

***The Hashemite Kingdom of Jordan***

***Ministry of Energy and Mineral Resources***

***The Jordanian IPP Solar Power Project***

***The International Executive Conference on Concentrating  
Solar Power (CSP)***

***Berlin, 19-20 June, 2002***

## **General Information about Jordan**

- **The area of Jordan is approx. 34500 sq.miles (90000 sq km).**
- **5.1 million population.**
- **3.4% population growth.**
- **The gross domestic product (GDP) for 2001 at current price reached million JD 6259 (million US\$ 8.815).**
- **GDP Growth for 2000 and 2001 is 3.9% and 2.8% respectively.**

## *Sources of Energy in Jordan*

•Jordan depends mainly on imported oil for its energy needs. In the year 2001 it imported about 4.9 million tons, out of which electricity consumed about 1.8 million tons.

•Jordan has very limited source of natural gas with a yearly production of about 220 Thousand tons equivalent heavy fuel oil and is completely consumed for electricity generation . The generation from domestic gas is about 11% .

•Oil shale reserves are quite available ( about 40 billion tons proven reserves ) but not yet in use.

•Potential for wind and solar energy is quite available. Efforts are being made to promote electricity generation from wind and solar energy.

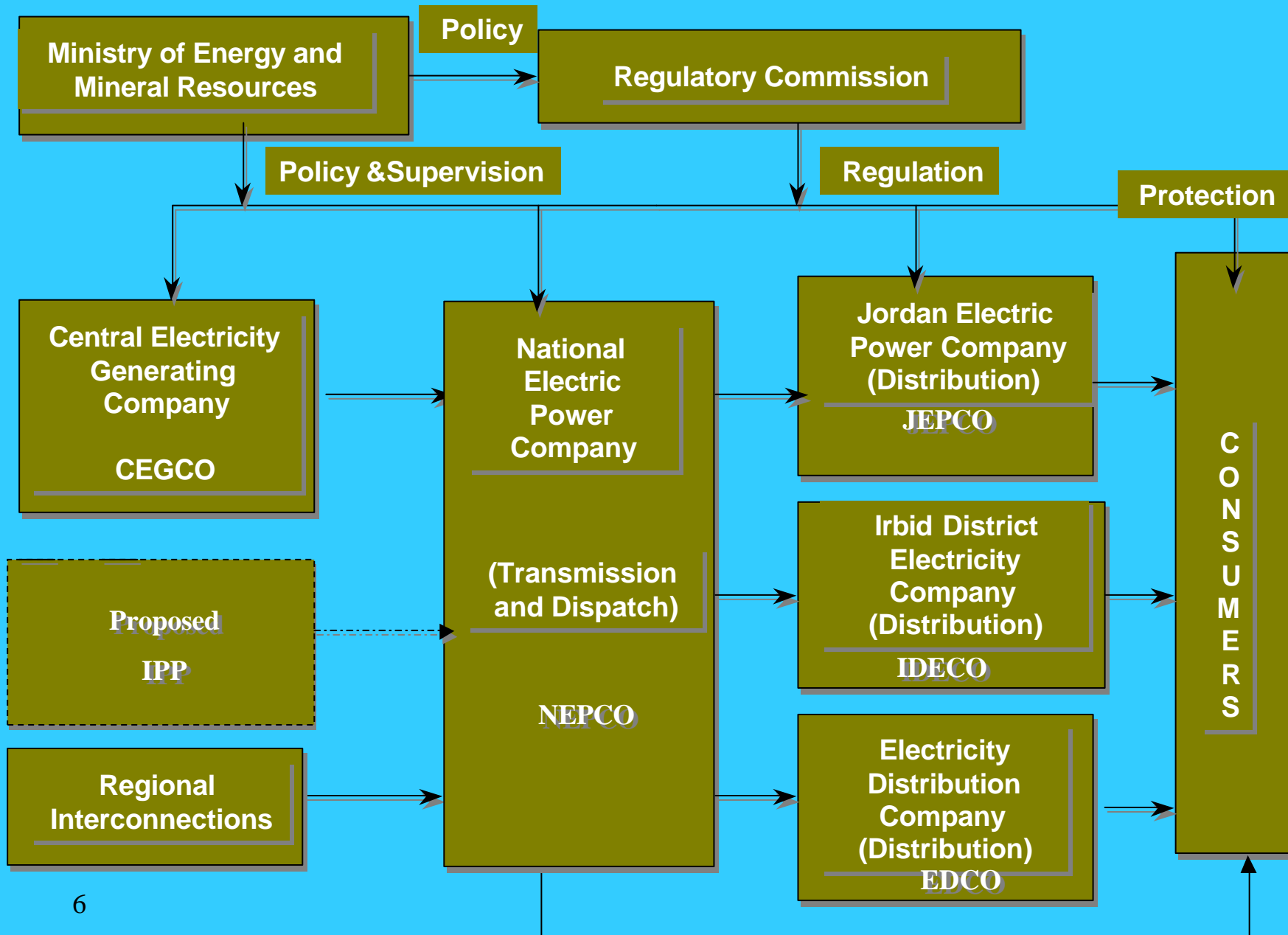
## *Significant Electricity Indicators in Jordan – 2001*

<b>Jordan's installed generation capacity</b>	<b>1575 MW</b>
<b>Available generation capacity</b>	<b>1470 MW</b>
<b>System's peak load</b>	<b>1255 MW</b>
<b>Average per capita yearly consumption</b>	<b>1400KWh</b>
<b>Population % supplied with electricity</b>	<b>99 %</b>
<b>Total system losses</b>	<b>18 %</b>

# Electricity Demand Forecast

YEAR	Max. Demand			Generated Electrical Energy		
	(MW)	Growth Rate(%)		(GWH)	Growth Rate(%)	
2001	1255	4.0%	6.6%	7668	7.0%	6.3%
2002	1324	5.5%		8179	6.7%	
2003	1399	5.7%		8687	6.2%	
2004	1488	6.3%		9218	6.1%	
2005	1581	6.3%		9788	6.2%	
2006	1692	7.0%	4.5%	10529	7.6%	4.7%
2007	1777	5.0%		11021	4.7%	
2008	1844	3.8%		11477	4.1%	
2009	1910	3.6%		11904	3.7%	
2010	1968	3.1%		12289	3.2%	
2015	2219	2.3%	2.4%	13901	2.3%	2.5%

# Jordan Electricity Sector - Existing Structure



# **Electricity Sector Reform**

## **Government Strategy**

- **Increasing Private Sector participation in generation and distribution electricity.**
- **Promotion of Competition (Generation).**
- **Establishment of Independent Regulatory body for the Power Sector.**

## **Implementation of the Strategy**

- **The vertically integrated state-owned utility, NEPCO has been unbundled in 1999 into three separate public shareholding companies:**

**CEGCO- Generation**

**NEPCO- Transmission**

**EDCO - Distribution**

- **The Gov. issued a new Electricity law in April 1999 which establishes regulatory frame work and supports sector restructuring.**
- **The interested Independent Power Producers (IPPs) have been invited to bid for IPP projects in Jordan.**

## ***Current IPP Projects in Jordan***

- **Samra 450 MW Combined Cycle Power Plant.**
- **75-90 MW Wind Parks at three sites.**
- **130 MW Solar Hybrid Power Plant.**

**GOJ Reform Policy within the**  
**Framework of Economic Stabilization &**  
**Restructuring Programs/ 1990-2001.**

- 1- Legal and Regulatory Reforms**
- 2- Liberalization**
- 3- Reform of the Financial Market**
- 4- Jordan Responding to Globalization**

## **Development of 100 -150 MW solar hybrid power project at Quwairah area south of Jordan**

### **Project Description:**

**The project is aiming at the development of 100-150 MW solar hybrid power plant using solar energy source assisted with fuel oil or natural gas fired boiler at Quwairah area south of Jordan , on a Build , Own, and Operate ( BOO) Basis. The solar system could utilize either the parabolic trough technology or the solar tower technology.**

**The estimated total investment cost is about Million US\$ (200-300).**

## *Project Timetable:*

The expected implementation schedule of the project will be as follows:

<u><i>Date</i></u>	<u><i>Action</i></u>
<b>July 8,2001</b>	<b>Call for Proposals</b>
<b>Feb. 14, 2002</b>	<b>Deadline for Proposals submission</b>
<b>June 2002</b>	<b>Evaluation of proposals</b>
<b>December 2002</b>	<b>Completing negotiations with developer and signing the project agreements( if the prices are competitive)</b>
<b>June 2003</b>	<b>Reaching the financial close</b>
<b>End of 2005</b>	<b>Commercial operation date</b>

### ***Project Current Status:***

**One proposal was received from Solar Millennium (Germany) and is now under evaluation.**

### ***Consulting Services:***

**Hiring a Consultant for this project depends on the outcomes of the evaluation process to the received proposal, and on the competitiveness of the tariff proposed.**

## **Project Requirements**

**The Project Sponsor shall be responsible for the following requirements :**

- The design, Procurement of equipment, Construction, Operation and Maintenance of the Power Plant.**
- Secure the required Financing of the Project.**
- Enter into an Implementation Agreement (IA), Power Purchase Agreement (PPA), and Land Lease Agreement (LLA) with the concerned Institutions.**

## **Project Requirements (continued)**

- EPC, and all other agreements including the loan agreements required to construct finance, operate, and maintain the project.**
- Establish and register a Local Project Company upon the completion of negotiation and signing of the project agreements.**
- Propose a Competitive Levelized Tariff compared to the conventional base unit plants.**

## *Some Incentives and Exemptions for power projects*

**1- Electricity Generation Projects fall into the category of “industrial projects” and qualify for the following incentives according to the Investment Promotion Law No.(16) of 1995.**

**A- 100% exemption of fixed assets and spare parts from custom duties and taxes.**

**B- 75% exemption from income and social services taxes over a period of (10) years in the Southern Region which falls into zone C. ( such as this Solar power project).**

**2- In addition, the Law No.(16) provides for:**

- A- National treatment.**
- B- Repatriation/ transfer of capital, profits and proceeds  
from asset sales and liquidation in foreign currency.**
- C- Dispute settlement.**
- D- Protection against experimentation.**

## **Implications of the Electricity Law for Electricity Generating Power Projects**

- **Competitive bidding is mandatory for projects with an installed capacity of more than 5 MW.**
- **The Project Company have to be licensed from the Electricity Regulatory Commission (ERC) of the power sector.**
- **The power projects are required to produce electricity at competitive prices.**

**Implications of the Electricity Law for Electricity  
Generating Power Projects (Continued)**

- 4- The IA agreement shall be with MEMR, and the PPA shall be with NEPCO.**
- 5- Electricity tariffs are set by the ERC.**
- 6- The technical, financial and statistical information related to the installation and operation of the power project have to be submitted to both MEMR and ERC.**
- 7- An Environmental Impact Assessment (EIA) is required.**

# *Power Purchase Agreement*

## *Single Buyer MODEL*

### *National Electric Power Company*

#### *(NEPCO)*

- *Capacity Charge*
- *Energy Charge*

## ***Current Barriers in the Project:***

- **Very High Production Cost (cents/kWh)**
- **The Investment Cost of the Solar Block is High**
- **The Electricity Tariff is not Competitive**
- **Project Financing**

## **Possible Solutions:**

- Preferential Financing**
- Some Grants to Cover the Solar Share or the Incremental Cost.**