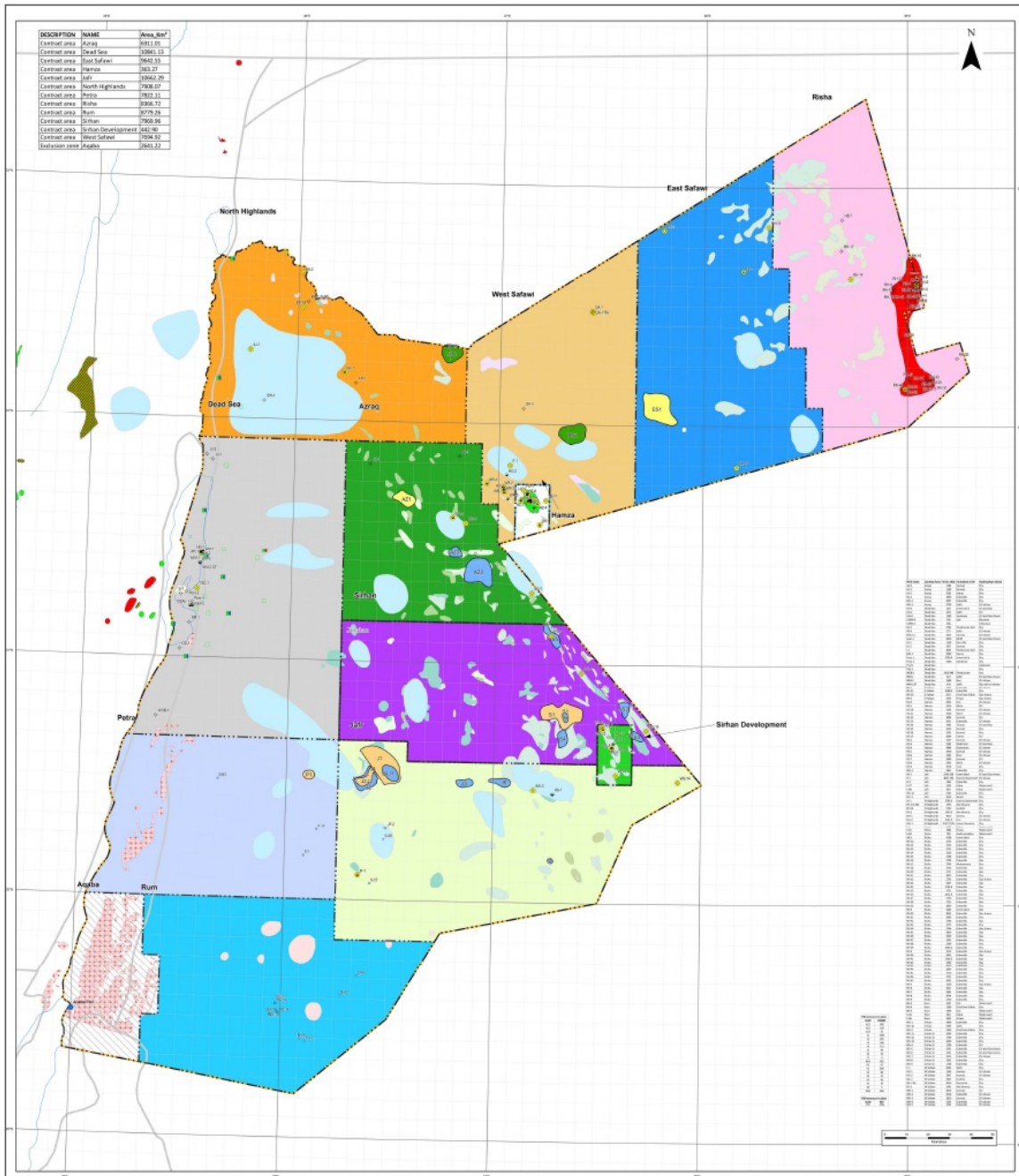


# Petroleum and Oil Shale Sectors

## Petroleum Sector

### Petroleum Exploration Contract Areas in Jordan



**Table of Contract Areas in Jordan**

<b>No.</b>	<b>Description</b>	<b>Name</b>	<b>Area (km<sup>2</sup>)</b>	<b>Number of drilled wells</b>	<b>Status</b>
1	Contract Area	Azraq	6311	6	Under negotiation
2	Contract Area	Dead Sea	10841	20	Open
3	Contract Area	East Safawi	9642	4	Under PSA
4	Contract Area	Hamza	363	19	MEMR Assesment
5	Contract Area	Jafr	10662	7	Open
6	Contract Area	North Highlands	7908	7	Open
7	Contract Area	Petra	7822	3	Open
8	Contract Area	Risha	8366	43	Under concession
9	Contract Area	Rum	8779	5	Open
10	Contract Area	Sirhan	7969	3	Under negotiation
11	Contract Area	Sirhan Development	442	9	MEMR Assesment
12	Contract Area	West Safawi	7694	11	Open
13	Exclosion Zone	Aqapa	2641	-	Open

### **Exploration for oil and gas sector**

Oil was discovered in the Year 1984 in Hamza Field of Azraq Area with a cumulative production to-date of about 1.1 million barrels. Commercial gas was discovered in the Year 1987 in the Risha area close to the borders with Iraq with a cumulative production to-date of about 221 BCF. Other oil occurrences in Jordan include light oil of 42 API are present in well WS-4 of Sirhan development contact area. Oil shows are present in Cambrian sandstones of wells AH-1, AH-2 and HD-1 in the Dead Sea area. Oil shows were also recorded from Jurassic carbonates of well NH-2 near the borders with Syria. Such oils are highly sourced from organic rich Triassic carbonate and shale of Triassic age that were deeply buried within Damascus Basin. Base Silurian hot shale constitute a major source rock for Paleozoic petroleum systems while the deep-seated upper Cretaceous oil shale are believed to constitute a major petroleum system that is yet to be tested.

The Kingdom was divided into twelve contract areas two of them are development areas according to CGG study 2017.

### **Oil & Gas Agreements: -**

1. Risha contract area: It is given to the National Petroleum Company under a concession for period of (50) years from 1996 until 2046, with a daily production rate (9-10) MMCF that are supplied for the power station in the site. It contributes around (2%) of the Kingdom's needs of electric power.
2. East Safawi contract area: This area was awarded through a Production Sharing Agreement "PSA" to the National Petroleum Company "NPC" since 2014; the agreement was issued by a special law 14/2014.

### **Open Exploration Blocks**

1. Jafr contract area.
2. West Safawi contract area.
3. Dead Sea contract area.
4. North Highlands contract area.
5. Petra contract area.
6. Rum contract area.

The two development areas of Hamza field and Sirhan 4 are under the Ministry of Energy & Mineral Resources assessment process.

Azraq & Sirhan open Blocks are under negotiation with an interested company for signing PSA Agreement.

## Oil Shale sector

### The Government has signed four retorting concession agreements to produce oil:

#### **1. Jordan Oil Shale Company B.V (JOSCO).**

A company that is owned by Dutch Shell for exploiting the deep oil shale reserves to produce oil, signed a concession agreement that was issued as a law in 2009 and for 120 years, the company completed the first two phases during which it has constructed the Jordan Field Experiment "JFE", the company is undergoing the technical interpretation of the JFE results in order to develop its technology accordingly.

#### **2. Karak International for Oil Company.**

A British company working in oil shale exploitation through surface retorting to produce oil with an approximate investment of 1.9 billion Dollars, a concession agreement was signed with the company which was issued as special law in 2011; the agreement was amended in 2018 extending the pre-development phase upon the global oil price drop.

#### **3. Saudi Arabian Oil Shale Company.**

A Saudi company for oil shale exploitation through surface retorting to produce oil with an approximate investment of 1.8 billion Dollars, a concession agreement was signed with the company which was issued as special law in 2014, the company still working on the pre-development phase plan. Specific articles in the agreement were amended in 2018 according to the project special requirements.

#### **4. Jordan Oil Shale Energy.**

A consortium of Estonian/Malaysian/Jordanian for oil shale exploitation through surface retorting to produce oil with an approximate investment of 4-6 billion Dollars, a concession agreement was signed with the company which was issued as special law in 2010.

**The government also has signed 5 Memoranda of Understanding “MoU” with many international and local companies for investigating the possibility of retorting oil shale to produce oil.**

- 1- Shale Energy (JOSECO)
- 2- Global Oil Shale Holdings Inc. (GOSH)
- 3- Al Qamer for Energy & Infrastructure Ltd. Co.
- 4- Questerre Energy Company
- 5-AL-Lajjun Company.

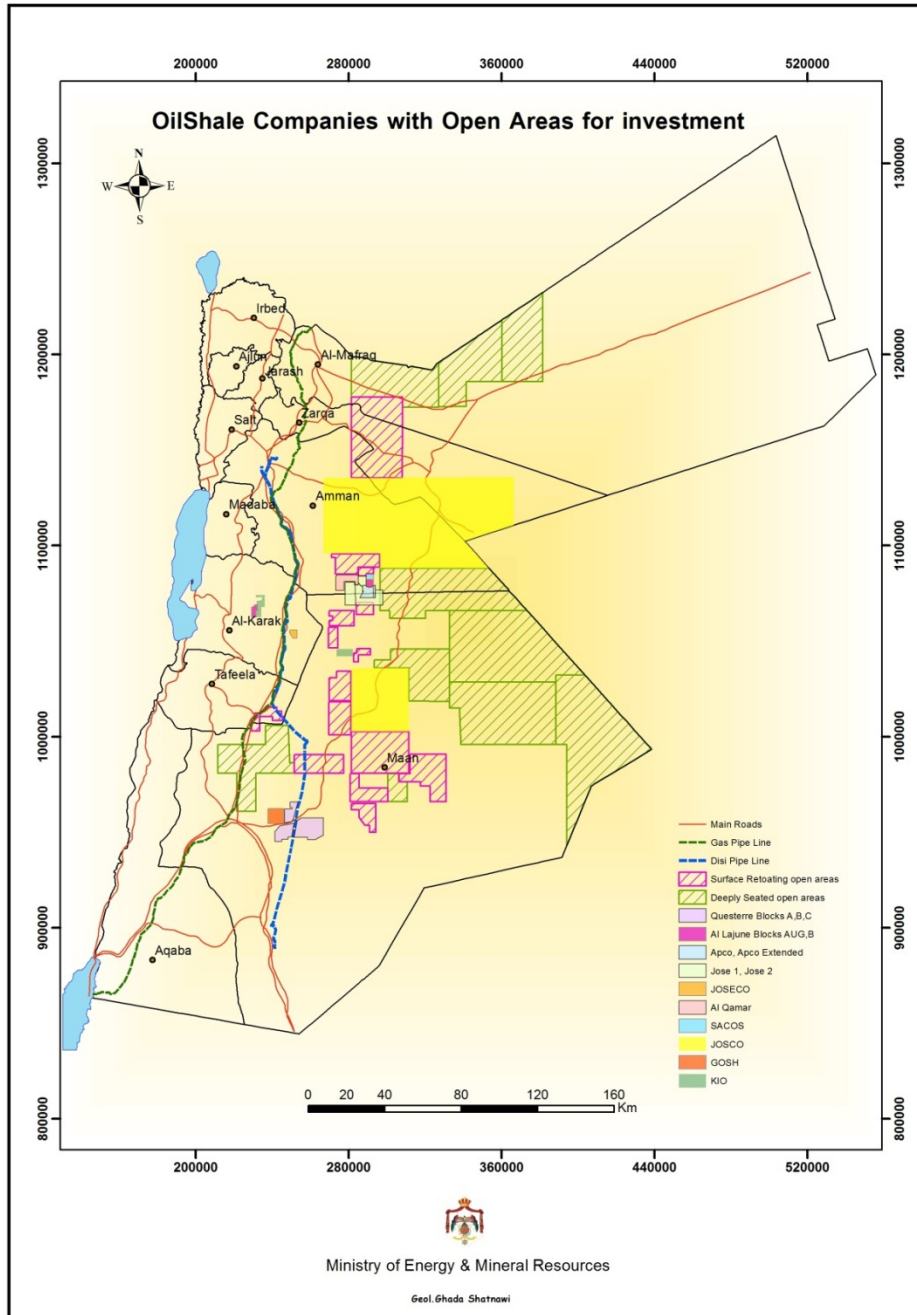
### **Oil Shale Direct Combustion Power Projects**

#### **Attarat Power Company (Chinese – Malaysian – Estonian)**

Attarat Power Company had signed the Agreements to generate electricity by Oil Shale Direct Combustion. The company has already started the construction of the project on ground during the second quarter of 2017 and it is expected to the first commercial operation with a capacity of 470 megawatts by the mid of 2020. This Oil Shale project is considered one of a kind in Jordan and in the region.

Based on a policy that has been approved by the Council of Ministers, and based on the capacity of the electrical local grid in Jordan, competitive bidding shall be adopted for better competitive Tariff in the future.

# Oil Shale Investment in Jordan



The Government of Jordan, represented by the Ministry of Energy and Mineral Resources (MEMR), is continuing to actively encourage the development of its Oil Shale resources by supporting qualified entities in Research, development, mining, processing and production of oil and electricity from Oil Shale. MEMR encourages investments by capable developers in Oil Shale. MEMR supports projects across the Oil Shale industry, including:

- Oil production from surface and deep oil shale:
  - ✓ Mining;
  - ✓ Processing;
  - ✓ Upgrading of synthetic crude oil;
  - ✓ Processing and production of oil shale derived products;
- Generating electricity and
- Research and development

MEMR requires that certain criteria need to be met by interested developers in order to achieve the efficient, cost-effective and successful Oil Shale Development. These criteria are common to the parties that have so far been successfully selected to commercially develop Oil Shale in Jordan. In the interests of transparency, by publishing these Guidelines, MEMR is sharing these criteria with other interested Applicants. This will assist Applicants when putting proposals together and will streamline the process.

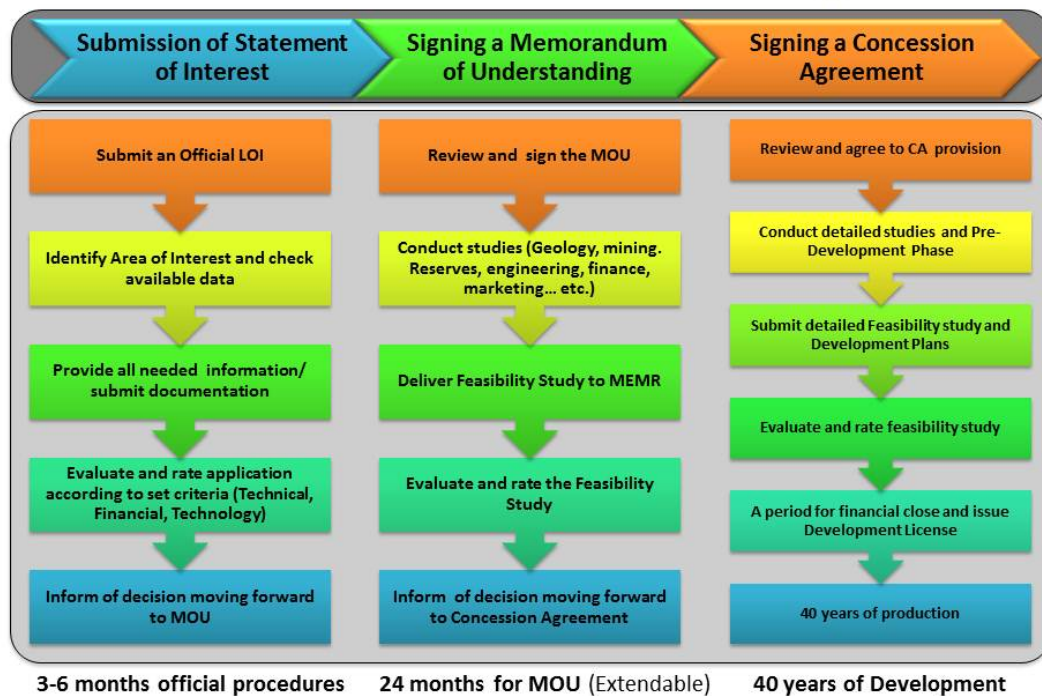
These Guidelines have been created to provide guidance to Applicants who are seeking to enter into a contract with MEMR to develop Oil Shale.

These Guidelines share the criteria and conditions under which Development will occur and seek to create a collaborative structure for the management and monitoring of all activities related to Oil Shale Development in Jordan.

## Summary of application process for all Tracks

- Applicants must first submit a statement to the MEMR; letter of intent contains their track of oil shale development and demonstrates the applicant qualifies.
- If the Statement demonstrates that an Applicant qualifies; an Applicant then prepares an Application which contains more detailed information as to the proposed project.
- If this Application is successful, an MOU, PPA or Concession Agreement may be signed.
- For Applicants seeking to develop commercial oil shale exploitation projects, MEMR expects that all companies will first enter into an MOU with MEMR, before submitting a Concession Application.

### Oil Shale Investment – General Framework



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