IEA Renewable Energy Working Party

International Energy Agency

International Low-Carbon Energy Technology Platform

Workshop Summary[1]

From Mediterranean Plans to Renewable Energy Power Plants

3 October 2012
GSE, Viale Maresciallo Pilsudski 92, Rome, Italy

Organised by the IEA Renewable Energy Working Party and the IEA International Low-Carbon Energy Technology Platform, this regional workshop was held in collaboration with GSE, OME and RES4Med, and under the auspices of the Italian Ministries of Foreign Affairs and Environment, Land and Sea.

Summary and Conclusions

Renewables will play a key role in the transition to a low carbon economy and the Mediterranean region holds massive renewable energy potential, in particular with strong solar and wind resources. Renewables could help meet the rapidly growing energy demand in the region as well as having the potential to export renewable electricity to Europe. So far deployment, particularly of solar technologies has been modest. Southern Mediterranean countries have ambitious short to medium term targets, but progress is currently restricted by various barriers – technical, institutional and financial – that are inhibiting development. This workshop brought together decision makers and experts from both sides of the Mediterranean to explore how regional initiatives can complement the countries' individual efforts, and unleash the huge untapped potential.

The discussions highlighted the regional potential, the good progress and ambitious plans developed in some countries but also emphasised the challenges remaining to be overcome, most notably:

- The lack of market readiness for investment, with political, policy and regulatory uncertainty, un-liberalised markets and highly subsidised energy pricing;
- A shortage of the local technical and regulatory capacity and experience to create suitable investment climates and to develop projects;
- A reluctance amongst private-sector investors, given the political and policy and regulatory uncertainties, and a lack of appropriate risk-proofing mechanisms;
- Insufficient data and experience to enable planners to adopt a whole-system approach to renewable technologies deployment. Integrating energy efficiency and renewables could play a central role is strategies to meet rapidly increasing energy demands, and providing a full spectrum of social and economic benefits;
- The lack of national grids and markets, let alone regional ones, and the tremendous need for investment capital to create them.

The discussions highlighted the need to:

- Share regional experience of RE technologies and work together to share policy solutions as a way of developing best practice in creating a sustainable investment climate and in planning and developing projects;

[1] *This summary reflects the general views of the discussions and not necessarily that of the IEA or its member countries.*

- Develop a coherent financing model, with a coordinated regional approach from the development banks to off-set political risks and so enable private-sector investment;
- Ensure that projects are developed in a way that allocates benefits, including technology transfer and local content/job creation, equitably among the parties; this is essential for generating continuing domestic support.
- Articulate, a long-term vision for a harmonized regional (EU/MENA) market which is an essential factor in attracting investment, even if progress toward this is of necessity to be made gradually in stages over decades; and

Introduction

Renewables will play a key role in the transition to a low carbon economy, passing from today's share of 20% of global electricity generation to 57% in 2050. But the challenge to reach this goal is huge - in absolute numbers, electricity generation from renewables will need to increase by around 20 000 TWh – this is roughly equivalent to the entire world electricity generation today. Non-OECD countries will account for two-thirds of this generation. The Mediterranean region holds massive renewable energy potential, in particular with strong solar and wind resources. Over 1 GW of wind farms operate in North Africa, mainly in Egypt, Morocco and Tunisia. Solar technology deployment is however relatively slow on the southern shore with only 20 MW of CSP installed and 160 MW under development in Morocco. Small CSP fields, 20 MW each, are also in operation in Algeria and Egypt.

The population of the Southern Mediterranean contries is expected to grow at a rate of some 6-9% per year from now until 2030, adding some 80 million people. This will result in increasing power demand (about 5% per year from now until 2030). This growth in demand coupled with a strong need for rural electrification and the potential for exporting clean electricity to Europe, should provide added stimulus to renewable energy (RE) technology deployment. Southern Mediterranean countries' targets for RE technologies deployment in the short-to-medium term are very ambitious (see Annex 1, Table 1), but despite the favourable potential, various barriers (e.g. technical, institutional, financial and market risks) are preventing the Mediterranean region from accelerating the deployment of renewable energy technologies.

North Africa has the potential to become a major exporter of renewable energy to Europe which has ambitious energy security and climate goals of its own. In a context of global economic crisis and regional instability due to political changes, realizing the opportunities for trade in power could have major economic benefits on both sides of the Mediterranean, with improved energy supplies and employment opportunities.

This workshop intended to explore how Mediterranean wide initiatives can really complement the countries' individual plans to deploy RE technologies in the short-to-medium term, as a response to electricity demand increase as well as an opportunity for green economic growth. In short, this workshop explored how to go from Mediterranean plans to RE power plants in Southern Mediterranean countries. To respond to this challenge, the workshop included three panel discussions that respectively discussed:

- The added value of ongoing regional initiatives;
- The Action Plans in the Southern Mediterranean Countries; and
- What is needed to unlock investment: the Industry stakeholders' views.

For many months now, the IEA International Low-Carbon Energy Technology Platform has worked closely with countries of the Mediterranean, in particular Italy and Morocco, building momentum to support efforts to deploy renewable energy technologies. This workshop report aims to summarise stakeholders' views on regional specific barriers to RE technologies deployment and provide recommendations on what needs to be done to unlock the situation.

Panel 1: The added value of regional initiatives

Chaired by Roberto Vigotti, Vice-Chairman of the IEA Renewable Energy Working Party (REWP)

Participants to this panel included representatives from the following regional entities:

- Sotiris Varouxakis, Deputy Secretary General, Union for the Mediterranean (UfM);
- Fabian Wigand, Analyst Strategy, Desertec Industry Initiative (Dii);
- Fabio Tambone, General Coordinator, Medreg;
- Michelangelo Celozzi, Secretary General, Med TSO;
- Jean Kowal, CEO, Medgrid; and
- Kamel Esseghairi, Executive Director, Arab Platform for Renewable Energy and Energy Efficiency (APFREEE).

There are many barriers to sustainable deployment of renewables in Southern Mediterranean: lack of market readiness, instability due to political changes, difficulties to access financing due to political risks and remaining uncertainty over policy and regulatory frameworks. The Mediterranean initiatives represented in this panel aim to (1) create an integrated large-scale private sector driven market for REEE; (2) develop regional specific regulatory and investment frameworks informed by best practices; (3) catalyse regional stakeholders' collaboration; and (4) further integrate the grid in the Mediterranean area (North-South and South-South). The panel discussed how these initiatives plan to actually achieve their ambitious objectives and how these initiatives can support the achievement of individual countries' targets.

The concept of a "Mediterranean Energy Community" was mentioned by almost all panel participants as the main objective that the Mediterranean region should aim for, in the short-to-medium term. The initiatives focus on different stakeholder groups – public, private or sectoral, but each has identified one common critical element: set the right conditions for renewable energy technology deployment by identifying most efficient regulatory and policy frameworks. In support of this effort, roadmaps are being developed, notably by the UfM and Dii.

The Mediterranean renewable energy collaboration was reinforced by the European Union Directive 2009/28/EC on the Promotion of the Use of Energy from Renewable Energy Sources. Article 9 of the Directive regulates joint projects between European Union Member States and third countries to reach the EU 2020 goals. While this framework is recognised as an efficient tool to facilitate investments, panel participants indicated the need to go beyond this and aim for an integrated renewable energy market in the Mediterranean.

Over the past decade, the creation of these regional initiatives has provided platforms for interested stakeholders to meet regularly and exchange policy best practices, build consortia to undertake projects on the ground, build local stakeholders capacity, and draw the attention of Mediterranean policy makers to the needs and opportunities around renewable energy technology collaboration in the region. Of particular interest is the issue of high-voltage, presumably direct-current lines, that could connect North-Africa to Europe. The current lines, mostly used to export electricity from Spain to Morocco, do provide some room for initiating north-south electricity trade, but would rapidly become insufficient to carry on large amounts of clean electricity to Europe.

Discussions highlighted some issues that should be addressed to strengthen the sustainable deployment of renewable energy technologies in the Mediterranean, they include:

- Coordinate better with investment and multilateral development banks, such as the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB);
- Promote further an integrated approach to the deployment of renewable technologies, in particular solar technologies;
- Encourage a political commitment be taken to build momentum of these regional initiatives efforts, possibly at the occasion of the upcoming UfM Ministerial meeting scheduled in 2015.

Panel 2: The Action Plans in the Southern Mediterranean Countries
Chaired by Cedric Philibert, Medener

This panel comprised the following representatives:

- Ehab Ismail Ameen Abdalla, General Manager Planning Dept., New and Renewable Energy Authority, Egypt;
- Khairy Agha, Executive Director, Renewable Energy Authority of Libya; and
- Nabil Saimi, Director International Cooperation, Moroccan Agency for Solar Energy, Morocco

A presentation was also sent by the Tunisian agency for energy management (ANME).

The aim of this panel was to get an overview of how Southern Mediterranean countries translate their renewable energy targets into action plans, recent developments and difficulties these countries face in the implementation of these plans.

In Egypt, renewable energy is considered as a priority. The country plans for 20% generation from renewables by 2020. In July 2012, Egypt adopted a plan for solar – 3500MW by 2027 (2800 MW CSP; 700MW PV). 67% investment is intended to come from the private sector with substantial support from the government, notably in allocating lands. In implementing its plan, Egypt collaborates substantially with the European Union, banks, such as KfW, and foreign companies (notably Italian). The main difficulties identified in the implementation of the national action are the following:

- difficulty to access sustainable financial resources;
- the unit price of RE electricity is still substantially higher than from traditional fossil fuels.

In Libya, renewables are less developed than in other countries of the region. Solar and wind technologies are meant to take the biggest share of renewables in the Libyan energy mix, and the government intends have an integrated approach, including both renewable energy technology deployment and energy efficiency measures. To date, there are no targets for renewables. Presently theres is no generation, but the prospects are for 10% of overall power generation by 2025 - including: 1000MW from wind; 400 MW from CSP; and 800 MW from PV. If such targets were to be reached, this would lead to saving of 2.9 million barrels of oil per year and so provide a significant financial return. Libya wants to become an exporter of clean energy. The main barriers identified are the following: capacity building; policy; infrastructures; finance mechanisms.

Today the electricity market is a monopoly and the price of electricity is very low – therefore it is hard to assess the risks related to renewables deployment. Libya has developed a work programme in 3 phases

1. By 2015: capacity building, development of supporting policies, launch of pilot projects, collaborative efforts;
2. By 2025: develop private sector, create a market for renewables;
3. By 2050: large scale deployment of REN.

The country already has acollaboration with a Spanish company on wind energy and the Government plans to build awareness on clean energy, notably through energy efficiency programmes in high schools.

In Morocco, the Government has made a very strong commitment to deploy renewable energy technologies, in particular wind and solar, with for both technologies to reach 2 000 MW by 2020. The first phase of the Ouarzazate CSP power plant was launched in late September 2012 (160MW). For wind, 300MW are currently in operation and 1000MW in preparation. Two issues are identified as slowing down the country's capacity to deploy renewable technologies faster. First, there is a lack of capacity from local institutions to enable the development of sustainable renewables projects. Secondly, there is a need for bankable business models for renewables projects which provide local electricity supply and employment opportunities, while at the same time providing a contribution to Europe's clean energy targets at lower costs

Overall, on a question related to export plans for the Southern countries to the Northern side of the Mediterranean, all three speakers indicated that the priority should be given to satisfy local needs.

Panel 3: Industry Stakeholder's Views – What is needed to unlock investment?
Chaired by Paolo Frankl, Head Renewable Energy Division IEA

This panel was comprised of representatives from utilities, system operators, manufacturing companies, developers and investors including: Abengoa Solar; Egyptian Electricity Transmission Company; Enel Green Power; E.ON Climate & Renewables; European Solar Thermal Electricity Association; First Solar; Global Wind Energy Council; Medrec; PwC; Res4Med; RWE Innogy; TuNur; Turkish Electricity Transmission Corporation; Vestas

From the discussions, the main barriers to private sector's investment in renewable projects in Southern Mediterranean can be summarised as follow:

- **Policy and regulatory issues:** there is a lack of clarity and objectives for national policies as regards to renewables and fossil fuel subsidies. Regulatory frameworks are not sufficiently stable to allow investments, and support schemes are changing too rapidly in the short term. Besides, in most Southern Mediterranean countries, the market is not yet liberalised.
- **Market readiness and environment favourable to investments:** multilateral development banks need to further cover the risks, notably EIB. Besides some technologies are perceived as risky for investment, notably less mature technologies such as CSP and off-shore wind. In

addition, although there is growing interest from institutional investors, they are looking for secondary assets and are not willing to take construction risk.

- **Operational issues:** renewable energy projects take time to be developed (usually 5 years for solar technologies) and it implies that the project needs to be adjusted several times to adjust to financing, regulatory frameworks, land use, etc. Another issue identified is the question of where to invest now that North Africa is a very attractive market for foreign investment and is a very crowded investment space.

Recommendations by the Chairs:

Roberto Vigotti:

- This is a key period for the North African region that wants to create their own local industries;
- There is a pressing need to encourage South-South interconnections;
- There is a key role for the IEA in bringing policy and technology insights;

Cedric Philibert:

- Renewable energy projects must be inclusive of energy efficiency measures;
- The continuing subsidies to fossil fuels is a key barrier to renewable technology deployment;
- Capacity building and knowledge sharing between EU and South Mediterranean countries is crucial;
- In the long term, the EU will need import of clean electricity that could come from the South Mediterranean countries – despite that, renewables power generation produced in the South should be designed firstly for local needs.

Paolo Frankl:

- The main issue is the risks related to investment in renewables in the South Mediterranean. The discussions in the workshop suggest a series of recommendations:
    - Short term: more knowledge sharing is needed – especially from the finance and bank sector – with the aim of developing financeable business models;
    - Medium term (5 years time): improve regulatory certainty – fossil fuels subsidies are a problem, but there is a need to remove them properly taking into account the social/economic impacts. There is a need to create the right framework to build bilateral trust – and good pilot projects to build investors' trust;
    - Long-term: create a long-term vision for a unified market. The European market was created in 1992 but still needs time to be fully integrated. The political will is key – the UfM Ministerial in 2013 can play a crucial role in forging this vision.

Conclusions and Way Forward

Ambassador Richard Jones, Deputy Executive Director of IEA

Although the global economic context and North African political uncertainties represent notable challenges, the well developed regional initiatives and local connections are a considerable strength and should provide a basis to implement actions on the ground.

The discussions highlighted the regional potential, the good progress and ambitious plans developed in some countries but also emphasised the challenges remaining to be overcome, most notably:

- The lack of market readiness for investment, with political and policy and regulatory uncertainty, unliberalsied markets and highly subsidised energy pricing;
- A shortage of the local technical and regulatory capacity and experience to create suitable investment climates and to develop projects;
- A reluctance amongst private-sector investors, given political and policy and regulatory uncertainties, and a lack of appropriate risk-proofing mechanisms;
- Insufficient data and experience to enable planners to adopt a whole-system approach to renewable technologies deployment, integrating energy efficiency and renewables as central parts of the solution to rapidly increasing energy demand, and taking into account the full spectrum of social and economic benefits;
- The lack of national grids and markets, let alone regional ones, and the tremendous need for investment capital to create them;

More specifically, we need to further reinforce our collaboration to:

- Share regionally experience of RE technologies and work together to share policy solutions as a way of developing best practice in creating a sustainable investment climate and in planning and developing projects;
- Develop a coherent financing model, with a coordinated regional approach from the development banks to off-set political risks and so enable private-sector investment;
- Ensure that projects are developed in a way that allocates benefits, including technology transfer and local content/job creation, equitably among the parties; this is essential for generating continuing domestic support.
- Articulate, a long-term vision for a harmonized regional (EU/MENA) market which is an essential factor in attracting investment, even if progress toward this is of necessity to be made gradually in stages over decades; and

ANNEX 1

Table 1 • Renewable energy targets in North African countries

Algeria	Wind 50 MW wind farm development from 2011–2015; 3% of final energy by 2030; 1,700 MW installed from 2016–2030; 3% of final energy by 2030 Solar PV 800 MW by 2020; 200 MW/yr every year from 2021–2030; 2,800 MW by 2030 Solar (PV and CSP) 37% of final energy by 2030 CSP 300 MW 2012–2013; 1,200 MW 2016–2020; 500 MW/yr every year from 2021–2023; 600 MW/yr every year from 2024–2030
Egypt	Wind 12% of electricity and 7,200 MW by 2020 Hydro, solar, and other renewables 8% of electricity by 2020
Jordan	Wind 1,000 MW by 2020 CSP and PV: 300–600 MW by 2020 Solar water heaters 30% of households by 2020 (from 13% in 2010)
Libya	Wind 500 MW by 2015; 1,000 MW by 2020 Solar PV 100 MW by 2015; 500 MW by 2020 CSP 200 MW by 2015; 750 MW by 2020 Solar water heaters 80 MW by 2015; 250 MW by 2020
Morocco	Wind 1,440 MW by 2015; 2,000 MW by 2020 Solar 2,000 MW by 2020, 22 000 MW by 2030 (12 000 MW for national demand, 10 000 MW for exports) Small hydro 400 MW by 2015 Solar hot water 0.28 GWth (400,000 m2) by 2012, 1.19 GWth (1.7 million m2) by 2020
Tunisia	Renewable capacity 1,000 MW (16%) by 2016; 4,700 MW (40%) by 2030 (plus initiatives for export)

Sources: Renewable Global Status Report 2012, REN21, IEA analysis.