



MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA

MINISTRY MINING AND HEAVY INDUSTRY



PETROLEUM POTENTIAL OF MONGOLIA



March 6-10, 2023, Singapore



OUTLINE

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA

MINISTRY MINING AND HEAVY INDUSTRY

1. MONGOLIA
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3. PETROLEUM EXPLORATION, PRODUCTION
4. LEGAL FRAMEWORK
5. PRODUCT SHARING CONTRACT
6. STATUS EXPLORATION PRE-1990 AND POST-1990
7. MONGOLIAN BASINS ADJACENT TO PROVEN PROLIFIC CHINESE BASINS
8. PETROLEUM EXPLORATION OPEN BLOCKS



MONGOLIA AT A GLANCE

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POPULATION THE GOVERNANCE

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.



Geography

- 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](#).



Climate

- 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.



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

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MINING SECTOR (2021)



24%



76%



69%









93%

TOTAL BUDGET REVENUE (2021)



4,114.4 billion MNT
29.6%

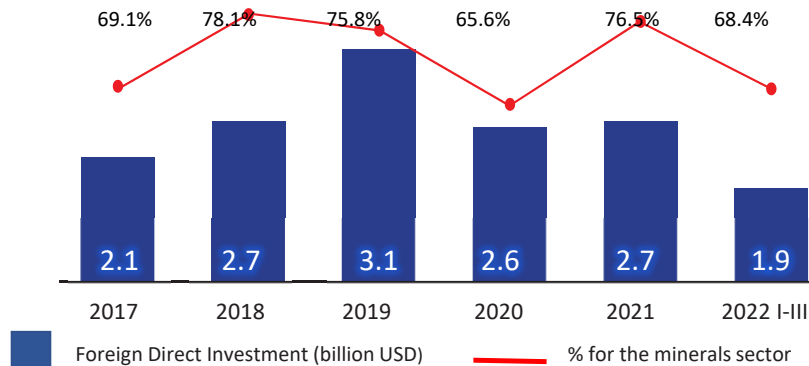
MINERAL RESERVES

	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

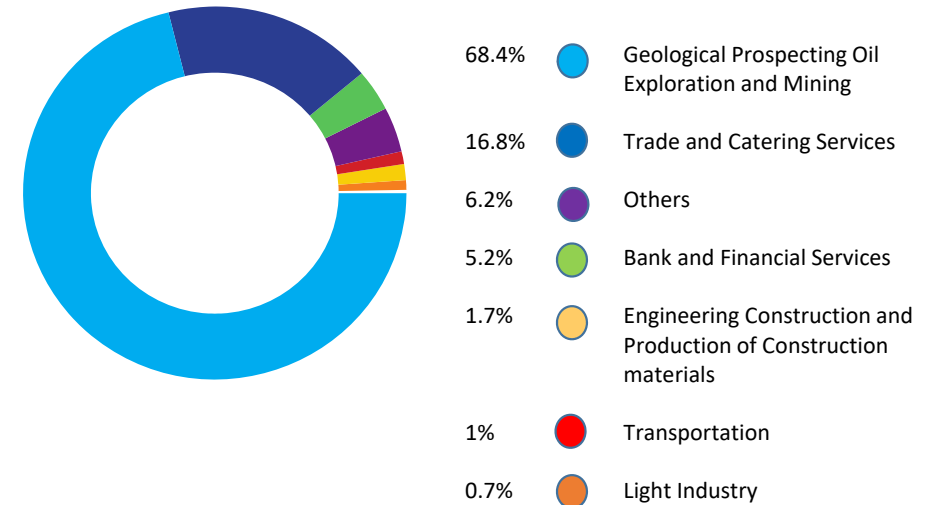
* - GDP, Direct Foreign Investment in 2021 Source: National Statistics Office, General Customs Office

FOREIGN DIRECT INVESTMENT

The 68% of the total Foreign Direct Investment is fueled into the Minerals sector



FOREIGN DIRECT INVESTMENT BY SECTORS 2022 I-III



FOREIGN DIRECT INVESTMENT STATISTICS 2022 I-III

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.

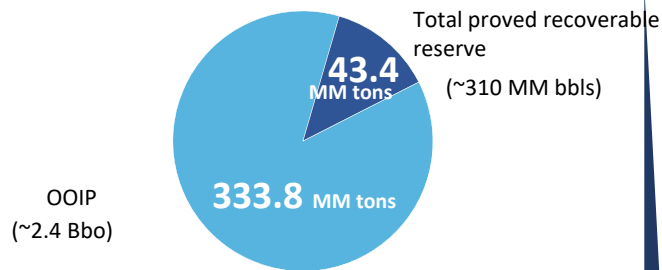
SOURCE: National Statistics Office of Mongolia

PETROLEUM SECTOR

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2022



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
(100%)

\$1.2 BILLION



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



TO INCREASE EXTRACTION OF CRUDE OIL



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

3 projects

Import of Petroleum products

1.17 MM tons
(45%)

Domestic refinery

1.33 MM tons
(55%)

SOURCE: Ministry of Mining and Heavy Industry, Mineral Resources and Petroleum Authority of Mongolia

PETROLEUM EXPLORATION & PRODUCTION

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PETROLEUM EXPLORATION BLOCKS

9 CURRENT
PRODUCTION SHARING
CONTRACTS

14 BLOCKS IN
TENDER ROUND

6 UNCONVEN-
TIONAL
4 PRODUCTION
BLOCKS

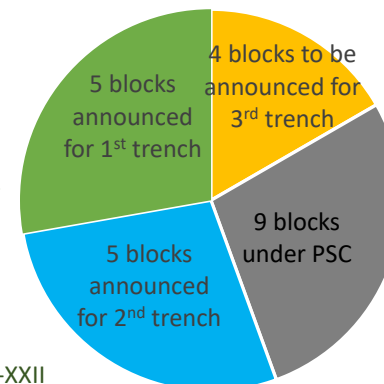
PETROLEUM EXPLORATION, PRODUCTION exp
TOTAL - 4.3 Bn USD

Khar us II	23003.3
Sharga III	27093
Nemegt IV	13813
Barzon VII	33663.5
Khongor VIII	29259.9
Namgan IX	29878
Tukhum X north	20903.9
Tsagaan els XIII	11729.3
Zuunbayan XIV	8699.1
Bayankhoshuu XXII	6,484
Dariganga XXIV	16936.3
Choir XXV	18588
Tsaidam XXVI	20993.3
Khertentokhai XXVIII	14812.4

275857.1

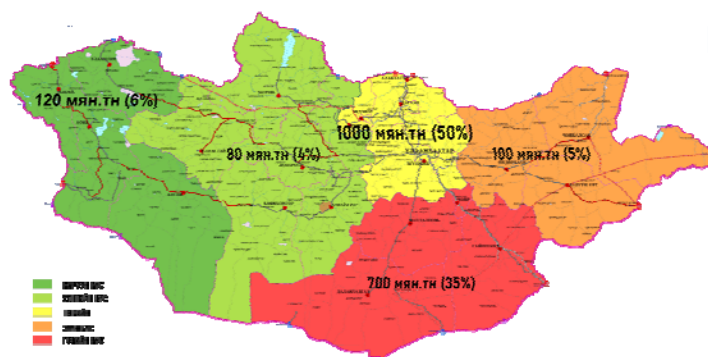
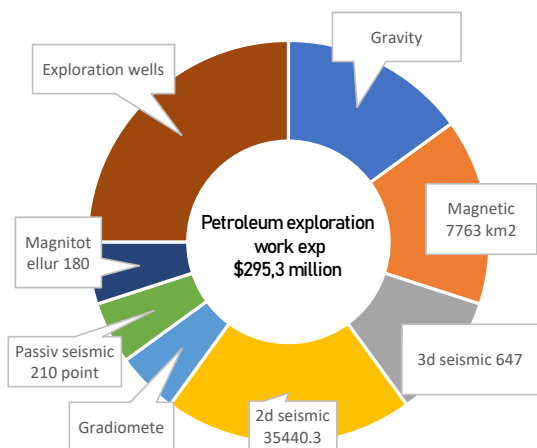
First Trench Blocks
✓ NOMGON-IX
✓ TUKHUM north-X
✓ TSAGAAN ELS-XIII
✓ ZUUNBAYAN-XIV
✓ DARIGANGA-XXIV

Second Trench Blocks
✓ CHOIR-XIV
✓ HONGOR-VIII
✓ BAYANKHOSHUU-XXII
✓ TSAIDAM XXVI
✓ HERLEN TOKHOI-XXVIII



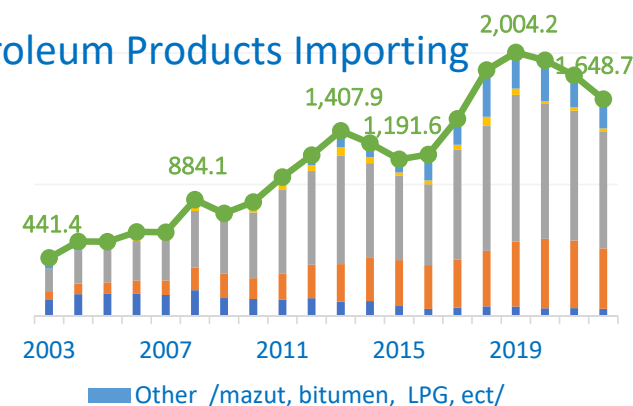
PETROLEUM PRODUCTS IMPORT, CONSUMPTION /THOUSAND.TONS/ (2008-2021)

EXPLORATION WORK ACTIVITIES



PETROLEUM PRODUCTS IMPORT MILLION DOLLARS (2018-2021)

Petroleum Products Importing



2019
1165,8\$

2020
838,2\$

2021 он
1,159 \$

LEGAL FRAMEWORK

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Vision 2050 (Parliament), 2020

- ✓ 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;

Investment Law (2013/10/03)

- ✓ To create stable environment for investment (investment would be stabilized);
- ✓ Not affect the rights of investors;

Border Law (2013/12/26)

- ✓ Improved border management;
- ✓ Integrated administration with permanent operation and reduction of bureaucracy;

Customs & VAT-free Law (2013/06/07)

- ✓ Customs and VAT tax relieve for facilities and equipment, which are used in the processing of crude oil, coal, oil shale, are till 2018;

Amendment of Customs tariffs, duties and VAT laws (2014/07/01)

- ✓ 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.

CONTINUED

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MINISTRY MINING AND HEAVY INDUSTRY

Government action program 2020-2024

- Enrich mineral resources by increasing investments in high-tech raw materials ..., oil exploration..
- Establish oil refinery based on domestic raw materials
- increase the reserves by intensifying the search, exploration and production of oil and unconventional oil.
- 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.
- To establish Refinery in Dornogovi aimag Altanshiree sum,

Petroleum Law Amended in 2014.07.01

- 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.

Production Sharing Contract

- 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.

Petroleum Law

- ✓ 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.

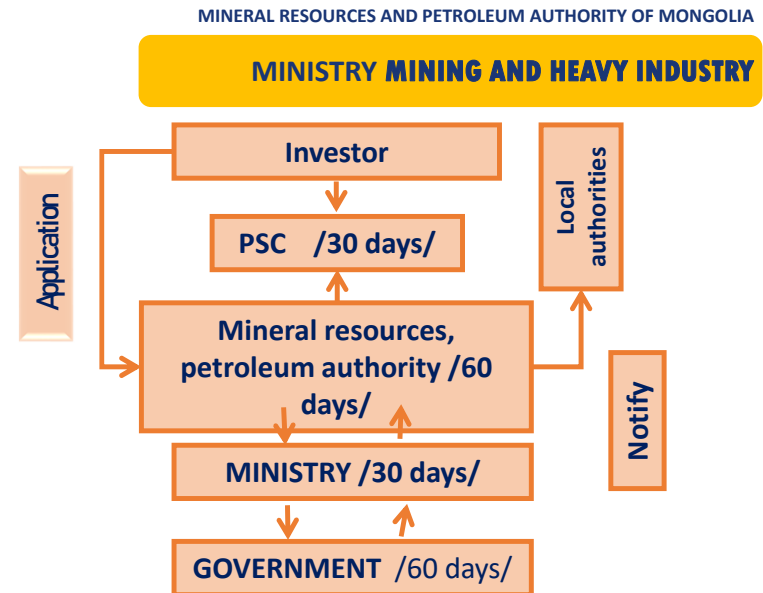
FISCAL REGIME

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.

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.



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 – *negotiated*
- Royalty 5% to 15% - *negotiated*
- 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)

- Basin Areas
- 'Oil' Seeps
- Bitumen Sandstones
- Geochemistry Samples
- Organic 'Paper' Shales

Zuunbayan and Tsagaan Els Fields
c. 1940's onwards

Two shallow holes into granite

Westernmost Basins
Remain Undrilled
(Source Rocks Present)

Petroleum Systems Proven in Previously
Undrilled Basins

- Source Rocks
TOC >1%, S₂ >5%
- All Geochemistry Samples
- Basin Areas
- 'Oil' Seeps
- Bitumen Sandstones
- Geochemistry Samples
- Organic 'Paper' Shales



300

600 km

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

- Spectacular outcrops show clastic reservoirs well develop
- Sands >10m thickness proven oil bearing

Oil Recovered From Choibalsan Basin
Wells

PetroChina
Block XIX/XII Fields

Block XX Discovery

Block XXIX Discovery

Zuunbayan and Tsagaan Els
Fields

Block XI Discovery

Extensive Turbidites

Interbedded Fluvio-lacustrine Sands

Thick Deltaic & Shoreface
Packages

MONGOLIAN BASINS ADJACENT TO PROVEN PROLIFIC CHINESE BASINS

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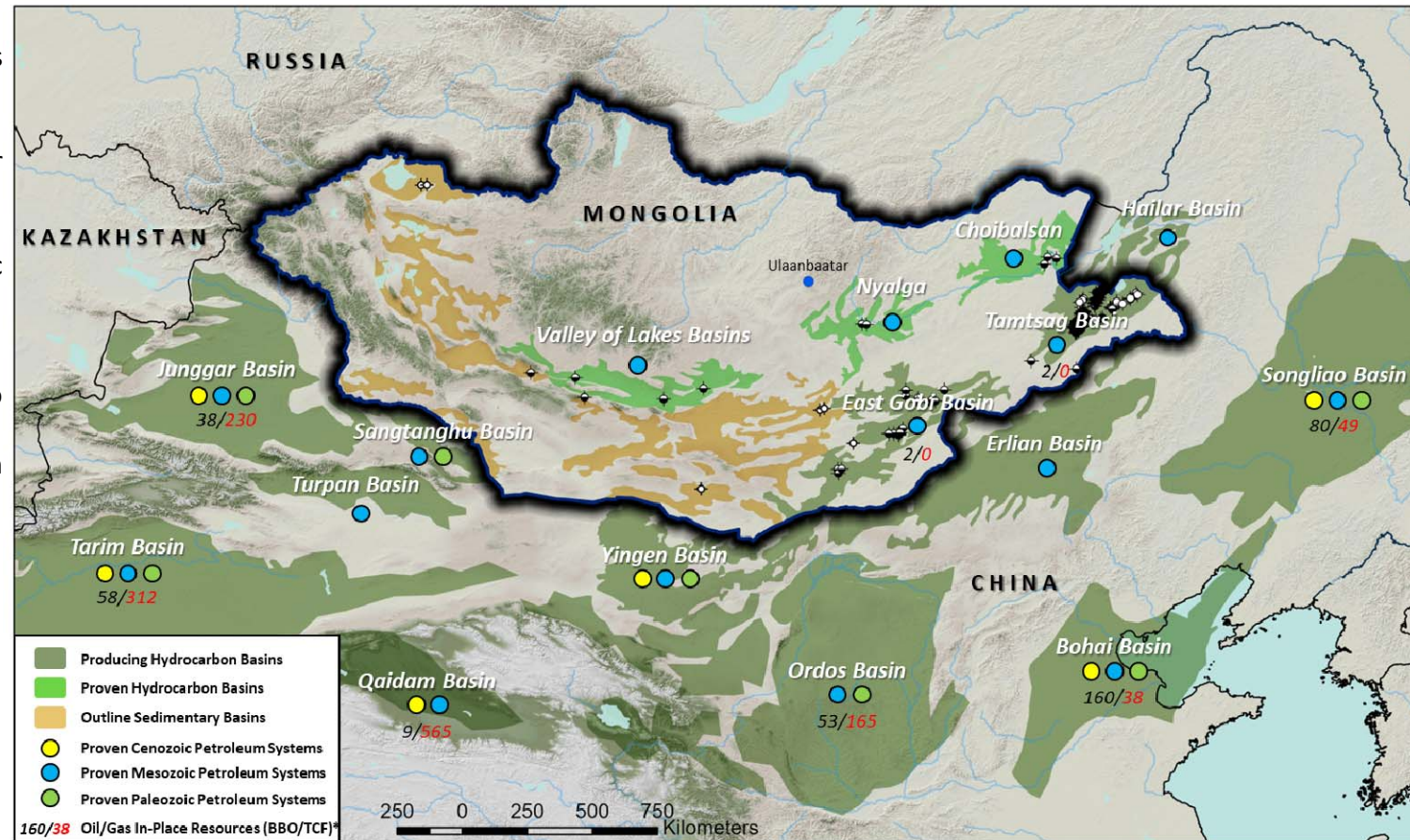
Huge resources in Chinese Basins increasingly from new deeper plays

Cambrian to Paleogene Petroleum Systems now proven in northern Chinese Basins

Similar stratigraphy exists in under explored 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

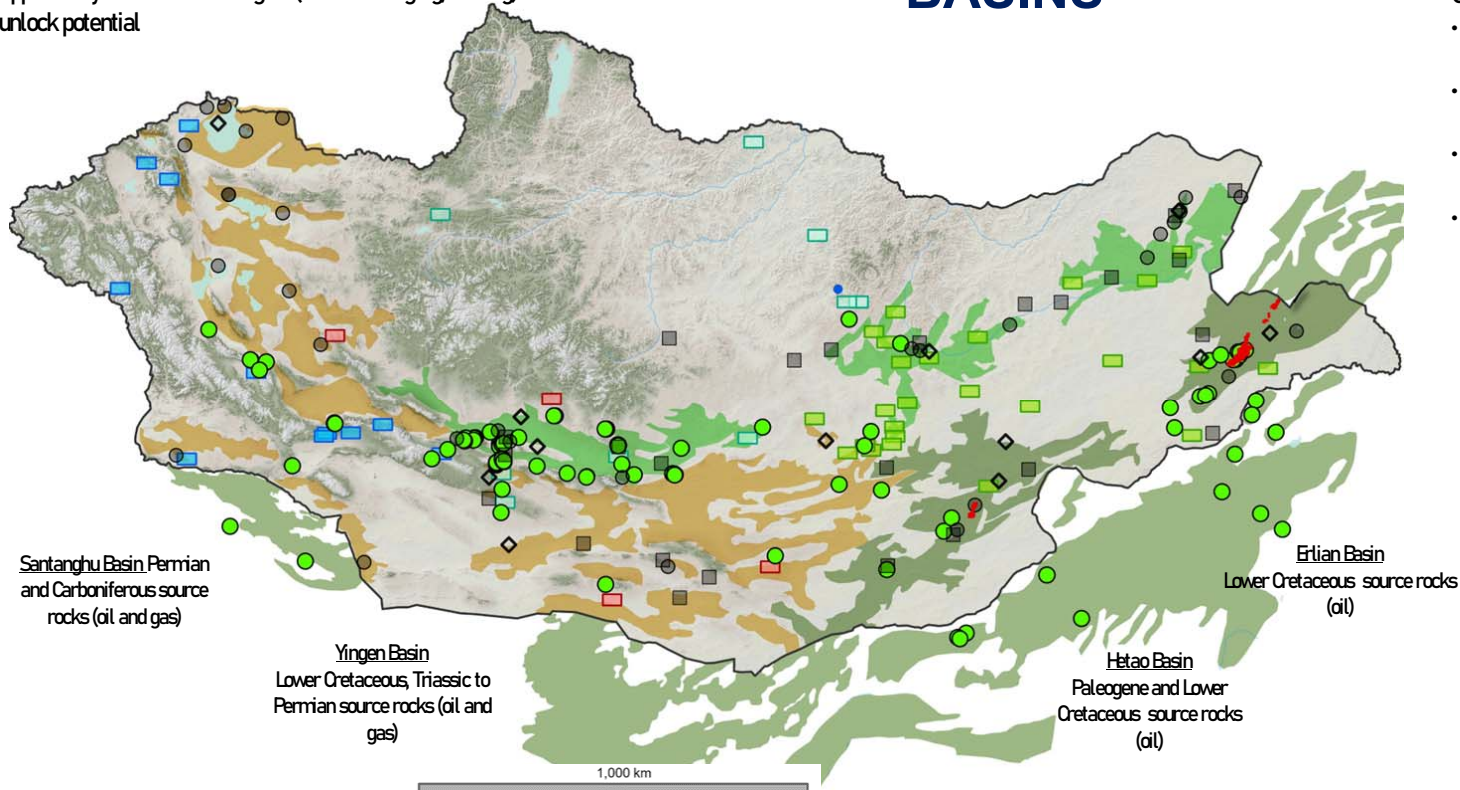
MONGOLIAN BASINS ADJACENT TO PROVEN PROLIFIC CHINESE BASINS

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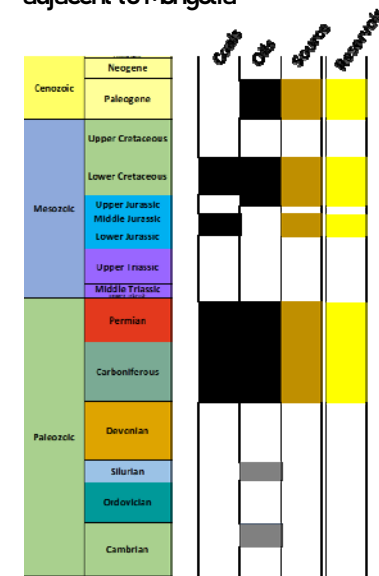
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Carboniferous to Paleogene plays proven adjacent to Mongolia where:

- 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

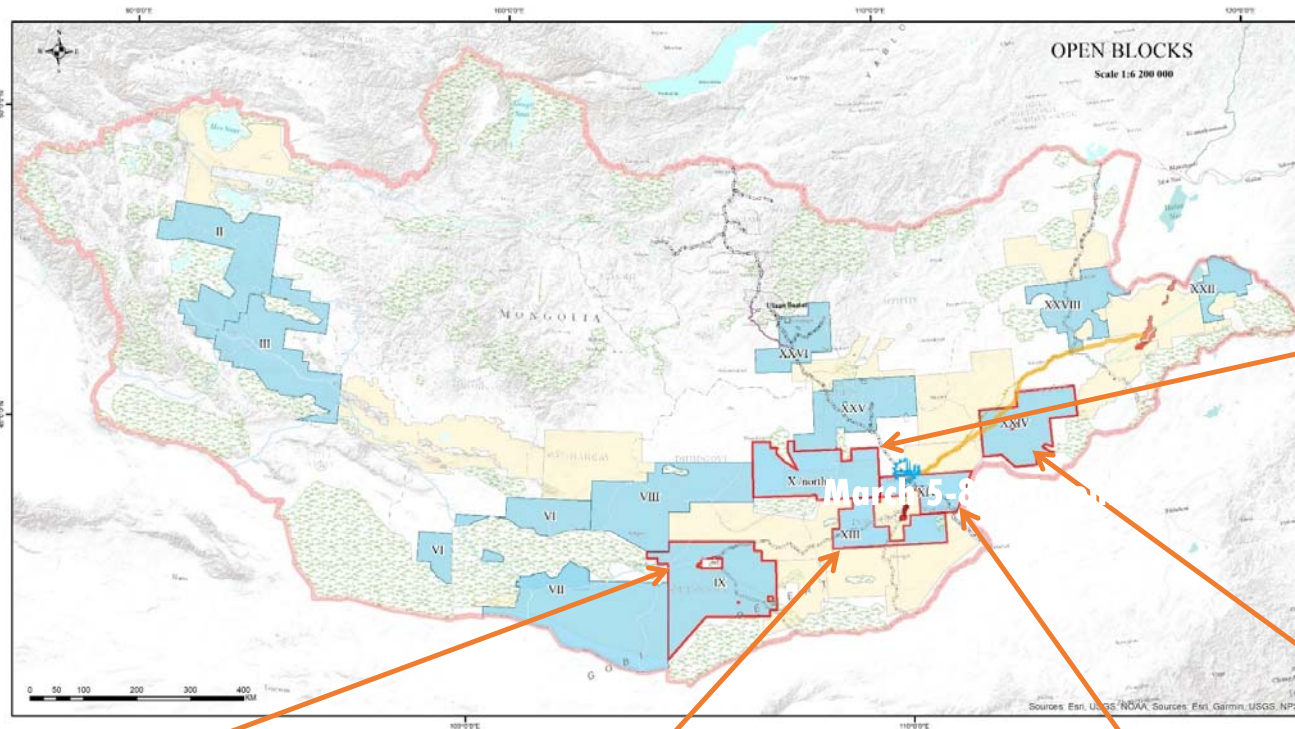


FIRST TRANCHE TENDER ROUND BLOCKS

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Nomgon IX	29878
Tukhum X north	20903.9
Tsagaan els XIII	11729.3
Dzuunbayan XIV	8699.1
Dariganga XXIV	16936.3
	88146.65



Block X (Tukhum-north)

Block Area: 20,847.6 km²
 Basin Area: c. 6,058 km² (3 areas)
 Restricted Areas: 1,276 km² area is overlapped by National Park
 Previous Operator: Satellite Geology Survey LLC
 Award/Relinquished: July 29, 2009 / June 23, 2020
 Exploration Activity: 55242 outcrop samples of geochemical analysis, Gravity survey at 5390 point, 2D seismic survey for 1131km (2010-2011), N10-001 well TD 1982m, and N10-002 well (2011-2013)
 Petroleum Systems: Lwr Cretaceous/Upper Jurassic Triassic Permian-Carboniferous

Block - XXIV /Dariganga/

Block Area: 16954.6 km²
 Basin Area: c. 5523.85 km² (3 areas)
 Restricted Areas: 261.7 km² National Park overlap
 Previous Operator: Mongolia Shin II Energy LLC
 Award/Relinquished: Feb 09, 2011 / Sep 05, 2022
 Exploration Activity¹: Outcrop samples - geochemical analysis, 2278 points gravity, 210 km I2D seismic survey (2011)
 Petroleum Systems: Middle Jurassic/ Upper Jurassic/Lower Cretaceous Permian-Carboniferous /limited/

Block IX (Nomgon)

Block Area: 29878.0383 km²
 Basin Area: c. 13292.39 km² (2 areas)
 Previous Operator: South Mongolia Petroleum LLC
 Award/Relinquished: Feb 07, 2014 / Sep 05, 2022
 Exploration Activity¹: -
 Petroleum Systems: Lwr Cretaceous/Upper Jurassic/Triassic/Permian-Carboniferous

Block XIII (Tsagaan els)

Block Area: 11,590 km²
 Basin Area: Unegt, Tsetserleg, Tavan Har
 Previous Operator: Gobi Energy Partners GmbH (2009-2018/
 Award/Relinquished: April 21, 2009 / August 25, 2020
 Exploration Activity¹: 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)

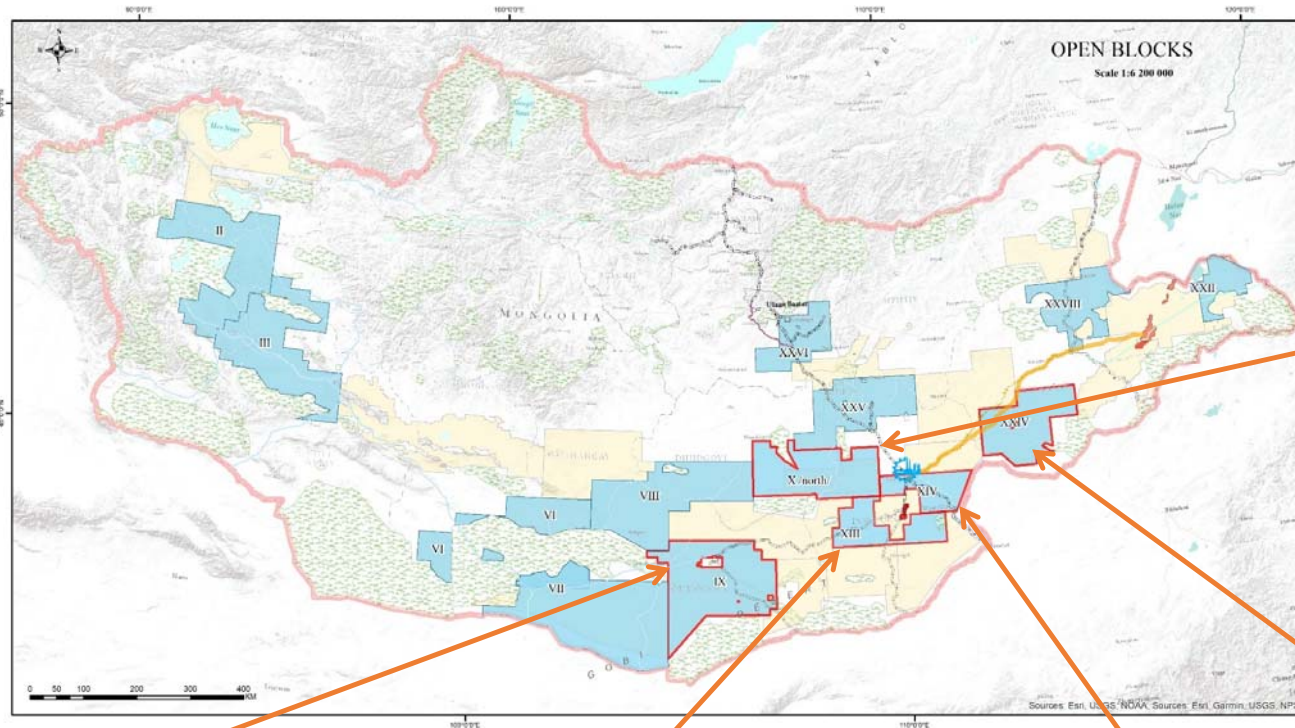
Block Area: 8,731 km²
 Basin Area: Erdene, West Sainshand, East Sainshand (3 areas)
 Restricted Areas: None
 Previous Operator: Gobi Energy Partners GmbH (2009 - 2018)
 Award/Relinquished: April 21, 2009 / August 25, 2020
 Exploration Activity¹: Outcrop samples - geochemical analysis, 2221 km² gravity survey, 1945.3 km 2D seismic (2010-2012),
 Petroleum Systems: Lwr-Mid-Early Cretaceous/Lwr-

SECOND TRANCHE TENDER ROUND

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- ✓ CHOIR-XIV
- ✓ HONGOR-VIII
- ✓ BAYANKHOSHUU-XXII
- ✓ TSAIDAM XXVI
- ✓ HERLEN TOKHOI-XXVIII



Block VIII (Khongor)

Block Area: 29,259.9 km²
 Basin Area: c. 13292.39 km² (2 areas)
 Previous Operator: n/A
 Award/Relinquished: n/A
 Exploration Activity¹: -
 Petroleum Systems: Lwr Cretaceous/Upper Jurassic, Triassic/Permian-Carboniferous

Block XXV (Choir)

Block Area: 18588.15 km²
 Basin Area: Unegt, Tsetserleg, Tavan Har
 Previous Operator: n/A
 Award/Relinquished: n/A
 Exploration Activity¹: Outcrop samples - geochemical analysis
 • Petroleum Systems: Lwr Cretaceous/Upper, Jurassic/Triassic, Permian-Carboniferous

Block XXVI (Tsaidam)

Block Area: 11,121.55 km²
 Basin Area: Nyalga Basin
 Restricted Areas: None
 Previous Operator: Satellite Geology Survey LLC (2009 - 2020)
 Award/Relinquished: n/A
 • Exploration Activity¹: 10291 point gravity survey(2013), 1709.5 km 2D seismic (2013), 1 exploration well
 • Petroleum Systems: Lwr Cretaceous/Upper Jurassic, Triassic* Permian-Carboniferous

Block XXVIII (Kherlentokhoi)

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 Activity¹: Outcrop samples - geochemical analysis
 2278 point gravity, 210 km I2D seismic survey (2011)
 • Petroleum Systems: Lower Jurassic/ Upper Jurassic, Lower Jurassic/ Upper Cretaceous, Permian-Carboniferous /limited/

Block - XXII (Bayankhoshuu)

Block Area: 16954.6 km²
 Basin Area: Tamsag Basin
 Restricted Areas: 261.7 km² National Park overlap
 Previous Operator: Petrochina Dachin Tamsag LLC
 Award/Relinquished:
 • Exploration Activity¹: Outcrop samples - geochemical analysis, 2,345.12 km 2D seismic survey (2011), 8 exploration wells
 • Petroleum Systems: Middle Jurassic/ Upper Jurassic, Upper Jurassic/Lower Cretaceous, Permian-Carboniferous /limited/



Thank for your attention

For more information please contact

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MRPAM website:

<https://www.mrpam.gov.mn>