



MINISTRY OF ENERGY AND MINERAL RESOURCES

Annual Report 2018





Table of Contents

Vision	4
Mission	4
Core Values	4
Strategic Goals	4
Organizational Structure	5
Terms	6
Economic Statistics in Jordan 2018	7
Energy Statistics in Jordan 2018	7
Foreward	8
Summary	8
Structure of Energy Sector Companies	18
Status of Energy Sector Institutions in 2018	20
Development of the Oil and Natural Gas Sector	26
Energy Sources in Jordan	28
Summary of Ministry of Energy and Mineral Resources Accomplishments	44

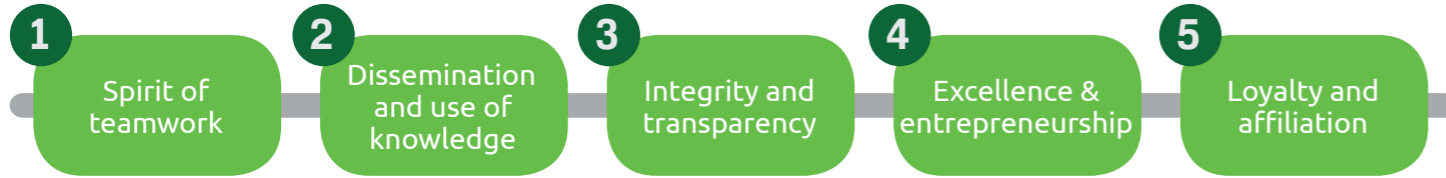
Vision

Achieve a secure sustainable supply of energy and optimal use of natural resources.

Mission

Set and develop the appropriate policies and legislation to achieve a secure sustainable supply of energy and the optimal use of natural resources, according to international best practices.

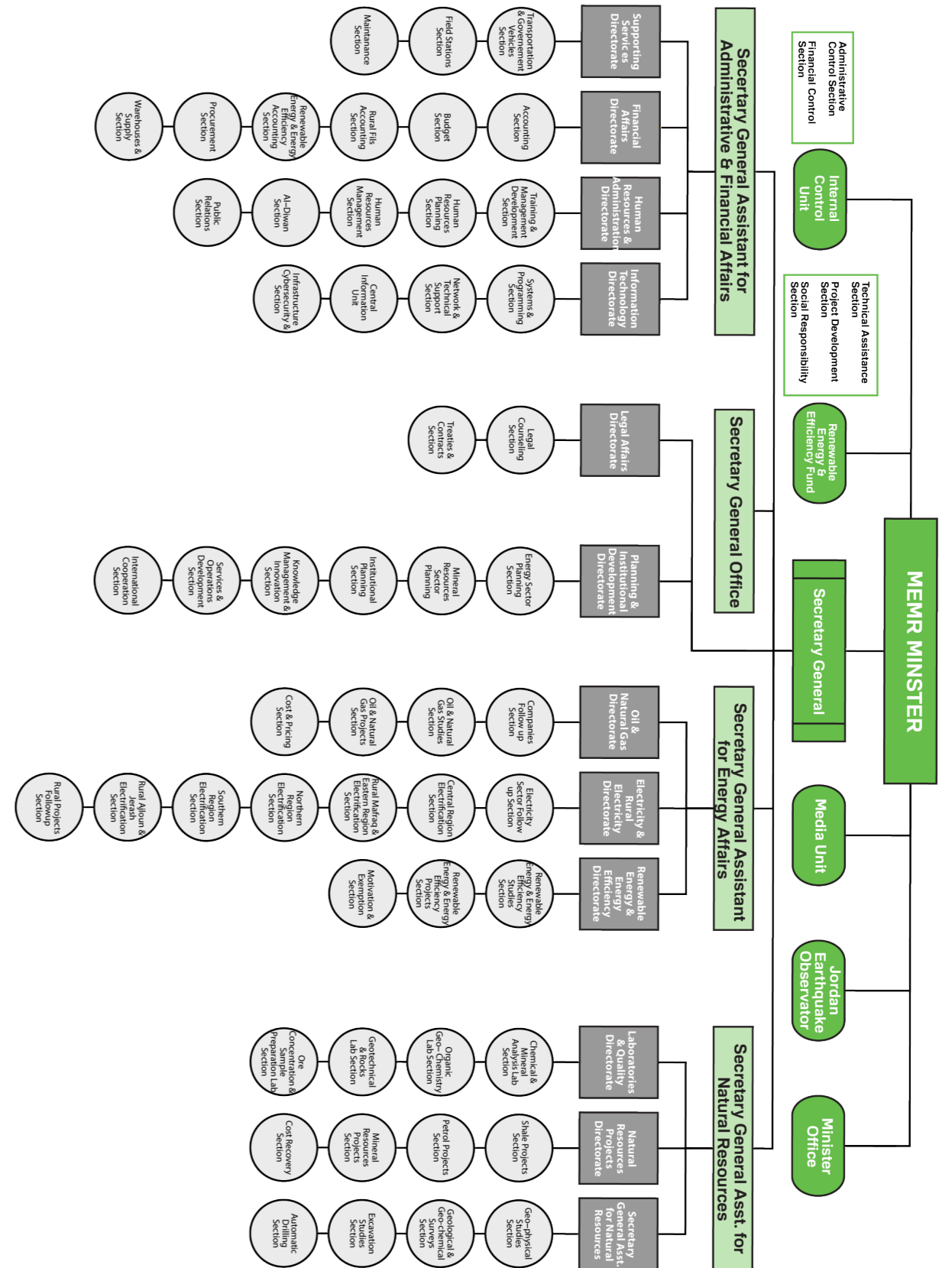
Core Values



Strategic Goals

- | | |
|--|---|
| 1 Consolidate and strengthen strategic thinking and governance practices | 8 Conserve energy consumption and improve efficiency in all sectors by %20 in 2020 |
| 2 Maintain secure supply of petroleum products | 9 Increase investment in the mining sector |
| 3 Maintain secure supply of electricity | 10 Monitor and analyze seismic data |
| 4 Increase the contribution of natural gas to the overall energy mix | 11 Apply the latest specifications and standards to laboratory analyses of soil, rock, and water |
| 5 Increase the contribution of renewable energy to the overall energy mix | 12 Strengthen international relations and cooperation |
| 6 Use oil shale to produce oil and generate electricity | 13 Achieve efficient fiscal performance |
| 7 Develop local sources of oil and natural gas | 14 Improve institutional performance |
| 15 Develop human resources and build and stimulate capabilities | |

Organizational Structure



Terms

KW	Kilowatt
KWh	Kilowatt-hour
GWh	Gigawatt-hour
MW	Megawatt
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	Kilogram

Economic Statistics in Jordan 2018

ITEM	UNIT	AMOUNT
Population	million	10,309
GDP at current producer prices	JD million	29,984
Annual per capita income	JD	2,909

*Source: Dept. of Statistics

Energy Statistics in Jordan 2018

ITEM	UNIT	AMOUNT
Energy intensity	kgoe/USD 1,000 Fixed Price	235
Per capita energy consumption	kgoe	942
Per capital electricity consumption	KWh	1,701
Electricity generation	GWh	19,755
Electricity consumption	GWh	17,532
Population with electricity	%	99
Domestic energy production (crude oil and natural gas)	1,000 toe	79
Energy imports	1,000 toe	9,121
Primary energy consumption	1,000 toe	9,712
Cost of consumed energy	JD million	3,010
COST OF ENERGY CONSUMED		
Exports	%	64.5
Imports	%	21
GDP	%	10

Foreword

The Ministry of Energy and Mineral Resources seeks to utilize natural resources and provide the energy needed to achieve sustainable development, by developing and implementing appropriate policies, legislation, and programs, diversifying sources and forms of imported energy, developing domestic and renewable sources of energy, and increasing their efficiency.

To achieve this goal, the Ministry began updating the comprehensive national strategy for the energy sector in the Kingdom for the period 2030-2019, in order to keep pace with domestic and regional developments and challenges facing the sector.

This report includes the achievements of the Ministry of Energy and Mineral Resources in the energy sector, which is a major driver of the national economy.

Summary

1. Electric Energy

1.1 Conventional Generation

The fourth phase of the Samra plant was in commercial operation with a total capacity of 213 MW. The combined cycle power plant at Zarqa was also in commercial operation with a capacity of 485 MW and at an estimated cost of JD 325 million.

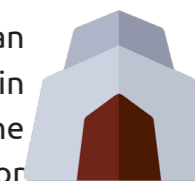


In the field of electricity, the following have been completed:

- An energy exchange contract was signed between the National Electric Power Co. and the Jerusalem District Electricity Co. for the purpose of supplying Jericho Governorate with electric power of about 150 GWh per year.
- The Council of Ministers approved a Memorandum of Understanding to implement the electric connection project between the Kingdom of Saudi Arabia and the Hashemite Kingdom of Jordan.
- Jordan and Iraq agreed to provide the Kingdom of Iraq with electricity through the electric grid. Technical studies and securing the necessary funding for the implementation of the project will be over three months, and Jordan is expected to start exporting electricity to Iraq in less than two years.

1.2 Oil Shale (generation)

Attarat Power Co. (a consortium of Chinese, Malaysian, and Estonian companies) continued to implement the project, with agreements signed in 2014 and a capacity of 470 MW, to use oil shale to generate electricity. The project will be in operation in 2020, and is considered the first of its kind for oil shale in Jordan and the region.



1.3 Renewable Energy

The renewable energy sector is a Jordanian success story on a global level. By the end of 2018, installed generating capacity reached 1130 MW for electricity projects using renewable energy sources, representing %11 of the electricity generated in the Kingdom. The capacity is expected to reach 2400 MW by 2021, representing %20 of the electricity generated that year. By comparison, renewable energy contributed %1 of the electric energy generated in 2014. This would achieve the specific sector goal for renewable energy to represent %15 of the energy mix by the end of 2050.

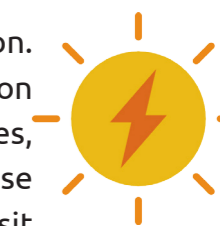


The generating capacity of renewable energy projects expected in 2021 (under construction, development, and implementation) will be approximately 1270 MW. This increases the installed capacity of renewable energy stations to 2400 MW, which will constitute %20 of the total electricity generated in 2021. This will also achieve the desired goal in the energy strategy achieved before the specified time, the year 2025.

Solar Power Projects

Solar power projects are divided into the following categories:

- Solarenergysystems owned by subscribers to cover their consumption. These systems are installed and connected to the electric distribution networks by the end of 2018, in various sectors (homes, universities, houses of worship, and various public and private sector institutions). These systems have reached approximately 360 MW using net metering, transit metering, and consumption coverage projects that cover an area of about 4500 dunams with solar panels.



- Commercial solar energy projects that sell electricity to electric companies, including direct proposals. Twelve separate Phase One projects are being implemented, with a total capacity of 204 MW. All of these projects became operational in 2016.

Commercial Solar Energy Projects			
Phase One		Phase Two	
Number of Projects	Region	Number of Projects	Region
3	Ma'raq Development Zone	10	Ma'an
1	Safawi	1	Ma'raq
		1	Aqaba

Phase Two: Projects in this phase have been implemented with a capacity of approximately 200 MW, at a rate of 50 megawatts for each project. All of them have entered the commercial operation phase, three of them in the Ma'raq Development Zone and one in Safawi.

Phase Three: This phase seeks to develop solar energy projects in Ma'an with a capacity of 150 MW. These projects will enter the operational phase later.

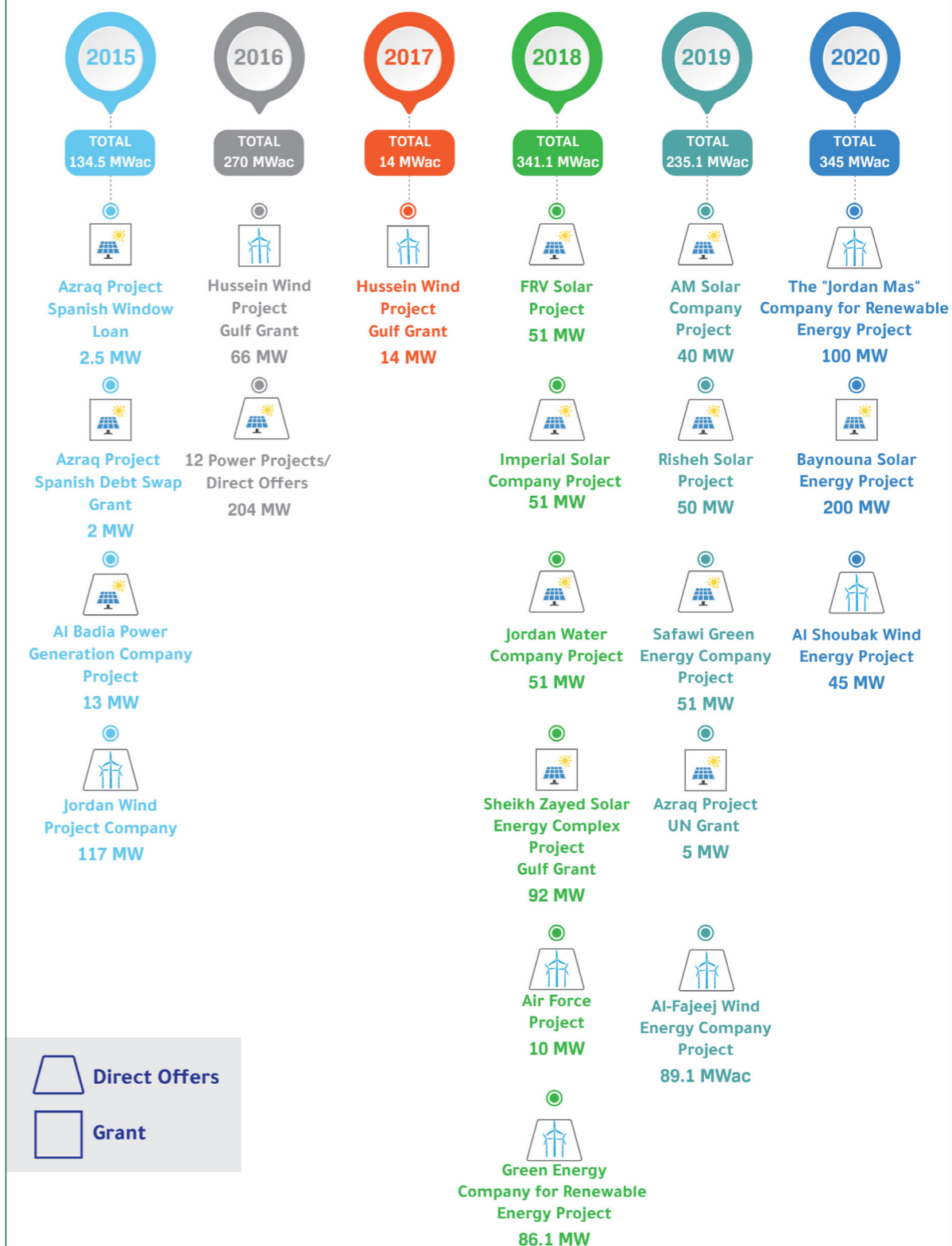
Other projects, according to the direct proposal system: A Masdar/Baynouna Co. project with a capacity of 200 MW in Al-Muwaqqar; power-generating company projects in Risha and East Amman with a capacity of 90 MW; Philadelphia Co. in Al-Husseiniya with a capacity of 50 MW; and solar energy projects implemented through various grants in Quwera (103 MW), Azraq (5 MW), Zaatari (11 MW), projects underway in southern Amman (40 MW), and Azraq (6 MW).

Commercial Energy Projects			
Grant Projects		Phase Three/Other Direct Proposal Projects	
Region	(Capacity (MW)	Region	(Capacity (MW)
Ma'an	150	Quwera	keep 301
Al-Muwaqqar	200	Azraq	5
Risha and East Amman	90	Zaatari	11
Projects Underway			
Al-Husseiniya	50	Southern Amman	40
		Azraq	6

Electricity generation projects using renewable energy During the years 2015 - 2020



MINISTRY OF ENERGY AND MINERAL RESOURCES



Wind Energy Projects

All wind energy projects are in southern regions of the Kingdom. The most prominent are the Jordan Wind Project Co. in Tafileh (117 MW) and six phase one, direct proposal projects (total capacity of 420 MW), three of which are in Tafileh and three in Ma'an (Fujeij, Shobak, Rajif). In addition, there is a phase three project still under bid in the southern Kingdom (50 MW), as well a wind energy project in Ma'an (80 MW), implemented via Gulf grants.



Wind Energy Projects in the Southern Kingdom		
Name of Project	Region	Capacity (MW)
Jordan Wind Project Co.	Tafileh	117
Direct Proposal Projects	in Tafileh 3	420
	in Ma'an 3	
Phase Three Projects	The South	50
Gulf Grant Projects	Ma'an	80

Work continues on the Green Corridor project, which is being implemented by the National Electric Power Co., to help transmit energy ranging between 1000-800 MW of renewable energy from the south of the Kingdom to load stations. This is the result of projects by renewable energy companies that are committed, contracted, and with capacities pre-allocated for this project.

Work is also underway to study the construction of the Eastern Corridor to enhance the transport network in the eastern region of the Kingdom to increase its ability to absorb renewable energy projects and configure it to link with neighboring countries.

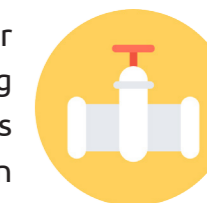
In its endeavor to spread a culture of renewable energy among small subscribers, the Ministry launched an initiative this year via Fils Al Reef to install solar heaters linked to the grid for needy families and beneficiaries of the National Aid Fund. The initiative will install -2KW solar energy systems that produce electricity and are linked to the electrical grid for approximately 7,000 families each year.

The Jordan Renewable Energy and Energy Efficiency Fund (JREEEF)—part of the Ministry of Energy and Mineral Resources—continues to implement its programs in all target sectors. By the end of 2018, JREEEF had installed 300 solar cell systems, 8,000 residential solar heaters, 329 solar cell systems in mosques, and heated 128 schools. In addition, four industrial plants participated in an industrial sector project, eight hotels participated in a tourism sector projects, eight government buildings were audited in a government buildings program, and 120 trainees were trained in capacity-building.

Via the energy efficiency and renewable energy project for major municipal buildings to be implemented in 2019 and 2020, under a grant from the Italian government, the Ministry continues to cover close to 100 municipalities. The Ministry of Energy highlights its pursuit of diversifying energy sources to increase the contribution of domestic sources to the overall energy mix, including minimizing energy bills and easing the pressure on the budget. Work is currently underway on projects to store energy, enhance the electrical network, reduce waste, and increase energy security and self-reliance.

1.4 Natural Gas

The Ministry has continued to cooperate with the National Electric Power Co. to meet most of the natural gas needs of electricity-generating stations and industries through the Sheikh Sabah Liquefied Natural Gas (LNG) Terminal in Aqaba. The terminal began operating commercially in July 2015, and it imports LNG. The storage capacity of the floating gas storage steamship is 160 thousand cubic meters of LNG, which is equivalent to 3.3 billion cubic feet of gas in the gaseous state. The capacity for supplying the ship is 750 million cubic feet of gas per day, which allows Jordan to import LNG from all part of the world through contracts and the instant market.



As of September 2018, natural gas pumping from Egypt has resumed, contributed %10 of electric power generation in 2018. In 2019, natural gas is expected to supply Jordan with about half of its electrical needs.

To encourage the use of natural gas in the industrial sector, the Council of Ministers approved lowering the special tax on natural gas for industries from %16 to %7. The Council of Ministers gave three-year exemptions from the special tax for companies that switch from using oil, fuel, and the like, to natural gas.

1.5 Rural Electrification

The Ministry continues to work to deliver electricity to remote villages, rural communities, and needy families through Fils Al Reef. Throughout various parts of the Kingdom, 2722 homes were electrified.

In addition, the Ministry used alternative energy sources to produce and deliver electricity to communities in rural areas and municipalities of Jordan far removed from the grid. Electricity via solar cell systems not connected to the grid was delivered to 26 sites, including 26 homes, distributed throughout all regions of the Kingdom.



2. Crude Oil, Gas, and Petroleum Products

2.1. Import and Marketing of Petroleum Products

As part of its move towards fully liberalizing the market for petroleum products, the Ministry opened the door to three marketing companies licensed to import their petroleum product needs from outside or inside Jordan through the Jordan Petroleum Refinery Co. In the same framework, the government agreed to start licensing new companies to market oil products, and licensing procedures are currently underway.



2.2 Strategic Reserve of Petroleum Products

The Ministry of Energy and Mineral Resources believes in the importance of increasing the security of the sustainable supply of energy. Through the Jordan Oil Terminals Co., owned by the government, the Ministry, completed the oil products storage project in the Madounah region in the middle of the Kingdom and in Aqaba in the south. This raises the reserve capacity of oil products in the Kingdom to approximately 60 days. Energy owned by the government can be stored in the middle of the Kingdom at a total capacity of 350,000 tons for all types of products and 10,000 tons for liquefied petroleum gas (LPG).



The energy stored in Aqaba totals 100,000 tons, with the building and operation of three LPG storage tanks with a capacity of 6,000 tons. The private sector also owns tanks.

2.3. Use of Domestic Sources of Oil and Gas – Prospecting and Exploration

2.3.1 Oil and Gas

The Ministry of Energy and Mining Resources has continued to promote and market oil and gas exploration areas in the Kingdom. The Ministry announced six regions open for oil and gas exploration in Jordan and certified one of the international investment companies in the Azraq and Sarhan areas.



Several sites in the Risha oil field have been designated for digging wells, according to a plan drawn up by the National Petroleum Co. to raise production quantities from the Risha field in the coming years. Wells 49, 48, and 50 will be drilled in 2019.

2.3.2 Oil Shale

Four companies are working to exploit oil shale, one of which is currently in the financing stage, with the goal of producing 25,000 barrels per day of refined products (benzene and diesel).



2.3.3 Mining

In cooperation with the Jordan Atomic Energy Commission, the Ministry continues to work on exploratory projects for lithium and rare-earth elements in southern Jordan. Rare-earth elements make up a group of 17 elements in the periodic table with similar chemical properties.



The following table lists the oxides, rare-earth elements, and other elements present in small quantities.

A. Secondary Element Oxides

ZrO ₂	TiO ₂	P ₂ O ₅	MnO
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B. Rare-Earth Elements

La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy
Ho	Er	Tm	Lu	Y	Yb				

C. Secondary Elements

Li	Nb	Ta	Ga	V	W	Sb	Mo	Sn	Ge
Sc	Ba	Be	Sr	In	Rb	Cs	Te	Ni	Co
Cr	Zn	Pb	Th	Hf	Re				

The Ministry also continues its work on marketing precious and strategic minerals. The Ministry offered an investment opportunity for gold exploration in the Wadi Abu Khushayba region in Wadi Araba. The Ministry is negotiating with qualified companies to sign a Memorandum of Understanding (MOU).

Likewise, the Ministry signed a MOU with the Integrated Co. to explore, mine, and exploit copper ore and associated minerals in the Dana Reserve. The company has begun exploration work and studies that are expected to be completed in August, 2020 according to the MOU.

3. Seismological Observatory

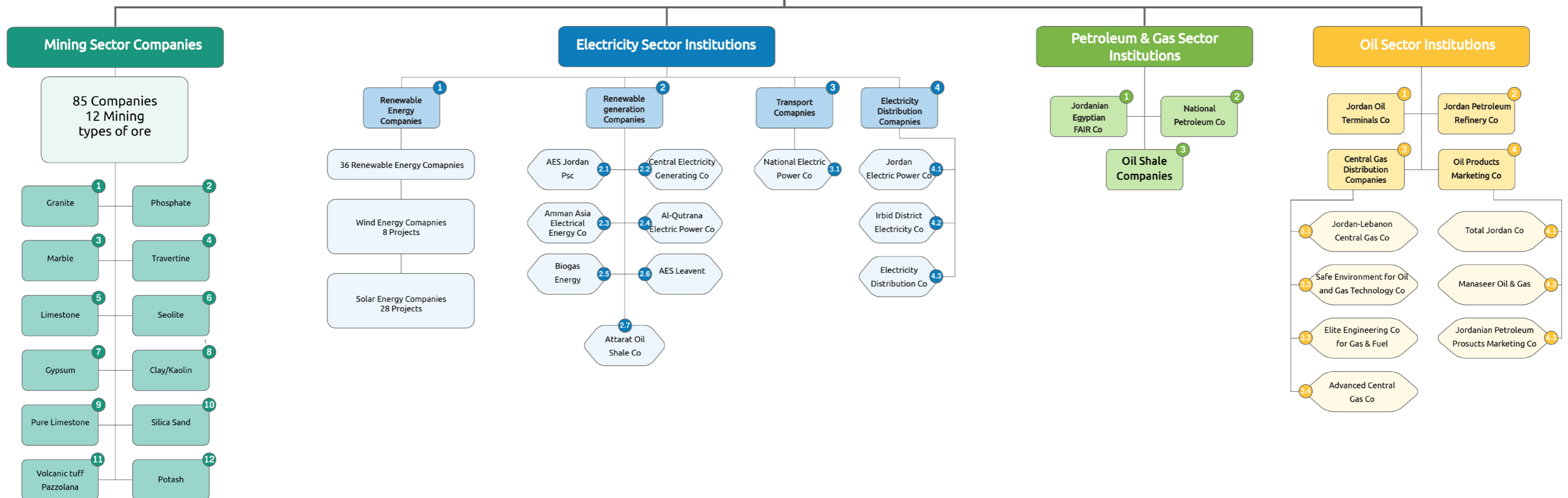
The Jordan Seismological Observatory continues its role of recording and analyzing seismic activity around the clock, through its national seismic network in the Ministry of Energy and Mineral Resources, which is updated every year. There are now 18 seismic stations distributed throughout most areas of Jordan, in addition to a network of 25 powerful seismic motion detection devices placed in important locations, such as dams and tall buildings, as well as in open areas.



The national seismic observation network recorded 1423 earthquakes distributed as follows:

1. Local quakes: 361 along the Dead Sea Rift Valley, which extends from the Gulf of Aqaba in the south to southern Turkey in the north; the largest quake was 4.7 and occurred in the region of Lake Tiberias (Sea of Galilee) on July 2018 ,4, at 22:45 local time.
2. Regional quakes: 480, most of which were in the eastern Mediterranean basin
3. Distant quakes: 582

Energy Sector Companies



Status of Energy Sector Institutions in 2018

Considering the importance this sector plays economically, socially, and politically, the government has taken care to reorganize this sector to boost its efficiency and effectiveness. The institutional framework for the energy sector consists of the following:

1. Ministry of Energy and Natural Resources

The Ministry adopts the comprehensive planning process for the sector in terms of organizing, setting general policies, and tracking their implementation to achieve the tasks entrusted to it. Its most important task is to provide the necessary energy in various forms for comprehensive growth at the lowest possible cost and with the best specifications. The Ministry is also responsible for attracting the necessary capital to invest in multiple energy fields, such as generating electricity, producing oil products, and exploiting domestic energy resources and wealth, especially renewable energy sources. It also delivers electricity to villages, communities, and needy families in rural Jordan through Fils Al Reef, supports studies to improve energy consumption efficiency in various sectors, and guarantees loans for energy conservation and renewable energy projects through JREEEF.

2. Energy and Minerals Regulatory Commission (EMRC)

EMRC is governmental body that possesses a legal personality with financial and administrative autonomy. It is considered the legal successor to the Electricity Regulatory Commission, the Jordan Nuclear Regulatory Commission, and the Natural Resources Authority, in regards to the regulatory tasks assigned it. Under Restructuring of Government Institutions and Departments Law No. 17 of 2014, the name was changed from the Electricity Regulatory Commission to the Energy and Minerals Regulatory Commission. Likewise, the Radiological and Nuclear Regulatory Authority expired, and its rights and assets were transferred to EMRC, which bears the resulting obligations and is considered its legal and practical successor. In addition, EMRC has taken on the prescribed regulatory tasks of the Natural Resources Authority and is considered its legal and practical successor in this field.

3. Jordan Atomic Energy Commission

The Jordan Atomic Energy Commission was established in 2008 with the goal of transferring peaceful uses for nuclear energy and radiation technology to the Kingdom and developing these uses for electric power, water desalination, and farming, medical, and industrial applications.

4. Electricity Sector Institutions

These institutions generate, transport, and distribute electricity within the Kingdom. They include the following:

4.1. Electricity-Generating Companies (conventional)

There are seven companies—one governmental, one joint, and five private—whose task is to generate and sell electrical energy wholesale to the National Electric Power Co.

4.1.1. Central Electricity Generating Co. (CEGCO)

CEGCO is a public shareholding company, of which the government owns %40, the Social Security Corporation %9, and Enara Energy Investments %90) %51 of Enara is owned by the Saudi company ACWA Power). It was established in 1999. The company's generating capacity as of the end of 2018 was about 983 MW.

4.1.2. Samra Electric Power Co. (SEPCO)

SEPCO is a private shareholding company wholly owned by the government, founded in 2004. The company's generating capacity as of the end of 2018 was about 1241 MW.

4.1.3. AES-Jordan Psc

This is a private company, -%50owned by the Qatari Nebras company, and -%50owned by the Japanese MITSUI company. It was established in 2009. The company owned the first private sector project to generate electricity in Jordan, the East Amman/Al-Manakher plant. The company's generating capacity as of the end of 2018 was about 373 MW.

4.1.4. Al-Qatrana Electric Power Co.

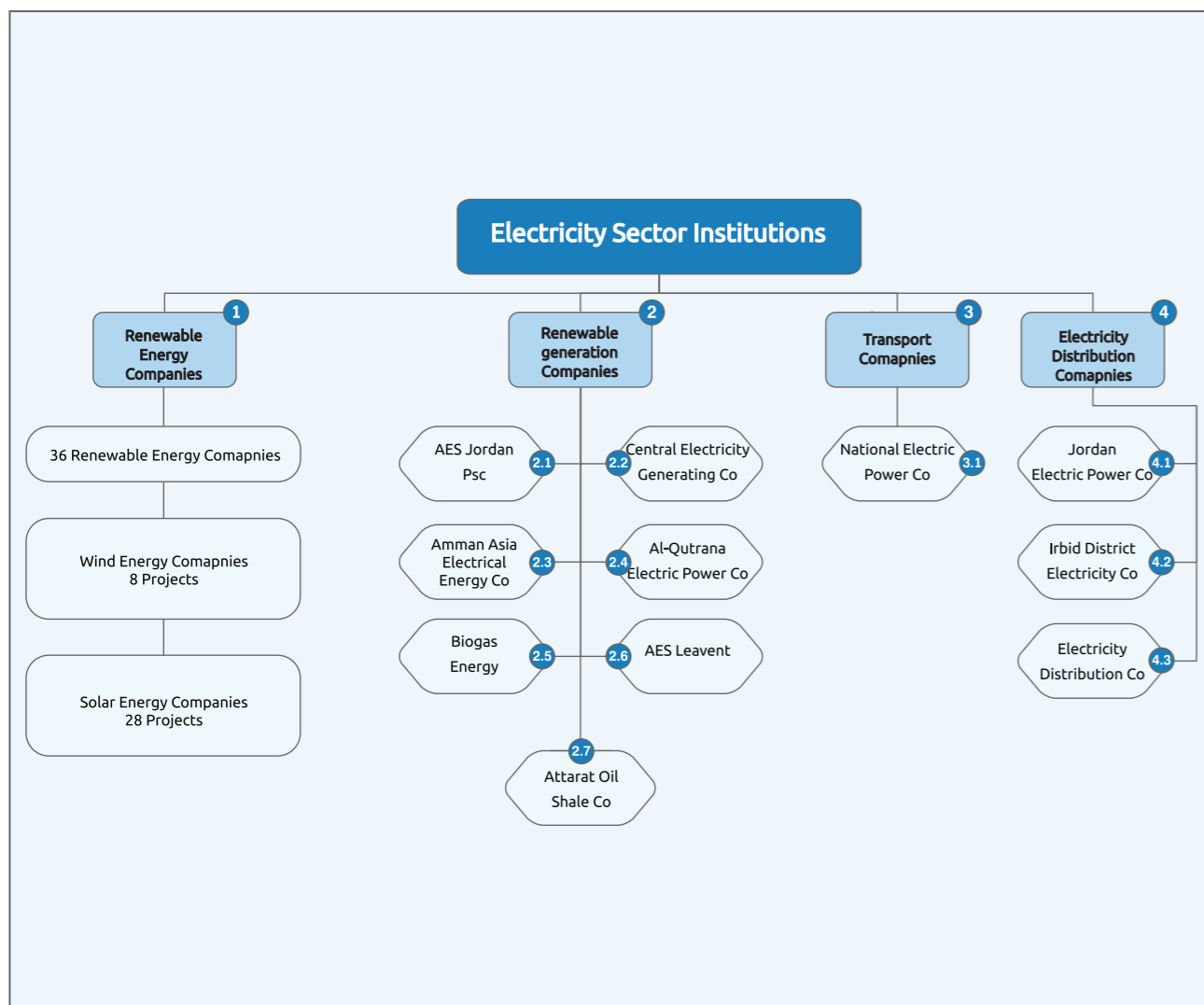
This is a private company joint-owned by the Korean KEPCO company and the Saudi XENEL company, founded in 2010. The company's generating capacity as of the end of 2018 was about 373 MW.

4.1.5. Amman Asia Electrical Energy Co.

This is a private company joint-owned by the Korean KEPCO company, the Japanese Mitsubishi company, and the Finnish Wärtsilä company. It was founded in 2014 to produce and sell electric power to the National Electric Power Co. The company's generating capacity as of the end of 2018 was about 570 MW.

4.1.6. AES Levant

This is a private company, -%50owned by the Qatari Nebras company, and -%50owned by the Japanese MITSUI company. It was established in 2014. The company's generating capacity as of the end of 2018 was about 240 MW.



4.1.7. Zarqa Electric Power Co.

This is a private company, -%60 owned by the Saudi ACWA Power company, and -%40 owned by Kingdom Electric Co. (Daman Energy Investments owns %70 and the Kuwaiti Privatization Holding Co. owns %30 of Kingdom Electric). The company's generating capacity via the Zarqa electric plant is about 485 MW.

4.2. Renewable Energy Companies

Several companies have been established through the direct proposal system for renewable energy projects. There are 28 companies for which energy purchase agreements have been signed for solar energy projects with a total capacity of 762 MW, and 8 companies for wind energy projects with a total capacity 539 MW by the end of 2018.

4.3. National Electric Power Co. (NEPCO)

A public shareholding company wholly owned by the government, NEPCO is responsible for the construction, operation, and maintenance of the transmission system inside Jordan. It is also responsible for the transmission system which connects the electric system with those of other countries. NEPCO also conducts planning studies for future expansions to ensure the availability of reserves to meet the expected demand for electric energy. It purchases electric power from various sources and sells it to distribution companies and major consumers (sole buyer).

4.4. Electricity-Distributing Companies

There are three companies that distribute electric energy, each with its own region.

4.4.1. Jordan Electric Power Co. (JEPCO)

JEPCO is a public shareholding company responsible for distributing electricity in the governorates of Amman, Zarqa, Madaba, and Balqa, excluding the Central Jordan Valley area. It was given a -20year license on May 2014 ,29.

4.4.2. Irbid District Electricity Co. (IDECO)

IDECO is a public shareholding company responsible for distributing electricity in the governorates of Irbid, Mafraq, Jerash, and Ajloun, excluding the Northern Jordan Valley and Eastern areas. It was given a -25year license in 2008.

4.4.3. Electricity Distribution Co. (EDCO)

IDECO is a public shareholding company responsible for distributing electricity in the areas outside the concession areas of JEPCO and IDECO, namely the Southern, Eastern, and Jordan Valley areas. It was given a -25year license in 2008.

5. Petroleum, Gas, and Mineral Ores Sector Institutions

These institutions are responsible for the exploration of petroleum, gas, and mineral ores in the Kingdom, as well as for refining crude oil and selling oil products.

5.1. National Petroleum Co. (NPCO)

A public shareholding company owned by the government, NPCO explores for and produces oil and gas in the concession area in the Northeastern Kingdom on the Iraqi border. The concession covers an area of 7000 km² and contains the 1500 km² Risha gas field. The concession period lasts for 50 years from the date of its effect in 1996.

5.2. Jordan Petroleum Refinery Co. (JPRCO)

JPRCO is a public shareholding company responsible for refining, producing, and distributing crude oil and oil products within the Kingdom.

5.3. Jordan Oil Terminals Co. (JOTC)

Founded in 2015, JOTC is a private shareholding company owned by the government. It is considered the first independent open-access storage provider in Jordan offering world-class storage, handling, transportation, and fueling services for local and regional clients in the petroleum industry. JOTC offers an integrated of oi storage and logistics services across Jordan. Additionally, the company designs, builds, operates, and maintains its storage terminals to meet regulatory and international standards.

5.4. Jordanian-Egyptian FAJR for Natural Gas Transmission & Supply Co.

This is a limited liability company, pursuant to the License Agreement signed on January 2004 ,1, between the Jordanian government, represented by the Ministry of Energy and Mineral Resources, and Jordanian-Egyptian FAJR. It builds, owns, and operates the gas pipeline from Aqaba to the Northern Kingdom. FAJR receives natural gas from Egypt in Aqaba and transports it through the pipeline to sell to power plants and major industries.

5.5. Gas Stations

Gas stations are owned by legal or natural persons and sell gas to citizens. By the end of 2018, there were 604 gas stations in operation, distributing gas through licensed marketing companies.

5.6. Gas Agencies

Gas agencies are owned by legal or natural persons and sell gas cylinders to citizens. By the end of 2018, there were 624 gas agencies in operation.

5.7. Gas Warehouses

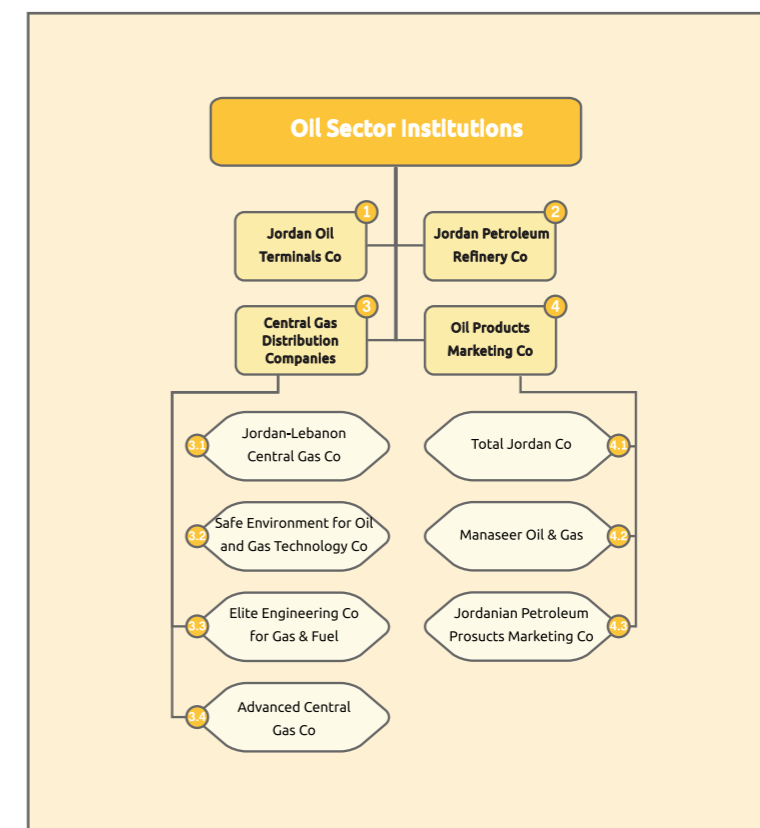
Gas warehouses are owned by legal or natural persons and transport liquefied gas from filling stations to warehouses. From there, they supply distribution vehicles belonging to licensed distribution agencies. By the end of 2018, there were 123 gas warehouses in operation.

5.8. Central Gas Distribution Companies

These are private sector companies that distribute gas by tanks. In 2018, there were seven such companies, six of them in operation and one of them non-operational.

5.9. Oil Products Marketing Companies

These are private sector companies that import and distribute oil products (gasoline, diesel, kerosene, and jet fuel). There are three such marketing companies: Manaseer Oil & Gas (Modern Jordan Oil & Gas Services), JOPetrol (Jordan Petroleum Products Marketing Co.), and Total Jordan.



6. Biogas Corporation

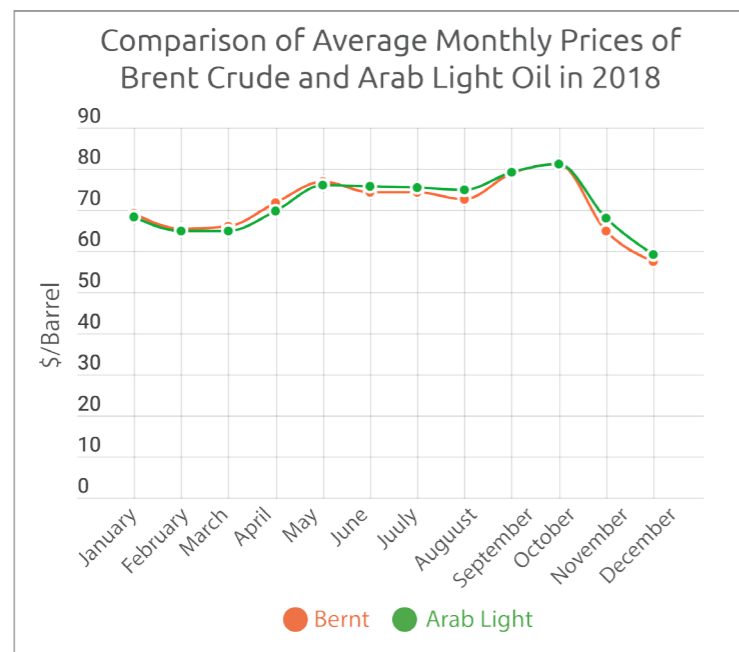
Biogas is a joint-stock company owned by CEGCO and Greater Amman Municipality. It was founded in 1998 to exploit methane gas extracted from organic waste to generate electric power. The plant's generating capacity is 3.5 MW.

Development of the Oil and Natural Gas Sector

1. Arab and Global Level

Global production of oil increased by %2.4 in 2018 over 2017. In 2018, global oil production was 94.718 million barrels/day, and proven oil reserves are estimated at 1729.7 billion barrels.

In 2018, Arab countries' daily, average rate of crude oil production was approximately 24 million barrels/day, representing %24 of global production. Additionally, in 2018, proven Arab crude oil reserves were estimated at 705 billion barrels, representing %53 of global reserves. The price of Brent Crude oil fluctuated during 2018, reaching a high of USD 81/barrel in October, and a low of USD 57/barrel in December. The following graph compares the monthly prices of Brent Crude oil and Arab light oil imported by Jordan in 2018.



Source: Platts Commodities Bulletin

Global production of natural gas increased by %5.2 in 2018 over 2017. In 2018, global gas production was 3867.9 billion m³, and proven natural gas reserves are estimated at 196.9 trillion m³. Arab countries' production of natural gas was approximately 650 billion m³, representing %17 of global production, and their natural gas reserves were approximately 60 trillion m³, representing %31 of global reserves.

2. Domestic Level

In 2018, domestic energy production (crude oil, natural gas, and renewable energy) total approximately 790,000 toe, representing %8 of Jordan's total energy needs.

Since little oil and gas are produced domestically—gas is extracted from the Risha field, while small quantities of oil are extracted from the Hamza field—Jordan relies on importing its energy needs. In 2018, Jordan imported approximately 5.242 million toe of crude oil and oil products and approximately 140 billion ft³ of natural gas. The total cost of imported crude oil, oil products, natural gas, and coal was approximately JD 3010 million in 2018, an estimated %24 increase over 2017.

The total demand for primary energy was about 9.712 million toe in 2018, a decrease of about %3 over 2017. The total demand for final energy, i.e. the energy available to the consumer, was about 6.867 million toe, a decrease of about %7.1 over 2017. In addition, the demand for oil products was 4.868 million toe, a decrease of %4.

Energy Sources in Jordan

Domestic sources of oil and natural gas in Jordan are very limited.

Jordan has enormous amounts of oil shale. Surface oil shale reserves are estimated at more than 70 billion tons, containing more than 7 billion tons of shale oil. Oil shale can be used to generate electricity by direct combustion technology or to produce shale oil and gas by distillation or thermal injection.

The contribution of new and renewable energy sources to the overall energy mix is approximately %7.76. The Ministry of Energy and Mineral Resources has adopted a proposed program to increase the share of renewable energy to the total energy mix to %10 by 2020 and %20 of the electricity generated in 2025.

Table 1 shows the domestic production of oil and natural gas and their contribution to total energy consumption in the Kingdom from 2014-2018.

Table 1

Domestic Production of Crude Oil and Natural Gas 2014-2018

Year	Oil Production (1000 tons)	Gas Production (billion ft ³)	Contribution of Local Production of Energy to Total Energy Consumption (%)
2014	0.8	4.6	3.0
2015	0.5	4.3	3.0
2016	0.4	4.1	5.0
2017	0.3	3.6	6.0
2018	1.0	3.3	8.0

Domestic Energy Demand

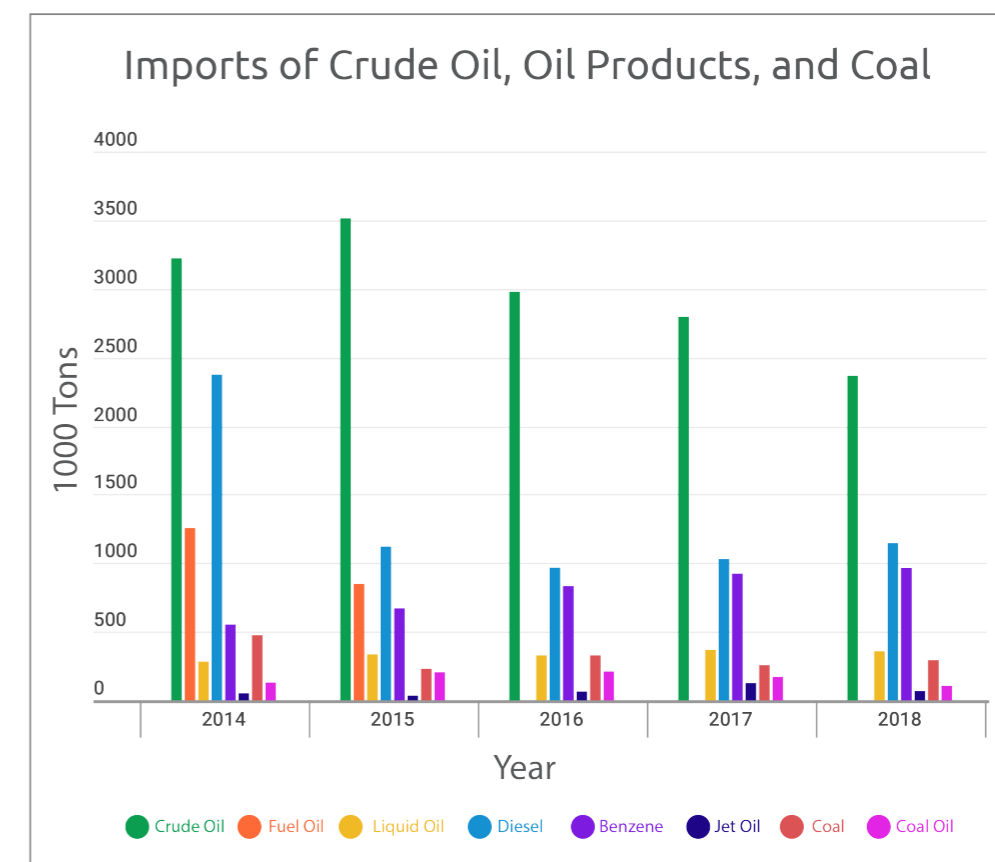
1. Crude Oil and Oil Products

The cost of importing crude oil and oil products was approximately JD 2111 million in 2018, representing an estimated increase of %22 over 2017. Table 2 shows the amount of crude oil and oil products imported from 2014-2018.

Table 2

Imports of Crude Oil, Oil Products, and Coal 2014- 2018 (1000 Tons)

Year	Crude Oil	Fuel Oil	Liquid Gas	Diesel	Benzene	Jet Fuel	Coal	Coal Oil	Total
2014	3221	1255	282	2373	552	51	474	130	8338
2015	3513	848	335	1121	670	34	230	204	6955
2016	2978	0	327	967	832	64	327	210	5705
2017	2795	0	368	1029	923	125	255	170	5665
2018	2366	0	357	1145	964	67	292	105	5296



2. Natural Gas

In 2018, natural gas imports were approximately 125 trillion ft³.

3. Primary and Final Energy Consumption

In 2018, the total demand for primary energy was approximately 712/9 million toe, a %3 decrease over 2017. Table 3 shows the domestic demand for primary energy from -2014 2018.

Table 3

Primary Energy Consumption 2014-2018 (1000 toe)

Year	Primary Energy Type						Total
	Crude Oil & Oil Products	Coal	Oil Coal	Natural Gas	Renewable Energy	Imported	
2014	7479	332	88	301	152	109	8461
2015	6331	161	165	1944	160	183	8944
2016	5327	220	182	3389	412	84	9614
2017	5671	165	148	3510	515	13	10009
2018	5242	205	92	3438	711	47	9712

Final energy consumption and distribution to all economic sectors is shown in Table 4.

Table 4

Final Energy Consumption by Sector 2014-2018 (1000 toe)

Year	Sector				Total
	Transportation	Industry	Residential	Other*	
2014	2558	1079	1152	718	5507
2015	2811	991	1272	754	5828
2016	3184	1064	1342	826	6416
2017	3431	938	1549	950	6868
2018	3363	953	1464	980	6760

*Includes commercial and farm sectors and street lighting

Table 5 shows the percent distribution of final energy by sector.

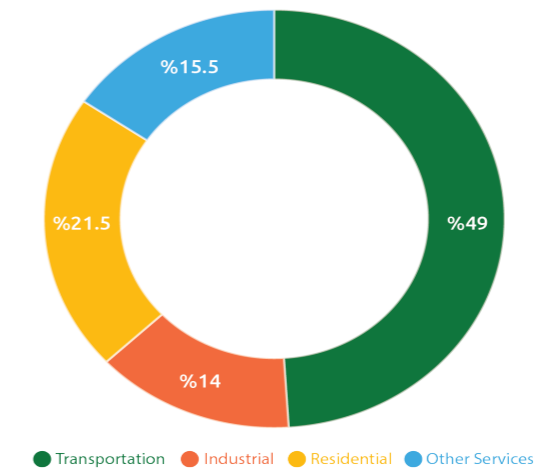
Table 5

Percent Distribution of Final Energy by Sector 2018-2014

Year	القطاع				Total
	Transportation %	Industry %	Residential %	Other* %	
2014	46	20	21	13	100
2015	48	17	22	13	100
2016	48	16	20	16	100
2017	49	14	23	14	100
2018	49	14	21.5	15.5	100

*Includes commercial, services, and farm sectors and street lighting

Distribution of Final Energy Consumption by Sector 2018



4. Consumption and Prices of Oil Products

Overall, there was a decrease in oil products consumption in 2018. The highest rate of decrease in consumption was in asphalt (down %25) and kerosene (down %22). The demand for oil products was approximately 4868.2 thousand toe, compared to 5081.8 thousand toe in %4) 2017 decrease).

Tables 6 and 7 show the production and consumption of oil products from 2018-2014.

Table 6

Jordan's Petroleum Refinery Production of Oil Products 2014-2018 (1000 toe)

Year	Liquid Gas	Benzene	Jet Fuel (Avtur)	Kerosene	Diesel	Fuel Oil	Asphalt + Others	Total
2014	91	634	318	63	930	812	160	3008
2015	80	653	257	91	1058	885	188	3212
2016	81	583	287	97	909	599	238	2794
2017	78	557	279	54	845	564	226	2603
2018	65	483	309	0	738	458	169	2212

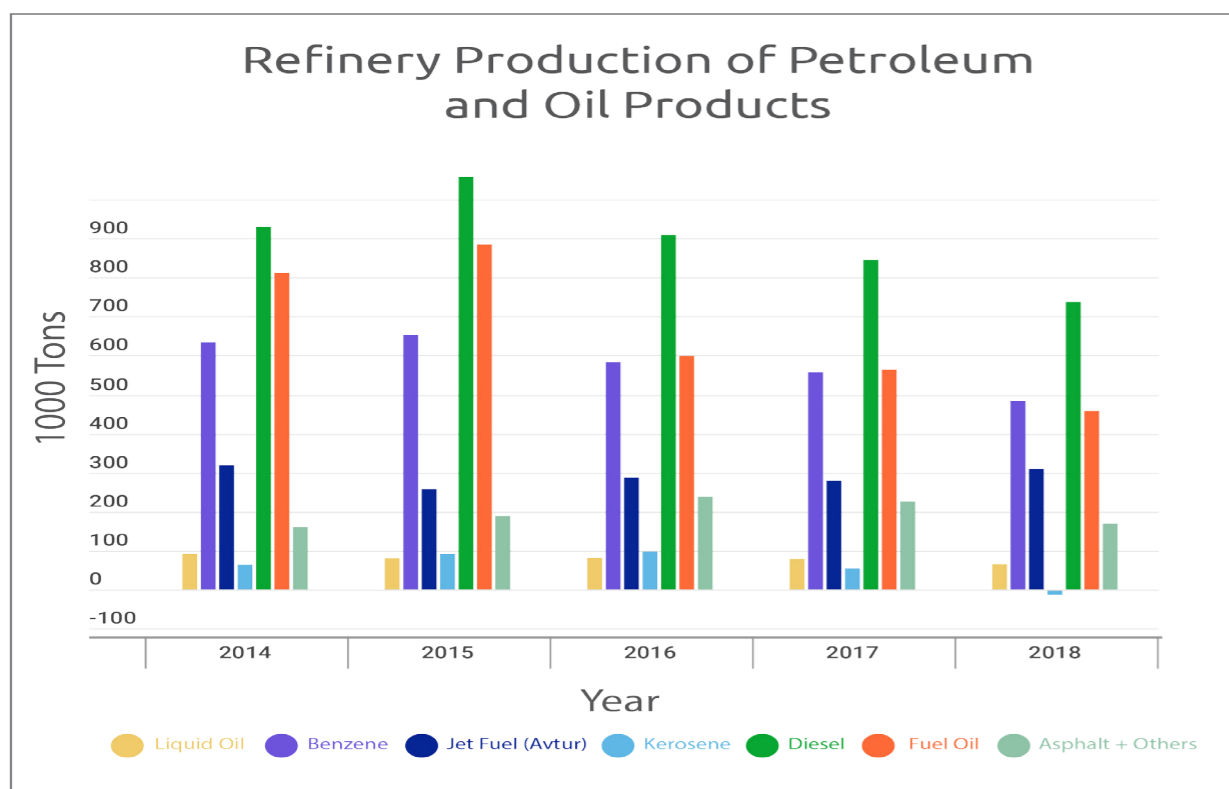


Table 7

Oil Products Consumption 2014-2018 (1000 toe)

Year	Liquid Gas	Benzene	Jet Fuel (Avtur)	Kerosene	Diesel	Fuel Oil	Asphalt + Others	Total
2014	371	1187	339	49	3274	2041	159	7420
2015	416	1319	321	91	2235	1705	185	6272
2016	433	1446	355	108	1726	606	238	4912
2017	431	1431	396	88	1859	505	226	4936
2018	429	1410	412	69	1672	515**	168	4675
Percent Growth (%)	(0.5)	(1.5)	4	(22)	(10)	2	(25)	(5)

* Parentheses denote negative value

** Includes quantities of fuel oil exported

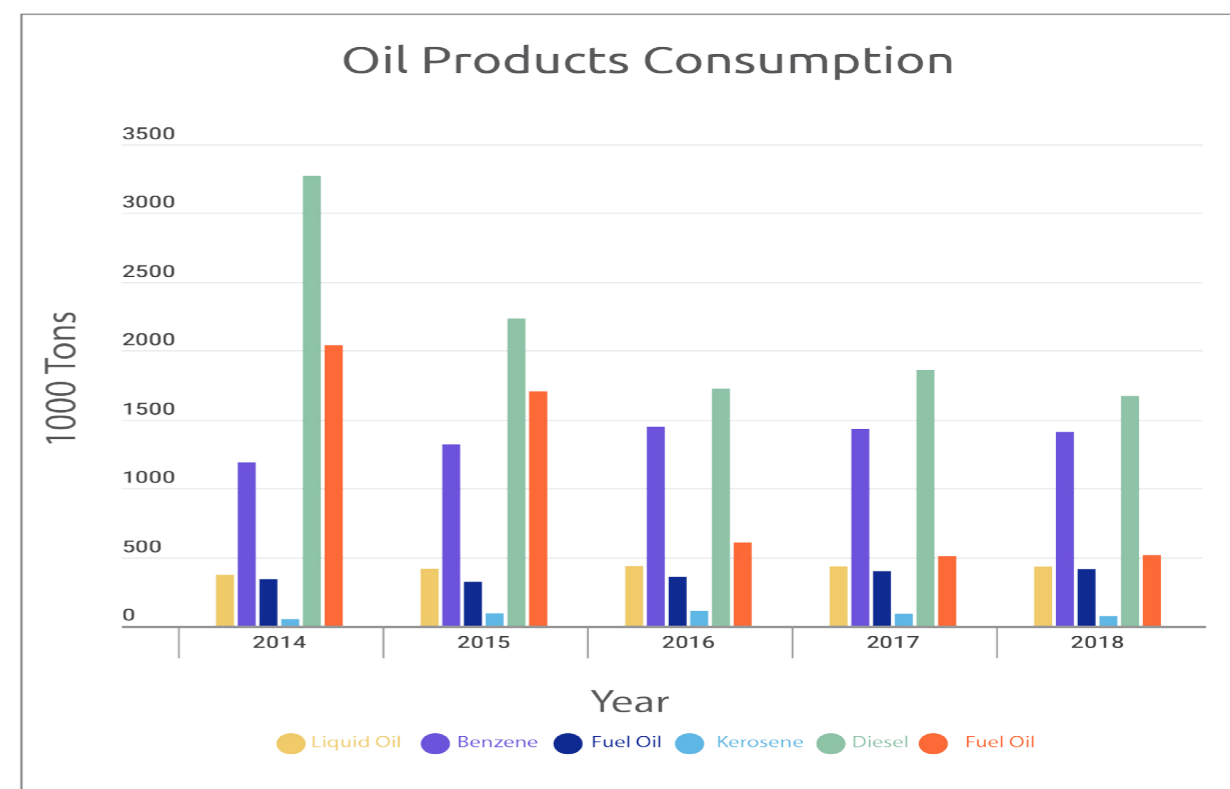


Table 8 shows the domestic public price of oil products in 2018.

جدول رقم (8)

أسعار المشتقات النفطية المعلنة محلياً خلال عام 2018

Material	Unit	Jan		Feb	Mar		Apr	May	Jun		Jul	Aug	Sep	Oct	Nov	Dec
		1-17	18-31						1	2-30						
Gasoline 90	Fils/liter	730	750	765	760		780	815	860	815	815	825	825	825	825	750
Gasoline 95	Fils/liter	955	975	1000	985		1005	1050	1100	1050	1050	1060	1060	1060	1060	965
Gasoline 98	Fils/liter	1105	1125	1150	1135		1155	1200	1250	1200	1200	1210	1210	1210	1210	1115
Kerosene	Fils/liter	520	520	520	520		520	615	645	615	615	625	625	625	625	605
Diesel	Fils/liter	550	550	565	560		570	615	645	615	615	625	625	625	625	605
Diesel/Ship	Fils/liter	550	550	565	550		570	615	645	615	615	625	635	660	675	615
Liquid Gas 12.5 kg	JD/cylinder	7.00	7.00	7.00	7.00		7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
Liquid Gas 50 kg	JD/cylinder	37.00	37.00	37.00	35.00		33.00	33.00	34.50	33.00	36.50	36.55	37.30	38.60	39.90	35.20
Liquid Gas/Central Distribution/Bulk	JD/ton	699.49	699.49	699.63	652.55		613.72	616.33	646.96	616.33	683.71	689.58	704.22	730.12	756.24	662.81
Natural Gas/Industry	JD/MBTU	7.651	7.651	8.491	7.437		7.520	7.913	7.671	7.913	8.594	8.557	8.504	8.330	8.421	7.459
Natural Gas/Risha	JD/MBTU	4.000	4.000	4.000	3.936		3.980	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
Fuel Oil/Industry	JD/ton	348.29	348.29	360.70	352.06		347.74	363.98	399.39	363.98	404.93	412.88	406.46	415.90	444.44	411.15
Fuel Oil/Industry	JD/ton	269.60	269.60	290.77	273.67		276.78	363.98		363.98	404.93	412.88				
Fuel Oil/1% Sulphur	JD/ton	383.61	383.61	396.02	387.37		383.06	399.30	434.71	399.30	440.24	448.19	441.46	451.22	446.47	446.47
Fuel Oil/Ships	JD/ton	348.29	348.29	360.70	352.06		347.74	363.98	399.39	363.98	404.93	412.88	406.46	415.90	444.44	411.15
Avtur/Local	Fils/liter	424.00	424.00	449.00	445.00		441.00	470.00	492.00	470.00	479.00	479.00	477.00	497.00	515.00	465.00
Avtur/Foreign	Fils/liter	429.00	429.00	454.00	450.00		446.00	475.00	497.00	475.00	484.00	484.00	482.00	502.00	520.00	470.00
Avtur/Charter	Fils/liter	444.00	444.00	469.00	465.00		461.00	490.00	512.00	490.00	499.00	499.00	497.00	517.00	535.00	485.00
Asphalt	JD/ton	378.48	378.48	390.90	380.45		375.79	392.02	428.70	392.02	434.79	443.00	436.39	446.20	476.46	441.17

5. Electric Power

The demand for electricity increased slightly in 2018, by about %0.2. The amount of electricity imported on the network with Egypt was 188.3 GWh, and 93.5 GWh of electricity was exported.

- Electricity Generation and Consumption

In 19,755,2018 GWh of electricity were generated, a decrease of about %1.5 over 2017. Electricity consumption was 17,541 GWh, representing %0.2 growth over 2017. The peak load of the electricity system was 3205 MW in 2018, a decrease of %3.5 over 2017.

Tables 10,9, and 11 show the growth of electricity production and consumption, as well as the distribution of consumption across all sectors.

Table 9

Oil Products Consumption 2014-2018

Year	Peak Load MW	Growth Rate %	Electricity Generated GWh	Growth Rate %
2014	3020	2.5-	18704	8.4
2015	3300	9	18911	1
2016	3250	1-	19390	2.5
2017	3320	2	20760	7
2018	3205	3.5-	19755	1.5-

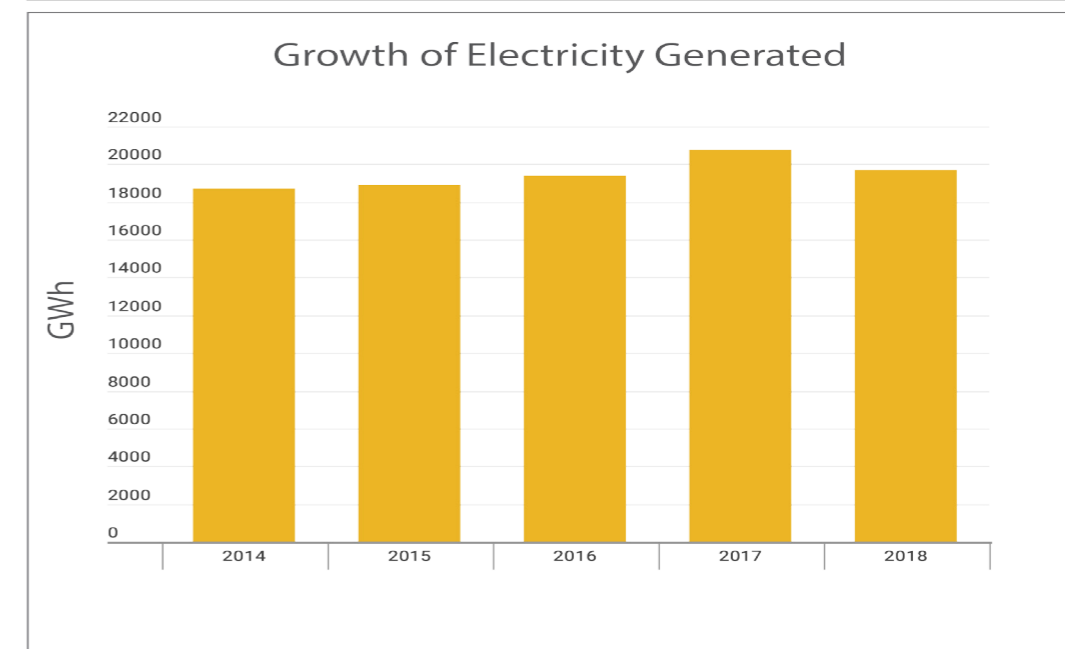
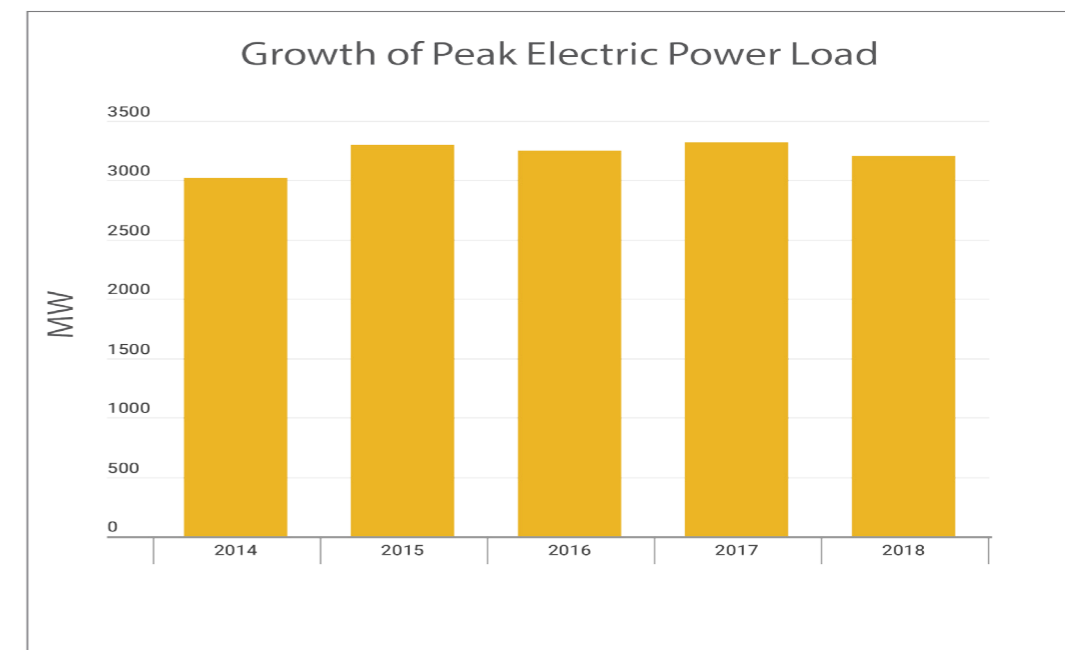


Table 10
Distribution of Electricity Consumption and Growth Rate by Sector 2014-2018

Year/ Sector	Residential	Industrial	Commercial	Water	Street Lights	Total	Growth Rate %
2014	6580	3877	2358	2287	316	15418	5.9
2015	6938	4013	2460	2426	336	16173	5
2016	7448	3939	2447	2485	350	16669	3
2017	7879	3910	2510	2683	403	17504	5
2018	8038	3877	2508	2706	404	17532	0.2

Table 11
Percent Electricity Consumption by Sector 2014-2018

Year/Sector	Residential %	Industrial %	Commercial %	Water Pumping %	Street Lights %	Total %
2014	43	25	15	15	2	100
2015	43	25	15	15	2	100
2016	45	23	15	15	2	100
2017	46	22	15	15	2	100
2018	45.5	22.5	14	16	2	100

**Distribution of Electric Consumption
by Sector 2018**

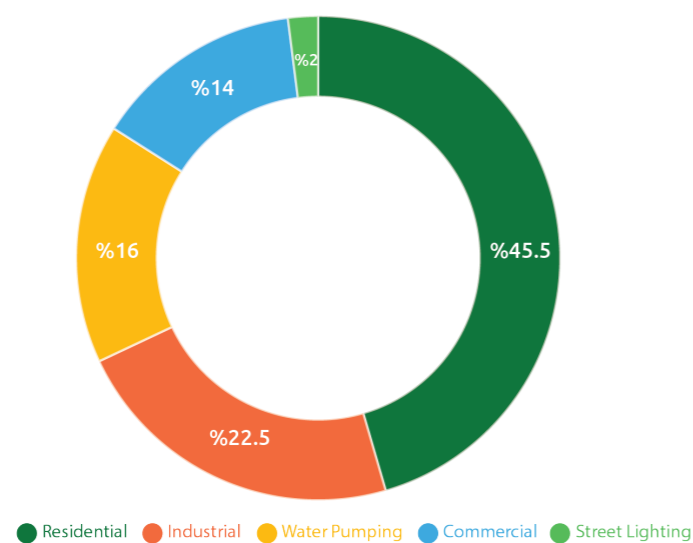


Table 12 shows the electricity tariff sold by distribution companies to consumers as of December 2017 ,31.

Table 12

Electricity Tariff Sold by Distribution Companies to Consumers	Unit	Tariff
A. Residential		
1-160 KWh/month	Fils/KWH	33
161-300 KWh/month	Fils/KWH	72
301-501 KWh/month	Fils/KWH	86
501-600 KWh/month	Fils/KWH	114
601-750 KWh/month	Fils/KWH	158
751-1000 KWh/month	Fils/KWH	188
>1000 KWh/month	Fils/KWH	265
B. Regular Subscribers		
1-160 KWh/month	Fils/KWH	42
161-300 KWh/month	Fils/KWH	92
301-501 KWh/month	Fils/KWH	109
501-600 KWh/month	Fils/KWH	145
601-750 KWh/month	Fils/KWH	169
751-1000 KWh/month	Fils/KWH	190
>1000 KWh/month	Fils/KWH	256
C. Radio & TV – Flat Tariff		
	Fils/KWH	173
D. Commercial		
2000 KWh/month	Fils/KWH	120
>2000 KWh/month	Fils/KWH	175
E. Banks – Flat Tariff		
	Fils/KWH	285
F. Telecommunications Companies		
2000 KWh/month	Fils/KWH	230
>2000 KWh/month	Fils/KWH	273
G. Small Industry		
1- 10,000 KWh/month	Fils/KWH	71
>10,000 KWh/month	Fils/KWH	81
H. Medium Industry		
1. Peak Load	JD/KW/month	2.0
2. Day Energy	Fils/KWH	89
3. Night Energy	Fils/KWH	75

Electricity Tariff Sold by Distribution Companies to Consumers		Unit	Tariff
I.	Agriculture – Flat Tariff	Fils/KWH	60
J.	Agriculture – 3 Tariffs		
1.	Peak Load	JD/KW/month	3.79
2.	Day Energy	Fils/KWH	59
3.	Night Energy	Fils/KWH	49
k.	Water Pumping – Flat Tariff	Fils/KWH	94
L.	Hotels – Flat Tariff		
1.	Peak Load	JD/KW/month	3.79
2.	Day Energy	Fils/KWH	89
3.	Night Energy	Fils/KWH	75
M.	Street Lighting – Flat Tariff	Fils/KWH	114
N.	Jordanian Armed Forces	Fils/KWH	146
O.	Ports Sector	Fils/KWH	159
P.	Large Industry		
First – Mining			
1.	Peak Load	JD/KW/month	2.98
2.	Day Energy	Fils/KWH	237
3.	Night Energy	Fils/KWH	170
Second – Other			
1.	Peak Load	JD/KW/month	2.98
2.	Day Energy	Fils/KWH	124
3.	Night Energy	Fils/KWH	109
Q.	Mixed (Commercial/Agricultural)		
	First 2/3 consumption	Fils/KWH	120
	Last 1/3 consumption	Fils/KWH	60

- Rural Electrification

The Ministry of Energy and Mineral Resources continued to deliver electricity to remote villages, rural communities, and needy families in 2018, according to the following approved criteria:

1. Rural communities that include at least 10 homes located outside administrative boundaries, at a maximum cost of JD 3,500 per home as of January 2019 ,1.
 2. Farms with artesian wells, at a maximum cost of JD 12,000, if using traditional electrical networks, or JD 20,000, if using unconnected solar cell systems.
 3. Farms near permanent water sources located outside administrative boundaries and establishment near dams, rivers, and torrents, for the purpose of connecting the water pumps of these farms to the electrical grid, at a maximum cost of JD 12,000.
 4. Various agricultural, industrial, and association projects in remote areas, at a cost of JD 20,000.
 5. Buildings of public benefit located on land considered the property of the treasury of the Hashemite Kingdom of Jordan, as well as Royal Initiatives, at a cost of JD 200,000.
- There were 2484 applications for electrification at an estimated cost of JD 13.325 million. Table 13 shows how these requests were handled, as well as the relative cost for each category based on the total estimated cost of all applications. Likewise, the graph shows that 2748 homes were electrified in 2018, and their distribution according to concession areas of the electricity distribution companies.

Table 13

Classification of Sites Handled in 2018 and Cost of Each Category of Total Estimated Cost

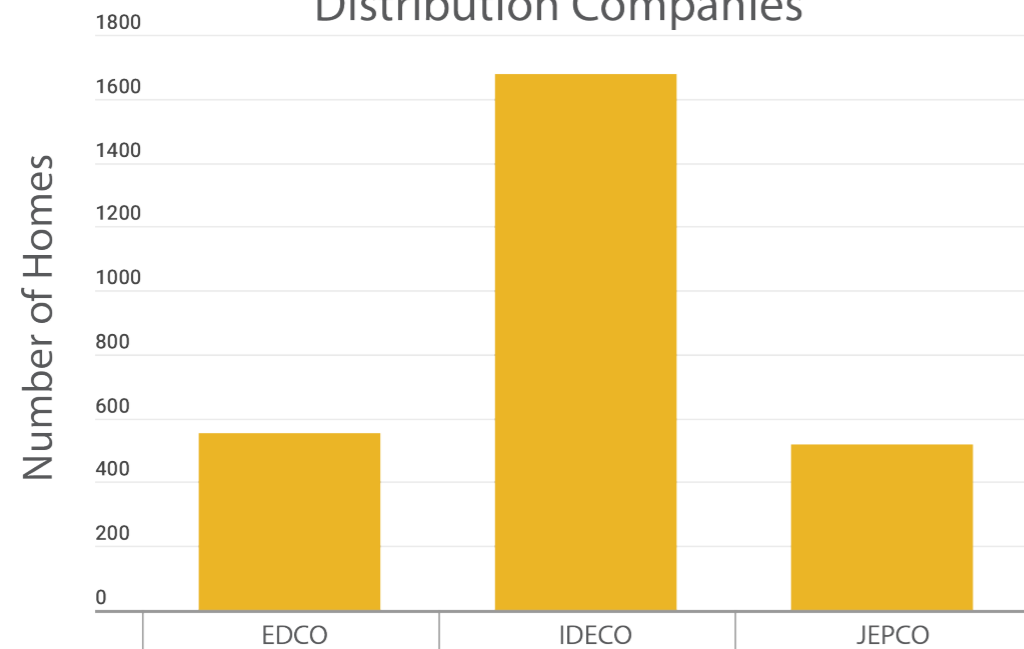
Approved Sites		Rejected Sites		Implemented Sites	
Cost (JD million)	Number	Cost (JD million)	Number	Cost (JD million)	Number
2747	8.64	624	5.587	1860	7.737

The objectives of Fils Al Reef are to contribute to the use of alternative energy sources to produce and deliver electricity to rural communities and the Jordanian Badia, to encourage local investment and create local job opportunities for Jordanians, to reduce electrical losses on the grid, and to achieve financial savings. To achieve these goals, the Ministry has delivered electricity to a number of sites via solar cell systems not connect to the grid, at a total cost of JD 869,283. Twenty-six sites, containing 26 homes and distributed across all regions of the Kingdom, were electrified, at a total cost of JD 135,416. The Council of Ministers' Supreme Steering Committee approved 30 sites for solar cell projects in Ruwaished, Jerash, Ajloun, Zarqa, the Jordan Valley, and elsewhere, at a cost of about JD 267,000. Completion of these projects is expected in the first quarter of 2019.

In addition, the Council of Ministers' Supreme Steering Committee approved approximately JD 584,000 worth of solar cell projects to be tendered during 2019.

In 2018, Fils Al Reef contributed JD 11,139,000 to the support and growth of the local community and government ministries and institutions.

Number of Homes Electrified in 2018 and Distribution According to Concession Areas of Electricity Distribution Companies



Summary of Ministry of Energy and Mineral Resources Accomplishments

A. International Planning and Cooperation

The Ministry has begun updating the comprehensive national strategy for the energy sector in Jordan for 2030-2019, taking into consideration the many local and regional developments and challenges facing the energy sector that emerged through the review and evaluation of the current strategy for 2025-2015.

- Jordan is the first Arab country to become a full member of the Energy Charter Treaty. This represents a milestone for increasing confidence in the energy investment climate in the Kingdom and encourages energy trade and transport throughout Jordan and the entire region. The treaty is an international investment agreement that establishes a multilateral framework for cross-border cooperation in the energy industry, and it covers all aspects of commercial energy activities in the trade, transit, and investment sectors. All requirements for Jordan to join the treaty were fulfilled through the issuance of the Energy Charter Treaty Ratification Act No. 22 of 2018, and its publication in the Official Gazette on May 2018 ,31, after the issuance of a royal decree approving it. The official announcement of Jordan's entry into the treaty and its attached documents came into force for the Hashemite Kingdom of Jordan on December 2018 ,11.

- The Ministry also worked on a report with an Energy Investment Risk Assessment (EIRA) team from the International Energy Charter. The report was published in October, and Jordan received an overall risk level of low. Coordination is underway for Jordan to participate in the same assessment in 2020.

- In terms of the Syria Crisis Response Plan for 2021-2019, the Ministry has prepared all reports related to the vulnerability study, the effects of the Syrian crisis, the response plan summary, and the response plan projects summaries.

- In addition, the Ministry has cooperated with all sector stakeholders in preparing the Jordan Economic Growth Plan for 2022-2018, according to the forms approved by the Ministry of Planning.

- The Ministry also participate in preparing, drafting, and debating all legislation related to the energy and mineral resources sector, according to their constitutional phases, such as:

- o Natural Resources Law No. 19 of 2018
- o Petroleum Products Law No. 1
- o Law No. 50 of 2018, amending the law of provisions and conditions for exempting renewable energy source systems, devices, and equipment, energy consumption conservation, and production inputs from customs duties and the general sales tax.
- o Draft electricity law
- o Draft law on radiation protection, and nuclear safety and security
- o Concession agreements for oil shale and petroleum, and ratification of them under a special law
- o Preparation or participation in preparation of forms for contracts, agreements and MOU's and expressing a legal opinion.

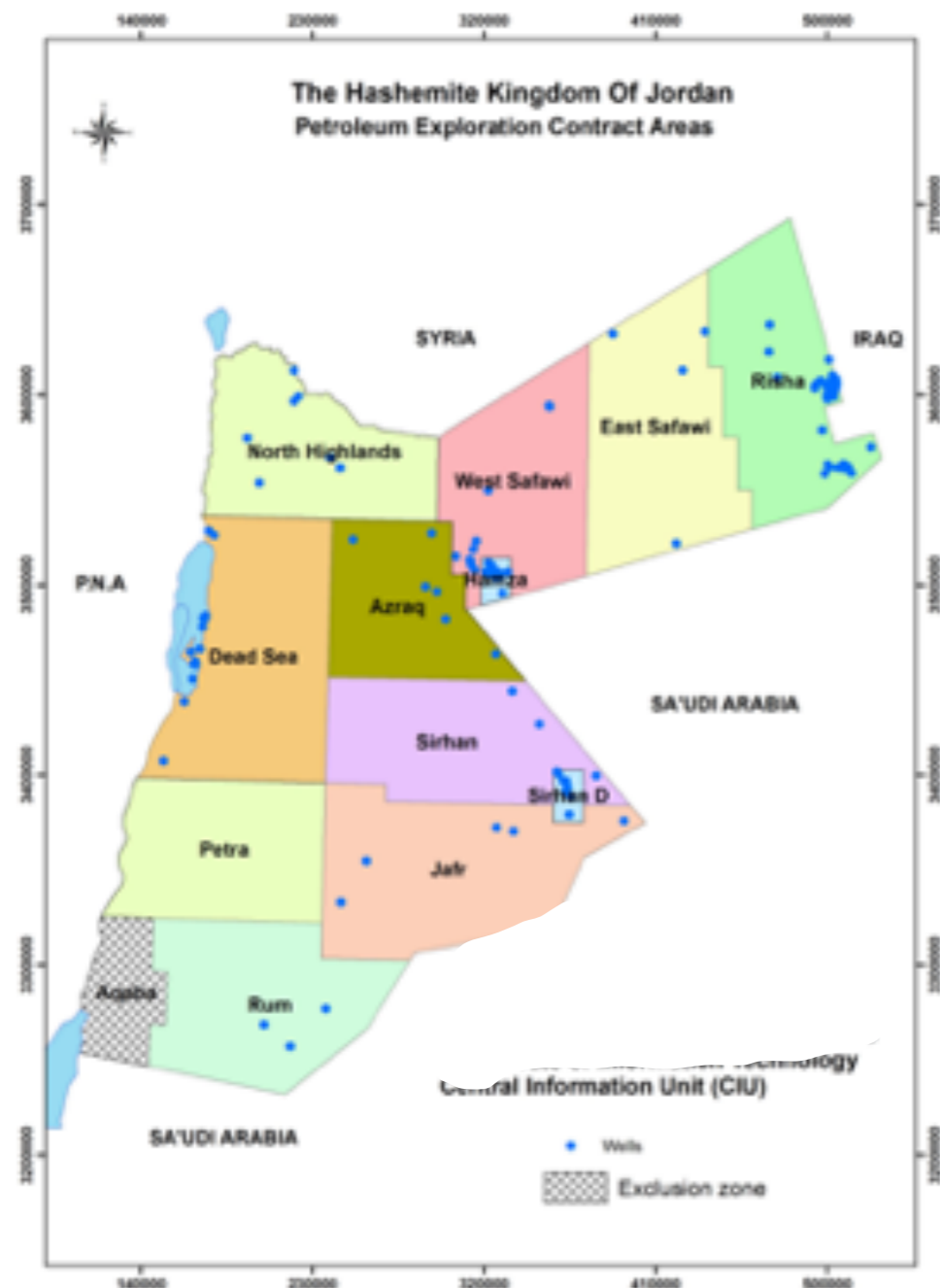
1. Crude Oil and Oil Products

The Ministry of Energy and Mineral Resources tracks projects related to the oil sector:

- Pipeline project, with a capacity of one million barrels/day, to export Iraqi crude oil through the port of Aqaba and construction of tanks with a capacity of 7 million barrels in Aqaba, with priority given to distribution to Jordan for domestic consumption.
- Tracking the progress of work on the Fourth Expansion Project at JPRCO, according to the agreed upon schedule. The project aims to build new refinery units to help improve the quality of petroleum products.
- Monthly pricing of oil products in accordance with mechanisms based on international prices through the pricing committee formed for this purpose.
- Strategic oil storage capacity project in Madounah, consisting of tanks for light oil products with a total capacity of 350,000 tons for all kinds of products and 10,000 tons for LPG. Commercial operation began in December 2018.
- Storage capacity project for crude oil and/or its products in Aqaba, consisting of six floating roof tanks for storing crude oil and/or oil products, with a capacity of 20,000 m3. Commercial operation began in May 2018.
- Project to build capacity for storage of LPG in Aqaba, consisting of three LPG storage tanks with a capacity of 6,000 tons. Commercial operation began in May 2018.

2. Utilization of Domestic Oil and Gas Sources

Through its cadres, the Ministry of Energy and Mineral Resources is supervising the exploration of petroleum (oil and gas), as well as tracking the performance of companies that have signed MOU's and production-sharing agreements. In terms of petroleum, the Kingdom is divided into 12 exploratory regions, according to the subsurface geological features performed in 2D and 3D seismic surveys. The petroleum potentials are shown in the chart below.



In 2018, work was done in the following areas:

2.1. Gas and Oil Agreements

East Safawi Region

This area covers 9459 km², and the Ministry tracks a production-sharing agreement with NPCO, previously issued under Special Law No. 14 on April 2014 ,1.

Hamza Oil Field

The Ministry tracks and monitors Hamza Oil Field production and shipment to JPRCO. In 2018, JPRCO received approximately 6749 barrels of crude oil, with a total value of approximately JD 97,000. The Ministry is working on a plan to develop this field in cooperation with JPRCO.

2.2. Marketing of Petroleum Areas

The Ministry is preparing marketing methods for the open petroleum areas through specialized conferences and workshops. In 2017, the Ministry also prepared a marketing brochure for investment in oil and gas exploration projects and updated and placed all information on a CD-ROM for the purpose of marketing and investment.

Through a Call for Interest, the Ministry also announced the marketing of the following six regions open for oil and gas exploration in Jordan:

- Azraq
- Dead Sea
- Jafr
- North Highlands
- West Safawi
- Sarhan

Oil Shale

The Ministry of Energy and Mineral Resources is creating general policies for the use of oil shale in the Kingdom. The national energy strategy has included electric power from oil shale as an alternative energy source at an estimated %5 of the energy mix by 2020.

Oil shale in Jordan is exploited three ways:

- Retorting underground oil shale to produce oil
- Distilling oil shale by surface mining to produce oil
- Direct combustion of oil shale to produce electricity

2018 Accomplishments:

MOU's

The Ministry tracks the activity of the following companies that signed MOU's to exploit crude oil shale in Jordan:

1. Global Oil Shale Holdings (GOSH)
2. Al Qamar for Energy & Infrastructure Ltd.
3. Questerre Energy Corporation
4. Jordan Oil Shale Electricity Co. (JOSECO)
5. El-Lujjon Co.

Concession Agreements

1. Jordan Oil Shale Co. (JOSCO)

JOSCO is a wholly-owned subsidiary of Royal Dutch Shell. In 2009, it signed an agreement to exploit deep oil shale to produce oil through the use of the company's thermal injection technique. The term of the agreement through various phases is 120 years. The project will be implemented in phases agreed upon within the agreement.

The company has completed the second phase of the project, which, according to the concession agreement, included field experiments of the technique in Jordan. Based on the results of the experiments, the company is currently conducting studies to develop the technique and increase its economic feasibility before proceeding with subsequent phases of the project.

2. Karak International Oil Co. (KIO)

KIO, a British company, signed a concession agreement to exploit oil shale to produce oil by surface mining of oil shale in the Ajloun region. The agreement was issued in 2011 as a special law. Over past years, KIO has conducted all necessary studies, according to the requirements of the project pre-development period and the concession agreement. The company is currently marketing the project and has obtained nearly USD 1.9 billion to implement and develop the project.

3. Saudi Arabian Corporation for Oil Shale (SACOS)

SACOS is owned by a Saudi investor, and it signed a concession agreement to exploit oil shale to produce oil by surface mining of oil shale in Attarat Um Ghudran. The agreement was issued in 2014 as a special law. The investment in this project is expected to be nearly USD 1.8 billion. The company is currently in a pre-development phase, which, according to the concession agreement, includes economic feasibility and banking studies, as well as technology development prior to the development and implementation phase of the project.

4. Jordan Oil Shale Energy Co.

A consortium of Estonian (Enefit), Malaysian (YTL), and Jordanian (Near East Group) companies, Jordan Oil Shale Energy signed a concession agreement to produce oil from surface oil shale in Attarat Um Ghudran, using Enefit's distillation technology. The agreement was issued in 2010 as a special law. The company is currently conducting the necessary studies and activities in the project's pre-development phase. The investment in this project is expected to be between USD 6-4 billion.

2.3. Electric Generation Projects Using Direct Combustion of Oil Shale

Attarat Power Co. (a consortium of Chinese, Malaysian, and Estonian companies) signed agreements for projects to produce electricity by direct combustion of oil shale. The project began actual implementation on the ground during the second quarter of 2017, and it is expected to generate 470 MW of electricity by 2020. The project is considered the first of its kind in Jordan and the region.

3. Renewable Energy

- The renewable energy sector is a Jordanian success story that matches the world. By the end of 2018, installed generating capacity for electricity projects using renewable energy sources totaled 1130 MW, representing %11 of the electricity generated in the Kingdom, compared to %1 in 2014. The capacity is expected to reach 2400 MW by 2021.
- By the end of 2018, solar systems installed and connected to electric distribution networks in all sectors (homes, universities, industrial and commercial enterprises, government institutions, schools, mosques, churches, telecommunications, companies, banks, civic associations, hospitals, farms, etc.), and various public and private sector institutions) totaled approximately 360 MW, the equivalent of covering about 4500 dunams with solar panels. These systems are installed under the instructions regulating the sale of electrical energy generated from renewable energy sources systems using net meters and those regulating the transit of electric energy generated from renewable energy source systems.
- Work continues on the Green Corridor project to strengthen the electric distribution network in the southern part of the Kingdom, at an estimated cost of JD 150 million.
- Work continues on a project to store electric energy using batteries with a capacity of 30 MW for a period of two hours (60 MWh), at an estimated cost of JD 40 million.
- Commercial operation reached for each of the solar cell projects in Quwera, with a capacity of 103 MW and funded by a grant from the Abu Dhabi Fund for Development, and the Rajef wind energy project, with a capacity of 86 MW within the first phase of direct proposals, and for three solar cell projects, with a capacity of about 50 MW each

within the second round of direct proposals.

- Work continues on the electric power generation project using solar energy in the southern Amman region, funded by the German government/German Reconstruction Bank, with a peak capacity of 40 megawatts. The project aims to serve the communities hosting Syrian refugees and is expected to be connected and operational during 2019.
- The Ministry has allocated a capacity of 100 megawatts on the electrical grid for the benefit of small and medium industries through instructions for electric energy transit. Government land has been allocated for a nominal fee for the purposes of establishing this project.
- Bids for solar cell projects have been received in the third round of direct proposals, bid evaluation has been completed, and the final rankings were announced. Prices as low as 17.6 fils/KWh were obtained in this round.
- Bids for a wind power project have been received in the third round of direct proposals, with a capacity of 50 MW.
- Ten proposals were received for an electric power storage project using batteries with a capacity of 30 MW and two hours (60 KWh), according to the bidding system. This is a pioneering project and the first of its kind in the region.
- An economic feasibility study is underway for a project to store electric power using water energy from the Wadi Al-Arab, Wadi Mujib, and King Talal dams, in cooperation with the EU's Renewable Energy and Energy Efficiency program (REEE II).
- An economic feasibility study is underway to implement an electric energy generation project using concentrating solar power (CSP).
- Work has begun to prepare the National Renewable Energy Action Plan (NREAP -2018 2023) in cooperation with the Regional Center for Renewable Energy and Energy Efficiency (RCREEE) and REEE II. The plan is expected to be completed and issued in 2019.
- In cooperation with EU advisors, the Ministry of Energy and Mineral Resources has undertaken the task of managing, monitoring, and evaluating the implementation of nine projects with a value of EUR six million, funded by an EU grant from the REEED program. These projects target a wide range of beneficiaries in the local community, and they aim to spread green energy use, reduce carbon emissions, and create job opportunities, thus promoting energy security. The following projects were completed in 2018:
 1. Biogas plant in the Jordan Valley region during April 2018.
 2. Localization of solar energy and its applications in Al-Basheer Hospital with the goal of studying and adopting a solar energy system. The installation of the solar system will be completed in June 2019.

4. Energy and Environment

- The Ministry is participating in the steering committee for a project to convert sold waste to energy in the Zaatari camp, thus enhancing the potential for economic growth in Mafrq governorate through developing private sector projects, improving livelihoods, promoting environmental sustainability, and providing green jobs. This project is in cooperation with the World Agriculture Organization, the Ministry of Planning and International Cooperation, and relevant institutions.
- The Ministry partnered with the Greater Amman Municipality on a technical committee to study technical and financial proposals for generating energy from wastes using the latest international techniques for converting solid waste to electricity. This project is in the area of the El-Ghabawi landfill using direct burning technologies for waste. The cost is approximately JD 200 million.
- As a member of the environmental impact assessment committee, the Ministry has continued to study many projects proposed to the Ministry, both projects in general and energy production projects in particular.

5. Jordan Renewable Energy and Energy Efficiency Fund (JREEEF)

JREEEF, in accordance with a comprehensive work plan, has implemented programs and projects targeting various sectors in all governorates of the Kingdom to achieve the metrics and goals of the National Energy Strategy and the National Energy Efficiency Plan. JREEEF is implementing these programs through various financial programs and frameworks and in partnership with international donor institutions, commercial banks, sectors institutions and umbrella organizations, and local development associations. The most important of these projects and programs completed in 2018 include the following:

1. Residential sector program: 300 residential solar systems were installed; 8,000 residential solar heaters were installed; the agreements were signed to install 2,448 solar heaters for needy families (recipients of makruma) throughout the Kingdom; under the energy-saving LED lighting program, bids were referred to the three electricity distribution companies, with 200,000 bulbs.
2. Industrial sector program: in cooperation with the Jordan Chamber of Industry to help small and medium industries invest in renewable energy technologies and improve energy efficiency; 34 industrial facilities participated.
3. Schools program: His Majesty the King's initiative to heat schools: JREEEF, in partnership with all stakeholders, developed the royal initiative into one of its programs, to be

implemented over 8-5 years in 2,600 schools; the vision of this program is to “provide a suitable learning environment in the classrooms of our schools.” 128 schools have been heated under this program.

4. Tourism sector program: use of energy-efficient applications in hotels in Petra, Madaba, and Aqaba. Eight hotels have benefited from this project.
5. Government buildings project conducted energy audits in eight government buildings.
6. Mosques and churches project installed solar cell systems in 329 mosques in cooperation with the Ministry of Awqaf.
7. Promotion and awareness project for renewable energy, energy efficiency, and energy conservation technologies, in which 10 activities were held through TV stations and media companies.
8. Capacity-building project through training and professional courses related to energy efficiency with support from the EU, the RCREEE, and the Jordanian Engineers' Syndicate; 120 individuals were trained.
9. Solar cell system installation project for civil society institutions and associations; included eight institutions with a generating capacity of 247 KW.
10. Energy efficiency and renewable energy project for major municipal buildings. The project was designed to include 100 municipalities divided into two sections during 2019 and 2020; funded by the Italian government.

6. Electric Power

The following are among the most important accomplishments in the field of electric power in 2018:

- On March 2018 ,27, the fourth phase of the Samra plant became commercially operational with a total capacity of 213 MW. This phase included the conversion of the seventh gas turbine (145 MW) to a combined cycle, as well as a steam turbine with a capacity of 70 MW.
- On September 2018 ,29, the combined cycle Zarqa electric power plant became commercially operational with a capacity of 485 MW and at an estimated cost of JD 325 million.
- Participation in a study of a project to establish an advanced, energy-saving, and environmentally-friendly electric car factory, in cooperation with all concerned parties.
- Participation on the project committee for replacing traditional street lighting units in municipalities with energy-saving LED bulbs and preparation of the terms of reference and technical specifications for the lighting units in preparation for tendering this project.

With regards to electrical connection with neighboring countries, the following took place:

- On October 2018 ,18, an energy exchange was signed between NEPCO and the governorate of Jerusalem for the purpose of supplying Irbid governorate with electric power in the amount of about 150 GWh annually (24 MW). In addition, technical studies on high voltage electrical connection (400.132 KV) between Jordan and Palestine were approved in order to increase the supply of the Palestinian side by about 80 MW.
- On December 2018 ,29, a MOU was signed between the Iraqi Ministry of Electricity and the Ministry of Energy and Mineral Resources for the purpose of strengthening the electrical connection between the two countries. This project will be implemented over three phases in coordination with Jordan's NEPCO and Iraqi Electric Co.

7. Natural Gas

The Ministry of Energy and Mineral Resources seeks to achieve the strategic goal of increasing the contribution of natural gas to the overall energy mix. The following initiatives and programs were implemented in 2018:

7.1. Development of Local Sources of Natural Gas

- Production in the Risha gas field began in 1989, when the government of the Hashemite Kingdom of Jordan signed a concession agreement with NPCO under Law No. 9 of 1996, for a period of 50 years.
- In 2018, production in the Risha gas field reached approximately 3,333 million ft³ of natural gas and a daily average of 9.13 million ft³. This represents %1 of the electricity generated in 2018.

7.2. Expanded Use of Natural Gas in Electric Power Plants and Industry

- Natural gas pumping from Egypt resumed on September 2018 ,10. The total amount of natural gas received from the Egyptian side was 14,230 million ft³ through December 2018 ,31.
- In cooperation with NEPCO, the Ministry of Energy and Mineral Resources met most of the natural gas needs of electric power plants and industry in 2018, via the Sheikh Sabah LNG Terminal in Aqaba.
- In 2018, an average of 381 million ft³/day of natural gas was consumed by electric power plants. This represents %87 of the electricity generated in 2018.
- The special tax on natural gas for industries was decreased from %16 to %7. A mechanism was created for implementing the needed infrastructure to deliver natural gas to industries via natural gas pipelines to the site of the factory.
- A three-year exemption from the special tax imposed on natural gas was approved for new companies that switch from using fuel oil to natural gas, provided that established companies that use natural gas submit an application to the Ministry of Finance to

obtain this exemption.

- Third, providing additional sources of natural gas
- Work continues to implement the northern natural gas supply line project by the Egyptian-Jordanian FAJR Co. and the contracting companies in preparation for beginning natural gas supply in early 2020. The rate of progress on the project in 2018 was %70.

8. Bio Energy

Biogas Corporation continues to work on treating organic waste in the Rusaifa landfill. In 2018, approximately 3.4 GWh of electricity were generated, and 3 million m3 of biogas were mitigated.

9. Geology and Mining

The mining sector is considered a vital sector that plays an active role in pushing the acceleration of growth and development in the national economy. Despite its fluctuating contribution to GDP at various times, its role remains valuable and represents a pillar of the national economy.

This sector is primarily based on the exploitation of domestic raw materials and consists of two main mining industries.

9.1 Mining Extraction Industries

(Phosphates, potash, carbonate, quarrying products, etc.)

- Chemical industries (fertilizers, chemical acids, quicklime, and slaked lime)
- Construction industries (cement, white cement, ceramics, and building materials)

The Ministry of Energy and Mining Resources has already coordinated with mineral resources through participation in specialized conferences and workshops both inside and outside Jordan. It also tracked companies working in the mineral resources field as follows:

- Negotiation with As-Sahra Mining Co. for a MOU for mining gold, preparation of a draft MOU for this purpose.
- Negotiation with Arab Potash Co. and Manaseer Group for a MOU for conduction evaluations of potash ores in the Lisan Peninsula-Dead Sea area.
- Tracking of MOU with Manaseer Group to mine copper in the Dana Reserve.

The most important projects of the Ministry of Energy and Mineral Resources in this field are as follows:

9.1. Geological Mapping Project

1. Geological Maps and Reports

The National Mapping Project's goal is to prepare geological maps at 1:50,000 and 1:100,000 scales throughout the Kingdom. It is currently working in the southern, southeastern, and eastern areas of the country, preparing geological reports, and conducting detailed and specialized geological studies. The following table shows the course of work and the accomplishments realized in this field.

Number	Name of Map or Report	Scale	Current Status of Map or Report
1	Ain Jedi & As-Safi Map	1:50,000	Printed and pending receipt
2	Mishash Hudruj Map	1:100,000	Field work in progress
3	Wadi Hudruj & Wadi Ed-Dhbei'ani Map	1:100,000	Field work in progress
4	Ras An-Naqab Map	1:50,000	Final review phase
5	Wadi Abu Hamam Report	-	Pending review and editing
6	Inab Report	-	Printed

The Mapping Project also provides petrographic studies to the public and private sectors, oversees the Geological Museum, and trains recently-graduated geologists and students (eight geologists and ten students were trained).

2. Petrographic Studies

Petrographic studies serve to identify the ages and components of rocks from minerals for the price. In 50,2018 microscopic samples were studied, and 47 reports were prepared for the Ministry of Energy and Mineral Resources and the public and private sector.

3. Geological Museum

Through exhibits open to all interested parties from all sectors, the museum highlights the significant achievements of the Ministry of Energy and Mineral Resources and the nature of its work in the field of mineral resources. In 2018, the museum had 641 visitors from government and private schools who learned about the age of the earth and the geology of Jordan. The museum also participated in an exhibition held on the sidelines of

the Ministry's Month of Excellence.

9.2 Prospecting Studies

Prospecting studies aim to add new areas to increase reserves, determine the horizontal and vertical extension of mineral ores, determine the quantities, and conduct the necessary analyses to determine the characteristic of these ores in order to provide accurate information to investors and in preparation for offering some or all of these areas for investment. The achievements during 2018 were as follows:

1. Lithium Prospecting Project
2. Prospecting Project for Rare, Precious, and Radioactive Elements

9.3. Geochemical Projects

These projects conduct geochemical investigations of minerals using various geochemical methods, such as the geochemistry of heavy metals and valley sediments and rocks in the southern Kingdom. They also track and evaluate the results of laboratory analyses of various geochemical samples. This year's accomplishments are as follows:

1. Geochemical Surface Mapping of the Dubaydib Formation

- Tracking of the implementation of the geochemical mapping project to investigate rare earth and radioactive elements at the Dubaydib rock formation in southern Jordan, from the southern borders of Jordan to Ras An-Naqab in the north.
- A surface geochemical study was conducted of the Dubaydib rock formation to determine what type and amounts of rare earth, radioactive, or other elements it contains.

2. Rare Earth Elements Project

The goal of this project is to conduct geological, prospecting, and exploration studies for radioactive and rare earth elements in southern Jordan (Dubaydib rock formation) to determine the concentration of these important elements in the Dubaydib formation, which consists of three sections, DB1, DB2, and DB3, with a focus on DB2 rock layers exposed in the study areas. This is a joint project between the Ministry of Energy and Mineral Resources and Jordan Atomic Energy Commission. Preparation of the project's scientific report has begun.

3. Lithium Project

The lithium project is located in the Dubaydib and Dead Sea region, and it currently preparing its first report.

9.4. Geophysical Projects

Geophysical projects are conducted in various parts of the Kingdom to help geological surveys locate anomalous areas with the goal of prospecting for natural resources. The projects are also for the purpose of earth crust studies, including studies of formations and groundwater reservoirs, and other needed studies, as well as geophysical and geotechnical studies. This year's accomplishments are as follows:

1. General Gravity Survey Project in the Kingdom

The significance of this project lies in conducting integrated geophysical and geological studies of the Kingdom, and its special importance is in determining the geological structures, studying the earth's crust and water reservoirs, and searching for mineral ores. Work continued in the south of the Kingdom, covering 4290 km² in the Dubaydib, Batn Al-Ghul, and Mudawwara areas. About %33 coverage has been accomplished.

2. Geophysical Services

The Ministry of Energy and Mineral Resources is conducting multiple geophysical studies at the request of official, private, and research institutions. The following studies have been conducted in this field:

- Geophysical Studies for Groundwater Sources Management Project
A geophysical technical study is being conducted with the aim of determining the depth of the water table in order to dig new water wells in the eastern regions of Mafraq governorate in response to the Syrian refugee crisis. The geophysical survey was conducted, producing 42 TEM measurement points using Time Domain Electromagnetism (TDEM).
- Geophysical Studies for Sinkholes Project
A multipolar geoelectric study is being conducted for the sinkholes study project, with the aim of determining the extent of areas at risk of sinking in the Ghor Haditha area of the Dead Sea.
- Magnetic Survey of Kahf al-Raqim Area
A magnetic survey study was conducted in the Kahf al-Raqim area south of Amman, near Sahab. The results showed no abnormal magnetic values measured or magnetic anomalies observed in the study area with the exception of some values that were related to metallic objects or the influence of power lines located in the area.
- Well Exploration Using Natural Gamma Radiation
At the request of Al-Own Co., gamma spectroscopy imaging of two wells was conducted (well logging) in an oil shale exploration project in the Attarat Um Ghudran area.

9.5. Jordan Seismological Observatory

The observatory continues its role of recording and analyzing seismic around the clock through its national network of monitoring stations under the Ministry of Energy and Mineral Resources. The network is updated annually. There are currently 18 stations distributed throughout most areas of Jordan, as well as a network of 25 powerful seismic motion detection devices placed in important locations, such as dams and tall buildings, and open areas.

The national seismic observation network recorded 1423 earthquakes distributed as follows:

1. Local quakes: 361 along the Dead Sea Rift Valley, which extends from the Gulf of Aqaba in the south to southern Turkey in the north; the largest quake was 4.7 and occurred in the region of Lake Tiberias (Sea of Galilee) on July 2018 ,4, at 22:45 local time.
2. Regional quakes: 480, most of which were in the eastern Mediterranean basin
3. Distant quakes: 582

10. Laboratories and Quality

Ministry laboratories analyze all types of natural ores using various methods to find out the types of minerals and the primary and secondary elements they contain. In December 2018, ISO 2005-17025 was applied over a period of five years, after obtaining certification for 14 tests in the field of physical, mechanical, chemical, and geochemical tests of the JAS Test-61 certification. The Ministry seeks to renew the certifications from the Jordan Standards and Metrology Organization for a new five-year cycle starting at the beginning of 2019 in order to obtain certifications for new tests and move toward the implementation of ISO 2017-17025, issued in Jordan and internationally in 2017. Under an agreement signed between the Ministry of Energy and Mineral Resources and Shell Jordan, the Geochemical Research Laboratory was donated with all equipment, devices, and materials, and an integrated cadre is being trained to manage this laboratory efficiently. This year, the achievements were as follows:

10.1. Chemical and Mineral Analyses

The laboratory analyzes all types of natural raw materials to find out the type of minerals and the primary, secondary, and rare elements they contain using X-ray spectroscopy, X-ray diffraction, plasma, graphite atomic absorption, and degree of whiteness. In 2018, approximately 1352 samples, including 557 samples for various Ministry projects and 795 samples for private mining companies and Jordanian universities, were analyzed.

10.2. Organic Geochemical Studies and Analyses

The laboratory analyzes rock samples containing organic materials, such as rocks and oil sands, to determine the proportion of elements they contain, such as carbon (organic and mineral), sulfur, hydrogen, and nitrogen, and the energy value of samples, whether liquid or solid.

The laboratory received and analyzed 296 samples, 27 for the Ministry and 269 for Jordanian government universities and private sector companies, in particular Al Qamar for Energy & Infrastructure Ltd.

10.3. Soil and Rock Mechanics and Quality

The laboratory analyzed 79 samples of various materials, conducting tests on them to determine their physical and mechanical properties (specific weight, absorption, volumetric density, volumetric gradient, surface corrosion, sand equivalent, moisture content, overburden pressure, and hydrometer) at the request of numerous different private sector entities.

The laboratory analyzed 138 samples of coarse, fine, and sand aggregates as part of a project to control the quality of aggregates produced by various crushers operating in the Kingdom. In addition, 414 tests were conducted on the samples (via Corrosion Measurement Device in Los Angeles, specific weight, absorption, passage through the 200# sieve, and sand equivalent).

11. Institutional Development

11.1. Strategic Planning

- Update and develop the Ministry's 2018-2016 strategic plan, publish it on the Ministry website and circulate to all stakeholders.
- Prepare and evaluate executive plans in coordination with all organizational units.
- Develop and evaluate procedures to promote the core values for 2018, relying on standards of integrity and transparency in the public sector.
- Review and develop a methodology for 2018 for managing partner relationships, incorporating all measures according to a comprehensive plan that involves and informs partners of developments. This occurred through holding three meetings with partners (two meetings of the Partnership Council and one meeting of the Ministry partners' liaison officers), which led to raising the level of partner satisfaction to %84.9 in 2018, compared to %83.4 in 2017.
- As part of the Month of Excellence events, 14 meetings were convened for all organizational units for the purpose of reviewing the 2018-2016 strategic plan in order to prepare the 2021-2019 plan.

11.2. Operations and Services

Developed a methodology for 2018 for managing customer relationships, incorporating all measures according to a comprehensive plan that is reflected in the improvement and development of services in a manner that ensures added value for customers with the goal of improving performance.

Developed four specialized questionnaires for customers, according to best practices:

- Questionnaire to measure satisfaction and determine needs of customers for fee-charged services.
- non-fee-charged services.
- Questionnaire to measure satisfaction and determine needs of customers for paper-based information request services.
- Questionnaire to measure satisfaction and determine needs of customers for services offered by JREEEF.
- Updated and developed the 2019-2017 services manual, which includes 31 services, and circulated it to all stakeholders.
- Studied all services and determined priorities according to specific criteria, such as the intensity of demand for the service and its impact on the environment and society, and placed them on the list of priorities for simplifying services for 2020-2018. Accordingly, the following services have been re-engineered:
 - Exemption placement service for systems and inputs of renewable energy and energy conservation: the service provision form was completed and placed on the Ministry's external website, and the customer satisfaction office was charged with receiving requests for lamps and lighting units to accommodate customers.
 - Fils Al Reef service to deliver electricity to needy sectors: the service provision form was completed and placed on the Ministry's external website to facilitate customers, especially in places far from any service center.
 - Service to exempt electrical equipment for private electric generation projects: the service provision form was completed and placed on the Ministry's external website to facilitate the category benefitting from the service, i.e. all companies that generate electricity privately.

In order to accommodate the customer, the implementation of the electronic payment project for the following five services has been completed:

- Laboratory tests
- Sale of digital maps
- Geological maps and reports
- Seismological studies
- Tender purchase

- Addressed all complaints and suggestions received by the suggestions and complaints committee during 2018 through the approved communication channels (consisting of the "At Your Service Platform," suggestion and complaint boxes, devoted email address for suggestions and complaints, and the government complaints system) within the specified time and based on the methodology of managing suggestions and complaints at government agencies.
- The level of customer satisfaction in 2018 was %91.9, compared to %91.7 in 2017.
- Reviewed and developed a methodology for managing operations; reviewed and developed an operations booklet and operations for all organizational units, beginning with creating a form for designing operations according to best practices; documented and coded all operations based on this form.
- Developed and reviewed a methodology in 2018 for managing operations, after preparing the evaluation report and the operations simplification plan.

11.3. Knowledge Management

- Developed a methodology for managing knowledge in the Ministry in 2018, with the goal of creating documented principles for managing knowledge in the Ministry to help strengthen institutional performance and bring about awareness of and attention to the subject of knowledge management.
- Developed and updated a methodology for holding lectures in the Ministry in 2018, which formed the basis for holding 19 lectures on a variety of topics as part of the monthly visitor program.
- Prepared studies to assess the cognitive impact of the lectures (semi-annual/annual) during 2018, including all metrics for the methodology of holding lectures.
- Prepared a study to measure email satisfaction (Sabah al-Marefa).
- Evaluated the information and knowledge management strategy for 2018-2016.
- Offered a reply service to requests for information during 2018.
- Prepared reports on information requests (semi-annual/annual) during 2018, including all metrics achieved after providing the service, and gave copies to the Information Council.
- Listed all knowledge assets available in the organizational units in electronic form for the purpose of publishing them on the internal website of the Ministry portal under the heading "Knowledge Bank."
- Inventoried and documented clear knowledge assets in the Ministry for the year 2018.
- Inventoried all confidential and protected documents from the Ministry's organizational units in 2018, and provided them to the Information Council and the National Library, pursuant to the law guaranteeing the right to access information.

11.4. Implementation of Law Guaranteeing Right to Access Information

- The Ministry of Energy and Mineral Resources implements the Guarantee of the Right to Access Information Law No. 47 of 2007, and it is considered one of the first ministries to document and classify its confidential and protected documents since 2008 in response to the Prime Minister's state communiqué No. 7 of 2007.
- The Ministry has worked to institutionalize work with regard to law enforcement through several procedures, including the designation of an information officer in the Ministry, adding his duties to the job description of "Head of the Knowledge Management Department," in order to ensure the sustainability of the work.
- Automated service requests for information.
- Raised Ministry employee awareness of the right to obtain information through various means such as e-mail, periodic meetings, and lectures.
- Provided the Jordanian Information Commissioner/Information Council with two reports during 2018, a semi-annual report and an annual report, including information requests received by the Ministry.
- Inventoried and classified all confidential and protected documents in the Ministry during 2018.
- Developed a questionnaire to measure satisfaction and determine customer needs for paper-based information request responses.
- Published the publishable information on the Ministry's external website under the heading "Frequently Asked Questions" under the Open Data tab.
- The Ministry celebrated International Access to Information Day, held on September 28 every year, by holding an awareness-raising activity for citizens on this right as part of the activities of the Ministry's second Month of Excellence. The celebration included allocating a booth in Mecca Mall to raise awareness of this right. The booth distributed a special brochure on the Ministry's procedures for responding to information requests and explained the mechanism declared for providing the service. The celebration also included educating employees about the Ministry's achievements in implementing the right to obtain information through its work with the "I Know" project. The Ministry is considered a success story for the project, which is working with 22 ministries and governmental institutions in its first phase.
- The Ministry received 87 requests for information in 13 ,2018 of them paper and 74 electronic.
- The average reply time for information requests, both paper and electronic, was 3.6 days.
- The satisfaction rate of those requesting information was %92.5.



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