

RESTRUCTURING AND REGULATION IMPACT ON ELECTRICITY DISTRIBUTION ACTIVITY IN JORDAN

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ABSTRACT

Restructuring and regulation in electricity sector has many effects on distribution activities. It may have advantages and disadvantages from either view of utilities and customers. The paper illustrates the privatization process impact in Jordan on the electricity distribution activity, especially on the part that is owned by the government (Electricity Distribution Company- EDCO) in the following aspects:

- *Unbundling the integrated electricity company (NEPCO) highlighted the financial deficit in the distribution region.*
- *Improves the financial viability of the industries.*
- *Highlighted the importance of increasing the efficiency of the distribution activities.*
- *Requires technical and commercial rules and agreements.*
- *Requires adequacy of infrastructure requirements for market operation.*

INTRODUCTION

Within the scope of Jordan Government in privatizing the electricity sector, to reduce its role and enhance the role of the private sector, the government restructured Jordan electricity authority in 1999 which was a vertically integrated statutory monopoly into 3 companies - owned currently by the government:

- 1- (CEGCO) responsible for generation.
- 2- (NEPCO) responsible for transmission and system operation.
- 3- (EDCO) responsible for distribution.

Consequently the electricity distribution activity in Jordan became covered by 3 companies that are:

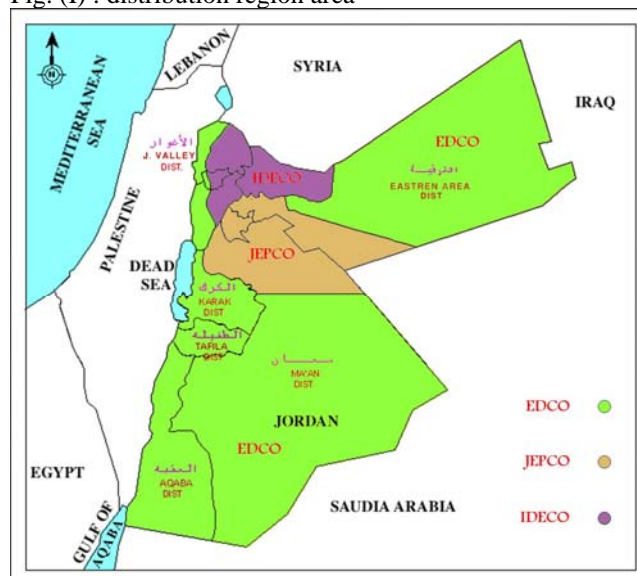
- JEPSCO (totally private co.), responsible for distributing electricity in the central part of Jordan (Amman- the capital, and the surrounding areas).
- IEDCO (Partly private co.), responsible for distributing electricity in the northern part of Jordan. Government owns about (55%) of it, while the rest owned by the municipalities.
- EDCO (totally governmental co.), responsible for distributing electricity in the areas outside the concession areas of the other two distribution companies JEPSCO and IEDCO.

In year 2001, a regulatory commission for power sector ERC was established.

On December 2001, a consultancy firm was appointed to advise the government of Jordan in developing and implementing the privatization strategy for CEGCO, EDCO, and IEDCO.

The consultant appointed by the government is still updating and evaluating the data required to privatize the shares owned by the Gov. in the companies as: (%51) of CEGCO, (100%) of EDCO and (55%) of IEDCO.

Fig. (I) : distribution region area



PRIVATIZATION IMPACT ON DISTRIBUTION ACTIVITY:

1- Unbundling of the industries highlighted the financial and technical deficit in the distribution region:

Restructuring the electricity sector had highlighted the technical and financial losses in the distribution activity in EDCO region. This loss was due to the following reasons:

1. No previous awareness of distribution activity expenses or revenues. EDCO was part of an integrated company (NEPCO) which was responsible for generation, transmission and distribution activities, and it was profitable without looking for each activity separately.
2. The expanded range of EDCO region that covers (77%) of the area of Jordan, with only (13%) of the total customers in Jordan, (70%) of them are rural residential customers.
3. High loss rate that reaches (15%) in year 1999, due to following technical and non technical reasons :
 - EDCO networks cover rural areas with Long networks with low loads.

- Low power factor feeders, there were no previous calculation or monitoring for it before companies separation.
 - High non technical losses due to high fraud percentage from networks or meters.
4. High supply cost due to: Increased debt, Depending on NEPCO for the IT services, increased cost for executing projects by external contractors.
 5. Long cash flow period, the bills were distributed after a month from reading the consumer meter.
 6. The behaviour and culture of people towards EDCO, since it was known that it is a governmental company, people were not paying in time or caring about the payments.

After restructuring EDCO received for years (1999-2001) a compensation from the government due to the loss occurred at the end of the financial years– with a return on capital of (5%) for years 2000 and 2001. Hence EDCO's management decided in 2000 to establish a strategy to overcome the financial losses mainly by :

- Increasing the efficiency and productivity of the available sources (manpower, income, equipments).
- Decreasing the operational expenses.
- Changing the tariff structure.

Accordingly, EDCO statement of income in years (2002-2005) has achieved a net profit, which was a big achievement for the company.

2- Improves the financial viability of the industries:

Restructuring process highlighted the importance of using a cost-effective tariffs, based on elimination the cross subsidies between some consumer classes. This had lead to gradual changes in tariff structure in Jordan.

After Edco establishment in 1999, the impact of having an unbalance tariff structure appeared highly at EDCO customer categories. The margin price between the governmental decided sale price and purchase price for EDCO region was too small, it was not enough to cover the operating costs, as follows:

The average selling price	= 37.6 fils/kWh
The average purchase price	= 30.2 fils/kWh
The supply cost	= 41.1 fils/kWh

The financial studies showed that about (70%) of EDCO's consumers are in the categories that are subsidized by the government, which are: Street lighting, agriculture, water pumping, and residential (first category). The purchase price for those categories was higher than the selling price as follows:

- Water pumping, agriculture and street lighting consumption forms about (56%) of EDCO's total consumption, which sold with an average tariff price equals to (30.8 fils/kWh) that is almost equal to the purchase price, regardless of the operating costs.
- The industrial category consumption forms about (13%) of the total consumption, which sold with an average price of (37.5 fils/kWh), which is also less than the supply cost.
- The Commercial, TV, radio broadcasting and hotels

consumption forms only (8%) of the total consumption, which sold with a price of (60 fils/kWh) are the only categories that have a selling cost higher than the supply cost.

The tariff changed in: 6/2002, 1/2004, 3/2004 and 7/2005, due to the increased in fuel price, and still the final tariff in 2005 does not cover all the operational losses, especially for the categories that have a subsidized tariff.

The following figures illustrate the supply cost compared with the average selling price for (1999-2005)

Table (I) : Supply cost for (1999-2005)

Year	1999	2000	2001	2002	2003	2004	2005
Purchase Price (fils/kWh)	30.2	30.2	30.2	31.7	32.6	32.7	33.8
Supply Cost (fils/ kWh)	41.1	41.4	42.0	43.1	44.1	43.4	44.7
Selling Price (fils/kWh)	37.6	37.7	38.4	40.2	41.8	42.8	44.5
Selling price - Supply cost (fils/ kWh)	-3.5	-3.7	-3.6	-2.9	-2.3	-0.6	-0.2

Purchase price = Electricity power purchase / Purchased energy.

Supply cost = (Electricity power purchase + other operating expenses)/consumed energy.

Selling price = Sales of electricity power / consumed energy.

Tariff methodology

ERC is now developing a Tariff methodology for the distribution licensees for their core business activities. The expected tariff will use an approach to price regulation referred to as "Rate of Return" on Investment regulation as the basis for setting tariffs for the Distribution Licensees. "Rate of Return" regulation determines the Tariffs to be charged by the Distribution Licensees so that each Distribution Licensee will earn sufficient revenues, from its Core activities, that cover all legitimate operating and capital costs, associated with providing the Core activities, while providing the Distribution Licensee with a fair rate of return on its capital employed.

The fundamental principles of this approach are:

- Distribution Licensees should be able to recover all reasonable costs of providing services to customers
- Distribution Licensees should not be financially responsible for factors beyond their control. Tariffs, therefore, will be adjusted between Periodic Reviews for factors beyond the control of the Distribution Licensees.
- Tariffs will be set for a specified period of time to encourage companies to improve efficiency and reduce costs and to provide price certainty to consumers
- Tariffs will be set to cover only Core activities, namely the supply and distribution of electrical power.

Distribution Licensees will face financial penalties for failing to meet performance standards, in the form of compensation subtracted from the Revenue Requirements.

Tariff Structure:

The ERC will determine the structure of tariffs for each customer class. The Tariff Structures will be designed to reflect the cost of providing the service by the Distribution Licensee. Tariffs for the sale of electric power may include a charge in JD/kwh for energy and JD/kW for demand as appropriate for each customer class. Energy charges may vary by day-time and night-time, to reflect the variations in the cost of meeting demand during those periods.

3- Regulation:

Privatization highlighted the importance of increasing the efficiency of distribution activities, through establishing the ERC that concerns of issuing the distribution licensee. This licensee includes a set of performance standards that Distribution companies should maintain to:

- Ensure the quality of electric power in distribution system.
- Specify consumer services for the protection of the consumer.
- Ensure that the voltage at the connection point of a consumer or user is adequate for the normal operation of equipments and appliances.
- Ensure that the distribution system will be operated in a safe and efficient manner and with a high degree of reliability.

The performance standards are set in the following:

1. **Supply quality standards.**
2. **Power quality standards.**
3. **Consumer service quality standards.**
4. **Distribution losses.**

The standards will be applied through three control Phases:

Phase 1: Adaptation Phase

This phase will have duration of one year and six (6) months (from 1/7/2005-31/12/2006). In which, no targets are established to any of the indicators, but the indicators will be calculated and data monitored in order for the ERC to evaluate the performance of the Distributor.

Phase 2: Compliance with Overall Indicators.

This phase will have duration of two (2) years and six (6) months after the end of Phase 1. In which, performance targets will be defined for overall indicators, but any deviation to such targets will not be subject to penalties.

Final Phase: Compliance with Individual Indicators

This phase will begin after the end of Phase 2. In addition to the obligations established in Phase 2, the Distributor shall comply with all the overall and individual performance indicators for each customer. In case of not complying, Distributors will be subject to a financial penalty.

Supply quality standards:

Will be expressed as a function of the Interruptions to Customers, and will be evaluated using indicators which measure the number of Interruptions and their duration. Interruptions will be classified according to their type and

origin as: Scheduled Interruptions, Unscheduled Interruptions, and External Interruptions. Interruptions will also be classified according to the affected customers as: Interruptions to Rural Customers, and Interruptions to Urban Customers.

These indicators will measure Supply Quality to each individual Customer as (Individual Indicators), and will measure average Supply Quality of the Distributor as a whole (overall indicators).

AFIK - TTIK – SAIDI – SAIFI- RENA – EENS –MAIFI
The procedures and systems to be implemented will include among others the following:

- To identify and register all the Interruptions to Customers that occurs in its System.
- To classify Interruptions to Customers according to the Performance Standards
- To determine the duration each customer has been disconnected.

Power quality standards:

The standard includes: Voltage, Frequency, Perturbations: Frequency deviations will not be a controlled indicator. The indicator to control Voltage Quality will be the voltage level, measured within seven consecutive calendar days. The allowed tolerances are: +-6% for low voltage urban areas, +-10% for others.

The Perturbations to be controlled will be flicker and harmonic distortion. The allowed ranges are established in the Distribution Code.

Consumer service quality standards:

Customer Service Quality will be evaluated based on four different characteristics:

1- Connection

The Distributor is obliged to connect the customer within a specified maximum allowed times that ranges (5-45) working days, depending weather a change should be done to the network or not.

2- Customer Information

The Distributor has the obligation to inform their Customers the following:

- All quality standards the Distributor should fulfil.
- All Customers rights that result from the implementation of Performance Standard.
- Applicable tariffs.
- If tariff options are available for a Customer class, advise on the most favourable tariff to be selected by the Customer, subject to its expected consumption and load profile.

3- Management of complains:

In order to record consumer complaints, the Distributor will organize, maintain and update adequate information system for the registration of every complaint received, regardless of the way the complaint is received (written or by telephone) through :

- Commercial offices.
- Adequate number of free phone lines.
- Consumer complaints division, in charge of responding to complaints, monitoring that the problem is solved.

Each complaint should be worked out and answered to the Customer, in a written form, within the next 15 (fifteen) working days of the complaint reception.

4- Billing:

The Distributor shall procure that billing is based on actual readouts of meters. Only in the case of impossibility of reading meters, billing may be done based on estimated consumption, subject to the following:

- The Distributor is not allowed to issue two (2) consecutive bills based on estimated consumption.
- During one calendar year and for each individual Customer, the number of bills issued based on estimated consumption should not exceed three.
- For each billing period, the number of bills issued based on estimated consumption should not exceed 8 % of the total numbers of bills, for each Customer category.

Distribution losses:

For a specified period, Distribution Losses shall be classified in three categories:

- Technical Losses:
- Administrative Losses:
- Non Technical Losses:

In case there is non-compliance with any of the performance established Standards, the Distributor shall be subject to penalties. The numerical values for **Supply quality standards and distribution losses rates** are unique to each Distributor, and based on the Distribution Network and load dispersion characteristics in the area of supply. But the numerical values for **Power quality and Consumer service quality standards** are same for all distributors.

To fulfil these requirements, Distribution Companies should re-evaluate the information and data systems that it uses. This requires adding a cost that shall be taken into consideration in the tariff methodology, which may lead to increase the customer tariff.

4- Requires technical and commercial rules and agreements:

In a system with multiple users, there must be rules that identify responsibilities and duties; this will lead to establish a lot of agreements and codes to control the process as:

- Distribution license, which issued by ERC to authorize the Licensee to engage in distribution and retail supply of electric power to consumers situated in the authorized area. The Licensee shall comply with the electricity law, ERC regulation, and all other codes: distribution code, and the performance standards.

- Distribution code, which produced by ERC jointly with the distribution companies to sets out the rules and responsibilities between the users and the distribution companies.
- Grid (transmission) code, produced by the system operator to sets out the rules and responsibilities between the system operator and users directly connected to the transmission network and those users that require wheeling across the network.
- Connection agreements between the distribution companies and any user.

5- Ensure the adequacy of infrastructure requirements for market operation :

Privatization ensures the adequacy of the specifications of system metering requirements, through establishing the metering code between the system operator and the distribution companies, and the specifications of consumer metering needs.

CONCLUSION:

Restructuring and regulation in electricity sector has many effects on distribution activity. It may have advantages and disadvantages from either view of utilities and customers. These effects differ from company to company, but as a whole distribution activity, regulation gives opportunities and advantages in the following aspects:

- Unbundling prevent discrimination and encourages transparency and effective regulation.
- Regulation develop fair and efficient methods of setting prices, by having cost reflective tariffs that eliminates cross subsidy between customer categories.
- Regulation monitors and increases the performance and the efficiency of the distribution companies.
- Regulation improves customer services.

On the other hand, regulation may have the following requirements:

- Regulation requires re-evaluation of the information and data systems that the distribution companies use. This may add a cost that shall be taken into consideration in the tariff methodology which may increase the tariff.
- Regulation increase the service cost in distribution companies to fulfil the required regulation standards.
- Regulation requires more technical and commercial rules and agreements.
- Regulation requires adequacy of the infrastructure (metering).

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