation platform (MedREG and MED TSO)
  - Creating institutionalised instruments (EnC)
  - Adoption of International Standards (IS)

The promotion of law and regulations can be analysed by means of three main channels of regulatory diffusion *(Cambini and Franzi, 2014)*

- bottom up pressures,
- hierarchical top-down approach and
- network pressures for rules change and adoption

- We have explored these three potential mechanism in our recent perception survey

Table of contents

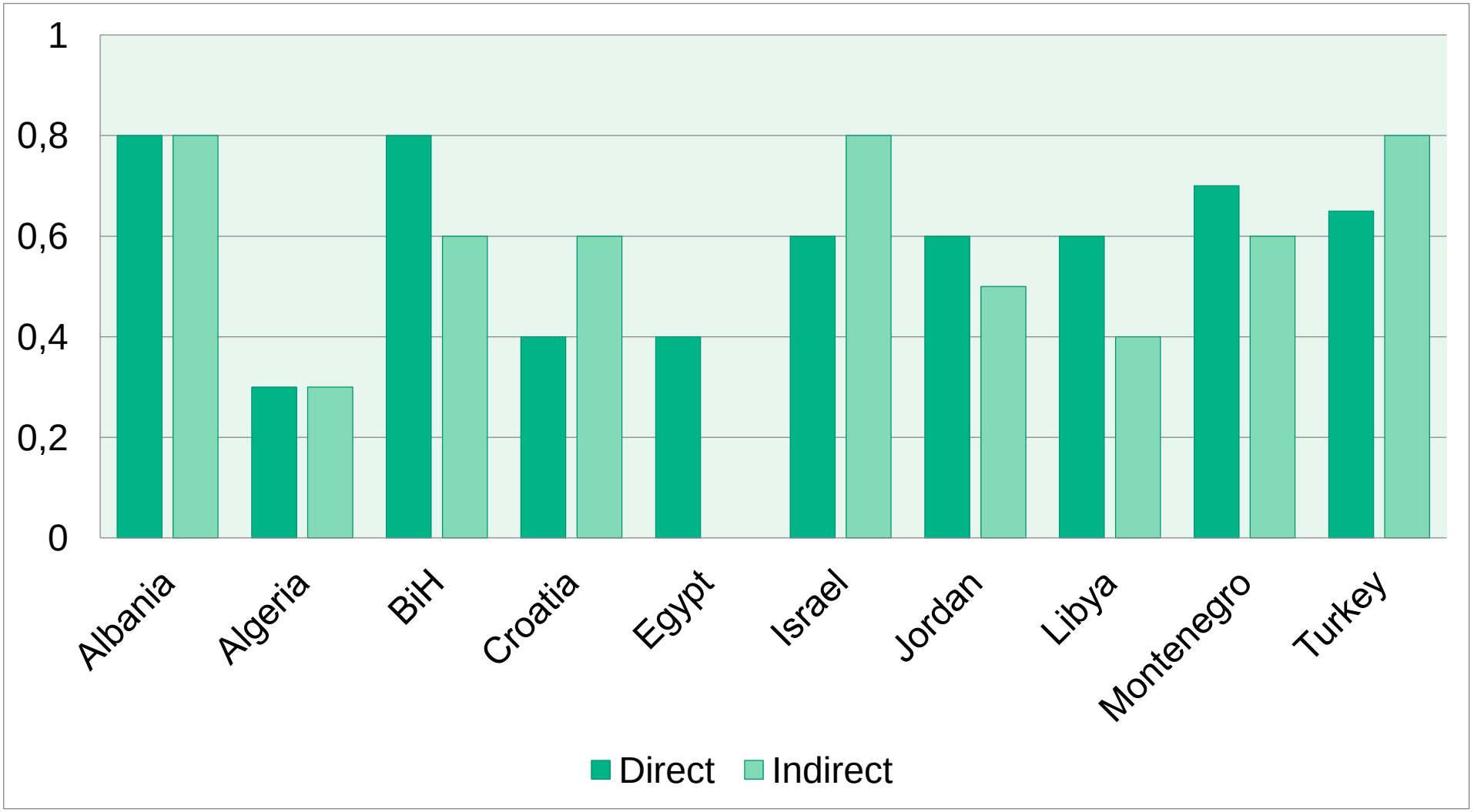
Perception survey

- Provide direct information on the impact of regulatory intervention
- Acquires informat6ion from an end-user point of view
- Measures regulatory policy design and evaluation
- Based on the methodology recommended by OECD (2012) and tested in a earlier exercise *(Cambini & Franzi, 2014)*
- Extends the scope by increasing the number of the countries involved[1](11)
- Submitted to 20 energy experts from non-EU Mediterranean Countries
- Information collected during a training event organized by Enel Foundation held in Venice in May 2013
- Score measured with a 0-5 scale and normalized

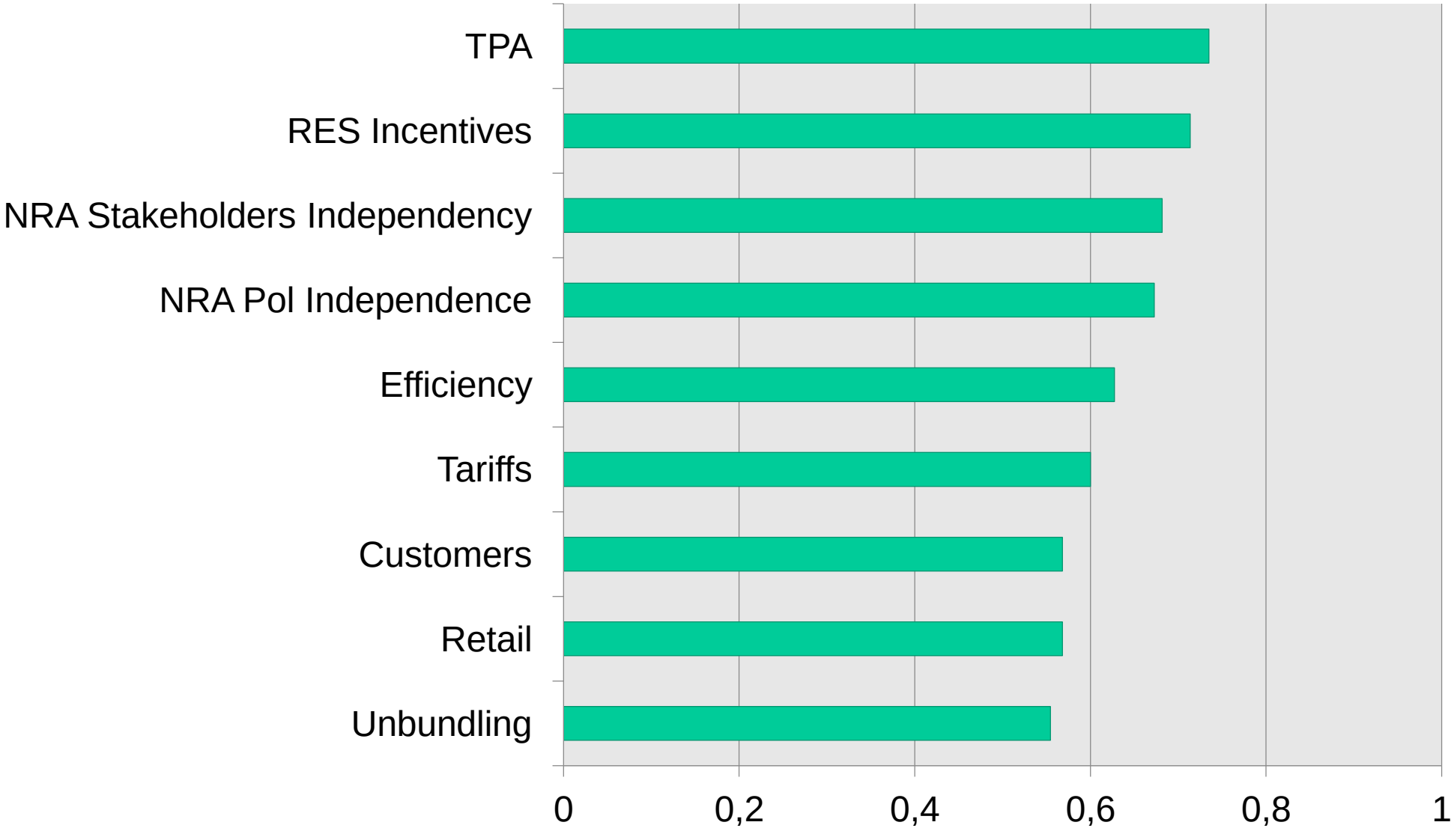
Useful diagnostic tool to identify areas of concerns and to inform future regulatory reforms

1 Albania, Algeria, Bosnia and Herzegovina, Croatia, Egypt, Israel, Jordan, Libya, Montenegro, Palestine, and Turkey

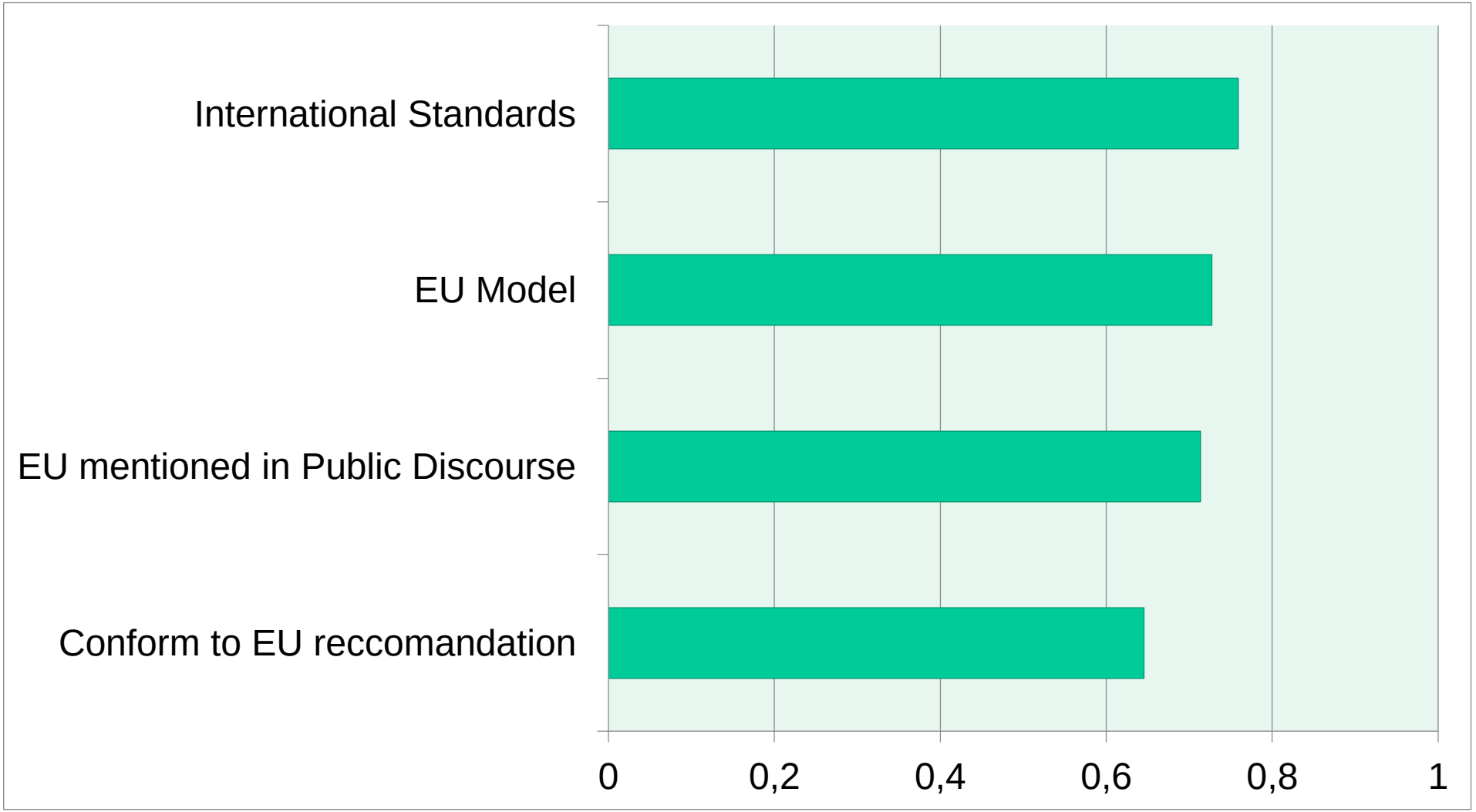
EU Methods
Energy rules promotion



EU Role
Rules Adoption

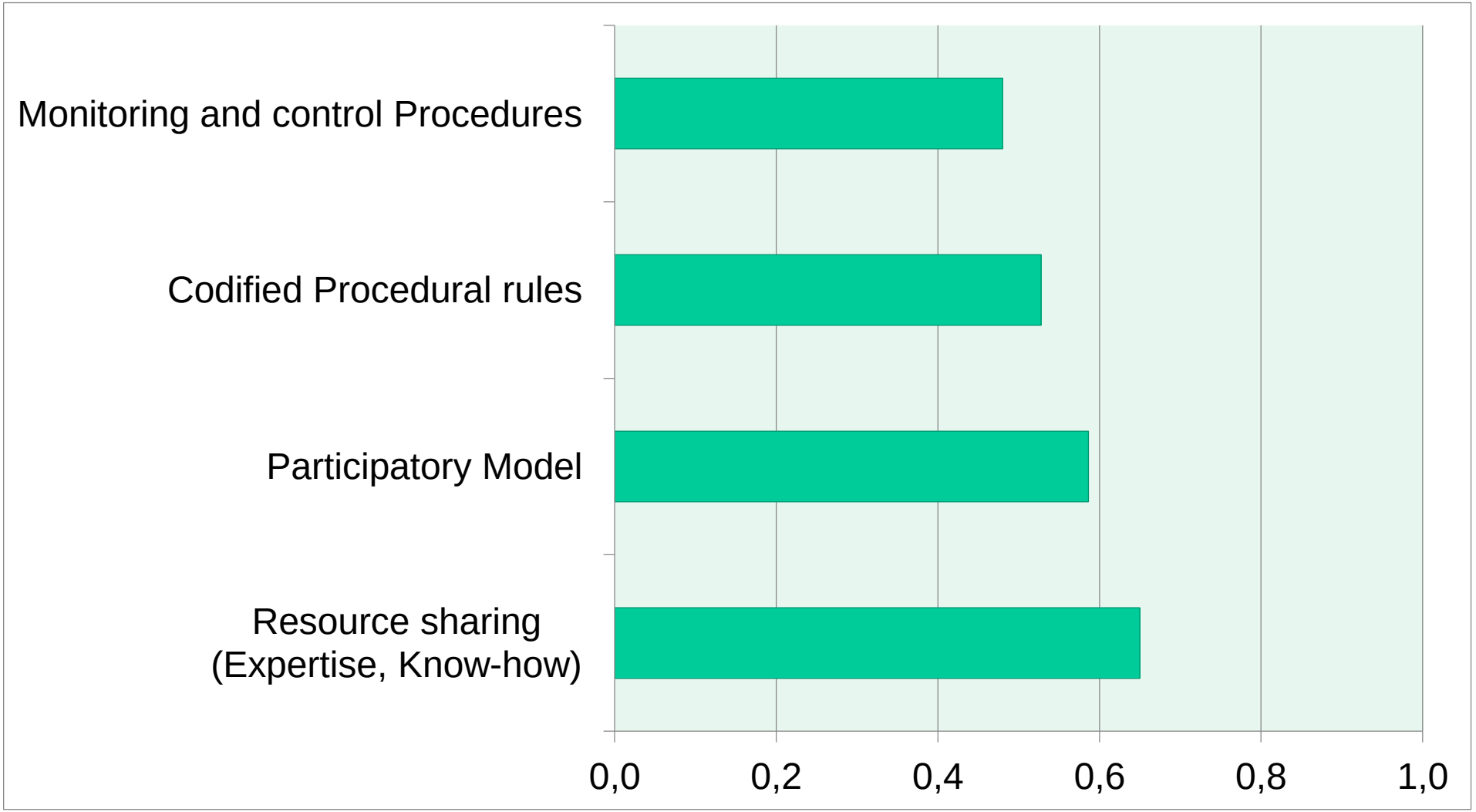


Conformity with Energy rules system

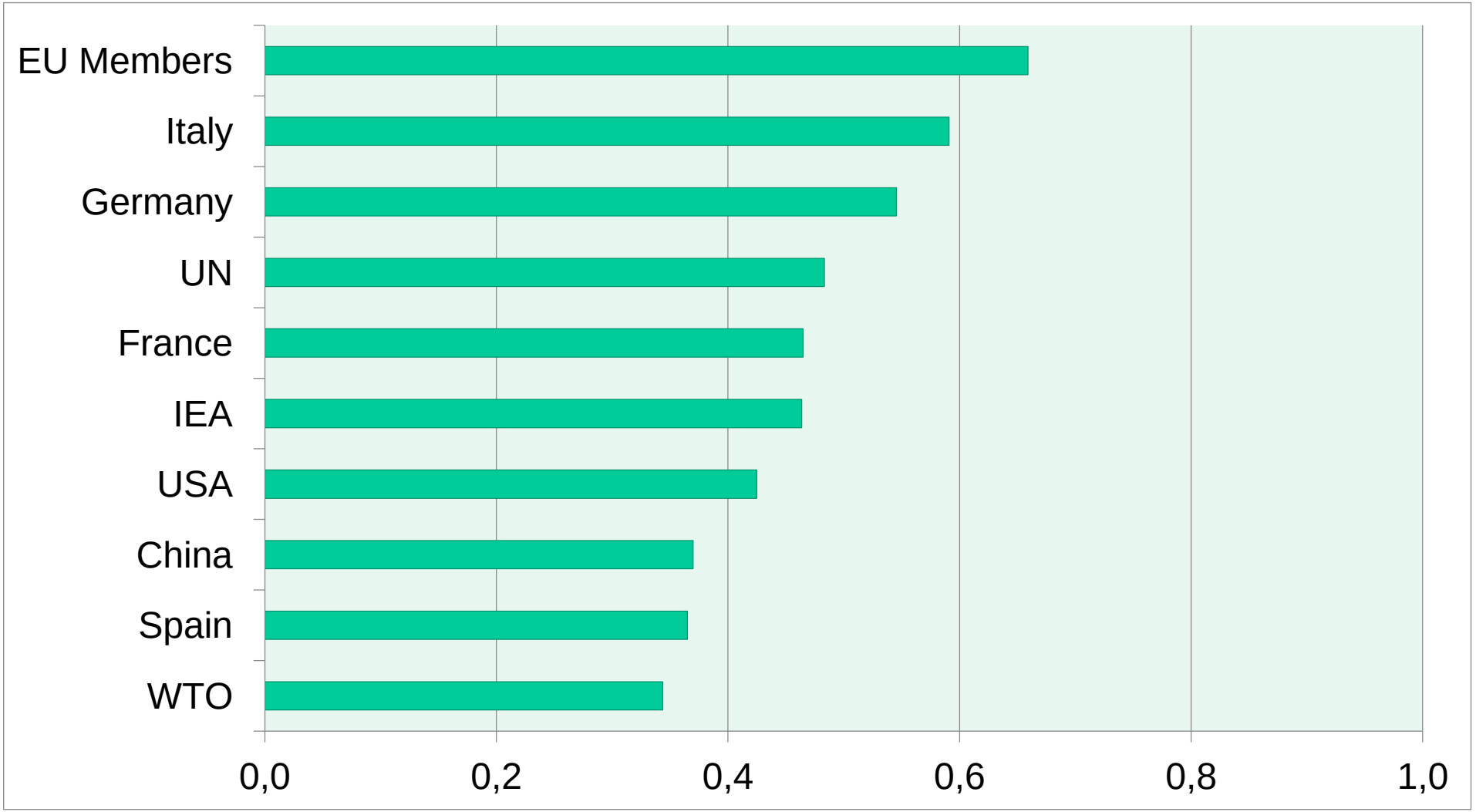


Network role
Rules Adoption

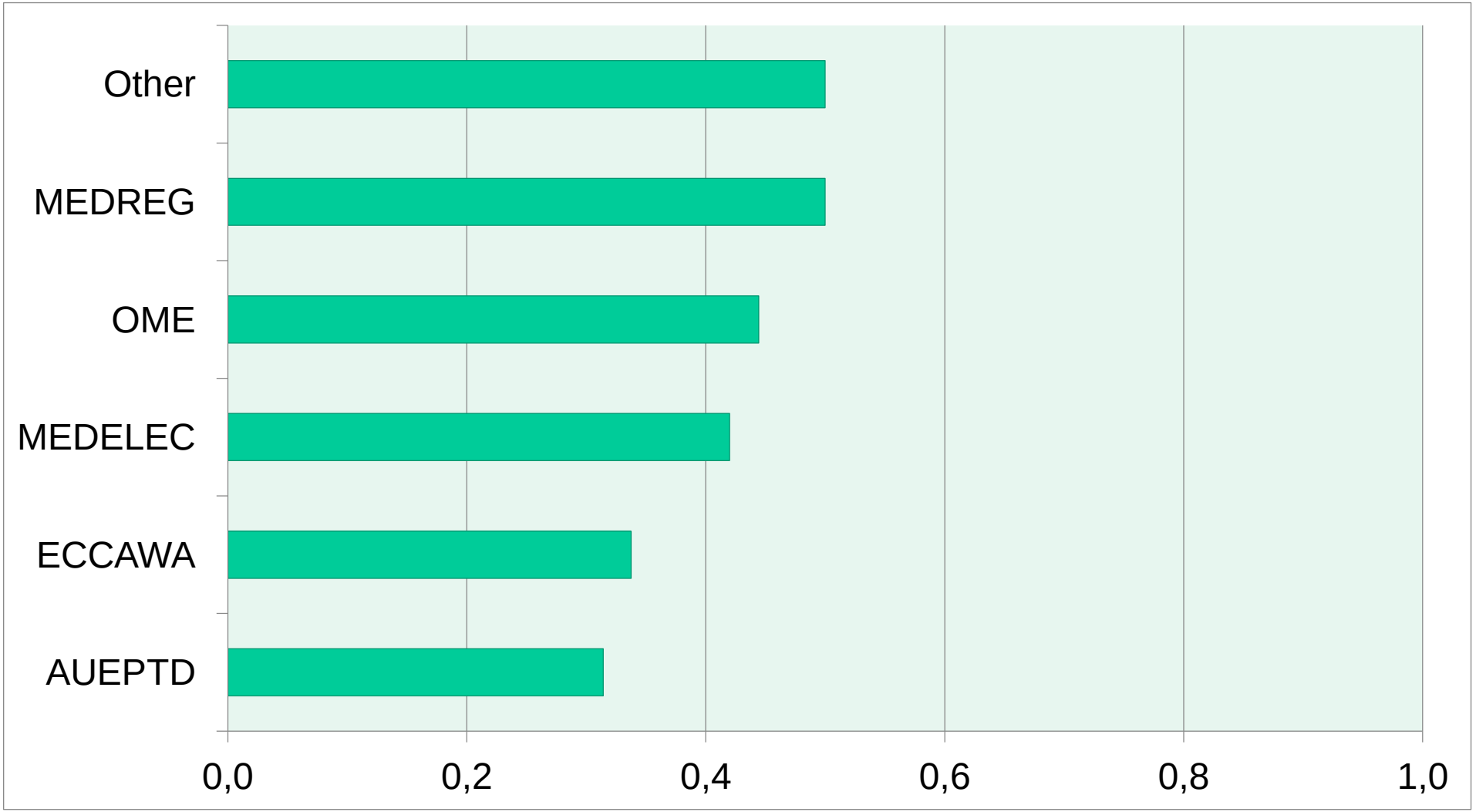
Energy networks
Rules promotion



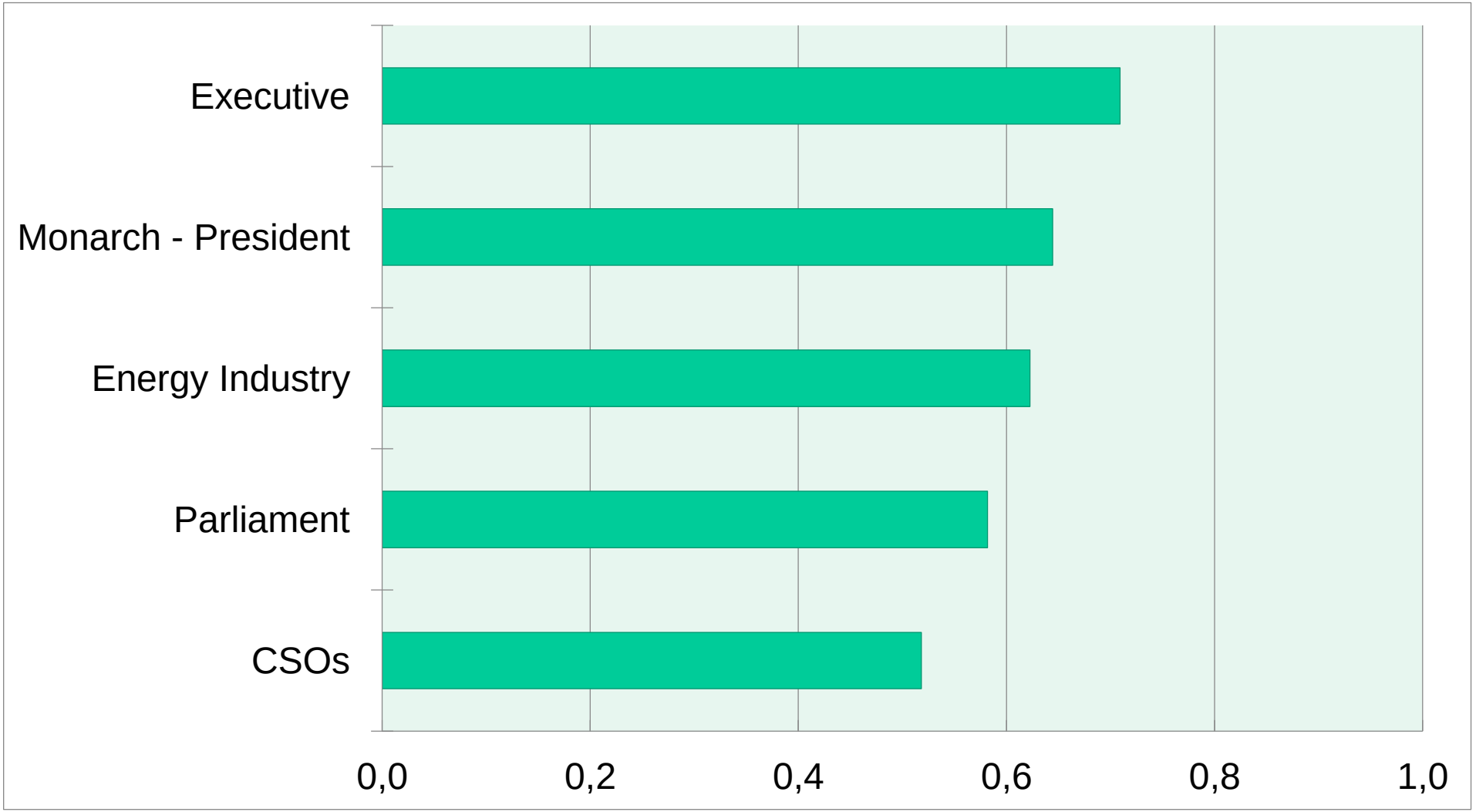
Other International actors



Role
Regional Networks



Role
Domestic Actors



EU - Med
Cooperation Drivers

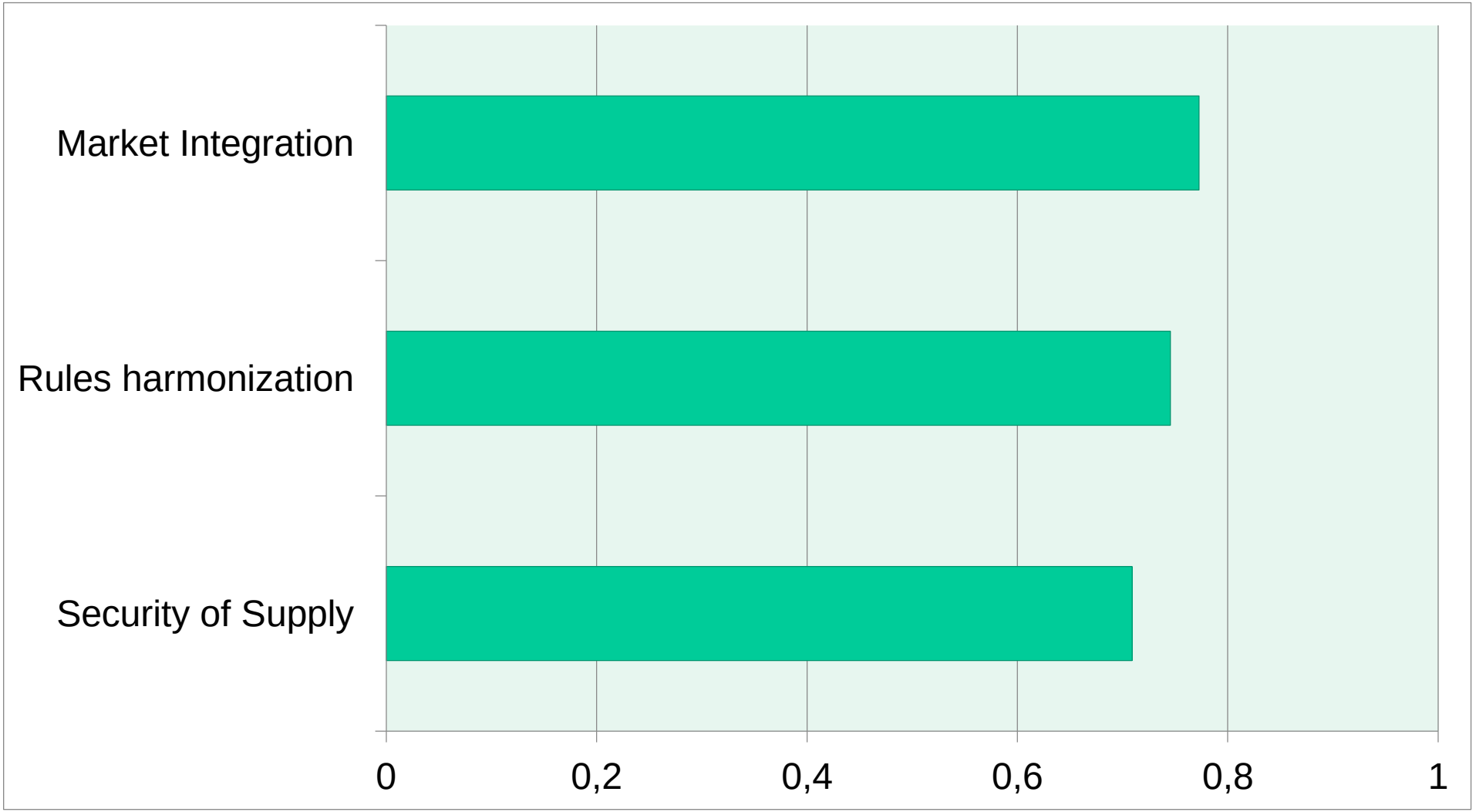


Table of contents

Conclusions

1. Increasing demand consumption in the Mediterranean region mostly concentrated in SEMC.
2. Substantial Investment needs to meet increasing demand in SEMC.
3. EU pushing for liberalization in non-EU countries.
4. Voluntary multilateral networks collaborate towards a common Mediterranean energy policy framework.
5. Still limited influence of both EU and voluntary multilateral networks when shaping countries' energy policy.

RES4MED

RENEWABLE ENERGY SOLUTIONS
FOR THE MEDITERRANEAN

End of first part

Any Questions?

Table of contents

Part I

Assessing the EU pressure for future Mediterranean energy markets

- *Electricity needs in the Mediterranean region*
- *EU External Energy Policy*
- *Perception Survey – Methodology and results*
- *Policy Implication*
- *Q&A*

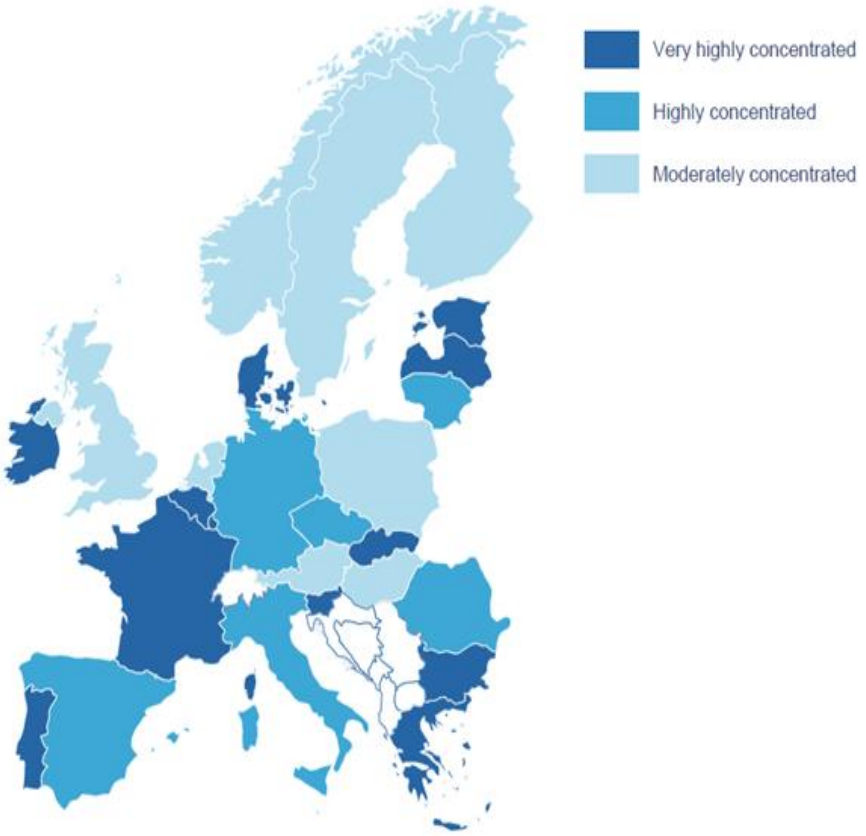
Part II

Institutional model

- *Co-evolution between technology and institutions*
- *RES development and the establishment of a Euro-Mediterranean energy area*
  - *Corridor approach | Network expansion | Establishment of a energy free trade area*
- *Policy implications*

Table of contents

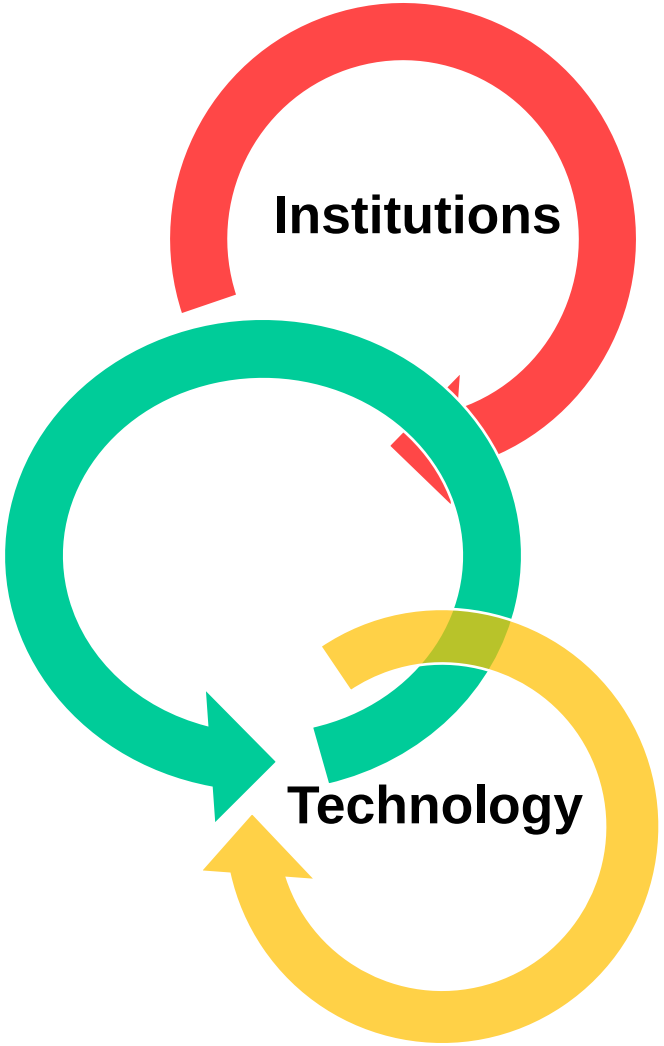
Electricity market in the Mediterranean basin



Source: EC, Report on progress in creating the internal gas and electricity market, SEC(2009) 287, 2009

- Vertically integrated public monopoly has been the default option in EU (and still is the reference case in many countries)
- Liberalisation process has imposed a (gradual) opening of the competitive activities of the ESI.
- A "neo-realist" approach to market model is also possible (Escribano, 2010) – bilateral long-term relationship.
- A variety of situation co-exist
- Energy cooperation needs to be formulated in order to accommodate different approaches in a stable framework

Factors affecting co-evolution process (I-T)



- Sector specific regulation could reassess the deregulated market and assure reliable and efficient operations
- Institutional changes are sufficient to create a market in the infrastructures
- Technology would remain stable and neutral and support the functioning of any kind of market structure

The link between institutions and technology is bi-directional

- **Economic/technical aspect of energy market**

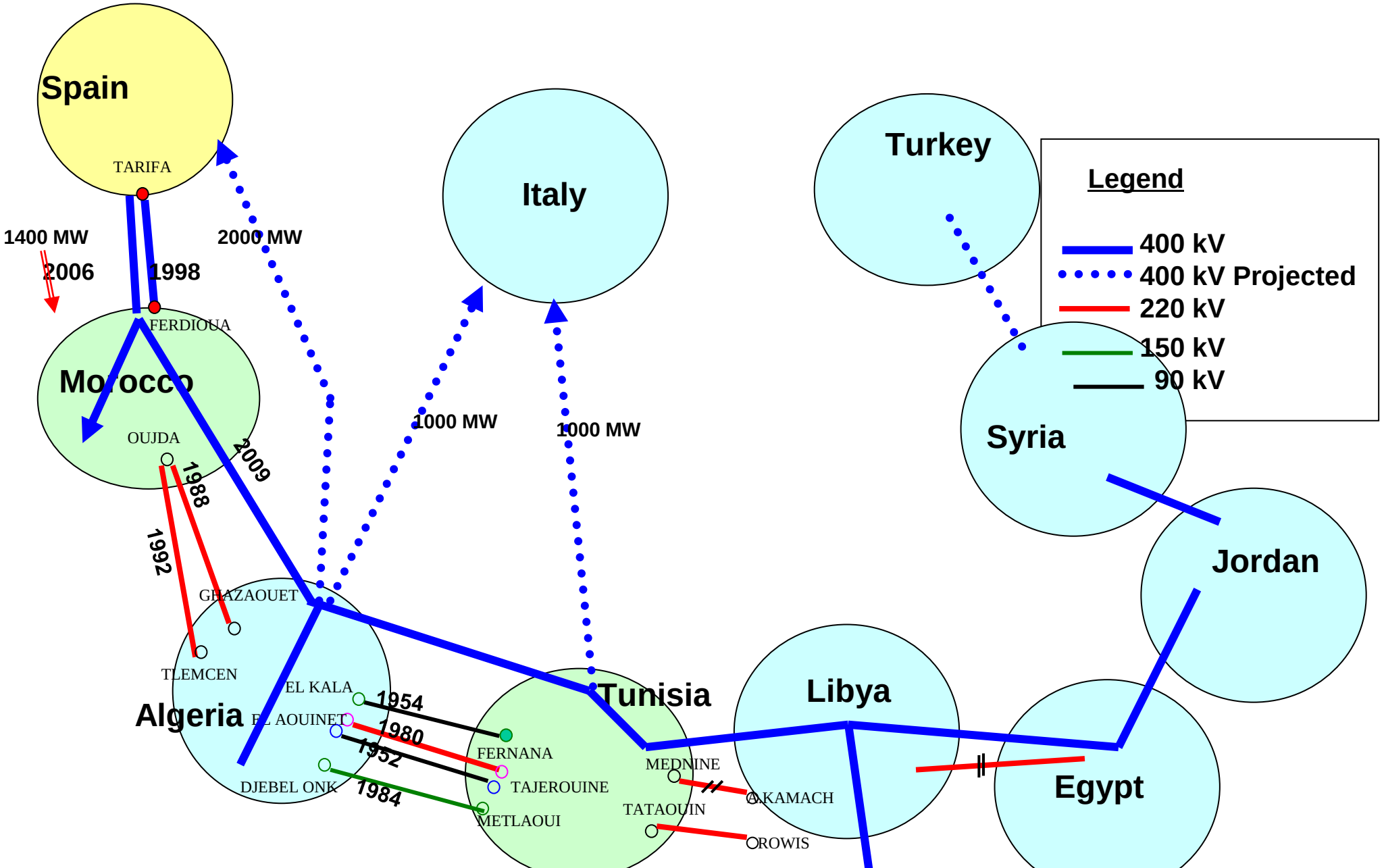
  Vertical integration, Horizontal integration, Price/tariff structure, Available interconnections, Access to the National Network, Efficient dimension of the market.

- **Institutional environment**

  Allocation of powers of regulation, legal and judicial system, Power to reallocate property rights, Corruption, Country risk

South-South and North-South Interconnections

Existing and planned



Driving forces

Euro-Mediterranean electricity paradigm

The EU energy strategy

- EU transition to low carbon economy
- 3x20 targets – directive 2009/28/CE
- increasing the security of supply by mutual back-up of power grids

EU initiatives in the area

- Euro Mediterranean partnership (EMP)
- European Neighborhood Policy (ENP)
- Reproduction of the acquis communautaire at a larger scale
- Thick normative and regulatory dimension
- Strategic energy relations based on EU SoS needs (fossil fuels dependency)

Evolutionary stable reforms

- Voluntary bottom up approach (compatibility rather than convergence)
- Multi-stakeholders process (TSO, NRAs or ministry, policymakers, internal vs. external institutions)

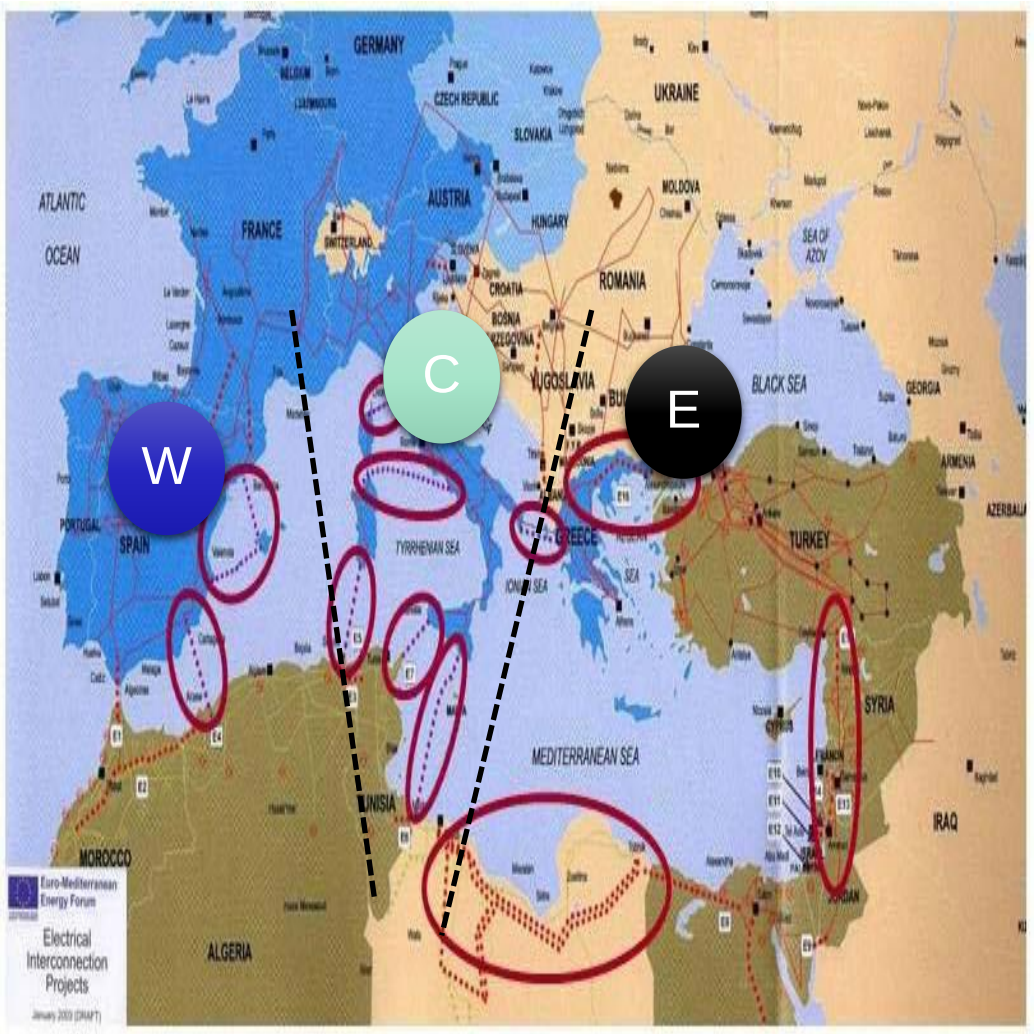
I. Corridor approach

II. Network Expansion

III. Establishment of a energy free trade area

I - Corridor approach

flexibility



- Set of policy options available are dominated by local electricity players →corridor specific
- Complementary electricity systems (joint welfare maximization, Chao&Peck, 1996)
- Harmonizing rules, physical interconnections and legislative provisions
- Three corridor currently emerging in North-South direction
  - **West: Morocco-EU (via Spain)**
  - **Central: Maghreb- EU (via Italy)**
  - **East: Middle East- EU (via Turkey)**

II – Network Expansion

SoS

- Power grids constructed based on a national perspective
- Increase penetration of RES generation
- Limited existing interconnection capacity (inside and outside EU)→negative prices in national markets
- Allows efficient location of RES generation
- Increase the geographic scale of network operation (and supervision)
  - ENTSO-E, ACER, MED TSO

II – Network Expansion

SoS

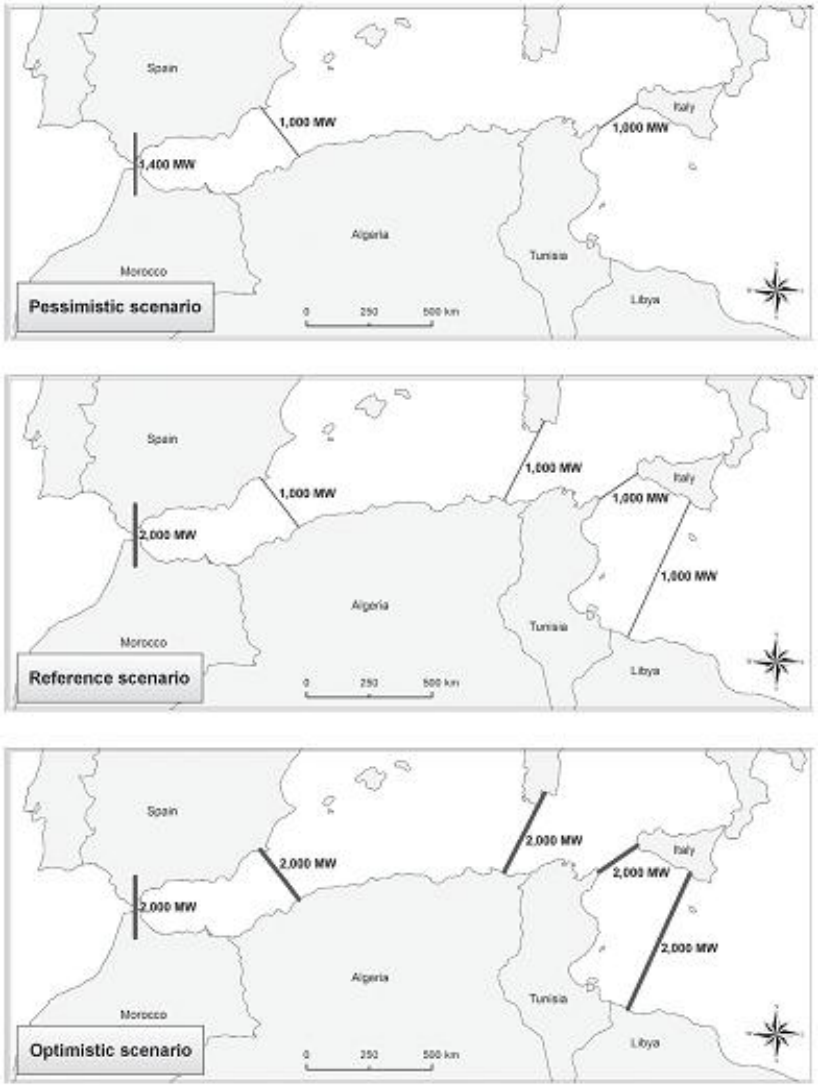


Figure 14.2 The three main 2030 scenarios for the interconnection between North Africa and Europe

- Power grids constructed based on a national perspective
- Increase penetration of RES generation
- Limited existing interconnection capacity (inside and outside EU)→negative prices in national markets
- Allows efficient location of RES generation
- Increase the geographic scale of network operation (and supervision)
  - ENTSO-E, ACER, MED TSO

III – Establishment of Energy free trade area

compatibility between corridors

Normative convergence

+

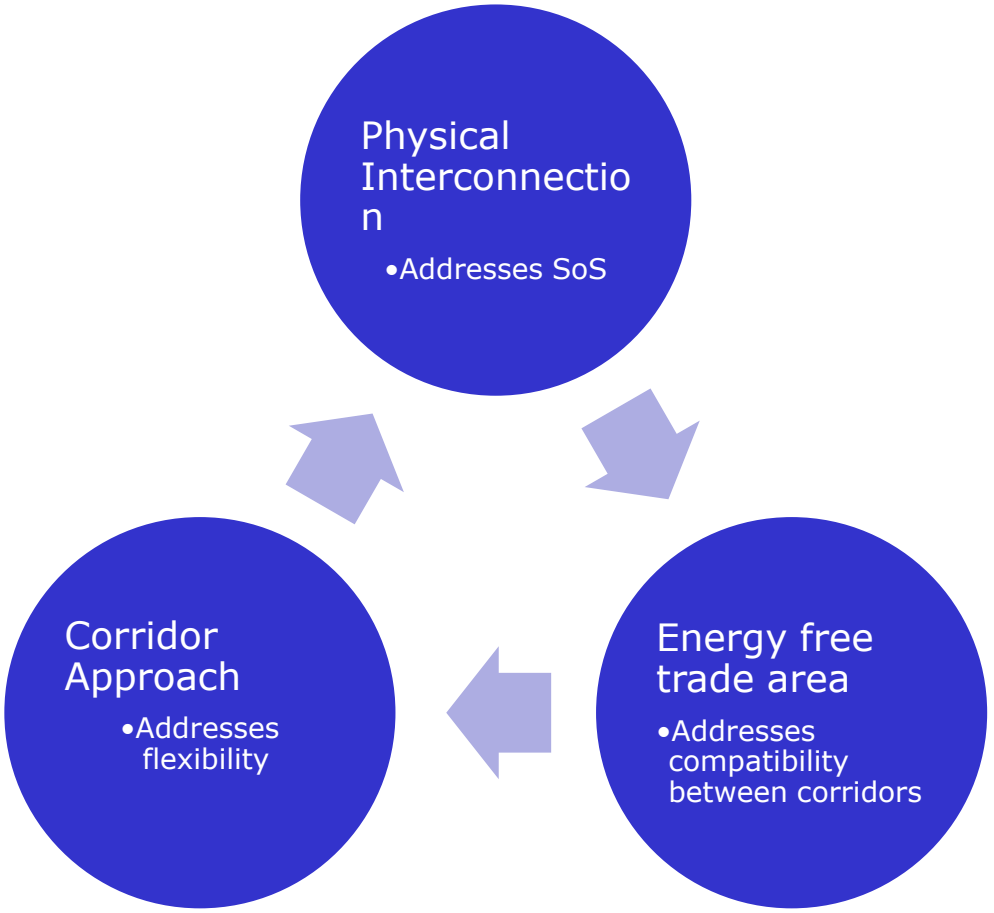
Physical infrastructure

=

Sub-regional dynamics along corridors

- Artificial obstacles to energy trade shall be removed
- EFTA should be based on
  - **Transparent and long term policies (longevity)**
  - **Co- development**
  - **Regional view**
- MedReg and MedTSO are expected to play a role in this process

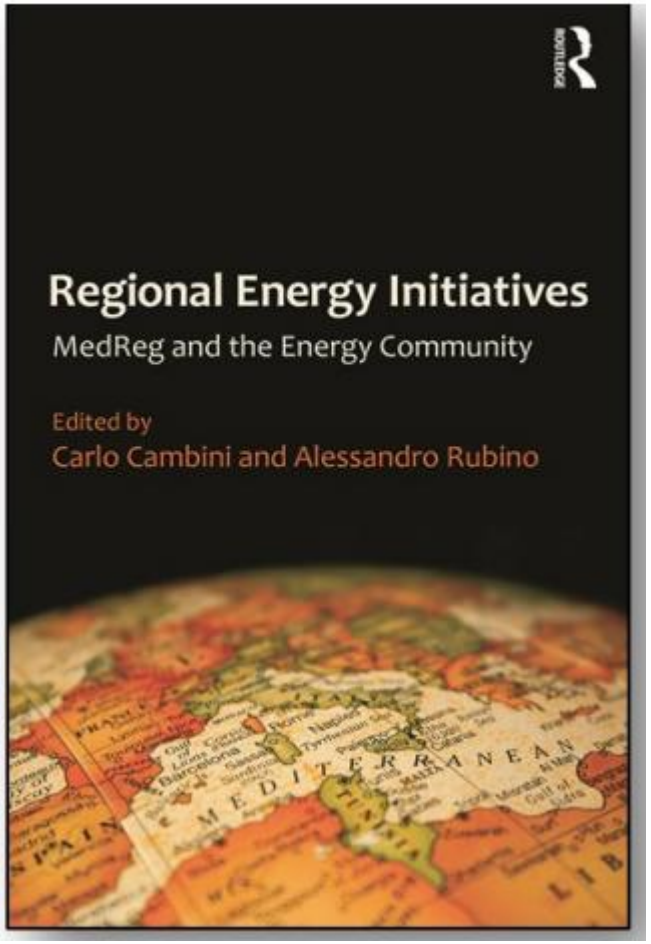
Conclusions and policy implications



- Reproduction of EU legislation is not feasible and not desirable
- Bottom up approach vs. Top down approach
- Mediterranean area as a region
- RES generation ease the alignment of incentives between demand and supply hubs
- Coordination between multiple stakeholders

Further readings

If you want to know more about these issues



Thanks for you attention

Alessandro Rubino
alessandro.rubino@res4med.org

www.enelfoundation.org