



The Hashemite kingdom of Jordan



Ministry of Energy and Mineral Resources

Annual Report

2009



His Majesty King Abdullah the second Ibn Al- Hussein



Crown Prince Hussein bin Al Abdullah

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Vision

Achieving a secure sustainable supply of energy.

Mission

Ensuring the required energy supply; for sustainable development, with the least cost and best quality through enhancement and implementation of proper policies, legislation and plans.



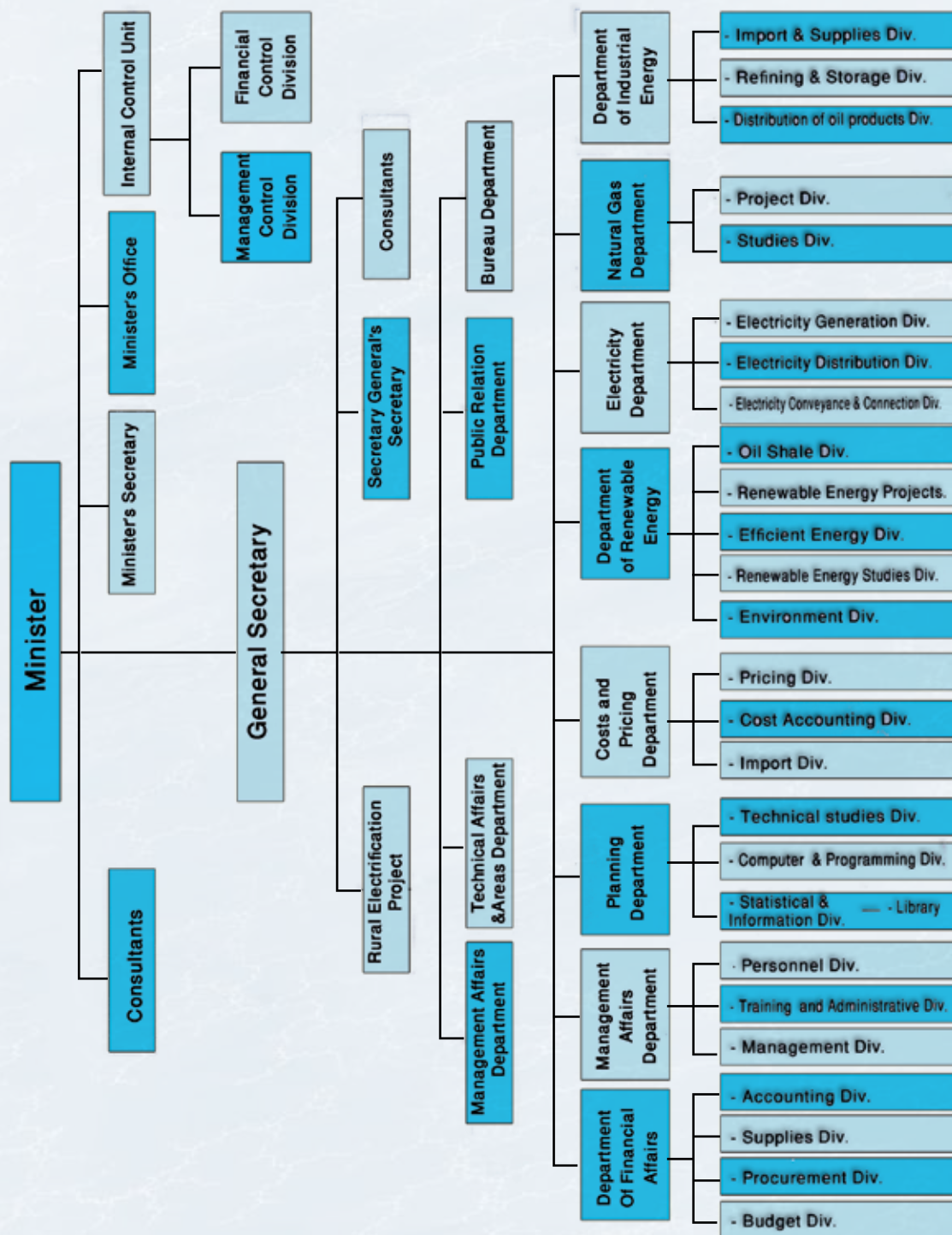
Core values

- **Working in team spirit**
- **Dissemination of knowledge**
- **Transparency and un-biasness**
- **Affiliation and discipline**
- **Excellence**
- **Justice and equal opportunities**



Strategic objectives

- **Diversify the sources and kinds of energy**
- **Develop and utilize the local conventional and renewable sources of energy, oil, shale, and uranium**
- **Liberalizing the energy market and open it for the competition.**
- **Create opportunities for the private sector and encourage this sector to invest in the infrastructure projects of the energy sector**
- **Reinforce the regional energy grid projects and maximize the benefits thereof**
- **Rationalize energy consumption in all the sectors and improve their efficiency**



Terms and Abbreviations

KW	kilowatt (100 watt)
GWh	Gigawatt – hour = Million Kilo Watt – hour
KWh	kilowatt – hour
MW	Megawatt
MWh	Megawatt – hour
b /day	Barrel / day
boe	Barrel oil equivalent
boe/day	Barrel oil equivalent / day
toe	Ton oil equivalent
MVA	Mega volt ampere
KV	Kilovolt
km	Kilometer
kg	Kilograms
kgoe	Kilogram oil equivalent
GDP	Gross Domestic Product
JD	Jordan Dinar (10³ Fils)
CF	Cubic Feet

Significant Figures of Energy and Economy in Jordan 2009

Population (millions)	5.980
Gross Domestic Product (GDP) at current prices (million JD)	16266
GDP per capita (JD)	2720
Energy Intensity (toe/1000 JD in 1994)	0.8
Per capita primary energy consumption (Kgoe)	1294
Per capita share of electricity consumption (KWh)	1999
Electricity generation (GWh)	14272
Electricity consumption (GWh)	11956
Percentage of population supplied with electricity (%)	99.9
Overall domestic energy production (1000 toe)	163
Imported Oil (1000 toe)	7579
Primary energy consumption (1000 toe)	7739
Cost of consumed energy (million JD)	1916
Cost of consumed energy as a percentage of:-	
Exports (%)	42
Imports (%)	19
Gross Domestic Product (%)	12
Jordan Dinar (JD) = 1000 Fils = US\$ 1.41 in 200 Jordan Dinar (JD) = 1000 Fils = US\$ 1.41 in 2009	

Introduction

The main goal behind using the energy is to achieve the sustainable development, as energy is considered to be one of the comprehensive development's tools and the main driver for all the sectors; economic, social and service. So the exerted national efforts in the energy sector are focused to enable the Jordanian society to enjoy the services of energy in order to increase the level of welfare and improve life standards and to fight poverty. From this point , the issue of energy has been given the utmost importance to achieve a safe supply of energy through the diversification of energy sources and its imported forms and to develop and improve the local and renewable energy sources and to increase its efficiency in the various sectors.

In this context, The Ministry of Energy and Mineral Resources and the other sector's institutions were able to perform many achievements during 2009.

In the field of securing the crude oil and its products, The services agreement of importing, storing, securing, and distributing of petroleum products between the government and the Jordan Petroleum Refinery Company has been extended for a new term until the end of 2010, to secure the Kingdom's needs of oil products until opening the market for competition. Four other areas also have been marketed for oil and gas exploration and bounded by concession agreements with an international oil companies to search and explore oil and gas. The British Petroleum Company BP was granted on 25/10/2009 a concession to develop AlRisha gas field by entering as a strategic partner with the National Petroleum Company. The concession agreement has been ratified and issued in a temporary law published in the Official Gazette on 3/01/2010.

In the field of the natural gas, 80% of the Kingdom's electricity energy in 2009 was generated out of the natural gas imported from Egypt, as the overall capacity of the electricity Power plants operating on the natural gas in the kingdom is 1880MW. An agreement between NEPCO and the Jordanian-Egyptian Fajer Company has been signed in October 2009 to implement and establish the two points of natural gas' supply for each of Al-Samra electric Power plant/the third stage, and the second private electricity generation project /Al-Qatraneh.

In the field of Electricity, on 26/10/2009, under the patronage of His Majesty King Abdullah II the official inauguration of the first IPP project/ East Amman

Al-mnakher, as the project was operated previously with its full capacity which is 370 MW as a combined cycle on 26/08/2009 . On 29/09/2009, the agreement of the second IPP project/Al-Qatrana has been signed between the local concerned authorities and the project company. The project will be operated as a simple cycle on 30/11/2010 and as a combined cycle on 25/08/2011.

In the field of utilizing the Oil Shale, the number of companies that have signed memoranda of understanding with the government, represented by the authority of Natural Resources Authority has increased to reach 8 companies, in order to prepare economical banking feasibility studies to utilize the Oil Shale to produce oil through the surface distillation technology in Al-Lajjun and Al-Atarat areas. Shell company also was granted a concession to utilize the deep Oil Shale, and was issued as a special law in the Official Gazette on 16/8/2009.

In the field of the renewable energy, The coalition of the Greek company (TERNA) was chosen to implement the wind energy project in Al-Qamshih area in the governorate of Jerash with a capacity of 30-40 MW and it is expected to final the negotiations in 2010. The interested international and local companies has been called to bid on the wind energy project in Fujiej area in Al-shobak with a capacity of 80-90 MW.

In the field of energy conservation, The work has continued on implementing the Ministers Council's decision regarding the exemption of energy saving devices and renewable energy from the custom duties and the sale tax in order to encourage the citizens to buy the energy saving and renewable energy equipment and devices.

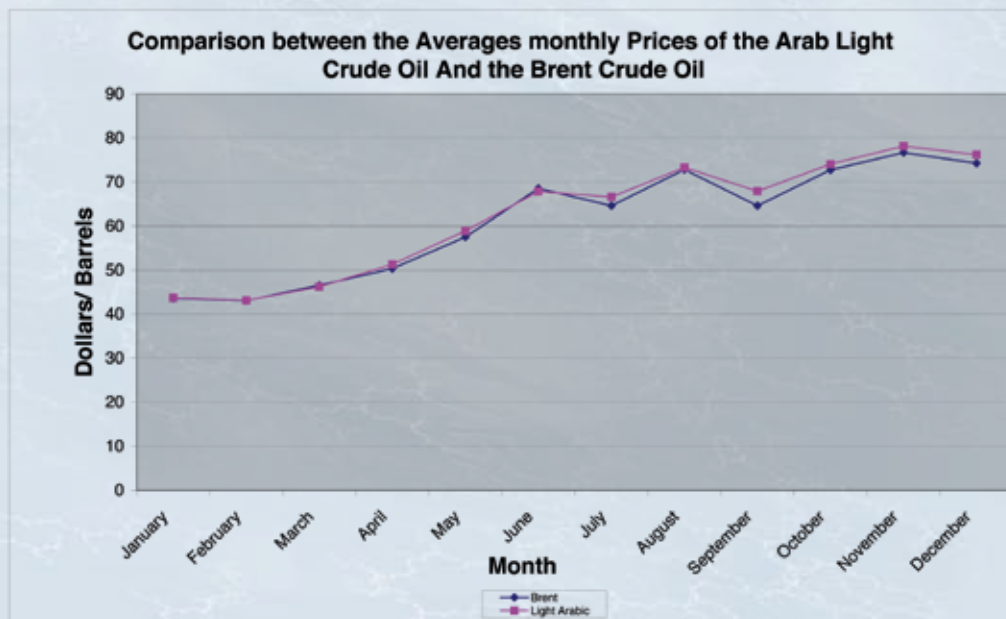
This report includes many of the achievements that are accomplished in other areas such as nuclear energy, mining, electric link project, Rural Electrification Project and others.

The Oil and Natural Gas Development

First- On the Arab and International Levels:

In 2009, the average daily world production of crude oil reached around 84 million b/d showing a dropping of 1.2% over the 2008 oil production level. However, the proven world oil reserves in 2009 were nearly 1178 billion barrels.

On the Arab level, the Arab countries produced an average of nearly 27 million b/d in 2009, which represented 32% of the world production. Arab crude oil reserves in the same year were 681 billion barrels, i.e. 57.8% of the world oil reserves. Brent oil prices in 2009 have fluctuated to reach 77 \$ US/ barrels in November. The lowest price has reached around 43 \$ US / barrels in February. The following diagram compares between the average monthly prices of the Arab light crude oil and the Brent crude oil that Jordan has imported in 2009.



World production of natural gas reached around 3157 billion cubic meters in 2009 thereby posting a growth rate estimated at 3% above the 2008 production level. The world's natural gas reserves were around 187 trillion cubic meters. On the Arab level, the Arab countries produced nearly 450 billion cubic meters of natural gas which represented 14% of the world production. Yet, the Arab countries' reserves of natural gas have reached nearly 54 trillion cubic meters, i.e. 28.9% of international reserves.

Second - On the Local Level:

In 2009, our local crude oil and natural gas production was nearly 163 thousand toe, i.e. 3.3% of Jordan's total energy needs. In view of the limited production of local resources, Jordan has depended on imports to meet its energy needs. Crude oil and oil products imported in 2009 were around 4557 thousand toe. The quantities of natural gas imported from Egypt were around 3149 million cubic meters; but the quantities of electricity imported through the lines linking Jordan with both of Egypt and Syria were about 383 GWh. The total cost of imported energy amounted to JD 1916 million in 2009 which represents a dropping rate of 31% as opposed to energy imports of 2008.

In 2009, the overall demand for primary energy was about 7739 thousand toe thereby posting a growth rate of 5.5% compared to demand in 2008. The total demand for final energy which is the energy available to consumers was nearly 5021 thousand toe with a growth rate of 6.6% compared to the 2008 demand levels. On the other hand, the amount of demand for oil products was 3873 thousand toe, and the quantity of electricity generated in 2009 in the Kingdom was 14272 GWh posting a growth rate of 3.1 % in 2008. The quantity of electricity consumption was 11956 GWh, realizing a growth rate of 3.9% above that of 2008. Yet, the peak load of the Kingdom reached 2320 MW posting a growth rate of 2.7% as opposed to the peak load recorded in 2008.

Institutions of the Energy Sector in 2009

In view of the important role which this sector plays in terms of the socioeconomic aspects, and as this sector's activities are directly related to the political and economic aspects, the government has been interested in re-organizing this sector in order to enhance its efficiency and increase its effectiveness. In light of the new institutional amendments, the current institutional framework of the energy sector consists of the following:

1- Ministry of Energy and Mineral Resources (MEMR):

The Ministry has adopted the process of comprehensive planning for this sector in terms of regulation, drawing up general policies, following up on the implementation of such policies towards carrying out the assigned tasks. Most important of these tasks include providing all forms of the energy needed for the purposes of comprehensive development at the lowest possible cost and with the best standards. Besides, tasks included attracting global capital funds for investing in the Kingdom in the various fields of energy such as generating electricity, producing oil products, utilizing local sources and resources of energy especially the renewable ones.

2- Electricity Sector's Institutions:

These institutions which are responsible for regulating, generating, transporting, and distributing electricity inside the Kingdom; include the following:

2-1- Electricity Sector Regulatory Commission (ESRC):

It is an independent commission established in 2001 whose most important tasks involve determining electricity prices, subscription fees and costs of the necessary services, issuing licenses to the companies generating, transmitting, and distributing electricity, and monitoring their compliance with the conditions stipulated in these licenses. This Commission is also responsible for providing amicable solutions to the disputes arising between the electricity sector's companies and the consumers, and also between the companies themselves, in as much as the public interest will be secured, as well as for extending consultancies and advice concerning any matters related to the electricity sector.

2-2- *National Electric Power Company (NEPCO):*

It is a public shareholding company which is owned by the government and which is responsible for the building, operation, and maintenance of the transmission system within the borders of the Kingdom, in addition to secure the kingdom with electricity through the expansion of building generation unites through the private sector.

2-3- *Central Electricity Generating Company (CEGCO):*

It is a public shareholding company responsible for generating and whole selling Electricity to the National Electric Power Company. This company whose shares were fully owned by the government was founded in 1999, and on 17/10/2007 .60% of the company shares were privatized, by selling 51% of the government shares to the Inara coalition company led by Dubai Capital Company along with 9% to the Social Insurance Corporation. The generated power for the company in 2009 was around 1750 MW.

2-4- *Samra Electric Power Generation Company (SEPGCO):*

It is a shareholding company whose shares are fully owned by the government and was founded according to the Council of Minister's decision taken on 20/01/2004 with a nominal capital value of JD 50 million. It was registered within the Private Shareholding Companies Registers under No. 40 on 21/04/2004. The generated power for the company in 2009 was around 500 MW.

2-5- *AES- Jordan. Psc:*

Which is a private company owned by the American Company AES and the Japanese Company MITSUI, it was founded on 28/2/2009, and it owned the first private project in Jordan in generating electricity; which is East Amman Power Plant/ Al Manakhir which was inaugurated under the patronage of His Majesty King Abdullah II, on 26/10/2009 with a capacity of 370 MW.

2-6- *Electricity Distribution Companies:*

These are three companies each with a concession area as follows:

2-6-1. Jordan Electric Power Company (JEPCO):

It is a public shareholding company responsible for distributing electricity in the Metropolis, Zarqa, Madaba and Balqa Governorates apart from the Central Jordan Valley, according to a 50-year concession contract which will expire in 2012.

2-6-2. Irbid District Electricity Company (IDECO):

It is a public shareholding company responsible for distributing the electricity in Irbid, Mafrq, Jerash, and Ajlun governorates apart from the Northern Jordan Valley and Eastern areas, according to a 50-year concession contract which will expire in 2011. In 2008 the company had been privatized by selling the government all their shares, which equal 55.4% from the Company.

2-6-3. Electricity Distribution Company (EDCO):

It is a public shareholding company responsible for distributing electricity in the areas beyond the concession of both the JEPCO and IDECO, namely in the Southern, Eastern and Jordan Valley areas. The company had been fully privatized in 2008.

2-7- Rural Electrification Project:

Work on this project has been started in 1992 in order to deliver the electricity to the villages and population concentrations in the Jordanian countryside towards attaining durable development in these areas and settling down the inhabitants in their villages.

3- Petroleum, Gas, and Mineral ores Institutions:

These institutions carry out operations related to prospecting for petroleum and mineral ores inside the Kingdom along with refining crude oil. These include:

3-1- Natural Resources Authority (NRA):

It is involved in implementing works related to prospecting for mineral

resources, conducting geological, geophysical, and geochemical surveys along with issuing licenses and rights for mining, stone quarries, and exploration, and monitoring the operations thereof.

3-2- *National Petroleum Company (NPCO):*

It is a government-owned public shareholding company which carries out works pertaining to research, exploration and production of oil and gas in the concession area to the northeast of the Kingdom on the Iraqi borders. The concession area covers 7000 square kilometers including the Risha Gas Field area of around 1500 square kilometers. The concession period is renewable and lasts for 50 years effective since 1996.

3-3- *Jordan Petroleum Refinery Company (JPRCO):*

It is a public shareholding company which is responsible for refining crude oil, producing and distributing oil products inside the Kingdom by concession contract signed in 1958 and terminated on 02/03/2008, now its operating with service agreement of importing, storing, providing, and distributing the oil products.

3-4- *The Jordanian Egyptian Fajer Company:*

It is a limited company work according to license agreement which was signed on 25/01/2004 between the Jordanian Government represented by the Ministry of Energy and Mineral Resources, and the Jordanian Egyptian Fajer Company. Its duty is to build, own and operating the natural gas pipe line from Aqaba to north of the Kingdom, and collecting the Egyptian natural gas in Aqaba and then transport it by the pipeline and sell it to the power plant and to the heavy industry.

4- *National Energy Research Centre (NERC):*

It is a scientific center affiliated with the Higher Council for Science and Technology which was founded in 1998 for carrying out the tasks of scientific research and development, technology related to transfer of the new and renewable energy, energy conservation, and oil shale. These tasks used to be shared by several

authorities including the Ministry of Energy and Mineral Resources, Royal Scientific Society, and the Natural Resources Authority. The Center's Board of Directors is headed by the Minister of Energy and Mineral Resources.

5- The Commission for Regulating Radiation and Nuclear Activity:

This Commission was established in 2007 as replacement of the Jordanian Nuclear Energy Commission which was established in 2001. The commission has a legal entity independent financially and administratively and directly responsible in front of the prime minister. The Commission aims to protect the health of the human being and the property of the surrounding environment from the radiation and nuclear dangers through regulate and monitor the use of the nuclear power, and making sure of the existence of the requirements and conditions of health and safety and the protection from the radiation and the nuclear security.

6- The Jordanian Atomic Energy Commission

The Jordanian Atomic Energy Commission was established in 2008 in order to transfer the use of the peaceful nuclear power and the technology of the radiation to the kingdom, and enhance its usage in order to generate the electricity, for the desalination of water and for agricultural, medical and industrial usage.

7- Bio-Gas Company:

It is a shareholding company jointly owned by the CEGCO and the Greater Amman Municipality. The company has been founded in the year 2000 for utilizing methane gas extracted out of the organic waste towards generating electricity. At present, the Bio-Gas Company can generate 3.5 MW.

Energy Sources in Jordan

The Jordanian local energy resources are very limited commercially, despite the efforts of the government that has been spent since decades in searching and prospecting for crude oil and gas. In addition to the foreign companies which has been bounded with the government with agreements for searching and prospecting. Those foreign companies have been offered the available information and that have been provided by the seismology studies and surveys. All of these efforts have came out with to find a humble and non- commercial crude oil in Hamza well in 1985, and to discover some gas amounts at Al Rishah in 1989 as it is used fully to generate electricity with a daily production average of 22 million CF, which form 4% of the generated electricity in Jordan. In 2009, an agreement has been signed with British Petroleum to be a strategic partner with the National Petroleum Company to develop Al Rishah Field which is located on the Jordanian-Iraqi borders.

There are huge amounts in Jordan of Oil Shale, as they can be utilized commercially either by the direct burning to produce electricity or by the cracking to produce crude oil; especially after the technological advancement in utilizing the oil shale which achieve the environmental demands and the international success in this field. This has led the government to adopt a strategy to market the oil shale, and to attract the interested international companies to utilize it, and to have investment agreements with them that guarantee the interests of both parties, especially with the increasing prices of the crude oil and the oil products in the international markets, this thing has made utilizing the oil shale economically possible to produce the crude oil. In this respect, in 2009, a concession agreement has been signed with Shell Company to produce crude oil from the deep oil shale, and eight other agreements have been signed with international companies to utilize the oil shale on the surface to produce crude oil. In addition to singe an agreement with the Estonian company Esty Energy to utilize the oil shale to generate electricity through the direct burning.

With respect to the new and renewable energy resources, their share to the energy mix is not exceeding 2%. The government has adopted an ambitious program to increase the new and renewable energy share to the energy mix to reach 7% by 2015 and 10% by 2020.

All the details of the local energy resources would be mentioned in the comprehensive strategy for the energy sector part.

Table (1) clarify the local production of crude oil and natural gas and its participation in the whole consumed energy in the Kingdome during the period 2005-2009

Table (1)
Jordan's production of crude oil and natural gas during the period 2005-2009

Year	Crude Oil (1000 tons)	Natural Gas (Billion CF)	Contribution to the overall Energy consumption (%)
2005	1.1	8.5	3.7
2006	1.2	8.9	3.8
2007	1.2	7.7	3.7
2008	1.7	7.2	3.2
2009	1.5	7.8	3.3

Local Demand for Energy and Electricity

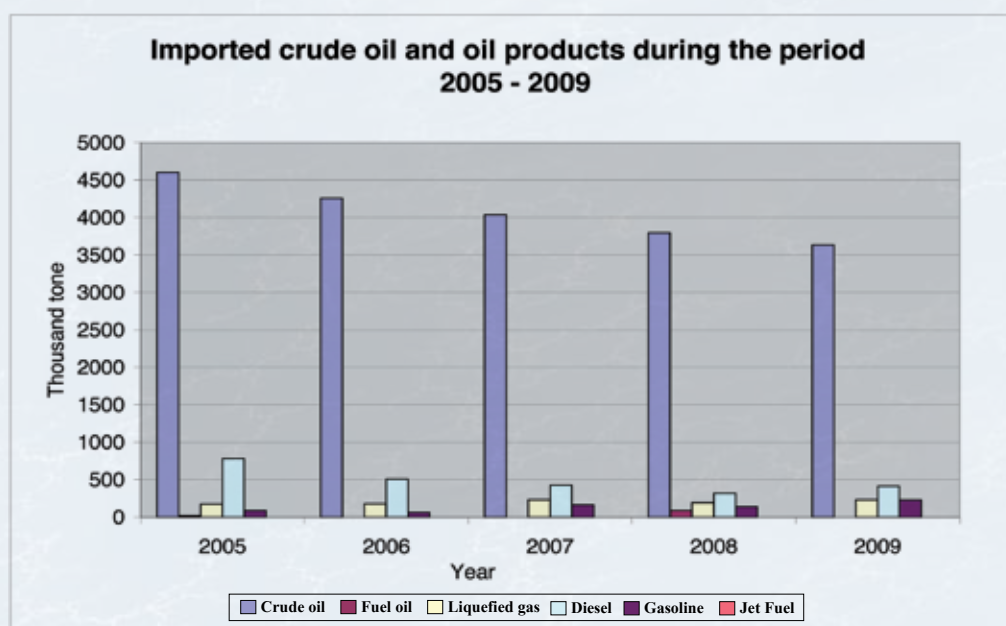
1- Crude Oil and Oil Products:

The cost of the imported crude oil was around 1916 million JD in 2009, registering a decline of 30% from 2008, and that's because of dropping the amounts of the imported crude oil in 2009 with nearly 4%. Table No. (2) Shows the quantity of the imported crude oil and oil products during the period 2005-2009.

Table No. (2)
Imported Crude Oil and Oil Products during the period 2005-2009
(000 metric tons)

Year	Crude oil	Fuel oil	Liquefied gas	Diesel	Gasoline	Jet Fuel	Total
2005	4602	19	178	785	93	1	5678
2006	4258	-	182	509	65	1	5015
2007	4040	-	233	429	166	1	4869
2008	3796	91	196	320	141	1	4544
2009	3633	-	234	414	231	1	4513
The growth rate for 2008	(4)	-	19	29	64	0	(1)

- The brackets here mean negative Signal.



2- Natural Gas

The quantity of the natural gas imported in 2009 from Egypt through the natural gas pipeline between the both of the countries, which form part of the Arab Natural Gas Pipeline, was around 3149 Million Cubic Meter.

3- Primary and Final Energy Consumption

In 2009, the overall demand for the primary energy was nearly 7739 million toe showing a growth rate of 5.5% beyond that 2008. Table No. (3) Demonstrates the local demand of the primary energy during the period 2005-2009.

Table No. (3)
Primary energy consumption during the period 2005-2009 (000 toe)

Type of primary energy					Total
Year	Crude Oil and the Oil products	Natural Gas	Renewable Energy	Imported Electricity	
2005	5325	1382.3	82	239	7028
2006	4953	1995.9	111	127	7187
2007	4906	2406	118	8	7438
2008	4426	2725	110	74	7335
2009	4454	3086	120	79	7739

The final energy consumption and distribution to all economic sectors are demonstrated through table No.(4).

Table (4)
Sectoral distribution of the Final Energy Consumption during the period
2005-2009 (000toe)

Year	Sector				Total
	Transport	Industry	Household	* Others	
2005	1779	1159	1060	804	4802
2006	1822	1182	1064	821	4889
2007	1912	1192	1070	853	5027
2008	1767	1095	1010	835	4707
2009	1952	1101	1083	885	5021

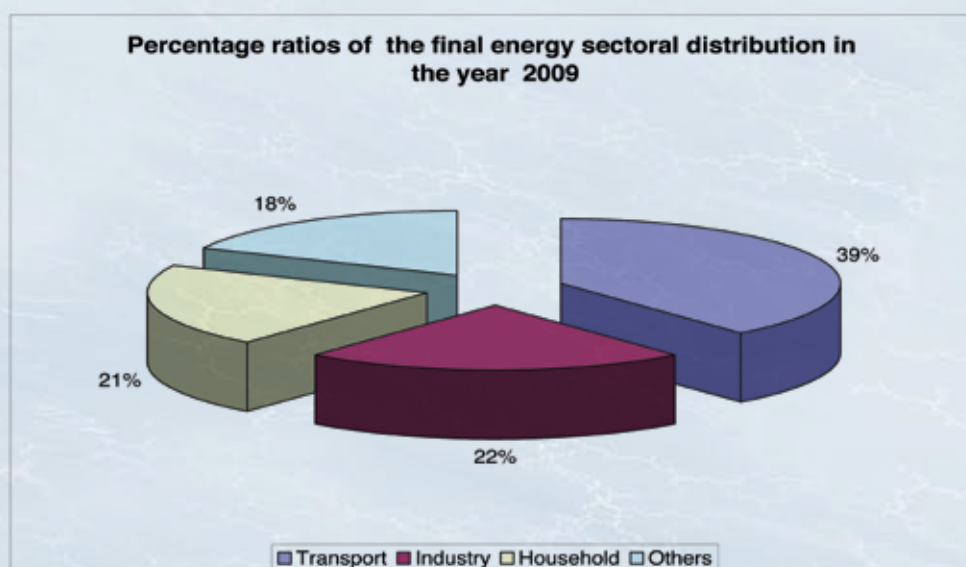
* Including the commercial and agricultural sectors along with street lights.

Also table No. (5) Demonstrate to the Percentage ratios of the sectoral distribution of final energy consumption.

Table (5)
Percentage ratios of the sectoral distribution of final energy consumption
during the period 2005 – 2009

Year	Sector				Total %
	Transport%	Industry %	Household %	*Others %	
2005	37	24	22	17	100
2006	37	24	22	17	100
2007	38	24	21	17	100
2008	38	23	21	18	100
2009	39	22	21	18	100

* Including the commercial and agricultural sectors along with street lights.



4- Oil products Consumption and prices

The year 2009 has witnessed a significant decline in the consumption of the oil products, and the volume of the consumption was nearly 4421 thousands tons compared around 4268 thousands tons in 2008 thereby posting a general drop in consumption to 4%.

It has been noticed that all of the oil products has witnessed a growth in the consumption except the fuel oil as the dropping rate were 25%. The oil product which witnessed a growth in terms of the consumption are the liquid gas, gasoline, Jet fuel, kerosene, Diesel and the asphalt, the rates are as the following 6%, 17%, 47%, 11%, 8% and 16% respectively. The most important reasons for decreasing the fuel oil consumption is depending on the natural gas in generating the electricity.

The following tables show the development in producing and consuming the oil products in the period 2005-2009.

Table No. (6)
Development of the Petroleum Refinery's production of oil products during
the period 2005-2009 (000 metric tons)

Oil products Year	Liquefied Gas	Gasoline	Avtur	Kerosene	Diesel	Fuel Oil	Asphalt	Total
2005	118	613	326	231	1323	1388	193	4210
2006	125	648	301	132	1324	1318	167	4015
2007	107	678	291	139	1213	1205	155	3788
2008	120	740	299	105	1236	1002	168	3670
2009	107	757	308	81	1173	920	193	3539

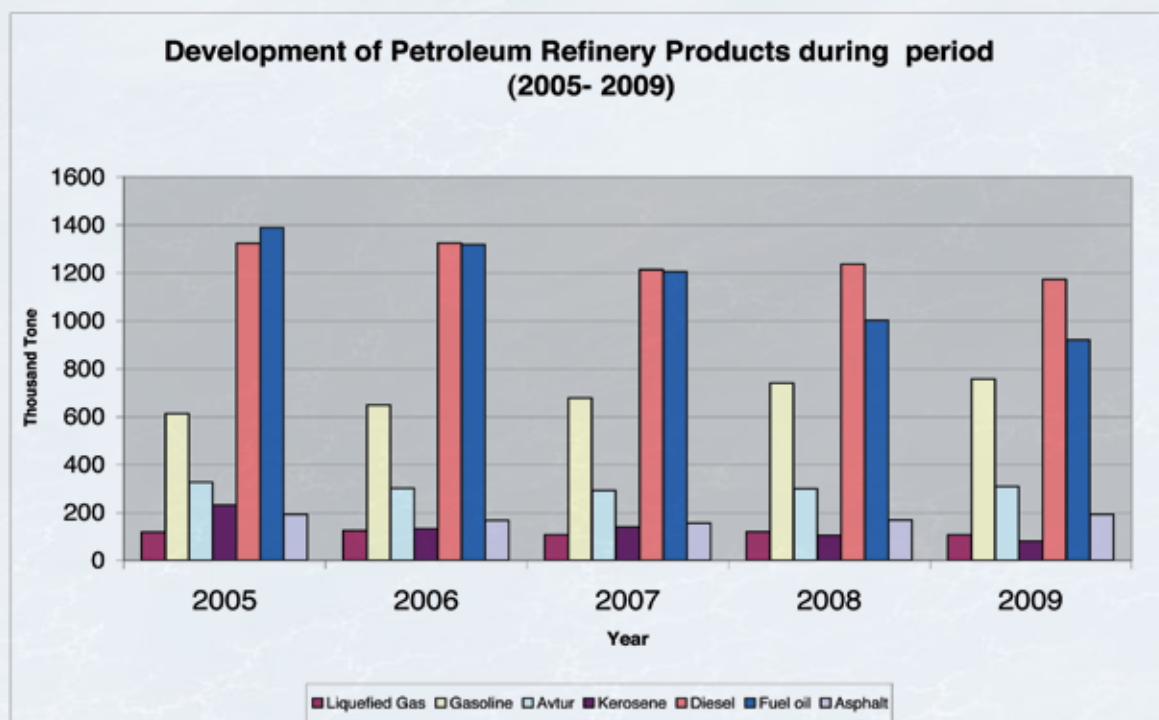
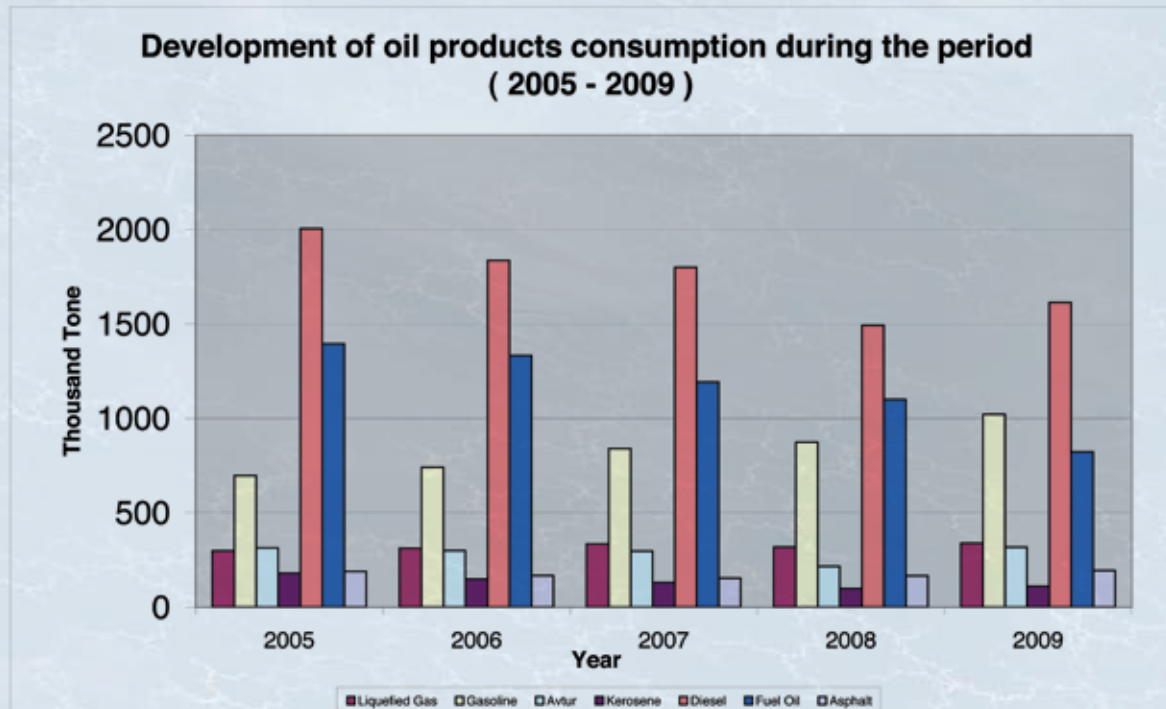


Table No. (7)
Development of oil products consumption during the period 2005-2009
(1000 metric tons)

Oil products Year	Liquefied Gas	Gasoline	Avtur	Kerosene	Diesel	Fuel Oil	Asphalt	Total
2005	299	697	314	181	2005	1395	190	5081
2006	313	741	300	150	1837	1333	168	4842
2007	335	840	297	131	1799	1193	154	4749
2008	319	873	216	100	1493	1100	167	4268
2009	339	1022	318	111	1614	823	194	4421
Growth Rate(%)	6	17	47	11	8	(25)	16	4

- The brackets here mean negative Signal.



Regards the prices of the oil products in 2009, the government has worked on keeping the subsidies on the liquid gas, and has subjected the rest of products pricing on a monthly basis in accordance with the pricing formula based on international prices, which include the rate of world prices for the oil products plus all the costs of importing oil products from the global market to the consumer. The following table shows the prices of the oil products prices locally in 2009.

Table (8)
The local prices of oil products during 2009

		Jan/ Feb	Feb/ Mar	Mar/ Apr	Apr/ May	May/ Jun	Jun/ July	July/ Aug	Aug/ Sep	Sep/ Oct	Oct/ Nov	Nov/ Dec	Dec 2009 Jan 2010
Item	Unite	16/1- 16/2	13/2 – 12/3	13/3 – 16/4	17/4 – 14/5	15/5 – 12/6	12/6 – 16/7	16/7 – 13/8	14/8 – 17/9	18/9 – 15/10	16/10 – 12/11	13/11 – 17/12	18/12 – 14/1/2010
Liquefied gas	Diner / Cylinder	6.25	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50
Gasoline (90)	Fils / Liter	350	350	350	375	380	430	440	455	455	445	485	485
(95) Gasolin	Fils / Liter	405	405	405	435	440	500	515	535	535	525	575	575
Diesel	Fils / Liter	335	320	310	330	335	375	400	415	415	410	445	445
Kerosene	Fils / Liter	335	320	310	330	335	375	400	415	415	410	445	445
Fuel oil/ Indus	Diner / ton	200.91	219.59	211.47	225.8	255.92	301.38	320.17	334.9	344.51	338.77	362.19	370.3
Avtur/ local	Fils / Liter	319	304	274	312	315	355	377	385	391	387	425	423
Avtur/ Foreign	Fils / Liter	423	306	279	317	320	360	382	390	396	392	430	428
Avtur/ Passing	Fils / Liter	339	324	294	332	335	375	397	405	411	407	445	443
Fuel oil/ Ships	Diner / ton	200.91	219.59	217.66	230.4	255.92	301.38	320.17	334.9	353.86	350.96	362.19	370.3
Diesel/ ships	Fils / Liter	553.21	479.2	457.48	446.8	452.4	462.58	470	450	422.32	419.74	455	445
Asphalt	Diner / ton	218.18	237.98	229.37	244.6	276.48	324.67	344.62	360.25	370.54	364.45	389.29	397.88

Electricity

The year 2009 witnessed a growth in demand for electricity on the part of all sectors with the exception to the industry sector, which has declined this year notably with a rate of 4.7%, with regards to the highest percentage for the consumption's growth was in the household sector which was 10%. The reason for that was the people switch to use of the electricity in heating instead the other oil products as a result low prices of the electricity in 2009 between the other oil products, which made the people to use the electricity heaters as they are available in cheap prices in addition that it is very clean and easy to get. As a result of that the ministry and the National Electric Power Company has done several procedures to encounter this increasing demand. The details of these procedures will be detailed later on when presenting the comprehensive strategy for the energy sector.

Electricity Generation and Consumption

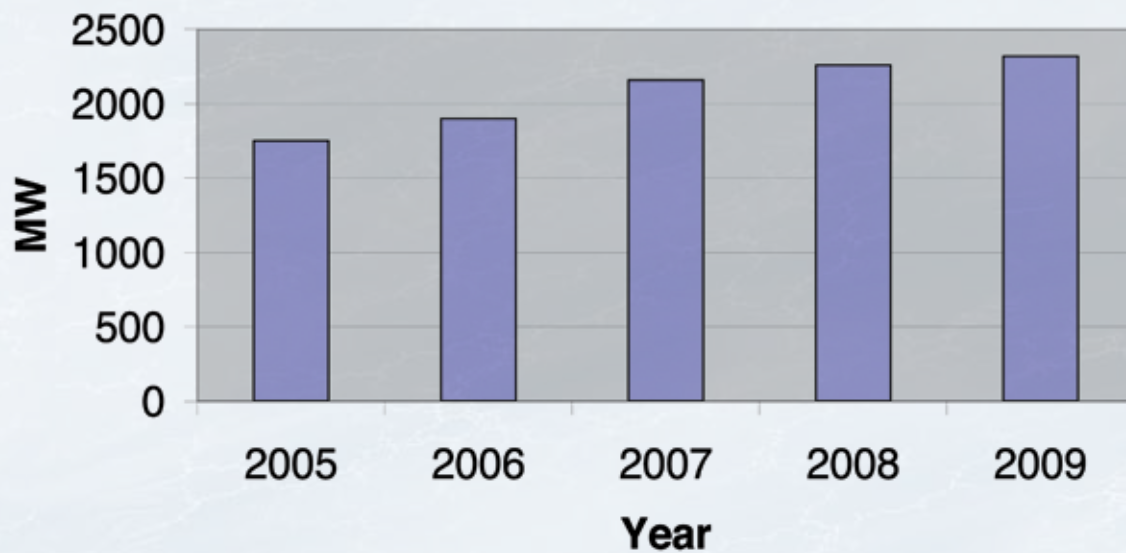
The quantity of electricity generated in 2009 around 14272 GWh showing a growth rate around 3% from 2008. The consumed electricity energy was around 11956 GWh showing a growth around 4% from 2008. The Electric Peak load of the Kingdom in 2009 reached around 2320 MW thereby posting a growth of 2.7% compared to that of 2008.

The following tables show the development of consuming and producing of the electricity and distributing the consumption and its rate to all the sectors.

Table No. (9)
Growth of the electricity production and Peak load during the period 2005-2009

Year	Peak Load MW	Growth Rate (%)	Electricity generated GWh	Growth Rate(%)
2005	1751	12.6	9654	7.7
2006	1901	8.6	11120	15.2
2007	2160	13.6	13001	16.9
2008	2260	4.6	13838	6.4
2009	2320	2.7	14272	3

Development of peak load of Electricity during the period (2005 - 2009)



Development of electricity Generation during the period (2005 - 2009)

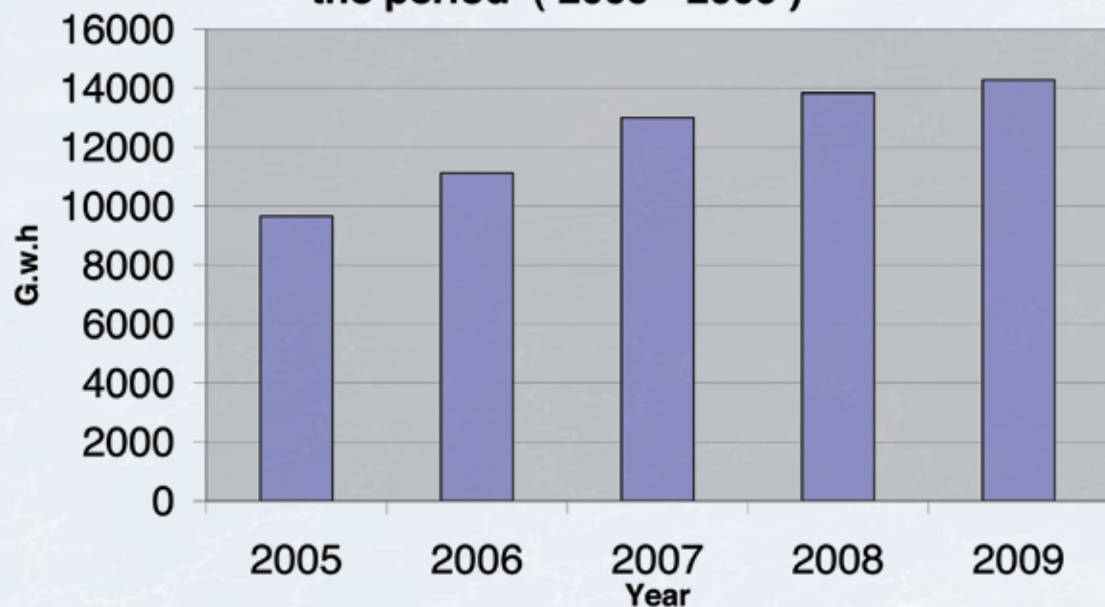
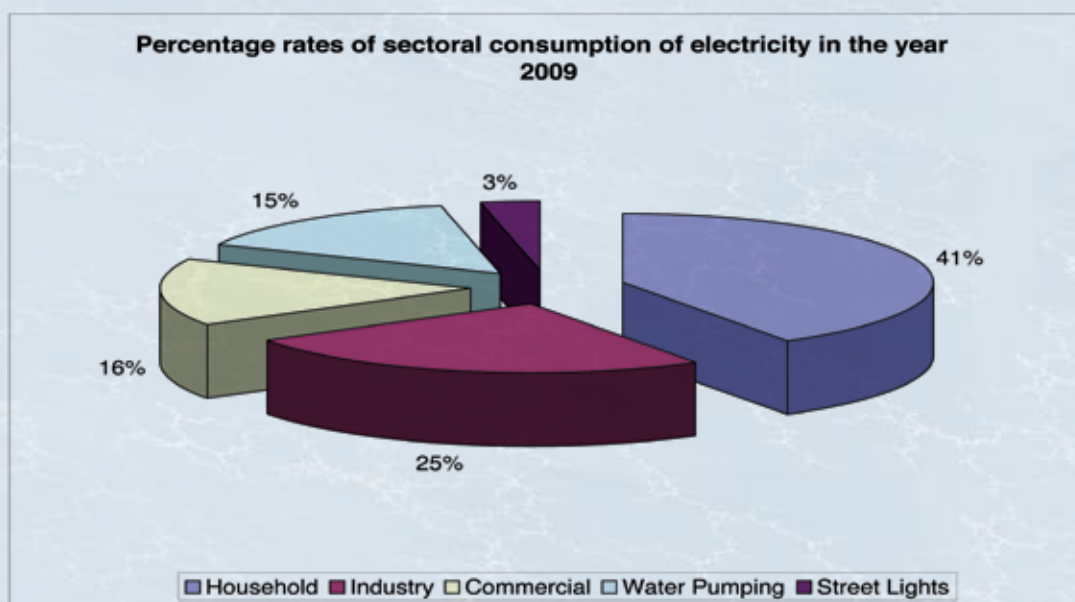


Table No. (10)
Sectoral distribution of electricity consumption and growth rate during the period 2005-2009 (GWh)

Type of Sector Year	Household	Industry	Commercial	Water Pumping	Street lights	Others	Total	Growth Rate %
2005	2989	2659	1317	1298	248	201	8712	7.7
2006	3421	2757	1516	1396	261	228	9579	9.6
2007	4001	2917	1759	1592	269	-	10538	10
2008	4459	3128	1925	1713	284	-	11509	9.2
2009	4926	2981	1978	1761	310	-	11956	3.9

Table No. (11)
Percentage rate of sectoral consumption of electricity during the period 2005-2009

Type of Sector Year	Household %	Industry %	Commercial %	Water Pumping %	Street lights %	Others %	Total %
2005	34	31	15	15	3	2	100
2006	36	29	16	15	2	2	100
2007	38	28	17	15	2	-	100
2008	39	27	17	15	2	-	100
2009	41	25	16	15	3	-	100



Electricity tariff are demonstrated in the following table:

Table No.(12)
Electricity tariff valid in the Kingdom as issued on 14/03/2008

First: Tariff of electricity sold by the NEPCO to the Distribution Company and the major subscribers:	Unit	Value
a- Major subscribers tariff:		
1- Peak Load.	(JD/KW/Month)	2.98
2- Daytime supply.	(Fils/KWh)	65.0
3- Night time supply.	(Fils/KWh)	49.0
b- Harrana Broadcasting – Flat Rate	(Fils/KWh)	86.0
c- Electricity Distribution Companies		
a- (JEPCO)		
1- Peak Load.	(JD/KW/Month)	2.98
2- Daytime supply.	(Fils/KWh)	45.81
3- Night time supply.	(Fils/KWh)	35.76
b- (EDCO)		
1- Peak Load.	(JD/KW/Month)	2.98
2- Daytime supply.	(Fils/KWh)	37.35
3- Night time supply.	(Fils/KWh)	27.30
c- (IDECO)		
1- Peak Load.	(JD/KW/Month)	2.98
2- Daytime supply.	(Fils/KWh)	38.16
3- Night time supply.	(Fils/KWh)	28.11

Second: Tariff of the electricity sold by the distribution companies to the consumers:	Unit	Value
a- Ordinary Consumers' tariff:		
1- First block: 1-160 KWh per month.	(Fils/KWh)	32.0
2- Second block: 161-300 KWh per month.	(Fils/KWh)	71.0
3- Third block: 301-500 KWh per month.	(Fils/KWh)	85.0
4- Fourth block: More than 500 KWh per month.	(Fils/KWh)	113.0
b- Broadcasting Station & TV Station Flat rate.	(Fils/KWh)	86.0
c- Commercial Consumers	(Fils/KWh)	86.0
d- Small industrial consumers with loads not Exceeding 200 KW.	(Fils/KWh)	49.0

e- Medium industrial consumers supplied by medium voltage networks 33, 11, 6.6 KV or supplied by low voltage networks with loads exceeding 200 KW.		
1- Peak Load.	(JD/KW/Month)	3.79
2- Daytime supply.	(Fils/KWh)	46.0
3- Night time supply.	(Fils/KWh)	36.0
f- Agriculture: Flat rate.	(Fils/KWh)	47.0 *
1- Peak Load.	(JD/KW/Month)	3.79
2- Daytime supply.	(Fils/KWh)	46.0
3- Night time supply.	(Fils/KWh)	36.0
g- Water pumping.	(Fils/KWh)	41.0
h- Hotels: Flat rate.	(Fils/KWh)	86.0 **
1- Peak Load.	(JD/KW/Month)	3.79
2- Daytime supply.	(Fils/KWh)	81.0
3- Night time supply.	(Fils/KWh)	70.0
I- Street lights.	(Fils/KWh)	51.0 ***
J- Armed Forces.	(Fils/KWh)	81.0
K- Ports Corporation.	(Fils/KWh)	58.0
Note: Minimum rate of monthly consumption:		
a- Regular consumers.		JD 1
b- Other consumers.		JD 1.25

* Agricultural subscribers are entitled to opt for applying the trilateral tariff or continuing to use the flat rate.

** Five- or four-star hotels may opt for using the trilateral tariff or continuing to use the flat rate.

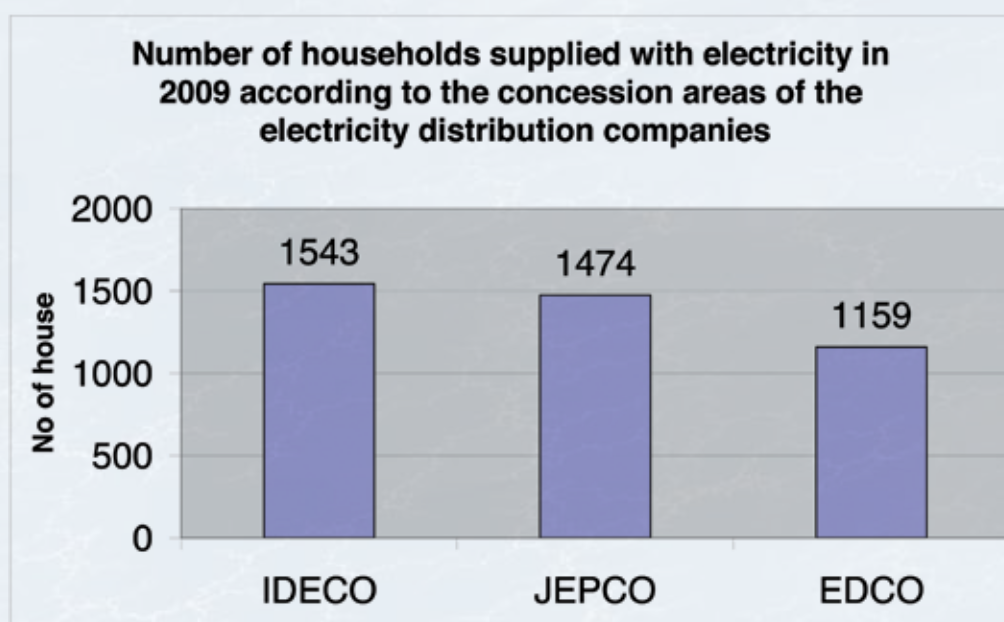
*** Applicable to the consumptions exceeding the 1988 level.

Rural Electrification Project

Electricity has been continued, as the Government insisted, to reach all remote villages and rural areas via the Rural Electrification project by means of the various electricity distribution companies in Jordan. In 2009, a sum of 4176 houses including 23386 people were electrified. This electrification cost approximately JD 8.7 Million in total. Table no. (13) Illustrates the number of houses electrified, along with both the number of beneficiaries and the total cost according to concession areas of the electricity distribution companies in 2009.

Table (13)
Number of Houses Electrified in 2009 Distributed According to Each Electricity Distribution Company's Concession Area

Company	Houses	Beneficiaries	Total Cost (Million JD)
Irbid District Electricity Co. (IDECO)	1543	8641	2.6
Jordan Electric Power Co. (JEPCO)	1474	8254	2.9
Electricity Distribution Co. (EDCO)	1159	6490	3.2
Total	4176	23386	8.7



The Accomplished Goals in the light of the Comprehensive Strategy for Energy Sector:

The strategy has studied all the alternatives and economic options available to meet the demand of energy in all its forms. It has suggested specific mechanisms to ensure the security of energy supply, including the needed infrastructure projects. The estimated investment cost for the infrastructure projects included in the strategy would amount to 14 -18 billion U.S. dollars for the period (2007-2020).

The implementation of the infrastructure projects included in the strategy would increase the contribution of the local resources in the total energy mix from 4% in 2009 to about 39% in 2020. The rates of the components of the total energy mix in 2020 will be as follows: -

- Oil products	39%
- Natural gas	29%
- Renewable Energy	10%
- Oil shale,	14%
- Nuclear energy,	6%
- Imported electricity	1%

The Ministry of Energy's most prominent accomplishment in this issue in 2009 is the following:

In the field of crude oil and oil products:

- Continue to ensure the Kingdom's needs of crude oil through importing from Saudi Arabia via the port of Aqaba.
- Signing a services agreement to import, store, secure, and distribute of oil products between the government and the Jordan Petroleum Refinery Company on 25/2/2008. The agreement was extended until the end of 2010, and under this agreement the Jordan Petroleum Refinery Company was assigned to secure the Kingdom's needs of oil products until licensing the new companies and begin their works in the local market.
- The Ministry is following up the memorandum of understanding signed between the Jordanian and the Iraqi government of transferring the Iraqi crude oil from Peggy / Kirkuk to the location of the Jordan Petroleum Refinery Company at Zarqa, as in 2009 a tender issued to transfer an amount of one million tons of crude oil, the amounts transferred by the end of the year are about half a million tons, or approximately 3.6 million barrels of crude oil.

- New directives have been issued to license the Gas stations and the fuel distribution's tanks so that the Ministry would be able to follow the works and the establishment of the gas stations instead of the Petroleum Refinery Company.
- Keeping on organizing and monitoring the activities of the oil derivatives supply sector. So 29 license were given to establish gas stations, 49 license to establish Gas distribution agencies, 7 licenses to establish stores for storing liquefied gas cylinders, and 52 license for constructions to distribute liquefied gas through pipelines.
- Participating in drafting and issuing the directives of licensing the activities of the bio-diesel with the concerned authorities, as working on completing the necessary procedures to start licensing in this regard is currently undergoing.
- Managing Jarash oiler owned by the government, which provides the required storage capacities that is necessary to secure the Kingdom's strategic storage of crude oil, and to transfer it throughout the year via the port of Aqaba.
- on 11/07/2009 an agreement has been signed between the Ministry of Energy and Aqaba Development Corporation and Aqaba Petroleum Company to develop, operate the oil port and to provide sufficient storage capacities of crude oil instead of the oiler Jarash.

With regard to what the strategy has approved by recommending to keep the oil refinery company and to continue in the expansion project and modernization of the refinery on the grounds that it is the best option for the national economy. The project aims to boost the refining capacity to 17 thousand tons instead of 14 thousand tons and to add manufacturing units to improve the quality of oil products. The cost of the project is about 1.3 billion dollars, the refinery is seeking to implement the project by attracting a strategic partner. In light of this, the work will be resumed in a program of restructuring the oil sector by the separation of the activities of refining, storage, transport, distribution and establishment and licensing of companies to distribute oil products in the local market, and a logistic company to secure the storage capacity and strategic reserve. In this regard the following are done:

- reviewing the tender's documents related to establish and market the marketing companies, and the logistic company and sent to the companies that have paid the value of these documents and signed a confidentiality of information agreement.

- A conference was held on 16/06/2009 to investors and in the presence of 12 companies during which their questions were answered as well Charles River company has applied a proposal on the tender and procedures that will be later.
- working on completing the documentation of the information room and opening it up for investors to take advantage of is done.
- on 01/09/2009 the tender of establishing and licensing the marketing companies and the logistic company was suspended by a decision from the Council of Ministers to grant the Jordan Petroleum Refinery Company the exclusive concession for a period of 15 years to supply the local market of oil products.

In utilizing the local energy resources of oil and gas:

The Ministry of Energy and Mineral Resources, and the Natural Resources Authority were able to attract many international companies for oil exploration in Jordan, the Kingdom has been divided into eight exploration blocks in accordance with the geological features of each region and the potentiality of oil and the volume of technical information available to them. Franchise rights for research and exploration and production has been awarded to oil companies in six exploratory regions, the achievements in 2009 are as the following:

- Al-Risha area given to the National Petroleum Company (NPCO) according to concession agreement for 50 years as of 1996 until 2046. As the total production for Al-Risha filed was in 2009 around 221 million metric cubic from the natural gas. The company has signed on 25/10/2009 a partnership agreement with British Petroleum (BP), and under this convention, the British Company will participate in two phases; the first phase includes the works of exploration and evaluation, and the second phase includes the works of development and production.
- East Safawi area given to the Petril Company of Ireland according to an agreement to participate in production. The law was issued in the official Gazette on 01/05/2007 according to special law No. 36/2007 and the agreement was signed on 19/05/2007 (commencement date) on the sidelines of the activities of the World Economic Forum at the Dead Sea,. The company is done now from the petrophysics and the geochemical studies, in addition to the restoration and interpretation of approximately 2400 linear kilometers of seismic lines. The company is looking for a strategic partner because of the financial difficulties faced as a result of the global financial crisis.
- West safawi area given to the Global Petroleum Company of India according to an agreement to participate in production. The law was issued in the

official Gazette on 01/05/2007 according to special law No. 38/2007 and the agreement was signed on 19/05/2007 (commencement date) on the sidelines of the activities of the World Economic Forum at the Dead Sea. The company is done now from the Geological and the Geophysical studies, and the processing and interpretation of about 1800 km linear of two-dimensional of seismic lines was done again. The company has completed two-dimensional seismic survey of 492 km length of seismic lines .

- Al-Azraq area given to the American Company “Sonoran” according to an agreement to participate in production. The law was issued in the official gazette on 01/05/2007 according to special law No. 37/2007. the agreement was signed on 19/05/2007 (commencement date) on the sidelines of the activities of the World Economic Forum at the Dead Sea. The works of the three-dimensional seismic surveys have been completed in Al-Azraq and by 300 square kilometers. The total production of Hamza field in 2009 is about 9397 barrel.
- Al-Sarhan area given to the Universal Energy Limited Company of India according to an agreement to participate in production. The law was issued in the official gazette on 01/05/2007 according to special law No. 39/2007. the agreement was signed on 19/05/2007 (commencement date) on the sidelines of the activities of the World Economic Forum at the Dead Sea, the company has re-processed and made interpretation of 2977 km longitudinal lines of two-dimensional seismic surveys, and the company has made the work of the topographic survey of the area by the Russian Company PANGEA.
- Porosity Company and Trans Global Company: both companies have operating in the concession area granted in 1997 (Dead Sea and Wadi Araba) to the Trans global (American Company). According to a special law No. 3/97, the third and the last exploratory phase were entered into on 17/08/2005 and the third period was extended until 31/12/2008. The Trans global company (American Company) assigned on 23/12/2006 for 80% of its share to the Porosity company whereby the new company has become the new operator in the agreement. Porosity has provided the Natural Resources Authority with all the geological information and the interpretations and the evaluation of the wells, and it transferred its of contractual rights to the American Trans Global company which still has to present the guarantee of proper implementation to the Natural Resources Authority to enter into the second optional extension for the third exploratory phase which is of two years period.

With regards the Northern Heights and Al-Jafr Regions, The Natural Resources Authority has addressed some of the international companies specialized in the exploratory studies to view the available technical information, whether the

lines of a seismic survey or the magnetic information, or the gravity related to the northern Heights and Al-Jafr regions. Technical meetings were held with two specialized companies in this area and they are Services Furgo Gravity of Magnetic and Geotrace Technology. The Canadian Ammonite Energy International Inc Company has expressed its will to sign a memorandum of understanding to evaluate the technical information available in Al-Jafr and center of the kingdom for five months to be extended for another month upon the agreement of both parties, and the procedures of preparing the memorandum are still undergoing. Ramazan Nafta Gas Corporation has expressed its interest in exploring oil in the Southern part of Jordan (south of the Jafr). The company has been provided with all the required technical information, the company has provided its work program and expenditure in order to establish a sharing production agreement to be preceded by the company's integrated report about the results of their study to the target area so that the Natural Resources Authority can complete the procedures to conclude the agreement. The northern Heights and Al-Jafr areas are still open to the interested international companies in prospecting oil there.

In utilizing the Oil Shale, The national strategy of the energy sector considered oil shale as an alternative to the energy resources to contribute up to 11% in the energy mix in 2015 and 14% in 2020. The reserve of the installed surface oil shale is estimated by more than 42 billion tons, containing more than 4 billion tons of oil. Oil shale can be used to generate electricity through the direct burning technology or for the production of oil through the distillation technologies. The government has focused its efforts to exploit oil shale on three dimensions:

1. Surface mining project to exploit oil shale.
2. Shell project company to exploit the deep oil shale.
3. The project of generating electricity by direct combustion of oil shale.

The following is a summary of the activities carried out for the dimensions above:

1. The Oil Shale's Surface Mining Project:

The companies that have signed memorandums of Understanding with the government, represented by The Natural Resources Authority, have reached up to 8 companies, and that's to prepare an economical banking feasibility studies to utilize the oil shale to produce oil through the surface distillation technology in the area of Al- Ljun and the Al-Atarat area, appropriate decisions will be taken based on the results of these studies to implement the commercial projects to distillate the surface oil shale. These companies are:

- Jordanian Oil Shale Company (Estonian Company).The company has completed the feasibility study for the allocated area on 29/04/2008. The study was revised and evaluated by the Government with the assistance of an international consultant and it was approved and entered in negotiations about the concession agreement for the project proposed in the study. The negotiations have been completed by the end 2009 preparing to submitting the agreement to the Council of Ministers as to approve by the first half of 2010.
- The Jordanian Company for Mining and Energy (British Company), this company's has ended its feasibility study and submitted it by the beginning of July 2009 and it has been approved, and it is expected to enter into negotiations with the company about the concession agreement by the beginning of the year 2010.
- The International Company for Natural Resources Investments (Jordanian Company) the company provided a feasibility study for the allocated area. A number of observations were put and the company was asked to complete some deficiencies in accordance with the terms of the memorandum of understanding signed with the company. The study is still under evaluation. This company is seeking a coalition with the Emirate Company, Taka and Hamid future company and sign a new Memorandum of Understanding for the project.
- The International Company for Investment of crude oil shale (Saudi Company) it is expected that the company ends its economical feasibility study on one of the areas of Atarat um Al-ghdran by November 2010.

The government also has attracted another four companies to conduct exploratory and excavation studies of the oil shale in the areas of Wadi Mughar, Azarwa Mount, Alnaadeia and Bayer areas which have not been studied previously, economical banking feasibility studies based on the results of these studies will be done to utilize oil shale and produce oil in those areas, the companies are:

- The Brazilian Petrobras Company: the company has made a coalition with the French Total company to conduct exploratory studies on the area of Wadi Maghar to have the concession rights on one part of it to exploit it in producing oil and to evacuate the rest and to provide the Government with all the information resulting from the study to use it in the future to market this region.
- The Universal Company (Indian Company) which is doing an exploratory studies of the area Adarwa mountain to get the concession rights on part of it to utilize it in the production of oil and to evacuate the rest and to provide the Government with all the information resulting from the study to use it in the future marketing of this region.

- Antraos Company (Russian Company) It was given Bayer area to study and to take the concession rights on part of it and to evacuate the rest and to provide the government with all the information resulting from the study for use in the future marketing of this region.
- Aqaba Petroleum Company (Jordanian Company), a memorandum of understanding has been signed with this company to study the bulk part of Alnedeia region to take the concession rights on part of it and to evacuate the rest and provide the Government with all the information resulting from the study for the use of marketing this region.

2. Shell Company Project for the Exploitation of the Deep Oil Shale:

The negotiations on the concession agreement for this project have been completed, which is based on producing oil through utilizing the deep oil shale positioned in the deep ground without the surface mining operations and through a new technology owned by the International shell company called (In Situ Conversion Process-ICP). The company has set out a long-term plan and a program of work to reach to the commercial production of the project. The concession agreement has been approved by the Council of Ministers and ratified by the Parliament and issued as a special law in the Official Gazette on 16/08/2009. The company began its works since the entry of the agreement into force and in accordance with the program of action of the project included in this agreement.

3. The Project of Generating Electricity by the Direct Burning of Oil Shale:

The Estonian Company (The Estonian Government Company of Electricity) continues preparing the technical and financial offer required for the project in accordance with the terms of the agreement of principles that has been signed with this company on 12/08/2008, where the project is to build an electricity power plant station operating by the direct burning technology with a capacity of 600-900 M.W and to be operating commercially by 2015, it is planned that the company will provide the offer to the government by the end of 2011.

In the field of the New and Renewable Energy.

The comprehensive strategy for energy sector included the work on increasing the contribution of the new and renewable energy up to 7% of the energy mix in 2015 and 10% in 2020. To achieve this, the focus will be on the implementation of the following large projects until the year 2020:

1. Utilizing the wind energy to generate electricity with a capacity of 1000 MW.

2. Utilizing the solar energy to generate electricity with a capacity of 300-600 MW.
3. Utilizing the vital energy resources to generate electricity with a capacity of 20-30 MW.

Jordan has a good level of renewable energy resources that can be summed up in terms of quantities or rates and the current exploitation as follows:

Solar Energy:

Rates: 5-7 kilowatt/ hour /meter square (is considered the highest rates internationally).

The size of the current exploitation: water heating (the solar water heaters are spreading by rate of about 15%, providing about (100) thousand tons of equivalent oil every year), lighting and pumping water in the remote areas through the systems of solar cells (PV) about 1000 compound kilowatt .

Wind Energy:

Rates: the average of wind speed is around 7m/s (300 watts /meter square as average per year) in some locations (Hofa, Alkamsha, Alfaj, Alhareer, Aqaba).

Size of exploitation: experimental projects to generate electricity (1.5 MW in the north), water pumping, and both of Al-kamsha projects 40 MW and Alfaj 80-90 MW under the procedures of the tender.

Bio Energy:

Rates: about 5000 - 7000 tons per day.

Size of exploitation: an experimental project to generate electricity (3.5 MW) – Jordan Bio-Gas Company (divided equally between the Great Amman Municipality and the Central Electricity Generating Company).

Hydro Power:

Rates: very limited, with the exception of the expected size of the two seas canal project.

The size of exploitation: experimental projects to generate electricity (10 MW, King Talal Dam and Aqaba Thermal Station).

Geothermal Energy:

Rates: very limited.

The size of exploitation: the technical feasibility study have demonstrated the possibility of exploiting of the hot springs in the area of Ma'in ,Zara , Alazrak and others for the purposes of generating electricity done by the Ministry of Energy through a Japanese consulting firm the unproductive of this and there is a need to dig deep wells (up to 3000 meters) to be more familiar with the temperature and its suitability to generate electricity, and this needs a significant financial cost according to the roadmap in this regard.

The following is a review of the main activities and achievements in the field of the renewable energy:

1. *Wind Energy:*

- The wind energy project in Alkamsha area with a capacity of 30-40 MW: the coalition of the Greek company (TERNA) the first by ranking for the project has been chosen to enter with in the negotiations about the project's agreement. Some environmental, technical and financial matters have emerged that need to overcome before beginning in the procedures for the referral of the project, as it is expected to execute the project when having a successful negotiations by the end of 2011.
- The wind energy project in Al-fjaej with a capacity of 80-90 MW: The tender has been offered for the qualified interested international and local companies, the qualification phase has resulted by qualifying 16 Company, and the distribution of the tender's documents on the qualified companies will be by the beginning of 2010 to enable them to provide their technical and financial bids for the project, the project is expected to begin in the second quarter of 2012.
- The approved measurement program for the wind energy: In the light of the study results of the possibility of collecting wind energy projects in Al-hareer/ Al Tafila, Ma'an, and Wadi Araba / Aqaba area and offering them in one tender, the study showed lack of readiness of these sites to develop and to offer as a commercial tender, the need has emerged to choose an international institute dedicated and reliable in the field of wind energy measurements to adopt this program, which will reduce investment risks and enhance the credibility among investors in the development of wind projects in the locations referred to above and others. This program has been submitted for funding from the World Bank from the grant offered for developing wind energy market in Jordan, it is expected to start the program during the second half of 2010.

- The Central Electricity Generating Company continued to produce electricity by using wind turbines in Hofa and Al-abraheemia stations. The electricity produced from these stations in 2009 is about 2.76 GWh
- The National Energy Researches Centre (NERC) is doing several activities related to wind energy, the most prominent are the following:
 - Preparation of appropriate locations for the installation of towers measuring the characteristics of wind, as they are 13 towers, in addition to receiving the equipment and devices to do so.
 - Follow-up the project' implementation "Establishing a plant for wind energy inspecting and testing" in Al-fjaej area in the governorate of Maan. Receiving the plant is expected to be in the first half of 2010.
 - Follow-up updating the database of the wind qualities in Jordan (Data Bank) and building an atlas of wind to help in the study of the promising areas.

2. *Solar Energy:*

The Ministry of Energy continued its efforts in cooperation with The National Energy Researches Centre to maximize the use of solar energy in various fields, and the most prominent activities in this area include the following:

- The Private solar thermal project(CSP) for generating electricity with a capacity of 100 MW: The required proposal for this project is prepared to be funded through the Clean Technology Fund (CTF) run by the World Bank and dedicated to providing support and financing for such projects within the so-called "the solar Mediterranean plan" as one of the initiatives of the Union for the Mediterranean, it is expected to begin in the procedures of the tender of this project to the private sector during the second half of 2010 in the event of the availability of the finance required for the project.
- The Japanese project for the solar cells 300 KW -a grant of 7 million dollars – for the Royal Scientific Society and Panorama Hotel the Dead Sea, The National Energy Researches Centre (NERC) will supervise the implementation, maintenance and operation of the project which is expected by the end of 2010.
- The Spanish project of the solar cells with a capacity of 1 MW to generate electricity - a grant through (Debt / Swap) of 5 million dollars, as the Spanish government Institute of Solar Energy was selected as a consultant for the project to assist the ministry of Energy in selecting the project location and in preparing the documents of the tender and the tender referral procedures for the selection of the Spanish company, the equipment supplier ,the constructor and the operator of the project and to deliver it with the beginning of 2011 as it is expected.

The National Energy Researches Centre continues its programs and activities in this area, as it did the following:

- A feasibility study for an experimental project to use the solar thermal energy through the intensive systems (CSP) with a capacity of 5 MW, through a grant from the European Union and to implement the project in the event of proven feasibility.
- Providing economical feasibility studies to the demanding parties with respect to uses of solar cells for the purpose of pumping and water desalination, lighting and communications.
- Study, analysis and evaluate the solar radiation measurements which were taken at seven sites in the Kingdom.

3. Bio Energy:

The Bio Gas Company continues working to process the organic waste in Alrosaifa landfill ,the amount of the solid and liquid waste that was processed in 2009 reached to 6000 tons, and the amount of electricity generated reached to 7411 MWh. And the amount of the biogas that its emissions were reduced reached about 4.5 million cubic meters.

In the field of electricity:

The ministry is currently working within its programs to ensure the availability of the electricity permanently within the following policies:

- Implementing the expansion projects by generating electricity based on the private generating projects IPP's and in manner of (Build - Own - Operate) BOO.
- Diversification of the generation sources.
- Restructuring the electricity sector and privatizing the generation and distribution sectors.
- Maximizing the use of regional electricity linking networks.
- Raise the efficiency of the existing power plants, and reduce the loss from transmission and distribution networks.

One of the main electricity generation projects that address the future demand of electric energy are the following:

1. Samra Electric Power Generation:

Phase II:

The installation works to convert both the third and fourth gas units /the second

phase to a Combined Cycle are still undergoing, it is expected that the commercial operation of the steam unit to be by 12/06/2010.

Phase III:

This project aims to add two gas units with a capacity of 200 MW to meet the demand on electricity for the period 2010-2011. Offers were received on 28/03/2009 and the tender was referred to the Korean company HANHWA on 28/09/2009 , it is expected that the commercial operation of the first gas unit is at the end of November 2010 and the second gas unit is at the end of January 2011.

2.First IPP project / East of Amman Manakhir:

on 26/10/2009 the project was formally opened under the patronage of His Majesty King Abdullah II in which the second phase of the project was operated as a combined cycle on 26/08/2009 with a total capacity of 370 MW. knowing that the commercial operation of the project as a simple cycle was on 25/07/2008.

3.Second IPP project / Qatrana:

The project aims to contribute in cover the electric loads during 2010/2011 and with a capacity of 373 MW, by using the technology of the combined cycle that burns natural gas as a primary fuel and diesel as a secondary fuel according to the environmental standards applied in Jordan with a total cost of up to 460 million dollars, the project is located in AlQatraneh area which lies 80 km south of the capital Amman, the location was selected based on a technical study by the concerned authorities. Al-Qatraneh company of the electric power which is founded by a coalition from the Korean company KEPCO and the Saudi Arabia XENEL company is implementing this project. The agreements of the project have been signed on 29/09/2009 between the local parties and the concerned parties and the project company. The project reached the financial lock on 24/11/2009 and it will be operated as a simple cycle on 30/11/2010 and as a combined cycle on 25/08/2011 .

Maximizing the benefit of the Regional Electric Interconnection Project:

- The contract of the electric energy exchange between the Jordanian and Syrian sides was renewed for the year 2009 in December / 2008, and also the contract of the electric energy exchange with the Egyptian side was renewed for the year 2009 in January/ 2009.
- A sum of 362.8 GWh was transferred from the Egyptian network to meet the Jordanian electricity reserves during 2009, along with a sum of 20 GWh from the Syrian network during 2009, and 139.5 GWh passed over from

the Egyptian network to the Syrian network and 5.9 GWh from the Syrian network to the Egyptian network through the Jordanian network during 2009 which brought material benefit to the Jordanian side by the fees earned on energy transit.

In the field of the Natural Gas

The Ministry of Energy and Mineral Resources, within the overall strategy of the energy sector is aiming to the following:

- Provide the new electricity power plant with the natural gas.
- Continue working on the plans of transforming the industries to use the natural gas instead of fuel oil and diesel.
- Establish natural gas distribution networks in several cities in the Kingdom in order to provide the domestic sector and the commercial sector by the natural gas and use it instead of the oil products.
- Search of alternative resources for the supply of natural gas.

Among the achievements that are accomplished in 2009 include the following:

- The Jordanian-Egyptian Fajer company for the transport and supply of the natural gas that owns and operates the natural gas pipeline project from Aqaba to the north of the Kingdom ended (the second phase of the Arab Gas Pipeline) at the beginning of February 2006, and thirteen months ahead of the contractual date and by a length of 393 km, and a diameter of 36 inches, at a cost of 300 million U.S. dollars, and according to the system of Build, Own, Operate and Transfer (BOOT).
- The Ministry of Energy and Mineral Resources (the licensee) under the licensing agreement signed with the Jordanian- Egyptian Fajer company for the transport and supply of natural gas issued on 25/01/2004 a certificate of completion of the works of the natural gas pipeline project from Aqaba to the north of the kingdom for the Jordanian-Egyptian Fajer company in April 2007 . The engineering Tractebel company, the Joint Technical Adviser for the Ministry of Energy and Mineral Resources and the Housing Bank for Trade and Finance issued the final report of the project in November 2009 after the completion of the rest of the outstanding work of the project.
- The second Phase of the Arab gas pipeline has been completed from Rehab until the Jordanian-Syrian borders of 30 km long and a diameter of 36 inches to be connected with the third phase of the Arab gas pipeline inside the Syrian territory in order to export Egyptian gas to Syria via Jordan, the implementation of this part was completed in March of 2008, also the

technical advisor of Tractebel company provided the final report of this part and, accordingly, the ministry of energy issued a completion certificate of the works for this part in December 2009.

- The Syrian side carried out the implementation of the southern part of the third phase of the Arab gas pipeline inside the Syrian territory, stretching from the Jordanian- Syrian border to the Syrian city of Hems of 310 km long and a diameter of 36 inches. This stage has been operated and importing the natural gas from Egypt to Syria via Jordan was started in July of 2008, and exporting the Egyptian natural gas to Lebanon via Jordan was started in November 2009.
- About 80% of the electricity in the Kingdom has been generated in 2009 through the use of the Egyptian natural gas, and the total capacity of the electric generating stations operating on natural gas in the kingdom is estimated about 1880 MW.
- An agreement was signed between the National Electric Power Company (NEPCO) and the Jordanian-Egyptian Fajer company in October 2009 for the implementation and establishment of the two points provision of natural gas for each Samra Electric Power Generation/the third stage and the second private electricity generating project (AlQatraneh), and it is expected to finish the implementation the supply point of the second private electricity generating Project (AlQatraneh) at the end of July 2010, and the point of provision of Samra Electric Power Generation (the third stage) at the end of August 2010.
- The Jordanian-Egyptian Fajer Company for Natural Gas transport and supply has presented the updated offer to the distribution of natural gas project in Amman and Zarqa, the updated offer of the project was received on 15/02/2009, after reaching an understanding with the Egyptian side for securing adequate amounts of natural gas for the implementation of the distribution projects, the offer has been studied by the Ministry of Energy and Mineral Resources with the assistance of the international experience house the consulting firm CRA, and a comprehensive assessment of the offer has been completed. And now Fajer Company is being followed up with regards completing the required project's financing conditions, preparing to reach signing the agreement stage to start the project.

In the field of Improving the Efficiency of Energy Consumption:

According to the energy sector strategy which aims at reducing the energy consumption 20% in all sectors (Household, industrial, commercial, governmental, transportation and water pumping) by the year 2020, the Ministry of Energy and Mineral Resources and the National Energy Researches Centre (NERC) accomplished many programs and activities , the most important of which are:

- ***The Development of the Public Service Office of Energy and Electricity:***
completing what has been accomplished in 2008, the office has continued to provide the awareness and the free consultation to citizens about the procedures of conserving energy consumption, and to recognize the equipment and devices that save energy used in this field and which are available in the local market, in addition to performing lectures and field visits to companies and factories to spread awareness in this regard and holding workshops and participation in scientific conferences. The office has a hall in which there are energy-saving devices show.

- ***Exempting the Saving and the Renewable Energy Devices and Equipment from Duties and Taxes:***

In order to encourage the citizens to buy the saving energy and the renewable energy equipment and devices and to implement the Council of Ministers decision on exempting the saving energy and the renewable energy equipment from custom duties and the sales tax, a technical committee of the concerned authorities including the Ministry of Energy has been formed to discuss all the outstanding issues that face the implementation and the application of all the resolution provisions. A mechanism for exempting saving energy and the renewable energy devices and equipment has been adopted .

- ***Energy Efficiency Fund:***

The draft law of the renewable energy and energy saving includes establishing a fund called (the renewable energy and energy conservation Fund). It aims to provide support for studies to improve energy consumption efficiency in various sectors, the public awareness campaigns and the training programs in this field, in addition to guaranteeing loans for projects of energy saving and renewable energy. This fund is financed from the Treasury and foreign grants and aids provided by the international donor institutions.

In order to develop the market of energy-saving in the industrial and commercial sectors in Jordan and to help the industrial and commercial Jordanian institutions to obtain the necessary funding for renewable energy and energy conservation projects, an agreement has been signed to finance the project “Improving energy management in industrial and commercial sectors in Jordan,” of 1.56 million euros. The French Agency has also funded

the project of conservation of energy consumption in lighting streets and houses .It is a pioneer project aimed at reducing energy consumption and electrical load . The National Energy Research Centre in cooperation with the Jordan Electric power Company and the Greater Amman Municipality will implement it.

- ***The Project of Supporting the use of Solar Energy for Water Heating:***

This national project aims to promote the use of solar heaters and to increase the spread of them in the domestic sectors to reach 30% by 2020, according to the comprehensive strategy for the energy sector. The proposal of this project was prepared in cooperation between the Ministry of Energy and Mineral Resources and the National Energy Researches Centre. It is expected to begin the implementation of this project during the year 2010 when the fund is established.

- ***The Awareness and Training Programs in the field of Renewable Energy and Conservation of Energy Consumption:***

The ministry and the National Energy Research Center continued to conduct many awareness and training programs through holding the specialized training courses and the guidance seminars for professionals in addition to the general public. Guidance tips were prepared through the Jordanian TV and Radio, in addition to a free distribution of publications on ways to conserve energy. Also, the ministry through the National Energy Research Centre issued a handbook of energy conservation equipment and devices, and participated in the public festivals and specialized conferences by offering the saving energy consumption equipment and devices as well as communicating with citizens through the direct line of the Office of the Public Service of energy and electricity.

- ***The Technical Studies***

The National Energy Research center implemented in 2009 detailed studies for the conservation of energy consumption in the industrial , commercial and government sectors . The studies focused on facilities and services such as electrical systems and water pumping systems, and others , cooling systems, boilers, compressed air, steam and lighting systems .The studies dealt with the aspect of management and monitoring of energy which is the first step in the ongoing follow-up and the permanent observation of the various aspects of the energy consumption to evaluate its performance properly. The Centre is working on implementing the conditioning system project using solar energy within the project “React”, which aims to transfer this technique and studies its feasibility to provide the buildings with heating and cooling. The project is supported by the EU.

- ***Building Codes***

The ministry participated actively through its staff in the committees of the preparation of codes relating to energy including the solar energy code and the energy-saving building code and the green building code.

In the field of Legislation

To provide legal, practical and legislative frameworks that can raise the efficiency of the energy sector and to give flexibility and ability to deal with the new trends aimed at attracting investment by the private sector, so ,a draft law of mineral and oil and renewable energy and geological survey committee have been prepared. Also, the completing study of the consolidation of the bodies of energy sector represented by the Electricity Regulatory Sector Commission and the Petroleum and Minerals commission by establishing a single body for the energy sector within a unified draft law for the energy sector.

To help achieve the objective in the strategic energy sector which is to reach the rate of 10% of the contribution of the renewable energy in the total energy mix by 2020, and to encourage the private sector to investment in the renewable energy projects, so the Government decided to issue a separate legislation for the renewable energy, therefore the draft law of the renewable energy and energy saving is prepared in preparation for approval and issuance as a temporary law with the beginning of the year 2010.

In the field of Utilizing of Nuclear Energy for Peaceful Purposes:

Jordan interest in the nuclear energy option came as an alternative of the electricity generating to confront the difficult challenges represented by the scarcity of domestic energy sources and its increased demand, especially in the light of the growing rise in its prices and the high cost of its import, as well as the scarcity of water resources, especially drinking water. So the Jordan Atomic Energy Commission has been established in order to transfer the peaceful uses of the nuclear energy and the radiation technology to Jordan and to develop their use and management and to establish the investment projects in the service of the national economy in the areas of electricity generating energy and water desalination as well as agricultural, medical and industrial areas.

The main achievements of the Jordan Atomic Energy Commission in 2009 as follows:

First - Jordan's Nuclear Program

The Jordan's nuclear program was stated to achieve the following specific objectives:

- Exploitation and investment of the natural raw nuclear materials in Jordan, especially Uranium.

- Establishment of nuclear energy plants for electricity generation and water desalination.
- Building and developing of the abilities and human resources necessary for the implementation of Jordan's nuclear program axis.
- Strengthening the infrastructure of nuclear science and its applications. Promoting and strengthening the cooperation with the International Atomic Energy Agency and with the friendly nations of experience in the area of nuclear energy.

Second – Utilizing of Uranium

The scientific and laboratory studies and analysis which took place during the past period have confirmed the presence of natural uranium in the central of Jordan in large quantities up to about 65 thousand tons in the form of surface sediment in addition to approximately 100 thousand tons found in the Jordan Phosphate. Therefore came the establishment of the Jordanian Company for energy sources as a wholly owned company for the Jordan Atomic Energy Commission and by a capital of a hundred million Jordanian diners, which is responsible for prospecting and exploration of uranium and other natural nuclear materials in Jordan. The commission also signed on 30/09/2008 the convention of uranium exploration in the center area with AREVA French company, and it also signed a memorandum of understanding on 23/02/2009 with English – Australian company (Rio Tinto) for uranium exploration in south and east of Jordan.

Third - Nuclear Reactors

The Jordan Atomic Energy Commission followed up the preparations for the nuclear energy plant for electricity generation and water desalination, which is expected to generate 2000 MW of electricity using nuclear reactors, which are expected to be of the type of light compressed water reactors (PLWR) during the year 2020, through the operation of two nuclear reactors of a capacity of 1000 MW of each.

On the other side, a commission to organize the work of radiological and nuclear weapons was established in 2007 as a legitimate heir to the Jordanian Nuclear Energy Commission established in 2001, and the commission has a legal personality with financial and administrative independence and tracking directly to the Prime Minister. The Commission aims to protect human health and property and the surrounding environment of the radiological and nuclear threats through the organization and the control of nuclear energy uses and ionizing radiation and to ensure the availability of the conditions and requirements of public safety and radiation protection and safety and nuclear security.

The most significant achievements of this commission in 2009 as follows:

- 850 licenses and permits to operate radiation have been granted whether for institutions or persons engaged in radiation work.
- 160 inspection visits regularly programmed and unprogrammed and emergency on the medical, industrial and research institutions and cargo containers to make sure that they meet the conditions for the radiation protection and also to verify that the cargo containers are free of any radiological materials ,sources or contaminants.
- Auditing of 850 Personal radiation monitoring report for workers in the field of the radiation work. It was detected that 11 cases have been exposed to radiation doses exceeding the permissible limits internationally.
- The continuous monitoring of the environmental radiation monitoring stations and the early warning systems in each of Qafqafa, Qadisiyah and Alkarama.
- Follow-up the devices of the border radiation monitoring gates.
- Expanding the channels of communication and cooperation with local, regional and international authorities, particularly the International Atomic Energy Agency through the signing of agreements and memorandums of understanding.

Energy and Environment

The ministry of energy and mineral resources continued to follow-up the activities and environmental programs related to energy sector and through its participation in all the related activities ,the most prominent are: -

- The participation in the committee of the assessment of the environmental impact of projects.
- Follow-up the second national communications draft.
- Contribute to the preparation of the report of the environmental situation in the country of Jordan.
- Participation in consultative seminars of projects to assess the environmental impact of projects.
- Participation in the national , technical and negotiating committees of the clean development mechanism projects (CDM)specially for trading of quantities to reduce carbon emissions.

The Mining Sector

The mineral wealth is considered one of the most important pillars on which the mining industries depend on, and which constitutes a key and important tributary to the national economy. Jordan possesses a lot of natural resources, many of which metal such as copper and iron and non-metallic as clay and its different derivatives, such as kaolin, pure limestone, silica sand and gypsum and construction materials produced by various quarries in various regions of the Kingdom, such as building stone, marble and granite slabs, etc., in addition to the exploitation of the wealth of the Dead Sea as salts or mud, which are used in the production of the medical and cosmetic products.

Therefore, the Natural Resources Authority continued the investigation operations and the prospecting of raw minerals and industrial rocks in various regions of the Kingdom.

The most significant projects undertaken by the Natural Resources Authority of prospecting for mineral wealth, in 2009 are the following: -

- **Prospecting Project of Feldspar:**

This project is located in Al Rashidiya / Wadi Almleghan, the feldspar ore is of alkaline-rock (silicate of aluminum, sodium and hydrous potassium)which the Authority treat by increasing the proportion of oxides of sodium and potassium to obtain silica of high purity used in the manufacture of glass, ceramics, Chinese tiles , paintings and pottery. 71 exploratory terraces were drilled in the project area , and 100 samples were analyzed from which it appeared that the main component of these samples is the feldspar and quartz .The reserve of this ore is about 9.5 million metric tons.

- **The Prospecting Project for Volcanic Crude and Zeolite:**

This project is located in the areas of the north east of the Kingdom and aims to search for new places of this ore and to identify its reserve , as well as the possibility of exploiting it in various industries. The existence of two locations has been proved in the plates of DyrAlkhf and Tlul Alshahba .Surface samples were collected and analyzed to identify their chemical and mineralogical characteristics It appeared that the main component of these samples are the feldspar mineral and sometimes Augite, but the work has stopped because some companies wanted to obtain prospecting and mining rights therein.

- **The Prospecting Project of Pure Limestone:**

This project is located in the northwest of Al Hasa, and it is a continuation of what has been done of the works of prospecting for pure limestone (Alkokina) in the central regions of the Kingdom,42 wells have been drilled and 117 samples were taken for chemical analysis and its whiteness degree , as well as taking 23 samples to determine the specific gravity,as the results of the analysis showed that the proportion of calcium carbonate ranges between (41.6-55.2)%.

Financial Statement in 2009

Item	Allocations	Expenses	Disbursed
Current expenses	2800300	2605375	93%
Capital expenses	11436500	11248254	98%
Total	14236800	13853629	97%

The Financial Statement for Important projects in the Ministry in 2009

The Project's Name	Allocations for the year 2009	Expenses for the year 2009	Disbursed Rate
Utilizing the Oil Shale	267000	230625	86%
Encouraging the establishment of natural gas network	2397000	2389361	99.7%
Establishment for the Second Electricity Generation Project/ Qatrana	300000	300000	100%
Utilizing wind energy to produce electricity at Jarash – Al- Kamshah.	200000	120439	60%
Supporting the projects of the Atomic committee	8000000	8000000	100%
The administrative projects	272500	207829	76%
Total	11436500	11248254	98%