THE LEGAL FRAMEWORK FOR THE ENERGY SECTOR IN THE HASHEMITE KINGDOM OF JORDAN

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Abstract - This study aims to shed light on the energy related legislations of the Hashemite Kingdom of Jordan, (referred to as Jordan). It also presents Jordan's renewable energy and nuclear power plans and programs to alleviate its dependency on imported energy sources, mostly natural gas from Egypt and Israel, as well as to meet its future electricity demand which is expected to double by 2030. This research is qualitative. Theoretical approach and analytical examination of the national legislation: Temporary Law No. (64) for the Year 2003 General Electricity Law, Law No. (13) Of 2012 Renewable Energy & Energy Efficiency Law, the Nuclear Energy and Radiation Protection Act No. 29 of 2001, the Law of Nuclear Energy No. 42 of 2007 and the Law of Radiation Protection and Nuclear Safety No. 43 of 2007, and international conventions and agreements that Jordan is a signatory to and has ratified, will be followed. Furthermore, review of relevant sources and references was conducted.

Keywords - Electricity, energy, natural gas, nuclear energy law, nuclear program, legal framework, pollution, radiation, international conventions, agreements, renewable energy

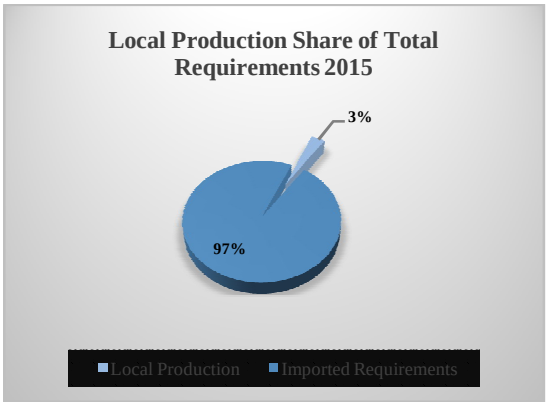
I. INTRODUCTION

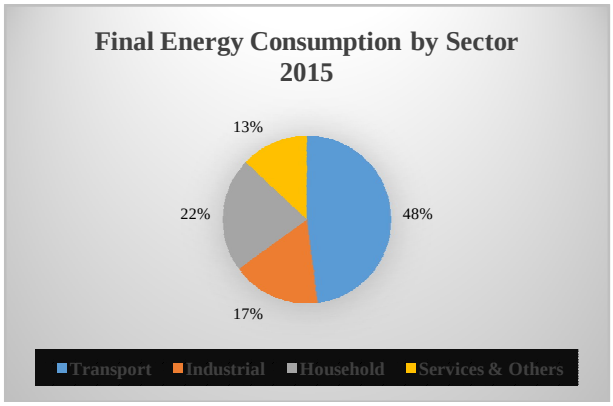
Jordan's special geographical location in the heart of the Arab World and the Middle East and its stable political and economic environment, it has served as a corridor linking neighboring countries, Asia, Africa and Europe. The total area of Jordan of about 90 thousand sq. km with a total population of the country is estimated to 7.8 million with an average growth rate of 2.38, with Syrian accounted for to about 1.3 million, with almost half as refugees, and an average family size of 5.4. Women constitute about 48.5 % of the total population. It is characterized by having a young population of median age of 22 (Jordan 2015 census, Department of statistics of Jordan).

1.1. Energy Facts & Figures- 2016 (Ministry of Energy & Mineral Resources Website: http://www.memr.gov.jo, 2017)

The following tables and figures depict the energy consumption in Jordan and its dependency on imported energy sources from neighbouring countries.

General Indicators	2011	2012	2013	2014	2015
Population	6250	6388	6530	6650	6514
GDP (Million JD) at current price	20477	21965	23852	25437	26637
GDP Per Capita (JD)	3276	3432	3653	3825	4089
Energy Intensity (Kgoe/1000$ in fixed price	209	208	208	207	207
Per Capita Primary Energy Consumption (kgoe)	1193	1247	1249	1272	1373
Per Capita Primary Electricity (kwh)	2166	2230	2235	2318	2483
Percentage of Population Supplied with Electricity (%)	99.9	99.9	99.9	99.9	99.9





Jordan Primary Energy sources (2015-2025)	2015	2020	2025
Crude Oil and Products	71%	51%	50%
Coal & Coke	4%	4%	4%
Renewable Energy	2%	10%	6%
Natural Gas	22%	30%	8%
Electricity Imports	1%	0%	0%
Oil Shale		5%	10%
Nuclear			22%

1.2. Research Design and Procedure

This research is qualitative. Theoretical approach and analytical examination of the national legislation (Temporary Law No. (64) for the Year 2003 General Electricity Law, Law No. (13) Of 2012 Renewable Energy & Energy Efficiency Law, the Nuclear Energy and Radiation Protection Act No. 29 of 2001, the Law of Nuclear Energy No. 42 of 2007 and the Law of Radiation Protection and Nuclear Safety No. 43 of 2007and international conventions and agreements that Jordan is a signatory and has ratified, was followed, Furthermore, review of relevant sources and references was conducted.

1.3 Research Difficulty

A major difficulty encountered while conducting this research is the scarcity of Arabic literature on the subject matter. Arab, and Jordanian experience in specific, especially in the field of nuclear energy and establishment of nuclear reactors is very recent in the region.

II. ELECTRICITY LAW

Jordan has largely unbundled its electricity to separate transmission from generation, distribution and supply; it has created a relatively competent regulator. However, some gaps remain with respect to compliance with the acquis communautaire ("acquis") such as limited third party access, non-compensatory tariffs, ministry interference in retail tariff-setting, and lack of judicial review on the regulator's decisions. With respect to the natural gas market, the latter does not comply in any respect with the acquis because gas is used exclusively for generation, and there is so little domestic production (European Bank for Reconstruction & Assessment Board, 2013)

The Temporary Law No. 64 of the year 2003, General Electricity Law outlays the legal framework for the electricity sector of Jordan. Under this Law, the Ministry of Energy and Mineral Resources (MEMR) mandate is to set and prepare the general policies of the sector, submit to the Cabinet (Council of Ministers) for approval and adoption by the country. Additionally, the MEMR negotiates and concludes agreements with other countries in regard to electrical power interconnections, request bulk supply licensee, as necessary, for generating companies set for privatization and for independent power producers (IPPs), promote renewable energy.

Pursuant to Article 6B of this Law, the Electricity Sector Regulatory Commission was established, as a financially and admiratively independent body, with the main purpose to set electricity tariffs, subscription fees, service fees, disbursements, royalties and connection charges to the transmission and distribution system. It also licenses persons engaged in generation, transmission, supply, distribution, and system operation, and monitors compliance with license conditions. Furthermore, the ERC participates in setting technical standards relating to electrical appliances and installations in coordination with the Standards and Meteorology Corporation, as well as environmental standards with concerned bodies.

Under the Electricity Law Article 48, ERC also has a continuing obligation to monitor the competition in the electricity sector; about progression of the single buyer model to a competitive electricity market model and must prepare an annual report for MEMR on potential competition in the sector. ERC also has authority to resolve disputes between licensees and consumers, and disputes between licensees

ERC has the authority to publish its own regulations and setting out the terms and conditions for issuing, amending and revoking licenses. Additionally, under this law, ERC is authorized to enforce penalties on licensees for non-compliance with the Electricity Law, the terms of their licenses or any ERC regulation.

III. RENEWABLE ENERGY

Environmental issues have always been among the top priorities of Jordan concerns. Nature protection has been a constant matter to be taken into considerations by both the Royalty and the Government. A healthy environment leads to a strong economy and healthy society. Jordan has taken long strides in protecting its fragile environment and in 2012 took a conscious decision in issuing Law No. 13 of 2012, Renewable Energy & Efficiency Law. Pursuant to this Law, the Ministry of Energy & Mineral resources shall collaborate with competent and concerned parties to exploit renewable energy resources to increase the percent contribution to the total energy mix and working towards more efficient

solutions to reduce energy consumption in the country.

The Law provides the legal platform for the government to allocate land, identified and designated by the government, Council of Ministers, as locations of suitable nature and of high potential for exploiting renewable energy sources (RES), for the development of projects to generate electrical power that exceeds the total capacity of 500 Mega Watt. If the land is privately owned, the Law gives the authority to acquire the land and compensate the private owner.

With the exceptions of the sites where government projects are being implemented, the Law allows any person may submit a direct proposal to the Ministry or any designate of the Cabinet, requesting the development of the site for exploiting RES. If the purpose is to generate electricity and connect to the national grid, the requester must abide by the conditions stipulated in this Law. If the request is approved by the Council of Ministers, a license shall be issued which includes all terms, conditions and obligations to the license and will be revoked in case of contradiction of any of the terms etc. The private investor shall incur all relevant costs such as connecting to the grid and distribution system.

Additionally, the law allows any person including small ERS facilities and homes to sell their generated electricity to the Bulk Supply licensees and to the Retail Supply Licensees. The selling price are specified by the Electricity Regulatory Commission.

To encourage the exploitation of the ERS, the Ministry has established and manages the Renewable Energy and Energy Efficiency Fund for the purpose to promote the rationalization of energy consumption and establishment of small ERS facilities.

IV. NUCLEAR ENERGY

Jordan has limited options for replacing petroleum products by natural gas (see Table 1.1 above). Jordan, with limited supply of natural gas in the southern region of the country, imports its gas needs from Egypt & Israel. Furthermore, the political instability in the region poses a real threat to the supply of oil and gas to Jordan. Thus, having an alternative source of energy is not a matter of choice in the long term.

Jordan's long term energy strategy is to reduce its dependency on energy imports, which currently constitutes 97% of energy production to ensure its security of its energy supply. It has been estimated that Jordan has about 65 thousand tons of uranium oxide from sources in the central region of the country, in addition nearly one hundred thousand tons of uranium can be extracted from the Jordanian phosphate. Furthermore, a new reserve of uranium in the region of "Alhasa" has also been discovered. Preliminary estimate of the quantity is equivalent to twenty thousand tons of uranium oxide. These quantities and reserves are concentrated in the central Jordan, Bahja Valley, AlsahebAlabyad Valley, and Alorishid (Abu Ayyub, 2011). Based on these estimates, the Government of Jordan has made decision to build a 2x1000MWe nuclear plan (NPP) in cooperation with the Russian Federation, which will also make a significant investment in the nuclear Power Plant. These intentions have been considered by some countries in the international community as an alarm for danger, especially that the Arab Regionis prone to conflict and instability. To alleviate these fears, Jordan issued the required legislative framework with regards to nuclear energy and had been keen and committed to be party to international conventions and treaties such as the Treaty on the Non-Proliferation of Nuclear Weapons, in addition to ensuring the application of nuclear safety standards and working closely with the IAEA (Saleh Al-Sharari, 2014)

4.1 Jordan Nuclear Energy Related Framework

Nuclear energy industry is considered as one of the industries that require the highest levels of safety and security in accordance to the international standards to protect workers in this field, citizens and the environment. In addition, it necessitates a high technical and technological standards and expertise during the distinct phases of setting up, operating and retiring a nuclear power plant. This industry can't tolerate errors and does not allow any chances of nuclear incidences leading to disasters since safety considerations are of top priority and supersedes any other considerations (Badran, 2014).

In 2001, the Government of Jordan passed the Atomic Energy and Radiation Protection Law No. 29 of 2001 with the purpose to provide direction, infrastructure and establish projects necessary to utilize nuclear energy for peaceful purposes, whilst ensuring public safety, human health and protection against radiation, etc. The law called for the creation of an independent and effectively empowered body called the Jordanian Nuclear Energy Commission (JNEC) to attain these objectives. In 2007, this Law was annulled and two new laws were enacted:1) the Nuclear Energy Law No. 42 for the year 2007 and 2) the Radiation, Protection and Nuclear Safety and Security Law No. 43 for the year 2007.

The Nuclear Energy Law No. 42 for the year 2007 primary objective is to introduce the peaceful uses of nuclear energy to the country mainly for electricity generation, water desalination and medicine, and setting up investment projects. The Law called for the creation of the Jordan Atomic Energy Commission (JAEC, as a financial and administrative independent legal entity reporting directly to the Prime Minister. JAEC main mandate is to transform Jordan from a net importer for energy by the year 2030, and alleviating the direct reliance on fossil fuels to alternative sources of energy, and the peaceful utilization of nuclear energy(Saleh Al-Sharari, 2014).

The Radiation, Protection and Nuclear Safety and Security Law No. 43 for the year 2007 created the Jordan Nuclear Regulatory Commission (JNRC), as a successor to JNEC, and as a legal entity that has full financial andadministrative independence that is directly reports to the Prime Minister. The JNRC was established to implementcomprehensive nuclear and radioactive related safeguards and create a system for and control of all nuclearmaterials (Sharaf , 2010). The Law also stipulates the duties and powers of the Commission, the constitute of theBoard of Directors (BOD), roles and responsibilities of the BOD, its Director, financial resources of the Commission, prohibitions and compliance requirements with regards to establishing, operating or managing anynuclear facility, management (use, transport & disposal) of radioactive waste in the Kingdom and related matters without obtaining the necessary licenses to be provided bythe Commission, in additions to defining penalties in the case of violation.

4.2 International Conventions and Agreements

Jordan has been keen to achieve Nuclear Safety consistent with its international obligations and in July of 1998, Jordan signed an additional Protocol to the Agreement between the Hashemite Kingdom of Jordan and the International Atomic Energy Agency for the application of safeguards related to the Treaty on the Non-Proliferation of Nuclear Weapons (Abutaleb, 2010).

Jordan's status in Relation to International Instruments (Saleh Al-Sharari, 2014):

1) Signed and ratified/ accessed:

a) Convention on Physical Protection of Nuclear Material (CPPNM)
b) Convention on Nuclear Safety
c) Convention on Early Notification of a Nuclear Accident
d) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
e) The Comprehensive Safeguards Agreements Between Jordan and the Agency for the Application ofsafeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons and theAdditional Protocol
f) Treaty on the Non-Proliferation of Nuclear Weapons (NPT)
g) Comprehensive Test Ban Treaty
h) Agreement on the Privileges and Immunities of the IAEA

2) Signed but hasn't ratified yet:

a) International Convention for the Suppression of Acts of Nuclear Terrorism,
b) Convention for the Suppression of Acts of Nuclear Terrorism
c) Co-operative Agreement for Arab States in Asia for Research, Development and Training Related toNuclear Science and Technology (ARASIA)
d) Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water, Partial TestBan Treaty 1963
e) Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of MassDestruction on the Sea-Bed and the Ocean Floor and in the Subsoil Thereof,
f) Revised Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistanceby the Agency; - Revised Supplementary Agreement Concerning the Provision of Technical Assistanceby the IAEA (RSA)

CONCLUSION

It is imperative for Jordan to develop an efficient energy projects including the exploitation of renewable energy sources as well as a peaceful civilian nuclear program to face future energy challenges, the accelerating growth for electricity demand, attain greater energy security, alleviate dependency on oil import by diversifying its energy mix, reduce financial burden as a result of the cost of imported oil and gas, and create an opportunity to generate revenue by exporting excess electricity to neighboring countries

It is critical for Jordan to ensure that it has adequate capacity building within the country including government, private sector and non-for profit sector for it to be able to fulfil itsobligations mandated by the law, infrastructure, required investment, expertise, trained personnel and mostimportantly strong legal framework to manage and implement its nuclear ambition and programs to avoid adverseimpacts on the environment, public health and nuclear accidents.

RECOMMENDATIONS

- Review comparative legislation and regulations, specifically with leading countries in the exploitation of renewable energy sources (RES)and nuclear programs to build a balancedadequate legislative framework for the appropriate and efficient use of RES and safe useof nuclear power in the country.
- Draft of a new comprehensive nuclear energy law that covers all the nuclear project's elements includingrecommendations for a suitable organization structure.
- Develop a capacity building program for judges to ensure that they have the right expertise, capabilities andresources to consider general energy related matters and nuclear related cases.
- Encourage investment in Renewable Energy research, by providing economic incentives, to

increase its contribution beyond 6% to the total energy demand in 2025.

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