



# Energy Situation in Jordan

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**Ministry of Planning and International Cooperation**

**Jordan**  
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# Current Energy Challenges

Jordan is facing a real challenge in securing its energy supply due to:

- **Almost no indigenous energy resources**
- **High dependency on imported energy**  
(97% imports in 2011)
- **Oil prices up**  
(energy imports accounted for 16% of GDP in 2011)
- **Continued increase in demand**
  - **high growth of primary energy demand (5.5% per annual)**
  - **high growth of electricity generated capacity (7.4% per annual)**

# Cost of Energy

▪ **Cost of imported energy in 2011 was 4019 million JD.**

- Crude oil and oil products	→	3700 million JD
- Imported natural gas	→	122 million JD
- Imported electricity	→	197 million JD

▪ **Total subsidies for oil products in 2011 was 555 million JD.**

▪ **Accumulated loss for electricity production was 992 million JD.**

## **Present Energy Crises**

- **Repeated sabotage of the Arab Gas Pipeline, which supplies Egyptian natural gas to Jordan, since February 2011, and resulting disruption in gas supplies has significant adverse macroeconomic implications for Jordan. Prior to the sabotage, Jordan imported about 80% of its gas needs from Egypt to generate electricity. When supplies of natural gas were interrupted, power plants had to switch to heavy fuel oil and diesel for electricity generation, which are about four times more costly than natural gas. This move cost the country approximately 3.5 million JD a day.**

**As a result, 555 million JD was paid as subsidy for oil products in 2011.**

## Potential and Strong Points

- **Jordan is considered as a hub and transit country and can play a major role linking oil, gas and electricity networks among the region.**
- **Jordan has a huge potential of Renewable Energy utilization (wind, solar).**  
*(Solar radiation 5-7 Kwh/m<sup>2</sup> per day, wind speed 7-11 m/s).*
- **Jordan has a huge potential of energy resources (Oil shale, Uranium).**
- **Jordan has potential of oil and gas exploration.**

- **Liberating oil products prices and adopting an international parity pricing for oil products.**
- **Restructuring the oil sector and open the market for competition.**
- **Establishment of Electricity Regulatory Commission in 2003.**
- **Structuring regulatory framework**
  - **General Electricity Law**
  - **Renewable Energy & Energy Efficiency Law**
  - **Energy Law (in progress)**

## **Implementation of Sector Policy**

- **A sound strategic framework is in place whose main elements are the Updated Energy Master Strategy of 2007, which is currently in the process of being revised, and the Executive Development Plan 2011-2013 of the Ministry of Energy and Mineral Resources (MEMR) to face the challenges of high and volatile energy prices, decreasing conventional energy resources, growth in energy demand and growing environmental concerns.**

## **Addressing Challenges**

- **The GoJ is seeking to address challenges in the energy sector through a combination of medium to long-term solutions. Additionally, the GoJ is seeking to improve its energy security and lower its exposure to external shocks in terms of supply. It is also working on the implementation of measures in line with the objectives to improve fiscal and macro-economic situation and sound and sustainable growth for Jordan.**



## Short-Term Solutions

- **Construct LNG Jetty at Aqaba port and connect with main Arab Gas Pipeline to diversify the gas resources. *(the cost of this project is around 300 million JD and the GoJ has allocated US\$ 65 million to fund the Jetty and other onshore infrastructure).***
- **Increase the country's strategic oil and oil products storage capacity. *(the cost is around 250 million JD).***
- **Implement comprehensive Energy Efficiency program in all sectors. *(the cost is around 50 million JD).***

## **Medium and Long Term Solutions**

- **Continue the implementation of the country's energy strategy through:-**
  - **Maximizing the utilization of domestic resources (oil shale, natural gas, etc.).**
  - **Expanding the development of renewable energy projects.**
  - **Generating electricity from nuclear energy.**
  - **Enhancing regional interconnection of electricity and promoting Jordan as a regional hub.**

# **Renewable Energy Targets**

**Promoting Renewable Energy to share 7% in the primary energy mix in 2015 , and 10% in 2020 :**

- **1200 MW Wind Energy**
- **600 MW Solar Energy**
- **20 - 30 MW Waste to Energy**

# Current Activities and Projects

## **A. Renewable Energy and Energy Efficiency Law:**

The Renewable Energy and Energy Efficiency Law No.(13) of 2012 have been issued in the Official Gazette on 16/4/2012.

### By-Laws and Regulations for Investment:

The by-laws and regulations related to renewable energy projects for electricity generation have been issued by the Electricity Regulatory Commission, especially the indicative price list for Renewables and the Net-metering mechanism for small RE systems.

### Renewable Energy & Energy Efficiency Fund:

Upon the issuance of the Renewable Energy Law, MEMR started the process for establishing this Fund.

## **B. Direct Proposal Submission:**

### **- Expression of Interest:**

MEMR received (64) EOIs, (34) of them with total capacity of (1000 MW) have been shortlisted on 23 April, 2012. (29) MOUs were signed.

### **C. Al-Kamshah (30-40) MW Wind Energy Project:**

Project stopped under the direct proposals submission due to withdrawal of the two bidders. MEMR is studying options in this regard.

### **D. Fujeij (70-90) MW Wind Energy Project:**

- Coordinated by the World Bank.
- An Addendum was issued to bidders to submit revised bids by the 23rd August 2012.
- One revised bid was received, under evaluation.

### **E. Al-Azraq (1) MW PV Solar Project (Debt Swap):**

Tender Documents prepared and submitted to the Spanish Government for approval. Tender to be launched in September to Spanish companies.

## **Future Activities and Projects**

### **A. Wind Pooling Project in the Southern Region with a Capacity of (200-300) MW:**

- Under land surveying, tender to be lunched in September. Pending upon successful conduction of the joint wind measurement campaign.

### **B. (100) MW CSP Solar Project:**

- Pending upon securing the required soft financing schemes and the Land at Quweirah site.

## **C. Direct Proposal Submissions under the Signed MOUs with the Qualified Applicants:**

Direct Proposal Submissions for Renewable Energy Projects are expected as follows:

- Photovoltaic (PV) Projects; by the 1st quarter of year 2013.
- Concentrated Solar Power (CSP) Projects; by end 2013.
- Wind Energy Projects; by the end of 2013 or the 1st quarter of 2014.



## **Oil Shale**



**The Energy Strategy comprises promoting oil shale as a new source of energy to contribute 11% in the primary energy mix in 2015, and 14% in 2020.**

**The GoJ is currently engaged with a three-tracks approach to deal with Oil Shale development.**

# Oil Shale

✓ **Exploiting Oil Shale in three ways:**

**1. In Situ technology to produce oil from deep reserves of oil shale (Shell Technology):** The company is executing its exploration program in the concession areas (the Final Investment Decision to be taken during the period 2020 to 2023).

**2. Surface Retorting of Oil Shale:**

▪ **Currently (6) international companies are preparing bankable feasibility studies to produce oil from the surface oil shale reserves especially in Lajjoun and Attarat Umm Ghudran areas in the southern part of Jordan.**

▪ **The Estonian Company Enefit and the British Karak International Oil Company have signed Concession Agreements to produce oil through surface retorting, now the two companies are completing their Exploration and Development programs to take the Final Investment Decision.**

# Oil Shale

- 3. Electricity Generation through direct combustion of oil shale:**
  - **Negotiations ongoing with the Estonian Governmental Company Eesti Energia to develop a 430 MW plant on BOO basis for power generation to be operational in 2016. The company was given a Comfort letter to be used for financing reasons.**
  - **A MoU was signed with a consortium consisting of the Chinese Company (HTG) and the Jordanian Company (Lajjoun) to conduct a complete feasibility study for developing (600-900) MW power plant through direct combustion of oil shale.**

# Electricity Sector

- The actual electricity generation capacity in the kingdom is 3050 MW.
- Electricity consumption is amounted to 2800 MW during the peak period.
- It is expected that the annual growth rate of demand for electric power to reach about 7.4% up to the year 2020.
- Two decisions for changing the electricity tariff were taken by the cabinet in which the tariff was increased with an average of 20% for all consumers categories and the tariff level reached to 88 fils/kWh instead of 72 fils/kWh, while the cost of electrical system tariff is about 189 fils/kWh.
- There is an electric interconnection with Egypt & Syria under the framework of Eight Countries Electric Interconnection Projects.

## **Electricity Sector**

- **Continuing the privatization of power sector program.**
- **Diversifying the energy sources for electricity generation through using oil shale, nuclear and renewable energy.**
- **Attracting Independent Power Producers( IPP) to generate electricity on BOO basis.**

- **4000 MW new additional generating capacity is needed until the year 2020. This capacity will be implemented through Independent Power Producers (IPPs) based on BOO basis with an average 300MW /annum.**

Project /Tender	Status
- First IPP- 370 MW CC (AES- Mitsui)	in operation since September 2009.
- Second IPP- 373 MW CC (Kepco)	under commissioning test
- Third IPP: 573 MW. Diesel engines on dual fuel.	Expected to be in operation in 2014
-Fourth IPP with a capacity of 241 MW	

## **Oil and Gas Exploration**

- **Increase oil and gas exploration activities.**

- The Kingdom is divided into 9 blocks according to its geological features.**

- Five blocks are currently under concession agreements.**

- South Jordan block under process of CSA.**

- Al-Jafer area and Dead Sea blocks under process of MOU's.**

- Northern highlands block is still open for exploration.**

# Petroleum Sector

- Currently crude oil is imported from Saudi Arabia, at an average of 2.5 million barrels monthly with an annual signed contract with ARAMCO Saudi Arabia on a commercial basis.
- Daily imports of about 10000 barrels of crude oil from Iraq and it was agreed to increase the imported quantity to 15000 barrels daily.
- The consumption of crude oil and its products was about six millions tons of oil equivalent in the year 2011.
- 70% of the kingdom's needs of oil products is secured by Jordan Petroleum Refinery Company (JPRC), and the remaining 30% of the quantity is supplied from the world market via tenders submitted by JPRC.
- It is expected that the average annual yearly growth for energy demand until the year 2020 is about 5.5%.
- Monthly pricing of products is made according to world procedures which includes the average pricing as published in the economic brochure such as Platts plus the extra charges on delivery of these oil products from the world markets to the consumer.



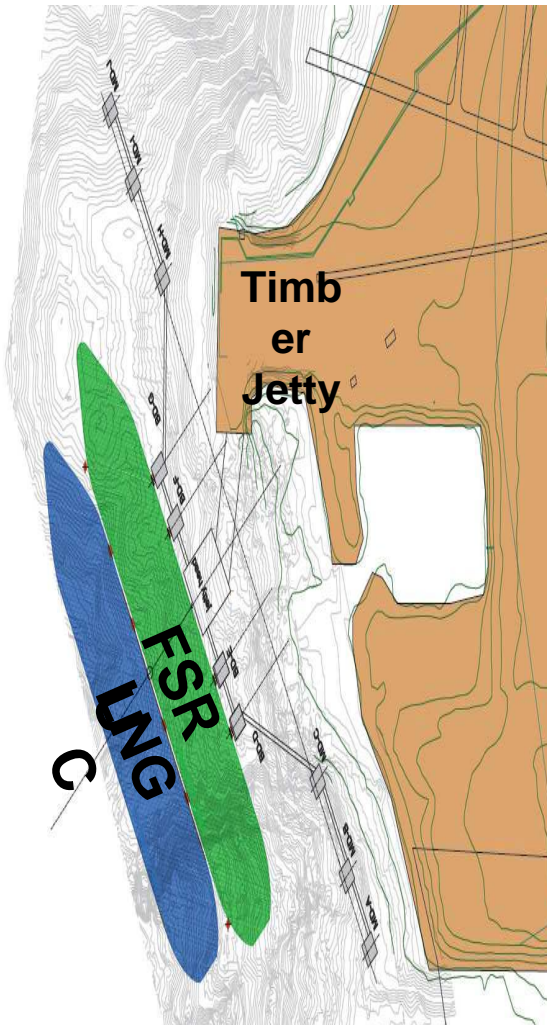
## **Securing Storage Capacities for Crude Oil and Oil Products**

- The tender for this project has been announced (Request for Prequalification), and it is anticipated for the project to be in operation in the first half of 2014 for building storage capacities ( 100,000 ton crude oil or products in Aqaba).
- Assigning of extra land for the project about 23,000 square meter sto be used for building storage capacities in Aqaba about 6000 tons to meet the kingdom's need for three days in winter.

# Energy Ports in Aqaba

- The Ministry of Energy and Mineral Resources together with Aqaba Development Cooperation (ADC) and Aqaba Special Economic Zone Authority (ASEZA) are following up to continue the studies for build and construct the projects of the following energy ports in Aqaba:
- Development and rehabilitation of the current oil port (19 million JD), to be operational in of 2013.
- Temporary berthing facility to serve the LPG vessels (3.5 million JD), to be operational by the end of 2014.
- Building LNG port (45 million JD), tender has been announced in September 2012 to be operational in end of 2014.
- Building the second oil jetty to be operational after the year 2017.
- Building LPG port to be operational in 2015.
- Miscellaneous Liquids port in partnership with the private sector.

# Liquefied Natural Gas



- ❑ Approval of the cabinet on 26/5/2012 to import LNG through three main tracks:
  1. Importing LNG from international market through tendering or bilateral agreements- complete tendering process and awarding gas contract by one year from date of cabinet resolution.
  2. Constructing LNG Jetty and connecting with main Arab Gas Pipeline (issuing tender by ADC in coordination with MEMR. GoJ has allocated 65 million USD to fund the Jetty and other onshore infrastructure).
  3. Leasing FSRU through requesting for proposals from the main FSRU providers, to be completed by the end of 1st quarter of 2013.
- ❑ Holding a meeting of joint technical team with Qatari side to discuss the issues related to supply Jordan with LNG after making available all the data requested by them. A technical meeting was held in Amman which agreed upon the next steps..



# **Priorities in the Energy Sector Presented for Donor Support**

- **Construct LNG terminal at Aqaba port to diversify the gas resources.**
- **Increase the country's strategic oil and oil products storage capacity.**
- **Assist Jordan Government to complete already undertaken institutional and legislative reforms, with a view to create the best possible enabling environment to mobilize public and private actors to achieve goals of 10% renewable energy and 20% of energy saving in 2020.**

- **100 MW Concentrated Solar Power (CSP) project:** through the Mediterranean Solar Plan (MSP), where soft financing is expected through the so-called Clean Technology Fund (CTF) managed by the World Bank. A roadmap for project financing and implementation is currently undergoing by an international consulting. Financial support is required for this project.
- **2 MW (PV) Solar Power Project:** through a soft loan provided by the Spanish Government. Financial support is required for the expenses of the expected Consultant to supervise the implementation and construction of the project.

- **Renewable Energy & Energy Efficiency Fund (REEEF):** to be established under the Renewable Energy Efficiency Law provisions. Support is required for the Fund after establishment.
- **Promoting support on sustainable production and use of renewable energy, its importance in accelerating the transition towards a low-carbon economy, and also its positive effects on the economics of developing countries, serving to generate income and employment, to combat poverty and inequality.**
- **Creation of knowledge-networks and partnerships within and between regional authorities, in order to promote the sustainable production use of RE worldwide.**

- **Setting up the Energy Efficiency Database within the framework of the “support to the implementation of the Jordan Energy Efficiency Roadmap”.**
- **Supporting Ministry of Energy and Mineral Resources with concerned experts to qualify the Energy Service Companies (ESCO’s) and experts in the field of training and enabling the energy auditors.**



**Thank You**

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