

Workshop on RES and new technologies for energy production

Malta, 2nd-6th May 2017

Workshop Report - Wednesday, 3rd of May

The session was intended to present case studies regarding RES plants implemented in the project partners' countries, with a focus on innovation and technology issues.

Each partner presented one or more case study, accompanied in most cases by an overview of the environmental, socio-economic, institutional and regulatory framework in which each case study was set. This report is meant as a reasoned summary of partners' presentations, organized by country and by theme.

Malta

1) Overview of RES technologies

Federica Di Pietrantonio – Malta Intelligent Energy Management Agency (MIEMA)

The presentation provides an overview of the main types of renewable energy sources (as defined by the EU Directive 2009/28/EC) and of the technologies currently used to exploit them, with a focus on the possible impacts and points of attention of each technology and examples of realized plants:

- Ocean Energy:
 - Salinity Gradient Power (SGP): Reverse Electro-Dialysis (RED), Pressure Retarded Osmosis (PRO)
 - Wave energy: overtopping systems, oscillating elements, Oscillating Water Column (OWC)
 - Tidal energy: tidal barrages, tidal turbines
 - Ocean Thermal Energy Conversion (OTEC)
 - Marine geothermal
- Geothermal energy: high-enthalpy, low-enthalpy
- Biomass
- Solar energy: PV, CSP, Solar Thermal Energy Collectors
- Wind energy: offshore (fixed-bottom and floating), onshore, small wind turbines, horizontal or vertical axis turbines

Jordan

2) Renewable Energy Projects in Southern region of Jordan and Tri-Generation Parabolic Trough System

Prof. Ahmed Al-Salaymeh – University of Jordan (UJ)

- Description of the current Jordanian situation regarding RES – with a focus on Solar and Wind energy
- Description of the case study: small-scale pilot Tri-Generation system based on CSP technology for power generation, water desalination, cooling and heating implemented in Southern Jordan by Muta'h University

3) Solar Heat for Industrial Processes

Prof. Fahmi Abu Al-Rub and Eng. Qatada Damra - Jordan University of Science and Technology (JUST)

- Overview of the situation of the industrial sector in Jordan and of its energy consumptions
- Explanation of the potentials of solar heating for industrial heat supply and presentation of examples

4) University of Petra On-Grid PV Solar System

Prof. Ali Al Maqousi – University of Petra (UOP)

- Presentation of the System assumption and requirements
- Presentation of the PV System characteristics and components, with a focus on the monitoring system (SCADA and mobile application)

5) Wind energy production in Jordan

Dr. Majd G. Batarseh - Princess Sumaya University for Technology (PSUT)

- Overview of Jordan's energy sector in general and of the electricity sector in particular
- Presentation of Jordan's national energy strategy
- Presentation of Jordan's wind atlas and of the more promising sites for wind energy production
- Wind projects in the south of Jordan and related installed capacities

6) Biogas Portable Unit

Prof. Nidal Abdalla – Royal Scientific Society (RSS)

- Description of the general context of the project – Biomass exploitation in Jordan
- Description of the case study: portable biogas unit operated by renewable energy sources (PV and Solar thermal), targeted mainly to restaurants, cafeterias and houses to treat daily bio-waste, and generating biogas and bio fertilizer

7) Animal waste-to-energy in Jordan

Dr. Amjad Abu Sirhan - Al Balqa Applied University (BAU)

- Description of the case study: recycling system that uses cow manure to produce biogas and fertilizer through anaerobic digestion - awarded the 2016 Energy Global National Award (Austrian Energy Globe Foundation) for the best environmental project in Jordan.

Egypt

8) Sustainable Environment: Case Studies, Egypt

Dr. Walid El-Khattam - Ain Shams University (ASU)

- Description of the energy sector in Egypt, of its historical development and institutional setup, with information on waste as potential energy source
- Environmental concerns regarding waste disposal in Egypt
- Description of the case studies: BioGas in Ezbet Al-Nasr (Trash Becomes Cash); Recycling; Cairo-Black clouds (Rice Straw for Bio-Fuel Production to Conserve Environment in Egypt)
- Bio-Gas Digesters and Thermal Gas Plants in Egypt

9) Waste to Energy, using the RDF as an alternative source of Energy in Egypt

Prof. Ibrahim Ismail, Eslam Gomaa & Nady Mahmoud

- Overview of the waste and energy problems at global and national level (Egypt)
- Examples of WTE processes, and figures on the WTE sector in Egypt
- RDF (Refused Derived Fuel) technologies
- Description of the case study: RDF applied to cement plants

Lebanon

10) Institutional support: a prerequisite for technological innovation in RE production in Lebanon

Dr. Yaser Abunnasr and Petra Samaha – American University of Beirut (AUB)

- Overview of the Lebanese regulatory and infrastructural context regarding energy and RES, with a focus on the need for a supportive environment (strong role of the State, policies/political will, good governance, favourable market conditions) to develop innovation in RES exploitation
- Description of the case study: Country Energy efficiency and Renewable energy Demonstration Project for the recovery of Lebanon (CEDRO) – National Wind Atlas, solar hybrid systems, Low Carbon Village, Briquettes production from forestry residues, et al.

11) Photovoltaic

Nathalie Bassil – Mediterranean Durably Green (MEDGREEN)

- General introduction on the power sector and on PV development in Lebanon, with a focus on the governmental policies to encourage the PV diffusion
- Description of the case studies: Berdawni solar farm (mountain area location); residential PV plant in Zahle (installation on rooftop); PV plant in Ferzoul (embedded in vineyard); Georges Saker (supplying power for the water pumps used in watering system in the Bekaa Valley)

12) RAMSES: Renewable Energy Agricultural Multipurpose System for Farmers

Said Chehab - Lebanese association for Energy saving and Environment (ALMEE)

- Description of the case study: integrated solar power system including battery storage, usable to power an all-purpose vehicle designed for rural communities on the Southern bank of the Mediterranean

13) Pyrolysis

Nathalie Bassil – Lebanese University (LU)

- General introduction on waste disposal in Lebanon
- Description of the pyrolysis procedure and outputs, with a focus on its advantages
- Description of the case study: Factory in Chikka (Lebanon)

Italy

14) Biofuel from biomass

Elena Neri – University of Siena (UNISI)

- Brief introduction to biorefineries: how they work, what are the outputs
- Categories of biofuels and their aim
- Application/feasibility studies in Italy (description, results and environmental impacts):
 - ENERBIOCHEM – Eco-compatible processes of eNERgy and BIO-CHEMicals production from renewable sources and for the land valorization: development of integrated agro-industrial chain processes to produce bio-ethanol, bio-diesel and biomaterials from renewable sources in brownfields (marginal areas that cannot be used for food production purposes) in Campania Region.
 - BALLO - Biofuels from Algae in the Lagoon of Lesina and Orbetello (Tuscany): development and check of feasibility for biofuel production from aquatic macroalgae
- LCA results of biofuel production processes

15) A wood-energy chain to reduce the costs for river maintenance: a case study from Musone River

Federico Maria Tardella – University of Camerino (UNICAM)

- General description of the wood-energy chain
- Description of the case study: reducing the costs for maintenance of riverbeds and river banks through the use of woody biomass for renewable energy production - Pilot project for the management of a river stretch and for the energetic valorisation of wood in Marche Region

16) Wave energy in the Port of Civitavecchia (IT)

Stefano Magaudda – University of Roma 3

- Short overview of the potentialities of the Blue energy sector – and of wave energy in particular
- Description of case study: Resonant Wave Energy Converter REWEC3, an Oscillating Water Column prototype built in Civitavecchia's harbor (IT) - Central Mediterranean - for the enlargement of an existing breakwater, technically supported by a spin-off of the Mediterranean University of Reggio Calabria (IT).

Portugal

17) ENERCOUTIM: a Platform for Testing & Demonstration of Solar Technologies

Flávio Martins and António Mortal – University of Algarve (UAlg)

- Site Characterization (location, solar irradiation...)
- ENERCOUTIM Concept
- Solar Lab - An outdoor Testing & Demonstration platform with unique irradiation conditions in Europe
- The Solar Lab Services
- Hosted H2020 Projects: VICINITY, SHAR-Q

Spain

18) Solar Concentrated Power in Andalusia (lessons from a rather new RES technology)

Manuel Calvo – University “Pablo de Olavide” (UPO)

- General facts and figures on energy consumption and RES development in Andalusia (Spain), with a focus on solar energy and CSP
- Description of the case study: Almería Solar Platform - the largest research, development and test center in the world devoted to concentrating solar technologies
- Lessons learnt on the importance of territory management and socio-economic aspects of applying technologies.