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# ASSESSMENT OF PRIVATIZATION OF THE ELECTRIC POWER SECTOR IN SELECTED ESCWA MEMBER COUNTRIES

## VOLUME III

## CASE-STUDY OF JORDAN

UNITED NATIONS
New York, 1997

Bibliographical and other references have, wherever possible, been verified. References to dollars ($) are to United States dollars unless otherwise stated.

## Foreword

The importance of the role of electrical energy in socio-economic development cannot be overemphasized. Electrical energy can be easily converted to any other form of energy, transmitted long distances and distributed over large areas. It can cross countries without being subjected to any border-crossing formalities. It is therefore a tradable commodity as well as a service rendered to consumers.

However, the provision of electricity requires large investments in establishing, operating and maintaining electric power generation, transmission and distribution systems and the related facilities. A projected investment of about US$ 1,500 billion will be needed between 1995 and 2010 to finance the electric power expansion projects in developing countries. The share of the ESCWA region[1] in this investment is estimated at US$ 90 billion. It is clear that the required investment in the power sector is huge. The ability of the concerned Governments to provide this funding in the amount required is severely limited and the international funding institutions have neither the will nor the capability to provide soft loans for power projects. Therefore, the only viable option is to involve private investment in the power sector. Consequently, new financing modalities are needed to pool all available resources to ensure an acceptable level of risk. Different modalities are evolving worldwide, and countries should select carefully the modality most appropriate for their requirements.

In spite of the fact that there are growing efforts in most of the ESCWA member countries to promote more involvement of the private sector in various economic activities and infrastructure projects, the privatization of the power sector is still an evolving process and its logistics need to be more carefully studied.

Some ESCWA member States have already taken steps to privatize the electric power sector. The ESCWA secretariat has assumed the responsibility of studying the experiences in the region and of presenting a synthesis of these studies to the other member States so that each ESCWA member can benefit from the experience of the others. To that end, the ESCWA secretariat commissioned a group of experts to prepare four studies on the project. The experts have different backgrounds and work experience in both the public and private sectors. The first study is an overview of the whole issue of privatizing the electric power sector, including a summary of the present situation, projected future developments in the power sector and the approaches of the three selected countries to privatization of this sector. The other three studies commissioned are case-studies of three selected member countries: Egypt, Jordan and Yemen. The four experts and the ESCWA regional adviser on energy held a two-day round table discussion in Cairo on 28 and 29 November 1996, to exchange views in order to coordinate the content of the four studies and to discuss the conclusions of the studies.

The four studies have been revised by ESCWA secretariat staff and are presented in separate volumes:

1. **Volume I.** *Assessment of Privatization of the Electric Power Sector in Selected ESCWA Member Countries, An Overview.* This volume depends mainly on the contributions of Salah Afifi, the ex-Regional Director of Westinghouse Company and the present Chairman of the International Business Network (IBN) Egypt and Emad El-Sharkawi, the former Chairman of the Egypt Electricity Authority.

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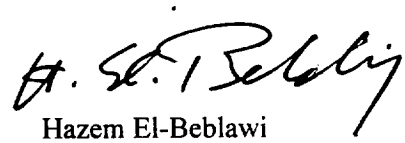
[1] The ESCWA members are Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, the Syrian Arab Republic, the United Arab Emirates and Yemen.

2. **Volume II.** *Assessment of Privatization of the Electric Power Sector in Selected ESCWA Member Countries, Case-study of Egypt.* This volume was prepared by Emad El-Sharkawi, the former Chairman of the Egypt Electricity Authority.

3. **Volume III.** *Assessment of Privatization of the Electric Power Sector in Selected ESCWA Member Countries, Case-study of Jordan.* This volume is based mainly on the study prepared by Mohammed Azzam, Director of Planning of the Jordanian Electricity Authority/National Electricity Power Company.

4. **Volume IV.** *Assessment of Privatization of the Electric Power Sector in Selected ESCWA Member Countries, Case-study of Yemen.* This volume is based mainly on the study prepared by Abdel Moati Al-Jonaid, Deputy Director of Technical Affairs of the Yemeni Public Electricity Cooperation.

Finally, on behalf of ESCWA, I am pleased to acknowledge the valuable contributions made by the four consultants and the ESCWA staff members to the present publication.



Hazem El-Beblawi
Executive Secretary

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## ABBREVIATIONS

| | |
|---|---|
| **BOO** | build - own - operate |
| **BOOT** | build - own- operate - transfer |
| **GDP** | gross domestic product |
| **GEL** | General Electricity Law |
| **GNP** | gross national product |
| **IDECO** | Irbid District Electricity Company |
| **IPP** | independent power producer |
| **JEA** | Jordan Electricity Authority |
| **JEPCO** | Jordan Electric Power Company |
| **JIC** | Jordan Investment Corporation |
| **LRMC** | long run marginal cost |
| **NEPCO** | National Electric Power Company |
| **TOE** | ton of oil equivalent |
| **WASP** | Wein Automatic Scheduling Programme |

Currencies

| | |
|---|---|
| **JD** | Jordanian dinar |
| **US$** | United States dollar |

Measures

| | |
|---|---|
| **GWh** | Gigawatt hours = Million kWh |
| **km** | kilometre = 1,000 metres |
| **kV** | Kilovolt = 1,000 volts |
| **kWh** | Kilowatt hour = 1,000 watt hour |
| **MVA** | Megavolt - ampere |
| **MW** | Megawatt = 1,000 kW |
| **MWh** | Megawatt hour |

## Introduction

The Hashemite Kingdom of Jordan lies at the crossroads between Asia and Africa. The area of Jordan is approximately 90,000 square km. The population is slightly more than 4 million inhabitants; 23 per cent live in rural areas. About 90 per cent of the population live in the north-west of the country, in a region constituting approximately 10 per cent of the country's total area. The GNP for 1995 reached about US$ 1,750 per capita.

The Jordanian economy grew rapidly in the 1970s and the early 1980s, and per capita income reached a level of about US$ 1,690 in 1982. The Government had no difficulty in mobilizing the resources required to finance most of the public infrastructure projects. However, this situation changed and in the late 1980s, reflecting the drop in the substantial financial support of the oil-producing countries in the Gulf region which, when combined with Jordan's limited resources base, led in 1989 to an economic crisis. Per capita income dropped to about US$ 1,100 in 1991, a decrease of about 35 per cent over 1982 levels in real terms. The economic crisis led the Government to initiate implementation of a comprehensive economic adjustment and reform programme.

Jordan is currently implementing an economic adjustment programme aimed at sustaining and improving growth levels, improving the balance of payments, and reducing both inflation and the budget deficit. Most important, the programme, along with other economic policies, is aimed at liberalizing the economy, integrating it with other economies, and stimulating private sector involvement in long-term development.

Jordanian economic performance improved steadily after the Government began to implement the economic adjustment and reform programme. Per capita income increased in 1995 to a level of about US$ 1,750, as noted above. Table 1 presents projected movements of some key economic indicators.

TABLE 1. SELECTED ECONOMIC INDICATORS FOR THE YEARS 1995-2000

| | Actual | Estimated | Projected | | | |
|---|---|---|---|---|---|---|
| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| Real GDP growth (%) | 6.4 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| GNP per capita (US dollars) | 1 747 | 1 846 | 1 939 | 2 021 | 2 109 | 2 212 |
| Fixed investment | | | | | | |
| (millions of US dollars) | 2 168 | 2 412 | 2 739 | 2 895 | 3 138 | 3 409 |
| Public | 461 | 520 | 538 | 562 | 584 | 616 |
| Private | 1 707 | 1 893 | 2 201 | 2 333 | 2 554 | 2 793 |
| Gross domestic savings | 14.9 | 15.0 | 16.3 | 17.6 | 19.4 | 21.2 |
| Public | 1.7 | 2.7 | 3.4 | 3.7 | 4.0 | 4.0 |
| Private | 13.2 | 12.3 | 13.0 | 13.9 | 15.5 | 17.2 |

During the period 1996-2000, total investment was projected at US$ 14.6 billion, of which the Government of Jordan plans to commit the equivalent of about US$ 2.8 billion in fixed public investment expenditure. Investment will be financed by government savings, private sector savings, and foreign assistance in the form of external borrowing from official and non-official sources, grants and foreign investment.

# I. THE JORDANIAN ELECTRIC POWER SECTOR

## A. INSTITUTIONAL FRAMEWORK

Jordan is almost entirely dependent on imported oil to meet its commercial energy needs, which in 1995 amounted to about 4.4 million TOE. Jordan's modest energy resources consist of small amounts of proven oil and natural reserves in the eastern part of the country near the borders with Iraq, and oil shale deposits located mainly in the central part of the country. Efforts have been made to promote the utilization of solar and wind energy resources.

The energy and electricity sectors in Jordan are under the supervision of the Ministry of Energy and Mineral Resources, which was established in 1984 to address Jordan's unique energy situation: lack of indigenous resources, dependence on imports of crude and petroleum products, and the high cost to the economy of this dependence. The role of the Ministry is to formulate a coherent set of national policies to achieve energy security by improving efficiency, diversifying supply sources, and ensuring the efficient and reliable operation of the entire energy system.

The year 1947 witnessed the beginnings of the electricity industry in Jordan. In that year, the first electrical company was established by private investors to generate and distribute electricity in the Amman area. This company is known as the Jordan Electric Power Company (JEPCO).

In 1961, another privately owned electrical power company was established to serve the northern area of the country, the Irbid District Electricity Company (IDECO).

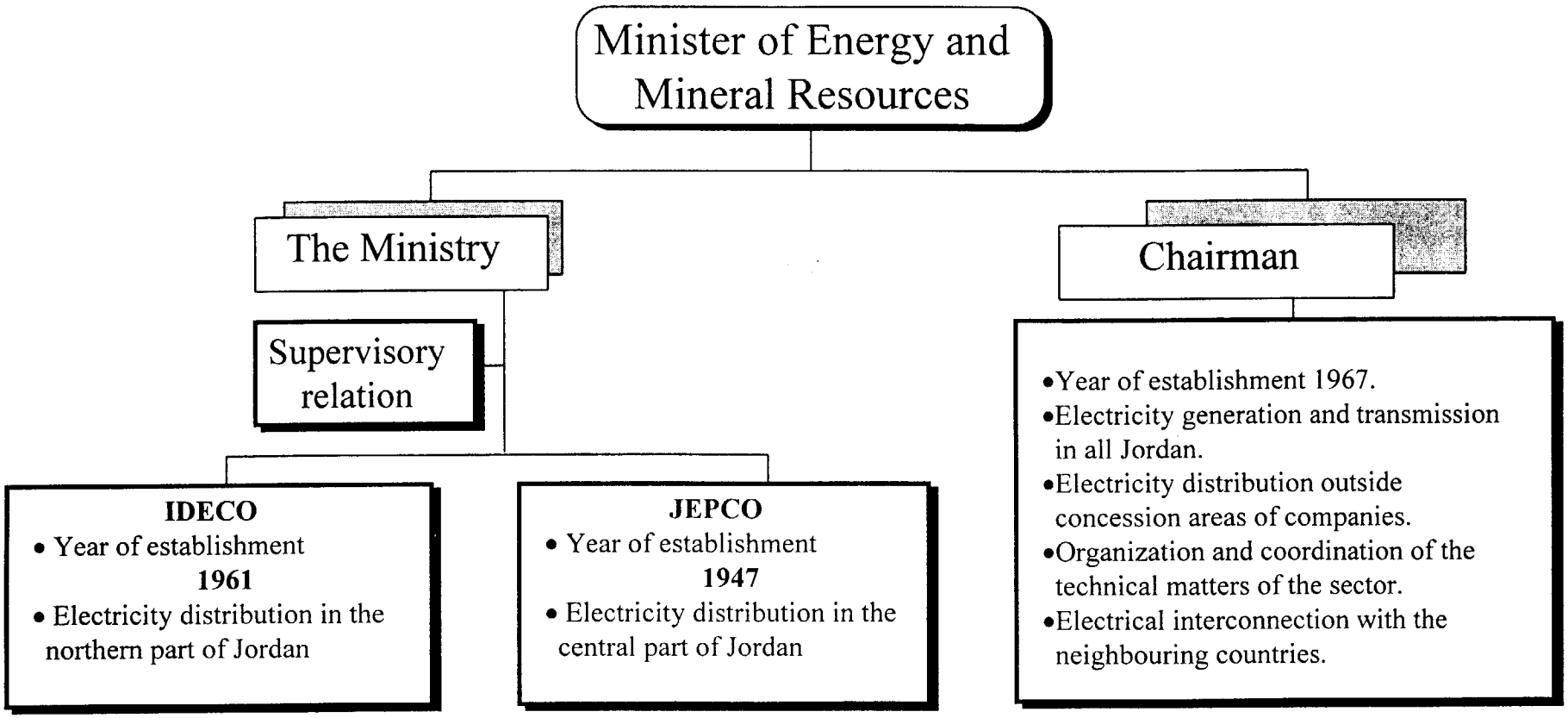
Electrification on a national scale began to develop significantly in the early 1960s; this required huge investments beyond the capacity of the two private shareholding companies JEPCO and IDECO. The Government therefore established the Jordan Electricity Authority (JEA) in 1967 as a semi-autonomous government utility, responsible for generation and transmission of electricity all over Jordan. Figure I shows the organizational structure of the electricity sector in Jordan before September 1996.

In September 1996, the JEA was transformed into a shareholding company, 100 per cent government-owned. The new company is the National Electric Power Company (NEPCO).

## B. JORDAN ELECTRICITY AUTHORITY

The JEA was until recently the dominant institution in the power sector. It was responsible for all generation (except industrial self-generation) and transmission. It directly distributes electricity to approximately 14 per cent of the nation's consumers, and owns a majority share (55 per cent) in IDECO as well as a minority share (8 per cent) in JEPCO.

**Figure I. Organizational structure of the electricity sector**



The JEA was established as a government-owned authority in 1967 under the General Electricity Law (GEL), which defines the responsibilities of the JEA. The responsibilities include the construction and operation of generation and transmission facilities, bulk power sales to large industrial customers and distribution entities, and retail sales to some consumers, mainly in the central areas of Jordan. In addition, the JEA was responsible for the determination and implementation of electricity tariffs, subject to the approval of the Cabinet. The JEA operated with a great deal of autonomy as a result of the legislation defining its role and responsibilities and its historically strong top management.

The JEA was managed by a Board of Directors under the chairmanship of the Minister of Energy and Mineral Resources and operated on a commercial basis. The JEA enjoyed considerable independence and more flexibility of operation than most government agencies in Jordan. Its Board approved the annual budget and loans subject to the approval of the Cabinet. Tariff changes also had to be submitted to the Cabinet for approval.

On the basis of all performance indicators, the JEA was fairly efficient in its generation and transmission operations; however, its financial performance during the period 1989-1992 faltered because of the devaluation of the Jordanian dinar. Performance improved in 1993, however. Some of the performance indicators for the JEA are provided in table 2.

TABLE 2. PERFORMANCE INDICATORS FOR THE JORDAN ELECTRICITY AUTHORITY

| Performance indicators | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|
| Technical indications | | | | | |
| Thermal efficiency (%) | 33.8 | 33.8 | 32.9 | 32.0 | 33.1 |
| Average hours supply interruption per annum | 5.5 | 17.0 | 5.5 | 6.0 | 6.0 |
| Total energy losses (%) | 10.2 | 10 | 9.6 | 9.3 | 9.9 |
| Generation losses (%) | 6.6 | 6.6 | 6.5 | 6.1 | 5.8 |
| T&D losses (%) | 3.8 | 3.7 | 3.1 | 3.1 | 3.8 |
| Financial indicators | | | | | |
| Total cost/kWh sold (fils) | 27.5 | 24.2 | 25.2 | 27.0 | 27.0 |
| Fuel cost/kWh sold | 11.8 | 12.1 | 13.8 | 15.5 | 15.6 |
| Return on average net assets (%) | 4.4 | 6. | 10.5 | 14.8 | |
| Self-financing ratio (%) | -- | -- | 10.4 | 24 | 28 |
| Manpower indicators | | | | | |
| Productivity (megawatt hours/employee) | 1 641 | 1 973 | 2 119 | 2 190 | 2 308 |
| Consumers per employee | 112 | 112 | 116 | 120 | 123 |

*Note*: US$ 1 = 0.71 JD; JD 1 = 1,000 fils.

In 1995, the electricity sector's consumption of 4,777 GWh and 1,310 kWh per capita accounted for 33.5 per cent (equivalent to 1.475 million TOE) of the total primary energy consumption. A breakdown of consumption by consumer sector is given in table 3.

TABLE 3. ELECTRICITY CONSUMPTION IN JORDAN IN 1995 BY SECTOR

| Sector | GWh | Percentage of total |
|---|---|---|
| Industrial | 1 677 | 35.1 |
| Domestic | 1 421 | 29.8 |
| Water pumping | 885 | 18.5 |
| Commercial | 524 | 11.0 |
| Street lighting | 120 | 2.5 |
| Others | 150 | 3.1 |
| *Total* | *4 777* | *100.00* |

### 1. *Generation*

In 1995, Jordan's installed name-plate generation capacity was 986 MW, while the system's peak load was 862 MW; 5,200 GWh of electricity was produced. Approximately 99 per cent of the population are supplied with electricity.

The dominant role of steam turbines and diesel-fired plants leads to dependence on imported petroleum. Currently, 12 per cent of NEPCO generation is from gas supplied by the Al-Risha gas reservoir.

NEPCO provides all the bulk power to the Jordan electric sector, except for that supplied by interconnected industrial companies (about 30 MW) and three small diesel engines in the IDECO system totalling 6 MW. The NEPCO capacity portfolio includes fuel oil-fired thermal units, gas-fired combustion turbines, diesel-fired combustion turbines and diesel engines. A breakdown of the NEPCO-owned name-plate capacity as of November 1996 is shown in table 4.

NEPCO has plans to supply the growing power needs of Jordan through the commissioning of an additional three thermal units, with an aggregate capacity of 390 MW, at the Aqaba Power Station in 1997-1998. The addition of these units should prove sufficient for the forecasted growth in sector demand through the end of this century.

TABLE 4. NEPCO NAME-PLATE CAPACITY BY TYPE

| Plant name | Capacity (MW) | Type | Fuel |
|---|---|---|---|
| Hussein Power Station | 363 | Thermal | F.O |
| Hussein Power Station | 32 | Combustion | D |
| Aqaba Power Station | 260 | Thermal | F.O |
| Aqaba Central Station | 22 | Diesel | F.O |
| Marka Power Station | 72 | Combustion | D |
| Marka Power Station | 30 | Diesel | F.O |
| Al-Risha Power Station | 120 | Combustion | N.G |
| Rehab Power Station | 160 | Combustion | D |
| Amman South Power Station | 60 | Combustion | D |
| Karak Power Station | 18 | Combustion | D |
| Karak Power Station | 4 | Diesel | F.O |
| Miscellaneous | 4 | Misc | Misc. |
| *Total capacity* | *1 145* | | |

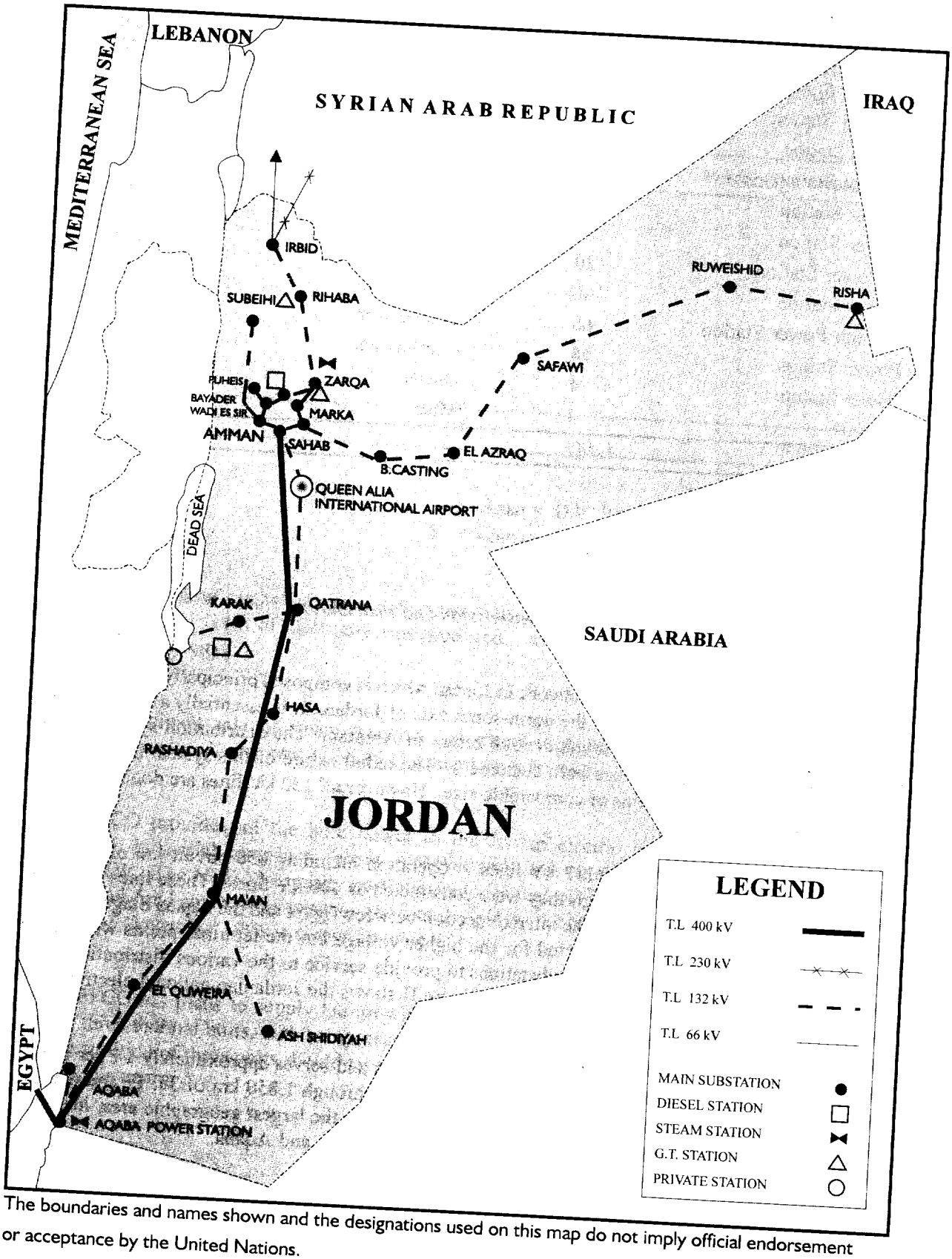
*Note*: F.O. = fuel oil; D = diesel; N.G. = natural gas.

### 2. *NEPCO transmission and distribution*

NEPCO operates the bulk power network in Jordan which is composed principally of 132 kV circuits. The transmission system is structured on the north-south axis of Jordan. It is essentially a radial system with no looping except for a ring around the major load centre of Amman. The distribution systems are served off this system, as are the direct service bulk customers. The radial nature of this system is consistent with what would be found in other systems of comparable size. However all 132 kV lines are double circuit lines.

There are 2,773 circuit km of 132 kV lines in operation including 650 circuit km of lines that are currently operated at 132 kV even though they were constructed as 400 kV lines. These lines are scheduled to work at 400 kV with the operation of the interconnection between Egypt and the Aqaba Stage II generating units. The transmission line was constructed for the higher voltage but the terminal points will have to be modified. NEPCO operates main supply substations to provide service to the various distribution networks which have an aggregate capacity of 1,989 MVA. Figure II shows the Jordanian national electrical system.

NEPCO distributes electricity mainly to the rural areas and serves approximately 14 per cent of the national consumers. Distribution in NEPCO areas is primarily through 1,850 km of 33, 11 and 6.6 kV, and 2,585 km of 0.4 kV lines. In terms of service area, NEPCO serves the largest geographic area, including the Eastern Region, the Jordan Valley, Karak, Tafilah, Shoubak, Ma'an, and Aqaba.




The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

### 3. *Bulk power system performance*

There are several criteria to measure a bulk power system's relative operating performance. These include: (a) thermal efficiency of power stations; (b) availability of the units; and (c) generating unit auxiliary usage. Three of the NEPCO generating stations (Hussein, Aqaba, Al-Risha) provide approximately 95 per cent of the total energy required of the sector and the performance data for these plants are presented in table 5.

TABLE 5. JORDAN ELECTRICITY AUTHORITY PLANT EFFICIENCY DATA

| Plant name | Capacity (MW) | Efficiency (percentage) | Availability of the unit (percentage) | Auxiliary usage (percentage) |
|---|---|---|---|---|
| Hussein | 396 | 30.1 | 88.3 | 6.98 |
| Aqaba | 260 | 40.7 | 88.2 | 7.40 |
| Al-Risha | 120 | 30.9 | 90.8 | 0.19 |

*Source:* JEA 1995 plant operating data.

The performance measures shown above are within the range acceptable in more developed countries except for the auxiliary usage percentages which are usually in the range of 3 to 4 per cent. Part of the reason for the higher auxiliary usage is the relatively smaller size of the thermal units at these plants as well as the type of condenser cooling units in use (dry cooling) and the site of the Aqaba Thermal Power Station inland at a level of 35 metres above sea level, which means much higher consumption to pump the required cooling water.

### 4. *Jordan Electricity Authority planning*

JEA was responsible for planning, constructing and operating all bulk supply activities in the Jordanian power sector, and for preparing tariff modification requests requiring the final approval of the Cabinet before implementation. Part of the planning process included the development of sales and peak demand forecasts for the sector.

The principal variables of the forecast are population data and estimates of GNP. The latest forecast assumes that Jordan's population will grow between 2 per cent and 3 per cent annually over the forecast horizon. The resultant population by 2010 will range between 6.4 million and 7.5 million, compared with slightly over 4 million in early 1994. The forecast of GNP growth ranges from 6 - 6.5 per cent in the early years to 3.5 - 4 per cent in the later years. The result of the aggregate forecast is illustrated in table 6.

TABLE 6. ELECTRIC SECTOR FORECAST

| Year | Medium forecast | | High forecast | | Low forecast | |
|---|---|---|---|---|---|---|
| | GWh | MW | GWh | MW | GWh | MW |
| Actual | | | | | | |
| 1993 | 4 343 | 717 | 4 343 | 717 | 4 343 | 717 |
| 1994 | 4 676 | 794 | 4 676 | 794 | 4 676 | 794 |
| 1995 | 5 201 | 862 | 5 201 | 862 | 5 201 | 862 |
| Forecast | | | | | | |
| 1996 | 5 667 | 937 | 5 821 | 961 | 5 480 | 910 |
| 1997 | 6 068 | 1 003 | 6 297 | 1 039 | 5 772 | 961 |
| 1998 | 6 586 | 1 094 | 6 918 | 1 145 | 6 152 | 1 031 |
| 1999 | 7 042 | 1 162 | 7 472 | 1 227 | 6 515 | 1 085 |
| 2000 | 7 466 | 1 228 | 7 999 | 1 308 | 6 851 | 1 137 |
| 2005 | 9 793 | 1 583 | 10 873 | 1 745 | 8 538 | 1 393 |
| 2010 | 11 600 | 1 888 | 13 208 | 2 139 | 9 774 | 1 601 |
| 2015 | 13 323 | 2 188 | 15 539 | 2 540 | 10 848 | 1 790 |

The NEPCO capacity planning process uses demand forecast as a starting point. The forecasted demand is compared on an annual basis with the installed capacity and the capacity previously committed. Additional capacity is needed when the difference between the capacity and peak demand is at a predetermined level. The NEPCO planning department uses the Wein Automatic Scheduling Programme (WASP) to determine the most economic capacity additions.

## 5. *Electricity tariffs*

The National Electricity Tariff, in Jordan includes both a bulk supply tariff and separate retail tariffs.

### (a) *Bulk supply tariff*

The Bulk supply tariff applies to customers supplied directly from the 132 kV networks, the distribution companies (JEPCO and IDECO) and the large industrial and other customers. The tariff

comprises a single maximum demand charge which is levied as a monthly lump sum per kW of recorded maximum demand and peak and off-peak energy charges. It also includes power factor penalty provisions.

(b) *Retail tariffs*

The Electricity Tariff in Jordan includes several retail tariff categories, such as:

(a) Standard tariff: The standard tariff applies to consumers in a number of different groups, including domestic users, public buildings, hospitals, sports clubs and workshops. It is a rising four-block tariff. The initial block is 160 kWh/month with a unit rate below the cost of supply, hence this is a baseline block. The fourth block is for consumption above 500 kWh/month, with a unit rate above the estimated long run marginal cost (LRMC) of supply;

(b) Commercial and hotel consumers;

(c) Small industrial consumers;

(d) Medium industrial consumers;

(e) Agricultural and water pumping tariffs.

The present tariff does not include a fuel cost adjustment clause. It does not reflect the estimated LRMC of supply for the different consumer groups, and hence it is deficient in the cost messages which it signals to consumers. This tariff includes significant cross subsidies between tariff categories, and also within the standard tariff.

However, the overall average tariff is equal to 6.5 US cents/kWh and it almost covers the average LRMC.

## C. Jordan Electric Power Company

JEPCO is a private shareholding company, with 57.5 per cent of shares in 1995 held by private individuals. The Company started operations in 1947 and it was given a 50-year concession agreement in 1961. JEPCO distributes electricity in the Amman, Zarqa, and Balqa governorates (except the Jordan Valley) and supplies 64 per cent of all consumers. JEPCO, at the request of the Government, is also providing electric power service in rural areas outside its concession area. It buys all its bulk power supply from NEPCO at nine supply points within the grid. In 1995, its system losses were approximately 9 per cent. Table 7 shows the progress of JEPCO.

TABLE 7. SIGNIFICANT FIGURES OF THE JORDAN ELECTRIC POWER COMPANY

| Year | 1947 | 1962 | 1988 | 1994 | 1995 |
|---|---|---|---|---|---|
| Number of employees | 70 | 476 | 1 920 | 2 143 | 2 199 |
| Number of consumers (thousands) | 0.6 | 24.9 | 305.4 | 406 | 430 |
| Generation capacity (kW) | 654 | 15 554 | 00 | 00 | 00 |
| Distribution networks (km) | 24 | 251 | 6 028 | 9 627 | 10 920 |
| Fixed assets (million of JD) | 0.15 | 2.1 | 53 | 88.8 | 112.4 |
| Capital (million of JD) | 0.122 | 1.5 | 9.0 | 15.0 | 15.0 |

The shareholders of the company at the end of 1995 were in the following categories:

57.50 per cent: Individuals

14.84 per cent: Government utilities

27.66 per cent: Companies, banks and others.

## D. IRBID DISTRICT ELECTRICITY COMPANY

IDECO is a shareholding company, with 85 per cent of the shares held by NEPCO and municipalities. Approximately 55 per cent of IDECO shares are held by NEPCO. In 1961, IDECO was given a 50-year concession agreement. Currently, IDECO distributes electricity in the Irbid, Mafraq, Ajlun and Jerash governorates, and supplies 23 per cent of all consumers in Jordan. Within its concession area, 99 per cent of consumers have access to electricity. The IDECO supply area is much larger geographically than the JEPCO supply area, but it is very sparsely populated. Table 8 shows the progress of IDECO.

TABLE 8. SIGNIFICANT FIGURES OF THE IRBID DISTRICT ELECTRICITY COMPANY

| Year | 1970 | 1980 | 1985 | 1990 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| Number of employees | 250 | 525 | 739 | 751 | 891 | 875 |
| Number of consumers (thousands) | 14.0 | 49.7 | 96.1 | 121.5 | 146 | 154 |
| Generation capacity (kW) | 1 000 | 13 000 | 9 000 | 9 000 | 6 000 | 6 000 |
| Distribution networks (km) | N.A. | 1 094 | 4 268 | 6 378 | 7 335 | 8 330 |
| Fixed assets | 0.6 | 36.2 | 11.8 | 18.9 | 31.2 | 33.5 |
| Capital (millions of JD) | 1.0 | 2.0 | 3.0 | 3.0 | 3.0 | 3.0 |

The shareholders of IDECO at the end of 1995 were in the following categories:

10.3 per cent: Individuals

55.5 per cent: NEPCO

25.9 per cent: Municipalities

8.36 per cent: Companies, banks and others.

# II. BENEFITS OF RESTRUCTURING THE ELECTRIC POWER SECTOR IN JORDAN

## A. SUFFICIENT MANAGERIAL AUTONOMY

The Jordan Electricity Authority was a government institution which, like other government institutions, was subjected to civil service regulations. These regulations severely restricted the ability of JEA management to hire, transfer, or reduce the numbers of its staff. The same may apply to IDECO, which is also more or less a government utility by virtue of JEA majority ownership. It is anticipated that the privatization of JEA and its transformation into NEPCO will lead to more managerial autonomy for NEPCO and thus improve its overall performance as a major company in the electric power sector.

## B. COST-EFFECTIVENESS ORIENTATION

In general, in private enterprises, performance is usually judged by evaluating the accomplishment of the management of the pre-established financial and performance targets. Such criteria could not be applied to JEA or IDECO, which are more interested in the continuity of the electric power supply rather than its cost-effectiveness or improved financial performance.

Neither JEA nor IDECO was geared to minimizing operating costs or maximizing profits.

The privatization of the electric power sector and the establishment of regulatory bodies are expected to establish more cost-reflective tariffs and more transparent regulations in addition to more managerial autonomy. All these factors will play a major role in minimizing operating costs and maximizing profits.

## C. EFFECTIVE REGULATORY SUPERVISION

The regulatory framework needs to be more adequate to support private sector participation and the power sector's access to private financial sources. With the Government of Jordan and the World Bank no longer willing or able to loan large amounts of money for new electric power generation projects, other sources of capital need to be assured that if they invest in the sector: (a) there will be technical, managerial and financial accountability and autonomy; (b) rates of return on investment will be fair and at least equal to the prevailing rates of return on investments in the power sector elsewhere in the world and/or capital markets; and (c) stability will be maintained in the service obligations and earnings of the power sector enterprises.

## D. Adequate tariff structure

The tariffs for the Jordanian power sector are uniform among customer classes nationwide. However, uniform tariffs and cross subsidies distort the real costs of providing service to consumers. These subsidies send wrong price signals and thus have the effect of distorting market operations.

The problems associated with non-cost-reflective tariffs were recently acknowledged in Jordan's Economic and Social Development Plan 1993-1997, which identified the overconsumption of energy and electricity by certain groups of consumers, owing to inadequate pricing policies and the rising demand for electricity, as one of the critical problems facing the energy and mineral sectors. The Plan's general goals are stipulated to be real cost recovery by energy-producing institutions and the adoption of a tariff system that reflects real production costs and takes into consideration different consumption patterns.

## E. Raising capital

The operating utilities have experienced financial difficulties in raising the necessary capital from outside sources to support their investment needs. The industry has had to rely primarily either on financing raised by the Government and then lent to the operating companies or the issuance by the Government of a sovereign guarantee to the lender.

The domestic capital market is fairly new, relatively small, and does not offer the various instruments routinely available in more developed markets. These factors impose limits upon the amount of capital that can be raised domestically for infrastructure projects. However, the successful flotation of equity by JEPCO shows that there is strong domestic interest in private sector participation in the Jordanian power sector. In addition, there are numerous entities in the international capital market, both developers and financiers, whose expertise and financial resources can be attracted to the energy sector.

## III. PRIVATIZATION OF THE ELECTRIC POWER SECTOR IN JORDAN

Jordan's development strategy will continue to expand and strengthen the structural reforms that will support sustained economic development and growth. In particular, this strategy will foster the legal, institutional and policy environment that encourages further integration of the Jordanian economy with the world economy and will promote the agreed role of the private sector, both domestic and foreign.

As a result, expenditure policies and management will face new challenges, including privatization and reorientation of public expenditure to make it more market-oriented and to meet the needs of the private sector.

A primary objective of the structural reform is to energize the private sector and enhance its role in the development of Jordan. The new economic strategy underscores the role of the Government as a regulatory and supportive body. Attention was subsequently directed at reforming the relevant legislative framework and modernizing the financial institutional policy environment to allow a greater role for private investors both domestic and foreign.

The Government has enacted a new investment law and amended the Income Tax Law and the General Sales Tax Law to make them more receptive to the private sector initiatives. In addition, new laws have been passed in the areas of labour, electricity and telecommunications with a view to opening these sectors up for private sector investment and greater competition on the fairest possible basis. At the same time, the Government is vigorously pursuing a wide range of legislative and regulatory reforms which would help to establish business-enabling institutional structures with strengthened investment incentives and would also allow for privatization. Several important business laws are being drafted and were to be submitted to the Parliament in 1996. The proposed legislation included a new securities law which will separate the regulatory and operational functions of the Amman Financial Market, an amendment to the Companies Law, a new Secured Financing Law, a new Customs Law and an up-to-date Competition (Antitrust) Law.

The State-owned enterprises are concentrated mainly in the infrastructure sectors (transport, electricity, water and telecommunication). Furthermore, through the Jordan Investment Corporation (JIC), the Government acquired a substantial number of shares in mining companies and held a minority of shares in various financial institutions and a number of small and medium-sized companies in several sectors.

In 1995, the Government embarked upon a significant programme for handing over sizeable portions of public assets to private investors. Of these assets, telecommunications and electricity were among the first major sectors earmarked for privatization. The Government also intends to transfer its shares in other areas to private investors. Institutions and procedures to facilitate implementation are being set up and priority lists are being developed to identify the candidates for privatization.

### A. RESTRUCTURING OF THE JORDANIAN POWER SECTOR

The Ministry of Energy and Mineral Resources initiated a comprehensive restructuring study of the power sector in Jordan. The study was submitted to the Ministry at the end of 1994.

The study recommended various measures that need to be implemented to achieve the objectives recommended. The measures are as follows:

(a) Reform of the tariff structure and financial planning and management;

(b) Reorganization of some of the power sector activities;

(c) Creation of an independent regulatory authority;

(d) Reform of the laws, regulations and orders governing the energy sector organizations.

The implementation of these measures will have a direct impact on the power sector and will lead to a major change in its organization. The measures will:

(a) Enhance sector coordination and planning;

(b) Broaden access to capital;

(c) Improve technical and operational efficiency;

(d) Foster commercial and autonomous enterprises;

(e) Permit private participation and ownership;

(f) Introduce competition;

(g) Improve enterprises' financial viability and reduce the need for government guarantees;

(h) Improve effective regulation of the sector.

## B. Privatization of the Jordan Electricity Authority

The Government believes that an efficient and financially sound power sector that satisfies the reform objectives requires a restructured industry. This industry will be competitive, commercially oriented, profit-driven, managed independently without government interference and effectively regulated. The Government therefore decided to reform the power sector in order to achieve the above-mentioned objectives. The reform

process started in April 1994 when the Cabinet issued a decree to transform JEA into a shareholding company owned by the Government. A special ministerial committee was formed to take the necessary steps to implement this process.

In 1994 the ministerial committee appointed a joint venture (international-local) consultant to evaluate JEA, to establish its initial balance sheet, including assets valuation and current business value, and to formulate recommendations on the capital structure of the new company.

The consultant recommended that the JEA net worth should be increased from the 1994 figure of JD 80 million to approximately JD 500 million (US$ 704 million). Based on the consultant's report, the committee, upon consultation with the Minister of Finance, decided that the opening capital of the new company should be JD 230 million (US$ 324 million).

To effect the transformation of JEA into a government-owned public shareholding company, a new General Electricity Law (GEL) was drafted and entered into force on 1 September 1996. GEL No. 10 of 1996 opened the power sector to private investors to invest in power generation.

According to the new law, the new company—NEPCO—will retain ownership and control of the national transmission network and existing generation plants. It will remain responsible for the efficient operation of the existing generation and coordinated dispatch of all generation resources connected with the transmission network. It will also be responsible for the distribution of electricity outside the concession areas of JEPCO and IDECO. NEPCO will recover its initial costs through the wholesale of power to the distribution companies and the large industrial consumers who are directly connected to the national transmission network. The distribution companies will be responsible for developing and implementing cost-effective investment programmes. However, if the Government asks them to provide non-financial socially mandated services such as rural electrification at baseline rates, they will be fully compensated for these services by the Government.

After the implementation of all the required legal steps to transform JEA into NEPCO on 1 September 1996, the Articles of Association of NEPCO were signed and put into force by the Ministry of Industry and Trade. All the responsibilities, obligations and rights of JEA were thereby transferred to NEPCO.

## C. Main articles of the General Electricity Law

The main features of the new electricity law can be illustrated from the following articles of the law:

Article Five

*The responsibility of generating the electrical energy, and construction of the power stations shall be vested in the company (NEPCO) or any other company or companies licensed for this purpose provided that the company in this case shall be a public shareholding.*

Article Six

*The responsibility of transmission of electrical energy, construction of the transmission lines and operating the national network shall be vested in the company (NEPCO). The company undertakes to permit the licensed companies to generate the electrical energy through the utilization of such transmission network according to the instructions issued by the Regulatory Commission provided for in this law which would regulate all aspects of such a process.*

Article Eight

*The licence pertaining to the generation, transmission and distribution of the electrical energy in the Kingdom shall be granted by a resolution of the Council of Ministers upon the recommendation of the Minister pursuant to an agreement to be concluded between the Ministry and the party to be granted the licence with due observation to any concession or licence granted prior to the enforcement of the provision of this law.*

Article Fifteen

*a. The Council of Ministers shall appoint a three-man experienced and competent independent control commission to be responsible towards the Prime Minister and provided that none of them shall have direct or indirect interest in the generation, transmission or distribution of the electrical energy;*

*b. The Commission shall, subsequent to consulting with the concerned parties, and with due observance to the Government's policies and strategies in the field of electrical energy, submit its recommendations to the Council of Ministers for the determination of the prices of electrical energy, subscription fees, service charge, cost, securities and other services necessary for connecting the electrical current to the consumer;*

*c. The Council of Ministers shall specify the functions and duties of the Commission pursuant to the instructions issued for this purpose by it.*

## D. THE REGULATORY FRAMEWORK

The new GEL No. 10 called for the creation of an independent regulatory commission consisting of three experienced professionals who should not have a direct or indirect interest in the electric power industry. According to the Law, the Cabinet will issue directives that would define precisely the duties and responsibilities of the commission.

The Government issued a decree in September 1996 appointing a Board consisting of three former Ministers to manage the commission.

To prepare the work procedures and environment for the regulatory commission, the Ministry of Planning appointed a consultant to carry out the following tasks:

(a) The modalities for implementing the new Electricity Law should be assessed to verify that the arrangements set out in the law would enhance the efficiency and effectiveness of the electricity sector. If necessary, the consultant should propose amendments to the law to ensure its efficient implementation in line with the Government's sector strategy.

(b) Following a detailed review of the prevailing laws, the consultant will examine how best to cover areas such as: (i) setting and approving tariffs; (ii) standard licensing procedures based on specified criteria; (iii) the funding of the commission; (iv) the terms of appointment of commissioners; (v) the staffing of the commission; and (vi) remedies in the case of non-compliance with the commission's rulings. The consultant will make recommendations as appropriate.

(c) Procedures for adjustments in tariffs, issue of licences and other matters will be transparent, predictable and published in a format accessible to all interested parties. The consultant should make recommendations on how best to achieve that objective. Since there are provisions in the Jordanian Constitution for appeal to the courts against decisions of the commission, the procedures for considering appeals should be developed by the consultant. Mechanisms for enforcement of decisions by the commission should be recommended, including the establishment of fines and penalties for non-compliance. The consultant should also recommend a suitable legal mechanism for collection of data and information from regulated power companies.

(d) In the case of existing concessions held by JEPCO and IDECO, the consultant should examine how the existing concessions might be converted to licences to conform with the expected licensing provisions of the new Electricity Law. This would facilitate the transfer of regulatory supervision of JEPCO and IDECO from the Ministry of Energy and Mineral Resources to the new regulatory commission.

(e) The functioning of the regulatory commission will be autonomous, independent and transparent and will ensure a level playing field for all concerned parties operating in the energy sector. The consultant's recommendations will cover the appointment criteria for the three-member regulatory board, compensation and budgetary matters, skill level of support staff, and broad organizational details for effective functioning.

In all matters related to tariffs, the consultant will ensure that the recommendations are consistent with the findings of a tariff consultant, who will prepare, *inter alia*, recommendations regarding the tariff structure. Currently, it is expected that the tariff consultant will carry out his assignment during the same time period as the legal consultant. Coordination between the legal consultant and the tariff consultant will be effected by the concerned government authorities and the power companies. The consultant's work is expected to be completed by early 1997.

# IV. ROLE OF THE PRIVATE SECTOR IN POWER PROJECTS IN JORDAN

The energy sector in general and electricity in particular are increasingly attracting the interest of private investors at the national and international levels, owing to many reasons including but not limited to the following:

(a) The technologies for electricity projects are among the most proven technologies;

(b) The dimensions of the electricity projects and their physical components are very clearly defined;

(c) The demand for electricity is continuous and is always increasing because of the natural growth and the replacement of other forms of energy.

The economic reforms in Jordan are expected to create new opportunities for development in all economic sectors. This in turn will lead to additional growth in electricity demand, which requires the construction of new projects, especially the interconnection between the electrical systems in the area. This interconnection will create a new element: competition between the electrical utilities in the region. All this requires the rapid privatization of the power industry.

The future electricity supply picture in Jordan is expected to change significantly with the new electricity law. As noted above, the former JEA was transformed into a stock company and its shares in both JEPCO and IDECO will be sold. The law will allow private entities as independent power producers (IPPs) to build electricity generation facilities for sale to the grid.

## A. INDEPENDENT POWER PRODUCERS

The Government of Jordan has taken several measures to enhance private power production and is willing in principle to consider the concept of build-operate-own or -transfer (BOO, BOOT) schemes. Within this scheme, local and foreign investors will be invited to construct and operate the powerplant for an agreed period of time during which the Government will guarantee the purchase of the output of the electricity generated at realistic rates that are projected to be economically competitive with the cost of power using conventional fuel oil, which is the main fuel used for local major power stations.

The Government has already taken several steps to support IPPs. These include:

(a) Attracting IPP investment to supply power to the regional market and to meet the future domestic requirements of electricity;

(b) Examining the best ways to develop the first IPP in Jordan and pave the way for more private participation in power projects;

(c) Giving equal opportunities to capable developers to build, own and operate private power-plants to meet the growth in demand beyond the year 2000 and, on a larger scale, to transmit electricity to the neighbouring countries.

The Government will consider any proposed set-up meeting the required criteria with regard to economics, environment and quality of supply.

It should be noted that the overall investment and construction costs are usually lower under a BOO scheme since the contractor is the owner and can thus exercise strict cost and project control.

## B. Development of the power industry in Jordan

### 1. *Demand for electricity*

The peak electricity load of Jordan was 894 MW in 1995 compared with 825 MW in 1994, representing a growth rate of 8.6 per cent.

Generated electrical energy in Jordan for local consumption amounted to 5,615 million kWh in 1995, compared with 5,076 million kWh in 1994.

The electricity demand forecast for Jordan during the period 1996-2010 is as follows:

| Year | Energy demand | | | |
|---|---|---|---|---|
| | GWh | Growth (%) | MW | Growth (%) |
| 1996 | 5 670 | 9.0 | 937 | 8.7 |
| 2000 | 7 470 | 7.1 | 1 230 | 7.0 |
| 2005 | 9 800 | 5.6 | 1 600 | 5.4 |
| 2010 | 11 600 | 3.4 | 1 900 | 3.5 |

### 2. *Installed capacity*

The installed capacity of NEPCO as of September 1996 is about 1,150 MW, detailed as follows:

| Unit type | Installed capacity (MW) |
|---|---|
| Steam | 623 |
| Gas turbine (on diesel) | 342 |
| Gas turbine (on natural gas) | 120 |
| Diesel units | 56 |
| Hydro + wind | 4 |

In addition, about 118 MW of installed capacity is generated by the industrial companies. The second stage of the Aqaba Thermal Power Station (ATPS) involving the third and fourth units (2 x 130 MW) which is under construction will be in operation by the end of 1997. The fifth unit of ATPS (1×130 MW) is expected to be in operation by September 1998. The total installed capacity will be about 1,540 MW.

NEPCO is also in charge of the high-voltage transmission network (400 and 132 kV) and the distribution of electricity outside the concession areas of the two private distribution companies, JEPCO and IDECO. JEPCO is responsible for about 57 per cent of the power market, IDECO 14 per cent and NEPCO for 9 per cent. In addition, NEPCO provides bulk supply to industrial companies which accounts for the remaining 20 per cent of the market.

### 3. *Share of private power production projects*

The Ministry of Energy and Mineral Resources is presently in the process of establishing a general policy to deal with the IPPs, including the percentage share of private power producers in total electricity generation in the country, in addition to the purchase of energy through short- or long-term agreements.

NEPCO, in cooperation with the Ministry of Energy and Mineral resources, formulated terms of reference for consultants to prepare a request for proposals for IPPs (see annex). The terms of reference have been issued and the consulting companies' proposals have been received and are being evaluated.

The steps for preparing the first IPP project are as follows:

1. Select the consultants.

2. Conduct the required studies as per the terms of reference.

3. Prepare the request for proposals for IPPs.

4. Request offers from qualified developers to develop IPPs.

5. Receive offers for IPPs.

6. Evaluate and award contracts.

7. Implement and operate the IPP project.

The projected time schedule is shown in the following chart:

CHART. SCHEDULE FOR PREPARING THE FIRST PROJECT FOR INDEPENDENT POWER PRODUCERS (IPPS) IN JORDAN

| Year | 1996 | | 1997 | | | | | | | | | | | | 1998 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | |
| 1. Select the consultant | | | | | | | | | | | | | | | | | | | | |
| 2. Conduct the required studies as per terms of reference | | | | | | | | | | | | | | | | | | | | |
| 3. Prepare a request for proposals for IPPs | | | | | | | | | | | | | | | | | | | | |
| 4. Request offers from a qualified developer to develop IPPs | | | | | | | | | | | | | | | | | | | | |
| 5. Receive offers for IPPs | | | | | | | | | | | | | | | | | | | | |
| 6. Evaluate, negotiate and award the contracts | | | | | | | | | | | | | | | | | | | | |
| 7. Implement and operate the IPP project | | | | | | | | | | | | | | | | | | | | |

Annex

# THE HASHEMITE KINGDOM OF JORDAN
# INTRODUCTION OF INDEPENDENT POWER PRODUCERS (IPPS)
# CONSULTANT'S TERMS OF REFERENCE*

## A. Background

1. The Ministry of Energy and Mineral Resources (MEMR) has primary responsibility for energy sector policy formulation and planning, including energy sector coordination.

2. The Jordan Electricity Authority (JEA) is the sole public generator of electricity in Jordan at present. Its installed capacity is 989 MW made up as follows:

- 623 MW steam
- 302 MW gas turbines, of which 120 MW, located in Risha, burn local natural gas
- 56.5 MW diesel
- 7 MW hydro
- 0.3 MW wind

3. An additional 118 MW (73 MW steam and 45 MW diesel) of installed capacity is accounted for by self generation by industrial companies.

4. A further 490 MW (100 MW of peaking capacity and 390 MW of base load capacity) is projected to be put in service over the next two years.

5. JEA is also in charge of the national transmission and regional interconnection network (400, 230 and 132 kV). A limited interconnection currently exists with Syria at 230 kV. A 400 kV interconnection with Egypt is under construction with completion scheduled by year end 1997. **This latter** interconnection is part of the programme to interconnect Egypt, Jordan, Syria, Iraq and Turkey at a 400 kV level. The first phase of this programme, which includes the lines between Egypt, Jordan, Syria and Turkey, is in the implementation stage and is scheduled to be commissioned late 1997/early 1998. In addition, discussions are underway to interconnect Egypt, Jordan, Israel and Palestine.

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* Issued as submitted.

6. Distribution is handled by Jordan Electric Power Company (JEPCO) which supplies 57% of the power market's requirements; Irbid District Electricity Company (IDECO) which supplies 14% of the market's requirements and JEA which provides bulk supply to industrial companies (representing 20% of the market's requirements) and also retails the remaining 9% of the market's requirements.

7. Power consumption has been increasing rapidly in recent years (averaging about 8 to 10% annually) and this trend is expected to continue in the future. As a result, JEA anticipates an additional 400 MW of capacity for the domestic market will be required starting from the year 2000.

8. In 1995, the demand for primary energy totaled 4.4 million tons of oil equivalent (TOE). The demand for energy has been growing at an annual rate of 6%. While Jordan has a limited availability of natural gas production from the Risha field (which is currently producing sufficient gas to generate about 100 MW of power), the bulk of Jordan's energy needs is met from imported oil. Jordan currently operates a single refinery at Zarqa with a capacity of 10,500 tons of crude oil per day. The refinery is operated by Jordan Petroleum Refinery Company (JPRC) which is a privately owned firm in which the Government of Jordan holds a 12% stake.

## B. The Objectives of the Government in the Power Sector

9. The objectives of the Government in the power sector are:

- To participate as an exporter in the development of a regional market for energy, including electricity;
- To develop mechanisms for the interchange of energy, including electricity, with neighbouring countries;
- To attract both private and foreign investment to the power sector; and
- To ensure a secure supply of power to meet internal demand.

10. The Government has recently taken important measures to commercialize the power sector, level the playing field to render it more competitive and improve the environment for private sector investment. A new electricity law which is being introduced after passing through all the legislative procedures will permit MEMR, among other things, to license new power producers and will provide for an independent regulator to design tariffs based on appropriate economic and financial principles, and by this new electricity law JEA will be transferred to a public shareholding company owned totally by the Government.

11. The Government has a particular interest in attracting foreign investment to Jordan and has passed legislation to encourage such investment.

12. The Government wants to introduce Independent Power Producers to Jordan, and, within the specific context of the peace environment, is particularly interested in participating through such IPP's in the development of a regional power market. In this regard, the country offers:

- A favourable geographic location;
- A well developed and efficient infrastructure;
- Political and economic stability; and
- A quality human resource base with a solid commercial orientation.

13. Within the context of its overall energy policy, therefore, the Government is interested in attracting IPP investment to supply power into the regional market and facilitate the establishment of an ongoing regional presence. Such a venture would also be able to help meet future domestic needs.

## C. The Power Generation Project

14. The Government wishes to encourage the sale of power into the export regional market and would favourably consider an IPP, supported by foreign investment, targeted at the regional export market.

15. As currently envisaged, the Government contemplates a requirement for additional facilities to supply the internal market starting in the year 2000. Annual demand is projected to grow at a rate of up to 100 MW per year and it is contemplated that this demand can be met through the IPP referenced above.

16. Several fuel supply options can be envisaged to support the generation of the next increments of power for the internal market as well as the potential export market. The Government is interested in an evaluation of this range of options which will be a key component in the evaluation of IPP alternatives. If, for example, gas is brought to the region, the existing power facilities in Aqaba (5 x 130 MW conventional steam) could be converted to burn gas.

17. The Government recognizes that investments could be required to reinforce or extend the existing transmission network to accommodate the IPP. It is also recognized that investment levels will vary depending upon the particular scheme selected and this will be considered in the evaluation process. JEA is responsible for the transmission network. Any requirements to construct additional transmission facilities, therefore, must be coordinated with JEA and, if such facilities are to be part of the interconnected system, they will be operated by JEA.

## D. The Consulting Assignment

18. The objective of this assignment is to help the Government of Jordan issue Requests for Proposals (RFPs) to qualified developers. (As a second stage in this programme, the Government will seek

consulting assistance to help with the process of selecting a developer, following evaluation of the proposals, and with negotiating the terms of an IPP arrangement). It is contemplated that this assignment will have two phases and the follow up assignment will also have two phases. All four phases are described below even though this request directly addresses only the first two phases.

19. The first phase (the definition of options) will address the range of options potentially available for an IPP. The Government has received a number of unsolicited expressions of interest which address the potential to deliver power to the country. The consultant will develop a Request for Information (RFI) which will be sent both to those who have already made unsolicited submissions and to other potentially qualified developers in order to obtain a range of concepts, developed on a consistent bases. This RFI will request that respondents address the fuel supply source, the technical approach, the timetable and specific additional requirements that may be sought from the concerned parties through MEMR. The RFI will also ask respondents to detail information about their relevant experience and their technical and financial background (this information will be used as part of the pre-qualification effort related to phase two). The RFI package will also define a power requirement for the Government of Jordan and will identify the need for international agreements on system operations and other issues to support power export opportunities. The RFI will not seek specific financial terms nor will it require the level of detail that will be called for in a Request for Proposal. The intent of this phase is to provide the Government with the full range of potential options that can be considered and to develop an associated tender strategy. During this phase, the consultant will also develop an approach for evaluating the diverse range of options, with the associated range of risks, that will be considered.

20. The second phase (the preparation of tender documents) will culminate in the preparation of formal Requests for Proposals (Raps). Initially, however, the second phase will address the results of the RFI. The concept submissions will be evaluated within the context of the Government's overall energy strategy and with regard to their likely feasibility. Based on the tender strategy and the RFI evaluation, a short list of developers will be selected to receive the RFP. The consultant will develop the RFP together with a transparent set of technical, commercial and financial evaluation and selection criteria.

21. In the third phase (the evaluation of bids), the consultant, who will be selected at a future date, will assist the Government in the evaluation of the bids and will make recommendations to the Government concerning the developer to be selected.

22. In the fourth phase (the negotiation of a definitive agreement), the consultant, who will be selected at a future date, will assist the Government with the negotiation and will help bring the project to financial closure.

23. Phases one and two will be developed in parallel. Throughout the course of these two phases, the consultant will also be required to develop recommendations concerning minor adjustments that may be required in the legislative and regulatory framework of Jordan to encourage IPP investment. These changes could include, but would not be limited to, the existing legislative and contractual framework covering power operations, the legislation applicable to foreign investment and applicable tax laws.

The consultant will also be required to address the full range of measures that will be required to enable Jordan to export power to neighbouring countries.

## E. Scope of Work

Phase One (The Definition of Options):

24. Review the power requirements of Jordan and establish, in conjunction with MEMR/JEA, the amount of future power requirements which will be targeted to be supplied by an IPP, together with associated timing.

25. Establish a detailed timetable for the entire process.

26. Develop a specific Request for Information (RFI) seeking conceptual approaches to delivering power to Jordan. As was noted above, the RFI should seek information concerning the anticipated fuel supply source, the technical approach and any specific requirements contemplated by the developer. Specific financial details need not be sought at this stage.

27. Identify a list of potential developers to whom the RFI will be sent and send out the RFI.

28. Develop a methodology to evaluate the various proposals that will be submitted both in response to the RFI and, subsequently, in response to the RFP. The methodology should take into account the diverse nature of the concepts that will be submitted, the range of risks that may be involved and the impact on the national economy.

29. Review the legal and regulatory framework for the introduction of IPPs. This review, which will be completed during phase two, could include, but would not be limited to the following:

- Licensing requirements for private generating companies;
- The private power project approval process;
- The regulation and monitoring of system operations;
- Contract signatory authority and contract enforcement authority;
- Arbitration venue and procedures;
- All arrangements associated with the regional interconnections and the opportunity to export power;
- Jordan's fiscal and tax regimes including: income tax, withholding tax, import duties, repatriation of dividends, rate of return on equity restrictions, depreciation schedules, ... etc.

30. Recommendations for any adjustment required to support the introduction of IPPs should be made. In addition, this effort should include the design of a monitoring and implementation unit to oversee IPP projects.

Phase Two (The Preparation of Tender Documents):

31. Evaluate the RFI submissions within the context of Jordan's overall energy strategy. This evaluation should also take into account other strategic considerations such as environmental concerns and the potential for conflict/synergy between the energy sector and other activities, e.g. tourism and water resources. This evaluation should lead to preparation of a short list of potential developers selected by the Government to receive a Request for Proposal (RFP).

32. This evaluation should also include a feasibility assessment of the options selected for further consideration. This assessment should address potential site availability, the existing capabilities of the country's electricity transmission system, its interconnection links with neighbouring countries and the implementation timetable associated with the various alternatives. Financial benefits/penalties associated with various options should also be identified so that they can be incorporated in the RFP, e.g. should an option require JEA to construct additional transmission facilities, an associated cost penalty should be identified.

33. Review the expectations of the international investment community, identify the spectrum of risks associated with the project and recommend alternative schemes and security arrangements for risk allocation and resolution.

34. Evaluate the implications of non-recourse and/or limited recourse financing techniques to finance the project including:

- The nature of risks associated with projects of this type, highlighting those areas of risk which will be of particular concern to investors, lenders and the Government;
- The project specific risks associated with the option under consideration;
- The requirements of lenders to such projects and the formulation of alternative attainable credit structures which would limit recourse to shareholders;
- The sources of debt finance (international capital markets, export credit agencies, ... etc.) for such projects;
- The sharing of risks between the various parties involved in the project and the costs and implications of non-recourse and/or limited recourse financing to the Government;
- The investors' requirements and the potential for an implications of equity participation by the Government or its agencies as a joint venture partner with the IPP developers;
- Guidelines and measures to evaluate the financial capability of project sponsors.

35. Develop transparent proposal evaluation criteria, identifying the methodology to be used an delineating the information required to permit consistent evaluation of technical specifications, projec implementation risks, project operation risks, financial terms and the financing plan.

36. Develop a financial evaluation model with the capability to perform sensitivity analyses for change in interest rates, fuel prices, construction schedules and costs, production levels, operating costs inflation rates, ... etc. The model should be capable of addressing the impact of these changes on the pre and post tax return on equity, the return on project investment, equity payback, operating coverage and debt service coverage ratios.

37. The consultant will prepare the RFP bidding documents. These will include the project background; minimum functional specifications such as operational interfaces and standards to be followed for construction and operation; the security package [incorporating a draft implementation agreement, a power purchase agreement covering the power to be purchased by Jordan, information concerning the potential to export power from Jordan (including the status of all agreements and negotiations on this subject), a fuel supply agreement (if applicable), required consents and approvals and security and guarantees, if any, provided by the Government]; the evaluation criteria and methodology; details of the submission requirements which will include, but may not be limited to, the developer's financing capability and a project financing plan; details concerning any performance guarantee requirements that may be deemed appropriate along with any bonus provisions and provisions for liquidated damages. The document will also address the Government's role during both the construction and the operation phases, its obligation to provide approvals and consents, its responsibility for environmental clearance and environmental impact assessment, its role in tariff setting, indexation and regulating fuel cost pass through.

38. The first two phases will be followed by other two phases as described below, and they are excluded from the scope of work of this consulting assignment.

Phase Three (The Evaluation of Bids):

39. Resolve any ambiguities that may arise out of the various submissions and obtain any clarifications that may be required.

40. Assist the Government in evaluating the submissions and help develop recommendations as to the potential winner. This evaluation should address technical considerations as well as financial and strategic considerations.

Phase Four (The Negotiation of a Definitive Agreement):

41. Assist the Government to complete negotiations and bring the project to financial closure.

42. Work results shall be reported as set out below, with 20 copies of each report being submitted to MEMR:

Progress of Work

- Progress reports every second month.

Draft and Final Reports

- Draft and final reports covering each of the phases identified above.

Post Completion Report

43. At the completion of the assignment, the consultant is requested to prepare a document to be used as a guideline for future IPP project development. 30 copies of this document are required.

44. The working language for all communications within the project shall be English.

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