Energy Efficiency

Ministerial Saving Goals

Introduction

- Energy forms a very difficult challenge to Jordan because of the lack of local energy resources and the great need for energy for social and economic development.
- In light of this situation and the social and economic development plan which is being implemented to improve the quality of life for Jordanian citizens,
- it is expected that the demand for energy will grow to high levels reaching 3% annually and around 6% annually for the electric consumption.

Introduction

- This situation, in addition to the regional development of 2013 have pushed the energy bill to around 4 billion Jordanian Dinars (JD) annually
- constituting 17% of the gross domestic product GDP
- around 85% of the value exported goods which is considered by international standards as a heavy burden.

Introduction

- Improving energy efficiency is an integral part of the 2007-2020 Energy Strategy in order to:
- reduce the impact of future increases in energy prices.
- support security of supply in view of the rapidly growing demand,
- create a green economy around energy efficiency services.
- The Strategy called for a 20% improvement in energy efficiency in all sectors.

Road Map

Jordan has prepared a previous Road Map for the Enabling steps for Energy Efficiency:

1. Government of Jordan commits to energy efficiency efforts as a cross-cutting policy issue with national priority
2. Ministry of Energy and Mineral Resources conducts an overall inventory to define the starting point for any future EE-related policies
3. Government of Jordan leads by example

Road Map

Jordan has prepared a previous Road Map for the Enabling steps for Energy Efficiency:

4. Government of Jordan creates financial and/or tax incentives for the different stakeholders to promote the implementation of energy efficiency projects

5. Electricity Regulatory Commission develops a rate structure for electricity tariffs that encourages energy efficiency

Road Map

- 6. Authorities establish minimum energy performance standards (MEPS) and labels for buildings, equipment and service organizations
- 7. Jordan National Building Council strengthens energy efficiency building codes and clear responsibility is established to monitor adherence to the building codes by all planning and certifying agencies
- 8. Ministry of Transport, the Municipalities and GAM incorporate energy efficiency in their activities to improve the energy impact of transport sector policies / plans in cooperation with the Ministry of Energy and Mineral Resources

Road Map

- 9. The Ministry of Energy and Mineral Resources and the National Energy Research Center (NERC) establish a monitoring, evaluation and verification (MEV) mechanism to continually review and refine the government policies
- 10. Authorities seek out and examine innovative approaches to encourage energy efficiency

National Energy Efficiency Action Plan (NEEAP)

- the Renewable Energy & Energy Efficiency Center (RCREEE) has helped Jordan to develop the National Energy Efficiency Action Plan (NEEAP). NEEAP had set certain action in all sectors in order to reach the 20% reduction on the consumption and these action could be summarized as follows:

National Energy Efficiency Action Plan (NEEAP)

- 1- The Sectorial Targets

- a. The Residential Sector
- It is the most consuming sector with a baseline consumption of 4447 GWh/5 yrs average.
- Its share of electricity consumption is projected to increase from 41% in 2010 to 34% in 2020.
- Thus, the target is to achieve a 25% saving by 2020 (1112GWh) which corresponds to a targeted minimum saving of 5.6 % in 2014(247 GWh).

National Energy Efficiency Action Plan (NEEAP)

- The government put a 4-measure program that can exceed the targeted saving to reach around 509 GWh (rather than 247 GWh) by 2014 with total budget of around $43 million. These measures include:
- Replacing 1.5 million incandescent lamps with energy efficient lamps (CFL)
- Adopting Energy Label Program for 9 home appliances
- Installing 30,000 Solar Water Heaters in addition to 5,162 SWHs in cooperation with Jordan River Foundation.
- An additional supporting measure is to convey a survey of energy consumption in the sector by the end of 2012.

National Energy Efficiency Action Plan (NEEAP)

- The Industrial Sector
- It comes as the second electricity-consuming sector with a projected steady share of 25% from 2010-2020.
- The baseline consumption for this sector equals 3013 GWh/5 yrs average.
- The national indicative target is to save 452 GWh by 2020 (15%) that is to save 100 GWh in 2014 (3.3%).
- Thus, the government is adopting a mobile energy and environment clinic projected to save 191 GWh by 2015.

National Energy Efficiency Action Plan (NEEAP)

- The Commercial Sector
- The baseline consumption for this sector equals 1875 GWh/5 yrs average.
- Its electricity consumption share is estimated to increase from 17% in 2010 to 25% in 2020.
- The target is to curb the electricity consumption by 2.7% in 2014 (50 GWh) to reach the 2020 national target of 12% saving (225 GWh).
- Replacing the conventional ballasts by electronic ballasts for fluorescent lamps will save around 31 GWh by 2013.

National Energy Efficiency Action Plan (NEEAP)

- Water Pumping
- It forms around 15% of the electricity consumption in 2010 with no projected increase by 2020.
- The baseline consumption equals 1668 GWh/5 yrs average.
- It is targeted to save 384 GWh (23%) by 2020 which requires decreasing consumption by 85 GWh (5.1%) in 2014.
- The government is implementing a two-phase program with a total cost of $43 million and a 60 GWh/yr projected saving.
- The first phase is improving the energy efficiency of the Water Authority of the Jordan

National Energy Efficiency Action Plan (NEEAP)

- e. Street Lighting
- It is the least consuming sector with an estimated steady share of 2% till 2020
- Baseline consumption of 288 GWh/5 yrs average.
- The 2014 target is reducing consumption by 6.6% (19 GWh) in order to save 86 GWh (30%) in 2020.
- Replacingthe mercury lamps by efficient lamps
- using automatic street lighting controls
- voltage regulators can save around 60 GWh by 2015and cost$9.15 million.

NEEAP- Phase 2

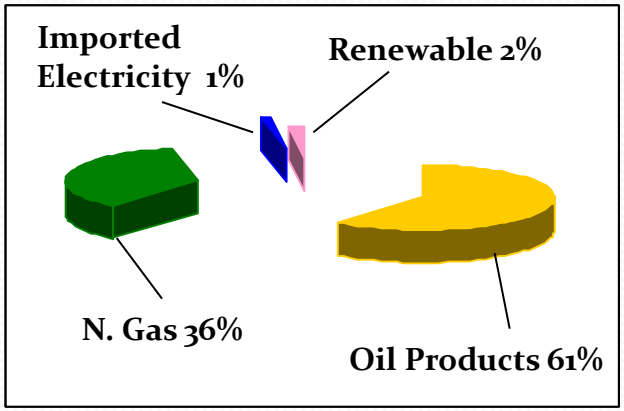
- In NEEAP 2 Jordan is trying to overcome all the obstacles that has faced Jordan in Implementing NEEAP –Phase 1
- Donors is playing a major role in helping Jordan to Implement the NEEAP.
- Donors Associate are:
  - ESCB/USAID Program and others
  - EU Sector budget Support Program "Renewable energy and Energy Efficiency Programme in Jordan"
  - Several AFD projects
  - GIZ program especially what is related to water pumping
  - JICA programs
  - Spanish Government & several others

RENEWABLE ENERGY IN JORDAN

Jordan Energy Strategy

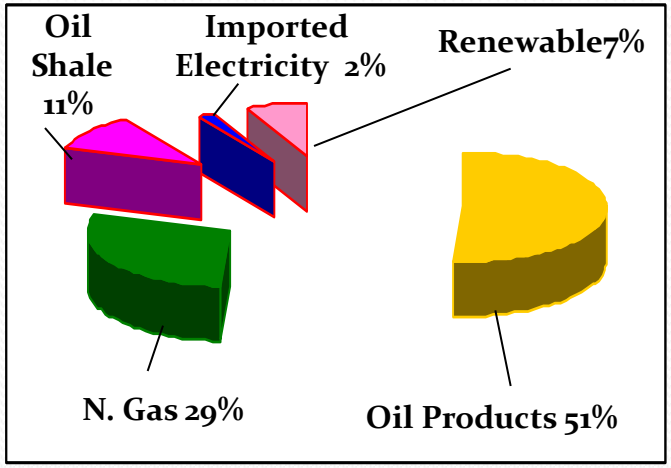
The Energy Mix in Jordan (2010 – 2020)

2010



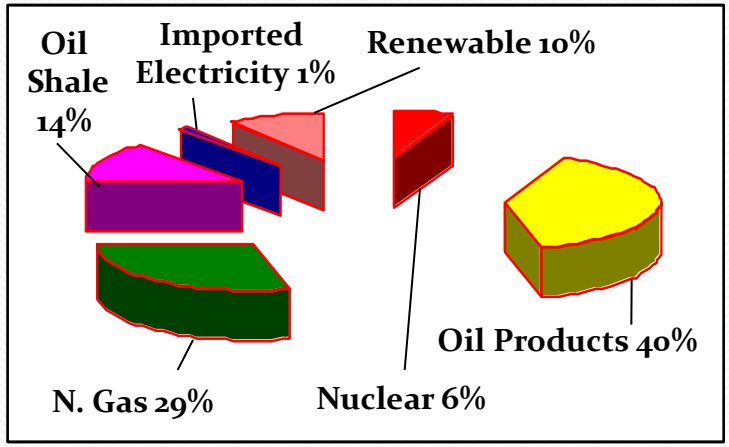
Domestic Resources 3%, Imported 97%

2015



Domestic Resources 25%, Imported 75%

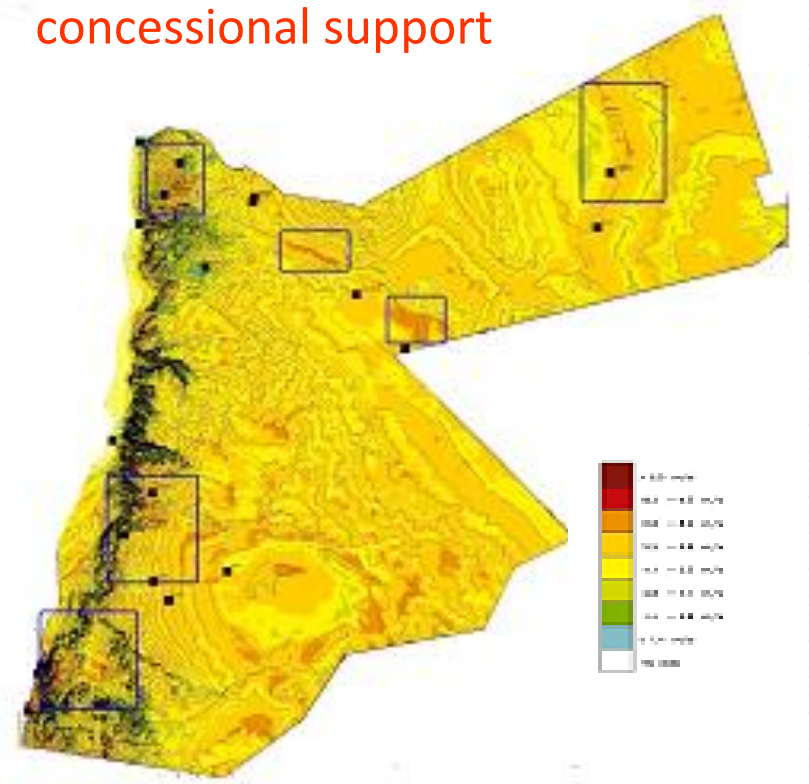
2020



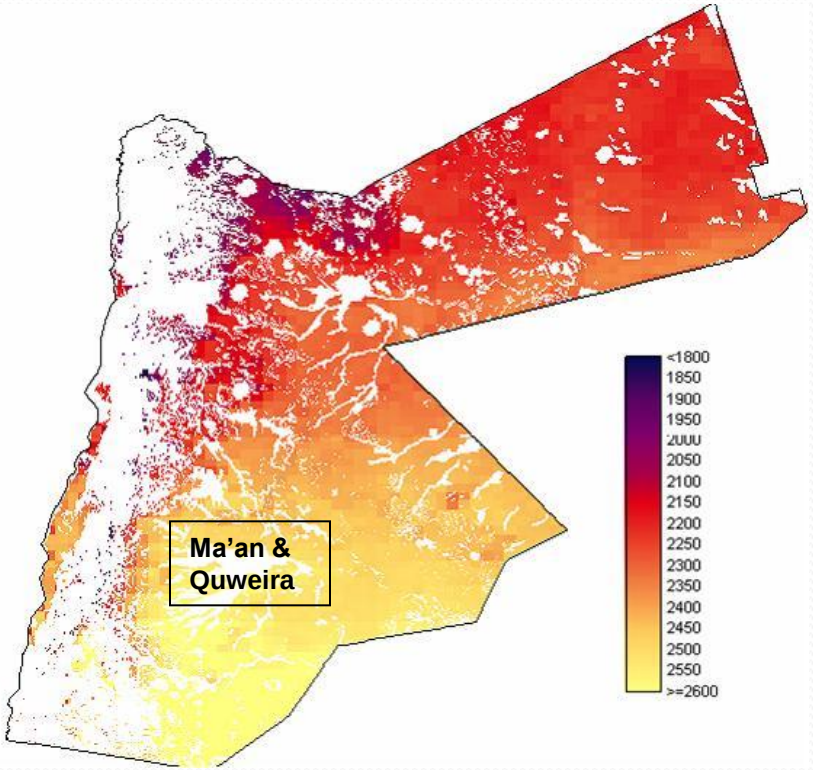
Domestic Resources 39%, Imported 61%

Jordan enjoys world class quality Solar and Wind Energy

- Wind speed reaching between 7.5 to 10.0 m/s in some places.
- Wind projects are now feasible and competitive without further concessional support



- High solar radiation figures of 5 – 7 kWh/m2 per day with about 300 sunny days per year.
- Jordan future Renewable Energy source is Solar Energy.



For Renewables to have the right position within the global Energy Context:

- Stable Regulatory Framework
- Adequate and Transparent Public Policies and Targets
- Clear Financial and Support Schemes
- Well defined Infrastructure Provisions (Lands, Grid connections, etc.)

Jordan is at the right path

A target of 10% renewable energy input into the energy mix by 2020 is set in the National Energy Strategy, mainly aiming for about 1200MW of Wind and 600MW Solar.

Regulatory Framework

- The Renewable Energy and Energy Efficiency Law was passed as a permanent Law in 2012 and amended in 2014.
- This law, the first in the region, allows investors to identify and develop grid-connected electricity production projects through the so called unsolicited or direct proposal submission.
- the Jordan Renewable Energy and Energy Efficiency Fund has been established, which aims to channel financial resources to that end.

- A well-founded reference price list (ceiling prices) for different Renewable technologies was set by the EMRC .
- Net- Metering for small RE Systems (Roof Tops) with Fixed Purchase Prices for Excess Power,
- Tax Incentive regime, a By-Law was issued on Tax exemptions for RE and EE systems and Equipment.
- Grid Expansion and Reinforcement Plans are ongoing

Reference Price List

RE source	Tariff Fills/ kWh
Wind Energy	80
Solar Energy (CSP)	135
PV	100
Bio mass	90
Bio gas	60

Renewable Energy Development Schemes

The Government is currently engaged with a three-track approach to develop RE Projects as follows:

a. Direct Proposals
b. Competitive Bidding
c. EPC Turn-Key

Direct Proposals Approach

Round 1:

- (64) EOIs were received in 2012 and (30) MOUs signed with total Capacity of 850 MW split between Solar and Wind.
- (12) Solar PV proposals were received in March 2013 with total capacity of (200) MW. PPAs signed in March 2014, financial close finished, or to be finished, maximum by the end of May 2015.
- Tafila wind project of (117) MW capacity is under construction, to be operational in September 2015.
- Solar PV project of (10) MW capacity in Mafraq area to be connected to the distribution network is under construction also, to be operational in July 2015.
- Wind Proposals of this round with total capacity of about (230) MW, in addition to a proposal from the first ranked bidder for the (90) MW IPP Wind Project at Fujei, have been received by the end of September 2014, currently under negotiations.

Tafila Wind Project (JWPC)

Round 2:

- Launched in August 2013, (83) Applications received on 14 November 2013, and (45) MOUs signed for PV projects (50 MW capacity each).
- (34) Solar PV proposals were received in February 2015, currently under evaluation.
- About (200-250) MW is allocated for this round

Round 3:

- A third round has been launched beginning of February 2014, but unfortunately cancelled later on due to grid limitation.
- About (400) MW total capacity is expected for this round after executing the expansion of the electricity grid (the Green Corridor).

Competitive Bidding Process

- Several projects are under investigation by MEMR to be tendered on public lands on due time, pending on grid capacity availability.

EPC Turn-Key approach

- (66) MW Wind project at Maan, funded through a Grant from the Kuwaiti Fund (USD 150 million), and awarded to a Spanish contractor, is currently under construction to be commissioned by the end of 2015 and operational by March 2016.
- (65-75MW) Solar PV Project at Quweira/Aqaba, funded through a Grant from Abu Dhabi Fund (USD 150 million) is currently under re-bidding process.
- Two Solar PV Projects with total capacity of (5) MW have finished construction at Azraq, in cooperation with the Spanish Government, and currently under commissioning.

Azraq Solar PV Projects

Net- Metering (Roof Top) Systems

- More than 4000 applications received by distribution companies, resulted in installations of about (20) MW of PV total capacity all over the country, it is expected to double this figure by the year end, or even more.

Conclusion

- Jordan has laid down the necessary Policy and Regulatory frameworks for Renewable Energy, and is ready to attract and receive commercial investments,
- Template contractual documents (mainly PPAs) and Instructions for developing RE projects do exist.
- By end of next year 2016, It is expected to have about (500) MW of Wind and solar projects operational, these will produce and inject clean electricity to the grid by an amount of (1500-2000) Giga watt hour and employ about (2000-3000) jobs at remote and less developed areas, beside saving about 2000 Million Tons of CO2 emissions.