The Hashemite kingdom of Jordan

جائزة الملك عبد الله الثاني
لتميز الأداء الحكومي والشفافية
الدورة الخامسة (٢٠١٠/٢٠١١)
المرحلة البرونزية
المركز الأول

Ministry of Energy and Mineral Resources

Annual Report
2010

His Majesty
King Abdullah II Ibn Al Hussein

H.R.H Crown Prince
Hussein bin Abdullah II

Contents

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
- Transparence 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

Minister
Consultants
General Secretary
Minister's Secretary
Minister's Office
Internal Control Unit
Financial Control Division
Management Control Division
Minister
Secretary's General Secretary
The legal Advisor
Public Relations Division
Bureau Department
Rural Electricity Project
Technical Affairs & Areas Department
Management Affairs Department
Financial Affairs Department
Purchasinbg Div
Supplies Div
Bugitery Div
Accounting Div
Management Affairs Department
Management Div
Training Div
Human resources Div
Planning Department
Statistics and Information Div
Library
IT Div
Technical Studies Div
Cost and Pricing Department
Pricing Div
Importing Div
Cost Accounting Div
Renewable Energy Department
Public service Div
Environment Studies Div
Renewable Energy Studies Div
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Energy Conseravtion
Oil Shale Div
Electricity Department
Transporting Div
Electricity Distribution
Electricity Generation
Natural gas Department
Gas Studies Div
Gas Projects Div
Industrial Energy Department
Transporting by Tanks Div
Crud oil accounting Div
Distributing oil and its products Div
Importing Div
Refining and reserving Div

Terms and abbreviations

KW	kilowatt (10^3 watt)
GWh	Gegawatt–hour (10^9 Watt–hour)
kWh	Kilowatt–hour
MW	Megawatt
MWh	Megawatt–hour (10^6 Watt 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 (10^3 Fils)
CF	Cubic Feet

Significant Figures of Energy and Economy in Jordan 2010

Population (millions)	6.11
Gross Domestic Product (GDP) at current prices (million JD)	19528
GDP per capita (JD)	3195
Energy Intensity (toe/1000 JD in 2002)	0.75
Per capita primary energy consumption (Kgoe)	1204
Per capita share of electricity consumption (kWh)	2102
Electricity generation (GWh)	14777
Electricity consumption (GWh)	12843
Percentage of population supplied with electricity (%)	99.9
Overall domestic energy production (1000 toe)	138
Imported Energy (1000 toe)	7446
Primary energy consumption (1000 toe)	7357
Cost of consumed energy (billion JD)	2.6
Cost of consumed energy as a percentage of:-	
Exports (%)	52
Imports (%)	14
Gross Domestic Product (%)	13
Jordan Dinar (JD) = 1000 Fils = US$ 1.41 in 2010	

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 2010. **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 2011, to secure the Kingdom's needs of oil products until opening the market for competition. Necessary measures have been taken to build a storage capacity of 70 thousand tons of crude oil in Aqaba, as well as marketing six areas for oil and gas exploration and linking them by franchise agreements with international oil companies for search and exploration of oil and gas, a memorandum of understanding was also signed on 04/05/2010 with the Canadian Ammonite Energy International company to explore oil in Aljafr as a seventh area.

In the field of natural gas, in 2010, approximately 68% of electricity in the Kingdom was generated by using natural gas imported from Egypt; the total capacity of the electricity generating stations operating on natural gas in the kingdom is about 1880 MW. The natural gas pipelines has been also finished to provide the second electricity generation project Al-Qatraneh and Al-Samra electricity generation station (Phase III).

In the field of electricity, within the expansion project of Al-Samra electricity generating station – second phase – both of the third and fourth gas units – the second stage – have been converted into combined cycle units by adding a steam-generating unit with a capacity of 100 MW. The commercial operation of the steam unit was on 02/08/2010. A tender of two gas units with a capacity of 142 MW was given to a Korean company in order to meet the demand of electricity in 2011. The company is expected to run these units commercially by the beginning of 2011. The second IPP project in Al-Qatraneh was operated as a simple cycle on 31/12/2010 and it is expected to be run as a combined cycle by 25/08/2011.

In the field of exploitation of oil shale, the number of companies that have signed memorandums of understanding to exploit oil shale to produce oil are nine companies, in order to make economical banking feasibility studies to exploit oil shale in the production of oil. The International Shell company was also awarded a franchise to exploit the deep oil shale, Esti Energia an Estonian company has also signed an agreement to conduct a study and to present a technical and financial offer to build electricity generating power station from the Jordanian oil shale in the area of Atarat Um Alghdran with a capacity of 600-900 MW.

In the field of renewable energy, the coalition of the Greek company (Tirana) has been chosen for the wind project in the area of Alkamsha. Negotiations on the project have been started; it is expected to have the project operated by the end of the year 2012.

The tender of the wind energy project was also offered in the area of Al fejeij with a capacity of 90 MW. 16 coalitions of international and local interested companies was qualified, and the Tender documents were distributed on the qualified companies in the mid of 2010 to enable them providing their technical and financial bids for the project.

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.

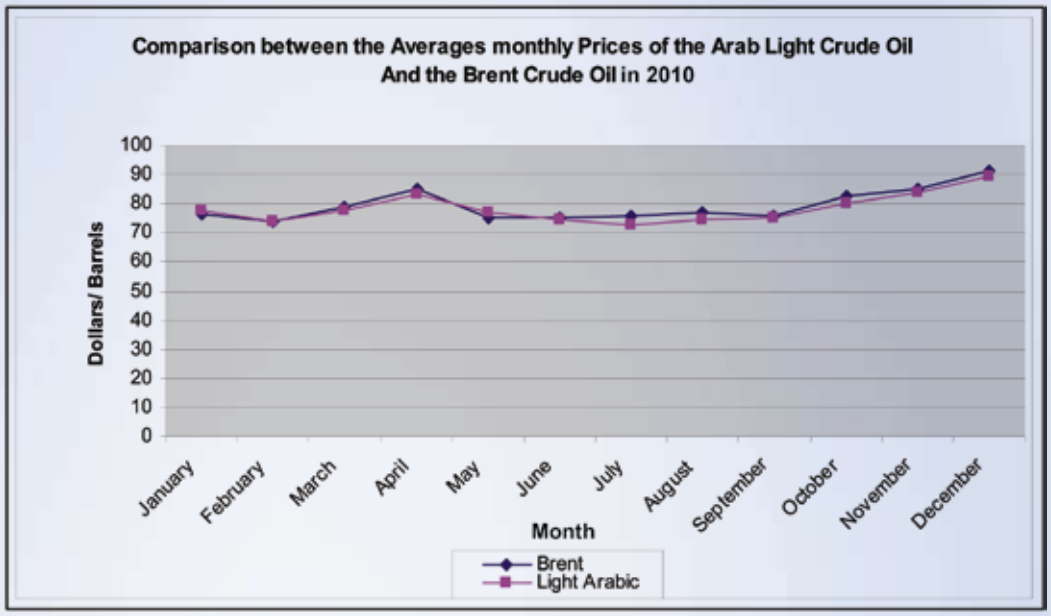
This report includes many of the achievements that are accomplished in other areas such as nuclear energy, mining, electric Interconnection project, Rural Electrification Project and others.

The Development of Oil and Natural Gas

On the Arab and International Level:

In 2010, the average daily world production of crude oil reached around 87 million b/d showing a growth of 3% over the 2009 oil production level. However, the proven world oil reserves in 2010 were nearly 1188 billion barrels.

On the Arab level, the Arab countries produced an average of nearly 25 million b/d in 2010, which represented 29% of the world production. Arab crude oil reserves in the same year were 683 billion barrels, i.e. (58 %) of the world oil reserves. Brent oil prices in 2010 have fluctuated to reach 91 US dollars/ barrels in December, the lowest price for oil were 74 US dollars/ 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 2010.



World production of natural gas reached around 3 Trillion cubic meters in 2010 thereby posting a dropping rate estimated at 4% above the 2009 production level. The world's natural gas reserves were around 188 trillion cubic meters. On the Arab level, the Arab countries produced nearly 366 billion cubic meters of natural gas which represented 12% of the world production. Yet, the Arab countries' reserves of natural gas have reached nearly 54 trillion cubic meters, i.e. 29% of international reserves.

On the Local Level:

In 2010, the Kingdom local crude oil and natural gas production was nearly 137.6 thousand toe, i.e. 2.8% 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 2010 were around 5125 thousand toe. The quantities of natural gas imported from Egypt were around 2285 million cubic meters; but the quantities of electricity imported through the interconnection line between Jordan with both of Egypt and Syria were about 670.1 GWh. The total cost of imported energy amounted to JD 2.6 billion in 2010 which represents a growth rate of 37% as opposed to energy imports of 2009.

In 2010, the overall demand for primary energy was about 7357 thousand toe thereby posting a dropping rate of 5 % compared to demand in 2009. The total demand for final energy which is the energy available to consumers was nearly 4872 thousand toe with a dropping rate of 3% compared to the 2009 demand levels. On the other hand, the amount of demand for oil products was 3644 thousand toe, and the quantity of electricity generated in 2010 in the Kingdom was 14777 GWh posting a growth rate of 3.5 % compared to 2009. The quantity of electricity consumption was 12843 GWh, realizing a growth rate of 7.4% compared to 2009. Yet, the peak load of the Kingdom reached 2670 MW posting a growth rate of 15% compared to 2009.

Institutions of the Energy Sector in 2010

In view of the important role which energy 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 are owned in full by the government was founded in 1999, and on17/10/2007, 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 installed capacity for the company in 2009 is 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 installed capacity for the company in 2010 is around 600 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 installed capacity of 370 MW.

2-6-Al qatraneh Electric Power Company:

It is private company established by coalition of Korean company KEPCO and Saudi company XENEL.The project operated as simple cycle on 31/12/2010 and expected to operate as combined cycle on 25/8/2011. The installed capacity for the project around 373 MW.

2-7-Electricity Distribution Companies:

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

2-7-1. 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.

2-7-2. Irbid District Electricity Company(IDECO):

It is a public shareholding company responsible for distributing the electricity in Irbid, Mafraq, Jerash, and Ajloun 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.

2-7-3. 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.

2-8-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 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 Kingdome the singed concession contract in 1958 which has been terminated on 02/03/2008, and it's operating now with an agreement of importing, storing, providing, and distributing.

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 operate the natural gas pipeline from Aqaba to north of the Kingdom, and collect 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.

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. The installed capacity for the Company is 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 21 million CF, an agreement was signed in 2009 with the British Petroleum company to enter as a strategic partner with the National Petroleum Company to develop Al- Risha gas field in two phases, the first phase is the exploration and evaluation stage and its duration is (3-4) years, extendible to another year. The BP Company is committed to spend an amount of 237 million US dollars on the work related to this phase such as three-dimensional seismic surveys, workshops and training of workers and others. The company has paid 20 million US dollars in 2010 as a grant to the Jordanian government in implementation of the amended concession agreement. The second phase will be the phase of development, and production and it will begin after the British company announces the availability of the project's commercial bases, as it will make a comprehensive development for the field with an amount of spending reaches between (8-10) billion US dollars to get to a volume of production ranges between 330 million cubic feet and one billion cubic feet per day.

There are huge amounts of Oil Shale in Jordan, as they can be utilized commercially 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.

With respect to the new and renewable energy resources, their share to the energy mix is not exceeding 1%. 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.

Table (1) clarify the local production of crude oil and gas and its participation in the whole consumed energy in the Kingdome during the period 2006-2010

Table (1)

Jordan's production of crude oil and gas during 2006-2010

Year	Crude Oil (000 tons)	Natural Gas (Billion CF)	Contribution to the overall Energy consumption (%)
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
2010	1.2	6.5	2.8

Local Demand for Energy and Electricity

1- Crude Oil and Oil Products:

The cost of the imported crude oil and oil products was around 2.6 billion JD in 2010, registering a growth of 37% from 2009, and that's because of increasing the amounts of the imported fuel oil, Diesel, Gasoline. The imported crude oil and oil products increased 12% from 2009.

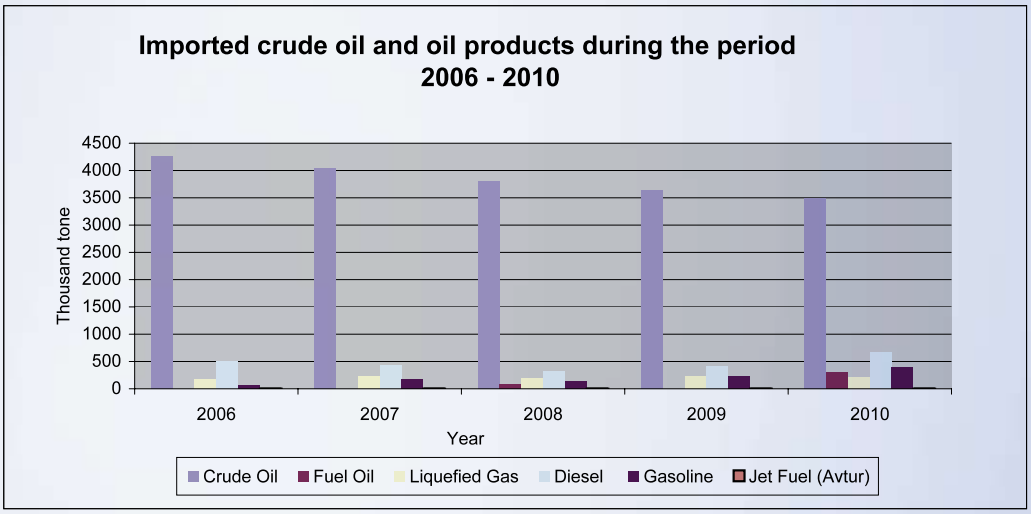
Table No. (2) Shows the quantity of the imported crude oil and oil products during the period 2006-2010.

Table No. (2)

Imported Crude Oil and Oil Products during 2006-2010 (000 tons)

Imported Type / Year	Crude oil	Fuel oil	Liquefied gas	Diesel	Gasoline	Jet Fuel	Total
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
2010	3485	307	219	670	400	1	5082
The growth rate for 2010	(4)	-	(6)	62	73	0	12

The brackets mean's negative Sign.



2- Natural Gas

The quantity of the natural gas imported in 2010 from Egypt through the natural gas pipeline between the both of the countries, which form part of the Arab Natural Gas Pipeline, was around 2285 Million Cubic Meter with a dropping percentage estimated by 27% from that was registered for 2009.

3- Primary and Final Energy Consumption

In 2010, the overall demand for the primary energy was nearly 7357 million toe showing a reduction rate of 5% beyond that 2009.

Table No. (3) Demonstrates the local demand of the primary energy during the period 2006-2010.

Table No. (3)

Primary energy consumption during 2006-2010 (000 toe)

Year	Type of energy				Total
	Crude Oil and the Oil products	Natural Gas	Renewable Energy	Imported Electricity	
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
2010	4774	2289	124	168	7355

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 2006-2010 (000toe)

Year	Sector				Total
	Transport	Industry	Household	*Others	
2006	1822	1182	1064	821	4889
2007	1912	1192	1070	853	5027
2008	1767	1095	1010	835	4707
2009	1952	1101	1083	885	5021
2010	1991	1014	1019	849	4873

* Including commercial and agricultural sectors along with street lights.

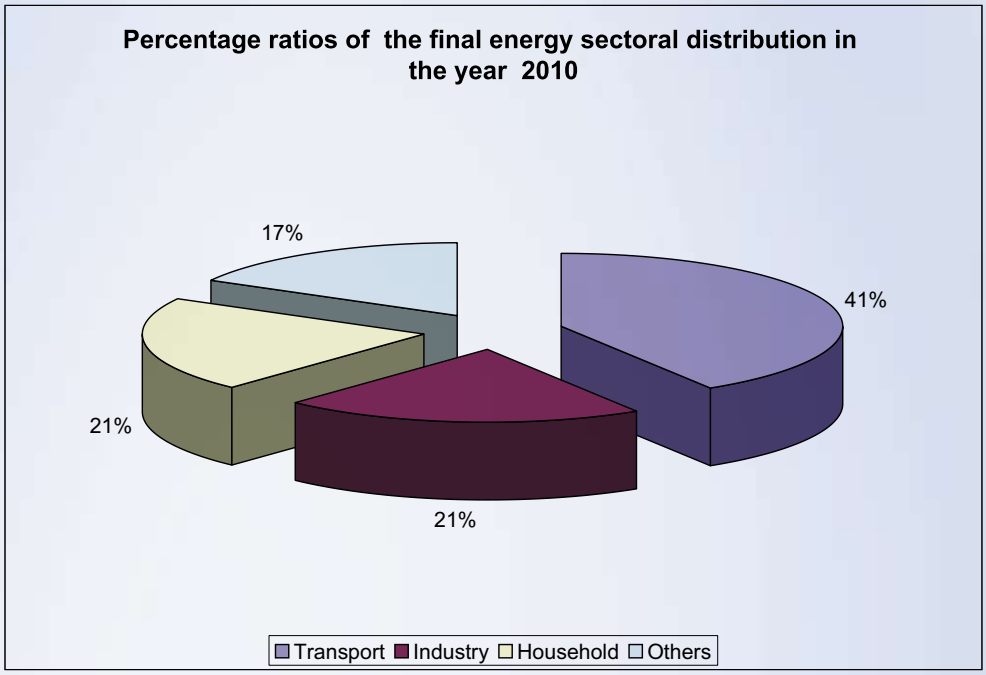
Also table No. (5) Demonstrate to the Percentage ratios of the sectoral distribution of final energy consumption.

Table (5)

Percentage ratios of the sectoral distribution of final energy consumption during 2006-2010

Year	Sector				Total %
	Transport %	Industry %	Household %	Others %*	
2006	37	24	22	17	100
2007	38	24	21	17	100
2008	38	23	21	18	100
2009	39	22	21	18	100
2010	41	21	21	17	100

• Including the Commercial and agricultural sectors along with street lights.



4- Oil products Consumption and prices

The year 2010 has witnessed a rise in the consumption of oil products in general; the reason for this is due to the significant rise in the consumption of fuel oil used in the electricity generation due to the decline of imported natural gas supplies from Egypt. The volume of consumption in oil products reaches about 4907 thousand tons while the volume of consumption in 2009 reaches about 4421 thousand tons, with a growth rate of 11%.

And some oil products have witnessed a decrease in the volume of consumption, such as liquefied gas, kerosene, diesel, asphalt and the rates of decrease 8%, 38%, 2%, 22%, respectively.

The following tables show the development in producing and consuming the oil products in the period 2006-2010.

Table No. (6)

Development of the Petroleum Refinery's production of oil products during 2006-2010 (000 tons)

Oil products / Year	Liquefied Gas	Gasoline	Avtur	Kerosene	Diesel	Fuel Oil	Asphalt	Total
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
2010	85	703	343	85	903	1080	150	3349

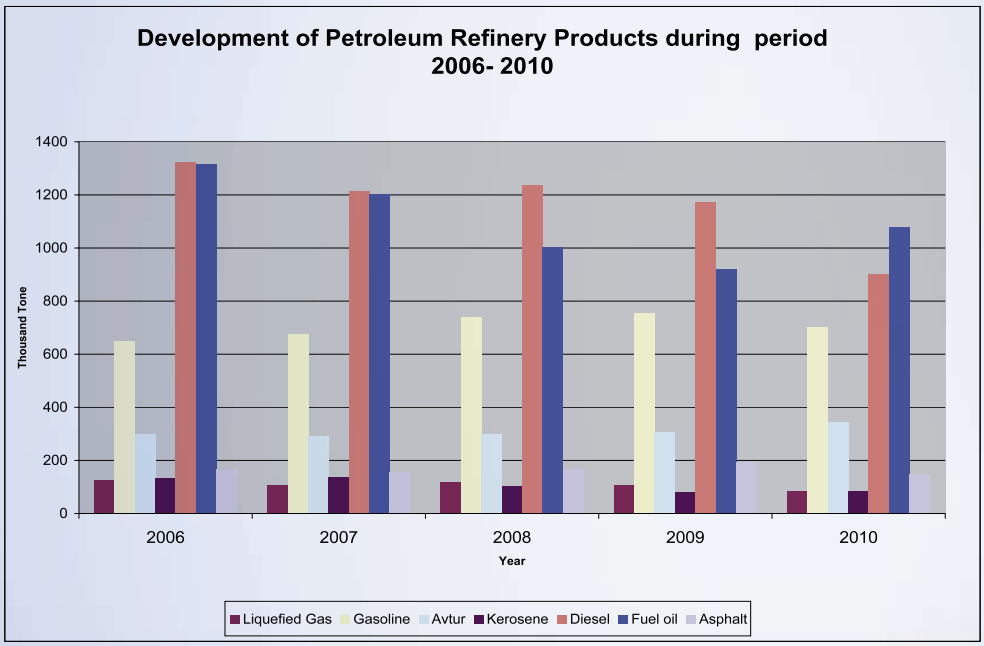
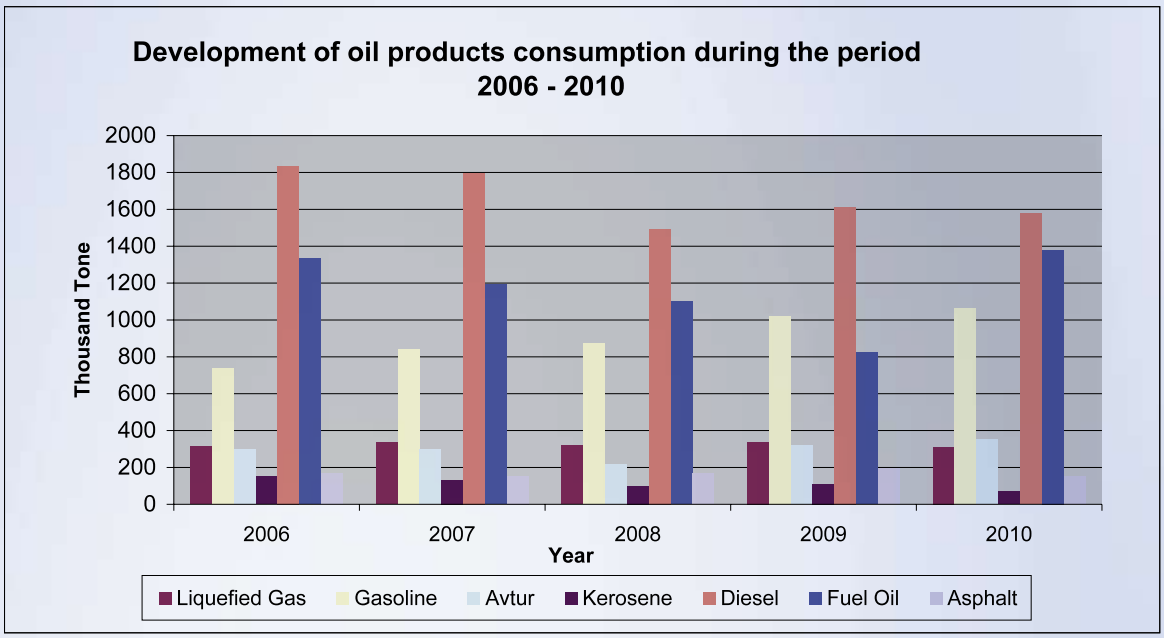


Table No. (7)
Development of oil products consumption during 2006-2010 (000 tons)

Oil products / Year	Liquefied Gas	Gasoline	Avtur	Kerosene	Diesel	Fuel Oil	Asphalt	Total
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
2010	312	1065	351	69	1577	1381	152	4907
Growth Rate(%)	(8)	4	10	(38)	(2)	67	(22)	11

• The brackets mean negative Signal.



Regards the prices of the oil products in 2010, the government has worked on keeping the subsidies on the liquefied gas, and has subjected the rest of oil 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 2010.

Table (8)

The local prices of oil products during 2010

		Jan 2010	Jan/ Feb	Feb/ Ma	Mar/ Apr	Apr/ May	May/ Jun	Jun/ July	Jul/ Aug	Aug/ Sep	Sep/ Oct	Oct/ Nov	Nov/ Dec	Dec 2010 – Jan 2011
Item	Unite	1/1-14/1	15/1-18/2	19/2-18/3	19/3-15/4	16/4-13/5	14/5-17/6	18/6-15/7	16/7-19/8	20/8-16/9	17/9-21/10	22/10-25/11	26/11-30/12	30/12/2010-31/1/2011
Liquefied gas	Diner / Cylinder	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.5	6.50
Gasoline (90)	Fils / Liter	485	500	490	525	550	575	540	550	555	540	575	600	655
Gasoline (95)	Fils / Liter	575	600	590	630	660	690	655	670	675	660	700	730	795
Diesel	Fils / Liter	445	455	435	465	485	505	455	465	470	465	495	515	545
Kerosene	Fils / Liter	445	455	435	465	485	505	455	465	470	465	495	515	545
Fuel oil/Indus	Diner / ton	370.3	379.05	363.9	367.67	370.06	384.95	345.3	348.68	358.83	349.89	365.01	381.83	397.14
Avtur/ local	Fils / Liter	423	431	412	434	455	471	426	435	442	434	463	483	512
Avtur/ Foreign	Fils / Liter	428	436	417	439	460	476	436	440	447	439	468	488	517
Avtur/ Charter	Fils / Liter	443	451	432	454	475	491	446	455	462	454	483	503	532
Fuel oil/Ships	Diner / ton	370.3	379.05	363.9	367.67	370.06	384.95	350	348.68	358.83	349.89	365.01	381.83	397.14
Diesel/ ships	Fils / Liter	445	530	620	585	397.62	505	485	470	470	465	495	515	545
Asphalt	Diner / ton	397.88	407.15	391.09	395.09	395.09	413.41	371.38	374.96	385.72	376.25	392.27	410.1	426.33

Electricity

The demand of electricity has been increased in 2010 by all sectors, this was due to the high temperatures in this summer, which led to the expansion in the use of air conditioning units, and the commercial sector registered the highest growth rate reaches to 10%, then the industrial sector registered growth rate reaches to 9% and the domestic sector and pumping water registered growth rate reaches to 6%, and as a result of this growing demand, the Ministry of Energy and Mineral Resources and the National Electric Power company made several actions to meet this growing demand. The details of these procedures will be dealt with later, when viewing the comprehensive strategy for the energy sector.

Electricity Generation and Consumption

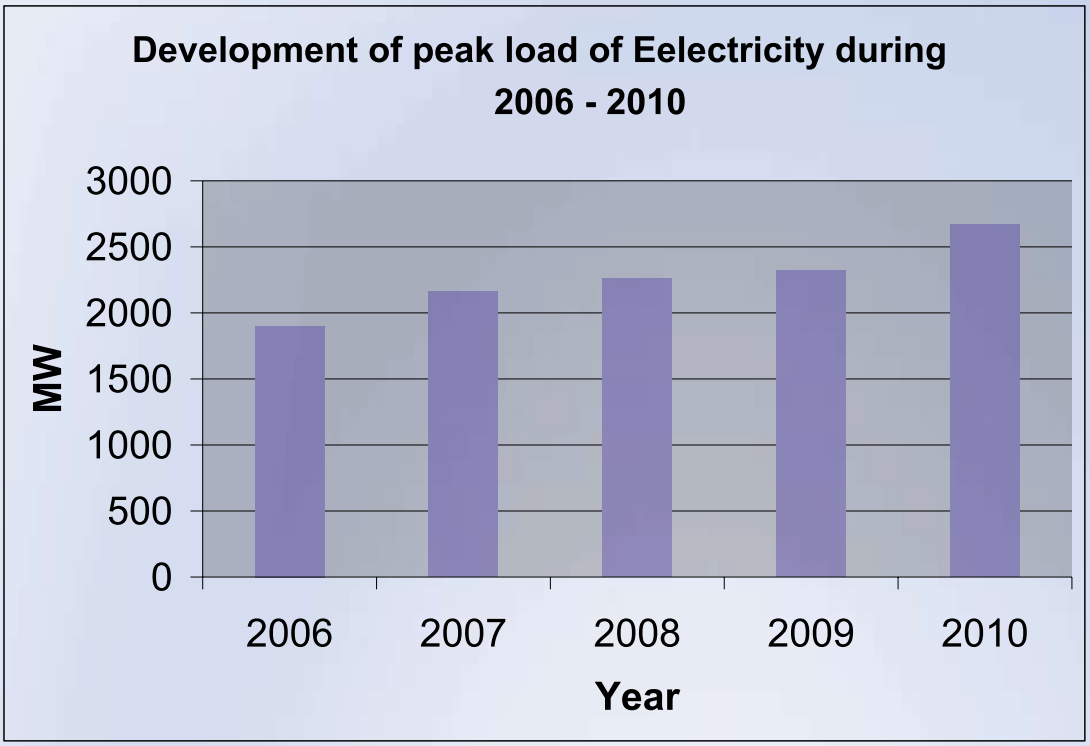
The quantity of electricity generated in 2010 around 14777 GWh showing a growth rate around 3.5% from 2009. The consumed electricity was around 12843 GWh showing a growth around 7.4% from 2009.The Electric Peak load of the Kingdom in 2010 reached around 2670 MW thereby posting a growth of 15 % compared to that of 2009.

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

Table No. (9)

Growth of the electricity production and Peak load during 2006-2010

Year	Peak Load MW	Growth Rate (%)	Electricity generated GWh	Growth Rate (%)
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
2010	2670	15	14777	3.5


Development of peak load of Eelectricity during 2006 - 2010
3000
2500
2000
1500
1000
500
0
MW
2006
2007
2008
2009
2010
Year

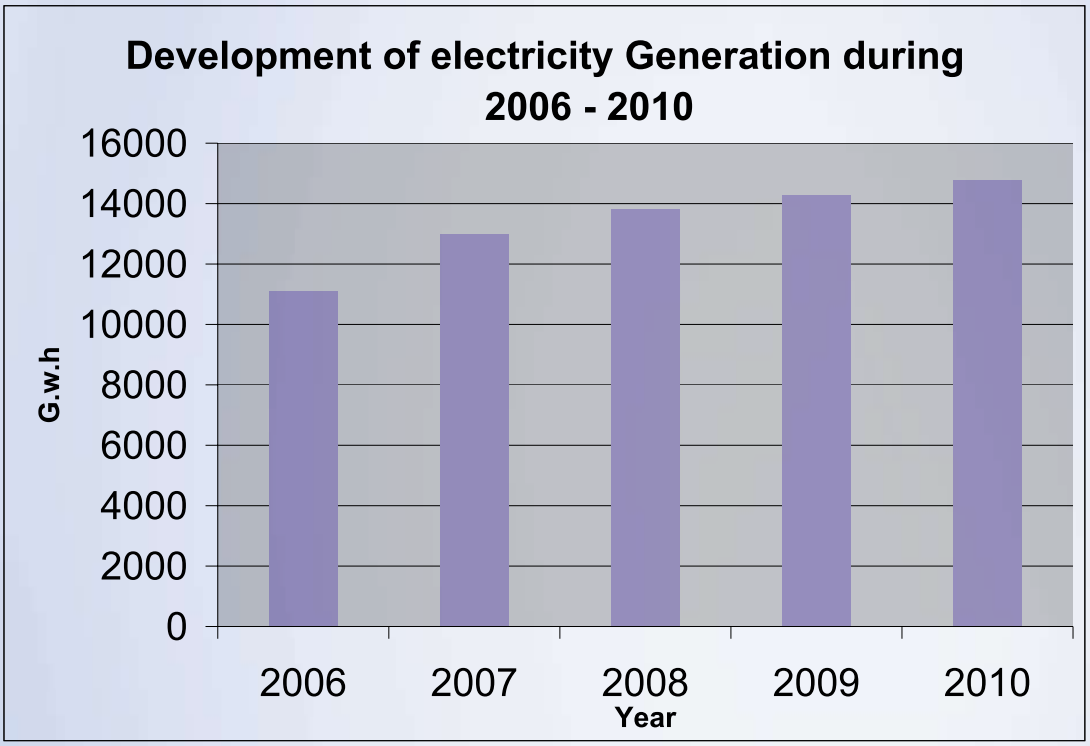

Development of electricity Generation during 2006 - 2010
16000
14000
12000
10000
8000
6000
4000
2000
0
G.w.h
2006
2007
2008
2009
2010
Year

Table No. (10)

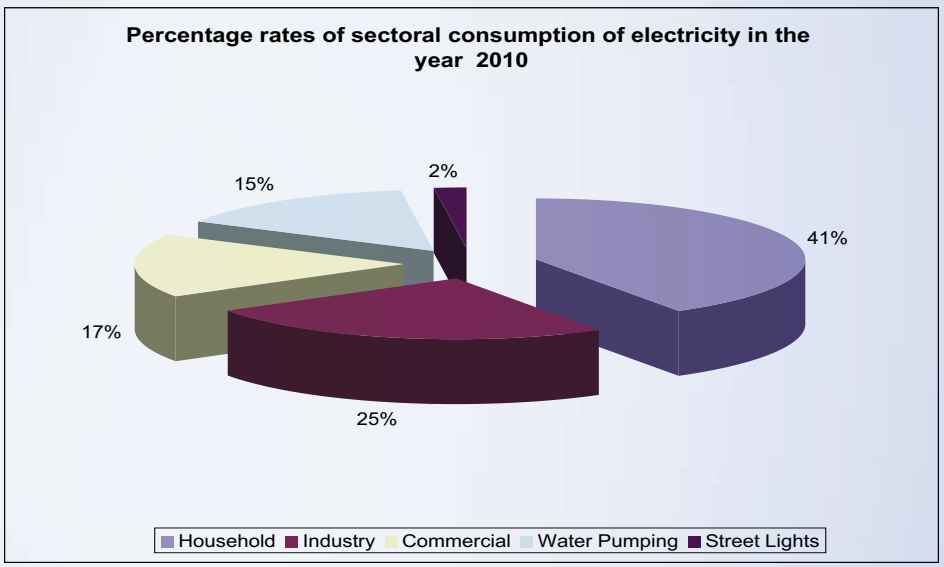
Sectoral distribution of electricity consumption and growth rate during 2006-2010 (GWh)

Type of Sector / Year	Household	Industry	Commercial	Water Pumping	Street lights	Others	Total	Growth Rate %
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
2010	5220	3258	2184	1867	315	-	12844	7.4

Table No. (11)

Percentage rate of sectoral consumption of electricity during 2006-2010

Type of Sector / Year	Household %	Industry %	Commercial %	Water Pumping %	Street lights %	Others %	Total %
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
2010	41	25	17	15	2	-	100



Electricity tariff are demonstrated in the following table:

Table No.(12)

Electricity tariff valid in the Kingdom as issued on 1/1/2010		
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)	66.0
3- Night time supply.	(Fils/KWh)	50.0
b- Harrana Broadcasting – Flat Rate	(Fils/KWh)	87.0
c- Electricity Distribution Companies a- (JEPCO)		
1- Peak Load.	(JD/KW/Month)	2.98
2- Daytime supply.	(Fils/KWh)	46.67
3- Night time supply.	(Fils/KWh)	36.62
b- (EDCO)		
1- Peak Load.	(JD/KW/Month)	2.98
2- Daytime supply.	(Fils/KWh)	35.86
3- Night time supply.	(Fils/KWh)	25.81
c- (IDECO)		
1- Peak Load.	(JD/KW/Month)	2.98
2- Daytime supply.	(Fils/KWh)	39.09
3- Night time supply.	(Fils/KWh)	29.04

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)	33.0
2- Second block: 161-300 KWh per month.	(Fils/KWh)	72.0
3- Third block: 301-500 KWh per month.	(Fils/KWh)	86.0
4- Fourth block: More than 500 KWh per month.	(Fils/KWh)	114.0

b- Broadcasting Station & TV Station Flat rate.	(Fils/KWh)	87.0
c- Commercial Consumers	(Fils/KWh)	87.0
d- Small industrial consumers with loads not Exceeding 200 KW.	(Fils/KWh)	50.0
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)	47.0
3- Night time supply.	(Fils/KWh)	37.0
f- Agriculture: Flat rate.	(Fils/KWh)	48.0 *
1- Peak Load.	(JD/KW/Month)	3.79
2- Daytime supply.	(Fils/KWh)	47.0
3- Night time supply.	(Fils/KWh)	37.0
g- Water pumping.	(Fils/KWh)	42.0
h- Hotels: Flat rate.	(Fils/KWh)	87.0 **
1- Peak Load.	(JD/KW/Month)	3.79
2- Daytime supply.	(Fils/KWh)	82.0
3- Night time supply.	(Fils/KWh)	71.0
I- Street lights.	(Fils/KWh)	52.0 ***
J- Armed Forces.	(Fils/KWh)	82.0
K- Ports Corporation.	(Fils/KWh)	59.0
Note: Minimum rate of monthly consumption: a- Regular consumers. b- Other consumers.		JD 1 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.

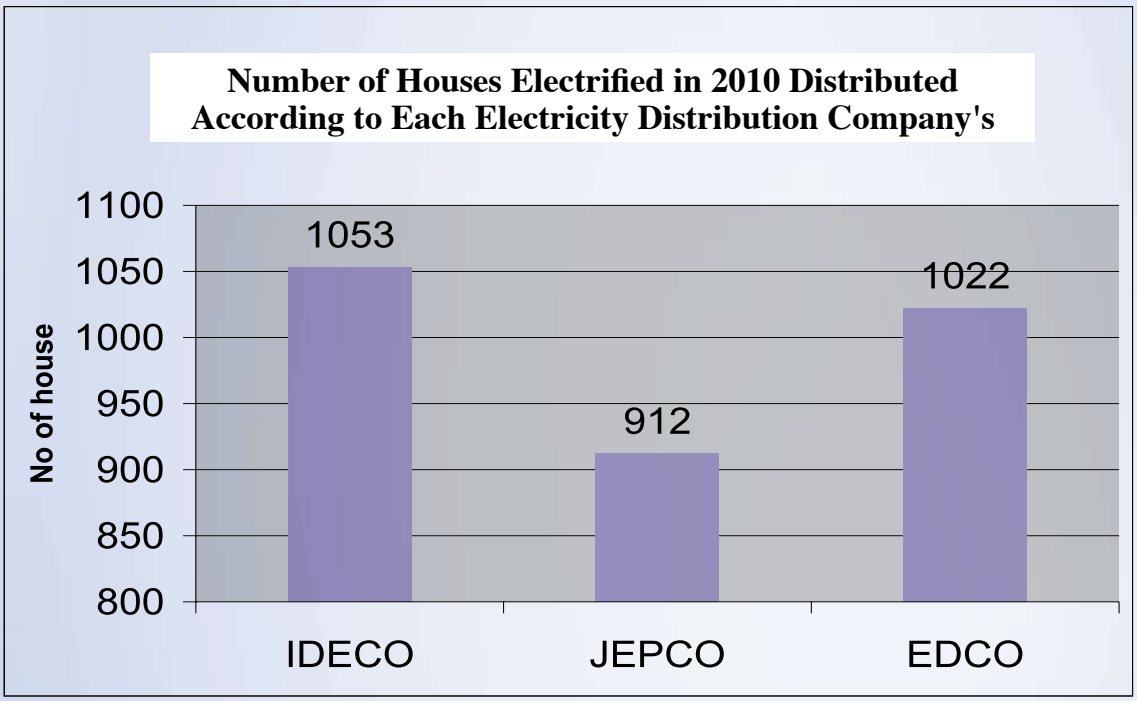
Rural Electrification Project

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 2010, a sum of 2987 houses including 16727 people was electrified. This electrification cost approximately JD 5.3 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 2010.

Table (13)

Number of Houses Electrified in 2010 Distributed According to Each Electricity Distribution Company's Concession Area

Company	Houses	Beneficiaries	Total Cost (Million JD)
Irbid District Electricity Co. (IDECO)	1053	5897	1.9
Jordan Electric Power Co. (JEPCO)	912	5107	1.5
Electricity Distribution Co. (EDCO)	1022	5723	1.9
Total	2987	16727	5.3



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 US 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 2010 is the following:

In the Field of Crude Oil and Oil Products:

- Continue to ensure the Kingdom's needs of crude oil through following up the execution of the agreement of providing importing, storing, securing, and distributing oil products which is signed with the Jordan Petroleum Refinery Company on 25/02/2008 and has been extended till the end of 2011.

- 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 2010 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.

- 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.

- Starting the procedures for the construction of storage capacities reaches to 70 thousand tons of crude oil in Aqaba, the work now is underway to complete the procedures to purchase the land which was selected in coordination with Aqaba Development Company.

- Keeping on organizing and monitoring the activities of the oil products supply sector. So 19 licenses were given to establish gas stations, 24 licenses to establish liquefied gas distribution

agencies, 40 licenses to establish stores for storing liquefied gas cylinders, and 67 licenses to operate constructions for central distribution liquefied gas.

- Reviewing the instructions of licensing gas stations, fuel distribution tanks to determine their suitability of the market need and to modify them if necessary.

- Following-up the implementation of the program to restructure the oil sector. In 2010 a feasibility study has been done for the expansion project of the Jordan Petroleum Refinery and stating the observations about it.

- Advertising the awareness campaign for the gas stations included an inspection campaign on all stations operating in the Kingdom, as well as the production and preparation and distribution of brochures to raise awareness about the procedures relating to public safety issues of the gas stations during the year 2010/2011.

- Prepare the instructions of mobile gas stations for the purpose of supplying petroleum products through these mobile stations within the Kingdom as a service for large projects.

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 2010 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 6.5 Billion cubic feet 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 exploration and evaluation, and the second phase includes development and production. The British Petroleum Company began in 2010 the implementation of its action plan, which included the preparation of three-dimensional seismic surveys covering an area of 5000 square kilometers, equivalent to 66% of the concession area.

- East Safawi area given to the Petril Company of Irland 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 singed 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 petro physics 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, as in 19/11/2010 an international tender has been announced for this purpose.

- 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 singed 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. In 2010, the company has completed two-dimensional seismic survey of 492 km length of seismic lines. The company has provided the Resources Authority with the final reports for these 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 singed 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 and the company has provided the NRA the final report. The total production of Hamza field in 2010 is about 8909 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 singed 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. The company has also accomplished of 350 km longitudinal lines of two-dimensional seismic surveys and 134 square kilometers of the three-dimensional seismic surveys.

- Dead Sea and Wadi Araba Area given to Porosity Company limited and Trans Global Company: both companies have operating in the concession area granted in 1997 to the Trans global. 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 assigned on 23/12/2006 for 80% of its share to the porosity company Ltd 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 It was signed in 4/5/2010 a memorandum of understanding with Ammonite Energy International Inc of Canada to explore oil in the exploration area of Al Jaffer, the company has completed its final study to assess the region and expressed its desire to enter into negotiations to conclude a production sharing agreement. An international tender was also offered for the North Highlands area on 7/11/2010.

In Utilizing the Oil Shale

Implementing of the government's strategy in the diversification of energy sources and the exploitation of domestic sources of energy it has been oriented to the exploitation of oil shale to contribute in a rate of 11% in the primary energy mix by 2015 and a rate of 14% in 2020, and for purposes in going ahead in the exploitation of oil shale the government was able to attract most of the international companies with experience in the field of oil shale, which owns the technology of exploitation of oil shale such as the Canadian, Estonian, Russian and Brazilian technology and Shell company technology .

The Government through the Natural Resources Authority has adopted three methods to exploit oil shale as follows:

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 burning of oil shale.

The following is a summary of the main activities accomplished during 2010:

1- The Surface Mining Project to exploit oil shale in the production of oil.

The number of companies which has been signed with memorandums of understanding to exploit oil shale in the production of oil reached to nine companies, to make economical banking feasibility studies for the exploitation of oil shale in the production of oil, and these companies are:

- Jordan's Oil Shale Company (Estonian company), where the company ended the study and was accepted, and after negotiating with the company a franchise agreement was signed for a part of the Atarat Um Alghdran area on 11/5/2010.

- The Jordanian Company of Energy and Mining (British Company): This Company ended its study about Alljoun area and was approved after the study. The franchise agreement negotiation with this company entered in its final stages and is expected to sign the agreement in the first quarter of 2011 after fulfilling the procedures as demanded.

- International Company for Investment of Raw Oil Shale (Saudi Arabian Company) this company ended its study about one of the areas of Atarat Um Alghdran during July / 2010, and after studying it by a government consultant for projects of surface mining and the relevant committees, some notes were put on the study and the company was given the opportunity to modify it.

- The coalition of Petrobras of Brazil and the Total of France companies. This coalition signed a Memorandum of Understanding on Wadi Maghar area in order to make exploratory studies of the area and select an area to be exploited in the production of oil. It has to evacuate the rest of the areas and provide the Natural Resources Authority with all information obtained from

the area that has been evacuated to use in marketing the rest of the area of Wadi Maghar, the company is still in the process of conducting the studies.

- National Company for the Production of Oil and Electricity from Oil Shale (Jordanian Company) a memorandum of understanding was signed with in 11/04/2009 on a part of Bayer area and was adjusted to a part of Alsultany area in 21/7/2010, it is expected that the company will provide the study in 2011.

- The Jordanian Aqaba Petroleum Company, (Jordanian Company): The company was given Alnedeih area for study and it made an exploratory study for the entire area where the company selected the area that it wanted to use and evacuated the rest of the lands and provided the Natural Resources Authority with all information concerning the area, it is expected that the company will submit the bank economic feasibility study during the first half of 2011.

- Russian Antrraws Company: the company was given a memorandum of understanding for the area of Bayer to study and in case of approval on the final study it could take the franchise rights on a specific part of the area.

- Allajaun Company to Invest in Oil Shale and Natural Resources (Jordanian\ Emeriti Company), the company signed a memorandum of understanding on the part of Allajaun and Atarat Um Alghdran area on 20/09/2010 to conduct an economical banking feasibility study.

- Universal Company (Indian company): This Company was given a memorandum of understanding for the area of Althrwa mount to make an exploratory study but the company did not complete the requirements of the Memorandum of Understanding and did not hand over the study of the area.

2- The Project of the Exploitation of Deep Oil Shale to Produce Oil (Shell Company Project)

A concession agreement was signed with Shell company for the exploitation of Jordanian deep oil shale without mining operations by using thermal injection technology (In Situ conversion process-ICP), owned by Shell company , where the company has developed a long-term program of work in preparation for access to the commercial production of the project.

The company began working in the prepared program since the agreement entered into force after obtaining official approvals and the issuance in the Official Gazette on 16/8/2009.

3- The Project of Generating Electricity by the direct Burning of Oil Shale :

The Company (Eesti Energia) Estonian Company has signed principles agreement to make a study and to present a technical and financial offer to build a power plant using the technology of the direct burning of the Jordanian oil shale in the area of Atarat Um Alghdran with a capacity of 600-900 MW, the company was given three years to present the financial and technical offer of the project which is expected to be presented at the end of 2011, and if the government approved it, an agreement will be signed to build a plant to generate electricity by the direct burning of oil shale .

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 bio 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%, Saving about 100 thousand tons of oil equivalent 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 7 m / s (300 watts /meter square as average per year) in some locations Hoffa, Alkamsha, Alfejeij, Alhareer, and 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 Alfejeij 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 companies (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 volume of exploitation: experimental projects to generate electricity (10 MW, King Talal Dam and Aqaba Thermal Station).

Geothermal Energy:

Rates: very limited.

The volume of exploitation: the technical feasibility study conducted by MEMR through Japanese Consulting firm has demonstrated that the possibility of exploiting the hot springs in Ma'in ,Zara , Alazrak and others for the purposes of generating electricity is unuseful and there is a need to dig deep wells (up to 3000 meters) to know more about temperature and its suitability for generate electricity, and this needs a significant cost of money 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:

- Alkamsha wind energy project with a capacity of (30-40) MW:

The coalition of the Greek Company TERNA has been chosen for the wind project, and the negotiations about the project's agreement were started. Some environmental, technical and financial matters have emerged that need to overcome before beginning in the procedures of the tender of this project, the project will be operate at the end of 2012 if the negotiations will successful.

- Al-fejeij wind energy project with a capacity of 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 mid of 2010 to enable them to provide their technical and financial bids for the project, the project is expected to operate in 2013.

- The Central Electricity Generating Company continued to produce electricity by using air turbines in Hoffa and Al-ebraheemia stations. The electricity produced from these stations in 2010 is about 3 GWh.

2. Solar Energy:

- Jordan participates in the Mediterranean Solar Plan (MSP) for the countries of the Middle East and North Africa (MENA region) and it is one of initiatives of the Union for the Mediterranean, and is summarized in the implementation of projects using basically solar energy (along with wind energy) to produce electricity with combined capacities reaches up to 20 GW by 2020, in the south of the Mediterranean region to contribute to the local needs of electricity and export the surplus to Europe. Under this plan a number of projects comes in both the public and private sectors in Jordan, one of them:

- Participation in the technical study funded by the German Development Bank (Kfw) about solar

energy in a number of Mediterranean countries. The study aims to highlight Jordan potentials in the production of electricity through the intensive solar thermal energy (CSP).

- The Solar Thermal Energy Project for the private Electricity Generation (CSP) with capacity of 100 MW. The required proposal for this project is prepared to be funded partially through the Clean Technology Fund (CTF) wich is run by the World Bank and is dedicated to provide support and easy financing for projects within "The Solar Mediterranean Plan". Acounselor will be appointted to study the required finance for the project and it's implemantation steps with the support of the French development agency (AFD). It is expected to begin in the procedures of offering the tender of this project on the private sector during the second half of 2011 in the event of the availability of the easy finance required for the project.

- Solar Power Plant Project to generate electricity using Solar Cells (PV) with a capacity of 1 MW. a grant through the debt swap with the Spanish Government by a value of 5 million dollars , as it was contracted with the Spanish government Institute of Solar Energy (IES) as a consultant for the project to help the ministry of Energy in the selection of the project site and to prepare the tender documents and the procedures of offering it for the purpose of selecting the Spanish company supplying the equipment for the project and its construction, operation and delivery which is expected by the end of 2011.

The Energy program (National Energy Research Center formerly) continues its programs and activities in this field, 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 2010 reached to 4100 tons, and the amount of electricity generated reached to 8739 MWh. And the amount of the biogas that its emissions were reduced reached about 8 million cubic meters.

In the field of Energy Efficiency

1. It has been prepared in collaboration with the Japanese expert the envoy by the Japanese JICA, a draft of the law of energy efficiency emanating from Article 17 in the law of renewable energy and energy efficiency, and it has been prepared a draft terms of reference to make a study on energy service companies (ESCO'S), and to develop a strategy to raise awareness in the field of energy conservation in Jordan.

2. Participate in the preparation of the Arab guide framework to improve efficiency in the electricity sector for the end user. This frame work has been prepared based on the decisions of the eighth session of the Council of Arab ministers responsible for electricity affairs.

3. Participate with local and foreign consultants in order to prepare the roadmap for energy efficiency in Jordan, as the map aimed at ensuring the arrival of Jordan to the goal of energy strategy for the year 2007, which aims to improve the energy by percentage of 20% by the year 2020.

4. Participate with local and foreign consultants in the preparation and amendment of the draft system of energy efficiency in Jordan in order to be the legislative cover for the implementation of the roadmap.

5. Implement the recommendation of the first meeting of the working group of the Arab strategy to develop the uses of new and renewable energy, which called for the preparation to a guide about the potentials of the Arab countries in the field of renewable energy, the section on Jordan's potential in renewable energy and energy efficiency has been prepared.

6. Participate with many local experts specializing in the field of green building to prepare the system of incentives for green building which aims to promote the green building in Jordan. Some of these incentives included the provision of material support for the installation of mechanical and electrical systems in addition to the thermal insulation materials in all the buildings that work on energy conservation.

7. Participation in the exemptions Commission established for the study of requests from citizens to exempt their imports of energy saving devices and equipment, in addition to renewable energy devices.

8. Oversee the tender of the consulting company for the sake of energy efficiency and renewable energy fund and through advertising in newspapers and receive and classify messages of concern and summarize the work of each company for evaluation and rehabilitation to apply for the mentioned tender. The section also studied the tender from the technical point of view and prepared the technical report, which was done through the evaluation of tender bidders.

9. Continue to provide guidnace services to all segments of society in the field of energy and electricity and deliver awareness and guidance lectures to different sectors.

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 electric interconnection networks.
- Raise the efficiency of the existing power plants, and reduce the loss from transmission and distribution networks.

The main electricity generation projects that address the future demand of electricity are the following:

1. Samra Electric Power Generation company:

- The second expansion project

Within the expansion project of Samra Electric Power Generation company - the second phase - both of the third and fourth gas unit - the second stage - were converted to a combined cycle unit by adding a steam-generating unit with a capacity of 100 MW. The commercial operation of the steam unit was done on 02/08/2010.

- The third expansion project:

This project aims to add two gas units with a capacity of 142 MW to meet the demand for electricity in 2011; the bid was given to a Korean company on 28/9/2009. It is expected to operate these units commercially in the beginning of the year 2011 to be converted later to a combined cycle unit.

2. The second IPP project /Al-Qatraneh

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 project operated as a simple cycle on 31/12/2010 and expected to operate as a combined cycle on 25/8/2011.

Maximizing the use of the Regional Electric Interconnection project:

- The contract of the electricity exchange between the Jordanian and Egyptian sides was renewed for the year 2010 on 29/12/2009, and also the contract of the electric energy exchange between the Jordanian and the Syrian side was renewed for the year 2010 on 28/03/2010.

- In 2010, 445.5 GWh from the Egyptian network and 224.8 GWh from the Syrian network has been transferred to fill the needs of the Jordanian network of electricity, and 3.78 GWh has been exported to the Egyptian network. Also 20.3 GWh passed over from the Egyptian network to the Syrian network and 21.96 GWh from the Syrian network to the Egyptian network through the Jordanian network, and 47.5 GWh passed over from the Egyptian network to the Lebanese network which brought 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 the natural gas.

Among the achievements that are accomplished in 2010 include the following:

- The first phase of building the Arab natural gas pipeline from Al- Ariesh–Egypt to Aqaba, and started supplying Aqaba thermal station with natural gas in July 2003.
- 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.
- 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 and Lebanon via Jordan, the implementation of this part was completed in March of 2008, 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.

- The execution of the natural gas lines that supply the second IPP project (Al-Qatraneh) and Samra electric power generation Company (the third phase).
- The imported natural gas from Egypt has participated in (68%) of the generated electricity in the kingdom in 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 energy alternatives 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 2010 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.
- The establishment and operation of the Jordanian Center for Nuclear Research, including the establishment and operation of the Jordanian nuclear research reactor and the facility of sub-critical system.
- The establishment of the Jordanian nuclear power plant through the establishment and operation of commercial nuclear react.
- Build and develop the capacities and the human resources necessary for the implementation of the axes of Jordan's nuclear program.
- Promoting and strengthening the cooperation with the International Atomic Energy Agency and Arab Atomic Energy Commission and with the friendly nations of experience in the field of nuclear energy.

Second - Utilizing of Uranium

The scientific and laboratory studies and analysis which took place during the past period have confirmed of 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, new sites have been discovered in Al- Hassa area with an estimated value of 15 thousand tons. There fore 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 has also signed with the French Company AREVA uranium mining agreement on 23/02/2010 in the middle area, in addition to the already signed agreement in September 2008 which is about the exploration of uranium in the same area, and it also signed a memorandum of understanding on 23/2/2009 with Rio Tinto English – Australian company for uranium exploration in areas south and east of Jordan.

Third - Nuclear Reactors

The Jordan Atomic Energy Commission followed up in the year 2010 the preparations for the nuclear power plant project to generate electricity and desalinate water, where it conducted studies to select the plant site in the region that has been identified primarily in the Aqaba region, and because the findings of these studies pointed to the high economic cost of the project as well to the presence of additional charges since the site needs to engineering processors to suit technically for the plant, so conducting studies at the site was stopped temporarily and the Studies were moved to the northeast of the Kingdom, near the purification plant of Khirbet al Samra, because of the possibility to establish a nuclear plant there at a less cost , as It will provide cooling water from the treated water from the purification plant, the nuclear plant need to about 22 million cubic meters per year for cooling purposes, while the purification plant of Khirbet al Samra is currently producing about 60 million cubic meters annually, it is expected to produce about 120 million cubic meters of water In 2018/2019, the year that the nuclear power plant will work. The process of cooling the nuclear reactors with treated water from purification plants is internationally known, such as the American nuclear plant in Arizona, where three nuclear reactors are cooled producing about 4200 MW of electricity.

The Commission continued in 2010, implementation of projects of the Jordanian Center for Nuclear Research, which will be held on the campus of the University of Science and Technology of Jordan, which includes the nuclear research reactor with a capacity of 5 MW And can be increased to 10 MW, and the non critical system for the use in the training of students of nuclear engineering at the university.

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 2010 as follows:

- 911 licenses and permits to operate radiation have been granted whether for institutions or persons engaged in radiation work.
- 190 inspection visits regularly programmed and un-programmed 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 1364 Personal radiation monitoring report for workers in the field of the radiation work. It was detected that 3 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.
- Participate in consultive seminars of projects to asses the environmental impact of projects.
- Contribute to prepare a study of environmental considerations of the energy sector in Jordan for the Arab Countries League.
- Preparing reports for technical studies relating to the environment such as the study of estimating the economic costs of environmental projects.
- Contribute to the preparation, study and assessment of the environmental standardizations such as the standardization of the environmental management system and the study of the road vehicles standardization - Methods of measuring the emissions of gases from the exhaust during the inspection or maintenance.
- Contribute to the evaluation of environmental legislation such as the study of the general framework law for management of waste.
- Participate in the membership of the Advisory Committee for developing the institutional capacity related to implementation of global environmental conventions.
- Participation in the national, technical and negotiating committees of the clean development mechanism projects (CDM) especially for trading of quantities to reduce carbon emissions.
- Participation in the national committees for the projects of the climate change, which are specialized in building capacity to apply the three environment agreements.
- Being a member in the consultant committee for the integrated management project for the material PCBs.
- Contribute to the preparation of the report of the sustainable development in Jordan. (Country Environmental Analyses)

The Mining Sector

The mineral resources 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 resources, in 2010 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 treats 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 of oil shale***

This project is located in areas south of the Kingdom and aims to find new places to this crude and determines its reserve , 3 wells have been drilled in the area of Sphere Almahata southeast of Maan , and from the results of the analysis it became clear that the percentage of oil in these wells ranging between (4.1 to 7.1%) . also 10 wells have been drilled in the area of Bear Khadad west of Maan , and it became clear from the results of the analysis that the percentage of oil in these wells is low and ranges between (1 to 3.5%),but in the north east areas of Maan the percentage of oil reaches to about 5.5%.

Financial Statement in 2010

Item	Allocations in 2010	Expenses in 2010	Disbursed
Current expenses	2301400	2154810	94%
Capital expenses	23596000	16941917	72%
Total	25897400	19096727	74%

The Financial Statement for Important projects in the Ministry in 2010

MEMR Projects' Financial Data in 2010			
The Project's Name	Allocations for the year 2010	Expenses for the year 2010	Disbursed Rate
The administrative projects	131000	60294	46%
Encouraging the establishment of natural gas network	2410000	1881623	78%
Supporting the projects of the Atomic committee	15000000	15000000	100%
Total	17541000	16941917	97%