

# Energy

Second Edition

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# Jordan

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## **Overview of the current energy mix, and the place in the market of different energy sources**

The energy sector plays a vital role practically in every other sector in Jordan. It is essential for increasing the standard of living, as it is fundamental for the establishment of sustainable development in the Kingdom. Jordan lacks conventional energy resources and imports the vast majority of its energy.

Jordan is facing serious problems in the energy field and is finding it very difficult to quench the Kingdom's need for energy. The rapid increase in the population size, and the growth of the economy in Jordan, are creating a high demand for energy.

The increase in the prices of crude oil and its derivatives, as well as the persisting effects of the events that occurred in Egypt and the Arab Spring, have significantly affected the energy sector as a whole. The Government is doing its best to attend to and deal with the energy deficit that has resulted.

Before we examine the energy situation and the energy sector in general, a brief overview of Jordan is offered in order to put things into perspective.

The Hashemite Kingdom of Jordan is a Middle Eastern country surrounded by Syria, the Kingdom of Saudi Arabia, Iraq and Israel/Palestine. It is an independent monarchy, which was initially established as the Hashemite Emirates of TransJordan in 1921. In 1945, it joined the Arab League of Nations and thereafter, in 1946, was officially declared as an independent sovereign monarchy.

Currently, Jordan has a total area of 89,318 sq km, of which 88,778 sq km is land area<sup>1</sup>. The total population at 6 June 2013 is 6,448,737<sup>2</sup>, which is approximately 3.2% more than that of the year ending 2011. At the end of 2012, Jordan's gross domestic product (GDP) was recorded at approximately 21,9655m Jordanian Dinars (approximately US\$30,980m)<sup>3</sup>.

## **Changes in the energy situation in the last 12 months which are likely to have an impact on future direction or policy**

Jordan has a small to medium-sized economy. It annually receives financial aid from abroad and has a number of foreign loans. Its recorded public debt constituted approximately 75.5% of its GDP for the year ending 2012,<sup>4</sup> and was reduced to 69.8% as at February 2013<sup>5</sup>. It has very limited natural resources and relies mainly on imports in order to satisfy the needs of the Kingdom. More specifically, Jordan is experiencing major problems in the energy and water sectors, as both energy and water are limited resources in the Kingdom. Therefore, Jordan imports most of its energy.

Due to the high levels of imported energy and scarcity of Government funds, as well as the excessive amount of financial aid and foreign loans that the Kingdom receives annually, the energy sector is extremely burdensome on the Jordanian economy. In 2012, Jordan imported approximately 96.5% of its energy<sup>6</sup>, which accounts for nearly 21% of its GDP<sup>7</sup>.

Recent figures show that Jordan's bill for imported energy for the year ending 2012 amounts to 4,5392m Jordanian Dinars (approximately US\$6,4021m), which shows a 18% increase compared with that of the previous year<sup>8</sup>. In light of the above, the weight that the energy sector in Jordan has on its economy is restricting the economic growth and stability of the Kingdom.

### Energy resources

Unlike neighbouring countries, Jordan has little or no reserves of oil. The Government has expended great efforts in the past in prospecting for oil and gas, by itself and in collaboration with several foreign companies. The outcome of such efforts only resulted in two findings:

1. small amounts of non-commercial crude oil in Hamza Field in 1985; and
2. natural gas in Al-Risha Field in 1989, which is now being used to generate electricity<sup>9</sup>.

In 2012, Jordan's local production of crude oil and natural gas amounted to approximately 279,000 tonnes equivalent of oil (toe), which constitutes nearly 3.5% of its energy needs. In light of the above, its imported crude oil and its derivatives and natural gas amounted to 7,232,000 toe and 587 million cubic metres, respectively<sup>10</sup>.

### **Developments in government policy/strategy/approach**

The Government is searching for more crude oil and natural gas mainly in areas such as Al-Risha Field, East and South areas of Al-Safawi and Azraq<sup>11</sup>. It is working in collaboration with several foreign companies with extensive technical expertise and financial capability to conduct the relevant searches and studies in order to determine whether there are viable and commercial energy resources in the Kingdom, and to exploit them if and when applicable. For example, the Government has previously granted a 50-year concession to the National Petroleum Company in 1996, which was later amended in 2009 to introduce BP (British Petroleum Company) to the concession area<sup>12</sup>. The amendment was ratified by a provisional law in 2010 and thereafter by a permanent law in 2012. In 2011, BP produced 3-dimensional seismic surveys of a specific area in Al-Risha Field. Following the results of further studies, and in the event BP decides to move forward into the second phase of the development and production stage, the company aims to produce approximately 300-1,000 cubic metres of natural gas per day<sup>13</sup>.

Jordan has excessive amounts of oil shale and is the fourth-richest country in the world in oil shale after each of USA, China and Brazil, as it has over 70 billion tonnes of oil shale, which contain over seven billion tonnes of shale oil. Oil shale may be used to generate electricity through the direct combustion of oil shale, or either distillation or thermal injection to produce crude oil<sup>14</sup>. After a series of technological breakthroughs and successful global efforts to use oil shale for the generation of electricity, the Government has adopted a strategy to market oil shale and attract international firms with technical expertise and financial capabilities to use oil shale for the generation of electricity<sup>15</sup>.

In terms of renewable energy, Jordan has high amounts of solar and wind energy which may be used to generate electricity. Solar energy in the Kingdom is considered to be one of the highest rates worldwide. Its rates range between 5-7 kilowatt hour/sq m<sup>16</sup>. With respect to wind energy, wind speed ranges between 7-9 metres/second<sup>17</sup>, which may be used to generate significant amounts of electricity if properly and efficiently used. However, as of now, renewable energy sources are not being utilised properly and efficiently for the generation of electricity.

Studies show that Jordan has large amounts of underground uranium deposits, which may be used to generate electricity through nuclear energy for peaceful purposes<sup>18</sup>. Currently, no nuclear energy or electricity is being generated and the prospect of utilising nuclear energy for the generation of electricity is still under investigation.

### The energy mix

The current energy mix in Jordan can be summarised thus:

1. crude oil and its derivatives;
2. natural gas;
3. imported electricity; and
4. renewable energy.

#### *Crude oil and its derivatives*

At present, Jordan's consumption of crude oil and its derivatives are a key component of the Kingdom's energy mix. It constitutes approximately 88% of the primary energy consumption of the Kingdom. Nearly all of Jordan's crude oil comes from the Kingdom of Saudi Arabia and Iraq which,

according to the Ministry of Energy and Mineral Resources, amount to approximately 90% and 10%, respectively.

Jordan depends on the Jordan Petroleum Refinery Company (Jordan Petroleum) for the supply of refined crude oil and/or its products. It previously awarded Jordan Petroleum a concession, creating a monopoly over the supply of crude oil and its products. However, the concession expired in 2008. After the expiry of the concession, the Government signed a services agreement with Jordan Petroleum for the supply, storage and distribution of crude oil and its products<sup>19</sup> which additionally granted the company exclusive rights over the supply of the oil. The services agreement was for a period of approximately two years and, therefore, was renewed several times<sup>20</sup>. In 2012 and in an effort to have an open and competitive market, the Government granted Total Company and Modern Jordanian Company for Oil and Fuel Services (Manaseer) petroleum products distribution licences. Additionally, it has granted a subsidiary of Jordan Petroleum such distribution licence. The licences granted to these three companies are exclusive for three years, after which the Government plans to grant licences to other petroleum products distribution companies<sup>21</sup>.

Jordan Petroleum's capabilities are limited, and the company faced many challenges in attempting to find a strategic partner and expand for the purposes of increasing the efficiency of converting heavy fuels to light fuel and improving the standard and quality of petroleum products<sup>22</sup>. Finding a strategic partner is crucial to Jordan Petroleum to improve its infrastructure and position itself in the market. The company is now exerting maximum effort to finally succeed in this enterprise, as the Government has granted Jordan Petroleum a six-year period to implement its expansion project<sup>23</sup>.

Jordan has renewed the memorandum of understanding executed between the Government of Jordan and the Government of Iraq in connection with the supply of Kirkuk oil to the Jordan Petroleum Refinery Company until 18 September 2013<sup>24</sup>. According to the memorandum, the agreed amount of Kirkuk oil to be imported was 30,000 barrels per day<sup>25</sup>. However, due to the prevailing limitation on the capabilities of Jordan Petroleum, the persisting problem arising from failure to find a strategic partner, and the characteristics of the oil imported, the amount of Kirkuk oil which was imported in 2012 was only 15,000 barrels per day.

There is an increase in the consumption of crude oil and its products, which is primarily due to the increase in the consumption of diesel. This increase resulted in a total growth in the consumption of such products of 11%<sup>26</sup> over and above the 24%<sup>27</sup> growth of such product in 2011. Such an increase is a direct result of the decrease in the amount of natural gas imported from Egypt as detailed below, and the overall increase of energy demand in the Kingdom.

The cost for importing crude oil and its products has further increased in the past 12 months. The total cost for importing it is 22%<sup>28</sup> more than that of the previous year. The percentage of the increase of importing crude oil and diesel was recorded at 16%<sup>29</sup>. Additionally, the increase in the prices of crude oil, generally, played a major role in the rise of the total cost of importing such products.

With the increase in the demand for crude oil and the rising cost of its products, the Government is trying hard to minimise the cost of the transport of the products, as well as increase the efficiency of such transport. Currently, crude oil is being transported from Iraq and the Kingdom of Saudi Arabia through ships to the port of Aqaba and thereafter in special vehicles to the refinery in Zarqa. The cost of transport is increasing significantly with the increase in the cost of gasoline and diesel. The Government has previously studied alternatives, by itself and in collaboration with Jordan Petroleum, in order to reduce such costs. The following are some alternatives which the Government has previously considered:

1. Building a pipeline directly from Iraq to Jordan.
2. Building a pipeline from Aqaba to the refinery in Zarqa.
3. Rehabilitating the tap-line between Jordan and the Kingdom of Saudi Arabia.
4. Implementing a national rail project.

The Government has started implementing projects in an effort to reduce the cost of transport. With respect to the Jordan/Iraq pipeline, the discussions regarding the pipeline date back to before 2007. Shortly after 2007, all discussions concerning the pipeline ceased. Throughout 2012, Jordan has negotiated with Iraq in order to build a pipeline from Basra, Iraq to Aqaba, Jordan to aid in

the worldwide export of Iraqi fuel. In fact, the Jordan-Iraq pipeline has been the indirect result of building a branch from the main Basra-Aqaba pipeline to transport Iraqi fuel that will be directly used for the Kingdom. Early in 2013, the Government executed a preliminary agreement with the Iraqi Government in order to implement the Basra-Aqaba pipeline.

The Government is facing many obstacles in connection with the alternatives listed under items 2-4 above. As for the pipeline proposed to be built between Aqaba and the refinery in Zarqa, Jordan Petroleum Company has previously taken the initiative and proposed to build the pipeline. Jordan Petroleum began the application for the licence and procured an approval from the Ministry of Energy and Mineral Resources. However, Jordan Petroleum never followed through and the licence was never granted.

In connection with the rehabilitation of the existing tap-line (pipeline) between Jordan and the Kingdom of Saudi Arabia, the tap-line presently is in extremely poor condition and cannot be used in any way. Therefore, a new pipeline in its entirety needs to be built, which implies considerable cost.

Finally, and regarding the implementation of a national rail project, the Government is encouraging such a project and leans towards implementing it, as it is not just beneficial for the energy sector, but also aids and supports the transport sector, given that it reduces transport costs in the long run. However, Jordan Petroleum is opposing the implementation of the project, as it is more expensive than building the Aqaba-Zarqa pipeline, and up until now no projects were awarded in this respect.

Additionally, the Government is trying to reduce transport costs using another approach. It has sold the crude oil storage facility currently present on Jerash, a floating ship in the Port of Aqaba. It intends to replace Jerash by building a storage facility in Aqaba with a capacity of 230,000 tonnes. The Government is proposing to build the facility in two phases. The Government has released a tender for the first phase to build underground storage for only 100,000 tonnes earlier in 2012. In December 2012, the Government received nine proposals from nine international companies and is still in the process of evaluating such proposals<sup>30</sup>.

#### *Natural gas*

Natural gas is one of the primary consumable energy resources in the Kingdom. It currently comprises approximately 8% of Jordan's energy mix<sup>31</sup>. On the other hand, in 2010, natural gas constituted 31%<sup>32</sup> of the Kingdom's energy mix, and later in 2011 decreased to constitute about 12%<sup>33</sup>. However, in light of the prevailing issues in Egypt due to a series of explosions which occurred on the Arab gas pipelines in February, April, July and September 2011 and the continued effect of the Arab Spring, the amount of gas imported from Egypt continued to decrease considerably. In 2012, natural gas imported decreased by 27%<sup>34</sup>.

Natural gas is an important element of the energy mix in Jordan. It was used to replace costly crude oil and its products, and was often used to generate electricity. In 2010, 68%<sup>35</sup> of the electricity generated in Jordan was from natural gas obtained from Egypt. Consequently, with the current political turmoil and the continuing financial troubles, Jordan is struggling to sustain a somewhat healthy economy. The Government has started implementing its adopted Liquefied Natural Gas Project, which can be divided into three stages:

1. securing supply of liquefied natural gas into the energy sector in order to be able to easily and readily transport natural gas and source supplies from across the world;
2. implementing a new jetty project in the port of Aqaba to make the transport of liquefied natural gas easier; and
3. leasing a ship fully equipped for the transport of liquefied natural gas.

The Government has taken the initiative and accepted the introduction of liquefied natural gas into the energy mix. It anticipates that importing liquefied natural gas shall start in the second quarter of 2014<sup>36</sup>.

In order to adapt the Kingdom's infrastructure and enhance its capabilities to import, store, regasify and consume liquefied natural gas, it has released a tender, in May 2012, for the establishment of a purpose-built storage in Aqaba for the storage and regasification of the liquefied gas<sup>37</sup>. The Government has completed the evaluation of the technical proposal and has entered into negotiations with Golar LNG

Limited, its first choice prequalified bidder<sup>38</sup>. In September 2012, Aqaba Development Company executed a consultancy services agreement with a specialised company for the purpose of providing advice and designs necessary to implement this jetty project<sup>39</sup>. Additionally, early in 2013, the Government released a tender for the supply of liquefied natural gas in an amount of 150 mmacf/d<sup>40</sup>.

As previously indicated, Jordan has natural gas in Al-Risha Field. The total production of natural gas for the year 2012 has been documented at 5.8 billion cubic feet,<sup>41</sup> recording a natural decline of approximately 9%.

### *Electricity*

The need for electricity has increased in the past 12 months due to the increase in the temperature in the summer, which in turn has increased the use of air conditioning units in most sectors. Additionally, electrical heaters were extensively used in the winter rather than usual fuel-based radiators, due to the low prices of electricity compared with the high prices of crude oil and its derivatives. The increase was most significantly shown in the housing sector, and thereafter the commercial sector<sup>42</sup>.

The Government is trying to digest the unexpected demand for electricity in the Kingdom. It is looking to increase the size and efficiency of the overall market for electricity in Jordan. It has participated in a series of projects, which present promising outcomes for the current electricity situation.

Jordan currently has six main electricity generation producers. The main electricity generation producers comprise: Central Electricity Generation Company (CEGCO); four Independent Power Producers (IPPs); and Samra, a Government-owned electricity generation company, details of which are as follows:

1. CEGCO electricity generation plants are operated by CEGCO, a company previously wholly owned by the Government, which was privatised in 2007. Currently, CEGCO is still implementing the projects undertaken by it prior to its privatisation;
2. IPP 1 was granted by the Government on 26 September 2009 to AES-Jordan PSC<sup>43</sup>, a joint venture company established by AES Electric and Mitsui<sup>44</sup>, and officially launched the project on 26 October 2009<sup>45</sup>;
3. IPP 2 was granted to Al-Qatraneh Company, a consortium made up of Korean Electric Power Corporation (KEPCO) and XENEL, which operated as a single cycle on 31 December 2010<sup>46</sup>. The combined cycle was officially opened in February 2012, and it began its operation earlier in 2012<sup>47</sup>;
4. IPP 3 was granted to a joint venture company owned by KEPCO, Mitsubishi Corporation and Wärsilä Development Financial Services OY. The project agreements were signed at the end of 2012<sup>48</sup> and the project has reached financial close in the first quarter of 2013. It is anticipated the first operation phase of the project will be in the first quarter of 2014, and the second phase in the third quarter of 2014<sup>49</sup>;
5. IPP 4 was granted to a joint venture owned by AES Electric and Mitsui. The project agreements were signed at the end of 2012,<sup>50</sup> and the project has reached financial close at the end of 2012/beginning of 2013. It is anticipated that the project will reach its commercial operation date in the third quarter of 2014<sup>51</sup>; and
6. Samra electricity generation project was granted to Samra Electric Power Generation Company. It has undergone three expansions, the last of which was in 2011<sup>52</sup>.

Jordan relies on an interconnection grid made between Jordan, Syria, Egypt and Lebanon for any minor deficit in electricity. The interconnection grid cannot be used as a stable alternative to relieve the Kingdom from any major shortfall in electricity, as it only has a maximum capacity of 400 Gigawatts. The interconnection grid was excessively used in 2011 and recorded an increase of 159%<sup>53</sup> in electricity imported from Egypt and Syria. However, in 2012, the electricity imported through the grid decreased considerably, by 55%<sup>54</sup>.

The interconnection grid is a key component of imported electricity. It helped in introducing imported electricity to the energy mix of the Kingdom. Imported electricity plays a minor role in the energy mix as it constitutes approximately 2%<sup>55</sup> of the primary energy consumption in the Kingdom.

Despite the rise in the cost of electricity and energy generally, the Government is using its best

endeavours to attend to the people’s needs, and continued to electrify rural areas through its rural electrification project via the relevant electricity distribution companies. In 2012, 2,456 houses were electrified<sup>56</sup>.

*Renewable energy*

The Government is trying to relieve the burden created by importing energy through the use of renewable energy resources. However, at present renewable energy plays a minor role in the energy sector. It comprises less than 2% of the energy mix<sup>57</sup>.

Renewable energy in the Kingdom can be divided into the following categories:

1. solar;
2. wind; and
3. bio.

Even though Jordan is blessed with high rates of solar and wind energy, it does not depend on them for the generation of electricity. The Government is trying to utilise wind and solar energy through several projects. The Government has received 64 direct proposals from different international companies for various wind and solar projects, and thereafter executed 30 memoranda of understanding in this regard<sup>58</sup>.

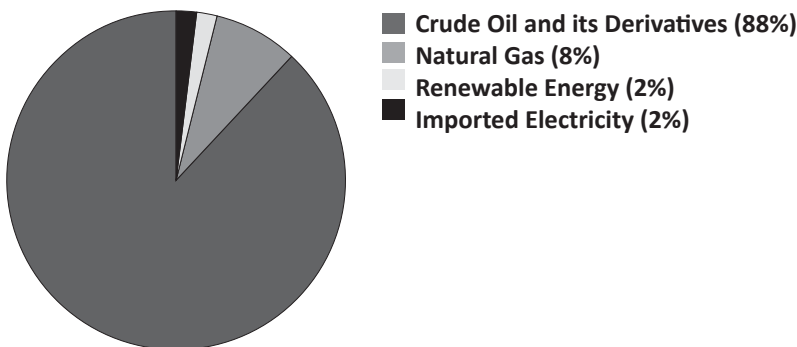
In the area of wind, there is presently one main project in progress, Al-fujeij wind project: the Government awarded this project to KEPCO, a Korean company. The Government is in the process of finalising all negotiations and agreements. It is anticipated that once the agreements are signed, the commercial operation date will be reached at the end of 2014<sup>59</sup>.

On the other hand, there are several solar projects in which the Government is involved. One example is the solar energy project for the generation of electricity through photovoltaic cells: the Government has prepared the tender documents and released the tender at the end of 2012. The project is for the generation of electricity using photovoltaic cells in Al Azraq, and is financed by a grant given by Spain. The grant agreement sets out the eligibility criteria for the companies’ award to international companies, provided that all equipment and machinery are of Spanish origin<sup>60</sup>.

Currently, bio energy is one of the very small contributors to renewable energy in the Kingdom. There is only one company that is presently working on the treatment of organic waste for the production of bio energy. In 2012, the Bio Gas Company generated around 5.9 Gigawatt hours of electricity<sup>61</sup>.

Jordan has very limited water. Therefore, the generation of hydro energy is very limited. There are no projects for the generation of electricity from hydropower; only experimental projects have been conducted on King Talal Dam. Additionally, thermal energy’s contribution to renewable energy in Jordan is negligible. In 2010, studies conducted by Japanese consultants indicate that the hot water springs in Ma’in, Zara and Alazrak cannot be used for the generation of electricity<sup>62</sup>.

**Primary Energy Consumption for 2012 (000 TOE)**



Source: this diagram was drawn using the figures in the Ministry of Energy and Mineral Resources, draft Annual Report 2012

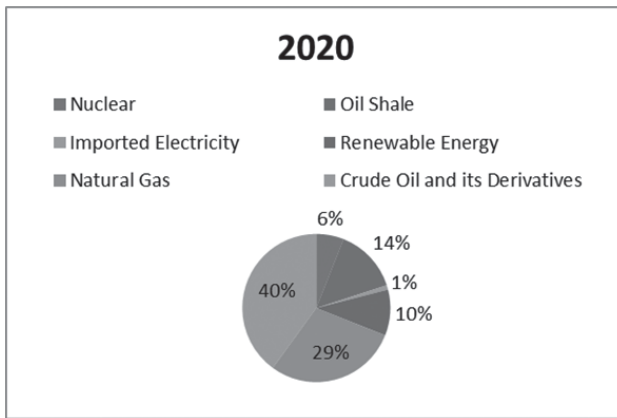


**Major events or developments**

The Government is working hard to alleviate the current energy problems and lift the burden this sector has on the Jordanian economy. As documented in the Master Strategy of the Energy Sector in Jordan dated 2007 (Master Strategy), Jordan is intending to rely more on the very limited resources it has for the generation of electricity by encouraging local energy production to replace pricey imported energy.

The Master Strategy was last updated in December 2007. It sets out an overview of the issues in the energy sector, and general feedback on how they may be overcome. Additionally, the Master Strategy indicates the Government’s approach and how the energy mix will change by the year 2020. It documents the introduction of oil shale, a new element to the current energy mix, as well as the increase in dependency on renewable energy sources to replace the Kingdom’s dependency on oil products, natural gas and imported electricity.

According to the Master Strategy and the Government’s approach, the changes in the energy mix can be shown in two main phases, for the years 2015 and 2020. The Government’s forecast of 2020 is shown below:



Source: Document obtained from officials at the Ministry of Energy and Mineral Resources in 2012

The Government, together with the Natural Resources Authority (NRA), is currently working on methods for the introduction of oil shale to the energy mix in Jordan in order to implement the Master Strategy and allow the contribution of oil shale to the energy mix to be 14% in 2020<sup>63</sup>. The Government is currently taking three approaches to using oil shale for the generation of electricity and its contribution to the energy mix:

1. surface mining of oil shale for the production of oil;
2. utilising deep oil shale for the production of oil; and
3. direct combustion of oil shale for the generation of electricity<sup>64</sup>.

The Government was able to attract many international companies with distinguished technical expertise for the surface mining of oil shale. Such companies must submit their feasibility studies prior to entering into any negotiations on the concession agreements to be granted. There are many companies who are presently preparing their feasibility studies. However, two companies have already been awarded concessions in Attarat and Allajoun, namely Jordan Oil Shale Company (a special purpose vehicle owned by Enefit, an Estonian company) and Karak International Oil Company (a company established by Oil Shale Development Limited, a Channel Island company), respectively.

Currently, there is only one project for the utilisation of deep oil shale for the production of oil. Awarded to Shell Oil through a concession, the company is currently using its own technology (*in situ* conversion process) to exploit deep oil shale without actually mining it. The company began implementation of the project on 16 August 2009<sup>65</sup>.

At present, there are only two proposed projects for the generation of electricity by the direct combustion of oil shale. However, neither project has been finalised, nor have any agreements been signed in this respect<sup>66</sup>.

The introduction of nuclear energy into the energy mix dates back to 2007, the date of the establishment of the Jordan Atomic Energy Commission (JAEC). JAEC was established in order to implement peaceful uses of nuclear energy in the Kingdom. Areva, a French company, and JAEC have formed a joint venture company which was granted a concession for the mining and exploitation of uranium. Due to certain disagreements between Areva and JAEC, at the end of 2012, the concession agreement was terminated by mutual agreement between the parties. Shortly after the termination of the concession agreement, the Government established a joint venture between JAEC and a company wholly owned by the Government that will undergo the implementation of the nuclear project. Currently, the Government is on a search to find a strategic partner to alleviate the financial burden this project has on the Government and provide technical expertise in this field<sup>67</sup>. Jordan's nuclear programme is still under investigation; the area of the nuclear power plant remains undetermined, and the technology used for the generation of electricity is still unknown.

The nuclear programme is experiencing great opposition from different sections of the Jordanian community, due to the danger it may represent and its high capital cost, as well as the large amounts of water it consumes. The Government, through JAEC, is trying its best to market the introduction of nuclear energy into the energy mix, as Jordan is in desperate need of local sources of energy.

Despite the Government's efforts in trying to attend to the energy situation in the Kingdom, Jordan lacks expertise in areas like nuclear. However, the Government is investing greatly in trying to overcome the scarcity of technical expertise in nuclear energy, and is encouraging the relevant personnel to obtain such expertise from abroad. The Government is trying to promote expertise in the nuclear field by arranging for grants to send the relevant personnel for continuing higher education and obtain Masters degrees from countries with extensive expertise such as France<sup>68</sup>. Additionally, the Government's approach is somewhat tentative to increasing the contribution of renewable energy and local energy into the energy mix. Currently, it is merely promoting the use of renewables and local energy and is, generally, not enforcing any stringent rules in this regard. By way of an example, there is no law to restrict the import of bulbs which are not energy-saving. However, the Government has released a tender for the promotion of the use of energy-saving bulbs, and another tender for the distribution of 1.5 million energy-saving bulbs to houses<sup>69</sup>.

Governments in Jordan are constantly changing and last for approximately 10-11 months in office. With the constant changes in the Government, this greatly impacts the decision-making process. This in turn affects development in many sectors like the energy sector.

Even though the Government adopted the Updated Master Strategy of 2007, with the current slow decision-making process, its soft approach to promoting local energy production, and the lack of expertise in certain areas, as well as the considerable pressures that different sections of the community are imposing on the Government, Jordan is facing many obstacles in the implementation of the Master Strategy, and may be prevented from reaching its targets as set forth therein.

### **Developments in legislation or regulation**

The Kingdom does not have a single piece of legislation that deals with the energy sector as a whole, but rather a series of different legislation that deals with certain aspects of the energy sector. There are five main laws that deal with the energy sector, namely:

1. The Temporary Public Electricity Law No. 64 of 2002 (Electricity Law).
2. The Law for the Regulation of Natural Resources Affairs No. 12 of 1968 (NRA Law).
3. The Nuclear Energy Law No. 42 of 2007.
4. The Radiation Protection and Safety and Nuclear Security Law No. 43 of 2007 (RPSNS Law).
5. The Renewable Energy and Energy Efficiency Law No.13 of 2012 (Renewable Energy Law).

In 2012, the adoption of the new Renewable Energy Law took place. The new energy law is deemed to be a step forward in the energy sector generally, as it documents the Government's growth and development in the energy field. The introduction of the new law is in conformity with the Kingdom's Master Strategy, as it aids and enhances the increase of renewable energy in the energy mix.

The Renewable Energy Law allows the private sector to engage directly in direct proposals. It also

encourages the use of renewables by granting renewable energy projects certain exemptions such as tax exemptions.

During the course of the past 12 months, several regulations and instructions needed for the implementation of the Renewable Energy Law were adopted, creating a full and comprehensive legal and legislative framework to regulate electricity generation from renewable energy systems and grant many financial incentives for renewable energy projects. As an example: (i) the Regulation of the Methods of Energy Conservation was adopted, which creates an essential feature in the energy sector, as it enriches the Government's current energy conservation methods and aids the overall development of the energy sector (additionally, the said regulation attempts to impose the use of renewable energy systems by not granting occupancy permits unless solar panels are used); and (ii) the Instructions for the Regulations of the Sale of Electrical Power Generated from Renewable Energy Systems was adopted, which allows persons generating electricity from renewable energy systems to sell any surplus electricity to the relevant distribution company.

### **Proposals for changes in laws or regulations**

Other than the enactment of the Renewable Energy Law, no recent amendments were made to any of the other energy laws.

The Ministry of Energy and Mineral Resources is presently working on a draft new energy law, to be named the Energy and Minerals Law. The Energy and Minerals Law is drafted in a way that combines the Electricity Law, the NRA Law and the RPSNS Law into one piece of legislation, as well as establishing one entity for the regulation of the energy sector (The Energy and Minerals Regulatory Commission).

### **Conclusion**

The energy sector is one of the most crucial elements of economic, social and environmental growth of the Kingdom. At present, it is greatly restricting the development of the Jordanian economy, as it places a great burden on the Jordanian economy and consumes enormous amounts of funds that Jordan does not have.

Jordan lacks conventional energy resources and relies mainly on imported energy. Jordan's current energy mix comprises crude oil and its products, natural gas, renewable energy and imported electricity. The Government is currently working on the introduction of new elements in the energy mix, namely: oil shale and nuclear energy for peaceful uses.

The Government is working to minimise the drain of the energy sector on the economy by promoting the local production of energy in order to replace the vast majority of imported energy. This strategy is extremely promising, but the implementation has been somewhat slow. The Government needs to be more affirmative and impose stricter rules, which need to be documented in the energy laws, for the local production of energy and energy conservation, rather than its mere promotion.

With the increase in the demand for electricity and the Government's approach in overcoming the struggle imposed by the energy sector and the promotion of local production of energy, Jordan's energy sector is slowly flourishing. Therefore, the energy sector offers good investment opportunities for local and foreign investors. Jordan is in great need of local energy production in order to sustain a healthy and stable economy.

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