

Report of “2nd EU- Jordan Networking in Renewable Energy ”

Deliverable 4.1

Highlights of Renewable Energy in the European and Mediterranean
Countries in the last three years
as a basis for
Promoting the cooperation between European and Mediterranean
Countries
Focus on Photovoltaic, Solar thermal, Bio Energy and Energy Efficiency

20th -21th November 2013
Fleming's Hotel Wien –Westbahnhof
Neubaugürtel 26-28 Vienna
Austria



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

Created by Momir Tabakovic
University of Applied Sciences Technikum Wien
December 2013

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Introduction

A Networking event in energy and energy efficiency was organised and held within the activities of the project JERA-CENTER, which was funded through the EU seventh framework (FP7).

The goal of the event was to gather research institutions, companies and Universities from European countries with the participants from the Mediterranean countries in the field of renewable energy.

- To develop joint projects that fits into the financing Scheme of the European Commission or other financing opportunities.
- To find new partners and strengthen their collaboration within the Mediterranean countries.

Objectives of the JERA-Center project

The overarching aim of the JERA-Center is to contribute to the effective integration of Jordan into ERA (European Research Area) and to build up capacities in international R&D cooperation and EU project management by providing targeted training to Jordanian researchers and enable them to distribute the benefiting knowledge to a wider target group in Jordan. The capacity building will result in making the Jordan Research Centers capable of conducting high-level research in the fields of renewable energy, in

particular PV, solar thermal systems, and energy efficiency and advanced bio-energy systems. Also, JERA-CENTER, will strengthen direct links between Jordanian research teams and their EU counterparts in order to initiate joint R&D initiatives in the area of renewable energy subsequently, through a series of networking / partnering events and facilitating mobility of researchers.

The continuous increase and strong short term fluctuation of the oil price, the increasing the carbon dioxide emissions and corresponding climate impact as well as the uncertainty of the security of supply; have made energy policy the dominant political discourse around the world. The current energy debate has been centered largely on how to secure future energy supply and how to promote and finance alternative sources.

Therefore, also in Jordan renewable energy sources are supposed to make an important contribution to ensure a secure energy supply in future.

The rapid increase of oil prices has put much pressure on Jordan's economy. Energy constitutes a very difficult challenge to Jordan because of the lack of local fossil energy resources and the great need of energy for social and economic development. In 2011, Jordan's energy bill reached JD 4,019 Million, the highest in the Kingdom's history. This is of course also because of the repeated blasts of the natural gas pipeline in the Egyptian side. In 2011 energy cost amounted to 31% of all Jordanian imports and to 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&D in renewable energy and energy efficiency should support the current needs of industry and society while preparing for the evolution of a energy market in which RE will play a much more significant role, in synergy with the Mediterranean Solar Plan. The R&D collaboration in RE and EE should focus on long-term regional Joint Technology and Innovation Programs (solar, wind, biomass, geothermal, hydro, energy storage, energy efficiency, Integrated Poly-Generation/Poly-Uses Systems, and Multi-Scale Smart Grids).

Enhancing cooperation between public research organizations and industry and networking initiatives to develop innovation in the Mediterranean region as well as, financing facilities to strengthen the innovation chain, will encourage strengthen innovations 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.





Figure 1: 2nd JERA-Center event 2013

Presentation are online available on JERACenter–Project homepage
<http://www.jera-center.eu/>
→JERA Events

Official documents from the European Commission
<http://ec.europa.eu/programmes/horizon2020/>

Dissimination

The Jordan delegation also attended the 11. Austrian Photovoltaic Conference
Photovoltaic – Research and Industry in Austria and Europe
Panoramasaal HYPO NÖ ZENTRALE
Hypogasse 1, 3100 St. Pölten

During the 2- days conference from 19th to 20th November 2013 the Jordan experts had the opportunity to meet about 250 PV experts from Austria and other European countries. In the evening a “Photovoltaic Innovation Market Place” was organized with a presentation of the Photovoltaic-Industry and research activities. The JERA-Center Project was involved in this market place and presented the project goals and expressed the interest of an international collaboration with a booth in an interview, which was part of this session.



Figure 2: Interview during the „Market Place“ at the Austrian Photovoltaic conference

Workshop Summary

20th November 2013 – Pre-Networking and come-together

Welcome speech and introduction of the J-ERACenter Project by Walid Salameh

- **Renewable energies** comprise a **big potential** and advantages compared to fossil oil and gas
- RES will become more and **more important in future**
- **Jordan** can act as **model-state** for the whole Arab, Middle East and African area
- J-ERACenter can help to **transfer knowledge** from Europe to Jordan
- The Jordanian scientific area has many years of **experience with EU-projects**

Introduction of the session by Momir Tabakovic

The participants were asked to present themselves with

- Name
- Organisation
- Priorities
- Expectations of the event; - also in case of project ideas, (short description, possible partners)



Figure 3: 20th November -Pre-networking event



J -EraCenter – 2ndEU- Jordan Networking in Renewable Energy



21st November 2013

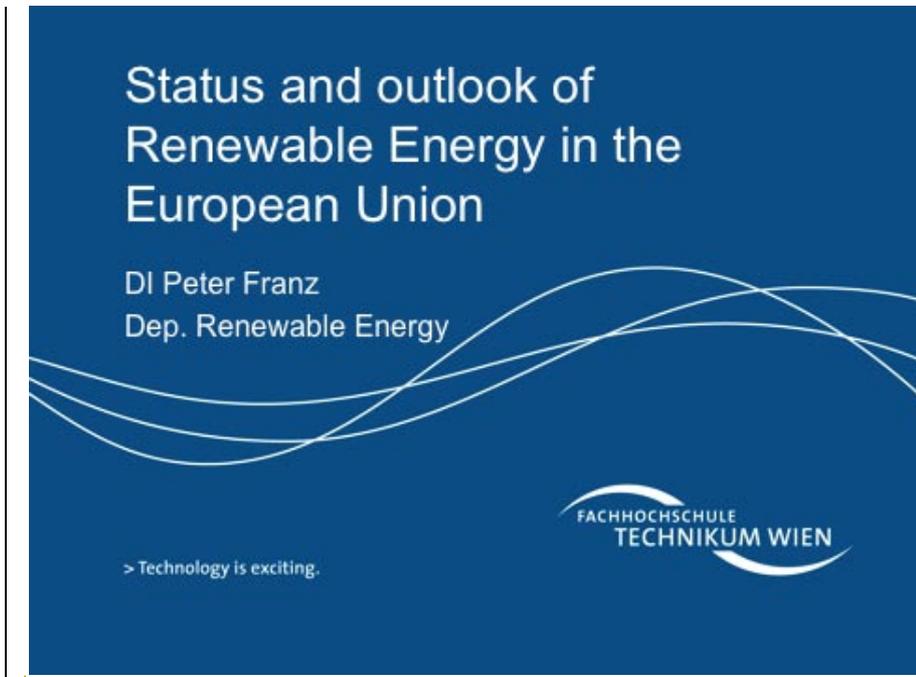
Welcome speech by the Host by Momir Tabakovic and Hubert Fechner

Ambition of this event is to come up with **new project ideas** and create new collaborations between Mediterranean countries and the European Union.

J-ERACenter Project Presentation by Walid Salameh

At the second day additional participants acceded the event. Due to the new participants, the J-ERACenter Project and the goals of the event was presented again (see above Welcome speech and introduction of the J-ERACenter Project by Walid Salameh).

Status and Outlook of the renewable Energy in the European Union by Peter Franz



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Core statement

- Nearly all European countries are on track to reach the 2020 goals, but will not reach the 2050 limits with the current policy. By the year 2050 55% - 90% of the energy consumed needs to be provided by renewable sources.
- Europe is world-leading in the development and application of renewable energies. Hopefully the EU can be a role-model for the rest of the world

Current Energy situation in Jordan by Muheiddine Tawalbeh



Energy Situation and State of research in Jordan/ Mediterranean Countries

Highlights of Renewable Energy in the European
and Mediterranean Countries in the last three
years
As a bases for
Promoting the Cooperation Between European and
Mediterranean Countries
Vienna/Austria

Eng. Muhieddin Tawalbeh, Dr. Jamal Othman

core statement

- **96%** of the energy is **imported**
- **RES only add 2%** to the energy mix
- The annual **increase in energy** consumption is 7,5%
- Goal is to reduce energy consumption by **20% till 2020**
- Small **PV** plants are **subsidized** in Jordan
- **Solar heat** was commonly used by private households but is now **on the decline**
- A **solar radiation map** is being created through a total of 15 measuring stations
- Further a **wind potential map** is being created through a total of 35 measuring stations
- There are a **few geo thermal** sources with 60-70°C

State of research in Jordan/Mediterranean Countries

- **97%** of the scientific research is **funded by the government**. A big share of that is spend on solar heat
- The **JREEEF (Jordan Renewable and Energy Efficiency Fund)** program to support research is currently reorganized, but should be operating by the end of the year
- 2 Million refugees from Syria overburden Jordan's infrastructure

- **Tertiary sector is the main sector** (Medical Services, ...), 17%
is Secondary sector (Chemical, Pharma, Mining and export of primary products)

Research and Development in Renewable Energy in Algeria by Nouredine Yassaa



**RESEARCH AND DEVELOPMENT
IN RENEWABLE ENERGY IN ALGERIA**

Prof. Nouredine YASSAA
Director of CDER

<http://www.cder.dz>

Centre de Développement des Energies Renouvelables



Core statement

- In 2014 rules and regulations for **supplying current from renewable energies** should be elaborated
- The **ambitious energy goals** will most probably not be met
- **CDER** was founded in 1986 as research centre and is nowadays **very visible** in the Arab/Mediterranean and African scientific community
- **RES are the biggest research area** in Algeria
- A **test and certification centre** for PV and solar thermal modules is under construction
- **Solar thermal plants are subsidised** by 45% by public authorities
- RES should help to provide **local production and lower costs**
- Waste is biggest source for biomass and biogas

Research Funding in EU FP7 Outlook/Horizon 2020 + Discussion by Siegfried Loicht



Official documents from the European Commission
http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020-documents

Core statement

- Focus of the new Horizon 2020 is to **network the European researchers** and to transfer research to market
- Push **key enabling technologies** and **light house projects**
- **Social aspects** get more important
- Covered topics are more **wide-spread** compared to FP7
- **Simpler rules** for applying for funding
- **Budget has increased** dramatically compared to FP7
- **Final Draft** of the work program has recently been released (www.c-energyplus.eu)
- There are no recommendations about **handling legal aspects** of knowledge/products developed in research projects
- Presentation of the Horizon 2020 program is fully booked, but there will be a web-stream available

Parallel session: Highlights of the topical fields

<p>Session A: Chaired by Albert Knotz</p> <p>Highlights of Photovoltaic research in the EU and best practise projects</p> <p><u>Presentations</u> Hubert Fechner/UASTV/IEA Photovoltaic Power Systems Programme (PVPS) (www.iea-pvps.org)</p> <p>Albert Knotz/Welser Profile Austria GmbH/Presentation of Welser Profile</p> <p>Dieter Geyer/Zentrum für Sonnenenergie- und Wasserstoff (ZSW)/Centre for Solar Energy and Hydrogen Research</p>	<p>Session B: Chaired by Jamal Othman</p> <p>Highlights of Bio Energy research in the EU and best practise projects</p> <p><u>Presentations</u> Boris Cosic/University of Zagreb/ Highlights of Bioenergy research in the EU and Best Practices Projects</p> <p>Manfred Manfred/BIOEnergy2020+/ Bioenergy and Microalgae Research</p> <p>Ari Pikkariainen/ Kemi-Tornio University of Applied Sciences/Energy projects</p> <p>Christian Aichernig/Repotec/ Renewable Power Technologies Umwelttechnik GmbH</p>
	
<p>Chaired by Miguel Angel Zamora</p> <p>Highlights of the Energy Efficiency in Smart Cities research in the EU and best practise projects</p> <p><u>Presentations</u> Felix Cesareo Gómez de León/UMU/ Smart Buildings and Industrial Processes</p> <p>Miguel Angel Zamora Izquierdo/ODINS /Presentation of OdinS</p> <p>Markus Jung/TU Vienna/An Austrian research project on interoperable data exchange within smart grids</p>	<p>Chaired by NCRD, Muhieddin Tawalbeh</p> <p>Highlights of Solar thermal research in the EU best practise projects</p> <p><u>Presentations</u> Roland Sterrer/UASTV/ Highlights of Solar Thermal Research in the EU – best practise Projects</p> <p>Martin Haagen/Industrial Solar/ Industrial Solar Company Presentation</p> <p>Christoph Brunner/AEE INTEC/</p>

Outcomes of the Project development sessions

Based on the inputs from the morning sessions and the expertise of the participants four groups were formed.

- Photovoltaic
- Solar thermal energy
- Bio energy
- Energy efficiency

The idea was to develop ideas for joint initiatives and joint project that **contribute** to the European Union's vision and objectives for **Horizon 2020**.

Project development session “Photovoltaic”

Participants

Hubert Fechner	Fachhochschule Technikum Wien UASTV
Dieter Geyer	Zentrum für Sonnenenergie- und Wasserstoff (ZSW)
Albert Knotz	Welser Profile Austria
Noureddine Yassaa	Centre de Développement des Énergies Renouvelable
Firas ALawne	National Energy Research Center
Peter Ahcin	Austrian Institute of Technology



Figure 4: PV working group

This group identified different potential topics for joint activities. The Jordan Participants and the Algeria experts showed big interest to join the IEA PVPS program and be active in the international collaboration. The experts consider Horizon 2020 as a good opportunity in joint project together with the European Union.

Identified potential topics for joint projects

Testing	Systems	Grid	Education	Framework
Soiling Degradation Maintenance Cleaning Surfaces, materials Meteorology Inverters Batteries Lifecycle, - time	BIPV Hybrid systems Smart Grid Mobile PV Business models Energy prediction	Grid integration Interconnection Forecasting loads Planning MENA, MENA-EU	Courses Certifications	Regulations Legal framework

Project development session “Energy Efficiency”

Participants

Walid Rajab Shahin	National Energy Research Center
Felix Cesareo Gómez de León	Universidad de Murcia
Miguel Angel Zamora Izquierdo	ODINS
Jaakko Etto	Kemi-Tornio University of Applied Sciences

Eligible calls (to be continued)

EE 11-2014/2015, in section A-Buildings and consumers

Idea

The idea was to use the ICT advantages through social networks and monitoring and control systems and other tools to motivate the change of citizen's behaviour relative to energy efficiency.



Figure 5: Energy Efficiency group

The energy efficiency group looked for eligible calls that deal with the consumers and buildings. Energy efficiency is an important topic in Jordan and has a huge priority in the

National Energy program. Collaboration with European partners is a good chance to meet the national goals in energy efficiency.

Project development session “Solar Thermal”

Participants

Muhieddin Tawalbeh	National Energy Research Center
Christoph Brunner	AEE INTEC
Roland Sterrer	Fachhochschule Technikum Wien
Martin Haagen	Industrial Solar

Project idea

- Solar heat for protecting
- Solar heat for paper and food industry
- Investigate the possibility of using central heating & cooling for industrial parks
- Local added value
- Phosphate production (Martin Haagen will look for something relevant)
- Improving of the solar collectors to produce >200°C
- Storage issue medium and low temperature
- Partners to be involved
- Provide some data about Jordan industry what kind/type of Industry. We have to select (Muhieddin Tawalbeh)
- Christoph Brunner look on call to have more details

Project Scopes

- Specific industrial process (e.g. thermal date treatment)
- Specific sector(s) (e.g. food, pharma, chemical)
 - Heat & cold provision
- Industrial Zones (district heat / steam supply)

Eligible calls (to be continued)

- LCE 2 2014?
- LCE 2 2015 – temperatures above 200°C
- SME call
 - First 50k€ for pre-feasibility
- ... to be continued

General

- R&D has to go beyond FP7 projects like SolBrew or InSun
- Collector development necessary
- System / Integration development
- Preferable when applicant is part of consortium (commitment)

Potential further partners

- Amman chamber of Industry
- Developers
- Other countries e.g. Lebanon

To-Do

- Select suitable calls Christoph Brunner
- Overview of thermal process in phosphate mining Martin Haagen
- Overview Jordanian industry Muhieddin Tawalbeh
- Industrial Solar eligible for SME funding? Martin Haagen
- Proposal for collector development Martin Haagen
- Follow Up Email / Telco all

Further Information

<http://www.massolia.com/energie-2/iresen-a-signe-un-memorandum-dentente-avec-snc-lavalin-mithras-energies-maroc-mem-et-transpacific-energy-tpe-pour-la-mise-en-oeuvre-dun-partenariat-integre-autour-de-la-technolo/>



Figure 6: Solar thermal working group

The Solar thermal working group has the most developed project idea including possible project partners. The To-Do's for the next steps are defined and already in discussion beyond the JERA-Center event. The goal is to submit the project next year under Horizon2020.

Project development session “Bio energy”

Participants

Thomas Nennung	Fachhochschule Technikum Wien –UASTV
Peter Franz	Fachhochschule Technikum Wien –UASTV
Boris Cosic	University of Zagreb
Ari Pikkarainen	Kemi-Tornio University of Applied Sciences
Jamal Othman	The Balqa University Research Center
Manfred Wörgetter	BioEnergy2020+

General

- **80% of Jordan is desert** so biomass is rare and already mostly locally used
- **Waste** seems to be the only source of Biomass

- There are practically **no rivers to supply water** for the biomass industry
- **Waste-water is being recycled** and used for agriculture
- First step should be a **broad survey on available biomass** resources

Potential topics for cooperation

1. Bioallege
2. Nonfoodbiomass potential and prospects
3. Innovativehybrid system comprising solar thermal and biomass
4. Combinedbiomass and oil shale gasification
5. Biomassstoves for heating and cocking instead of kerosene (or LPG) stoves



Figure 7: Bio Energy working group

The main focus of the six potential topics for cooperation is in the field of bio algae. Under the conditions in Jordan Algae biomass production should be made in combination with waste water treatment. Local infrastructures like in Aqaba should be used also the combination of solar and bio energy in hybrid systems may play an important role for the development of sustainable energy systems and should be examined closely.

Conclusion

The networking conference in Vienna was an excellent starting point for future research cooperation in the field of renewable energy. This was also confirmed by all of the participants. The attendees represented a wide spectrum of experts in different fields of renewable energy and energy efficiency from different institutions. The balanced mixture of research centres, industry and universities was a major contribution to the success of the event. But also the set up of the event program with enough time for networking and discussing was a positive effect on the event. Some of the institutes and companies are already involved in project with the Mediterranean countries and are interesting in further R&D projects. In the afternoon the participants



J -EraCenter – 2ndEU- Jordan Networking in Renewable Energy

had time for group discussion in small groups. The session was especially for partnering and project development with visible outputs.

The solar thermal working group has developed a project idea, which is supposed to be submitted as a proposal at Horizon2020. The Bio energy group is also in contact and in a first step analyses the needs of Jordan. The communication beyond the event is still going on.

The new possibilities for the Mediterranean countries under Horizon2020 could be a crucial financing mechanism, but other financing mechanism (e.g. Twinning programs) could also be an option.

Additionally strong efforts should be made to build up a scientific community in Jordan with strong collaboration with the European countries.

The active communication of the participants beyond the event is a good indication for joint project and further cooperation,



Minutes: Momir Tabakovic, 2013-12-16

ANNEX A

Program of the JERA-Center conference

20th November 2013
Pre- Networking and Come-together

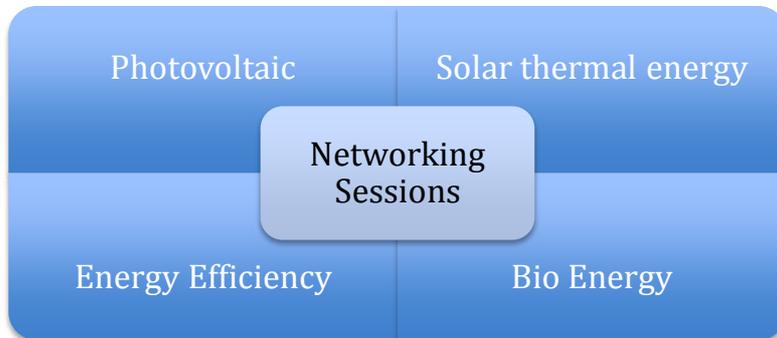
Welcome and Introduction

Welcome and introduction- Walid Salameh

Introduction to the networking session and session target - Momir Tabakovic

Networking and partnering sessions

Partnering



Summary and Outlook

Summary and Outlook for the next day -
Momir Tabakovic

Dinner with the possibility to intensify the discussions

21st November 2013

Welcome and Introduction

Welcome by the host UASTV- Hubert Fechner
J-ERACenter -Project presentation - Walid Salameh

Keynote

Chaired by Momir Tabakovic

Status in renewable Energy in the EU – Peter Franz

Current Energy situation in Jordan – Muheiddine Tawalbeh

State of research in Jordan/ Mediterranean Countries – Jamal
Othman

Research and Development in Renewable Energy in Algeria -
Noureddine Yassaa

Research Funding in EU- FP7 Outlook/Horizon 2020 + Discussion
- Siegfried Loicht

Parallel session: Highlights of the topical fields

Session A:

Chaired by Albert Knotz

Highlights of Photovoltaic
research in the EU and best
practise projects

Presentations

- Hubert Fechner - UASTV
- Albert Knotz – Welser Profile Austria GmbH
- Dieter Geyer –Zentrum für Sonnenenergie- und Wasserstoff (ZSW)

Chaired by Miguel Angel Zamora

Session B:

Chaired by Jamal Othman

Highlights of Bio Energy research
in the EU and best practise
projects

Presentations

- Boris Cosic - University of Zagreb
- Manfred Wörgetter–BIOEnergy2020+
- Ari Pikkarainen Kemi-Tornio University of Applied Sciences
- Christian Aichernig - Repotec

Chaired by NCRD, Muhieddin Tawalbeh

Highlights of the Energy Efficiency
in Smart Cities research in the EU
and best practise projects

Presentations

- Felix Cesareo Gómez de León - UMU
- Miguel Angel Zamora Izquierdo -ODINS
- Markus Jung –TU Vienna

Highlights of Solar thermal
research in the EU best practise
projects

Presentations

- Roland Sterrer - UASTV
- Martin Haagen – Industrial Solar
- Christoph Brunner –AEE INTEC

Technical networking and partnering; Ideas for joint initiatives and opportunity for finance

contribute to the European Union's vision and objectives for **Horizon 2020**

Introduction to the Project development and session target



Presentation of the results by the chairman

Outlook

Conclusion / Outlook - Walid Salameh and Momir Tabakvovic