PETROLEUM POTENTIAL OF MONGOLIA

March 6-10, 2023, Singapore
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MONGOLIA AT A GLANCE

Population

• Declaration independence 29/12/2011, Mongolia 1,564,116 square kilometers (603,909 sq mi), The total population of Mongolia estimated 3.12 million. The official language is Mongolian.

• It is also the world’s second-largest landlocked country behind Kazakhstan and the largest landlocked country that does not border a closed sea.

Geography

• Mongolia is known as the "Country of Blue Sky" because it has over 250 sunny days a year. Most of the country is hot in the summer +30 °C (+22 °F) and extremely cold in the winter, with January averages dropping as low as −30 °C (−22 °F).

• The geography of Mongolia is varied, with the Gobi Desert to the south and with cold and mountainous regions to the north and west.

• Much of Mongolia consists of the Mongolian-Manchurian grassland steppe, with forested areas comprising 11.2% of the total land area. The whole of Mongolia is considered to be part of the Mongolian Plateau, far from any oceans, with average elevation of 1580 meters above the sea level.

Climate

The Governance

Mongolia is a parliamentary republic. The Parliament is elected by the people and in turn elects the government. The President is elected directly. Mongolia’s constitution guarantees freedom of expression, religion, and others rights.

Mongolia has number of domestic airway and railway ports. The only International airport is the Chinggis Khaan Airport, located in outskirts of Ulaanbaatar city. Regular flights exist between Mongolia and Moscow, Berlin, Frankfurt, Beijing, Hong Kong, Shanghai, Seoul, Tokyo, Osaka, Bangkok, Istanbul and Bishkek.

The Trans-Mongolian Railway is the main rail link between Mongolia and its neighbors. It begins at the Trans-Siberian Railway in Russia at the town of Ulan-Ude, crosses into Mongolia, runs through Ulaanbaatar and then passes into China at Erlian port city, where it joins the Chinese railway system.
**EXTRACTION SECTOR OF MONGOLIA**

**MINING SECTOR**
(2021)

- **GROSS DOMESTIC PRODUCT** *
  - 24%

- **FOREIGN INVESTMENT**
  - 76%

- **INDUSTRY SECTOR**
  - 69%

- **EXPORT**
  - 93%

**TOTAL BUDGET REVENUE**
(2021)

- **TOTAL**
  - 13,362.3 Billion MNT

- **29.6%**

- **MINERAL RESERVES**
  - Copper (MM tons): 57
  - Coal (bn tons): 33.2
  - Iron (bn tons): 1.2
  - Gold (tons): 490
  - Fluorite (MM tons): 48.3
  - Crude oil (MM tons): 332.6

* - GDP, Direct Foreign Investment in 2021  
Source: National Satirists Office, General Customs Office
FDI inflow into Mongolia has been significantly increasing for the last few years. Totally 14,932 companies with investments from 120 countries are incorporated and USD 26.8 billion has been invested in Mongolia between 1990 and 2019. From 2000-2011, Mongolia registered an intense and sustained increase in FDI inflows, on the back of the dramatic expansion of the mining sector and the development of the Oyu Tolgoi surface mine. Such trends allowed it to reach an all-time peak of USD 5.7 billion in 2011. After 2012, weaker commodity prices added to deteriorating investor sentiment in Mongolia, ultimately leading to a drastic drop in FDI inflows. However, because the sustainable policy focused on the investors, FDI inflows to Mongolia have been constantly increasing since 2016. Geological prospecting, oil exploration, and mining industries are the main sector destination for FDI coming to Mongolia. Aside from extractives, FDI goes to various service industries, particularly trade and catering services, banking and financial services, and transportation.

**SOURCE:** National Statistics Office of Mongolia
**PETROLEUM SECTOR**

**2022**

- **Total proved recoverable reserve**: 333.8 MM tons (~310 MM bbls)
- **OOIP**: 43.4 MM tons (~2.4 Bbo)

**TOTAL BUDGET REVENUE**

2,035 bill. MNT (1998-2021)

(~USD 100 Million)

**TOTAL EXPORT**

9.5 mil. tons (1998-2021)

(~70 MM bbls)

**IMPORT OF PETROLEUM PRODUCTS**

1.9 MM TONS ($1.2 BILLION)

(100%)

**INDUSTRIAL REVIVAL (2022-2030)**

- **PETROLEUM EXPLORATION**
  - 14 exploration blocks in total to be awarded
  - First tranche of 5 blocks announced in November, 2022
  - Second tranche 5 blocks announced in February, 2023

- **PETROLEUM REFINERY**
  - Petroleum refinery
  - Crude oil Pipeline
  - Petroleum products standard and monitoring

**PETROLEUM REFINERY PROJECTS**

1. Petroleum resource and exploration project
2. Petroleum refinery
3. Crude oil pipeline and other projects

**TO INCREASE EXTRACTION OF CRUDE OIL**

- 14 exploration blocks in total to be awarded
- First tranche of 5 blocks announced in November, 2022
- Second tranche 5 blocks announced in February, 2023

**SOURCE**: Ministry of Mining and Heavy Industry, Mineral Resources and Petroleum Authority of Mongolia
PETROLEUM EXPLORATION & PRODUCTION

PRODUCTION SHARING CONTRACTS

- 3 blocks in 2015, 2016, 2017
- 2 blocks in 2018, 2019
- 4 blocks in 2020

PETROLEUM EXPLORATION BLOCKS

- 9 CURRENT PRODUCTION SHARING CONTRACTS
- 14 BLOCKS IN TENDER ROUND
- 6 UNCONVENTIONAL
- 4 PRODUCTION BLOCKS

PETROLEUM EXPLORATION, PRODUCTION exp
TOTAL - $4.3 Bn USD

EXPLORATION WORK ACTIVITIES

- Exploration wells
- Gravity
- Magnetic 7763 km²
- Magnitot ellur 180
- Passiv seismic 210 point
- Gradiomete
- 2d seismic 35440.3
- 3d seismic 647

PETROLEUM PRODUCTS IMPORT, CONSUMPTION /THOUSAND.TONS/ (2008-2021)

Petroleum Products Importing

- 2003: 441.4
- 2007: 884.1
- 2011: 1,407.9
- 2015: 1,191.6
- 2019: 2,004.2

PETROLEUM PRODUCTS IMPORT MILLION DOLLARS (2018-2021)

- 2019: $1165.8
- 2020: $838.2
- 2021: $1,159
## LEGAL FRAMEWORK

<table>
<thead>
<tr>
<th><strong>Vision 2050 (Parliament), 2020</strong></th>
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</thead>
</table>
| Mission: - to respect our roots, nationalism and heritage,  
- to value our united national values,  
- to support the progressive achievements of mankind,  
- to protect the earth and native nature with love,  
- to build a peaceful and humane society,  
- to promote democracy and justice strengthen the governance,  
- a self-sustaining economy is equally and accessible to every family and citizen,  
- it will develop into a country with healthy, educated, patriotic, flexible, intellectual and creative citizens; |

<table>
<thead>
<tr>
<th><strong>Investment Law (2013/10/03)</strong></th>
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</table>
| ✓ To create stable environment for investment (investment would be stabilized);  
✓ Not affect the rights of investors; |

<table>
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<tr>
<th><strong>Border Law (2013/12/26)</strong></th>
</tr>
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| ✓ Improved border management;  
✓ Integrated administration with permanent operation and reduction of bureaucracy; |

<table>
<thead>
<tr>
<th><strong>Customs &amp; VAT-free Law (2013/06/07)</strong></th>
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<tbody>
<tr>
<td>✓ Customs and VAT tax relieve for facilities and equipment, which are used in the processing of crude oil, coal, oil shale, are till 2018;</td>
</tr>
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<tr>
<th><strong>Amendment of Customs tariffs, duties and VAT laws (2014/07/01)</strong></th>
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<tr>
<td>✓ Imported facilities, equipment, tools, raw materials, chemicals, explosives and spare parts in the total period of exploration and in the first five year of exploitation of conventional and unconventional oil will be relieved from Customs and VAT.</td>
</tr>
<tr>
<td>Government action program 2020-2024</td>
</tr>
<tr>
<td>-------------------------------------</td>
</tr>
<tr>
<td>• Enrich mineral resources by increasing investments in high-tech raw materials ..., oil exploration..</td>
</tr>
<tr>
<td>• Establish oil refinery based on domestic raw materials</td>
</tr>
<tr>
<td>• Increase the reserves by intensifying the search, exploration and production of oil and unconventional oil.</td>
</tr>
<tr>
<td>• Make decision on the financial resources for the supply of raw materials to the oil refinery and the construction of pipelines, and carry out construction work.</td>
</tr>
<tr>
<td>• To establish Refinery in Dornogovi aimag Altanshiree sum,</td>
</tr>
</tbody>
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<table>
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<tr>
<th>Petroleum Law Amended in 2014.07.01</th>
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<tbody>
<tr>
<td>• Designed to create a favorable legal environment for exploration by oil companies. And to create a more suitable environment for investor’s whose with best industry practice.</td>
</tr>
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<thead>
<tr>
<th>Production Sharing Contract</th>
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<tr>
<td>• Mongolia's Model PSC serves as the basic document for negotiations between foreign oil companies and the Government and MRPAM. It sets out in detail the terms under which exploration and production can take place.</td>
</tr>
</tbody>
</table>
More clear for investors, creates more favourable conditions for investors than international average, and will not affect the investors’ rights;

To provide clear, transparent legal environment for investors through existing policies, laws, regulations, standards and permit-control systems of the industry to comply with international standards;

Legal entity that have performed the exploration for conventional and unconventional oil will be open to apply for PSC signing on the surveyed block;

The Parliament of Mongolia will consistently adhere to create a legal framework for long-term stable policy for investment in the petroleum industry.
The Stage of Production Sharing Contract

- Application obtained, making the negotiation and selection processes are provided within the 60 days by MRPAM.
- The negotiated draft PSC is delivered to MMHI (Ministry of mining and heavy industry)
- MMHI monitored and its proposition delivers to the government.
- The government makes final decision within 60 days.
- If the government approves the contract, MRPAM signs the PSC within 30 days and notify the local government.

Total 180 days.

Fiscal Regime

Mongolian petroleum policy, law, regulation and standards are clear, transparent and understandable in compliance with international standard and with the aim of being sustainable, long term legal environment in the sector.

Production Sharing Contract Summary

License Terms:
- Exploration Phase: 8 years plus two, 2 year extensions (maximum 12 years)
- Exploitation Phase: 25 years plus two, 5 year extension (maximum 35 years)
  - Production Split and Bonuses – negotiating
  - Royalty 5% to 15% - negotiating
  - Income Tax - exempt
  - Oil price based on world market price for similar quality crude
  - Cost Recovery up to 40% after deducting Royalty
- All costs expensed (no depreciation) and carried forward indefinitely

Acreage Fees:
- Exploration Phase: US$ 3/km², US$ 8/km² in extension periods
- Exploitation Phase: US$ 100/km², US$ 200/km² in extension periods
**Status Exploration Pre-1990**

- Field work, outcrop and boreholes suggest source rocks occur across the country
- Focus in Zuunbayan area with few wells drilled in other eastern basins in the 1950’s
- No or very little activity from 1960’s to 1990
- 1990 Petroleum Potential of Mongolia Report collates data for first time and generates international interest (BP and others do fieldwork)

**Status Exploration Post-1990**

- Penttila 1994 paper estimates up to ~ 6 Billion boe resources across all basins
- Soco’s discoveries developed by PetroChina reaching 22,500 bopd by 2016
- Lots more field work and geochemistry hints at country-wide source rock potential
- Drilling proves new accumulations and several new active petroleum systems
- But majority of basins are under-explored especially for older plays

### Map

- **Zuunbayan and Tsagaan Els Fields**
  - c. 1940’s onwards
- **Two shallow holes into granite**
- **Oil Recovered From Choibalsan Basin Wells**
- **Petroleum Systems Proven in Previously Undrilled Basins**
- **Westernmost Basins Remain Undrilled**
  - (Source Rocks Present)
- **Spectacular outcrops show clastic reservoirs well develop**
  - **Sands >10m thickness proven oil bearing**
- **Extensive Turbidites**
- **Interbedded Fluvio-lacustrine Sands**
- **Thick Deltaic & Shoreface Packages**
MONGOLIAN BASINS ADJACENT TO PROVEN PROLIFIC CHINESE BASINS

Huge resources in Chinese Basins increasingly from new deeper plays

Cambrian to Paleogene Petroleum Systems now proven in northern Chinese Basins

Similar stratigraphy exists in underexplored Mongolian basins

Opportunity for new technologies (seismic imaging/drilling) to unlock potential

Younger reservoirs deposited in fluvial to localized lacustrine systems
Older reservoirs possibly deposited in marine settings and more widespread
Cambrian to Paleogene Petroleum Systems now proven in northern Chinese Basins
Similar stratigraphy exists in under explored Mongolian basins
Opportunity for new technologies (seismic imaging/drilling) to unlock potential

Petroleum System Elements in and adjacent to Mongolia

Mongolian Basins Adjacent to Proven Prolific Chinese Basins

Santanghu Basin Permian and Carboniferous source rocks (oil and gas)
Yingen Basin Lower Cretaceous, Triassic to Permian source rocks (oil and gas)
Hetao Basin Paleogene and Lower Cretaceous source rocks (oil)
Erlian Basin Lower Cretaceous source rocks (oil)

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA
MINISTRY MINING AND HEAVY INDUSTRY

Carboniferous to Paleogene plays proven adjacent to Mongolia where:
- Large stratigraphic range of source rocks proven from outcrop data
- Recent wells prove active petroleum systems in central/western basins
- Paleozoic coal measures a source of gas where preserved at depth?
- Deeper/older basin plays yet to be penetrated but could be extensive

Petroleum System Elements in and adjacent to Mongolia

- Proven Hydrocarbon Basins
- Outline Sedimentary Basins
- Oil and gas
- Source Rocks
- Permian Coal Mines
- Carboniferous Coal Mines
- Jurassic Coal Mines

Map legend:
- Mongolia Oilfields
- EAIT Report 1990 Encl4 Oil Seeps
FIRST TRANCHE TENDER ROUND BLOCKS

Block IX (Nomgon)
- Block Area: 29878.0383 km²
- Basin Area: c. 13392.39 km² (2 areas)
- Previous Operator: South Mongolia Petroleum LLC
- Award/Relinquished: Feb 07, 2014 / Sep 05, 2022
- Exploration Activity: Outcrop samples - geochemical analysis, 1779 point gravity survey, 790.6 km 2D seismic (2010-2012), Ger chuluu A1 well TD 1097.8 m, Ger chuluu D1 806 m (2012)
- Petroleum Systems: Lwr-Mid-Early Cretaceous/Lwr-Mid-Upper Jurassic

Block XIII (Tsagaan els)
- Block Area: 11,590 km²
- Basin Area: Unegt, Tsetserleg, Tavan Har
- Award/Relinquished: April 21, 2009 / August 25, 2020
- Exploration Activity: Outcrop samples - geochemical analysis, 1779 point gravity survey, 790.6 km 2D seismic (2010-2012), Ger chuluu A1 well TD 1097.8 m, Ger chuluu D1 806 m (2012)
- Petroleum Systems: Lwr-Mid-Early Cretaceous/Lwr-Mid-Upper Jurassic

Block XIV (Zuunbayan)
- Block Area: 8,731 km²
- Basin Area: Erdene, West Sainshand, East Sainshand (3 areas)
- Award/Relinquished: April 21, 2009 / August 25, 2020
- Exploration Activity: Outcrop samples - geochemical analysis, 2221 km² gravity survey, 1945.3 km 2D seismic (2010-2012), Gerchuluu A1 well TD 1097.8 m, Gerchuluu D1 806 m (2012)
- Petroleum Systems: Lwr-Mid-Early Cretaceous/Lwr-Mid-Upper Jurassic

MINISTRY MINING AND HEAVY INDUSTRY

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA
SECOND TRANCHE TENDER ROUND

Block Area: 14,280.21 km²
Basin Area: c. 6,058 km² (3 areas)
Restricted Areas: 1,276 km² area is overlapped by National Park
Previous Operator: Hongkong Welpec Industrial LLC
Award/Relinquished: Nov 19, 2015 / May 09, 2021
• Exploration Activity 1: Outcrop samples - geochemical analysis
  2278 point gravity, 210 km 2D seismic survey (2011)
• Petroleum Systems: Lower Jurassic/Upper Jurassic, Lower Jurassic/Upper Cretaceous, Permian-Carboniferous /limited/

Block Area: 16,954.6 km²
Basin Area: Tamsag Basin
Restricted Areas: 261.7 km² National Park overlap
Previous Operator: Petrochina Dachin Tamsag LLC
Award/Relinquished:
• Exploration Activity 1: Outcrop samples - geochemical analysis, 2,345.12 km 2D seismic survey (2011), 8 exploration wells
• Petroleum Systems: Middle Jurassic/Upper Jurassic, Upper Jurassic/Upper Cretaceous, Permian-Carboniferous /limited/
Thank for your attention

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https://www.mrpam.gov.mn