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## **Report of “Networking Conference”**

**Project number:** 295073

**Project full title**

The National Center for Research and Development (NCRD) as a Centre of Excellence for EU-Jordan S&T Cooperation: Towards Jordan’s Integration into ERA

**Project Acronym:** J-ERACenter

**Call (part) identifier:** FP7-INCO-2011-6

**Funding scheme**

Coordination and support action

**Work programme topics addressed**

7.6 Reinforcing cooperation with Europe’s neighbors in the context of ERA  
(FP7-INCO-2011-6, ERA-WIDE)

**1. General Information:**



Conference Title: EU- Jordan Networking in Renewable Energy and Energy Efficiency

Date: 27<sup>th</sup> & 28<sup>th</sup> February, 2013

Location: Amman Jordan

Hotel: Regency Palace Hotel (five stars)

## **2. Introduction:**

A Networking event in energy and energy efficiency was held within the activities of the project JERA-CENTER, JERA-CENTER was funded through the EU seventh framework FP7. This event was mainly held to gather as many people as possible in Jordan who are interested in energy and renewable energy, along with several regional and international experts to find ways in which they all can collaborate and benefit each other.

## **3. Objective:**

The overarching aim of the JERA-Centre is: To contribute to the effective integration of Jordan into ERA (European Research Area), To build capacities in international R&D cooperation and EU project management, by providing targeted training to Jordanian researchers and enable them to replicate the knowledge benefiting a wider target group in Jordan. The capacity building will result in making the Jordan Research Centers capable of conducting high-level research in PVs, Solar Thermal Systems, and Energy Efficiency and advanced Bio-Energy Systems. Also, JERA-CENTER, will work to strengthen direct links between Jordanian research teams and their EU counterparts and initiate joint R&D initiatives in the area of Renewable Energy, through a series of networking / partnering events and facilitating mobility of researchers.

The fluctuation of oil prices in an upward trend, the concern about the Carbon emissions,



and the uncertainty about the security of supply; have made energy policy the dominant political discourse around the world. To date, the energy debate has been centered largely on how to secure future energy supply and how to promote and finance alternative sources. Therefore, it is renewable energy that we believe will ultimately make an important contribution to energy security of supply in the future.

The rapid increase in oil prices has put so much pressure on Jordan's economy. Energy constitutes a very difficult challenge to Jordan because of the lack of local energy resources and the great need of energy for social and economic development. In 2011, Jordan's energy bill reached JD 4019 Million, the highest in the Kingdom's history. This is of course because of the repeated blasts of the natural gas pipeline in the Egyptian side. In 2011 energy amounted to 31% of all Jordanian imports and 20% of the GDP. This is putting a strain on the Jordanian economy, increasing the country's debt and placing additional burdens on the budget. Local production of natural gas and crude oil represented only about 1% of primary energy consumption, while renewable energies contributed only by 2%.

The Renewable Energies (RE) & Energy Efficiency (EE) shall play a central role in the sustainable development of the Mediterranean rim. The EE deployment, in particular, should start now (esp. in built environment). The research in these two sectors should address the integration of renewable energies and grid developments; a common Mediterranean R&I strategy for renewable energy, and, Energy innovation to supply domestic markets and for export. The R & I in Renewable Energy & Energy Efficiency should support the current needs of industry and society while preparing for the evolution to an energy market in which RE will play a much more significant role, in synergy with the Mediterranean Solar Plan. The R & I collaboration in RE & EE should focus on long-term regional world-class Joint Technology and Innovation Programs (*Solar, Wind, Bio, Geo, Hydro, Energy Storage, Energy Efficiency, Integrated Poly-Generation/Poly-Uses Systems, and Multi-Scale Smart Grids*).

Enhancing cooperation between public research organizations and industry, Networking



initiatives to develop innovation in the Mediterranean region, and Financing facilities to strengthen the innovation chain, would strengthening innovation in the Mediterranean region.

The EU Jordan cooperation programs are intended to:

- Develop equal partnership and common long-term targets with emphasis on inter/intra-regional cooperation; and involve the private sector and NGOs at all levels;
- Create a suitable and simple governance framework to facilitate the emergence of much-needed synergies and enhance the efficiency of Euro-Med activities.
- Progressively initiate a suitable governance framework and action plan to enhance innovation at the national, regional and Euro-Med levels for the well-being of the Euro-Med community and humanity as a whole.

#### **4. Overview of Conference Participation**

A total number of 124 local experts and 12 European experts have participated in the two days event. The participants represented wide spectrum of specialized people in different fields of RE & EE. The distribution of participants according to their sector were classified as follows:

1. Science and Technology Community, 6%
2. Research and Development Centers, 20%
3. Academics in Universities, 24%
4. Private Sector and Industry, 9%
5. ESCO's (Energy Service Companies), 7%
6. Policy Makers and Regulators, 17%



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7. NGO's; Jordan Environment Society, Royal Scientific Society, Jordan Renewable Energy Society, 6%
8. Students (Young Researchers) from Universities. 11%

The conference consisted of six working sessions in which 22 speakers and 15 technical presentations were delivered as follows:

**Day 1:**

- a. Session 1: JERA-Center Introduction and Opening session, 3 speakers
  - **Dr. Walid Salameh** -*the Project Coordinator /Dean of Scientific Research and Graduate Studies at Princess Sumaya University for Technology*
  - **H.E. Dr. Adnan Badran**-*Former Prime Minister and President of Petra University*
  - **H.E. Dr. KhaledElShuraydeh**-*Secretary General of the Higher Council for Science and Technology, and Acting President of the National Center for Research and Development(NCRD)*
- b. Session 2: Photovoltaic Research and Development Trends, 4 speakers
  - **Dr. Dieter Geyer** - *Center for Solar Energy and Hydrogen Research, Baden-Wurttemberg, Germany*
  - **Eng. Firas Alawneh** - *Royal Scientific Society/ National Energy Research Center*
  - **Dr. Hubert Fechner** - *University of Applied Sciences Technikum Wien, Vienna, Austria.*
- c. Session 3: Energy Efficiency, 4 speakers
  - **Mr. Massimo DA VIA**-*Environment Park S.P.A, Italy*
  - **Eng. Muhidean Tawalbeh** - *Royal Scientific Society/National Energy Research Center*
  - **Dr. Mariano Alarcon**-*University of Murcia, Spain.*



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d. Session 4: Bio-Energy, 4 speakers

- **Dr. Andres Fullana:** *University of Alicante, Spain*
- **Dr. Ahmad M Abdel- Azeem:** *University of Suez Canal, Ismailia, Egypt*
- **Eng. Ahmad Al-Rousan:** *Royal Scientific Society/National Energy Research Center*

**Day 2:**

a. Session 5: Solar Thermal Energy, 4 speakers

- **Dr. Ayman Maaytah,** *American University of Madaba, Jordan*
- **Eng. Abdallah Al Jamleh** *RAYER Ltd. , England*
- **Eng. Nidal Abdallah,** *Royal Scientific Society/National Energy Research Center*

b. Session 6: Networking and Conclusions, 3 speakers

The analysis of participation is shown in the following figures.

## 5. Outcomes and Conclusions:

The scientific and technological outcomes of the conference were good. The networking activities concluded establishing 5 working groups as follows:

1. PV workgroup,
2. EE workgroup,
3. Solar Thermal Workgroup,
4. Bio-energy workgroup
5. Policy makers and Regulator

These workgroups constituted from local experts and at least one EU expert. The workgroups will continue working after finishing the conference. Specific topics were discussed during the networking session which is summarized as the following:

### **PV Workgroup**

#### **Combined Heat and Power Generation from Concentrated Photovoltaic (CPV)**

This technology can be used as CHP system for producing electricity and hot water. In spite the fact that the CPV with tracking systems, have achieved a very high efficiency of more than 40% at cost effective basis. A lower cost per watt by producing more power from the same amount of the expensive semiconductor, and using less areas of land. Modeling and annual simulation on hourly basis for possible options of PV system configurations at different sites over Jordan. The simulation results such as predicted electricity yields will be used to compare between these options.



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## **PV Technologies and Integration into Power System**

Consultative process that enable interconnection of renewable to the electricity grid, set prices for renewable generation technologies and establish net metering rules.

How are issues resolved, those related to provision of support to peak load, corresponding reserve capacities and quick response in case of interruption in supply of electricity to the network from RES in order to ensure security of supply?

What are common technical and economic problems of PV technology integration in the power grid, and problems in the local network that appear when PV is connected to the distribution network in connection with distribution network configuration for transmission of power in one direction? Studying problems and consequences (including financial ones) of strengthening of the distribution system, shifting costs to strengthening of the distribution system, and also additional network investment costs. Impact of methods of allocation of costs associated with proliferation of renewable production for the purpose of concealing the real cost of the resource and inefficient investment decisions.

### ***Solar Thermal Workgroup***

#### ***Solar Thermal storage***

Significant improvements in storage performance via heat loss reduction compactness of the storage material and efficiency in the charging and discharging process.

Increased storage density using thermochemical materials, Increased storage density using phase-change materials (PCM), More efficient storage through improved heat transfer and heat transport, Reliable and efficient system performance of thermal storage.

2-Manufacturing the solar absorber in the SWH to be coated with selective coating (paint) using Nano materials to increase thermal efficiency of the collector in (solar water heater).

### ***Bioenergy Workgroup***





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### ***2<sup>nd</sup> generation biofuels from micro-algae***

Algae are an attractive biofuel feedstock because of their fast growth rates and improved land use efficiency when compared with terrestrial crops. Process train components needed to produce algal biofuels include (1) cultivation, (2) harvesting, and (3) conversion into usable fuel. The production of algal biodiesel and algae-derived biogas. Furthermore, anaerobically digesting algal biomass generated from low-technology wastewater treatment processes represents an appropriate technology approach to algal biofuels that is poorly investigated in Jordan.

### ***Energy Efficiency Workgroup***

#### ***Demonstration of HiTAC technology (High Temperature Air Combustion)***

Industry proven combustion method allowing emissions reduction, combustion process improvement, thermal field flattening and heat transfer increase in high temperature energy intensive applications.

***Smart Cities and Communities*** Urban communities often share residential, public or commercial spaces that lend themselves to the early adoption of innovative energy technologies along with information management systems that can dramatically reduce energy consumption through efficiency savings. Smart cities and communities are those that integrate ICT and social and environmental capital to provide more efficient, new or enhanced services to citizens, especially in the energy and transport fields. Link together new technologies for the provision of services – such as heat, mobility, light, communications and other utilities – in intelligent and evolving networks that can facilitate an urban energy revolution supported by data management.



### Conclusions:

1. The networking conference was successfully organized. This was shown clearly by the number of institutions that have participated effectively in the conference sessions; 124 participants representing 22 universities, 6 research centers, science and technology community and others.
2. It was noted that the R&D community (R&D centers, academics and students from universities) have good attendance comprised by 55 % of the total local attendees.
3. A specialized workgroups were formed at the networking session which will sustain the networking activities, within the scope of the conference.
4. Based on the scope of these workgroups, NCRD shall schedule the project mobility and research visits with full coordination with EU partners in JERA-CENTER project.

### Annex I: Workgroups

P V W o r k g r o u p			
N o	Name	Institution	Title



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1	Firas Alawneh	Royal Scientific Society/ NERC	Head of PV division
2	Ibrahim Odeh	University of Jordan	PV expert/ EWE center
3	Ziad Jibreel	Ministry of Energy & Mineral Resources	Director of RE Dept
4	Mohammad Smiran	AL-Albait University	Director of Energy Research Center
5	Aiman Alshare	German Jordanian University	PV Research
6	Khaldoun Habahbeh	Electricity Regulatory Commission	PV expert
<b>E n e r g y E f f i c i e n c y W o r k g r o u p</b>			
1	Muhideen Tawalbeh	Royal Scientific Society/ NERC	Head of EE division
2	Sawsan Bawaresh	Royal Scientific Society/ NERC	Researcher/EE Division
3	Mohammad Al Dabbas	Ministry of Energy & Mineral Resources	Director of EE Dept
4	Ali Mashaqbeh	Electricity Regulatory Commission	EE Expert



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5	Ahmad Ghandour	German Jordanian University	EE Expert
6	Mwaffaq Hmaidat	National Electric Company	Director of Studies Dept./NEPCO
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1	Nida Abdallah	Royal Scientific Society/ NERC	solar thermal researcher
2	Haitham Adas	Royal Scientific Society/ NERC	solar thermal researcher
3	Aiman Maaitah	American University of Madaba	solar thermal researcher
4	Ala'a Mer'ei	Royal Scientific Society/ NERC	Researcher
5	Suhail Kiwan	German Jordanian University	solar thermal researcher
6	Ahmad Salaymeh	University of Jordan	Director of EWE Center
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<b>W o r k g r o u p</b>			
1	Ahmad Alrousan	Royal Scientific Society/ NERC	Head of bioenergy division
2	Hani Abu Qdais	Jordan University for Science and Technology	Biomass Expert
3	Jehad Abu Yamin	University of Jordan	Biofuel Expert
4	Adnan Badran	Petra University	President of Petra University
5	Fahmi Abu Alrub	Jordan University for Science & Technology	Dean of Scientific Research
6	Issa Al Motlaq	Private Sector	Biofuel Expert
<b>G e o t h e r m a l a n d H e a t P u m</b>			



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1	Bassam Sunna	Private Sector	Geothermal Expert
2	Salah Azzam	National Center for R&D	Director of Energy Research Program
3	Jamal Othman	Balqa Applied University	Energy Expert
<b>W i n d E n e r g y</b>			
1	Khaled AL Asfar	Jordan University for Science and Technology	Director of Entrepreneurship Center
2	Amjad Alshatel	Private Sector	Wind Energy Expert

## “Conference of EU- Jordan Networking in Renewable Energy and Energy Efficiency”

Amman, Jordan 27<sup>th</sup> and 28<sup>th</sup> February, 2013

Time	Subject
9: 30 – 10: 00	<b>Registration</b>
10: 00 – 10: 45	<p><b>Opening Session:</b></p> <ul style="list-style-type: none"> <li>● <b>Dr. Walid Salameh</b> -the Project Coordinator /Dean of Scientific Research and Graduate Studies at Princess Sumaya University for Technology: General Overview of JERA-Center Project-FP7</li> <li>● <b>H.E. Dr. Adnan Badran</b>-Former Prime Minister and President of Petra University,</li> <li>● Key note speaker</li> <li>● <b>H.E. Dr. Khaled ElShuraydeh</b>-Secretary General of the Higher Council for Science and Technology, and</li> </ul>



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*Acting President of the National Center for Research and Development(NCRD):Opening Speech*

<b>10: 45 – 11: 15</b>	<i>Coffee Break</i>
<b>11: 15 – 12: 45</b>	<b>Session One: <i>Recent Trends in Photovoltaic's Research and Development</i></b> <b>Chair: Eng. Salah Azzam - Director of Energy Research Program/ NCRD - HCST</b>
11:15	● <b>Dr. Dieter Geyer</b> - <i>Center for Solar Energy and Hydrogen Research, Baden-Wurttemberg, Germany.</i>
11:40	● <b>Eng. Firas Alawneh</b> - <i>Royal Scientific Society/ National Energy Research Center,</i>
12:05	● <b>Dr. Hubert Fechner</b> - <i>University of Applied Sciences Technikum Wien, Vienna, Austria.</i>
12:30	● <b>Panel Discussion</b>
<b>12: 45 – 13: 45</b>	<i>Lunch Break</i>
<b>13: 45 – 15: 15</b>	<b>Session Two: <i>Energy Efficiency</i></b> <b>Chair: Dr. Jamal Othman-Al-Balqa Applied University</b>
13:45	● <b>Mr. Massimo DA VIA</b> - <i>Environment Park S.P.A, Italy,</i>
14:10	● <b>Eng. Muhidean Tawalbeh</b> - <i>Royal Scientific Society/National Energy Research Center,</i>
14:35	● <b>Dr. Mariano Alarcon</b> - <i>University of Murcia, Spain.</i>
<b>15:00 – 15: 15</b>	<b>Panel Discussion</b>
<b>15: 15 - 16:30</b>	<b>Session Three: <i>Biomass and Biofuels,</i></b> <b>Chair: Dr. Hani Abu Qdais, Jordan University for Science and Technology</b>
15:15	● <b>Dr. Andres Fullana:</b> <i>University of Alicante, Spain</i>
15:35	● <b>Dr. Ahmad M Abdel- Azeem:</b> <i>University of Suez Canal, Ismailia, Egypt</i>
15:55	● <b>Eng. Ahmad Al-Rousan:</b> <i>Royal Scientific Society/National Energy Research Center</i>
<b>16:15-16:30</b>	<b>Panel Discussion and Close of 1<sup>st</sup> day.</b>



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## “Conference of EU- Jordan Networking in Renewable Energy and Energy Efficiency”

Amman, Jordan 27<sup>th</sup> and 28<sup>th</sup> February, 2013

### Day Two

Time	subject
9: 30 – 10: 30	<b>Session Four: Solar Thermal Technologies</b>  <b>Chair: Dr.KhalidAsfar-Jordan University for Science and Technology -JUST</b> <ul style="list-style-type: none"><li>● <b>Dr. AymanMaaytah, American University of Madaba, Jordan</b></li><li>● <b>Eng. Abdallah Al Jamleh RAYER Ltd. , England</b></li></ul> <b>Eng. NidalAbdallah, Royal Scientific Society/National Energy Research Center</b>
10:30-11:00	<b>General Discussion</b>
<b>11: 00 – 12: 00</b>	<b>Networking Session and Coffee Break</b>
12:00	Closing





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