MEDPRO

MEDITERRANEAN PROSPECTS

Thinking Ahead
for the Mediterranean

EUROPEAN COMMISSION
European Research Area

SEVENTH FRAMEWORK PROGRAMME

Funded under Socio-economic Sciences & Humanities

WP 4b - Energy and climate change mitigation

Scenarios for Energy and Climate Change in the EuroMed in 2030

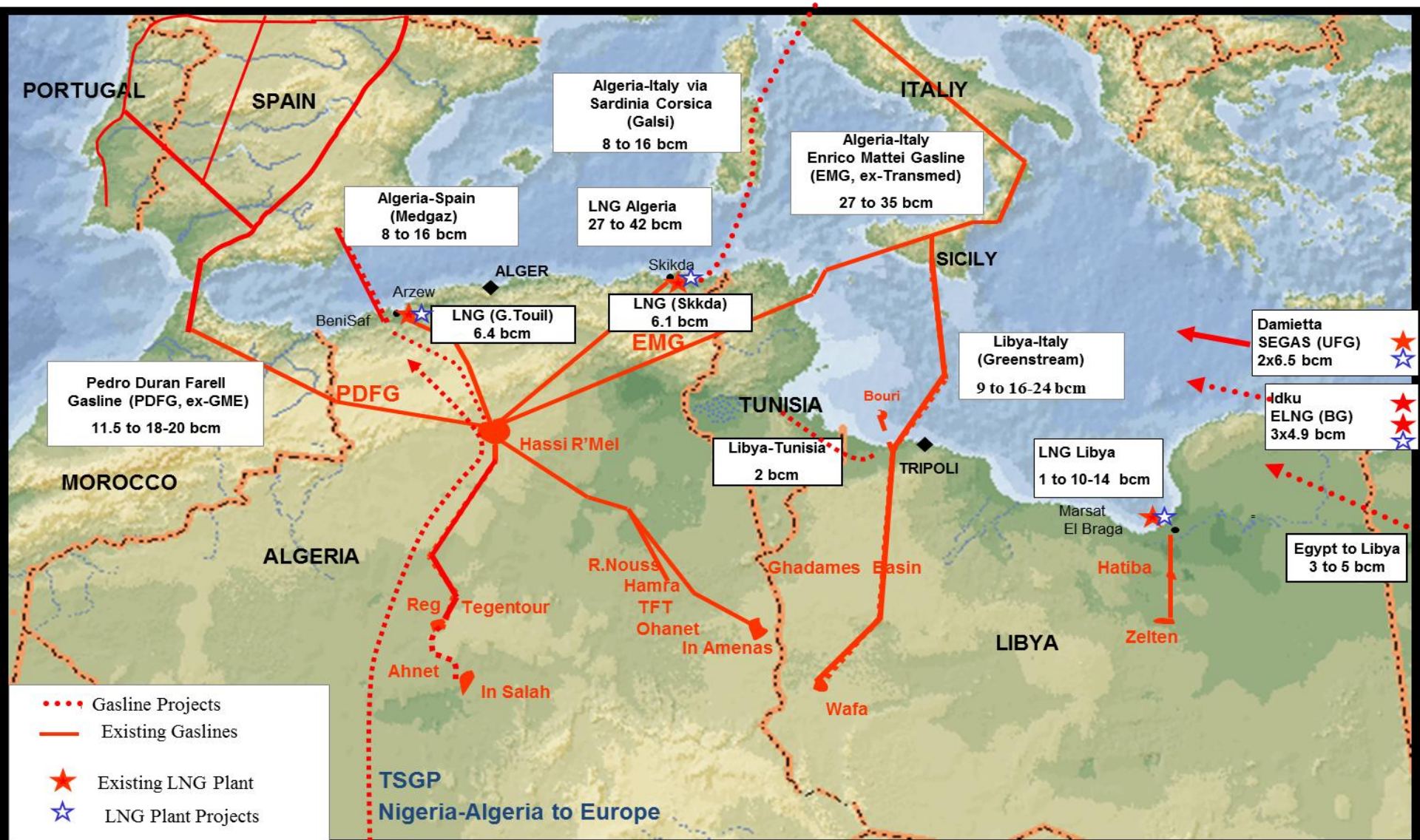
A new "Euro-Mediterranean Energy Roadmap" for a sustainable energy transition in the region

Prof. Manfred Hafner, FEEM

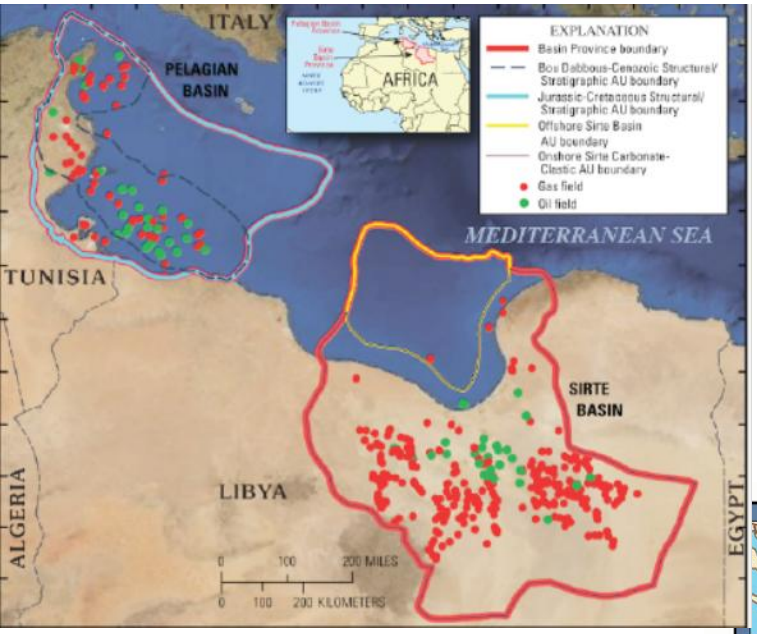
WP 4b deliverables

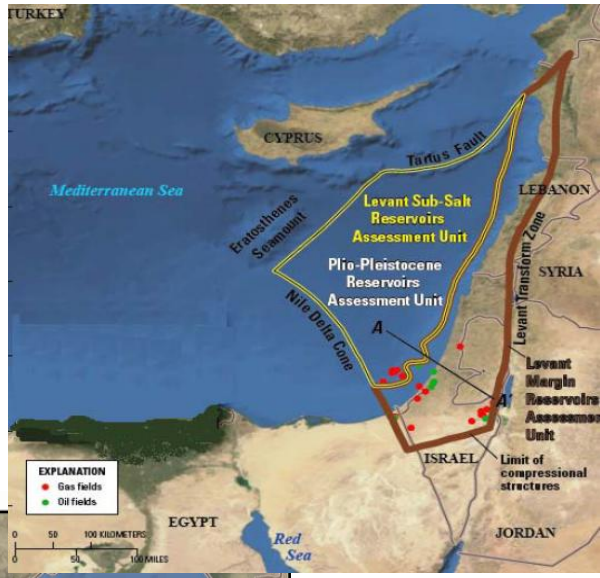
Nr.	Resp. Partner	Deliverable name	Delivery date
D4b.1	FEEM	TR: Future oil and gas supply outlook	July 2011
D4b.2	FEEM	TR: Electricity and Renewable Energy outlook	Sept. 2011
D4b.3	FEMISE	TR: Demand Side Policies including Energy efficiency and Demand Side Management	Feb. 2012
D4b.4	CEPS	TR: Analysis of a carbon market potential	Sept. 2011
D4b.5	ICCS	TR: New coherent energy supply and demand scenarios	May 2012
D4b.6	CASE	TR: Mechanisms and channels of relations between energy supply and demand policies and economic and social development	May 2012
D4b.7	FEEM	Policy Brief: Energy Outlook and recommendations for a closer cooperation between the EU and the SEMCs: A new "Euro-Mediterranean Energy Roadmap" for a sustainable energy transition in the region	Sept 2012

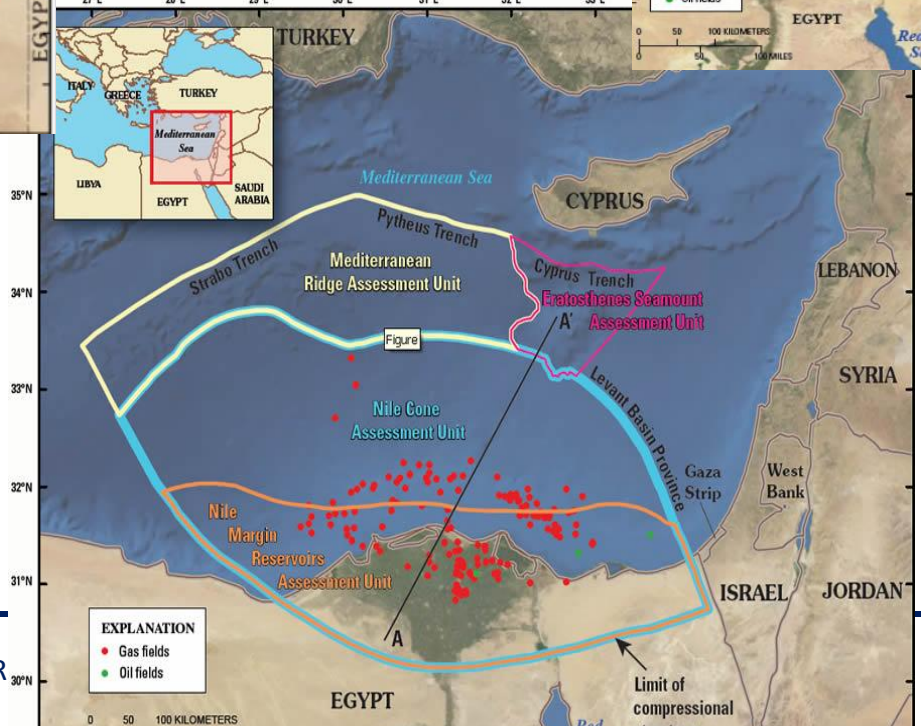
Energy cooperation in the Mediterranean was a great success story



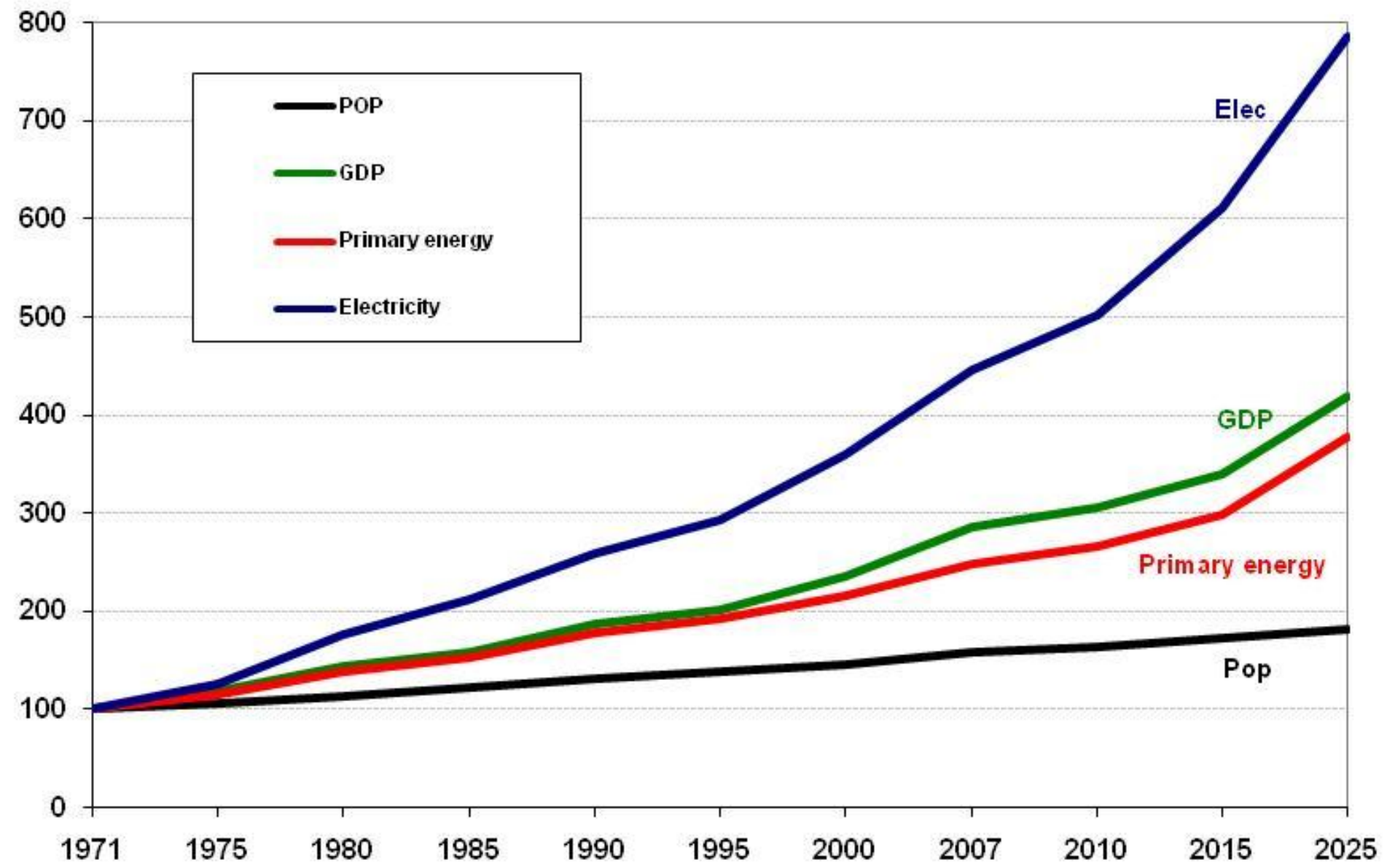
The Mediterranean region is still largely underexplored



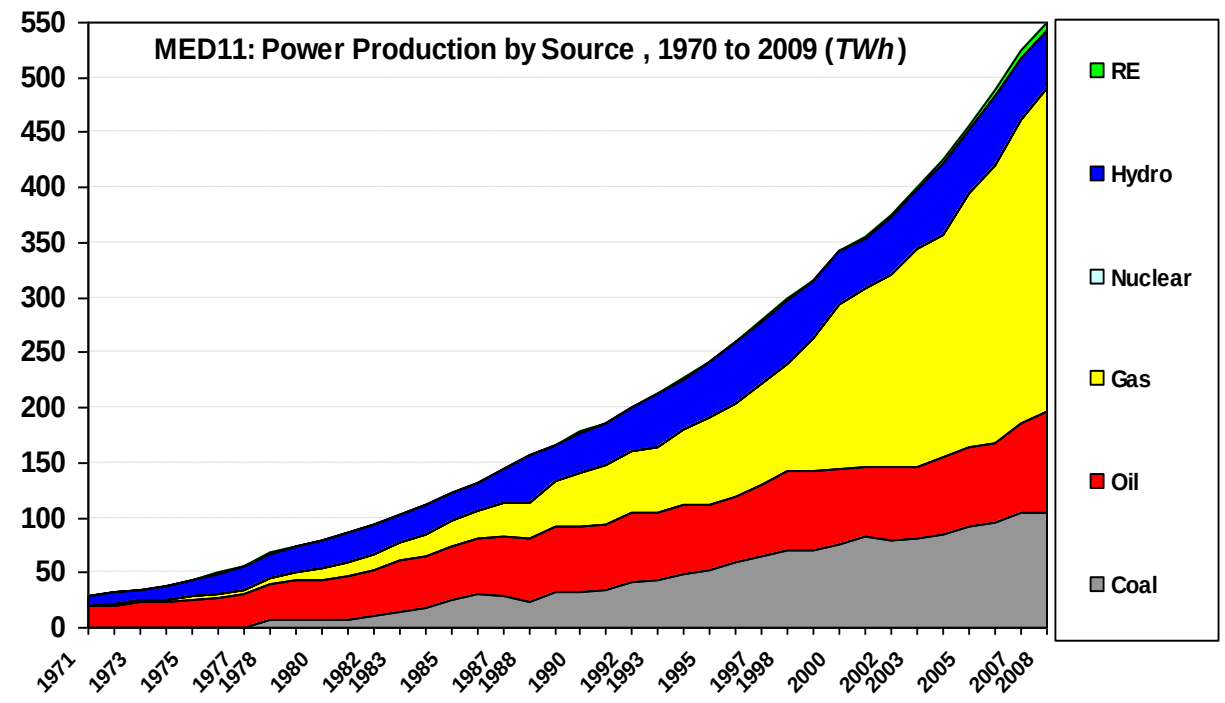




SEMCs:
Electricity demand grows strongest

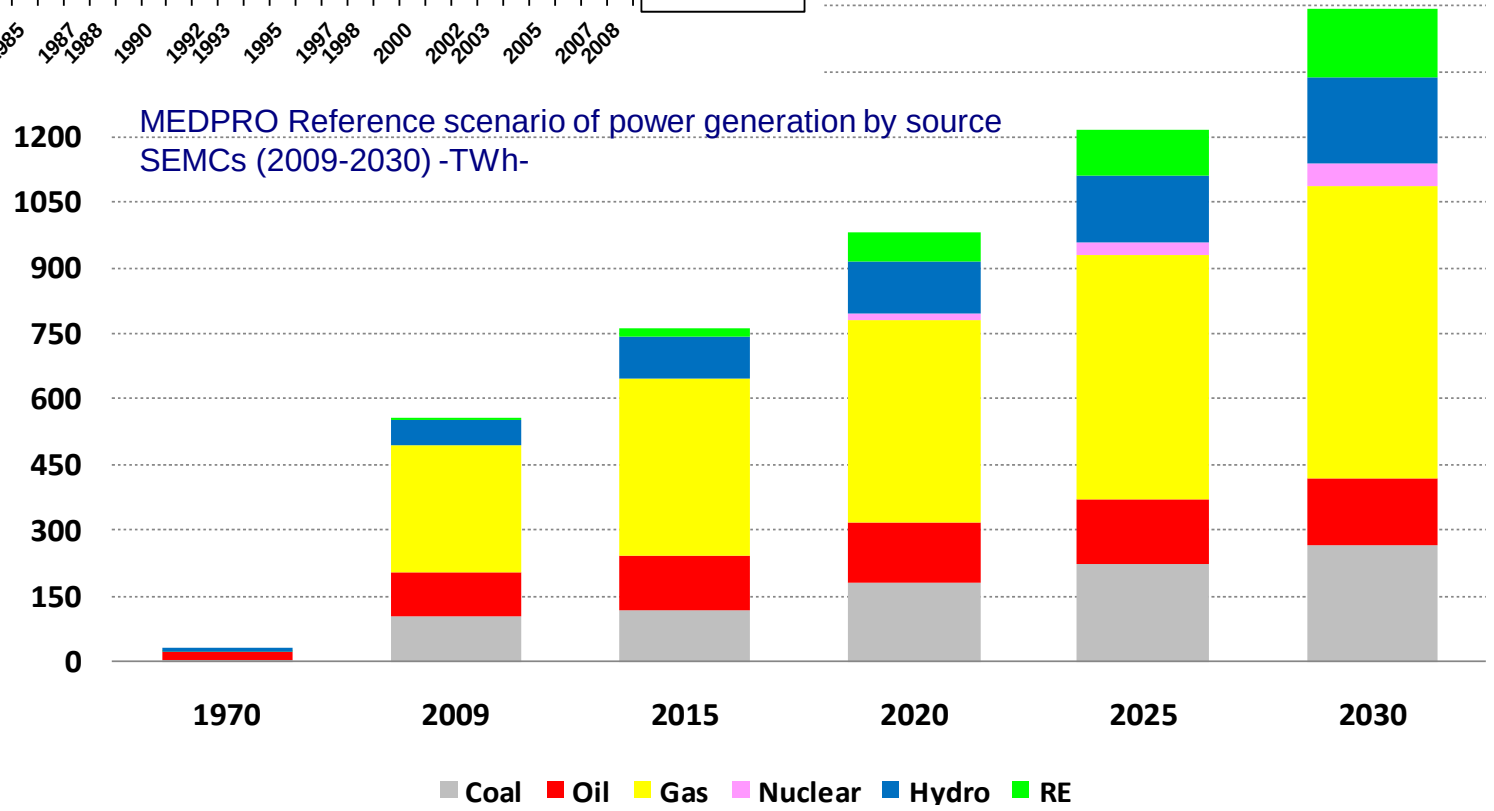


SEMCs: Southern and Eastern Mediterranean Countries – from Morocco to Turkey

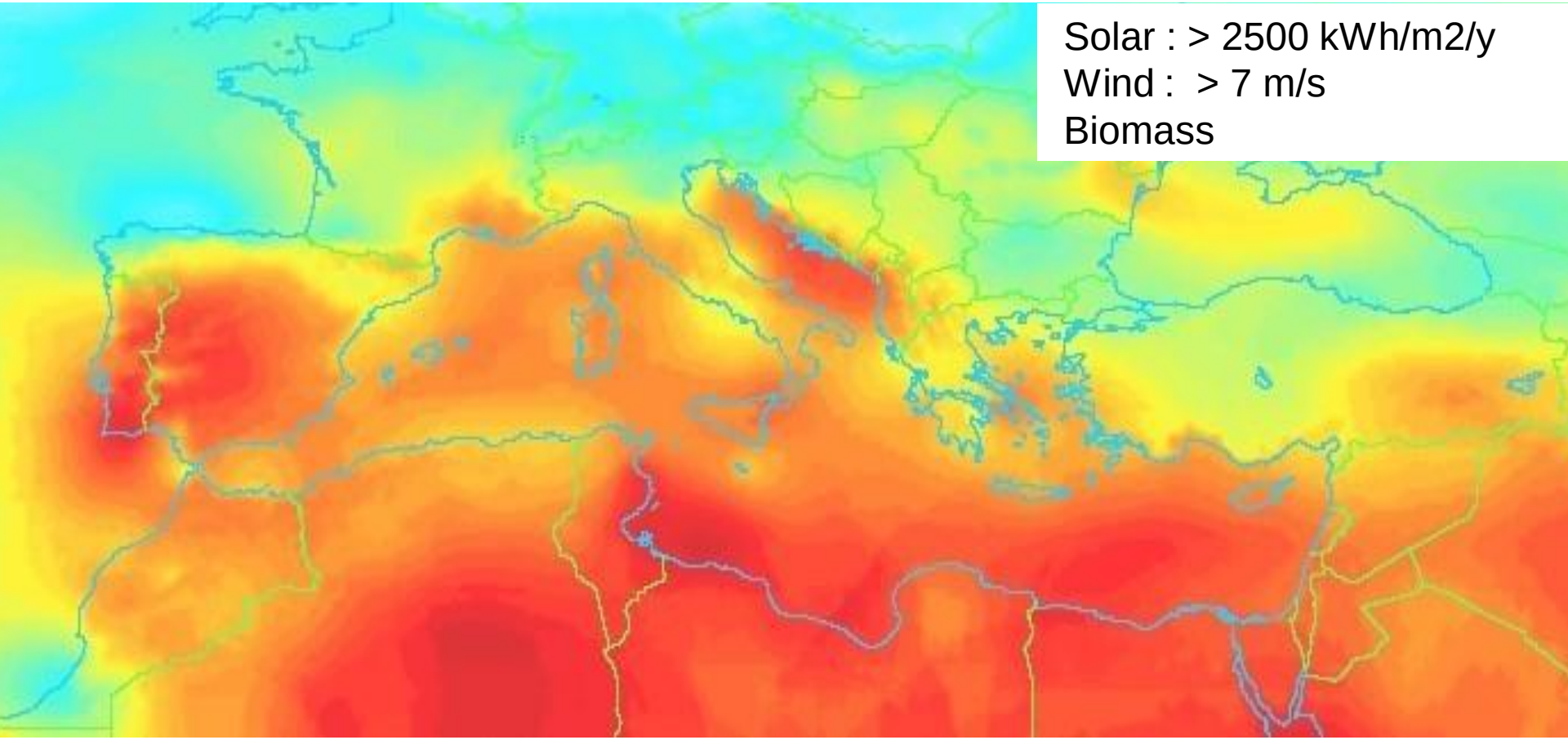


Power generation mix :
Past evolution (left)
and future outlook (below)

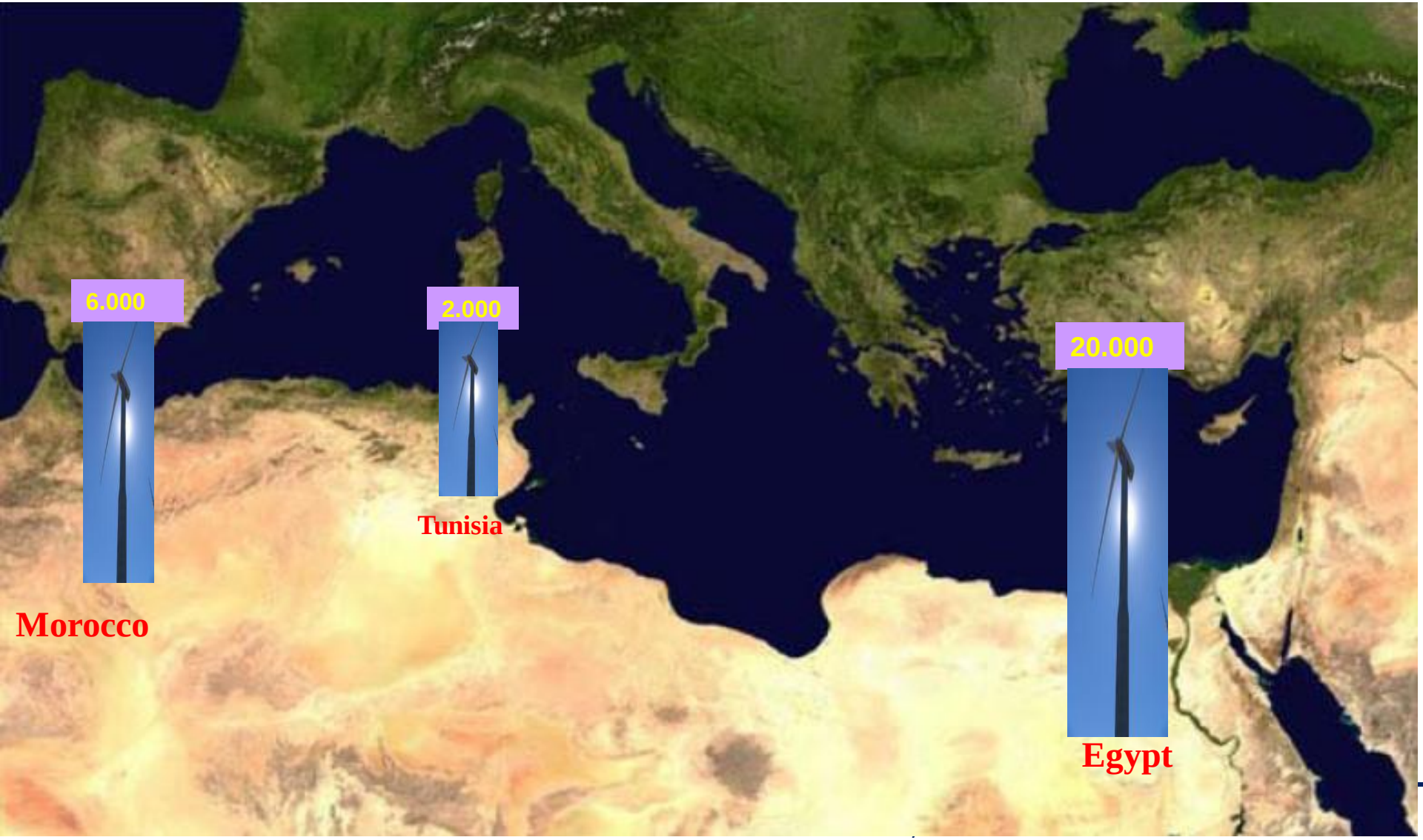
Gas is still dominant, but RES are seriously taking off in all SEMCs energy programmes



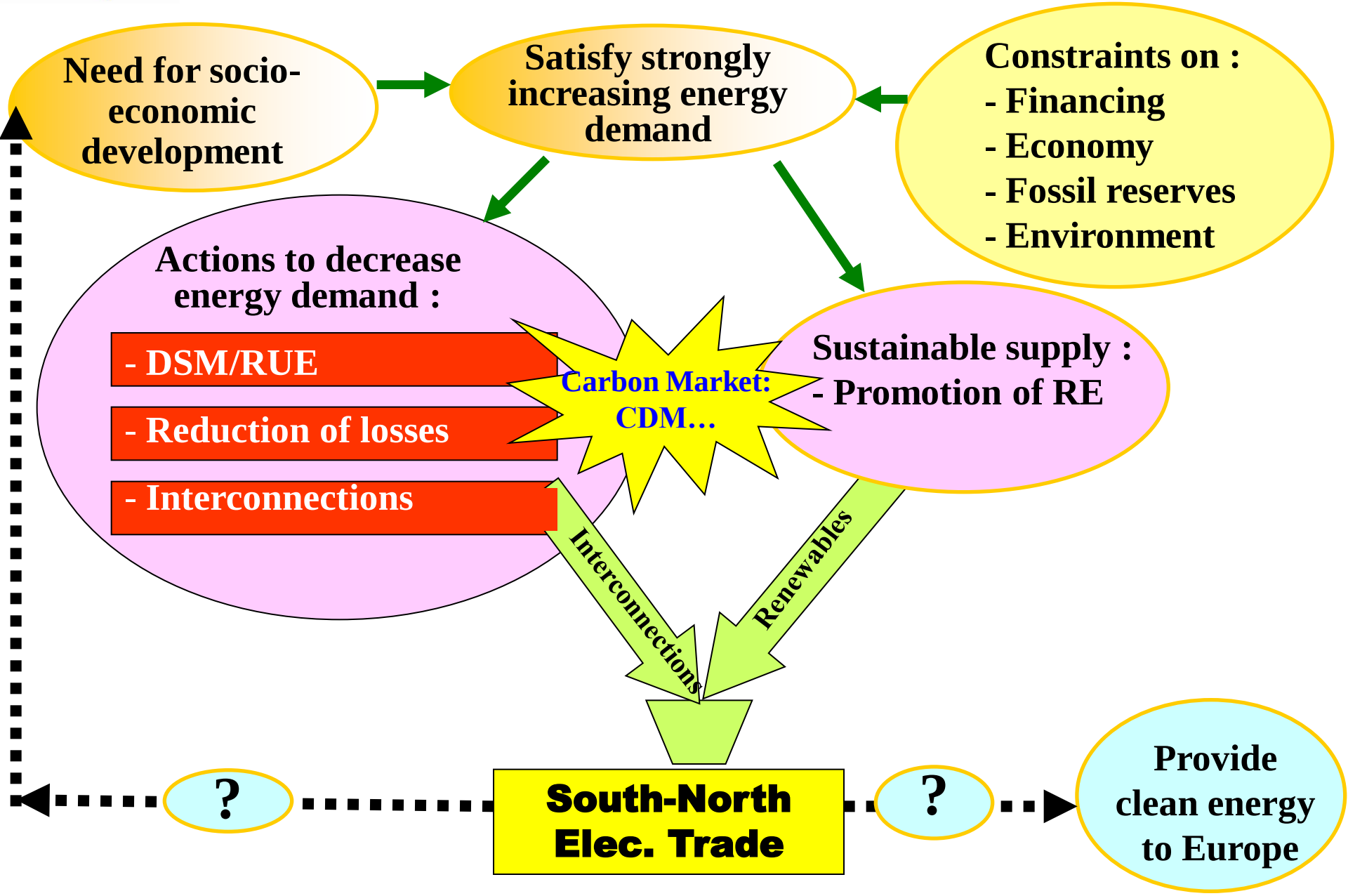
SEMCs: an important renewable energy potential



Wind energy potential



Challenges and Opportunities for MED11



A few recent and important international initiatives

Union for the Mediterranean
« Mediterranean Solar Plan »

-> 20 GW RE (mainly Solar)
+ 20% energy savings
(compared with BAU)
in SEMCs by 2020

DESERTEC

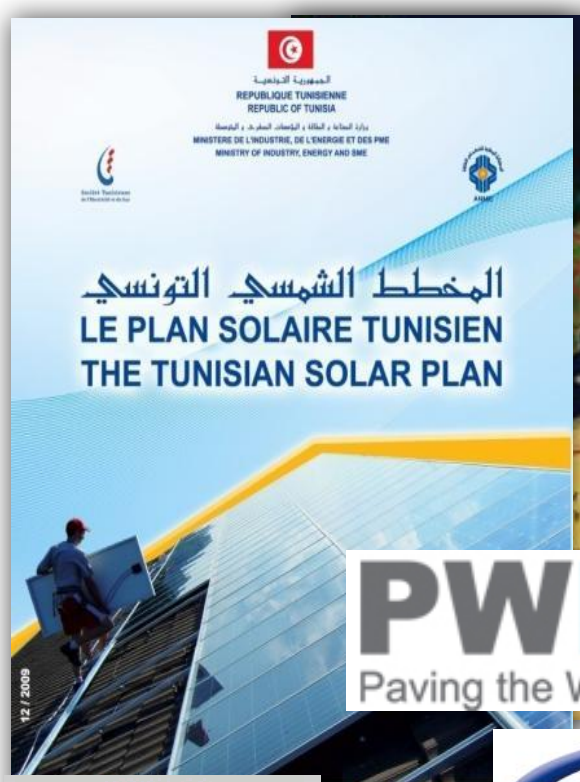
build by 2050 some 50 GW of CSP (concentrating solar power) systems over 17000 sq km of the Sahara to generate electricity that would be distributed to North Africa and Europe through high-voltage super grids

-> 15% of EU electricity demand by 2050

MEDGRID

Industrial initiative launched within the framework of the Mediterranean Solar Plan **to study the feasibility of electricity interconnections between the two shores of the Mediterranean**

Many ongoing initiatives in SEMCs



ome

Dii
Renewable energy
bridging continents

PWMSP
Paving the Way for the Mediterranean Solar Plan

CONCEPT
DESERTEC-EUMENA

MedReg
Mediterranean Energy Regulators

Medgrid

INFRAMED

CLIMATE INVESTMENT FUNDS
CIF BASICS | CLEAN TECHNOLOGY FUND | STRATEGIC CLIMATE FUND | PARTNERSHI

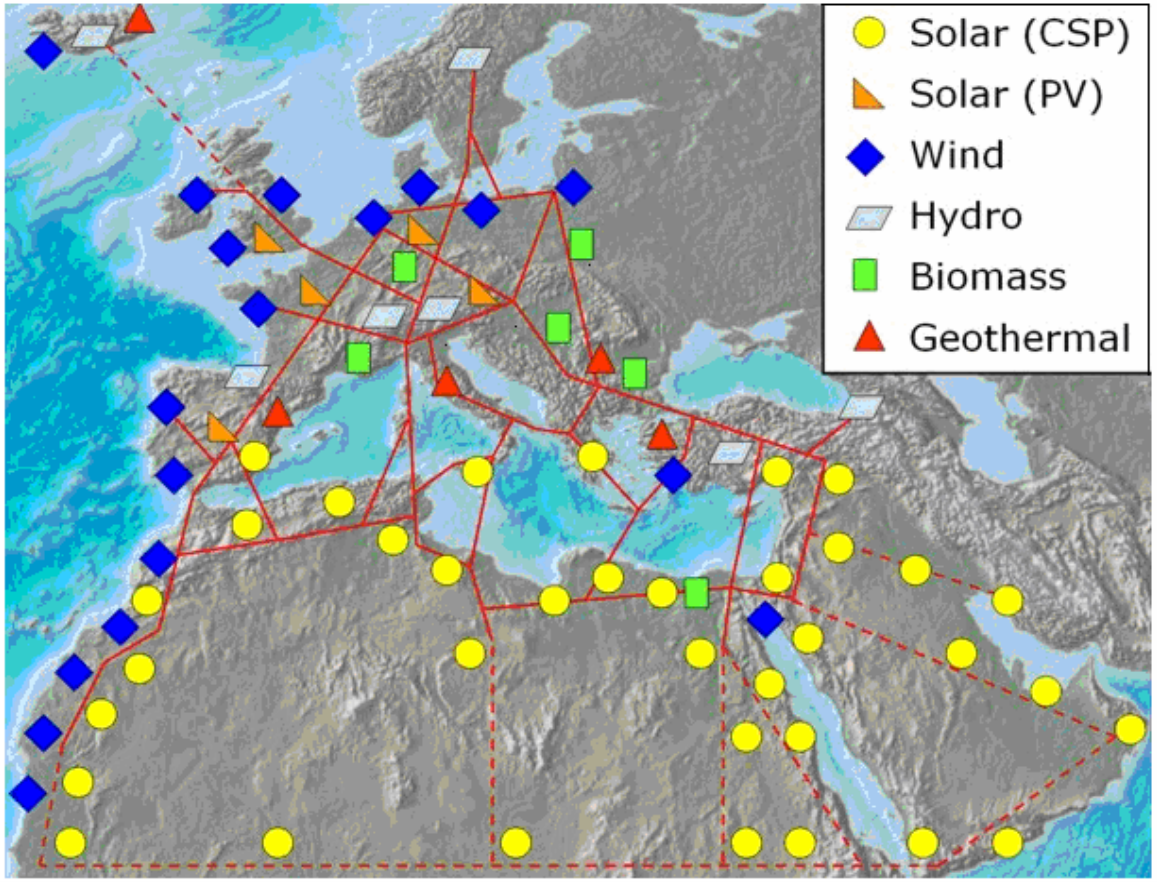
RES4MED

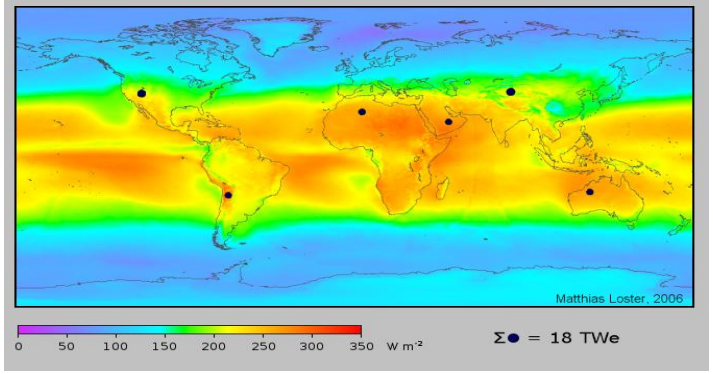
med-TSO
MEDITERRANEAN TRANSMISSION SYSTEM OPERATORS

Need for adapted renewable energy sources

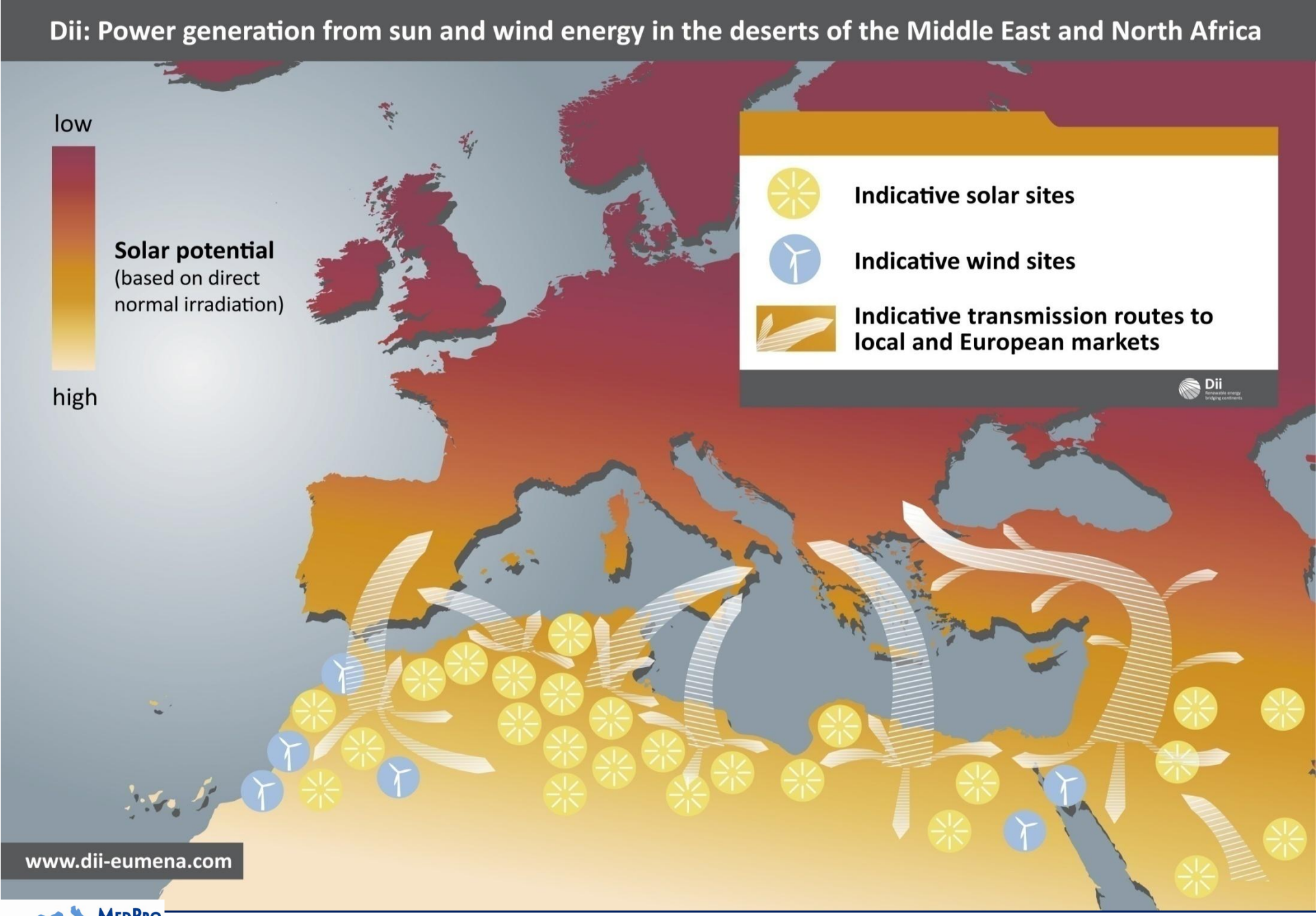
Warm water production, cooling applications, water pumping, decentralized energy

MENA renewable energy potential



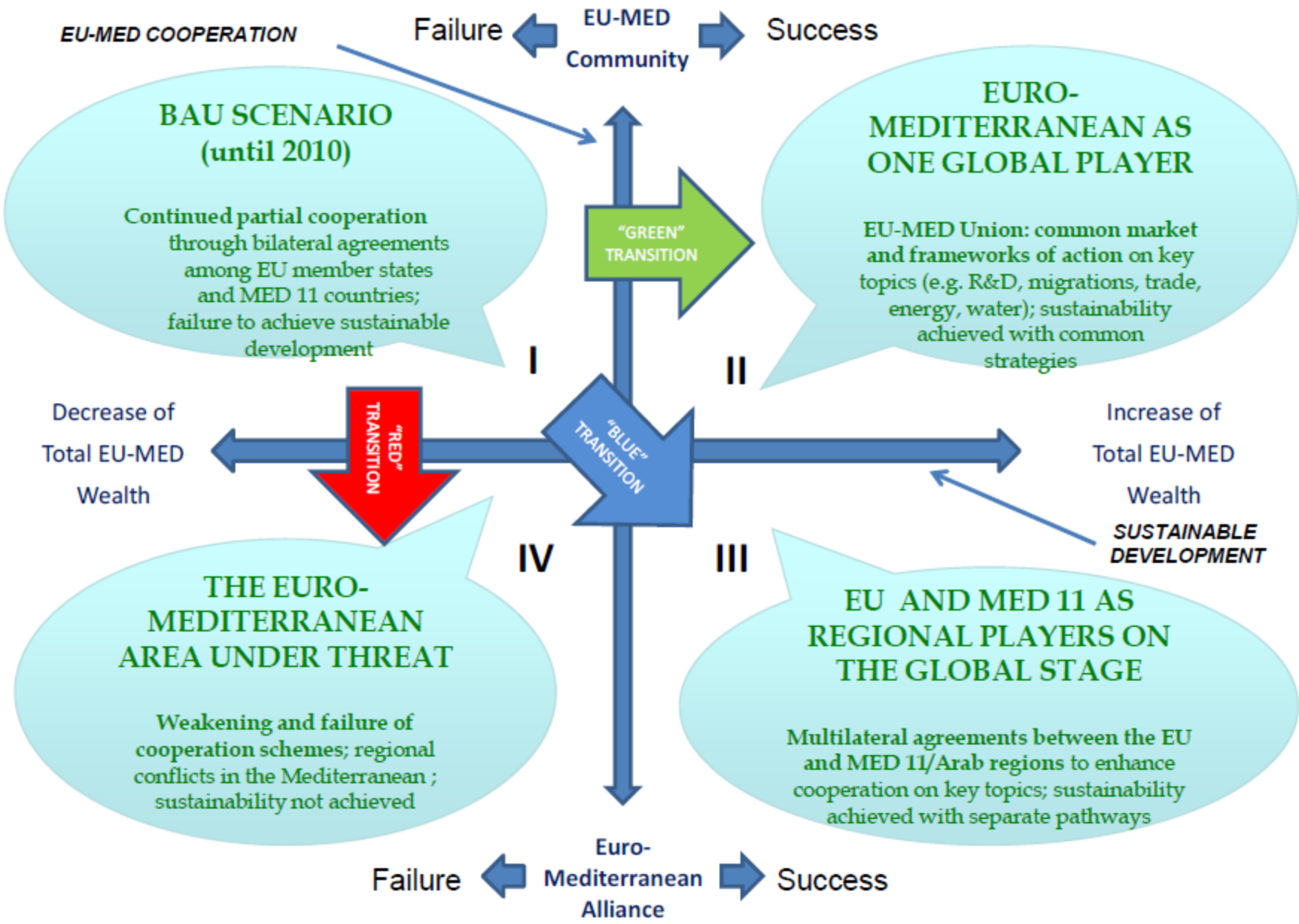


North Africa and Mediterranean regions enjoy high potential of abundant renewable energy resources.


Dii: Power generation from sun and wind energy in the deserts of the Middle East and North Africa
low
Solar potential
(based on direct
normal irradiation)
high
Indicative solar sites
Indicative wind sites
Indicative transmission routes to
local and European markets
Dii
www.dii-eumena.com

Electricity transmission and grid integration

Sustainable energy transitions: "blue transition" and "green transition"



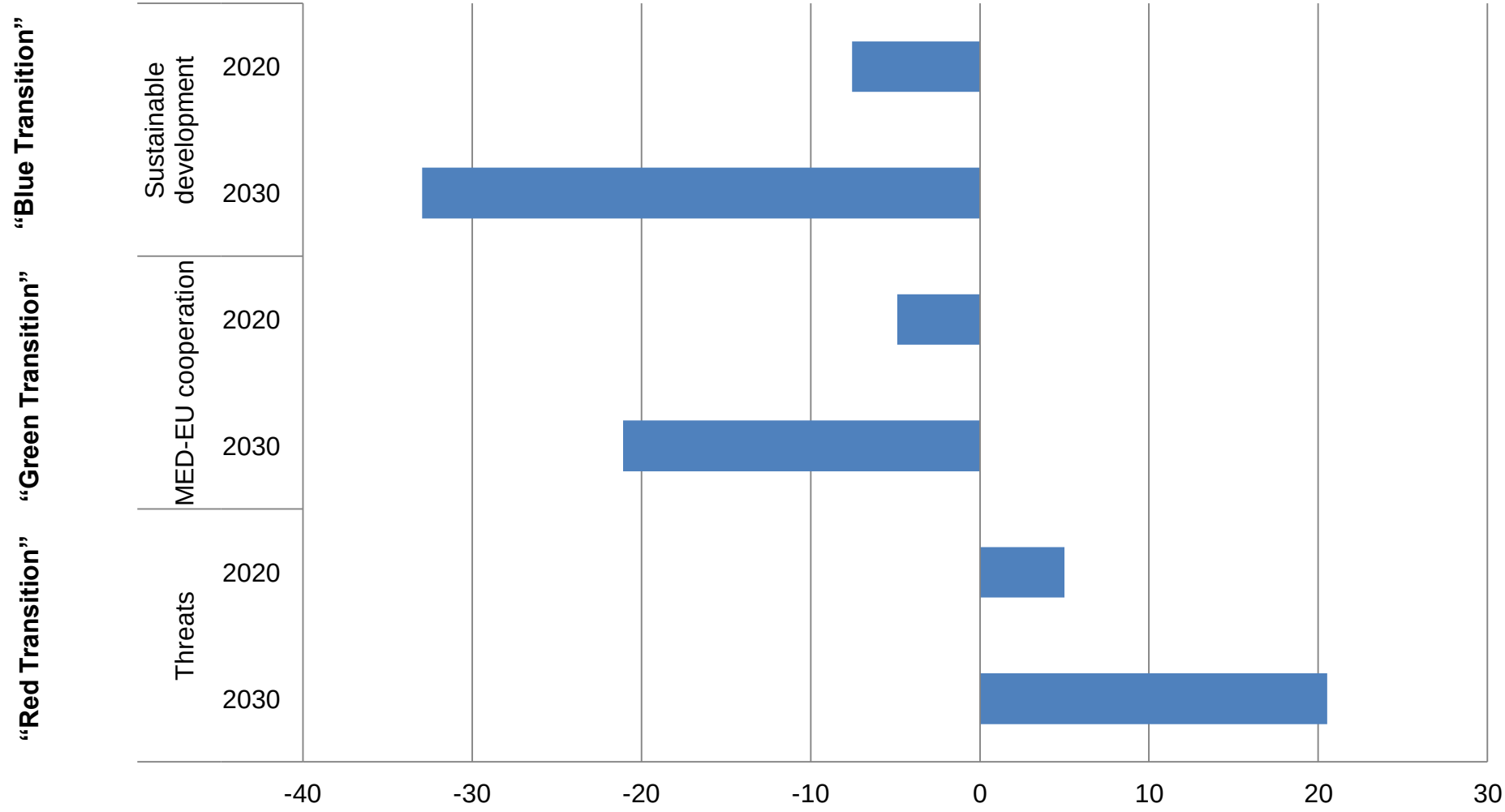
Alternative Energy scenarios examined

- **The Euro-Mediterranean area under "Threats" scenario ("red transition")**
  - Fragmentation and stalling of policy initiatives
  - In terms of the energy economy the main implications are
    - a shortage of capital
    - increased investment risks leading to high risk premiums
    - a stalling of market reform including price reform
- **The "Sustainable development" scenario ("blue transition")**
  - It assumes that SEMCs individually undertake vigorous measures on many fronts in order to promote energy efficiency and RES development
  - Relations of individual SEMCs with the EU deepen and as a consequence perceived risks are diminished thus encouraging foreign direct investment (FDI) originating from the EU and other parts of the world
- **The "MED-EU cooperation" scenario ("green transition")**
  - Integration in the EU-ETS system with free allocation of allowances for the SEMCs
  - RES facilitating policies and accelerated price reform accompany the ETS enlargement
  - HVDC lines from North Africa to Europe to transport centrally generated RES electricity

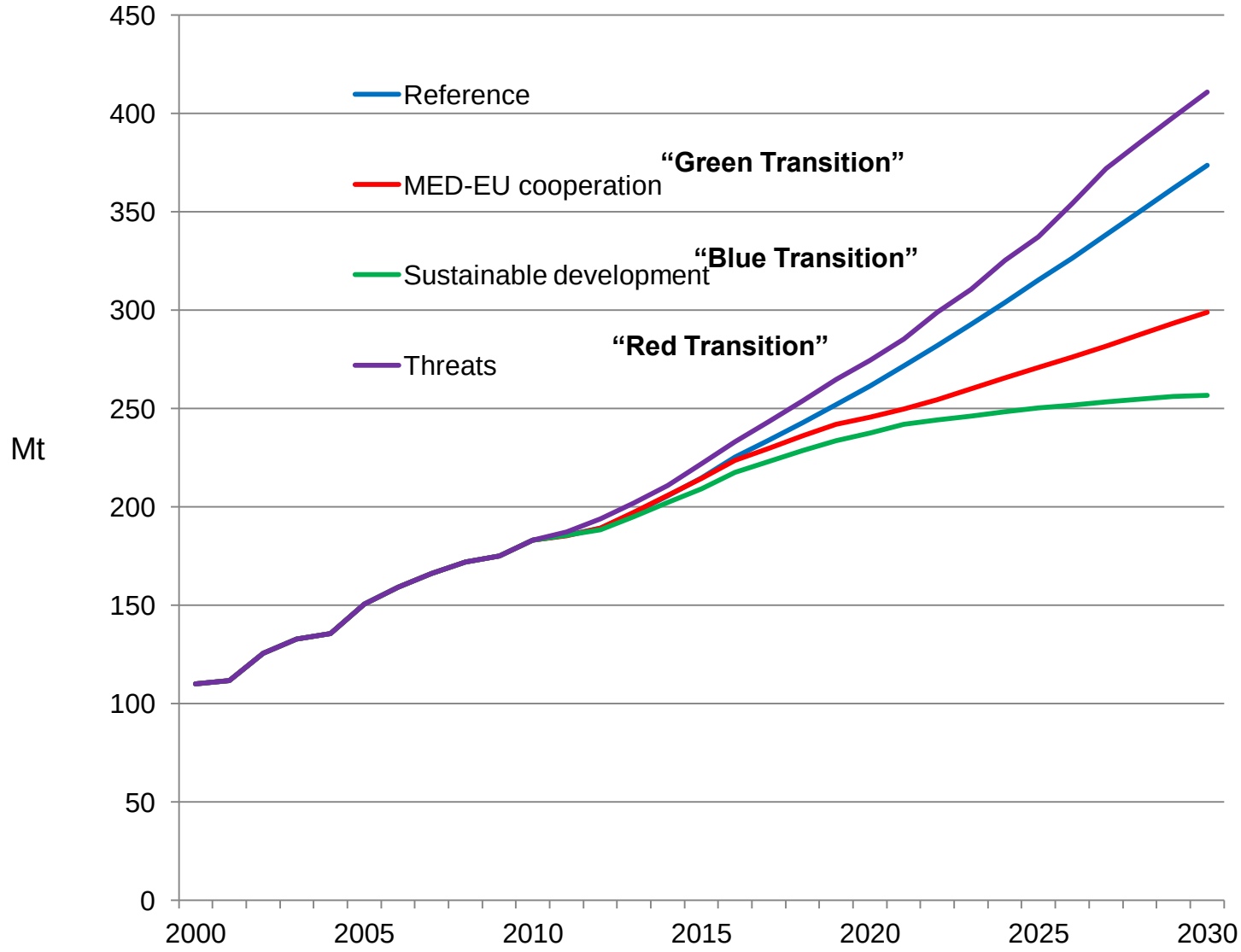
Power Generation

Impacts of the scenarios on Primary Energy Requirements

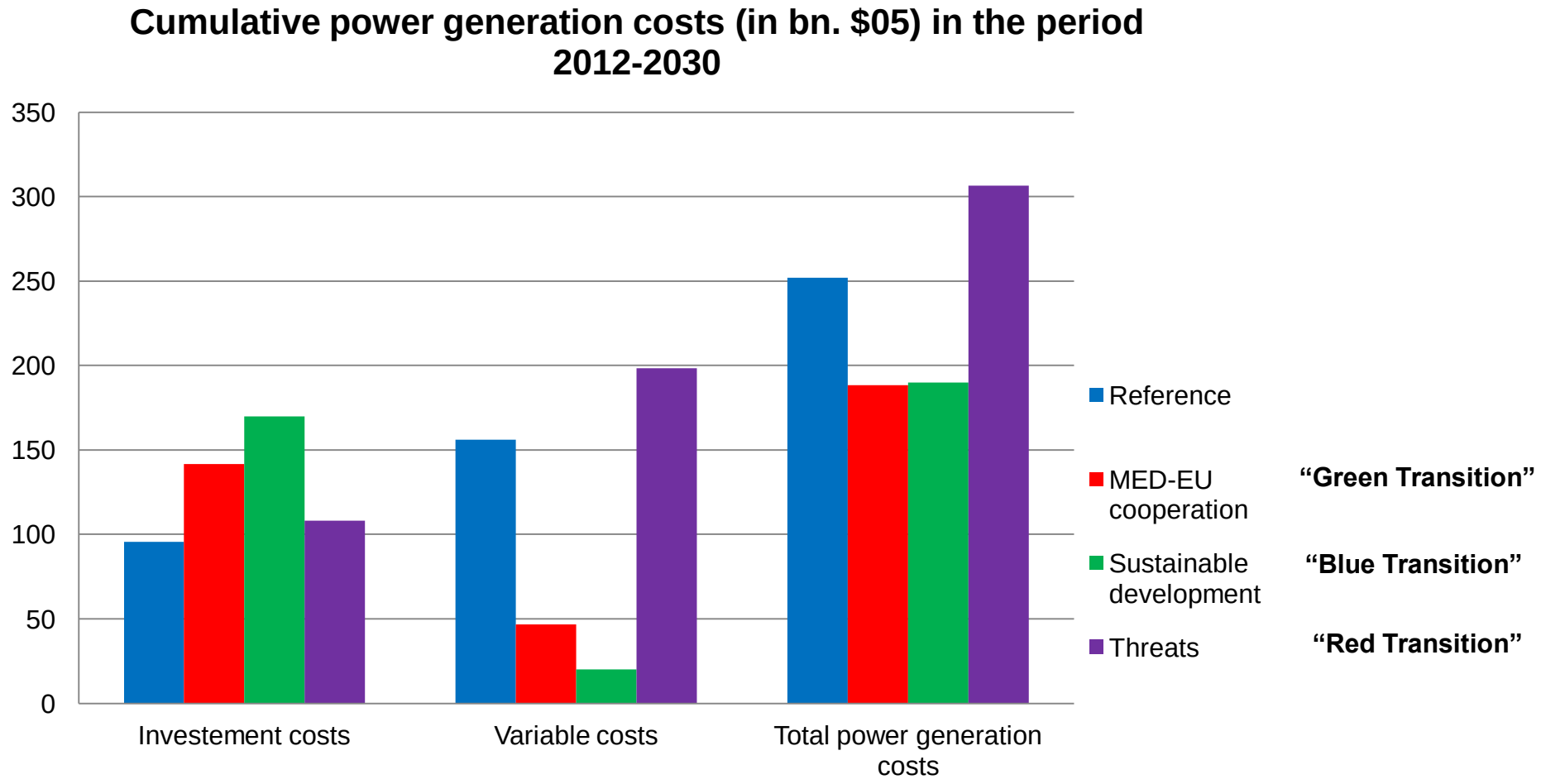
Changes (in Mtoe) in primary energy consumption from reference



Impacts of scenarios on CO2 emissions



Implications of scenarios on Power Generation Costs



How to organize a Blue or Green Energy Transition ?

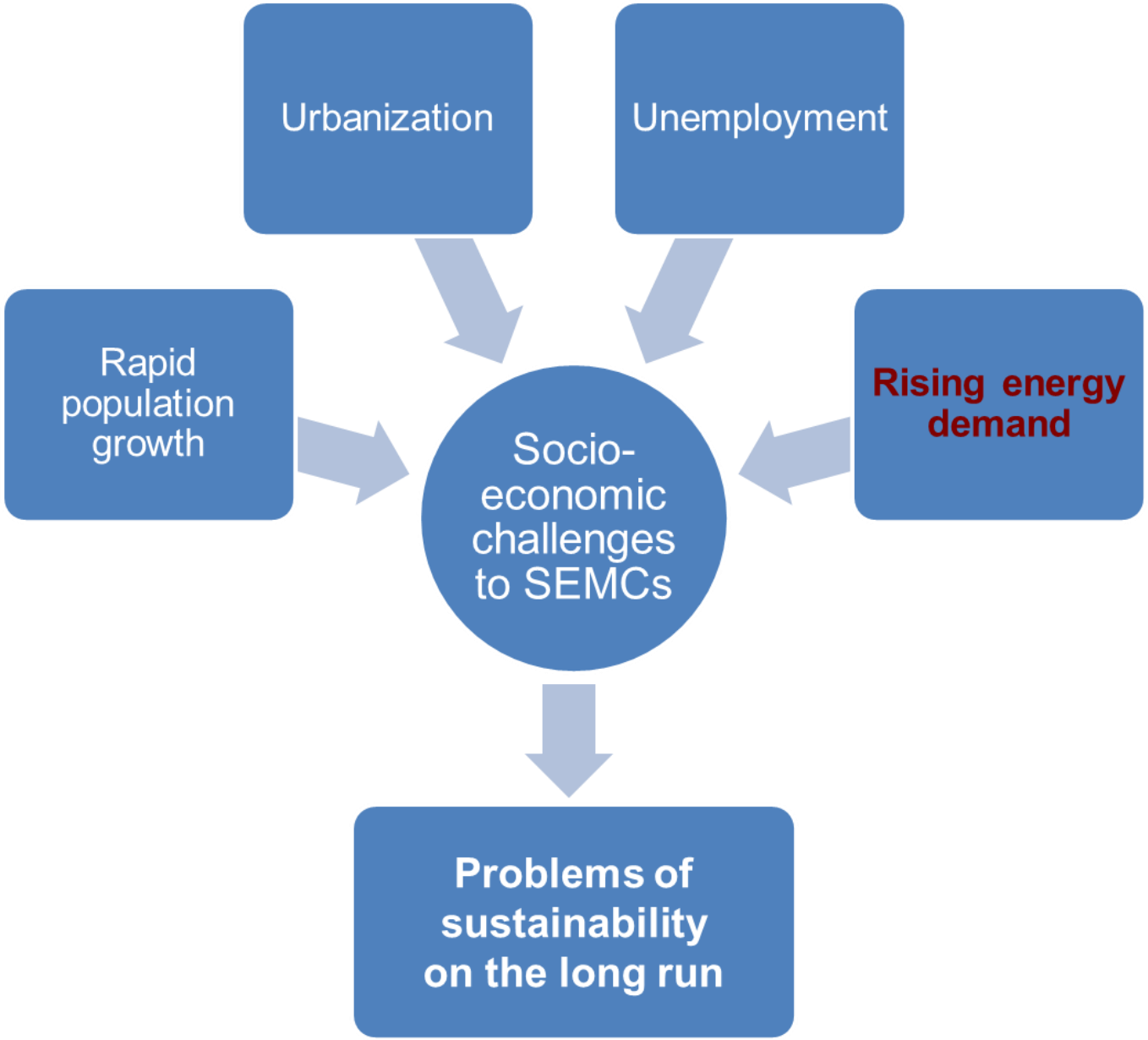
Need for:

A new Euro-Mediterranean Energy Roadmap *for a sustainable energy transition*

1. The urgent need for a sustainable energy transition in SEMCs
2. The unsustainable heaviness of energy subsidies
3. The huge potential for low cost energy efficiency and DSM policies
4. Unlocking the SEMCs renewable energy potential
5. Towards a new structure of regional and interconnected markets
6. How to finance the SEMCs sustainable energy transition
7. The urgent need for a "Euro-Mediterranean Energy Roadmap"

1) THE URGENT NEED FOR A SUSTAINABLE ENERGY TRANSITION IN SEMCs

A question of sustainability

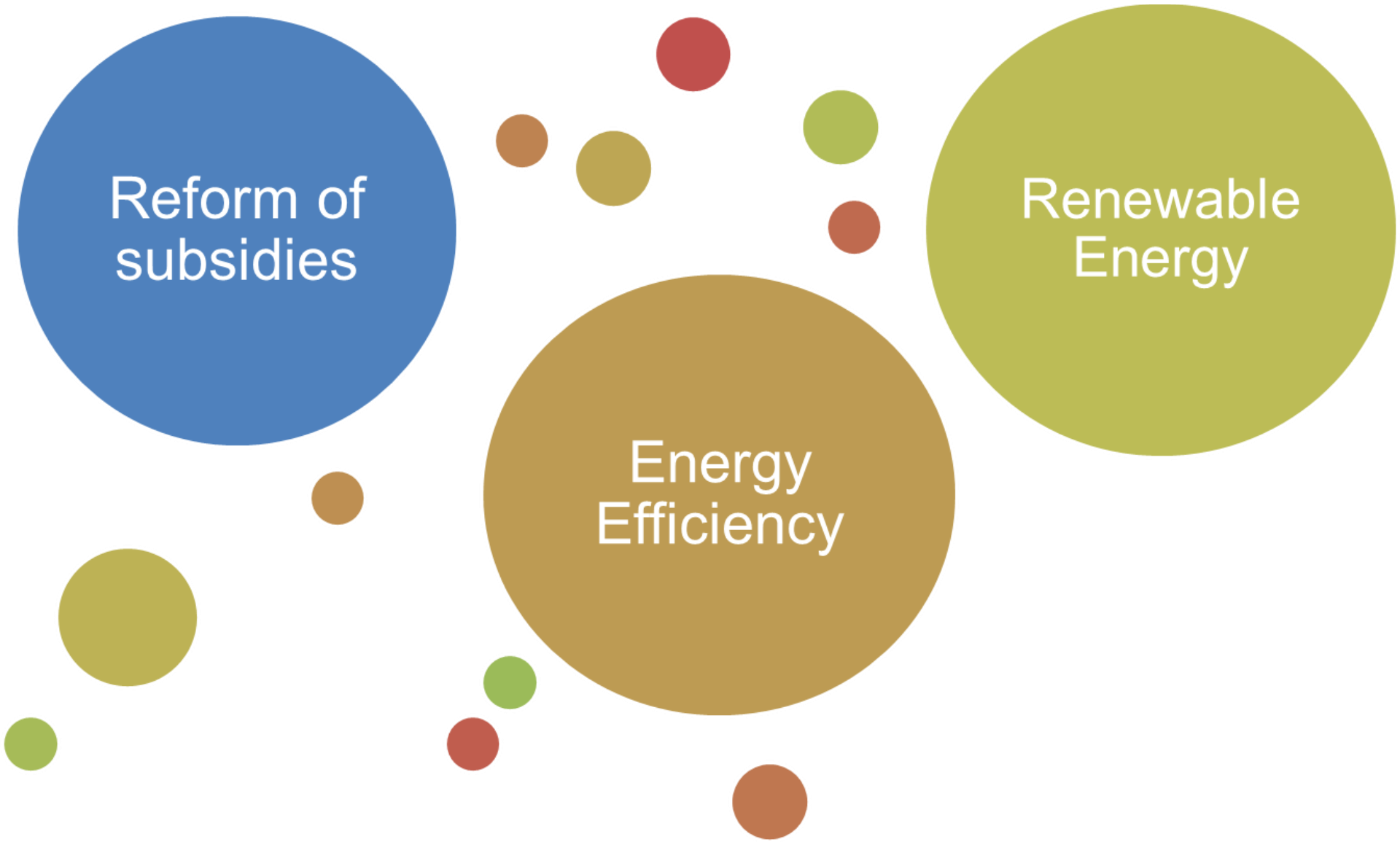


Energy: essential for enabling socio-economic development

The current **energy situation in SEMCs** is characterized by:

- rapid **increase of energy demand**;
- **Low energy efficiency**;
- **low domestic energy prices** (due to extensive **universal subsidy** schemes).

3 key elements for a sustainable energy transition in SEMCs



2) THE UNSUSTAINABLE HEAVINESS OF UNIVERSAL ENERGY SUBSIDIES

The unsustainable heaviness of universal energy subsidies

- **SEMCs** use **universal energy consumption subsidies**
- **Inefficient to mitigate energy poverty**: limited impact for the poor as restricted access and low consumption
- **Unfair**: 80% benefit the wealthiest
- **Inefficient from an economic** point of view as it creates shortages
- **Costly:** high burden for state budgets (12% of GDP in Egypt, 5% in Tunisia) and cost paid by all
- **Subsidies: strong disincentives** to a more **efficient use of energy** and -indirectly- to **investments in renewable energy**

Reform of energy subsidies

Not easy, but possible!

- **Jordan** reduced subsidies from **5%** to **2%** of the **GDP (2008-2010)**
- **Turkey:** level of **fuel prices** among the **highest in Europe**
- **Iran** tried to **replace universal subsidies** with **targeted subsidies**

3) THE HUGE POTENTIAL FOR LOW COST ENERGY EFFICIENCY AND DSM POLICIES

Issues for an effective policy agenda on EE and DSM

- **Energy intensity** in the SEMCs: up to **2 times higher** than in the **EU**
- **EE** and **DSM** measures allow to **improve public finances, business competitiveness and household welfare**
- **EE** and **DSM** concern **different sectors**, up to **different institutions**
  - Need for **coordination**
  - **Dedicated agencies** should be in place to **enforce regulation**
- **Timing** and **hierarchy** of **EE** and **DSM** implementation will matter
  - First target measures with **high visibility**, **lower costs**, **high rate** of return

4) UNLOCKING THE SEMCs RENEWABLE ENERGY POTENTIAL

RE in the SEMCs: a wide variety of advantages

- **Part** of the **RE electricity** could be devoted to the **domestic market**

> **Freeing up natural gas** for **additional exports** to **Europe**

- **Part** of the **RE electricity** could be **exported to Europe**

> **SEMCs** could **take advantage** of the higher **EU electricity prices**
> The **EU** could **meet** its **decarbonisation targets** at a **lower cost**

RE in the SEMCs: a wide variety of advantages

- **RE** could **develop** a significant **new industry** and **service sector**
  - > Local job creation
  - > Manufacturing developments
  - > **Enhancing cooperation** in a region with **low level of intra-regional trade**

- **Not only large scale projects- small scale projects are as important:**
  - **Warm water production, cooling applications, water pumping, decentralized energy**

- **Large-scale implementation of RE in the SEMCs = spillovers for the EU**
  - > Creating new markets
  - > Securing the **existing energy infrastructure** in the **Mediterranean**

RE projects: stimulus for enhance the Euro-Med economic cooperation

5) TOWARDS A NEW STRUCTURE OF REGIONAL AND INTERCONNECTED MARKETS

The importance of developing a regional energy market

- **Lack of a regional energy market in the SEMCs**
  - Due to energy price gaps and subsidies
  - Limited development of the electricity supply system

- **This is a key challenge to the production and development of renewable energy in the SEMCs**
  - Investment in new infrastructure is distorted
  - The development of renewable energy is delayed

- **Need for a functioning regional electricity market**
  - Exchange of power in substantial volumes
    - > It can alleviate some disadvantage of intermittent supplies
    - > It can permit joint venture to share risks

The key role of electricity interconnection

- **Crucial issue for energy cooperation in the SEMCs**

- **The reinforcement of interconnections is a multi-level challenge:**

  1) SEMCs national transmission lines

  2) Interconnections between SEMCs

  3) Interconnection between North/South Med

6) HOW TO FINANCE THE SEMCs SUSTAINABLE ENERGY TRANSITION

Looking at the future…

- The sectors likely to find the **highest obstacles** to their development in the SEMCs are **renewable energy** and **energy efficiency**
- These **technologies are often expensive** and require financial help which the **local Governments cannot always afford**

- **Innovative financing methods are thus needed**
- **> Carbon Market Opportunities**
- **> New SEMCs – GCC – EU Development Triangle**

Carbon Market Opportunities in SEMCs countries

- SEMCs countries should engage in the **UN process** for setting up a Nationally Appropriate Mitigation Action (**NAMA**) registry

- The Mediterranean region offers an interesting test case for an **integrated approach to carbon markets**, as:

  - There is an **institutional set-up** (the **UfM**)

  - There is a **financial facility** (the Mediterranean Carbon Fund of the **EIB**)

  - There is a **region wide initiative** with substantial potential for energy related emission reductions (the **Mediterranean Solar Plan**)

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- related emission reductions (the **Mediterranean Solar Plan**)

A new SEMCs – GCC – EU Development Triangle

The potential role of Europe

•Europe can play an **important role** also in this area, through the **financial facilities** devoted to the Southern Mediterranean:

- European Bank for Reconstruction and Development

- European Investment Bank

- InfraMed Fund

InfraMed: a bridge between SEMCs and the GCC

Long-term infrastructure investment fund launched in 2010 by five major institutional investors:

- Cassa Depositi e Prestiti (Italy)
- Caisse des Dépôts et de Consignations (France)
- Caisse de Dépots et de Gestion (Morocco)
- EFG Hermes (Egypt)
- European Investment Bank

The key-idea underlying InfraMed is to **collect capital owned by GCC' SWFs, directing it into infrastructure projects in the SEMCs**

A new SEMCs – GCC – EU Development Triangle

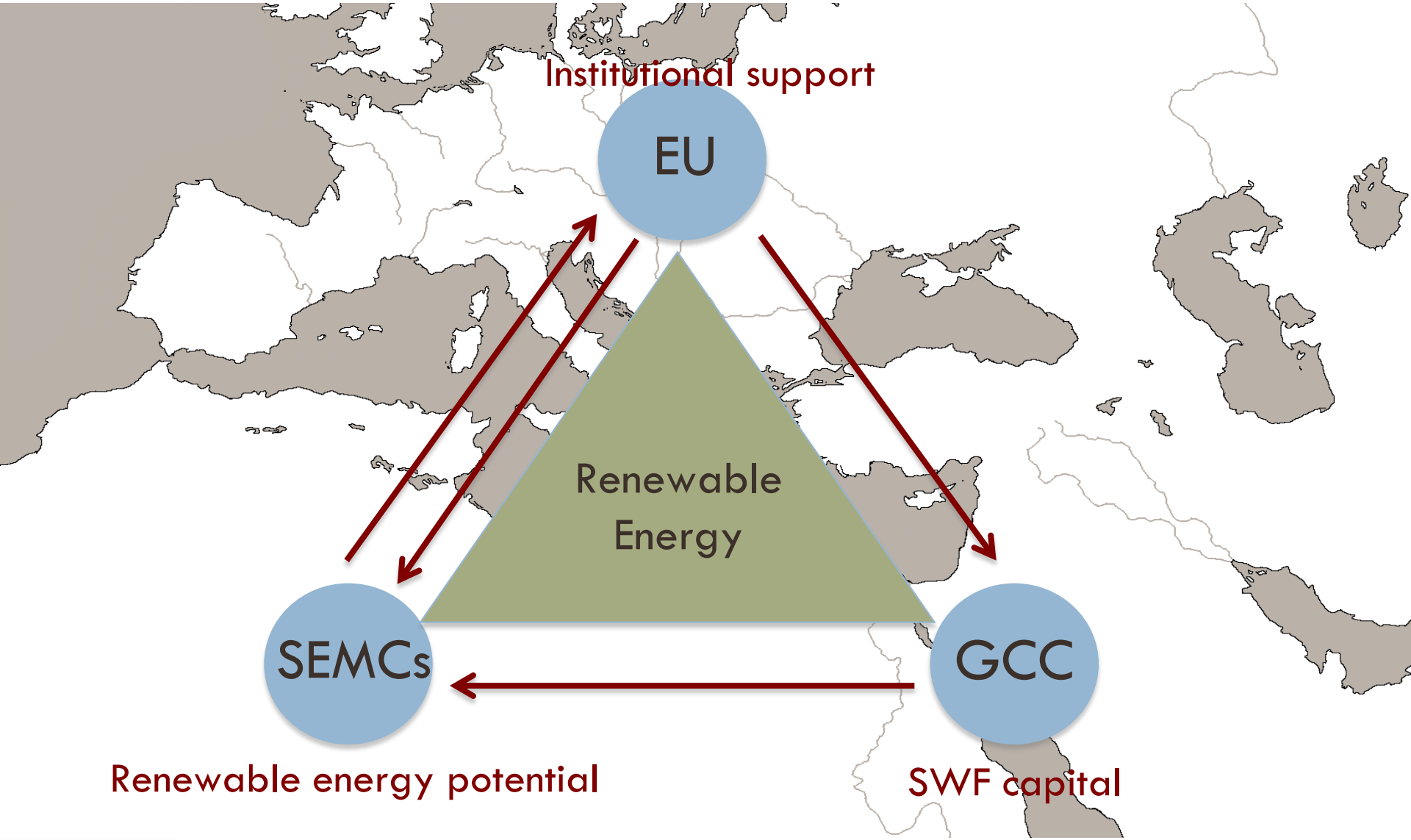
SWFs from the GCC

Aim:

- Diversification of GCC hydrocarbons-based economy
- Transforming oil wealth into a global renewable energy leadership

Country	Fund Name	Total assets (US$ billion)
UAE – Abu Dhabi	Abu Dhabi Investment Authority	627
Saudi Arabia	SAMA Foreign Holdings	532
Kuwait	Kuwait Investment Authority	296
Qatar	Qatar Investment Authority	100
UAE – Dubai	Investment Corporation of Dubai	70
UAE – Abu Dhabi	International Petroleum Investment Company	58
UAE – Abu Dhabi	Mubadala Development Company	27
Bahrain	Mumtalakat Holding Company	9
Oman	State General Reserve Fund	8
Saudi Arabia	Public Investment Fund	5
UAE - Ras Al Khaimah	RAK Investment Authority	1
TOTAL GCC		**1734**

A vision for a future SEMCs-GCC-EU development triangle



THE URGENT NEED FOR A "EURO-MEDITERRANEAN ENERGY ROADMAP"

A win-win cooperation scheme

- **Efforts towards a sustainable energy transition in SEMCs** could be the **key element of a new EU foreign energy policy**

- **Important dividends** to the **EU** and to **SEMCs:**
  - Further market integration
  - Durable and cost effective reduction of energy bills and subsidies
  - Energy security
  - Sustainable development
  - Economic growth
  - Job creation

Towards a “Euro-Mediterranean Energy Roadmap"

Why?

Best way to enhance energy cooperation (see EU-Russia, EU-GCC)

How?

Designing a sustainable energy transition for the overall Euro-Mediterranean region

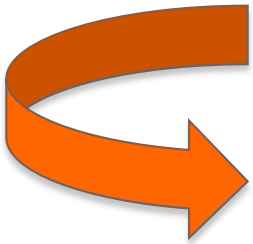
When?

Roadmap to be discussed by a EuroMed ministerial meeting in Brussels later in 2013

It’s not just about energy…

SUSTAINABLE ECONOMIC DEVELOPMENT

SOCIAL DEVELOPMENT



STABILITY AND PEACE

“If you want to travel fast, walk alone;
if you want to travel far, walk together.”

African saying

Thank you!

Contact:
Prof. Manfred Hafner (manfred.hafner@feem.it)

About MEDPRO

Title	MEDPRO – Prospective Analysis for the Mediterranean Region
Description	MEDPRO explores the challenges facing the countries in the South Mediterranean region in the coming decades. The project will undertake a comprehensive foresight analysis to provide a sound scientific underpinning for future policy decisions at both domestic and EU levels.
Mediterranean countries covered	Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria, Tunisia and Turkey
Coordinator	Dr. Rym Ayadi, Centre for European Policy Studies (CEPS)
Consortium	Centre for European Policy Studies, **CEPS**, Belgium; Center for Social and Economic Research, **CASE**, Poland; Cyprus Center for European and International Affairs, **CCEIA**, Cyprus; Fondazione Eni Enrico Mattei, **FEEM**, Italy; Forum Euro-Méditerranéen des Instituts de Sciences Economiques, **FEMISE**, France; Faculty of Economics and Political Sciences, **FEPS**, Egypt; Istituto Affari Internazionali, **IAI**, Italy; Institute of Communication and Computer Systems, **ICCS/NTUA**, Greece; Institut Europeu de la Mediterrania, **IEMed**, Spain; Institut Marocain des Relations Internationales, **IMRI**, Morocco; Istituto di Studi per l'Integrazione dei Sistemi, **ISIS**, Italy; Institut Tunisien de la Compétitivité et des Etudes Quantitatives, **ITCEQ**, Tunisia; Mediterranean Agronomic Institute of Bari, **MAIB**, Italy; Palestine Economic Policy Research Institute, **MAS**, Palestine; Netherlands Interdisciplinary Demographic Institute, **NIDI**, Netherlands; Universidad Politecnica de Madrid, **UPM**, Spain; Centre for European Economic Research, **ZEW**, Germany
Budget and Funding	Total budget: €3,088,573 EC-DG RESEARCH contribution: €2,647,330
Duration	1 April 2010 – 31March 2013 (36 months)
EC Scientific Officer	Dr. Domenico Rossetti Di Valdalbero, DG RESEARCH
Website	www.medpro-foresight.eu
Contact e-mail	medpro@ceps.eu