



MENA Regional Concentrated Solar Power Scale-up Program

CTF Investment Plan Preparatory Meeting

2nd Joint CSP Workshop of the African Development Bank
and the World Bank Group

Workshop Proceedings

21-22 October 2009
Sheraton Hotel
Tunis, Tunisia

Acknowledgments

The MENA CSP Scale-up program task team wishes to thank all who have aided in one way or another in the organization of the Tunis Meeting and in the writing of these proceedings. The workshop would have not been possible without the tireless efforts of Mr. Youssef Arfaoui, Ms. Chiraz Fatnassi, and Ms. Maali Harrathi from the African Development Bank. The task team also wishes to thank Mr. Georg Caspary, Mr. Roger Coma-Cunill and Mr. Jonathan d'Entremont Coony, at the World Bank's Headquarters, for their contributions in writing these proceedings.

Table of Abbreviations

AFD	Agence Française de Développement
AfDB	African Development Bank
ANME	National Agency for Energy Conservation
CCGT	Combined Cycle Gas Turbine
CO ₂	Carbon Dioxide
CSP	Concentrated Solar Power
CTF	Clean Technology Fund
DII	DESERTEC Industrial Initiative
EIB	European Investment Bank
EPC	Engineering Procurement and Construction
ESTELA	European Solar Thermal Electricity Association
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse gas
GTZ	German Technical Cooperation
GW	Gigawatt
HVDC	High Voltage Direct Current
IEA	International Energy Agency
IFC	International Finance Corporation
IPP	Independent Power Producer
IRR	Internal Rate of Return
ISCC	Integrated Solar Combined Cycle
IsDB	Islamic Development Bank
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
KfW	German Development Bank
kWh	kilowatt-hour
MWh	Megawatt-hour
MDB	Multilateral Development Bank
MENA	Middle East and North Africa region
MSP	Mediterranean Solar Plan
MW	Megawatt
ONE	Office National de l'Electricité
PPA	Power Purchase Agreement
PPP	Public Private Partnership
PV	Photovoltaics
RES	Renewable Energy Sources
SFD	Saudi Fund for Development
STEG	Société Tunisienne de l'Electricité et du Gaz
TFC	Trust Fund Committee (Clean Technology Fund)
UfM	Union for the Mediterranean
US	United States of America

Table of Contents

Table of Abbreviations	3
Table of Contents	4
Introduction.....	5
Welcome remarks	6
Session 1 - CTF Investment Plan Update	7
Session 2 - Update on the Mediterranean Solar Plan.....	9
Session 3 - Private Sector Role in CSP Scale-up.....	10
Country Panel 1 – Algeria, Morocco, Tunisia	12
Country Panel 2 – Egypt, Jordan, Libya.....	15
Session 4 – The South African experience in CSP R&D	18
Session 5 - Policy and Regulatory aspects of CSP Scale-up in MENA	18
Donors Panel on Financing for CSP in MENA	19
Annex 1 – Workshop Agenda.....	22
Annex 2 – Participant List	26

Introduction

The MENA region provides optimal conditions for the development of CSP technology at scale, e.g. plentiful of solar resources and existence of vast amounts of unused flat land close to road networks and transmission grids. The World Bank Group and the African Development Bank, in collaboration with other donors, are launching an initiative to scale-up CSP in the region up to 1 GW over 6-8 years in 8-10 sizeable projects. CSP deployment on this scale would bring substantial advantages to participating countries: meet rapidly growing power demand, reduce dependence on fossil fuels for electricity generation, lower carbon footprint, and promote job creation and economic development through increased opportunities for local manufacturing and technology transfer in this area.

To this end, the World Bank Group and the African Development Bank are in the process of applying to the Clean Technology Fund (CTF) Trust Fund Committee for use of \$750 million of concessional funds for the MENA CSP Scale-up.

Following a first meeting in Rabat (June 11-12 2009), the African Development Bank and the World Bank Group organized a second meeting in Tunis (October 21-22) aimed at preparing an Investment Plan, which will be assessed by the CTF Trust Fund Committee in early December 2009. The Tunis meeting was attended by more than 160 participants from MENA countries, donors, private sector, and civil society.

Projects totalling about 1GW of CSP were presented by Algeria, Egypt, Jordan, Morocco and Tunisia, and transmission projects by Tunisia and Jordan, for CTF financing. Libya also presented its CSP plans. These presentations were widely acclaimed as demonstrating strong commitment to the CSP scale-up, and a very sound understanding of the necessary framework conditions (including prospects for exports to EU as well as domestic consumption). Strong interest in the regional CSP scale-up initiative was demonstrated by the private sector present, including project developers and commercial banks. Donor participation in the conference was also strong, with participation from European Commission, Saudi Fund for Development, AFD (France), Islamic Development Bank, European Investment Bank, JBIC (Japan), KfW (Germany), JICA (Japan), AfDB, IFC, MIGA and World Bank.

These proceedings summarize the presentations made and main issues discussed to facilitate the scale-up of CSP projects in the MENA region.

Presentations

Welcome remarks

Mr. Gilbert Mbeshrubusa - Director, AfDB

Mr. Mbeshrubusa stressed AfDB's commitment to the Concentrated Solar Power (CSP) scale-up effort for the MENA region. He noted that, while many countries in the region had strong oil and gas resources, they all had extremely strong solar resources as well. While utilities in the region were strong, there was an over-dependence on fossil fuels to meet the countries' growing energy needs.

The region's energy future must include promotion of clean energy and regional integration of the countries' energy sectors. Renewable energy must be harnessed through cost-effective technologies.

AfDB recently approved a clean energy investment strategy with three axes:

- Energy security
- Energy access
- Global reduction of CO₂ emissions

AfDB has organized and promoted this conference because it believes CSP has great promise as a major energy resource providing dispatchable energy with significantly lowered greenhouse gases.

Mr. Mbeshrubusa acknowledged the current high cost of CSP compared to alternatives, but also said that there were economies-of-scale with the technology that had yet to be exploited.

He said that the Clean Technology Fund could potentially provide up to \$750 million in financing, but that additional financing would also be sought to meet the expected total financing needs of up to \$6 billion (\$4 billion for generation and \$2 billion in needed transmission lines). He said the Tunis conference would be an effective forum to pursue additional resource mobilization.

Mr. Laszlo Lovei - Director, World Bank

Mr. Lovei made several points regarding the scale-up of CSP in the region:

1. Regional energy integration needs to be enhanced, as was discussed and agreed upon in the Recent World Bank Group Annual meetings in Istanbul, Turkey. CSP can be a contributor to such enhanced regional integration.
2. CSP can also enhance energy security in the face of high and volatile fossil fuel prices. This is especially important for countries that lack sufficient domestic fuel resources.

3. The scale-up of CSP in the MENA region will bring substantial benefits to the technology in terms of accelerated commercialization and reduction of cost and price. These developments will bring global benefits.
4. The Tunis meeting will be important to understand the current state of the technology.
5. It will also be important to get feedback from the potential host countries in terms of technology choice and funding needs.
6. Another desired result from the Tunis meeting is to ascertain the volume and type of concessional funding that might be available for CSP plants in the regions.

Mr. Abdellaziz Rassaa, Secretary of State, Ministry of Industry, Energy & SMEs, Tunisia

Tunisia has supported the rational use of energy for the last twenty years. The promotion of renewable energy, including wind and solar power, has been a substantial part of the energy policy. In addition, the country has developed its gas resources and achieved improved energy efficiency, including through cogeneration.

In 2008, a new energy program was launched for the period 2008-2011. This program targets transport, tourism and buildings. It aims to achieve 13% of energy from renewable resources by 2011. In October 2009, a new solar plan was adopted. From 2010 – 2016, 4 million dirhams will be spent on 40 projects, whose combined savings will reach 1.2 million tCO₂ annually.

The government support and participates in the accelerated facilitation of renewable energy development. The Mediterranean Solar Plan and the Clean Technology Fund can be crucial aspects of this. The Tunisian Solar Plan will finance local solar energy projects.

Regional energy integration requires new infrastructure, especially electricity interconnections. Among the primary requirements in this area is a link with Italy. A sub-sea line with Italy could be used to export power to Europe and be a needed catalyst to creating a regional market for green energy.

Session 1 - CTF Investment Plan Update

Mr. Jonathan Walters - Sector Manager, World Bank - Overview

MENA has among the best solar resources in the world. The technology has traits that make it suitable and promising for scale-up in the region. One, it can provide substantial economies-of-scale with sufficient new capacity volume being ordered, developed and installed. Two, the MENA countries have industrial bases that can be adapted to CSP and thus participate directly in the economic development and job creation from plants built in the region.

There are many benefits of the CSP scale-up:

- 1) Brings industrial diversification and job creation

- 2) Provides countries showing leadership with “first mover” advantage in a promising growth industry
- 3) For fossil fuel producers, CSP scale-up frees up oil and gas for other uses
- 4) For fossil fuel importers, it enhances energy security
- 5) Provides the potential for exporting green power to Europe at attractive prices.

CSP scale-up in the MENA region would also have substantial global benefits:

- 1) MENA offers the best conditions in the world to scale-up the technology
- 2) Provides areas where economies-of-scale can be achieved
- 3) Leads to global CO₂ emission reduction

Mr. Walters pointed out that, when compared to other renewable energy technologies, CSP had yet to see similar investment levels. To date, wind has received \$200 billion in investments, photovoltaics \$100 billion in investments and CSP only \$1.5 billion in investments. This indicates that the \$4 billion or so projected for MENA CSP scale-up would have a tremendous add-on effect to the technology to realize the learning and economies-of-scale CSP has yet to realize vis-à-vis the other technologies.

Mr. Walters explained the structure and rationale of the Clean Technology Fund (CTF). It includes just over US\$5 billion for “transformational” projects to allow developing countries to follow a path of low-carbon growth. Money is invested with a 40-year tenure, a 10-yr grace period on repayments, no interest rate, and a 0.25% service fee. The CTF Trust Fund Committee is made up of eight representatives from the developing world and eight representatives from the industrialized world.

MENA CSP Scale-up represents an excellent opportunity for the CTF to invest since in addition to providing a means to lower emissions in developing countries, it would substantially accelerate the technology’s development, thus having a global benefit. The Investment Plan for the CSP Scale-up will be submitted before the end of 2009.

Mr. Walters then posited one financing model with the following assumptions:

- 100-MW CSP plant without storage
- 22.5% capacity factor
- \$4,000/kW capital cost
- \$10/ton for each ton of CO₂ emission reduced

Based on these assumptions, the CSP plants could offer power at the following prices:

	At 8% IRR	At 12% IRR
Pure commercial terms (no carbon finance)	\$0.25/kWh	\$0.29/kWh
Pure commercial terms (w/ carbon finance)	\$0.24/kWh	\$0.28/kWh
w/ 50% concessional funding	\$0.14/kWh	\$0.16/kWh

Mr. Walters further explained that for the entire scale-up, the CTF could provide up to \$750 million, other concessional financing could provide \$750 million to \$1 billion, and non-concessional (government and private) funds could provide \$4 to \$6 billion.

He outlined the conference objectives as:

- Agreeing to work as partners
- Confirming the scope of CSP scale-up to include in the CTF Investment Plan
- Agreeing the mobilize financing by spring 2010.

Ms. Hela Cheikhrouhou – Sector Manager, AfDB – Private Sector role

Ms. Cheikhrouhou began by explaining the AfDB’s new clean energy investment strategy. She said that while Africa lacks in providing access in energy to its citizens, it does have tremendous potential for renewable energy that has yet to be exploited. Additionally, Africa is one of the continents with maximum exposure to climate change.

Some promising technologies, such as CSP, require “soft financing” to be mobilized. One key additional benefit of solar power is that it includes local manufacturing which can provide a substantial boost to economies as well as create jobs.

AfDB has substantial involvement with the Clean Technology Fund (CTF):

- Egypt (\$300 million)
- Morocco (\$150 million)
- South Africa (\$500 million)
- Nigeria (Investment Plan underway)
- MENA CSP Scale-up

In addition to clean energy project investments themselves, there is substantial money for project preparation, with \$7 million having been made available.

The AfDB provides two lending windows. The first is a public window, with mostly concessional funds available to governments. The second is a private window, which offers debt and equity on commercial terms.

Session 2 - Update on the Mediterranean Solar Plan

Mr. Philippe Lorec - Conseiller du Directeur General de l’Energie et du Climat, (Plan Solaire Méditerranéen – UPM)

Mr. Lorec described how the Mediterranean Solar Plan (MSP) was one of the six projects launched under the Union for the Mediterranean initiative. The MSP has strong support of the European Union. It provides regulatory support to create the conditions in which CSP plants can be developed, financed and installed and ultimately wants to see concrete projects.

Goals of the MSP are to:

- 1) Address climate change through mitigation of CO₂ emissions,
- 2) Build power capacity to meet the electricity demand of the Mediterranean region.

The objective of the MSP is to have 20 MW of renewable energy built by 2020. This capacity would come in the form of a mix of technologies, including: photovoltaics, CSP, wind, biomass and geothermal. No technology is favored over the other. To date, there are almost 10 GW of potential projects in the pipeline. 56% of this is wind power, and 35% is CSP (constituting 3.2 GW of capacity), with the remainder coming from the other renewable technologies. These projects are spread around the MENA countries and Turkey. Five to ten projects are to be realized by 2010, five to ten feasibility studies, and approximately ten national calls for tender.

Mr. Lorec noted that the enhancement of transmission lines was also extremely important. Such lines would be needed to transfer power from the new renewable power plants to load centers. He also noted that additional work would be required to mobilize the financing needed.

Session 3 - Private Sector Role in CSP Scale-up

Chair: Mr. Abdelkader Allaoua – International Finance Corporation (IFC)

Mr. Allaoua stated that IFC was very positive towards solar energy, which had great potential to scale-up. All types of financing would be needed: concessional funding, private sector, commercial debt and equity. He raised several questions that he hoped to see addressed in the session:

- What are the costs?
- What are the required pre-conditions?
- How much off-take is required from the European countries?
- What is the role of commercial banks?
- Where is the equity going to come from?

Mr. Michael Geyer - Director, International Business Development, Abengoa Solar S.A., and Vice President, ESTELA

Mr. Geyer stated that there is sufficient operating history with CSP plants for this technology to be considered mature and financeable. There is no longer a need for “demonstration” plants. The costs for CSP-generated electricity are reduced by siting where there is large insolation and availability of land.

It is important to address the regulatory conditions within the European Union countries that limit the size and operating hours of certain plants receiving feed-in tariffs. It is important to allow renewable energy to cross intra-European borders, as well as borders between MENA and EU countries. An investment framework must be developed to allow for such transfers.

A sufficiently large domestic market will lead to manufacturers siting substantial portions of their activities in those countries. Money will be needed to scale-up next generation technologies from demonstration to commercial size.

Mr. Peter Gutman - Global Head for Renewable Energy, Standard Chartered Bank

Mr. Gutman began by describing Standard Chartered Bank as a financial institution with a focus on Asia, the Middle East and Africa. He said the major problem in securing investments for the type of projects under consideration is not obtaining new equity, but getting sufficient debt to provide the necessary leverage. He described the four different technology types for CSP – trough, linear Fresnel, tower and Sterling dish – and described the strengths and weaknesses of each one. He closed by providing an overview of the activities by industrial players in the solar industry.

Mr. Boukhalfa Yaïci - General Manager, Cevital Energies Renouvelables – Desertec Industry Initiative (DII)

Mr. Yaïci began by describing Cevital as a major Algerian industrial company with \$2 billion in revenues in 2008 and 7,400 employees. He stated the MENA region had deserts with tremendous amounts of solar energy.

He described the DII as a Club of Rome-based initiative. The goal was to provide EU and MENA with substantial renewable energy by 2025. In the next three years, it plans to:

- 1) Promote the creation of a favorable regulatory environment
- 2) Promote the creation of a roll-out plan to realize its ambitions on renewable energy capacity installation
- 3) Proposal of concrete “reference projects”
- 4) Additional, or more detailed studies, where needed.

An important issue for DESERTEC is to “build bridges” between the EU and MENA countries.

Mr. Daniel Calderon - Investment Manager, MASDAR

Mr. Calderon stated that MASDAR considers CSP as one of the growth industries. MASDAR has “put to work” over \$1.4 billion in three CSP opportunities over the last 12 months. Furthermore, MASDAR has created a partnership to create Torresol Energy to develop, finance, own and operate CSP plants.

Three CSP plants have been financed and have signed EPC contracts – two use trough technology and include storage, and one is based on tower technology.

Mr. Calderon pointed out that, when assessing CSP projects, the focus should be on \$/MWh rather than on \$/MW. He explained the financing structure for these plants to be:

- Project finance: 75-80%
- Grants: 5-10%
- Mezzanine debt: 10-15%
- Equity: ~ 15%

Ms. Magali Gontier - Lead Technology Officer Solar Energy of Tractebel Engineering, GDF-Suez

Ms. Gontier stated that renewable energy constitutes 20% of his company's revenues. They also have a strong presence in the MENA region. He noted the strong potential for CSP but also the barriers. To realize the CSP scale-up initiative, she underlined the following barriers:

- Interconnections with the EU countries as well as supporting regulatory environment(s)
- Ensuring the adequate support of local governments, especially towards the creation of public-private partnerships (PPPs)

Mr. David Gonzalez - Engineer, Energy and Transport Directorate, European Investment Bank (EIB)

Mr. Gonzalez stated that the EIB was the first international institution to finance CSP, currently making up 10% of their renewable energy portfolio. He pointed out the following barriers to CSP scale-up:

- 1) High costs
- 2) Grid constraints within the region and between MENA and the EU countries

Furthermore, he underlined the difficulties of transferring technology and, in the process, developing local industry and creating employment. He added that, for CSP, there are high-technology and low-technology components and suggested that each MENA country assesses their capacities to develop these different components.

Country Panel 1 – Algeria, Morocco, Tunisia

Chair: Ms. Hela Chekhrouhou, Manager, African Development Bank (AfDB)

Algeria - Mr Hamouda Rachid - Directeur de l'Elect., du Gaz et des ENR (DGE/MEM)

Mr. Rachid explained that the energy objectives for Algeria included reaching a 5% share for renewable energy in the electricity sector by 2017 (or 750 MW of capacity), and a 20% renewable share by 2030. The renewable energy capacity in 2030 would be made up of CSP (70%), PV (20%), and wind (10%).

The government is in the process of establishing laws, funds and institutions to support the development of renewables. In a tendering process, bidders must be 51% Algerian-owned

(public or private sector), and must include a local engineering/manufacturing concern. The government intends these projects to facilitate technology transfer to Algeria. Launched in 2002, New Energy Algeria (NEAL) SPA develops renewable projects in the country. NEAL is fully owned by state-owned energy companies.

Three CSP projects are currently in different stages of development:

1. **Project 1:** The Hassi R'mel plant is a 150 MW Integrated Solar Combined-Cycle (ISCC) plant with 125 MW being fired by natural gas, and 25 MW being fired by CSP. It is expected to generate 1,250 GWh per year. Capital expenditure is slated for € 315 million, construction time will be 33 months and commercial operation is scheduled for August 2010.
2. **Project 2:** This project will be a 400-MW ISCC, of which 70 MW will be provided by CSP. It will be located in Meghair, in south-eastern Algeria. There is an option to expand the scope of this plant to make it a 480-MW facility, of which 80 MW would come from solar, and include water desalination. 280 hectares of land are available for a 33-year concession, and water availability has been identified at Oued Righ. Total costs are currently estimated at US\$ 1 billion.
3. **Project 3:** This project will be an ISCC with 400-MW of total capacity, of which 70 MW will come from solar fields. It will utilize parabolic trough technology and is scheduled for commercial operation in 2015.

Morocco – Mr. Abdelhaquim El Moussaoui - Office National de l'Electricité (ONE)

Mr. El Moussaoui outlined Morocco's ambitious plans for renewable energy expansion in the medium and long term. He said the country was targeting a 20% renewable energy share in the power sector by 2012, including 1,550 MW of wind power. A number of important laws, regulations and institutions are being put in place to help achieve these objectives. The country has excellent insolation for CSP.

There are three major projects under development. All projects will be structured as Independent Power Producers (IPPs) with project sponsor being selected through competitive tendering.

1. **Ouarzazate:** This is a pure CSP 100-MW plant. It will use trough technology and there currently are no plans to include storage capacity. The selected site is ten km from a city of 100,000 inhabitants, with excellent access to transmission lines (225 kV) at a distance of four km. It is also located three km from a dam which provides good, year-round availability for fresh water. Insolation has been measured at greater than 2,400 kWh/m² per year.
2. **Ain Beni Mathar:** This a pure CSP 125-MW plant. The site is located 80 km south of the city of Oujda. Insolation has been measured at 2,290 kWh/m² per year. It will use parabolic trough technology. The site will be contiguous to an existing ISCC system. Most of the feasibility work in terms of power evacuation, water availability, and suitability of the terrain has already been completed.

3. **Tan Tan:** This plant will use CSP technology to both generate electricity and produce fresh water through reverse osmosis. Power generation capacity will be between 15 and 50 MW. It will also include storage for power generation. Insolation rates are around 2,000 kWh/m² per year.

Tunisia - Mr. Benaissa Ayadi, Director General - Agence Nationale pour la Maîtrise de l'Énergie (ANME)

Mr. Ayadi began by describing Tunisia's projects to support renewable energy, particularly wind and solar hot water heaters. On February 9 2009, the government passed a law for the rational use of energy. It allowed for the autogeneration of power from renewable energy sources, and the possibility to sell up to 30% of power generated from such facilities to the national power utility, STEG.

Mr. Ayadi described the three suggested CSP projects:

1. **Project 1:** This project will either be a pure 25-MW CSP project, or a 150-MW Integrated Solar Combined-Cycle (ISCC) plant with 125 MW generated from natural gas, and 25-MW generated from CSP. Production from this plant is intended to serve the Tunisian electricity market. Capital cost – based on the pure CSP option – is estimated at \$85 million. A call for tenders is expected by June 2010, selection of winning bidder by October 2010 with operations starting by 2012.

2. **Project 2:** This project will be a private CSP plant with a capacity of 100 MW using parabolic trough technology. Production from this plant will largely be directed towards exports. Pre-feasibility studies have identified five sites. Estimated costs are around €320 million. A call for tenders is scheduled in the beginning of 2011, with work beginning in 2012-2013. Operations would begin in 2015-2016, coinciding with the commissioning of the transmission line to Italy.

3. **Project 3:** This project will be closely linked with the ELMED interconnection between Italy and Tunisia. The total capacity will be 1,000 MW, of which 200 MW will be reserved for renewable energy. Generation to serve this transmission line will come from a plant (or plants) developed by a selected private company. It is expected that at least 100 MW of this production be composed of a CSP plant. The 100-MW plant is expected to have a cost of 320 million euros.

Tunisia (Private Sector) – Dr. Till Stenzel - Nur Energie Ltd¹

Dr. Stenzel explained that Nur Energie is a solar energy development company. It targets the Mediterranean region and among other opportunities, it is pursuing projects in Greece. It promotes tower CSP technology and currently has a pilot plant operating in Israel.

¹ This presentation is not part of the Tunisia country presentation and does not constitute an endorsement by Tunisian authorities. The purpose of this presentation is to showcase a project in Tunisia.

Nur Energie is currently exploring a sub-sea power interconnection between Tunisia and the Italian mainland. This sub-sea line is complementary to the one being developed in the framework of the ELMED project. A transmission line landing on the Italian mainland would avoid domestic grid bottle-necks in Southern Italy.

Furthermore, Nur Energie is exploring the possible development of a CSP plant in the south of the country. It is working in particular with local companies to assess the potential economic benefits of the project on the local industry.

Country Panel 2 – Egypt, Jordan, Libya

Chair: Mr. Jonathan Walters, Sector Manager, World Bank

Egypt – Mr. Khalid El-Fakry, Director, New and Renewable Energy Agency (NREA)

Mr. El-Fakry started by laying out the Egyptian energy sector policy, which focuses on the diversification of energy resources, improvements in energy efficiency, and energy conservation programs. He then showed how the Egyptian government was hoping to maximise the share of Renewable Energy (RE) in the energy mix in order to save fossil fuels for export and for future generations. Mr. El-Fakry further explained the Egyptian government willingness to export clean energy (wind, solar) to Europe, trade CERs, enhance local industrial capacity vis-à-vis RE, and create national and regional market for RE equipment, as well as jobs. Targets in this respect include to satisfy 20% of the generated electricity by REs by 2020, including 12% from wind energy, i.e., more than 7200 MW, and 8% from hydro, solar and others. The RE generation capacity so far installed consists mostly of wind, as well as of one CSP project.

After highlighting the generally positive conditions for CSP in Egypt (high DNI, large amounts of uninhabited flat desert), Mr El-Fakry also shed light on some of the challenges for CSP development, including high investment cost compared with wind energy, and lack of relevant R&D activities. He then proceeded to present the two current Egyptian CSP project proposals, Kom Ombo (70 MW; LEC 11.3 \$ Cent/kWh) and Marsa Alam (30 MW, LEC 9.2 \$ Cent/Kwh), both of which are parabolic trough-based installations that will be commissioned over the next 4-5 years, and are expected to be both about 2/3 donor-financed.

Jordan – Mr. Walid Shain, President, National Renewable Energy Research Center (NREC)

Mr. Shain emphasized the current focus on fossil fuels in Jordan, as well as the dependence on imports and the 7% annual demand growth since 2004. Hence, the Jordanian Government had made a commitment to increase the share of renewables in the energy mix to 10% by 2020, mostly from wind and CSP, while adapting the electricity network to the challenges of the fluctuating input from renewables. To this end, tax and customs exemptions were granted to renewable energies (RE) and energy efficiency (EE); and a dedicated agency for financial and technical support as well as relevant legislation is being created.

Mr. Shain also highlighted the potential for CSP in Jordan, with daily average solar radiation of 5 -7 Kwh/m². After an initial focus on solar heaters and PV, there is now increasing interest in commercially viable grid-connected solar projects, with international cooperation.

After an initial CSP project was launched in cooperation with the EU (5 MW), a large private CSP project is now planned with a likely size of approx. 100 MW in Ma'an. The technology choice remains open. The project will first provide electricity for the local market, then for export when market conditions allow it. Cost will likely be around US\$ 400 million, with LEC in an acceptable range (only slightly above conventional generation cost). Tendering will take place as competitive bids, in line with international benchmarks. The need for concessional financing will likely be in the range of 50% (half CTF) of total cost; equity will provide another 20 – 25%, with the rest coming from commercial debt. Preparatory activities will start in January 2010, with the project being expected to be finished by October 2013.

Jordan II – Mr. Khaled Al-Walidi, Jordanian National Electric Power Company

In a separate presentation, Mr. Al-Walidi focused on transmission infrastructure projects in Jordan, notably the reinforcement of the Jordanian 400 kV corridor to accommodate renewable energy projects and to prepare for power exports (including to the EU). Budget and schedule were presented for these considerable extension plans. Mr Al-Walidi stressed, in this context, Jordan's important geographical location between south MENA with its energy potential, and north MENA with its high demand. The implementation schedule for this project is: tendering process and awarding starting in 2010; manufacture in 2011/12; and complete erection works and commissioning in 2012/13. The total cost is estimated at around US\$ 110 million, of which 45% are to be funded from the CTF; 45% from multilateral concessional funds; and 10% from Jordan.

Jordan (Private Sector) – Mr. Samer Zureikat, MENA Cleantech AG²

Mr. Zureikat started his presentation by pointing out that CSP will not reduce the carbon footprint of MENA dramatically – because the region's carbon footprint is currently small. In a similar vein, Mr. Zureikat considered that security of future energy supplies is not the key driver for CSP scale-up in MENA, as this issue ought not to be a great concern for MENA countries either. Instead, the main reason to scale-up CSP in MENA, according to Mr Zureikat, is water, because population growth stresses the already meager water resources in the region. Indeed, Mr Zureikat argued that MENA water supply systems are very energy-dependent, with 10% of total primary energy in various countries being used for water desalination.

Libya – Dr. Mohamed Ali Ecklat, Manager, Renewable Energy Authority (REAOL)

Dr. Ecklat introduced Libya's energy policy objectives and emphasized that Libya's goal is to maximize crude oil (and natural gas) exports, which could be a driver for scaling-up renewables. Dr. Ecklat mentioned that a new law on liberalization of energy markets, including renewable energies and CSP, is under discussion. A feed-in tariff for the development of

² This presentation is not part of the Jordan country presentation and does not constitute an endorsement by Jordanian authorities. The purpose of this presentation is to showcase a project in Jordan.

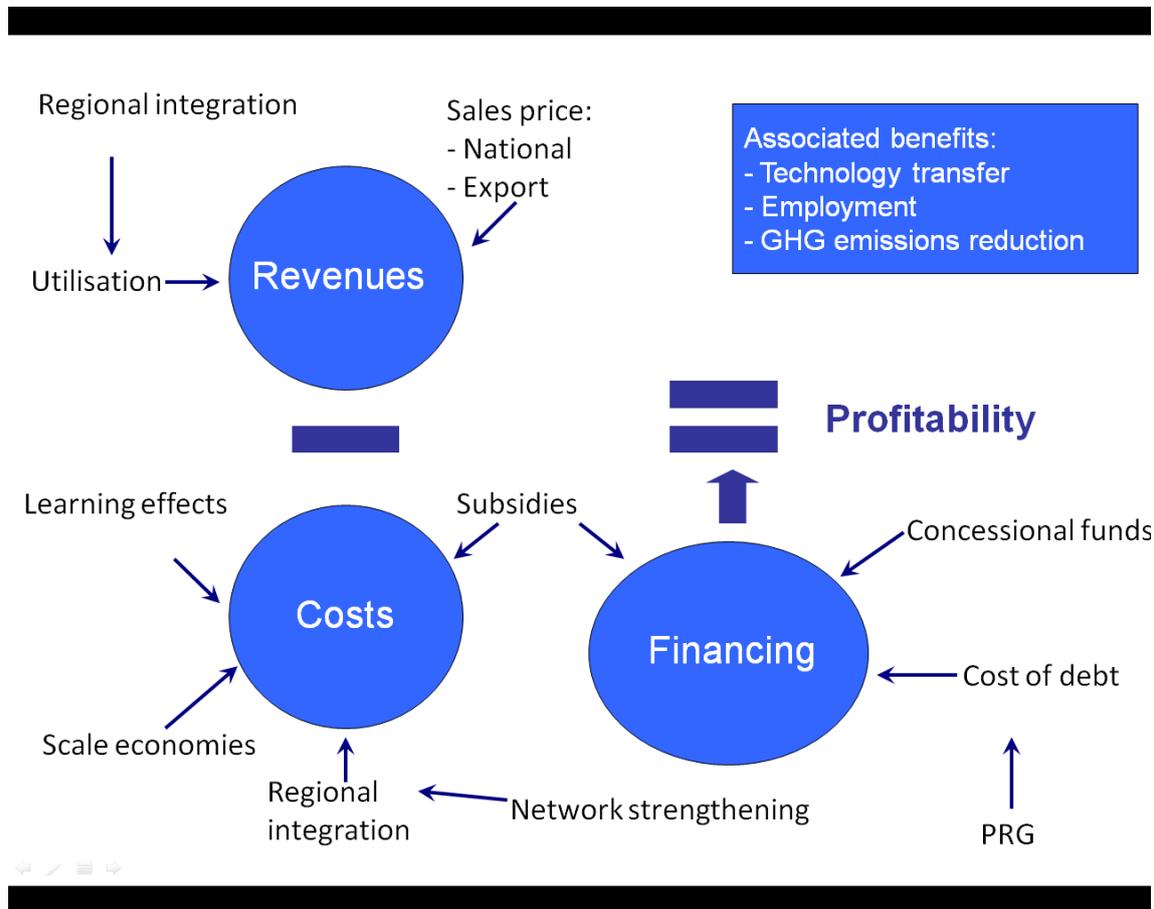
renewable energies is also under preparation. Moreover, Dr. Ecklat informed that wind, PV, and CSP are expected to contribute up to 10% of the electricity supply by 2020.

Dr. Ecklat also pointed out that a feasibility study for the construction of a 100 MW CSP plant is currently being prepared together with Abengoa, taking into account five candidate sites. The study is expected to be finished by end 2009, and a tender will be issued beginning 2010.

Summary of Day 1 discussions

Ms. Silvia Pariente-David, Sr. Energy Specialist, World Bank

Ms. Silvia Pariente-David summarized Day 1 sessions and concluded with a summary slide that illustrated which factors would influence the planned revenues as well as the costs in the CSP scale-up initiative, leading to profitability and a range of associated benefits.



Session 4 – The South African experience in CSP R&D

Mr. Kadri (Kevin) Nassiep, SANERI, South Africa

Mr. Nassiep started his presentation by outlining how the South African National Energy Research Institute (SANERI) assists the Department of Energy to achieve strategic energy objectives, notably supply diversification and supporting emerging technologies (e.g. through developing, demonstrating and preparing bankable projects), human capital, and energy R&D. SANERI may even take equity in particular projects.

In SANERI's activities, there is a considerable focus on CSP. One of the reasons is that South Africa has, in the Northern Cape, one of the best insolation sites in the world (with overall five out of the nine provinces of South Africa having an annual average DNI higher than 7.0 kWh/m²/d). Another reason for such attention to CSP is that other renewable energy technologies do not provide the same level of energy storage, and are hence unable to provide baseload power. Furthermore, manufacturing opportunities in CSP are sizeable and consistent with South African skills, and the green job potential from CSP is significant.

After a few words about the regulatory framework (focusing on the South African feed-in tariff system with an initial tariff of \$0.28/kWh), Mr. Nassiep provided details on current research areas on CSP. Finally, Mr. Nassiep pointed out that the cost increase of CSP will be made acceptable to the South African population through energy efficiency measures and by reference to the large financial shortfall given expansion needs. Mr. Nassiep also noted that SANERI has focused in tower technology so far.

Session 5 - Policy and Regulatory aspects of CSP Scale-up in MENA

Chair: Ms. Jamila Matar, Director, League of Arab States (LAS)

Ms. Matar introduced the session by stating that the success of the CSP scale-up initiative will depend on the evolution of enabling policy and regulatory environments in MENA countries to allow for effective penetration of CSP into local energy markets; and on relevant frameworks in Europe that would clear the path for CSP-generated power from MENA to Europe, thus allowing the EU to reach its renewable energy targets more cost effectively.

Mr. Sigurd Schmidt, DG Energy and Transport (DG TREN), European Commission

Mr Sigurd Schmidt started by explaining DG TREN's key policy and regulatory aspects for renewable, namely competitiveness, security of supply, and sustainable development. He then detailed the 'Directive on the promotion of the use of Energy from Renewable Sources' (RES Directive) recently adopted, which sets mandatory national targets for RE-shares, and national action plans for RE-shares in transport, electricity, heating and cooling.

Mr Schmidt continued by giving an overview of the current RE potential in Europe by country, and by shedding light on the priorities for an Energy Policy in the Mediterranean.

Mr. Mario Ragvitz, Fraunhofer Institute, Germany

Mr. Ragvitz focused his presentation on the policy framework in Europe and expected power import demand; and the different policy options to finance the gap with conventional power prices.

Mr. Ragvitz pointed out that the financing gap between CSP and conventional power is around US\$ 5-15 cent/kWh – depending on loan type, time of construction and conventional power price. He posited that sources for financing of this gap are: international donors, national support measures in MENA countries, and the Art. 9 of the new EU RES Directive, for which the level of financing available depends on the marginal price for flexible mechanisms to be established in the EU (which in turn also depends on alternative import options from non-EU countries). All of these sources would have to be combined to finance the overall gap.

The main policy development at EU level, according to Mr Ragvitz, is the EU Renewable Energy Directive, which sets a global EU target of 20% renewable energy in final energy consumption by 2020.

Donors Panel on Financing for CSP in MENA

Chair: Mr. Laszlo Lovei, Director, World Bank; Mr. Yogesh Vyas, AfDB

In this session, the co-chairs invited the representatives of donor organizations to express their views on the MENA CSP Scale-up program, focusing on its scope and the range of concessional financing needed. Donors largely supported the initiative. In particular, AFD, KfW/BMZ, and EIB expressed their willingness to work closely with the World Bank and AfDB to co-finance CSP projects in the region.

Japan International Cooperation Agency (JICA) – Tunis Office

JICA is co-financing one CSP project in Egypt, but most of the portfolio is composed of PV projects. The terms of JICA's concessional loans are: 0.3% interest rate, 40 years maturity, and 10 years of grace period.

Agence Française de Développement (AFD)

AFD is active in all renewable energies, including CPV and wind. To finance these technologies with AFD's loans, the host country is required to submit a program. AFD is currently working with EIB and KfW to confirm a new 5\$ billion fund for renewable energy projects. The fund will also be available for CSP projects in 2010.

European Investment Bank (EIB)

EIB strongly welcomes the World Bank/AfDB initiative, which will complement EIB's existing efforts. EIB stresses the fact that international donors need to work together, in mutual reliance, for this initiative to be successful. Partner countries, i.e. MENA countries hosting projects, must not deal with cumbersome International Financial Institutions (IFI)' bureaucracies once the first projects will be financed. Instead, IFI's need a very close coordination to ensure that real projects see the light soon.

Kreditanstalt für Wiederaufbau (KfW) / Bundesministerium Für Wirtschaftliche Zusammenarbeit (BMZ)

KfW expresses its support to the World Bank/AfDB initiative and to the CTF Trust Fund Committee approval of the \$750-million investment plan. KfW provides commercial financing and is already financing CSP projects in Spain and the USA. Similarly to the previous EIB representative, KfW notes that focusing on smooth "processes" among stakeholders is as important as focusing on the "projects" themselves. It is important that IFIs succeed in integrating CSP projects in local business plans.

BMZ announces that it is currently financing three feasibility studies on CSP, which are still in preparation. BMZ suggests not to restrict the MENA CTF Investment Plan to only one technology, i.e. CSP, and strongly encourages other donors to work together with the World Bank, AfDB, and MENA country partners to finance CSP projects.

Islamic Development Bank (IsDB)

Renewable energy, and solar in particular, is the future. Euro-Mediterranean partnership can be the best winner of this solar scale-up initiative. IsDB suggests to create a forum of users and providers to optimize the use of infrastructure, i.e. we do not want many submarine cables in the Mediterranean.

IsDB operates in Africa, Asia, and MENA and lends around \$3 billion per year in projects, one third of which in energy. Renewables are not very present in the current portfolio, but IsDB is very much interested in financing renewable energy projects. However, most of the financing available is non-concessional.

Japan Bank for International Cooperation (JBIC)

JBIC's main goal is to improve the industrial competitiveness of Japanese companies. JBIC has supported IPP projects in MENA, including Tunisia. JBIC does not finance projects unless there are Japanese companies involved. Japanese companies can provide components to renewable energy projects.

Saudi Fund for Development (SFD)

SFD has recently launched a \$500-million initiative to finance renewable energy projects. SFD is interested in financing energy projects in the region, including CSP.

Spanish Ministry of Industry, Tourism, and Trade (MITYC)

MITYC offers technical assistance and financing, mainly tied loans, to projects in the MENA region. MITYC can not commit financially to the MENA CSP Scale-up initiative yet because the Ministry works on a project by project basis. However, MITYC looks forward to receiving proposals for generation or transmission projects from the MENA CSP Scale-up initiative. The Ministry has already given concessional loans to CSP projects in the region, e.g. €100 million to Ain Beni Mattar project in Morocco.

Annex 1 – Workshop Agenda

MENA Regional Concentrated Solar Power Scale-Up Program

CTF Investment Plan Preparatory Meeting
October 21-22 2009 Sheraton Hotel, Tunis, Tunisia

AGENDA

Wednesday, October 21

Registration of Participants³ 8:15

Morning session Day 1 – 2nd CSP scale-up Workshop in MENA

Master of Ceremonies: Mr. Yogesh Vyas, AfDB

Welcome Remarks

Mr. Gilbert Mbeshherubusa, Director, AfDB 9:00

Mr. Abdellaziz Rassaa, Secretary of State, Ministry of Industry, Energy & SMEs, Tunisia 9:10

Mr. Laszlo Lovei, Director, World Bank 9:20

Investment Plan Update 9:30

Mr. Jonathan Walters, Sector Manager, World Bank – Overview

Ms. Hela Cheikhrouhou, Manager, AfDB – Private sector role

Update on the Mediterranean Solar Plan (MSP/Union for Mediterranean -UPM) 10:20

Mr. Philippe Lorec, Conseiller du Directeur General de l’Energie et du Climat, (Plan Solaire Méditerranéen – UPM)

Coffee Break 10:35

Private Sector Role in CSP Scale-up 10:45

This panel will address the issue of MENA CSP market with perspectives from developers, financiers and manufacturers. The panel will focus on the solutions that the private sector can

³ Registration at the Lobby of Sheraton Hotel, Tunis.

bring for the scaling-up of CSP in the region. In particular, guest speakers will share the legal, technical, implementation, and financial issues that they face and the possible solutions countries and donors could bring.

Chair: Mr. Abdelkader Allaoua, IFC

Mr. Michael Geyer, Director, International Business Development, Abengoa Solar S.A., and Vice President, ESTELA

Mr. Peter Gutman, Global Head for Renewable Energy, Standard Chartered Bank

Mr. Boukhalfa Yaïci, General Manager, Cevital Energies Renouvelables -Desertec Industry Initiative

Mr. Daniel Calderon, Investment Manager, MASDAR

Ms. Magali Gontier, Lead Technology Officer Solar Energy of Tractebel Engineering , GDF-Suez

Discussant: Mr. David Gonzalez, Engineer, Energy and Transport Directorate, European Investment Bank

Questions and Answers 11:45

Lunch 12:15

Afternoon session Day 1 – 2nd CSP scale-up Workshop in MENA

Country Panel 1 1:30

In this panel, countries will present proposed CSP projects (including transmission investments if required) with expected implementation approach (IPP, PPP or public), required financing plans, and project development schedule.

Chair: Ms. Hela Cheikhrouhou, Manager, AfDB

Algeria - Mr Hamouda Rachid, Directeur de l'Elect, du Gaz et des ENR (DGE/MEM)

Morocco – Mr. Abdelhaquim El Moussaoui, ONE

Tunisia - Mr. Benaïssa Ayadi, Director General, ANME

Tunisia (Pvt. Sector) – Dr. Till Stenzel, Nur Energie Ltd

Discussants: Mr. Kurt Hildebrand, Division Chief, KfW, Ms. Rima Le Cogic, Energy Project Manager, AFD 2:30

Questions and Answers 3:00

Coffee Break 3:30

Country Panel 2 3:45

In this panel, countries will present proposed CSP projects (including transmission investments if required) with expected implementation approach (IPP, PPP or public), required financing plans, and project development schedule.

Chair: *Mr. Jonathan Walters, Sector Manager, World Bank*

Egypt- Mr. Khalid El-Fakry, Director, New and Renewable Energy Agency (NREA)

Jordan-Walid Shain, President, National Renewable Energy Research Center (NREC)

Jordan (Pvt. Sector)-Mr. Samer Zureikat, MENA Cleantech AG

Libya – Dr. Mohamed Ali Eklat Manager of Planning Dept. Renewable Energy Authority of Libya

Discussant: *Mr. Salah Mansour, Officer-in Charge, Country Operations, IsDB* 4:45

Questions and Answers 5:15

Summary of Day 1 discussions 5:30

Ms. Silvia Pariente-David, Sr. Energy Specialist, World Bank

Reception Dinner 7:30

Thursday, October 22

Morning session Day 2

Learning from other countries – The South African experience in CSP research and Development 8:30

Kadri (Kevin) Nassiep, SANERI, South Africa

Policy and Regulatory aspects of CSP Scale-Up in MENA 9:00

Introduction of Sustainable energy is a precondition for stable growth, social development and climate change mitigation. The EU has unanimously agreed on a directive that will ensure 20 percent renewable energy in the union in 2020. The directive could provide an incentive for developing the renewable energy potential in Southern Mediterranean and exporting it to Europe. But development of renewable energy markets in MENA will also depend on the evolution of enabling policy and regulatory environments locally to facilitate increased penetration of renewable energy in countries. This panel will address the opportunities and constraints related to opening export markets for power from CSP plants in the Southern Mediterranean.

Chair: Ms. Jamila Matar, Director of Energy Department, League of Arab States (LAS)

Presentation Mr. Sigurd Schmidt, DG Energy and Transport, European Commission

Presentation Mr. Mario Ragwitz, Fraunhofer Institute and World Bank Consultant

Discussants: Mr. Philippe Lorec, Conseiller du Directeur General de l'Energie et du Climat,
(Plan Solaire Méditerranéen – UPM) 9:40

Coffee Break 10:30

Donors Panel on Financing for CSP in MENA 10:45-12:30

In this session donors will consider and agree on (a) the overall size and scope of the proposed program; (b) total financing and the range of concessional financing needed; (c) a resource mobilization process through Spring 2010 agreeing to work as development partners.

Chair: Mr. Laszlo Lovei, Director, World Bank, and Mr. Yogesh Vyas, AfDB

AFD/French Ministry for Ecology, Energy, and Sustainable Development

European Investment Bank

Islamic Development Bank

JBIC

JICA

KfW/German Development Ministry

Kuwait Fund

Saudi Fund for Development

Spanish Ministry of Industry, Tourism, and Trade

Closing Remarks 12:30

Ms. Hela Cheikhrouhou, AfDB

Lunch 12:35

Annex 2 – Participant List

Name	Company/Institution	Country
Mr. Messai Habib	ABB	Tunisia
Mr. Michael Geyer	ABENGOA Solar	Spain
Mr. Jose L.Sanchez Villar	Acciona Energia	Spain
Mr. Jose Nebrera	ACS-Cobra	Spain
Mr. Slim Babbou	ADS	Tunisia
Mr. Christian de Gromard	AFD	France
Ms. Rima Le Coguic	AFD	France
Mr. Yves des Rieux	AFD	France
Mr. Hayee	AFD	Tunisia
Mr. Le Ravallec	AFD	Tunisia
Mr. Ben Naceur	AFD	Tunisia
Mr. A.T Diallo	AFDB	Tunisia
Mr. Amadou Zakou	AFDB	Tunisia
Ms. Hela Cheikhrouhou	AFDB	Tunisia
Mr. Roger Gaillard	AFDB	Tunisia
Mr. Thiam Nogoye	AFDB	Tunisia
Ms. Sihem Mohamed	AFDB	Tunisia
Mr. Zeleke Eskander	AFDB	Tunisia
Mr. Derrahi Abdelaziz	AFDB	Tunisia
Mr. Richard Claudet	AFDB	UK
Mr. Chahbani Hatem	AFDB	Tunisia
Mr. Wilfreid Mandlebe	AFDB	Tunisia
Mr. Boaz Nimpe	AFDB	Tunisia
Mr. Thiam Negog	AFDB	Senegal
Mr. Uzoamaka Nwamah	AFDB	Nigeria
Mr. Youssef Arfaoui	AFDB	Tunisia
Ms. Subha Nagaragan	AFDB	Tunisia
Mr. Sebastian Veit	AFDB	Tunisia

Mr. Al-Hamndou Dorsoum	AFDB	Tunisia
Mr. Herve-Marie Cariou	AFDB	Morocco
Mr. Haykel Tlili	Africa Manager	Tunisia
Mr. Skander Gzara	AHK	Tunisia
Ms. Anne Cecile Barbier	Alston Power	France
Mr. Skander Bouchlaghem	Alston Power	Tunisia
Mr. Cherni Ezzeddine	Ambassade du Canada	Tunisia
Mr. Benaissa Ayadi	ANME	Tunisia
Mr. Imed Thabet	ANME	Tunisia
Mr. Amor Ounalli	ANME	Tunisia
Mr. Nafii Baccar	ANME	Tunisia
Mr. Nejib Osman	ANME	Tunisia
Mr. Othman Zaheg	ATB	Tunisia
Ms. Katharina Hofer	BMZ	Germany
Mr. Patrick François	BrightSource Energy	USA
Mr. Philippe Meunier	Caisse des Dépôts	France
Mr. Peter Stulkov	Canadian Embassy	Tunisia
Mr. Mohamed Berdai	CDER	Morocco
Mr. Boukhalifa Yaici	Cevital Energies Renouvelables - Desertec II	Algeria
Mr. A. Charani	CNIM	France
Mr. Walid Belhadj Amor	Comete Eng.	Tunisia
Mr. Nasser Slah Eddine	Consultant	Tunisia
Mr. Mazhoud Mehdi	Consultant	Tunisia
Ms. Amel Makhlouf	Consultant	Tunisia
Mr. Ahmed Oumtili	Consultant	Tunisia
Ms. Dalila Ramla	CREG	Algeria
Mr. Achour Tahar	CSNER	Tunisia
Mr. Ahmed Gzara	CTAIC	Tunisia
Ms. Marine Sabounji	Delegation European Comission Tunisia	France/Tunisia
Mr. Kanoun Faiza	DGTPE	France

Ms. Reham El Mohsen	Egyptian Commercial Office	Egypt
Mr. Nouri Fethi	ESCT	Tunisia
Mr. Sigurd Schmidt	European Commission - DG	Brussels
Mr. David Gonzalez Garcia	TREN	
Mr. Robert Feige	European Investment Bank	Luxembourg
Mr. Ioannis Kalisas	European Investment Bank	Tunisia Office
Mr. Mario Ragwitz	European Investment Bank	Luxembourg
Mr. Christoph Kost	Fraunhofer ISI	Germany
Ms. Magali Gontier	Fraunhofer ISI	Germany
Mr. Chiboub Belhassen	GDF Suez	France
Mr. Albrecht Kaupp	GIPP/MIEPME	Tunisia
Mr. Marzouki Hassen	GTZ	Egypt
Mr. Majaji Abrari	ICE-Innovation	Tunisia
Mr. Ahmed Besbess	IM Bank	Tunisia
Mr. Salah Mansour	IM Bank	Tunisia
Ms. Maria Llagumo	Islamic Development Bank	Saudi Arabia
Mr. Hironami Kagami	Isolux Corsan	Spain
Mr Ken Shimamoto	JBIC	Japan
Mr. Fumino Suzuki	JBIC	Japan
Mr. Asahiko Karashima	JBIC	Japan
Ms. Houda Chedly	JICA	Japan
Mr. G. Ragagnin	Journal Eleine	Tunisia
Mr Wolf Muth	JVR Loveston	Switzerland
Mr. Wolf Muth	KFW	Germany
Ms. Jamila Matar	KFW	Germany
Mr. Nader Hajj Shehadeh	League of Arab States	Egypt
Mr. Daniel Calderon	Lebanese Center Energy	Lebanon
Ms. Neila Ben khalifa	Conservation	UAE
Ms. Yosr Mehdi	MASDAR	Tunisia
Mr. Rachid Hamouda	MDCI	Tunisia
	MDIC	Algeria
	MEM	

Mr. Ziad Sabra	MEMR	Jordan
Mr. Samer Zureikat	MENA Cleantech AG	Germany
Mr. Chedli Landoulsi	MFT	Tunisia
Mr. Khalfallah Abdelhamid	MIE PME	Tunisia
Mr. Bertrand Marchais	MIGA/World Bank	France
Mr. Alain Correia	Ministère de l'Energie et du Développement durable	France
Mr. Zenir Youcef	Ministère de l'Environnement	Algeria
Mr. Kortas Jalel	Ministère de l'Industrie	Tunisia
Mr. Abdeladhim Guerrouj	Ministère des Finances	Morocco
Mr. Cyril Rousseau	Ministère des Finances	France
Mr. Atik Gerrof	Ministère des Finances	Algeria
Mr. Slim Lasta	Ministère du Developpment et Coopération Internationale	Tunisia
Ms. Vanesa Alvarez	Ministry of Economy and Finance	Spain
Ms. Loreto Taborga	Ministry of Industry, Tourism and Trade	Spain
Mr. Mohammed Hammam	Ministry of International Cooperation	Egypt
Mr. Miral Selim	Ministry of International Cooperation	Egypt
Mr. Mahmoud Thalji Quatarnah	MOPIC	Jordan
Mr. Alan Khalil	NEPCO	Jordan
Mr. Ali Sokhal	New Energy Ageria (NEAL)	Algeria
Ms. Laila Georgy	NREA	Egypt
Mr. Khalid El-Fakry	NREA	Egypt
Mr. Walid Shain	NREC	Jordan
Ms. Emma Haight	NUR Energy	UK
Mr. Till Stenzel	NUR Energy	UK
Mr. Abdelhaquim El Moussaoui	ONE	Morocco
Mr. Omar El Euch	One Tech Group	Tunisia
Ms. Abir Matmti	PWC	Tunisia
Mr. Dan Rorabaugh	QGEN	USA

Mr. Erik Mellen	QGEN	USA
Mr. Walid Bessrou	QGEN	USA/Tunisia
Mr. Mohamed Ali Ekhlal	Renewable Energy Authority (REAOL)	Libya
Mr. Kadri Nassiep	SANERI	South Africa
Mr. Ibrahim Alsughair	Saudi Fund for Development (SFD)	Saudi Arabia
Mr. Bandar Almotawa	Saudi Fund for Development (SFD)	Saudi Arabia
Mr. Anthony Stkes	SMBC	UK
Ms. Lorena Ciciriello	SMBC	UK
Mr. Nabil Naessany	SMBC	France
Mr. Sven Dervedde	Solar Millennium	Germany
Mr. Olivier Vignot	Solar Trade Solution	France
Mr. Wernev	Solarwerte	Germany
Mr. Suhotdil	Solarwerte	Germany
Mr. Smail Moussi	SONELGAZ	Algeria
Mr. Jean Minarro	Spanish Embassy	Spain/Tunisia
Ms. Lucrecia Rivera	Spanish Embassy	Spain/Tunisia
Mr. Peter Gutman	Standard Chartered Bank	UK
Ms. Esghir Mouna	TAP	Tunisia
Ms. Sana Morgène	Tech-Sol	Tunisia
Mr. Ayoub Hanzouli	Tech-Sol	Tunisia
Mr. Mourad Kaabi	TESCO	Tunisia
Mr. Trevor Nash	Tessera Solar International	UK
Mr. Dermot Liddy	Tessera Solar International	UK
Mr. Joe Cashion	Tessera Solar International	UK
Mr. Jean Philippe Larramendy	Tocqueville Renewable Energy	France
Mr. Rick Sellers	Tocqueville Renewable Energy Transnational Renewables	France
Mr. Gregor Czisch	Consulting	Germany
Mr. Julien Aubert	Union for the Mediterranean (UfM)	France
Mr. Philippe Lorec	Union for the Mediterranean (UfM)	France

Mr. Jameleddine Chetoui	UTAP	Tunisia
Mr. Mohamed Haddar	UTAP	Tunisia
Ms. Ben Hammadi Sarra	UTAP	Tunisia
Mr. Walid Mouawad	West LB Ag	UK
Mr. Henry Russell	World Bank	USA
Mr. Mohab Hallouda	World Bank	Egypt
Mr. Chandrasekar Govindarajalu	World Bank	USA
Ms. Silvia Pariente-David	World Bank	Morocco
Mr. Philippe Roos	World Bank	USA
Mr. Jonathan d'Entremont Coony	World Bank	USA
Mr. Roger Coma Cunill	World Bank	USA
Mr. Rohit Khanna	World Bank	USA
Mr. Rome Chavapricha	World Bank	USA
Mr. Lazlo Lovei	World Bank	USA
Mr. Georg Caspary	World Bank	USA
Mr. Jonathan Walters	World Bank	USA
Mr. Jean-Philippe Denruyter	World Wildlife Fund (WWF)	Belgium