MINERAL RESOURCES AND
PETROLEUM AUTHORITY
OF MONGOLIA

THE ANNUAL REPORT 2016

GEOLOGY
MINING
PETROLEUM
HEAVY INDUSTRY

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA

Builders square-3, Government building XII
Chingeltei district, Ulaanbaatar-15171, Mongolia.

Tel: +(976-51) 263701
Fax: +(976-51) 263701

web: www.mrpam.gov.mn
email: info@mram.gov.mn

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ABBREVIATIONS

MRPAM	Mineral Resources and Petroleum Authority of Mongolia
AMEP	Australia Mongolia Extractives Programme
LOM	Law on Minerals
GIP	Gross Industiral Products
PSAs	Production Sharing Agreements
LP	Law on Petroleum
GMGPW	Geological mapping and general prospecting work
FDI	Foreign Direct Investment
GDP	Gross Domestic Products
GOM	Government of Mongolia
GAP	Government Action Programme
IMF	International Monetary Fund
SGP	State Geological map
PM	Parliament of Mongolia
MMHI	Ministry of Mining and Heavy Industry
OSH	Occupational Safety and Health
LI	Law on Investment
MRITC	Mineral Resources Information and Technological Center
NGM-200	National geology mapping
GMGSW	Geological map and general survey work

Designed by The Mongolian Mining Journal

B.BAATARTSOGT, DIRECTOR OF
MINERAL RESOURCES AND PETROLEUM
AUTHORITY OF MONGOLIA

FOREWORD

The Government Resolution No.4 of July 27, 2016 issued following the Resolution No.12 of 2016 of the Parliament of Mongolia has established The Mineral Resources and Petroleum Authority of Mongolia (MRPAM), Government Implementing Agency, with a new structure by merging the former Mineral Resources Authority and The Petroleum Authority.

The MRPAM provides support to development of state policy on geology, mining and petroleum, to deliver effective and efficient services to investors and increase competitiveness of the sector and its contribution to overall economic development of Mongolia by implementing state policies.

We, in the year of 2016, have implemented government decisions and policies and tried to make our operations faster and more open and transparent, yet with less bureaucracy, using advanced information technology, and improved our services to business enterprises and citizens in line with relevant law and legistlation.

Having introduced the 2016 Annual report of the Mineral Resources and Petroleum Authority of Mongolia, we are also presenting the works planned under the State Policy on Minerals and The Government Action Programme for upcoming years including goals and objectives to be achieved.

We will give extensive attention to mineral resource revenue management in line with international good practices, as well as to improve institutional cooperation and coordination and access to information, and to promote responsible mining and investment by increasing competitiveness of the sector.

We are confident that our cooperation will prosper after you have learned our anticipated goals and objectives for the coming years.

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA

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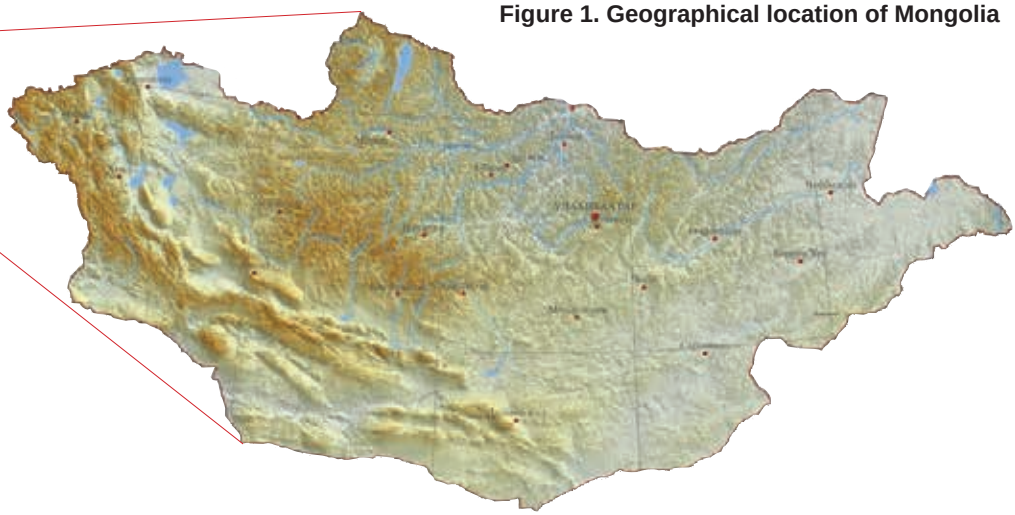
SOCIO-ECONOMIC OVERVIEW OF MONGOLIA

1.1. GENERAL INFORMATION ABOUT MONGOLIA

Geographical location

Mongolia is located in central Asia, between eastern longitudes of 87°44 and 119°56 and northern latitudes of 41°35 and 52°09, with 1,566.5 thousand sq.km, the seventeenth largest country by its size. It borders with the Russian Federation in the north, and the People's Republic of China in the south.

Figure 1. Geographical location of Mongolia



Natural Resources

There are approximately 3000 deposits and occurences of 50 different minerals explored and researched in Mongolia. Gold deposits are mainly explored in southern and northern parts of Khentii and Khangai mountains, copper and molybdenum deposits in the basin of Orkhon and Selenge Rivers, fluorspar in eastern part of Mongolia and phosphorus in Khuvsgul region. Large coal reserves are observed in Tavan tolgoi, Khar tarvagatai, Achit nuur, Bagan nuur and Uvdug khudag deposits. Nalaikh, Sharyn gol, Aduunchuluun and Baganuur deposits play an important role in supplying fuel to urban settlements due to their location in the industrial area.

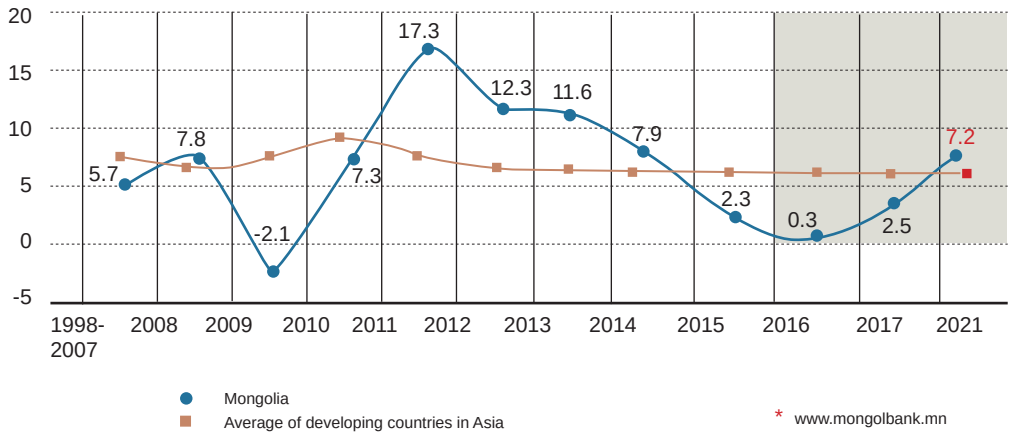
Mongolia has many iron ore deposits such as Tumur tolgoi, Bayar gol and Tamir gol. The majority of copper ore deposits are at Orkhon, Selenge, Gobi, south Kherlen, Bayankhongor and Khankhukhii area, and out of which, the largest is Erdenet Copper Molybdenum deposit of Orkhon-Selenge region. There are many gold deposits and the Zinc Ore deposits in Tumurtiin ovoo, Salkhit, Tulgatai Mountain and Modon ovoo. Berkh Flourspar mine was opened in 1954 and is one of the largest fluorspar mines in Mongolia. The Eastern part of the country has many fluorspar deposits. A majority of phosphorus deposits stretch along the west side of Khuvsgul Lake starting from Soyon Mountain. Jewels such as crystal, topaz, sapphire, garnet, chrysolite, amethyst, turquoise and jade are found, and among which there are some deposits with industrial importance. Total length of rivers and streams in Mongolia is about 67 thous.km, and lakes with more than 0.1 sq.km is counted around 4000. There are approximately 7000 springs. Mongolia is rich in underground fresh water.

Mongolian rivers and streams are divided into three categories: those flowing into the Arctic Ocean, Pacific Ocean and endorheic basin. Selenge is the largest river in Mongolia. Its basin including those that flow into it, account for 20 percent of total territory. Among the largest clear water lakes in Mongolia is Khuvsul, the deepest lake (262m) in Central Asia. The largest endoreheic lake is Uvs (total area is 3350 sq.km)

Current economic situation

Mongolia is considered one of the most resource extraction dependent countries in the world. According to statistics, Mongolian economy has started expanding at the onset of increase in price for minerals in 2006. When copper price reached USD 10, 000 per ton and copper price USD 300 in 2011, Mongolian economic growth reached 17.3 percent a year, and was considered the fastest growing economy in the world. However, the economy plummeted in 2015 at 2.3 percent, following the drop in minerals price and it is estimated that the economic growth will be around 0.3 percent at the end of 2016.

Figure 2. Economic growth of Mongolia and its prospects



One can see that Mongolian economic growth is not sustainable and is dependent on price fluctuation for minerals. At the same time, it lacks resource management: saving while price is high, and expending when its is low.

Key factors of Mongolian economy in 2016

The International Monetary Fund's (IMF) has estimated the world GDP growth at 3.5 percent, which is lower than the 4.5 percent - the growth rate following the year after world economic crisis 10 years ago.

The following factors largely affected the country's economy in 2016:

- Parliamentary election
- Large projects and funding of Oyutolgoi underground mine
- Debt pressure
- Financial sector situation
- Construction sector
- External environment

Gross domestic products

The National Statistics Office announced the GDP of 17,258.9 MNT billion in the first 9 months of 2016, at current prices, which is an increase of 136.4 billion MNT (0.8%) as compared with the same period of last year, and the GDP per capita is 6.5 MNT mln. Mongolia ranked 107th out of 183 countries by GDP per capita.

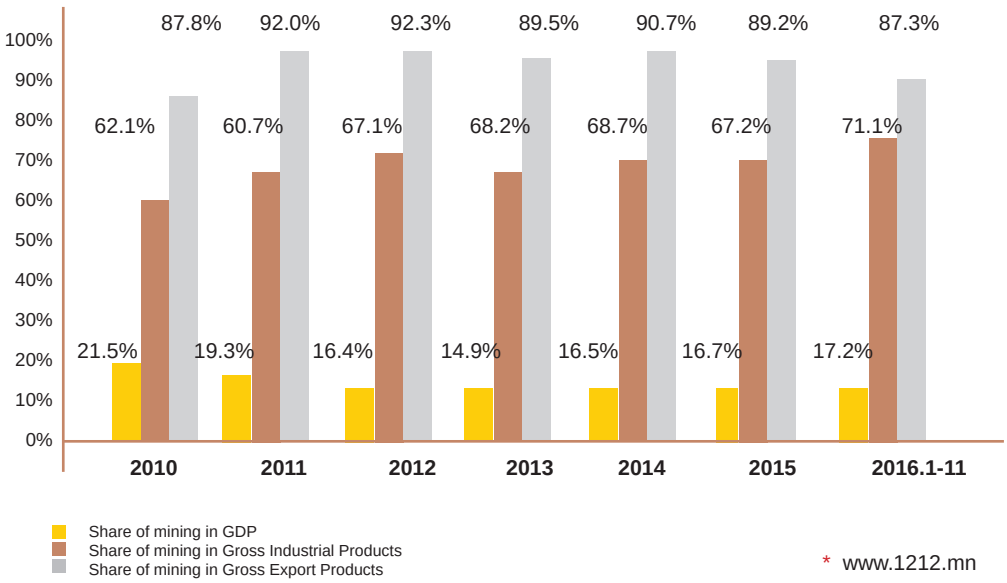
1.2 CONTRIBUTION OF GEOLOGY, MINING AND PETROLEUM SECTOR IN MONGOLIAN ECONOMY

In the first 9 months of 2016, the GDP reached 17.2 trillion MNT, where mining sector accounts for 2.9 trillion MNT. In 2015, the mining products comprised 5.8 trillion MNT, whereas total GDP was 23.2 trillion. In the first 11 months of 2016, the industrial sector production was around 8.8 trillion MNT and out of which, 71 percent or MNT 6.2 trillion MNT is from mining and extraction industry.

In October 2016, export volume reached USD 3.7 billion from the beginning of the year, out of which mining product was accounted for USD 3.2 billion. Mining export has decreased by USD 933.7 million compared with the same period of 2015 and mineral exports has declined by 2 percent. Mining products exported in the first ten months of 2016 account for USD 3.7billion or 87.3% of total exports.

The following graphic shows contribution of mining sector to the country's economy.

Figure 3. Share of mining in GDP and Gross Industrial Products *



* www.1212.mn

Investment Attractiveness Index by Fraser Institute

The Fraser Institute, an independent, non-partisan research institute, conducts a survey every year among mining companies, and attempts to assess how mineral endowments and public policy factors such as taxation and regulatory uncertainty affect exploration investment.

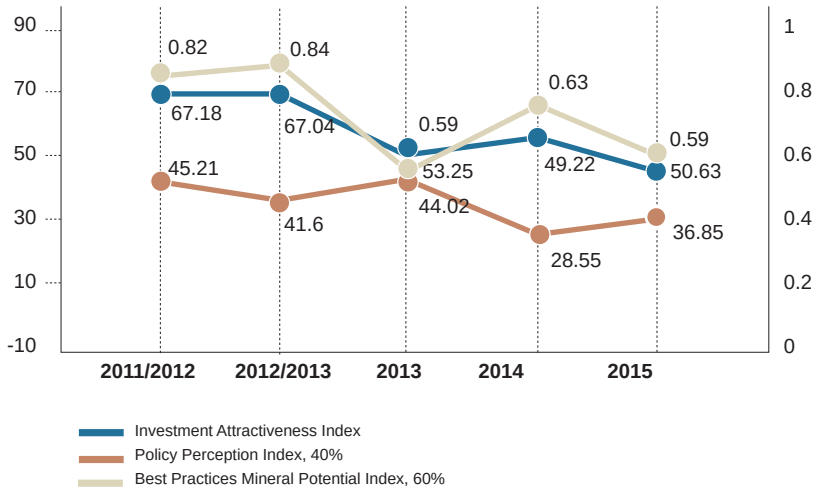
Investment Attractiveness Index is constructed by combining the Policy Perception Index for 40 percent, and Best Practices Mineral Potential Index for 60 percent. In 2005, Mongolia was rated at 85 out of 106 countries for its attractiveness for foreign direct investment.

Table 1. Investment Attractiveness Index of Asian countries , by ranks*

Asian countries	Score					Rank				
	2015	2014	2013	2012/ 2013	2011/ 2012	2015	2014	2013	2012/ 2013	2011/ 2012
China	58.49	48.89	58.69	54.5	61.07	64/109	94/122	62/112	63/96	59/93
India	55.47	58.26	52.13	58.69	50.34	73/109	68/122	84/112	53/96	82/93
Kazakhstan	74.66	50.84	63.45	62.5	61.27	20/109	88/122	53/112	42/96	58/93
Kyrgyzstan	45.91	40.69	37.5	55.27	55.71	91/109	109/122	107/112	62/96	75/93
The Law PDR	54.44	67.06	47.22	*	57.91	77/109	45/122	91/112	*	69/93
Mongolia	50.03	49.22	53.25	67.04	67.18	85/109	93/122	80/112	31/96	41/93
Myanmar	48.92	61.7	53.32	*	*	87/109	60/122	79/112	*	*
Vietnam	53.96	55.62	48.77	56.45	41.64	78/109	78/122	89/112	59/96	91/93

In the report of Investment Attractiveness Index 2011/2012, 2012/2013 for Mongolia was 67, and then declined to 53.2 in 2013, 49.2 at 2014 and 50 in 2015, a slight improvement.

Figure 4. Mongolia's Investment Attractiveness Index



The Fraser Institute pointed out overlap of rules and procedures, lack of coordination, regulatory uncertainty, low connectivity to railroad and autoroad, unsustainable supply of energy and political instability are all the factors that cause drop in investment attractiveness index.

* www.fraserintitute.org

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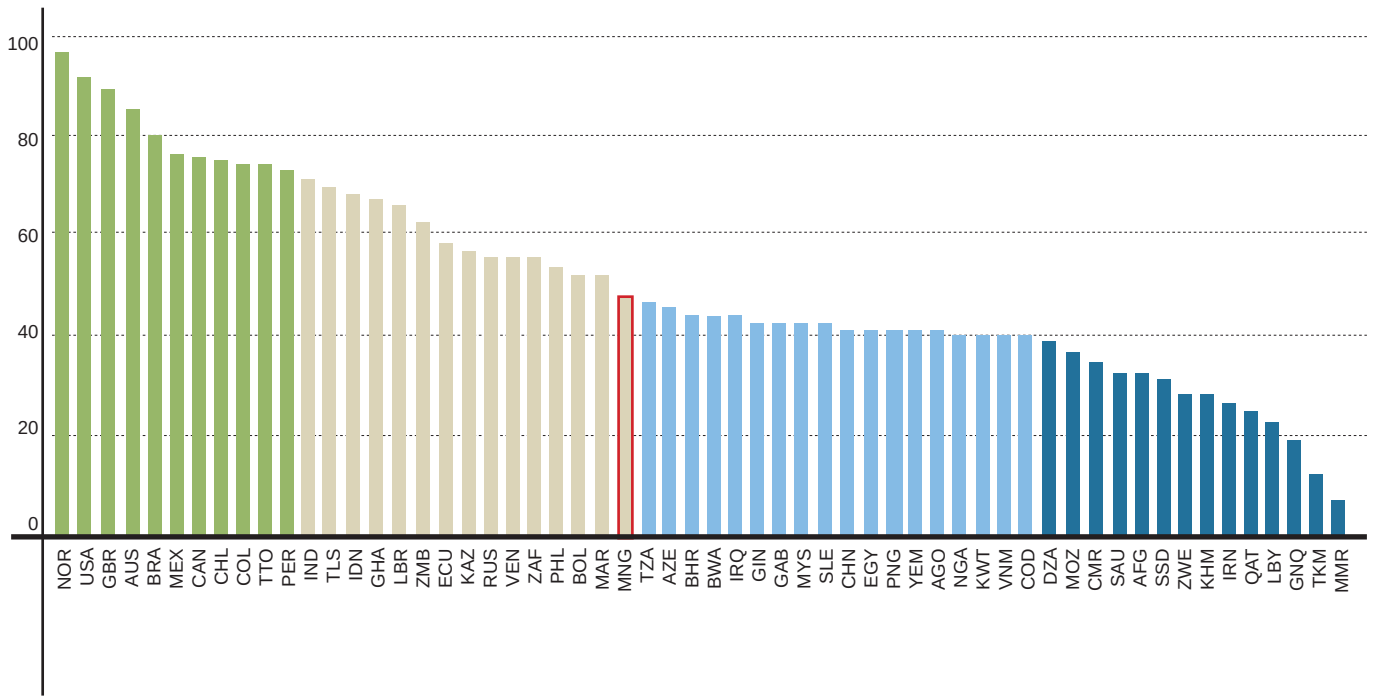
The Resource Governance Index by National Resource Governance Institute

The Resource Governance Index by the National Resource Governance Institute (formerly known as Revenue Watch Institute) assists the people of the country to understand benefits of oil, gas and mineral resources by providing technical recommendation and advocacy services, conducting thematic studies and policy analysis as well as strengthening capacity. The institute releases the Resource Governance Index to measure quality of governance in oil, gas and mining sectors of the resource-rich countries. In 2012, 58 countries have participated in the study responding 172 questions of 50 categories developed by one hundred experts. These indicators are divided into four groups concerning institutional and legal setting, reporting practices, safeguards and quality controls and enabling environment.

[1]	Set indicators	Percentage	Number of indicators	Rank	Score
1	Institutional and legal setting	20%	10	9	80
2	Reporting practices	40%	20	41	39
3	Safeguards and quality controls	20%	15	37	49
4	Enabling environemtn	20%	5	20	48
	Total			**26**	**51**

Mongolia was ranked 26th by receiving 51 points and evaluated as 'partial' among 58 participating countries. Mongolia got a very good score on institutional and legal setting, but was not sufficient on reporting, thus ranked 41st out of 58 countries.

Figure 5. International Resource Governance Index *



* www.resourcesgovernance.org

Credit rating for Mongolia

The Government's capacity to receive credit and ability to pay back the debt is measured by credit rating. In general, the credit rating is established by three international agencies - Standrad&Poor's, Moody's and Fitch. For example, Mongolia's credit rating in foreign and national currency was downgraded by Fitch to B- from B. Moody's has also downgraded Mongolia's long-term credit rating from Â3 to Ñàà1.

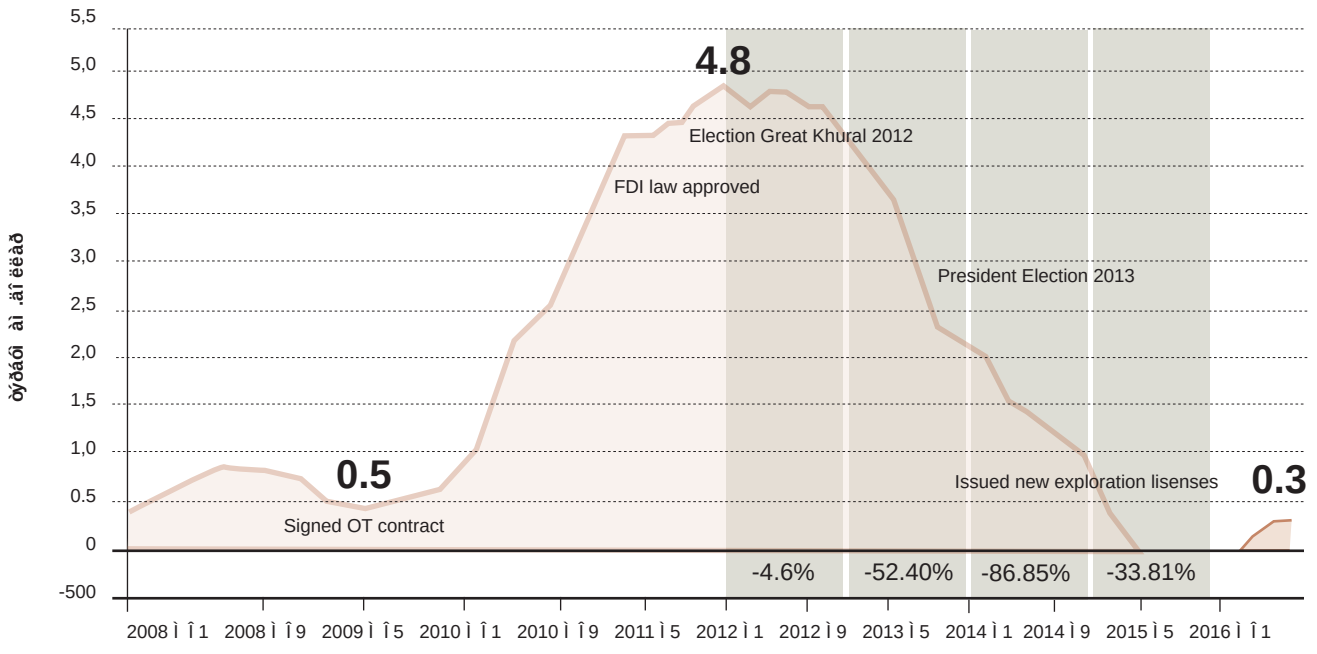
Table 2. 2016 Credit Rating for Mongolia

	Moody's	FitchRatings	Standard & Poor's
Credit rating	Caa1	B-	B-
Outlook	Stable	Stable	Stable
Date	18.11.2016	22.11.2016	19.08.2016

Foreign Direct Investment

Foreign direct investment (FDI) in Mongolia has drastically increased from 2005 until 2012 with the world mining boom and then went down starting in 2013. Foreign direct investment (FDI) in 2013 was USD 4.45 billion , whereas it was only USD 273 million in the first half of 2016.

Figure 6. Foreign Direct Investment in Mongolia *



* www.ikon.mn

1.4 ORGANIZATIONAL STRUCTURE OF MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA AND LEGAL ENVIRONMENT OF THE SECTOR

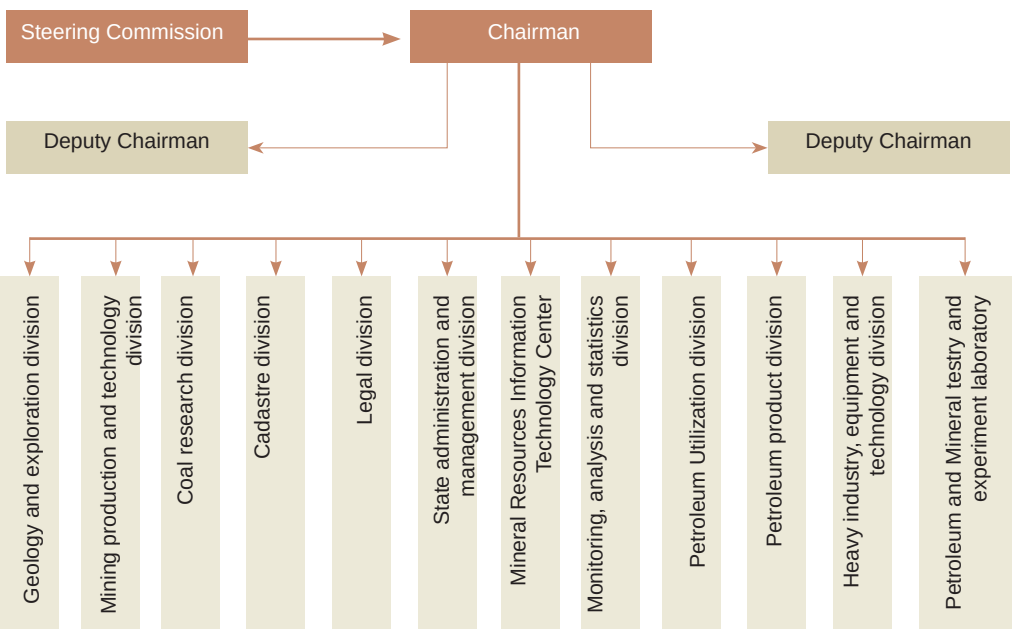
Organizational Structure of MRPAM

The Government Resolution No.4 of July 27, 2016 issued following the Resolution No.12 of 2016 of the Parliament of Mongolia, has established The Mineral Resources and Petroleum Authority of Mongolia (MRPAM), the Government Implementing Agency, with new structure by merging (formerly) the Mineral Resources Authority and the Petroleum Authority.

The Agency's main responsibility is to implement state policy and guidelines in geology, mining, petroleum and heavy industry sectors and has the following structure of 11 divisions and 1 laboratory with 185 employees.

Annex to the Order No.10 of the Minister for Mining and Heavy Industry dated August 25, 2016

Figure 7. Organizational Structure of Mineral Resources and Petroleum Authority of Mongolia



Legal Environment

The Parliament of Mongolia adopted State Policy on Minerals 2014-2015, with its Order No.18 of January 16, 2016.

The Parliament of Mongolia also approved State Policy on Radioactive Minerals and Nuclear Energy with Order No.45 of June 25, 2009, and State Policy on Petroleum until 2017 with Order No.65 of December 23, 2012.

STATE POLICIES IMPLEMENTED IN MINERALS SECTOR

Legislation concerning mineral resources and petroleum

"Regulation of all types of mines" approved in 1913 was the very first legislation of Mongolian minerals' sector. There are approximately 30 laws and 50 procedures and guidelines in force. A few of import laws and procedures are :

Law on Minerals

Law on Minerals was revised in 2006, and was amended and changed about 20 times since enforced. Some of the new principles adopted in the law are as follows:

- Rights, the extent to which the Parliament, Government, central administrative organization in charge of minerals issues (ministry) and government administrative organization (MRPAM) was clearly identified.
- According to the law, the Government will approve a template of the agreement concerning environmental protection, utilization of mines, infrastructure development for industries and employment issues between local administration and the license holder.
- The Government shall identify geographic coordinates of the licensed area for exploration and announce to the public
- National Geological Institute will be established to conduct geological research, analysis and information, which will contribute to the implementation of integrated policy of geological sector.
- Geological exploration license term has been extended from 9 years to 12 years.
- A license holder shall give a priority to business enterprises registered in Mongolia and to select sub-contractors when procuring goods and services required for their activities.
- The law also identified that minerals extracted, enriched and semi-processed mining products shall be supplied at a market price to factories operating in Mongolia for further processing.
- According to the Law on Investment, a Stabilization Certificate will be used to identify the rate and amount of tax for use of mineral resources for the given year.
- A legal environment was established to allow income, equivalent to or less than that the of the Government dividend, to be used as royalty payment.

Law on Investment	Law on Petroleum and Law on Petroleum products	Law on Budget
Law on Investment provides general regulatory framework to protect and guarantee both domestic and foreign investors from discrimination, ensuring the right to transfer assets and revenues out of the country without hindrance, and protecting intellectual property rights of the investor. Moreover, a special permit for foreign investment was abolished, thus a company may start operating after registering itself with the State registration office. With the law, State provides guarantee of stabilized rates of four types of taxes, fees and duties.	Legal environment in petroleum sector has been enhanced, and thus competitiveness has also improved. The legal environment was established for the petroleum sector, a non-traditional economic sector of Mongolia. Public and private partnership will play a key role in international trade of petroleum products.	On May 21, 2015, Article 60 of the Law on Budget was changed and amended in relation to income from minerals payment. With this amendment, at least 33 percent of income received from royalty will go to the Local Development Funds of soum and districts where the exploration work took place, and at least 50 percent of the license payment go to Local Development Fund of soums and districts where the exploration and exploitation license is issued.

THE GOVERNMENT ACTION PROGRAMME IN 2016-2020

The Parliament of Mongolia has approved the Government of Mongolia Action Programme (GAP) for 2016-2020 with its Order No.45 of September 9, 2016. The GAP identified several measures to establish a favourable investment environment for the geology and mining sector, and improve Mongolia's competitiveness at international minerals market. For example,

- Support the sustainable development of mining sector by enhancing geological mapping, general exploration, geophysics, geochemistry, hydrogeology and geo-ecological studies.

- Establish a National geology authority and a National geo-database in conformity with the international standards and simplify information delivery service.

- Create a favorable legal environment to attract investment in geology and mining sectors and jointly implement mutually beneficial projects and programs.

- Maintain an appropriate level of state involvement in the mining production, improve the cadaster registration system and make more efficient license issuing service.

- Intensify research, exploration and exploitation in conventional and nonconventional oil industry and increase oil deposits.

- Improve the legal basis for creating co-ops in artisanal mining sector for individuals as stipulated in the Article 3.1.2 of the "State Minerals Policy". 2.65. Formulate a long-term mining infrastructure development planning and improve coherence among sectors.

- Set up a mining research unit and create a favorable investment environment in the minerals sector.

- Create a legal environment to exploit secondary mineral resources and bring the process of mine rehabilitation and the closure up to the international standards. 2.68. Resolve required funding for the implementation of "Gold 2" program in cooperation with the Central Bank of Mongolia (Mongol Bank).

- Increase gold production and create a legal environment to purchase extracted gold from artisanal miners.

- Establish a National geology authority and a National geo-database in conformity with the international standards and simplify information delivery service.

- Create a legal environment to exploit secondary mineral resources and bring the process of mine rehabilitation and the closure up to the international standards.

- Steadily increase oil extraction and construct an oil refinery.

- Support the construction of copper concentrate smelter and refinery.

- Create conditions to construct a metallurgical complex in Darkhan and Selenge region.

- Render policy support to setting up a coal washing and deep processing plant and coal gas extracting plant.

- Render policy support to setting up a plant for liquefied fuels and lubricants.

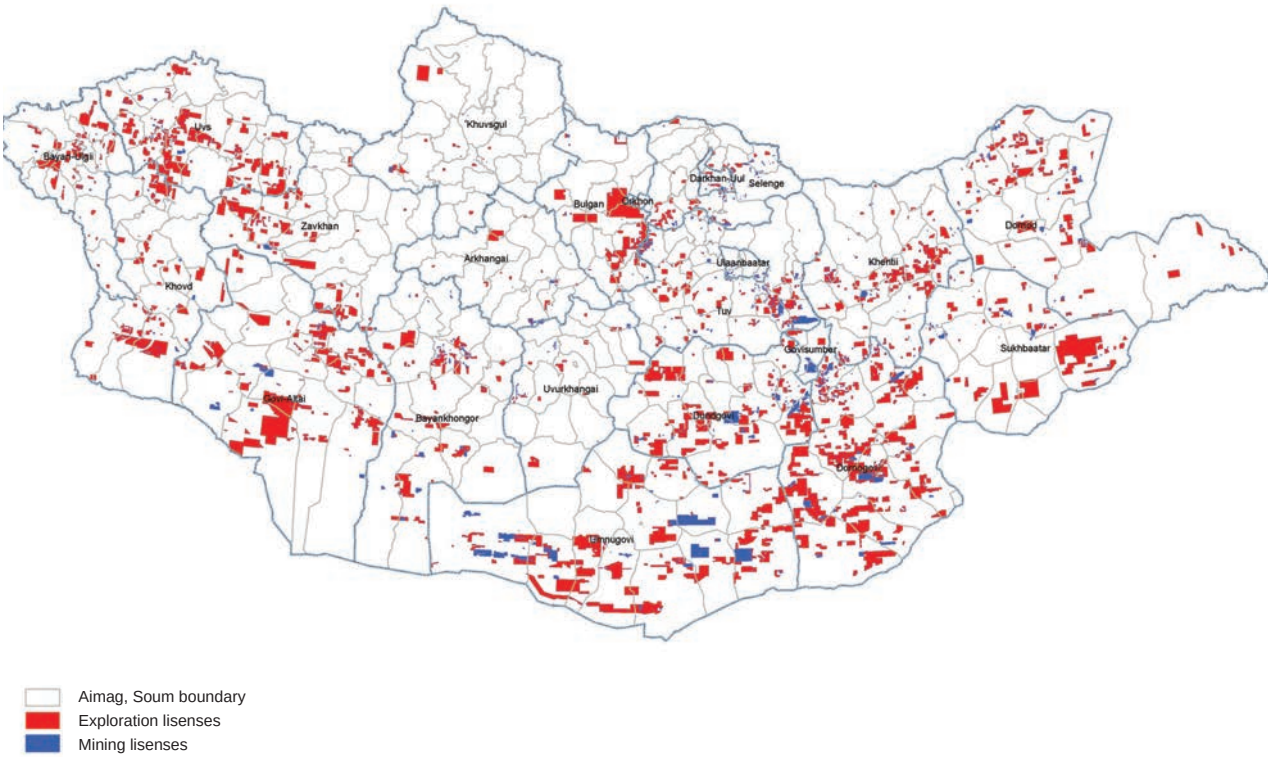
- Develop a metal component and assembly factory.

CHAPTER II.
OVERVIEW OF THE GEOLOGY, MINING, PETROLEUM AND HEAVY INDUSTRY SECTOR IN MONGOLIA

2.1 EXPLORATION AND MINING LICENSES

A total of 3580 exploration and mining licenses were issued in Mongolia end of 2016, 2022 licenses were for exploration and 1558 were for licenses for mining, for approximately 8.0% of Mongolia's territory special licenses issued for approximately 0.9% of Mongolia's territory.

Figure 8. Map of spread of licenses (2016.12.31) *



* https://cmcs.mram.gov.mn/cmcs#cid=1

The issuance of exploration licenses was temporarily halted by the Law on Prohibiting Issuance of New Exploration Licenses for Mining, which was approved on 2010. This above mentioned legislation was nullified in 2014 and the government started to issue licenses through an online platform starting in 2015. In 2016, A total of 757 special licenses were issued in 2016 of which 666 were exploration licenses and 91 were mining licenses.

Figure 9. Issuance of exploration licenses

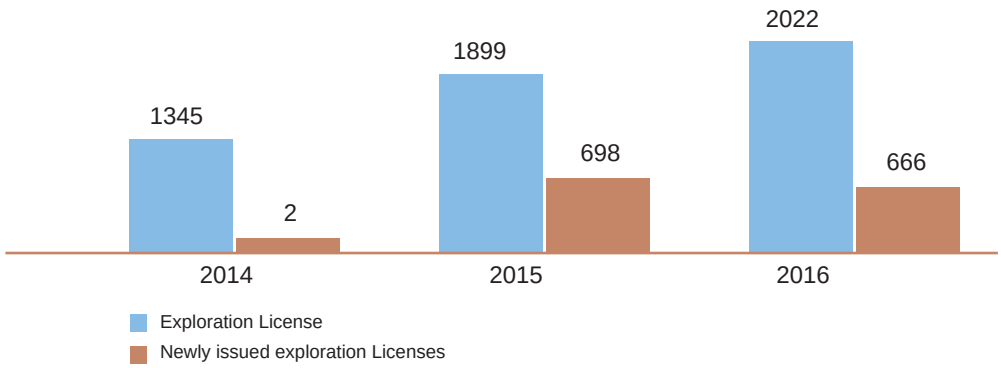
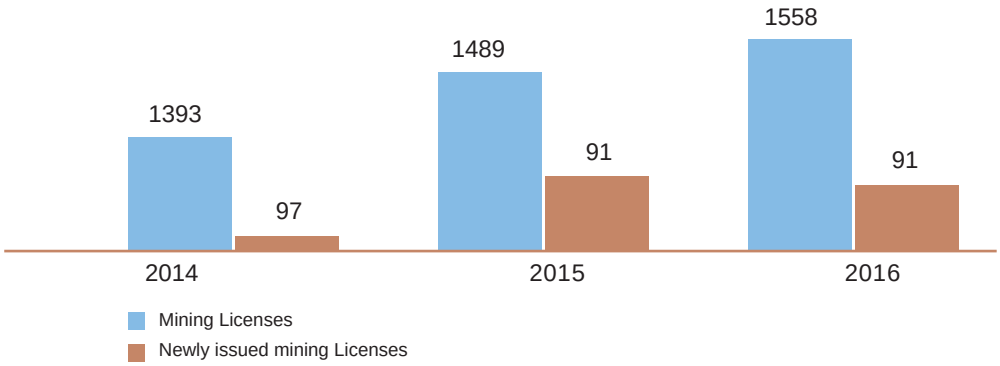


Figure 10. Issuance of mining licenses



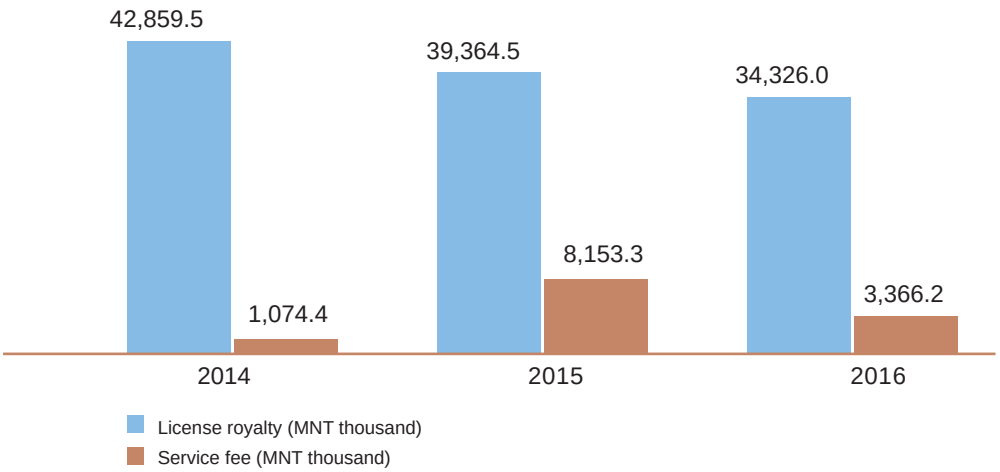
MRPAM has opened licence tender in 2016 by 10 batches for 97 selected places, which occurred 574.9 hectar land. Total of 39 selected places had licenced in 2016.

Thirty eight (38) valid licenses for radioactive licences were issued as of 2016. Twenty nine (29) of the 38 licenses were exploration licenses covering 955,700 hectares of land and 9 mining licenses covering 81,900 hectare land.

Service fees and license fees collected MRPAM in 2016

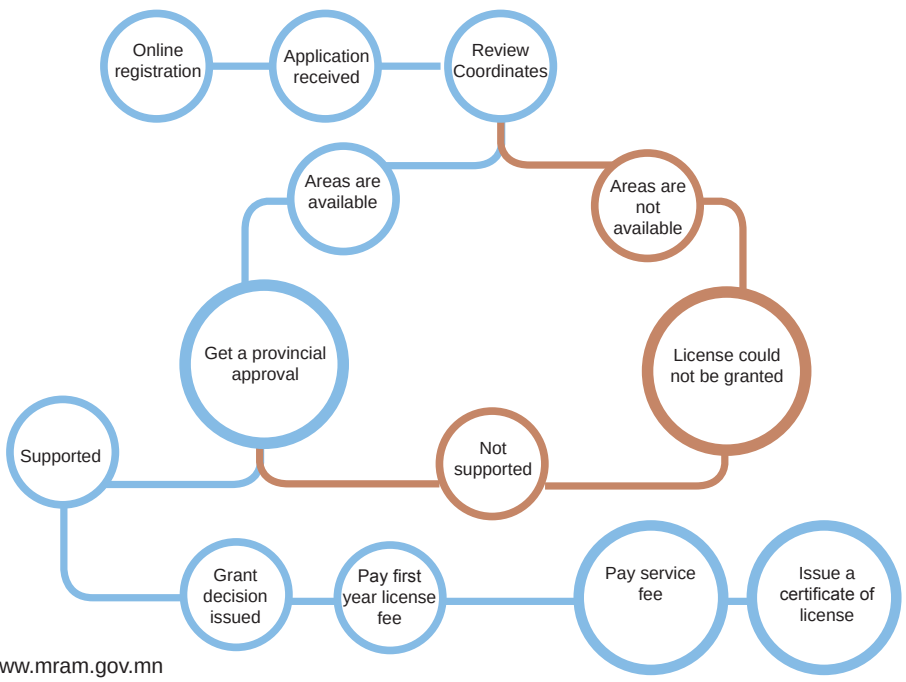
Mining and exploration licenses fees are collected at the state and local administration budget according to clause 32 of the Law on Minerals.

Figure 11. License fees and service fee collected by MRPAM *



The MRPAM was able to collect 42.8 billion MNT in 2014, 39.4 billion MNT in 2015 and 34.3 billion MNT in 2016 at the state and local government budgets from license fees and service fees. The Cadastre Department at Mineral Resources Authority started issuing mining and exploration licenses in accordance with the amendments on Law of Mineral Resources in 2014 based on requests from January 26, 2015 by the following scheme.

Figure 12. Diagram on steps to issue exploration license using online booking mechanism **



* www.mram.gov.mn
** https://cmcs.mram.gov.mn/cmcs#cid=1

The total site size of the approximately 13.26 million hectares was opened for new exploration licences which is 63.5% of 20.9 million hectare of public owned land in Mongolia.

The Cadastral department has received total number of 3915 online booking request for new exploration licensec by 37 batches, out of 1580 from 3915 request cancelled because of the deadline has over. Remaining 2235 request has been answered and sent forward processing. A summary of the the total 2335 answered requests is as follows:

- **1244** special licenses were issued
- **681** licenses were denied
- **38** requests are pending due to the previous court disputes and other reasons
- **5** requests were supported by the local administration
- **367** requests were not addressed based on rejection by local administration.

Approximately 3.7 billion MNT was collected at the state budget as a service fee of issuing new exploration licenses. A total of 2.8 billion MNT was collected by the state as a fee for access to online system to submit request.

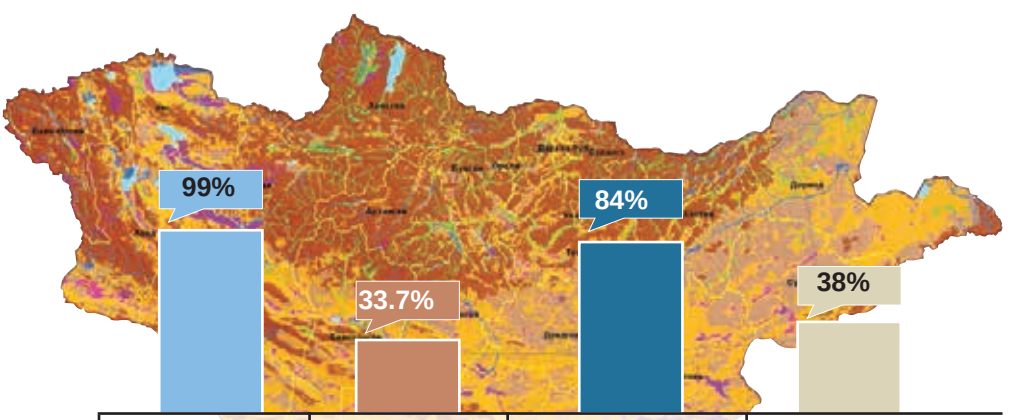
2.2 MINERAL AND PETROLEUM RESOURCES AND EXPLORATION

2.2.1 GEOLOGICAL SURVEY WORKS

A. Geological exploration implemented by the state budget

Covered areas and types of geological survey of Mongolia is shown in the figure 13.

Figure 13. Mongolian Geological Survey level *



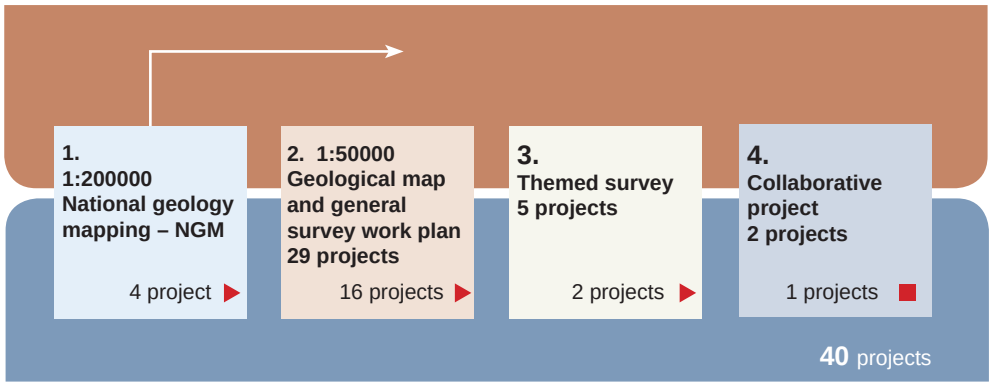
1: 200 000 scale geological map	1: 50 000 scale geological map	Hydro geology survey	Complex geaphysics survey /1: 25 000- 1: 200 000/
99%	33.7%	84%	38%

* www.mram.gov.mn

Geological survey have been implemented as a basic data requirement needed to assist in the development of regional minerals and raw materials, to evaluate proposed mineral resources, to support decision making processes on the issues related to natural and environmental protection, underground wealth use and exploitation.

Forty (40) geologic exploration projects have been implemented in 4 geological fields in Mongolia in 2016.

Figure 14. Ongoing geology projects funded by government budget



Project on planning 1: 200 000 scale comprehensive geology mapping of Mongolia

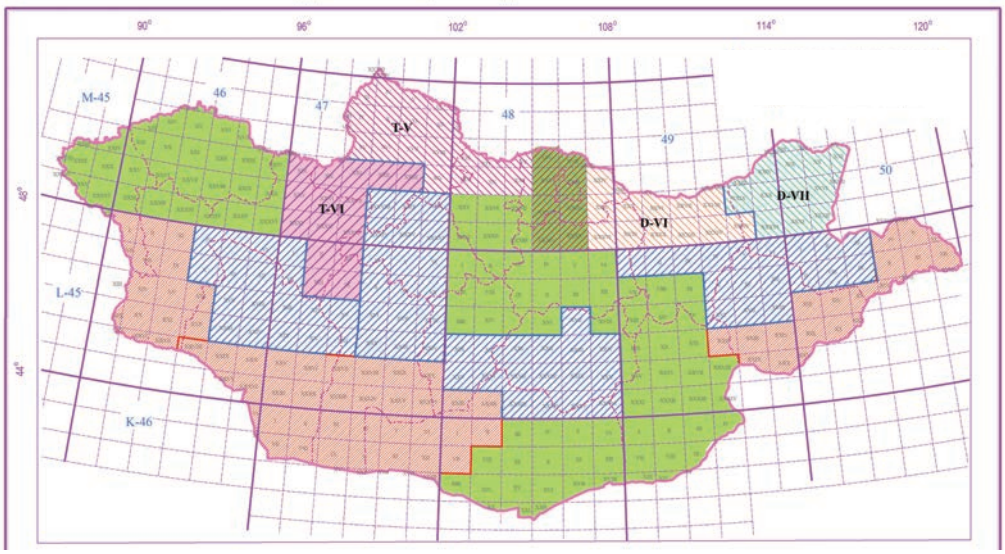
Four (4) NGM-200 projects comprehensive geological mapping have been successfully implemented in 2015, These 4 UGZ-200 complex geological map covered an area of 287, 924.35 square kilometers which is approximately 18% of total land area of Mongolia, In addition 100% of the Mongolian territory has been covered by digital geological mapping in 2016-2017. In accordance with the instruction handbook to make “UGZ-200” complex mapping and to prepare the map for publishing, 5 geological maps in 1:200000 scale, for each unit area in Geology, Minerals, Ecology-geology, quadrangle maps and documentations, will be made in comprehensive documentations with supplementary diagrams.

Total of 344 area has been covered NGM-200 project.

Table 3. NGM-200 project implementation

Project implementation	Quantity
Total site area	**344**
2001-2010	**114**
2010-2012	**82**
2011-2014	**71**
2013-2016	**77**

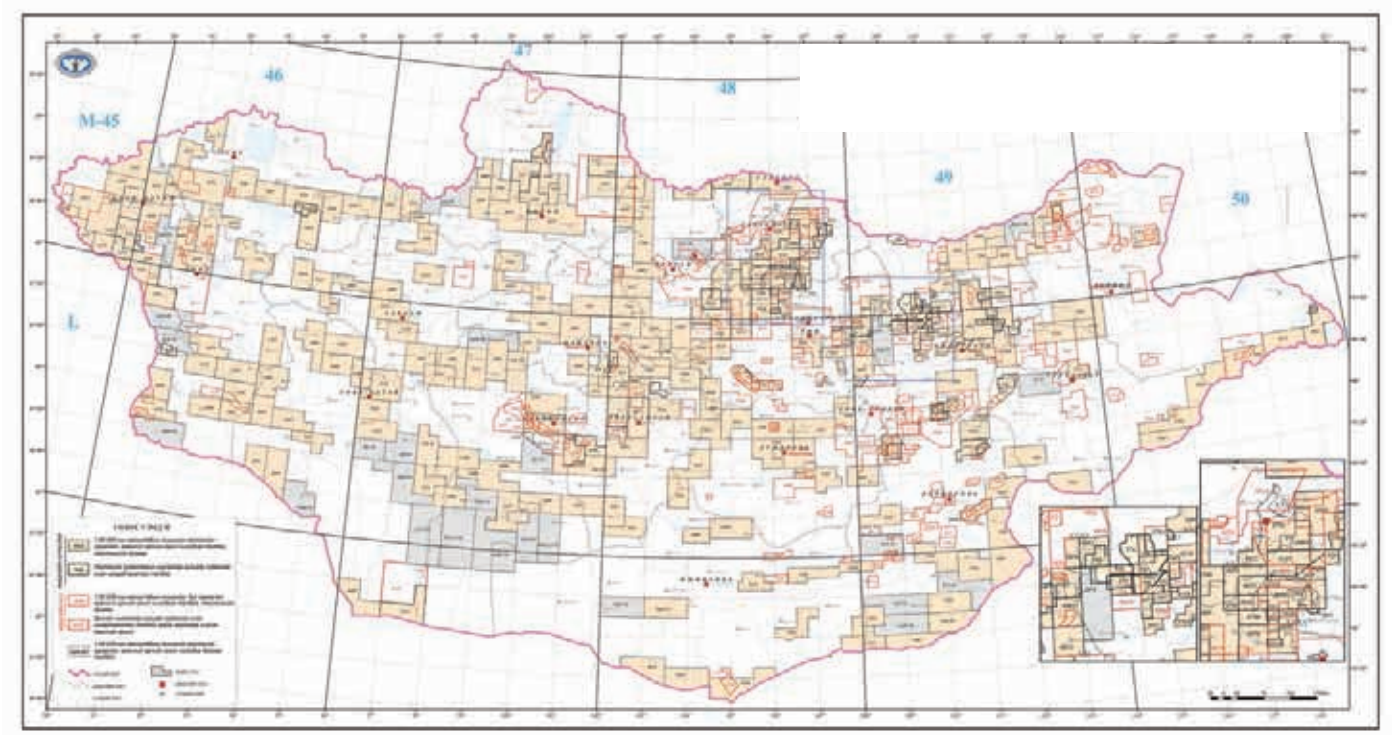
Figure 15. NGM-200 coverage area *



Geologic map and general exploration work project in 1:50000 scale

Twenty nine (29) projects that have been successfully in progress in the field of 1: 50 000 scale geologic map and general surveying projects are successfully being implemented in 2016 . One of the projects has been implemented with international cooperation and domestic business entities and organizations have been working on the implementation of the other 28 projects.Geologic map and general survey work was carried out on 33.3% of the total territory of Mongolia at a 1: 50 000 scale.

Figure 16. Geological map and general survey work plan

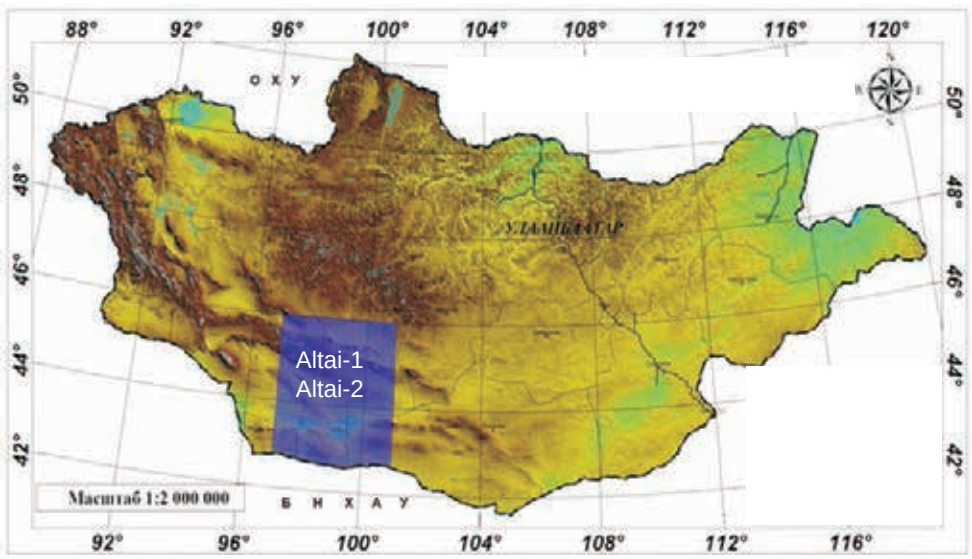


* www.mram.gov.mn

Themed survey

Several themed survey works have been implemented in Mongolia including Geo-information data survey, Spatial Image Decryption survey, Pure Sulphide Mineralization of Western Mongolia and its future prospect survey, Survey on metal genesis and mineral resource deposits, types and location and Altai-1 and Altai-2 aerial geophysical survey.

Figure 17. Altai-1, Altai-2 projects



Collaborative project

Geologic mapping projects carried out in partnership foreign countries include" The "Mongol Altai-50" 1:50000 geologic map and general exploration collaborative project carried out with the Republic of Czech. The "Khasagt 50" collaborative exploration project carried out with Poland. This project was successfully implemented and the final report was received by the Mongolian counterpart.

The "Tsogttsetsii-50" 1:50000 scale geologic map and general exploration project carried out in cooperation of Geologic Science and Mineral Resource Institution of the Republic of Korea. This project conducted mapping and exploration in Tsogttsetsii soum, Umnugbi province. The second year field work of the project was implemented in 2016.

The third stage of "North-Central and Eastern Asia" cooperation project is in progress is and is being implemented by Mongolia, the Russian Federation, the People's Republic of China, Kazakstan and the Republic of Korea.

Funding of geologic survey work implemented by the State Budget

Geologic survey work was delayed in 2016 partially due to the economic crisis in Mongolia. However, in 2016, the total amount of project funding from state budget is reached 98% as MNT 9.1 billions.

Table 4. Financing of the geological exploration surveys conducted with state budget

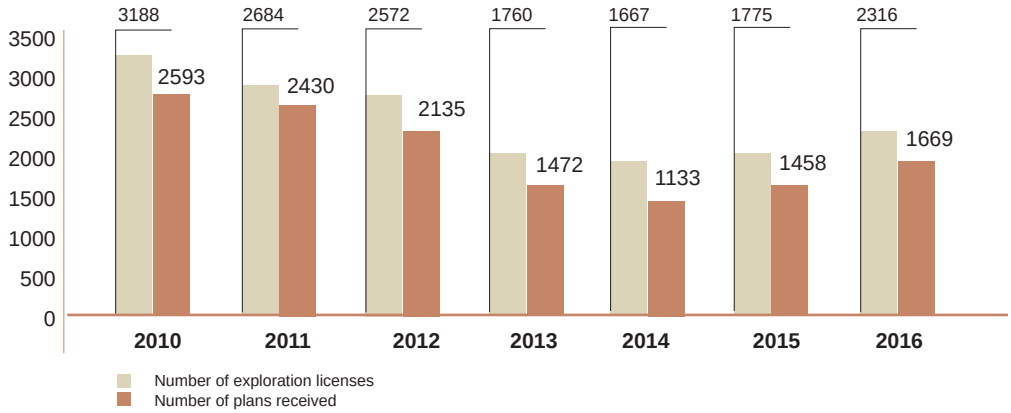
	2013		2014		2015		2016	
	Million MNT	Performance	Million MNT	Performance	Million MNT	Performance	Million MNT	Performance
TOTAL	**6809.9**	**93.0%**	**9209.2**	**92%**	**9280.6**	**82%**	**9164.2**	**98%**
NGM 1:200000	763.89	5.6%	807.2	89%	330.5	63%	649.5	99%
1:50000 GMGEWP	5809.4	96.5%	7314.8	93%	5556.7	78%	5103.2	105%
Themed project	155.8	34.3%	1003.5	88%	3167.7	92%	3183.9	100%
Partnership projects	80.9	168.9%	83.6	70%	225.6	79%	227.7	92%

B.Exploration works with private investment

The, Geology and Survey Department at Mineral Resources Authority of Mongolia receives and monitors exploration work plan and annual report from the license holders every year in accordance with Article #48.1 of the law on Mineral Resources. As stated in the Article # 33.1, 33.2 of the above stated Law, the minimum exploration costs work must be outlined and confirmed inn the annual financial report.

A total of 1669 exploration work plans were submitted by the exploration license holders in 2016.

Figure 18. Annual exploration work report submission



A careful review on the annual survey report shows that (2-4) billion MNT was spent by "Cogegobi", "Oyut-Ulaan", "OJCHL", "Bold Tumur Eruu River", "Alishaa Khairkhan", "Millennium Storm", "Kharanga Sumber" and "Blackrock" companies on exploration in 2015.

The spending of geology exploration work has been declining every year since 2012 as shown following in the cost performance on exploration operation . This decline is due to the price reduction of mineral resources in global market and the associated reduction in investment.

Figure 19. Planning and Implementation of geologic exploration work /MNT billion/

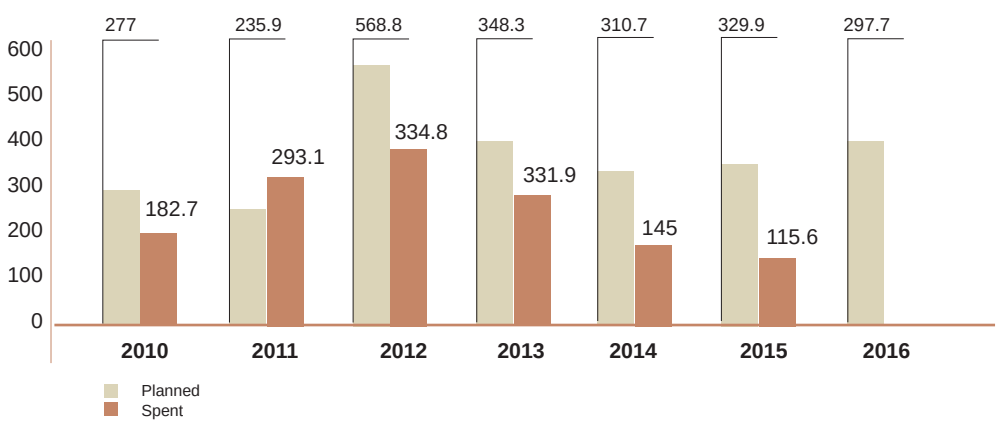
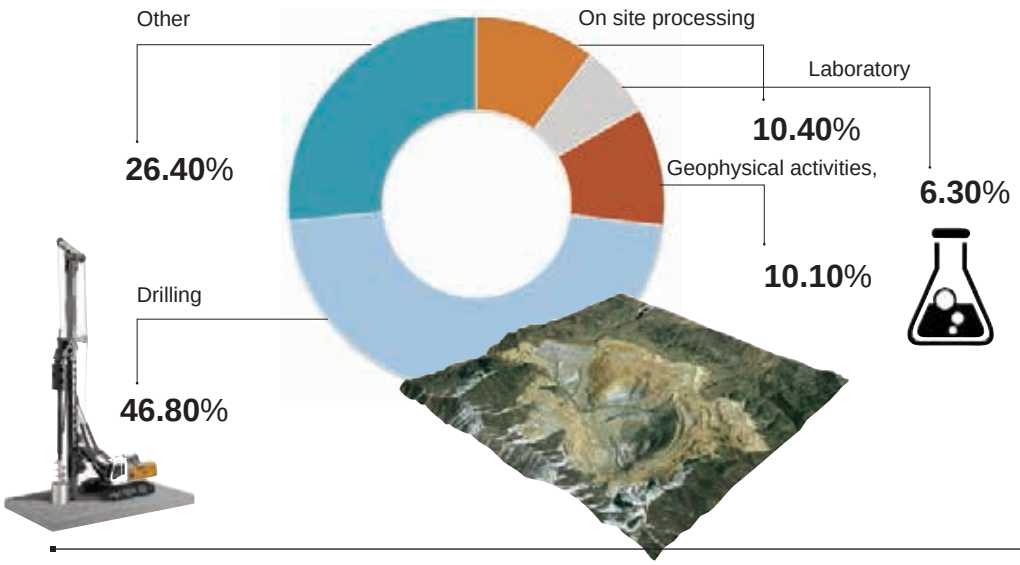


Figure 20. Types of exploration work cost by license holders in percentage

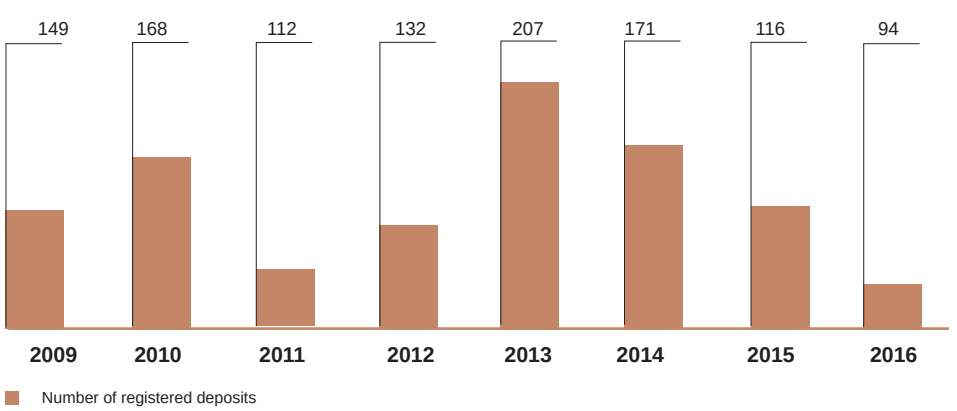


2.2.2 EXPLORATION WORKS AND REPORTED MINERAL RESOURCES

License holders are required to report the exploration result report in accordance with the clause 48.3 of Law on Mineral Resources. Over 105 reports were submitted to the mineral resources council in 2016 and 94 of them were registered at Geology information and technology center as potential deposits.

In 2016, there are 6 new gold deposits, 33 placer, 4 iron, 2 copper, 2 mixed metal, 2 rare metal, 8 coal, 4 flouspar, 1 uranium, 2 black lead, 3 limestone deposits plus quarry stone, sand, gravel and mud deposits were registered.

Figure 21. New deposits registered in the state resource data.



Sorted by main mineral type

Figure 22. Newly registered hard rock gold deposit resources by tons

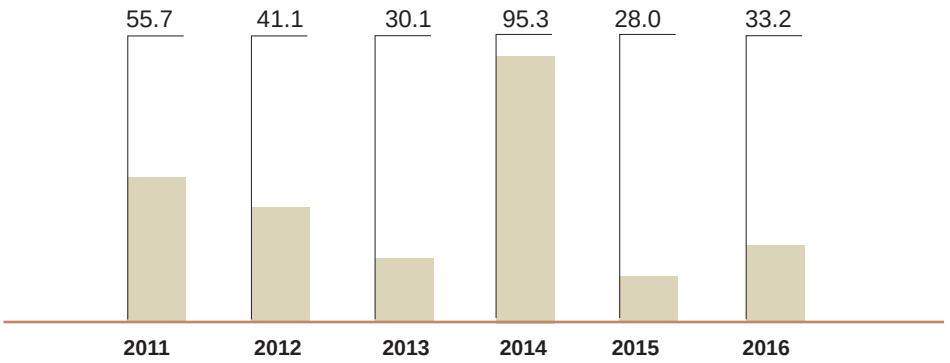
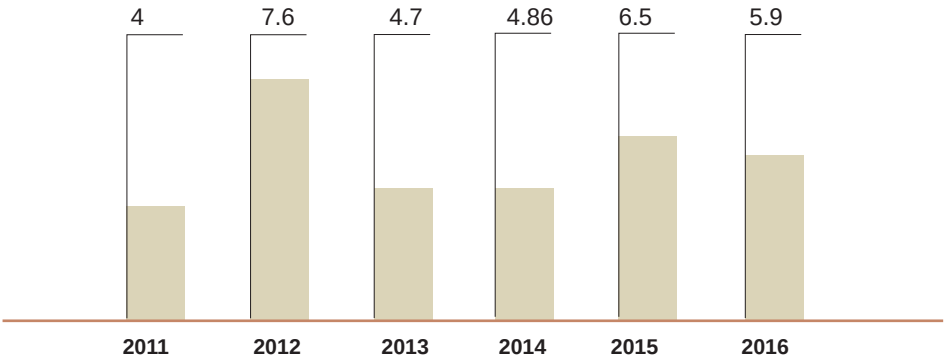


Figure 23. Newly registered placer mine resources by tons



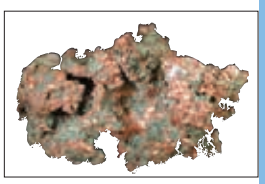


Figure 24. Newly registered copper deposit resources by thousand tons

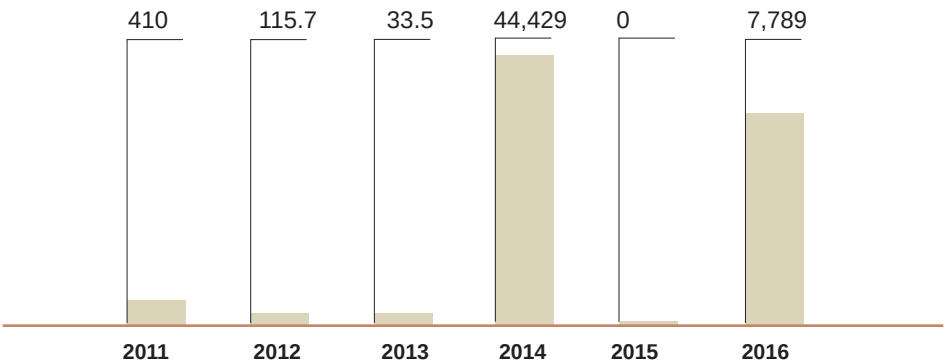
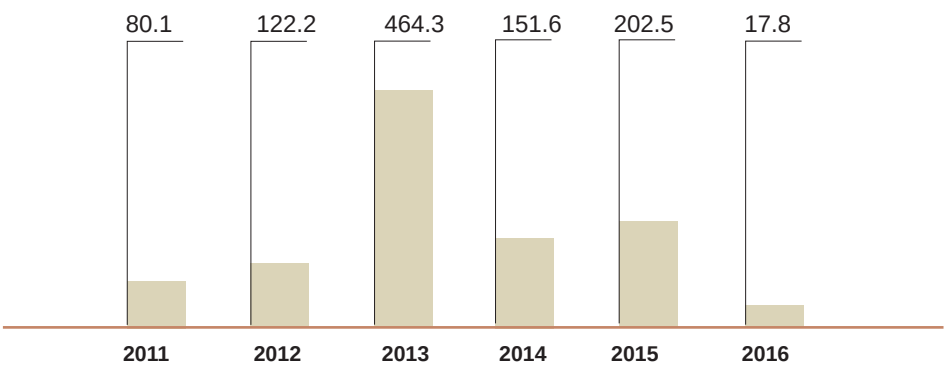


Figure 25. Newly registered iron ore resources by million tons



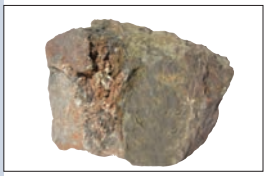
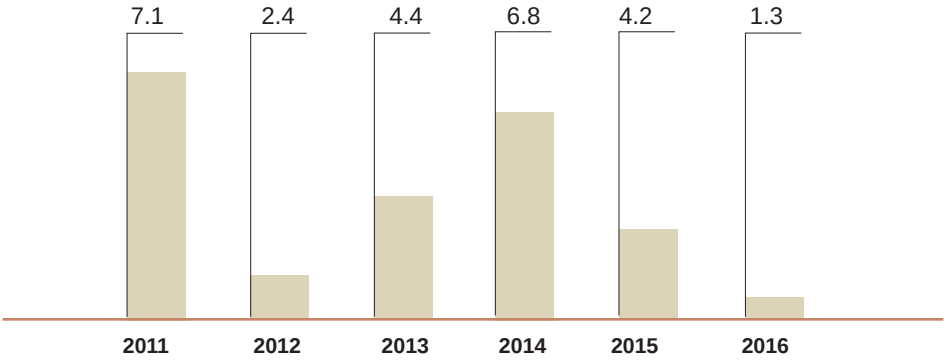


Figure 26. Newly registered coal resources by billion tons



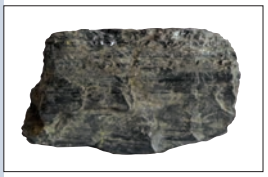
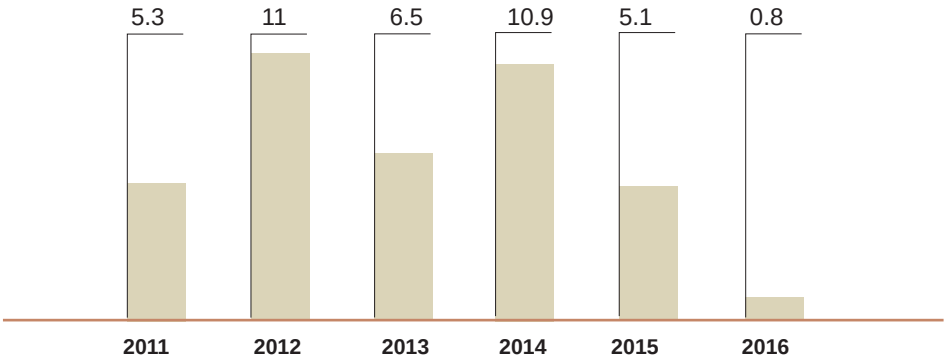
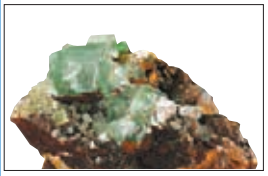


Figure 27. Newly registered flour spar ore resources by million tons

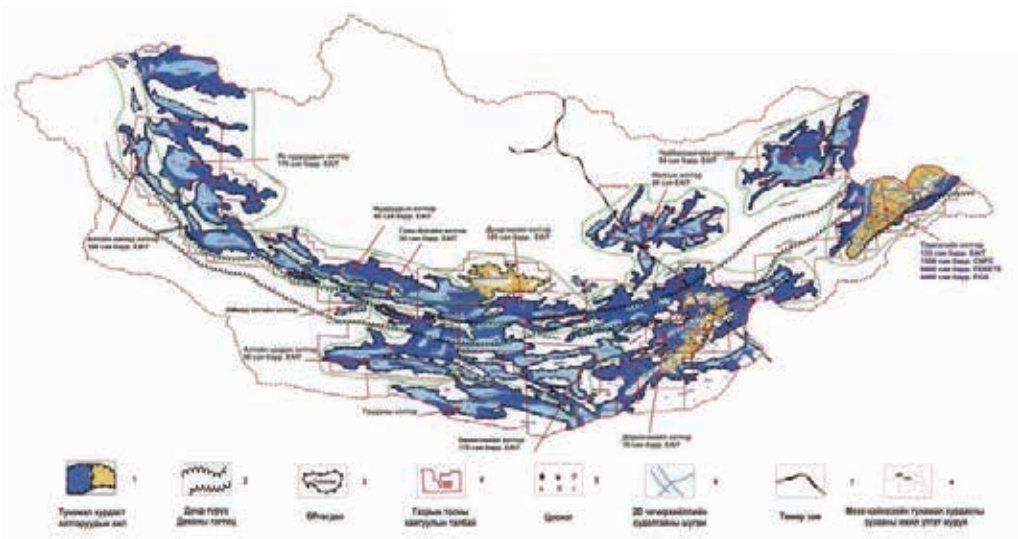




Mesozoic sedimentary basins of Mongolia were divided into 13 basins, 59 sub-basin which cover 523 thousand square km in 17 aimags.

According to the estimation of Exploration Associates International of Texas, Inc (EAIT) in 1990, the geology resources of crude oil in the Mesozoic sedimentary basins: Tamsag, Choibalsan, Dornogobi, Nyalga, Umnugobi, Dundgobi, Gashuun, Gobi-Altai, south Altai and back Altai, Great lakes, Lakes basin are with the possibility of 10 percent 2607 million bbl, with the possibility of 50 percent 1031 million bbl, with the possibility 95 percent 344 million bbl.

Figure 28. Petroleum Inferred Resources in Mesozoic Depositional Basin



Mesozoic basins of Mongolia are divided into 32 petroleum exploration blocks. Nowadays, Production sharing contract were approved on the 27 exploration blocks. At the present time, on the 25 exploration blocks are implementing PSC. The term of 2 PSC on the 2 exploration blocks are finished. There are 3 exploration blocks under negotiation and 2 exploration blocks open for bidding.

Totally, 21 Contractors company conducting petroleum exploration and production activities on the 25 exploration blocks. Those companies belong to the Mongolia-28,5%, China 28,7% others /Canada, Switzerland and Australia.

Figure 29. Petroleum exploration work

Petroleum exporation acivities

According to Production sharing contract, between 1993-2016 on the petroleum exploration area of 272890 ê ì ² covered by regional gravity survey at a scale of 1:200000.

There were conducted magnetic survey in area of 77630 ê ì ², passiv sesmic survey on the 210 physic point. full tensor gradiometry FTG survey in line of 21990 ê ì . 33494 km of 2D seismic work and 6273,9 km² of 3D seismic works were acquired. Total of 1537 wells were drilled for exploration, appraisal & production. Total 3,45 billion US dollars has been invested. As 2016, exploration block of Galba XI has been drilled 14 wells from which there are identified 11 wells with trace, 3 wells with fair oil shows. In this block is established 3 structures with potential of oil resources and from them produced 15717 m³ of oil. The estimation of oil reserve is 300X104 ton in area of 3.6 ê ì ². From the 3 wells in the exploration blocks of Khukh nuur were produced 35,2 m³ of oil.

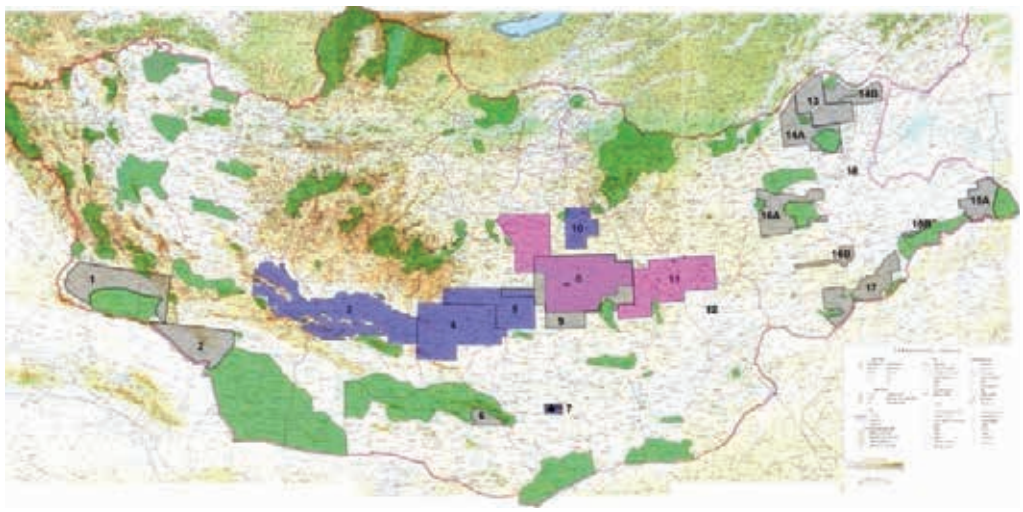
Table 5. Exploration works conducted on the sites under the petroleum PSA in 2015

1	Product Share A sites	Vibration survey		Gravitation survey /square km and f.point/	Drill holes
		2D/ longitude length.km	3D / square km/		
1	Uvs I	138		505	2
2	Khar-Us II			1480	
3	Bogd IV	1296.9		FTG 16260 ê ì	1
4	Ongi V	1681.4		FTG 5730 ê ì	1
5	Borzon VII	465.8		31430	1
6	Tukhum Õ$_{north}$	1130.9		21840	2
7	Òukhum Õ$_{south}$	345.3		7040	
8	Galba XI	1316	358.9		14
9	Tsagaan els XIII	790.6		11593	2
10	Zuunbayan XIV	1155.7		8730.8	
11	Tariach XV	1761.1	446.5	6570	21
12	Nyalga XVI	691.4			2
13	Bayantumen XVII	1073.3		7832	
14	Khukhnuur XVIII	2408.2		9861	5
15	Matad ÕÕ	1834.6	133.6	7900	12
16	Sulinkheer XXIII	480		13575.8	
17	Dariganga XXIV	210		17178	
18	Tsaidam XXVI	578.5		23503	1
19	Sukhbaatar XXVII	453.1		23043	
20	Arbulag XXIX	223		1769.4	
21	1997PSA	5138.8	339.6		124
22	Òoson-Uul XIX	10631.3	4995.2	8000	866
23	Òamsag XXI				475
24	Buir XXII				8
	TOTAL	**33494.2**	**6273.9**	**272890**	**1537**

Petroleum and unconventional petroleum prospecting surveys

According to the 16th article Petroleum law, with the aim of establishing and carving up new prospecting exploration blocks, there were signed with investors total 20 prospecting agreements in petroleum-10, coal bed methane-7, oilshale-3 from which 2 agreements were terminated. As 2016, there are implementing 18 prospecting agreements: in petroleum-10, in coal bed methane-5, in oilshale-3

Figure 30. Location map of Petroleum exploration pits in 1990-2014



According to the prospecting contract, there were conducted 4000 km geology inline survey, 7250 km^2 field survey in area of 12717 км^2 gravity survey and in area of 1600 ê ì ^{2} magnetic survey. Moreover, 713,84 km of 2D seismic work were provided. Total of 12 shallow wells were drilled and total 10,87 US dollar has been invested.

In 2016, as result of prospecting agreement, Arbulag exploration block was alienated as petroleum potential block and signed the Production sharing contract.

The result of labor study of oil shale sample of Genie oil shale Mongolia limited company showed that total organic content in oil shale are 12-23 percent which has less of sulfur and water conversation factor oil from kerogen is high.

Erdenes Tavantolgoi limited company tested the production of coal bed methane gas from Tavantolgoi coal deposit and the estimation of geology resource is 40 million ton.

According to the result of the prospecting survey, the Australian company, Golden Horde limited applied for coal bed methane Production sharing contract.

Central Archive of Geologic Documents

The Central Geology Archive consists of 7 types of database units including operation, resource, replacement, and confidential, online, private as well as annual reports. The database has 38,150 record units of total 8050 reports.

Table 8. Statistics of total information /2016/

1	Types of information funds	Quantity	Total books	Attached images
1	Reserve archive/repository	8050 units	18335	210532
2	Accession archive/repository	4704 units	10609	119036
3	Restored and retrospectively collected documents	1481 units	3890	53015
4	Documents for work funded privately	2270 units	5340	52585
5	Aerial photo	3551 units	-	652000
6	Positive and negative films	4010 units	3738	-
7	Primary field data	2500 units	6100	-
8	Mining plans, reports and annual exploration plans and reports	Volumes	35200	-

Categorized database:

- Mineral resources database
- Geological survey database
- Hydrogeological database
- Stratigraphical database
- Geochemical database
- Igneous unit database
- Mineral Resources Balance Database

Map database:

- Geological map
- Tectonic map
- Mineral resources map
- Geophysical map
- Geochemical map

Figure 31. Mineral Resource Database

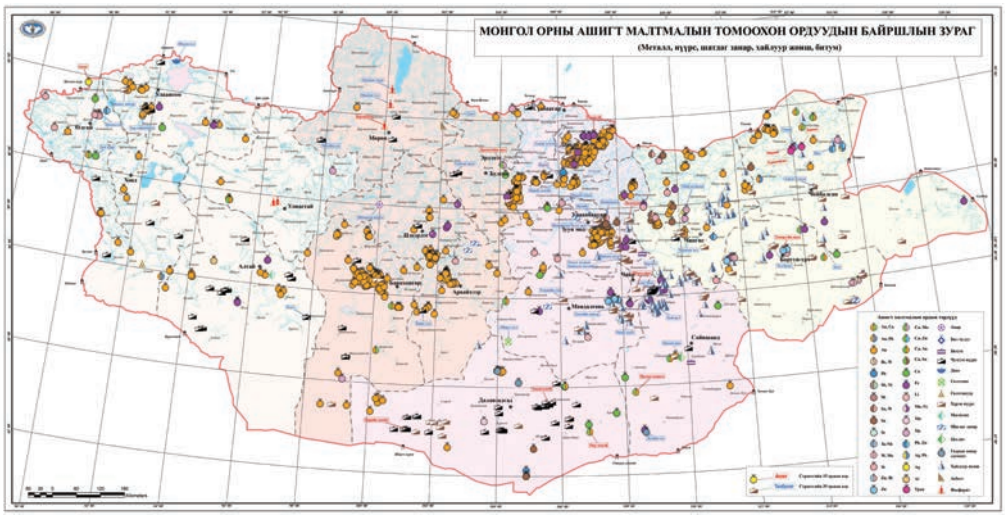


Figure 32. Geophysics map database

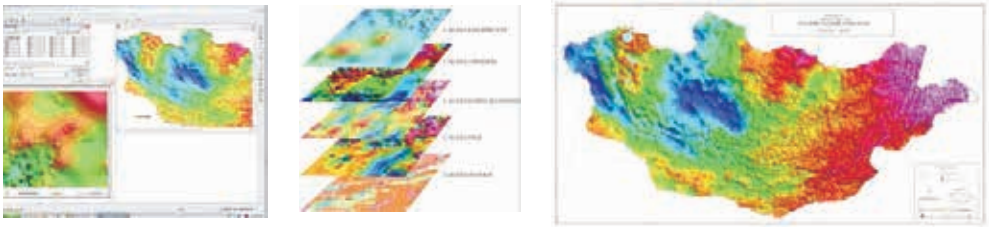
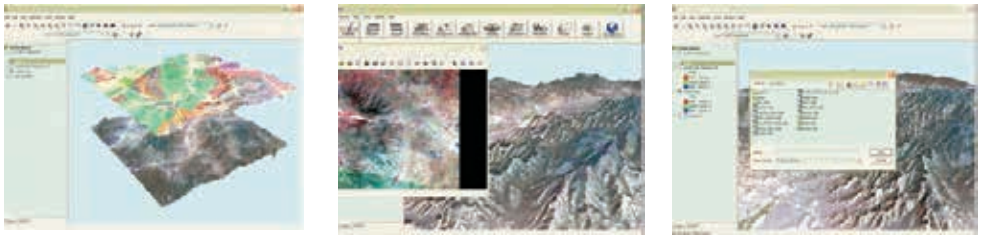


Figure 33. Aerial and satellite image data



2.3

MINING PRODUCTION

2.3.1

MINING LICENCES CURRENT STATUS

A total of 1558 mining licenses granted to companies in 2016 according to the Cadaster Registry of MRPAM, Figure 34 shows the disbursed mining licenses, disaggregated by types of mineral and license area locations.

Figure 34. Mining licenses *(by minerals type and aimag)*

By mineral types,

	Number	%
Au	537	34%
Other	49	30%
Sn	12	10%
NaCl	13	10%
Gypsum	15	10%
Cu	18	10%
W	31	20%
Polymetal	12	10%
Fe	77	50%
Mo	11	10%
Ca F2	167	11%
Rare earth	7	0%
Coal	295	19%
U	7	0%
Constr/mat	303	19%
Zn	6	0%

By aimags

	Number	%
Ulaanbaatar	162	10%
Tuv	272	17%
Dornogobi	160	10%
Selenge	118	8%
Khentii	102	7%
Umnugobi	91	6%
Dundgobi	84	5%
Zavkhan	7	0%
Orkhon	7	0%
Gobisymber	12	1%
Khuvsgul	17	1%
Bayan-Ulgii	25	2%
Uvurkhangai	25	2%
Arkhangai	26	2%
Khovd	27	2%
Gobi-Altai	43	3%
Uvs	43	3%
Sukhbaatar	59	4%
Bulgan	63	4%
Dornod	67	4%
Darkhan-Uul	68	4%
Bayankhongor	82	5%

Gold mining licenses account for 34% (537), construction material mining licenses account for 19% (303), coal mining licenses account for, 19% (295), fluorite mining licenses account for 11% (167) and iron ore mining licenses for 5% (77) of all mining licenses. The largest number of mining licenses were given in Tuv aimag. In contract each aimags, Orkhon and Zavkhan, had only 7 licenses .

The first mining license (MV-000906) was issued to the Mining Rescue Squad on 30 December 1992.

Table 9 shows the total number of mining licenses, and the status of submission of annual mining plans by the number of license holders and business entities holding licenses .

Table 7. Number of mining licenses vs. status of submission of annual mining plans

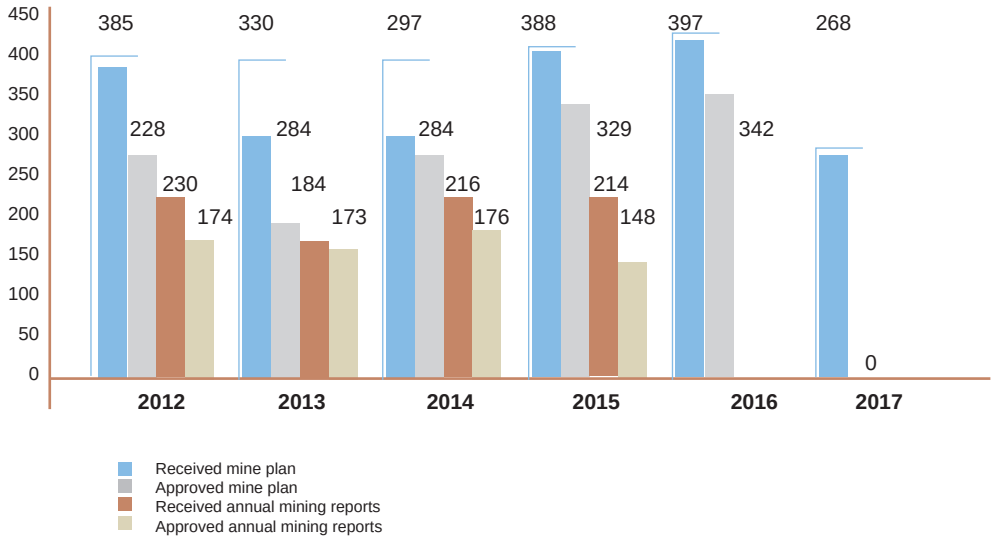
	Conditions	Number of mining licenses	Number of business entities holding licenses
1.	Total licenses	1560	1020
2.	Companies/license holders having submitted annual mining plans	408	348
3.	Companies/license holders notified non-operational by official letter	119	95
4.	Companies/license holders not having submitted annual report and plan to MRPAM	1033	577

In 2016, 1020 business entities held a total of 1560 mining licenses (overlapping); 348 of these business entities with 408 mining licenses had submitted annual mining plans, while 95 business entities with 119 mining licenses officially notified that they were not operating in 2016. Five hundred seventy seven (577) companies with 1033 mining licenses did not submit a mining plan or annual report and, thus failed to meet their obligations under Article 48 of the Minerals Law. These 1033 licenses were thus considered not operational, holded for future operation.

2.3.2 MINING REPORTS AND ANNUAL MINING PLANS

Mining license holders are obliged to submit an annual mining report and plans for the next year under Minerals Law Article 48. Data companies is used to help develop the country's fiscal framework; all reserves are registered in the central reserve database.

Figure 35 below shows the number of submitted/approved mining reports and plans, 2012-2017



In 2016, 348 companies submitted 397 annual mine plans (including 12 beneficiation and processing plants without licenses and 10 plan updates) for 408 mining licenses. Three hundred forty (342) of the 397 submitted mine planes were formally approved by MRPAM.

2.3.3 INFORMATION ON MINES AND PLANTS AT STANDSTILL

Non operating mining companies in 2016 study was conducted as follow.

One hundred twenty three (123) mines formally notified MRPAM that they would be at a standstill in 2016 including 34 fluorite mines, 27 gold mines, 17 iron ore mines and 4 tungsten .

Table 8. Mines and plants at standstill in 2016

Types of minerals	Quantity
Fluorite	34
Gold	27
Iron ore	17
Limestone	5
Tungsten	4
Stone chip	4
Clay	4
Sand and gravel	4
Gold, copper	2
Marble	2
Nonferrous metal	2
Aluminum	2
Tin	2
Sand	2
Molybdenum, copper	1
Gold, silver	1
Quartz crystals	1
Granite	1
Volcanic slag	1
Copper	1
Magnesite	1
Pegmatite	1
Polymetal	1
Iron, zinc	1
Rare earth	1
Zeolite	1
Total	**123**

Sixty one (61) mining companies were non-operational because they needed additional investment; 23 companies were still developing and updating feasibility studies and environmental impact assessments; 21 companies ceased to operate because of price volatility and sales-related issues in global commodity market price; 8 company had suspended operations because their mining licenced area was located watershed headwaters where mining activities are prohibited ; 5 companies had pending court disputes; 3 companies were waiting for local government approval; 2 companies were still completing exploration stages.

Table 9. Key company reasons for not operating in 2016

Key reasons	Number of respondents
Additional investment needed	61
Feasibility study and Environmental Impact Assessment needed renewal and update	23
Price volatility and sales-related issues in commodity market price;	21
Located in PROHIBITED with river flow and headwater OF WATERSHEDSs by law.	8
Pending Court dispute	5
Waiting for local government approval, and other reasons	3
Exploration incomplete and/or ongoing	2
Total	**123**

2.3.4 MINES AND PLANTS BROUGHT INTO OPERATION

Table 11 shows mines and plants commissioned in 2016 and formally approved by the State Commission.

Table 10. Information on newly commissioned plants and mines, 2016

	Name of entity	Location of plant/mine	Mineral type	Date of application (thousand m^3 and thousand tonnes)	Mine capacity million)	Investment (MNT jobs	Number of new
1	Irmuun Bosgo LLC	Orkhontuul soum, Selenge aimag	Gold	2016.04.20	124.0	1550.0	31
2	MGL Resources LLC	Zaamar soum, Tuv aimag	Gold	2016.04.25	86.1	634.3	29
3	Tod Undarga LLC	Bayangol soum, Selenge aimag	Gold	2016.04.29	80.0	4300.0	65
4	Erdenyn Tsakhirmaa Tal LLC	Bayan soum, Tuv aimag	Gold	2016.05.06	50.0	1056.0	35
5	Magic Bridge LLC	Ulziit soum, Dundgobi aimag	Fluorspar	2016.05.24	28.0 tons	1300.00	43
6	Ideal System LLC	Must soum, Khovd aimag	Gold	2016.06.07	200.0	369.7	46
7	SBF LLC	Zaamar soum, Tuv aimag	Gold	2016.06.08	80.0	1000.0	41
8	Pantaterra LLC	Bayangol soum, Selenge aimag	Gold	2016.06.09	76.7	1211.7	78
9	Altandornod Mongol LLC	Zaamar soum, Tuv aimag	Gold	2016.05.30	67.5	1400.0	124
10	Uuls Zaamar LLC	Zaamar soum, Tuv aimag	Gold	2016.06.13	150.0	6100.0	61
11	LMO Mining LLC	Lun soum, Tuv aimag	Gold	2016.06.16	100.0	1200.0	41
12	Altan Zaamar LLC	Zaamar soum, Tuv aimag and Buregkhangai soum, Bulgan aimag	Gold	2016.07.19	1691.1	10380.0	116
13	Mirae Fluorite LLC	Gurvansaikhan soum, Dundgobi aimag	Fluorspar	2016.07.26	100.0 tons	446.00	100
14	Orient Mining Investment LLC	Buregkhangai soum. Bulgan aimag	Gold	2016.07.25	100.0	3970.0	83
15	Shine Sansar LLC	Bumbugur soum, Bayankhongor aimag	Gold	2016.07.21	68.6	1000.0	32
16	E-Trans LLC	Bayantsagaan soum, Tuv aimag	Limestone	2016.07.20	1500.0tons	1770.0	31
17	Dungshinhenye LLC	Dalanjargalan soum, Dornogobi aimag	Fluorspar	2016.08.04	100.0 tons	800.00	100
18	Bolor Shur LLC	Bayan-Uul soum, Dornod aimag	Gold	2016.08.04	40.0	2200.0	44
19	FGP LLC	Tumentsogt soum, Sukhbaatar aimag	Fluorspar	2016.08.11	140.0 tons	1800.00	101
20	Uguuj Bayan Khangai LLC	Orkhontuul soum, Selenge aimag	Gold	2016.08.11	90.0	1560.0	53
21	Shin Shin LLC	Dashbalbar soum, Dornod aimag	Base metal	2016.11.07	900.0 tons	212.2	738

Forty seven (47) new mines and plants formally applied to the State Commission for inspection and approval in 2016. The State Commission inspected on the mines of 21 business entities and approved them for further operations. Fiften (15) of the approved new mines were gold mines in 2016.

Close to two thousand (1992) new jobs were created and MNT 44.2 billion of investment was injected into the mining industry in 2016.

2.3.5 STATISTICS ON MINERAL PRODUCTION

This section covers the production of key mineral products of Mongolia.

Gold

Table 12 shows Mongolia's gold production statistics .

Table 11. Gold mining Production Volumes, sales Revenue and Prcies – 2011 to 2016amount, total sales*

Indicators	Unit	2011	2012	2013	2014	2015	2016
Production volume	Metric tonne	4.39	4.33	7.243	7.537	12.59	18.51
Sales revenues	MNT billion	223.1	387.7	504.1	552.7	430.1	1244.0
Average price	US$/oz	1568	1668	1411	1271	1160	1257

Gold production declined after the adoption and enforcement of the Law Prohibiting Mineral Exploration and Extraction Near Water Sources, Protected Areas and Forests (2009), but production has revived since 2013 in part due to government encouragement of gold mining through a conducive legal and taxation environment.

A joint Working Group (from the Ministry of Finance, Ministry of Mining and Heavy Industry and Bank of Mongolia) was established in 2016 with the ain to further increase gold production. A new "Gold-II" Program is being developed and will come into effect in 2017.

Copper concentrate

In Mongolia there are two main concentrators that produce export copper concentrate (Erdenet and Oyu Tolgoi). The Erdenet Concentrator copper concentration capacity and export output have been relatively stable and indication are that stability will continue in the future.

Table 12. Copper concentrate production of Erdenet Mining Corporation **

Indicators	Unit	2011	2012	2013	2014	2015	2016
Copper concentrate	Thousand metric tonnes	516.09	517.78	520	516.81	546.19	657.35
Sales revenue	MNT billion	1233.7	1195.8	1183.4	1324.4	1035.4	
Sales price	USS/tonne	1568.2	1668.8	1411.0	1271.2	1160.1	
Average price	US$/metric tonne	8859	7952	7332	6863	5510	4790

* www.masm.gov.mn
** www.customs.gov.mn

The Oyu Tolgoi Concentrator started export production in 2014, and reached installed capacity by the end of 2016. Oyu Tolgoi is now developing its underground mine under the assumption that the development process finishes on schedule and the company will maintain production stability.

Table 13. Oyu Tolgoi copper concentrate production

Indicators	Unit	2013	2014	2015	2016
Copper concentrate	Thousand metric tonnes		734.35	814.2	904.64
Gold in concentrate	Kg			736.64	848.0
Silver in concentrate	Kg			1157.7	1200.0
Sales revenue	MNT billion	92.33	3155.8	3218	
Average price	US$/metric tonne	3383.8	3048.6	2782.1	

Iron ore

Mongolia has reserves of ready-for-development iron ore totaling 11.5 million metric tonnes annually. However production and export iron ore volumes have not exceeded 65% of this 11.5 million metric tonnes because of external market conditions and volatile of the iron ore prices.

Table 14. Iron ore extraction in Mongolia

Indicators	Unit	2011	2012	2013	2014	2015	2016
Production volume*	Thousand metric tonnes	4663.3	6382.1	6793.3	7557.8	6061.2	6084.78
Sales revenue	MNT billion	292.96	456.75	460.28	643.95	327.8	
Average price (58%)	US$/metric tonne	167.5	128.4	125	93.1	49.8	42.4

Fluorite

Historically, Mongolia's fluorite production and sales have been closely linked to production in the Russian and Chinese steel and other sectors. More recently, and particularly in 2012, fluorite extraction and processing has soared with the construction of new plants to an annual of around 400 000 metric tonnes. Increased fluorite extraction may be hampered due to of the near future market conditions.

Table 15. Fluorite production In Mongolia

	Unit	2011	2012	2013	2014	2015	2016
Production amount- FF type	Thousand metric tonnes	50.8	98.8	57.2	61	51.6	80
Production amount- FK type	Thousand metric tonnes	200.2	278.1	82	117.6	55.8	100
Sales revenue	MNT billion	26.83	63.64	51.15	58.38	41.18	
Price - FF 97 type (floatation fluorite)	US$/metric tonne 529.4	456.3	349.4	305.7	283.3	257	
Price - FK 85 type (lump fluorite)	US$/metric tonne 352.2	365.7	294	240	244.3	238	

Tungsten, molybdenum, zinc, tin

There has been relative stability in exports of lead and zinc concentrate, but at low sales e.g. Installed production capacity may rise to 20000 tonnes/year, which would have a positive impact on the national economy.

Table 16. Tungsten extraction and sales

Indicators	Unit	2011	2012	2013	2014	2015	2016
Production amount	Thousand metric tons	0.20	0.13	0.53	1.08	0.68	1.46
Sales revenues	MNT billion	0.669	2.325	9.47	20.09	11.59	
Price (99%)	US$ metric ton	59349	55349	57274	50970	36080	32408
Tungsten concentrate price, 65%	US$/ metric ton					11651	10545

Table 17. Molybdenum concentrate

Indicators	Unit	2011	2012	2013	2014	2015	2016
Production amount	Thousand metric tonnes	3.15	3.93	3.67	4.05	5.53	5.78
Average price	US$/metric tonne	34457	28037	22583	25203	14618	14103

Table 18. Zinc concentrate production

Indicator	Unit	2011	2012	2013	2014	2015	2016
Production amount	Thousand tonnes	105.85	118.02	103.53	93.10	89.60	126.04
Sales revenues	MNT billion	88.184	108.6	105.6	121.98	102.1	
Average price	US$/metric tonne	2198.90	1947.7	1910	2161	1928	2038

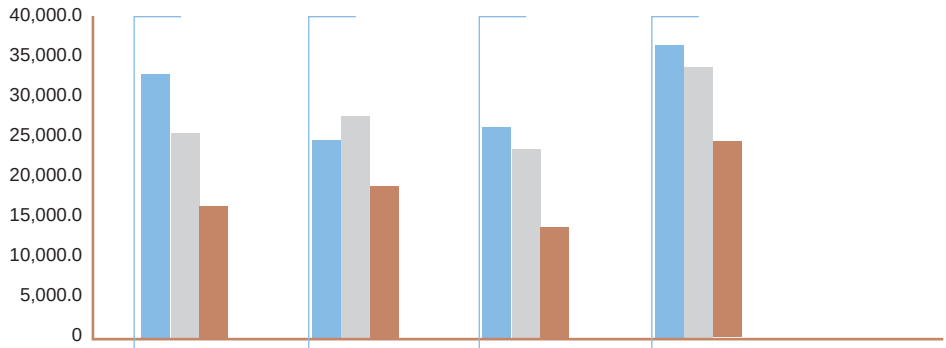
Table 19. Tin concentrate production

Indicators	Unit	2011	2012	2013	2014	2015	2016
Production amount	Tonnes 54.80	98.59	16.50	99.80	82.31	50.23	
Sales revenues	MNT million	898.1	1375.5	878.5	1989.9	91.17	
Average price	US$/metric tonne	26183	21112	22309	21909	16079	17676

Coal

Mongolia had registered coal reserves of 37.4 billion tons as of December 31st, 2016 and 171 entities are holding 296 coal mining licenses. In 2016, coal production in Mongolia reached 35.096 million tons, 33.83 million tons were sold and 25.8 million tons were exported. Coal production increased 152.9%, sales increased 152.9% and export increased 178.4% in 2016 from 2015 levels.

Figure 36. Coal mining, sales and export (thousand tones)



	2013	2014	2015	31.12.2016
Mining	33,340.5	24,449.3	24,146.1	**35,096.5**
Sales	26,076.2	27,305.0	22,125.4	**33,831.7**
Export	18,188.3	19,513.0	14,467.5	**25,809.3**

Table 20.
Approval of operational mining reports of coal mines and beneficiation plants
(2013-2016)

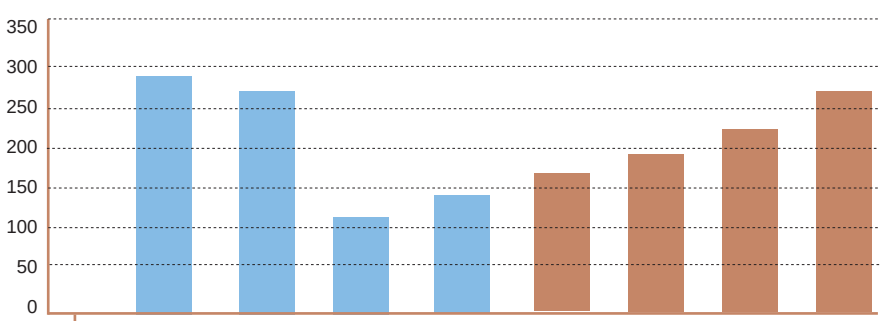
Year	2013	2014	2015
Number of submitted plans	40	48	40
Number of approved plans	35	40	33

Table 21.
Approval of operational plans of coal mines and coal beneficiation
(2013-2016)

Year	2013	2014	2015	2016	2017
Number of submitted plans	55	58	67	52	47
Number of approved plans	48	52	58	49	

Figure 37. Central and local government revenues from coal sector
(2013-2015, outlook for 2016-2020) **

Total genereted revenue, MNT billion

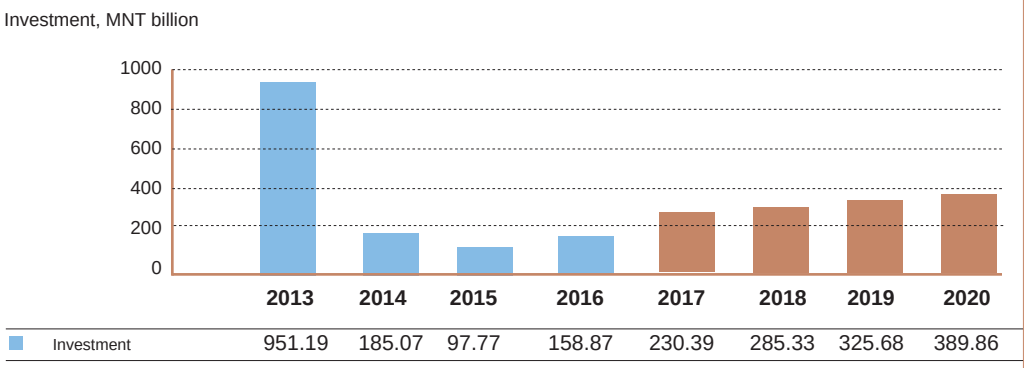


	2013	2014	2015	2016	2017	2018	2019	2020
Revenues	293.86	282.2	115.43	143.13	160.45	195.03	220.43	260.83

Note: The above forward data was based on data in the approved feasibility studies.

** www.mram.gov.mn

Figure 38. Coal sector investment projection (2013-2015, projection 2016-2020)



2.3.6 INFORMATION ON KEY MINERAL COMMODITIES EXPORT

It is a requirement under Minerals Law Article 48 that, mining license holders must annually submit their mining related data . Statistics for the end of November 2016 were based on data from the General Customs Authority.

Table 22. Statistics on mineral commodities export

	Mineral		2016 plan				2016 performance (actual)*		**Export data** (based on statistics of General Customs Authority, as of December 2016)	**Plan vs. actual, %** (As of 1 December 2016)
			Ore, sand		Export		Export			
			Measuring unit	Quantitative value	Measuring unit	Quantitative value	Measuring unit	Quantitative value		
1	Tungsten		---	---	Tonne	1,216.3	Tonne	985.77	1,466.47	81
2	Copper (cathode)		Thousand tonnes	17,289.0	Tonne	1,910.0	Tonne	2080.36	15,890.63	109
3	Copper (concentrate)		Thousand tonnes	68,600.0	Thousand tonnes	1,375.6	Thousand tonnes	1,561.99	1,561.99	114
4	Manganese		Thousand tonnes	858.1	Thousand tonnes	262.9	Thousand tonnes	28.76	28.76	11
5	Molybdenum (concentrate)		Thousand tonnes	30,600.0	Thousand tonnes	3.8	Thousand tonnes	5.39	5.78	142
6	Silver		Thousand tonnes	300.0	Tonne	41,400.0 (concentrate)	Tonne	94,840 (ore)	94,840 (ore)	32
7	Silver (in metals)*		---	---	Kg	9,576.8	Kg	1,920.25	1,920.25	20
8	Iron ore		Thousand tonnes	22,692.2	Thousand tonnes	12,234.6	Thousand tonnes	5,571.93	6,084.78	46
9	Uranium		Thousand tonnes	26.5	Thousand tonnes	2.83	Thousand tonnes	0	0	0
10	Fluorite (ore, concentrate)	FP-13-45	Thousand tonnes			246.5				---
		FK-65	Thousand tonnes			9.3				---
		FK-75	Thousand tonnes	1,975.8	Thousand tonnes	129.7	Thousand tonnes	140.86	248.87	---
		FK-85	Thousand tonnes			61.1				---
		FK-92	Thousand tonnes			78.4				---
		FF-95-97	Thousand tonnes			185.0				---
		TOTAL	Thousand tonnes	**1,975.8**	Thousand tonnes	**709.9**	Thousand tonnes	**140.86**	**248.87**	**20**
11	Lead (concentrate)		Thousand tonnes	670.0	Thousand tonnes	15.0	Thousand tonnes	10.04	10.04	67
12	Tin (concentrate)		Thousand m3	743.0	Tonne	411.5	Tonne	32.20	50.23	8
13	Zinc (concentrate)		Thousand tonnes	1,005.4	Thousand tonnes	113.4	Thousand tonnes	126.04	126.04	111

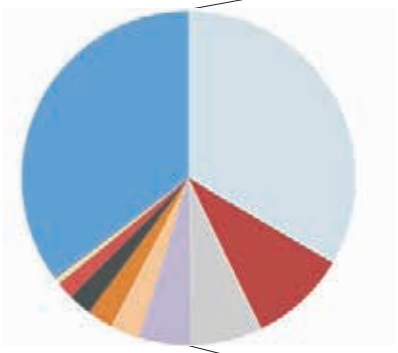
Note: Data relates to 78 businesses exporting mineral commodities *(not coal and gold),* as of 31 December 2016

* Grounded on export data 2016, General Customs Authority.

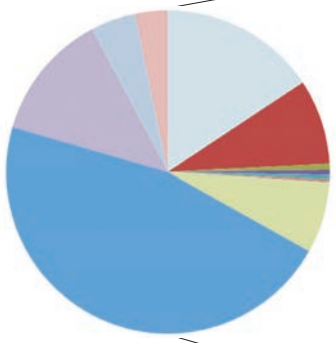
Businesses licensed for mineral extraction paid 638.7 billion MNT in tax to national and local governments in 2016.

2.3.7

TAXES AND FEES PAID BY MINING SECTOR TO BOTH LOCAL AND NATIONAL GOVERNMENTS AND ENVIRONMENTAL REHABILITATION STATUS



CIT	34%
Social Insurance	9%
Other	7.00%
Water fee	5.00%
VAT	2.90%
Property tax	2.50%
Air Pollution fee	2.30%
Land fee	1.70%
PIT	0.60%
Vehicle tax	0.2%
Royalty	35.10%



iron ore	2.2%
construction material	1.2%
lead	0.80%
flourite	0.70%
crude oil	0.60%
tin	0.20%
tungsten	0.10%
other	0.10%
uranium	0.1%
molybdenium	0%
copper	65.10%
coal	17.90%
gold	6.30%
zinc	4.60%

Copper concentrate producers paid MNT 415.8 billion MNT in tax, coal producers paid 114.2 billion MNT and gold producers paid 40.3 billion MNT, to central and local governments. In addition operational mining companies paid 224 billion MNT in royalties and 213.7 billion MNT in corporate income tax in 2016.

Information obtained from annual mining reports show that 590 hectares were affected by mining operations, technical reclamation was completed on 483 hectares and biological reclamation was completed on 387 hectares in 2015. Information obtained from annual mining reports show that show that 1124 hectares of greenfields have been affected by mining operation in 2016. Companies plan to complete 894 hectares of technical reclamation and 483 hectares of biological reclamation.

Presently 27912 hectares has been affected by mining operation in Mongolia. Approximately 75% (20,846 hectares) has been technically reclaimed, 29% (7,973 hectares) has been both technically and biologically reclaimed. Companies have spent 97.4 billion MNT on mine reclamation and incurred 60.7 billion MNT for costs of environmental protection measures.

Table 23. Total areas of mined and rehabilitated land, costs

	Indicators	Previous years	2015 performance	2016 plan	TOTAL
1	Total mined land *(hectares)*	26198	590	1124	27912
2	Total rehabilitated land *(hectares)*	19316	571	960	20846
3	Actual expenditures for rehabilitation *(MNT million)*	88859	334	5212	97420
4	Total area rehabilitated physical reclamation *(hectares)*	10786	483	894	12163
5	Total area rehabilitated, - biological reclamation *(hectares)*	7103	387	483	7973
6	Environmental protection costs *(MNT million)*	52957	3885	3895	60737

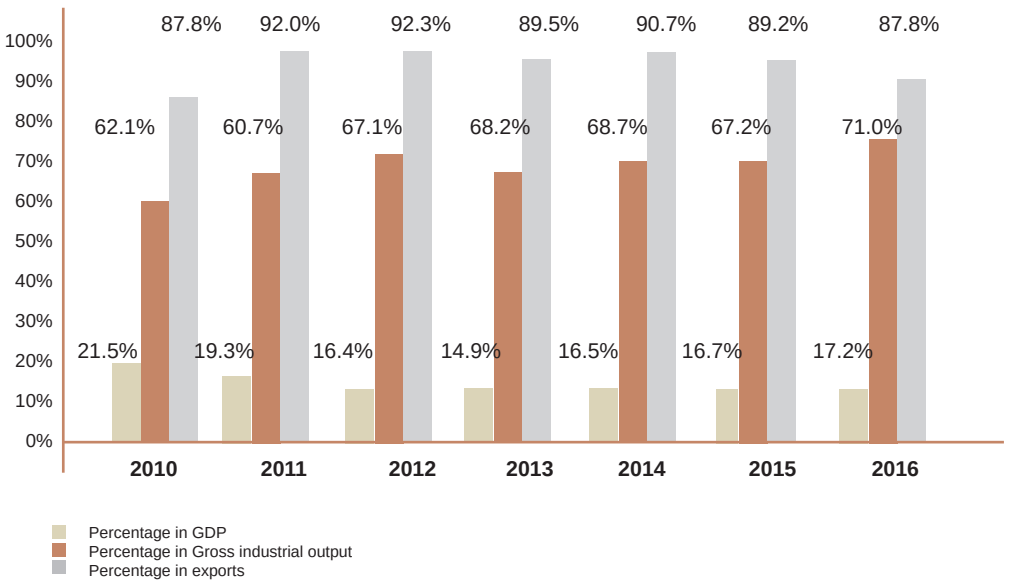
Information on workforce, health and safety

From the approved mine plans in 2016, the mining sector employed 25,392 people including: 2933 Mongolian and 119 expatriate engineers; 4083 Mongolian and 39 specialized technicians; and 4441 Mongolian and 536 women. Companies planned to allocated 34,349.4 million MNT for occupational safety and health, 16292.4 million MNT for safity clothing and equipment and 3795.94 million MNT for medical cost.

2.3.8 SOCIAL AND ECONOMIC CONTRIBUTION OF MINING SECTOR

The mining sector accounted for approximately 17% of Mongolia's 2016 GDP and 71% (worth 7 trillion MNT) of the overall industrial output in 2016.

Figure 39. Impact of mining sector on the national economy



Mining exports account for US$ 4.3 billion, making up 87.8% of national export products in 2016.

2.3.9 INVESTMENT IN THE MINING SECTOR

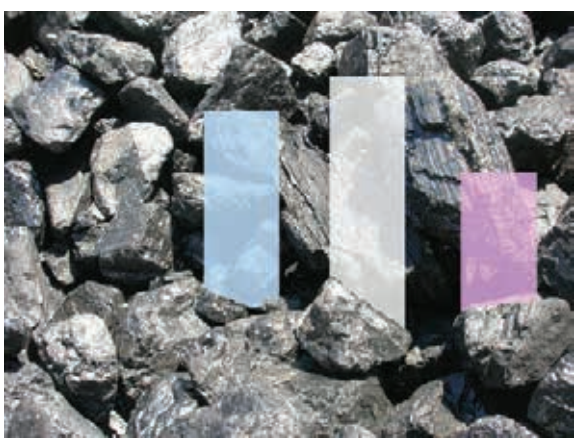
Key mining sector action in 2016 for promoting domestic and foreign investment in the mining sector:

- Continued disbursement of exploration licenses direct issuing and bidding procedures.

- Effective amendment to the Budget Law, which obliges part of company license and royalty payments be directly allocated to local government budget portfolios in order to attract support from local governments for geology, exploration and mining operations.

- Increased gold production and sales to Central Bank resulting from a policy to boost gold mining.

- Reactivating suspended gold mining projects by improved enforcement of the Long-named law.

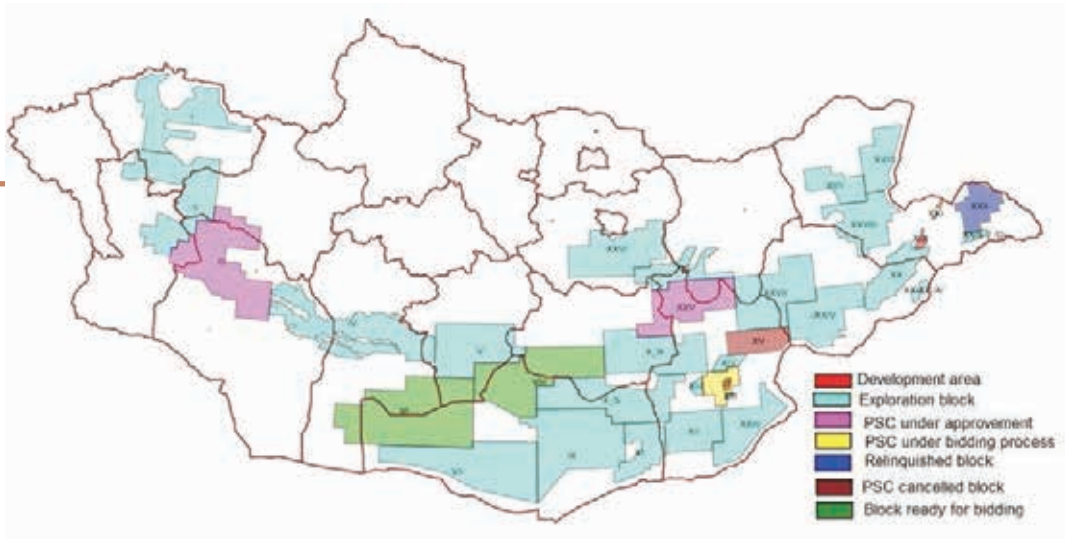


- MRPAM has developed of a First-of-its-kind Deposit Development Agreement with Areva Mines LLC on Zuuvch-Ovoo and Dulaan Uul uranium deposits and with Gurvansaikhan LLC on Khairkhan, Kharaat, Gurvansaikhan and Ulziit deposits. Preparations for commercialextraction of radioactive mineral deposits under Nuclear Energy Law Article 29.

- There is on-going efforts with MRPAM and Centerra Gold to build a “Deposit Development Agreement” to start commercial operations at the Gatsuurt hard rock gold deposit.

Thirty two 32 prospective petroleum blocks were identified in Mongolia for petroleum exploration. Currently the Government of Mongolia has signed a Production Sharing Contract with 21 companies for 25 of these prospective petroleum blocks.

Figure 40. Information on petroleum blocks with Product Sharing Contract and with active production



From which Petrochina Daqing Tamsag LLC and Dongsheng Petroleum (Mongol)" LLC are producing oil from Toson-Uul XIX, Tamsag-XXI and PSC-97 blocks.

Table 24. Information on oil-producing companies and oil fields

	Development blocks	Contractor company	PSC date
1	Toson-Uul XIX	Petro China Daqing Tamsag LLC	1993.04.26
2	Tamsag XXI		1995.12.11
3	BKhG-97	Dongsheng Petroleum (Mongol)" LLC	1997.01.24

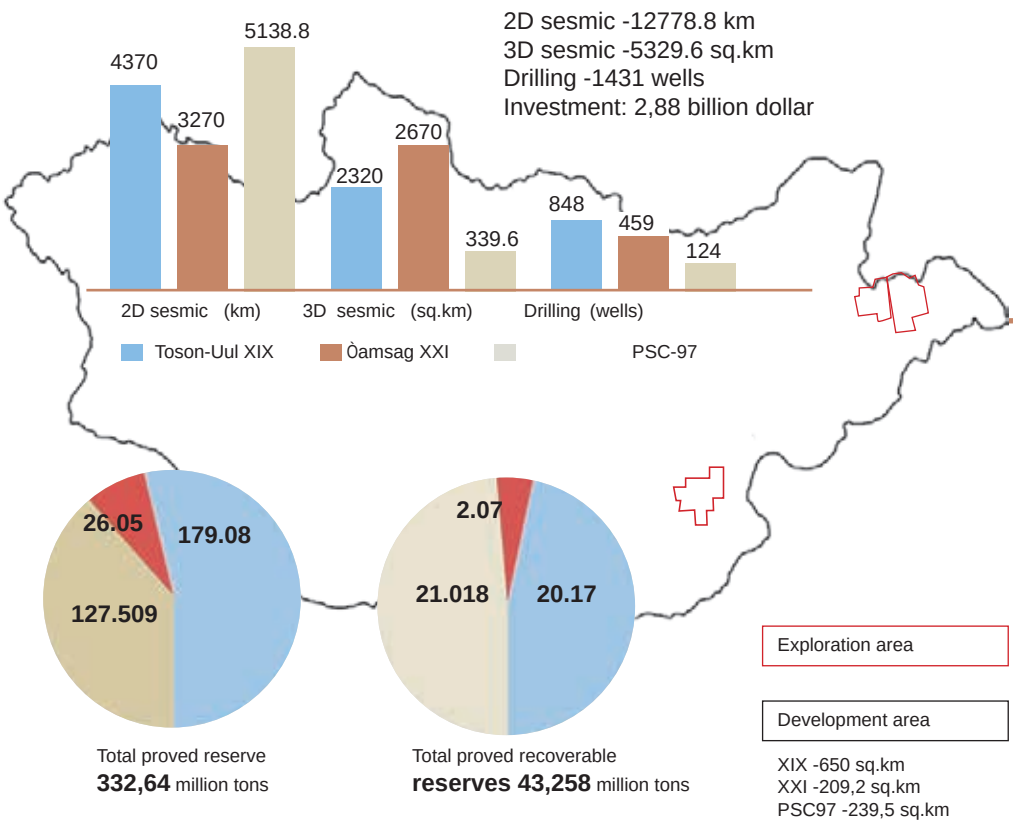
Petro China Daqing Tamsag LLC:

In August 2005, the Daqing Oilfield Limited (subsidiary of China National Petroleum Corporation) acquired the rights to the XIX, XXI and XXII petroleum blocks in Tamsag basin from SOCO-International LLC of the USA. The Petro China Daqing Tamsag LLC, 100% Chinese-invested entity in Mongolia began oil exploration and production related operations on the Toson-Uul XIX and Tamsag XXI petroleum blocks in Matad and Khalkhgol soums of Dornod province.

Dongsheng Petroleum (Mongol)" LLC:

The Dongsheng Jinggong Petroleum Development Group of China obtained the rights and obligations in a Production Sharing Contract which approved on the 15th of February 2003 by the Resolution 47 of the Government of Mongolia dated February 19, 1997 from Australian ROC OIL company. They established the Dongsheng Petroleum (Mongol) LLC in Mongolia with 100% investment and began oil exploration and production related operations on the assigned petroleum block under the Production Sharing Contract, in Dornogobi Aimag.

Figure 41. Oil reserves



Petro China Daqing Tamsag LLC and Dongsheng Petroleum (Mongol) LLC (between 1993-2016) drilled 1465 wells for exploration, appraisal development and development purposes (869 wells were drilled in Toson-Uul XIX block, 477 wells were drilled in Tamsag XXI block and 119 wells were drilled in PSC-97 block), conducted 12,78 thousand km 2D (4.37 thousand in Toson-Uul XIX block, 3.27 thousand in Tamsag XXI block and 5.14 thousand in PSC-97 block) and 5.33 thousand km2 3D (2.32 thousand km2 in Toson-Uul XIX block, 2.67 thousand in Tamsag XXI block and 339.6 in PSC-97 block) seismic survey.

The Mineral Resources Professional Council issued a revised report on the estimated reserves of the Toson-Uul XIX block in 2011 and the Minister of Mineral Resources and Energy issued Resolution 148 (June 21, 2011), based on Conclusion No.6 of the Mineral Resources Professional Council (June 3, 2011), approving the block's proved reserves at 60.06 million tonnes . Recoverable reserves were increased to 6.50 million tonnes and registered in the Mongolian Mineral Resources Reserve Fund. As a result, the overall block reserve was estimated at 179.08 million tonnes , of which 20.17 million tonnes was proved recoverable reserve.

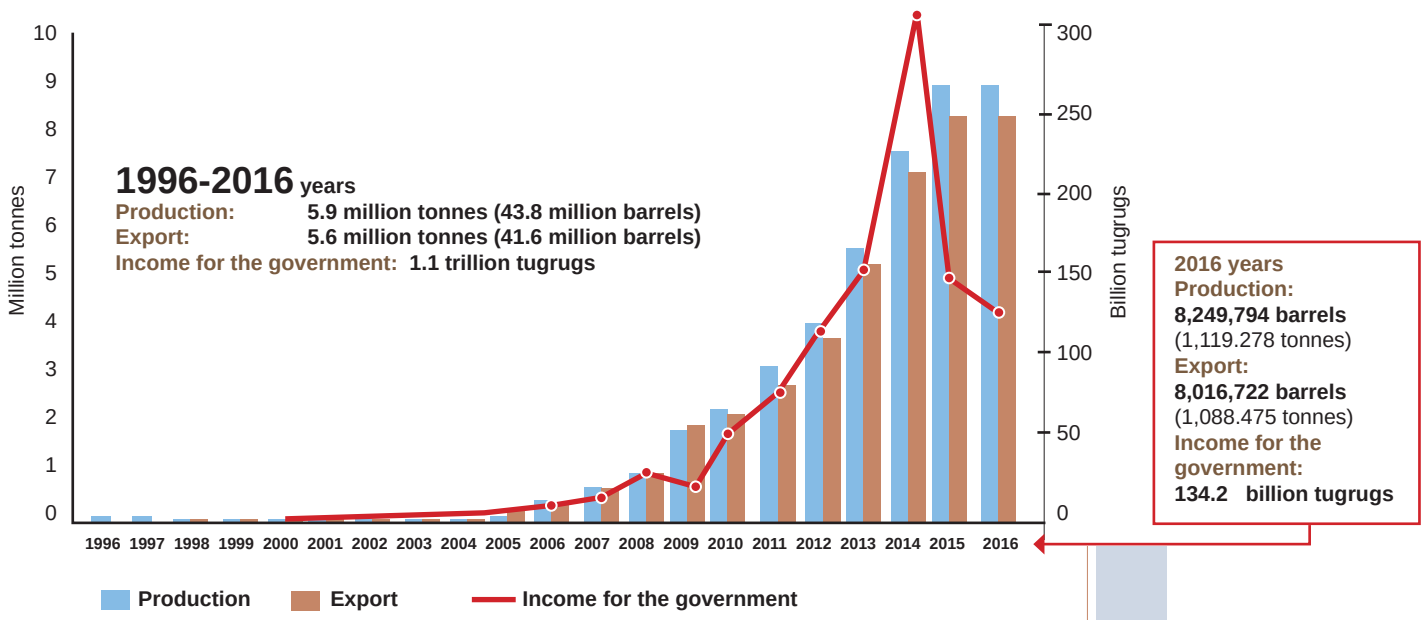
A subsequent resource evaluation report for the Tamsag XXI block was discussed by the Mineral Resources Professional Council. Conclusion No. 01/02 (March 2, 2012) led to Mineral Resources and Energy Minister Decree 41 (May 16, 2012) approving block proved reserves at 127.509 million tonnes , proved recoverable reserve by natural energy as 14.01 million tonnes and proved recoverable reserve for by water drive at 21.018 million tonnes, followed by registration in the Mongolian Mineral Resources Reserve Fund.

Reserves for PSC-97 block were estimated at 26.05 million tonnes (186.3 million barrels): the proved recoverable reserve was estimated at 2.07 million tonnes (14.86 million barrels). The reserve estimation report was discussed by the Mineral Resources Professional Council of the Mineral Resources and Energy Ministry. The reserve is registered in the Mongolian Mineral Resources Reserve Fund by the Resolution 137 (June 8, 2011) of Mineral Resources and Energy Minister on the basis of Conclusion 3 of the Mineral Resources Professional Council (April 18, 2010).

2.4.3 OIL PRODUCTION AND EXPORTATION

Approximately 43.8 million barrels (5.9 million tonnes) of oil were produced In Mongolia between 1996 and 2015, with 41.6 million barrels (5.6 million tonnes) exported to China, making 1.1 trillion MNT of income to the Government of Mongolia. In 2016, 8.25 million barrels (1.12 million tonnes) were produced, with 8.06 million barrels (1.09 million tonnes) exported, making MNT 160.6 billion income for the government.

Figure 42. Oil production, export and revenue generated in the national budget



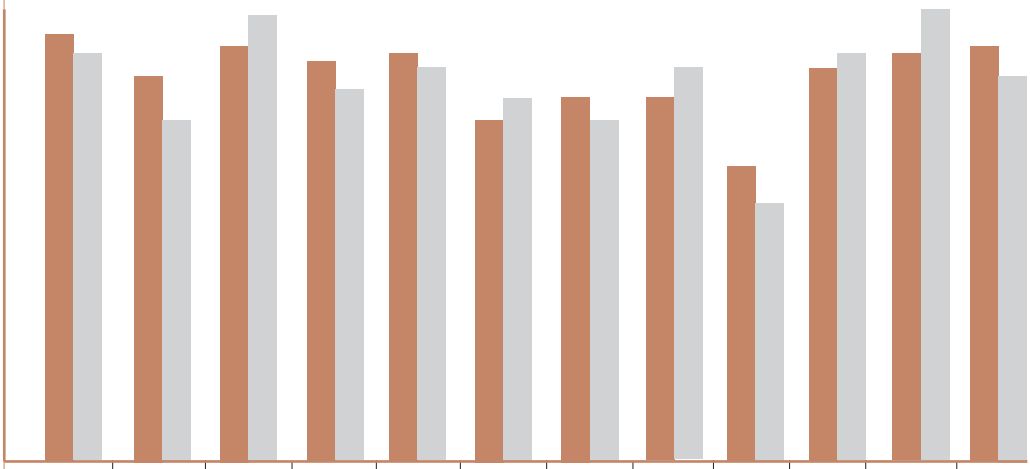
In the Toson-Uul XIX block, 456 development/production wells completed. An average 10,192 barrels (1350 tonnes) of oil per day is produced from 381 wells, with exports of 10,034 barrels (1333 tonnes) of crude oil to Chinathrough Bichigt border in Erdenetsagaan soum of Sukhbaatar province.

In the Tamsag XXI block, 229 development/production wells are in operation, producing 12,054 barrels (1600 tonnes) of oil from an average 218 wells. 13,636 barrels (1885 tonnes) of crude oil are exported to China through Bayankhoshuu border in Khalkhgol soum of Dornod province.

In the PSC-97 block, there are 106 development/production wells, with an average production of 948 barrels (133 tonnes) of oil per day from 103 wells . Each week 8535 barrels (1170 tonnes) of crude oil are carried to China on a train through Zamyn-Uud border in Zamyn-Uud soum of Dornogobi province.

in 2016, Mongolia produced and exported 8.25 million barrels (1.12 million tonnes) were produced, 8.06 barrels (1.09 million tonnes) were exported to China, generating MNT 134.2 billion revenue to the state budget.

Figure 43. Oil production and exports in 2016 (thousand barrels)



	1	2	3	4	5	6	7	8	9	10	11	12
Production	109,413	98,691	105,265	97,840	95,693	84,840	87,788	85,299	70,570	89,655	94,822	99,372
Export	105,448	88,157	108,804	87,400	92,048	87,963	83,782	90,422	60,255	93,098	107,943	89,118

2.4.4 TAXES, FEES AND CHARGES PAID TO CENTRAL AND LOCAL GOVERNMENTS

Oil production companies such as Petro China Daqing Tamsag and Dongsheng Petroleum (Mongol) LLCs paid US$ 3.41 million in tax and US$ 54.31 million in royalties in 1993-2015.

Table 25. Taxes, fees/royalties and charges paid by oil producers to central and local governments *

Indicators	Date	Toson-Uul XIX	Tamsag XXI	BKhG-97	Total
Amount of royalties paid *(US$ million)*	1993-2015 Projected for 2016	0 0	29.61 15.88	24.7 1.49	54.31 17.37
Taxes and fees (US$ million)	1993-2015	1.99	0.69	0.73	3.41

* www.mram.gov.mn

2.4.5 INVESTMENT IN THE OIL SECTOR

Oil production companies such as Petro China Daqing Tamsag and Dongsheng Petroleum (Mongol) LLCs invested US$ 2.83 billion in 1993-2015 and planned US$ 441.9 million investment in 2016.

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA

Table 26. Investment in oil sector

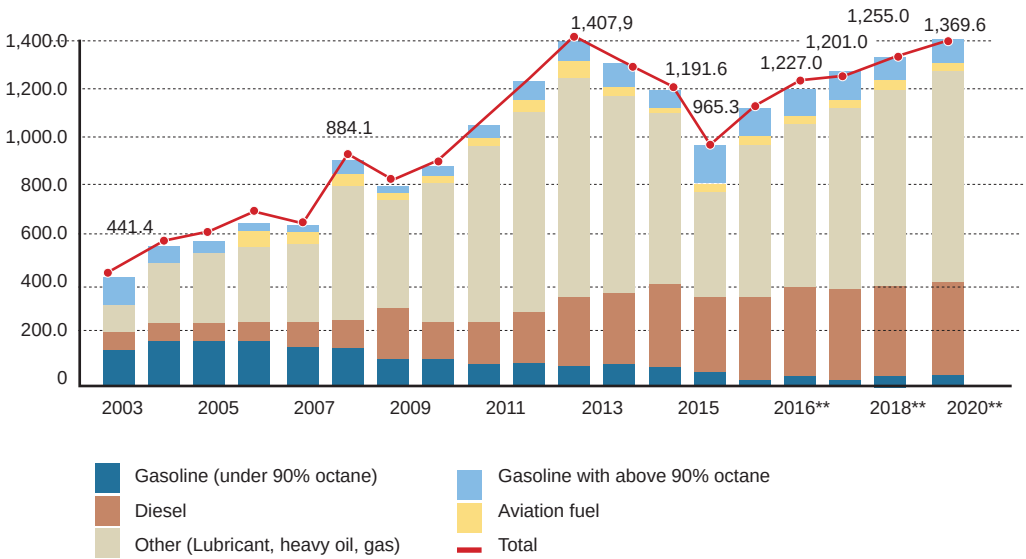
Indicators	Date	Toson- Uul XIX	Tamsag XXI	BKhG-97	Total
Investment amount (US$ million)	1993-2015	1795.4	742.87	291.41	2829.68
	Planned for 2016	173.9	251	17	441.9

2.5 MONGOLIA'S PETROLEUM PRODUCT CONSUMPTION AND IMPORTS

100% of Mongolia's domestic petroleum consumption is imported

Figure 44. Mongolia petroleum product imports

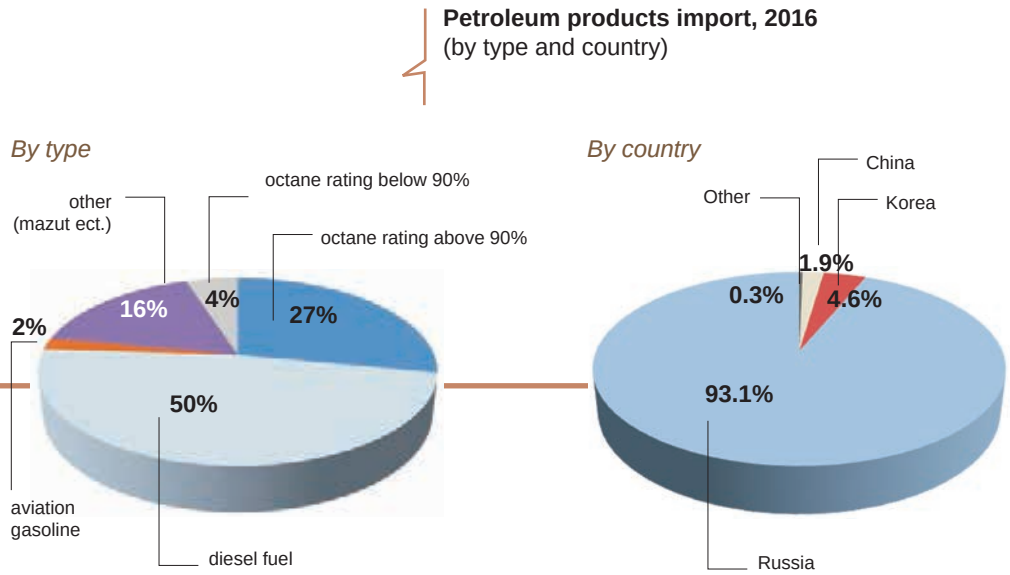
Mongolia's petroleum products imports, perspectives
(thousand tons)



Gasoline and diesel fuel imports rose 10% per annum between 2006 to 2013. Imports have fallen in the past two years due to the recession. Imports of A-80 (RON) lead gasoline have fallen year on year, while imports of A-92 (RON) unleaded fuel have increased. Imports of diesel fuel have been unstable, having both both risen and fallen in the past year. Diesel consumption has recently fell because of the plummeting global copper and coal prices and varying mining operations; but the expected trend is for a long-term rise in consumption.

It was estimated that imports in November and December 2016 would reach 165.0 thousand tonnes, with 1135.0 thousand tonnes of imports for 2016.

Figure 45. Petroleum products imports for 2016



More than 28% of petroleum products imports are of gasoline with an octane rating above 90% octane, 5% of petroleum products imports is gasoline with an octane rating below 90% , 48% of petroleum products imports is diesel fuel, 2% of petroleum products imports is aviation gasoline and 17% of petroleum products imports are other types (lubricants, heavy oil-boiler oil and natural gas). Over 90% of all petroleum imports come from Russia and 2% from China.

In the past 5 years, Mongolia's petroleum consumption has risen 66% while the number of vehicles has risen 53% (according to the vehicle registry).

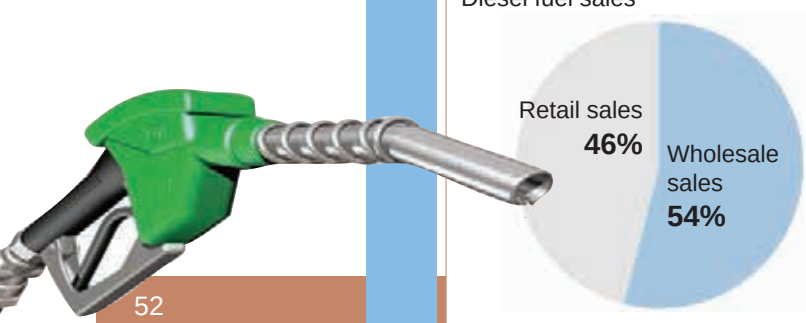
Table 27. Mongolia's petroleum consumption and vehicle numbers

Indicators/Year	2010	2011	2012	2013	2014	2015	Growth rate
Total consumption	650,299	798,252	871,974	989,588	1,046,193	980,373	+66%
Number of vehicles	254,486	312,542	345,473	384,864	437,677	482,049	+53%

Each additional vehicle in Mongolia means an increase in annual fuel consumption of approximately 1.8 tonnes (6 liters per day).

SUV/sedan type vehicles and public transport consume the most gasoline; cargo transport and the mining sector use the most diesel in higher capacity vehicles. Key factors influencing diesel consumption include wholesale buyers (mining and railway) and retail sales for private, passenger and goods vehicles.

Diesel fuel sales



PETROLEUM AND MINERAL TESTING AND EXPERIMENT LABORATORY

The petroleum and mineral testing and experimentation laboratory is petroleum products and mineral carbohydrates for compliance with Mongolian National Standards and develops policy recommendations for the minerals sector.

Figure 46. Petroleum and mineral testing and experiment laboratory

Central Lab was installed in 2013 new building with grade 2 fire resistance ratings and It has two rooms for substance testing, was able to test 40 items, with 70 equipments.
This equipment is fully checked and calibrated for comprehensive testing of petroleum products and lubricants.

MINING RESEARCH AND EXPERIMENTAL LABORATORY

Figure 47. Mining research and experimental laboratory

The Mining Research and Experimental Laboratory was built with central government financing. It has 1268.31 square meters of specially designed areas. The laboratory has 140 pieces of equipment , including 92 solid fuel testing and 50 water and soil testing sets. The laboratory is internationally accredited to test physical and chemical compositions for their mechanical and thermal properties as well as for soil and water pollution.

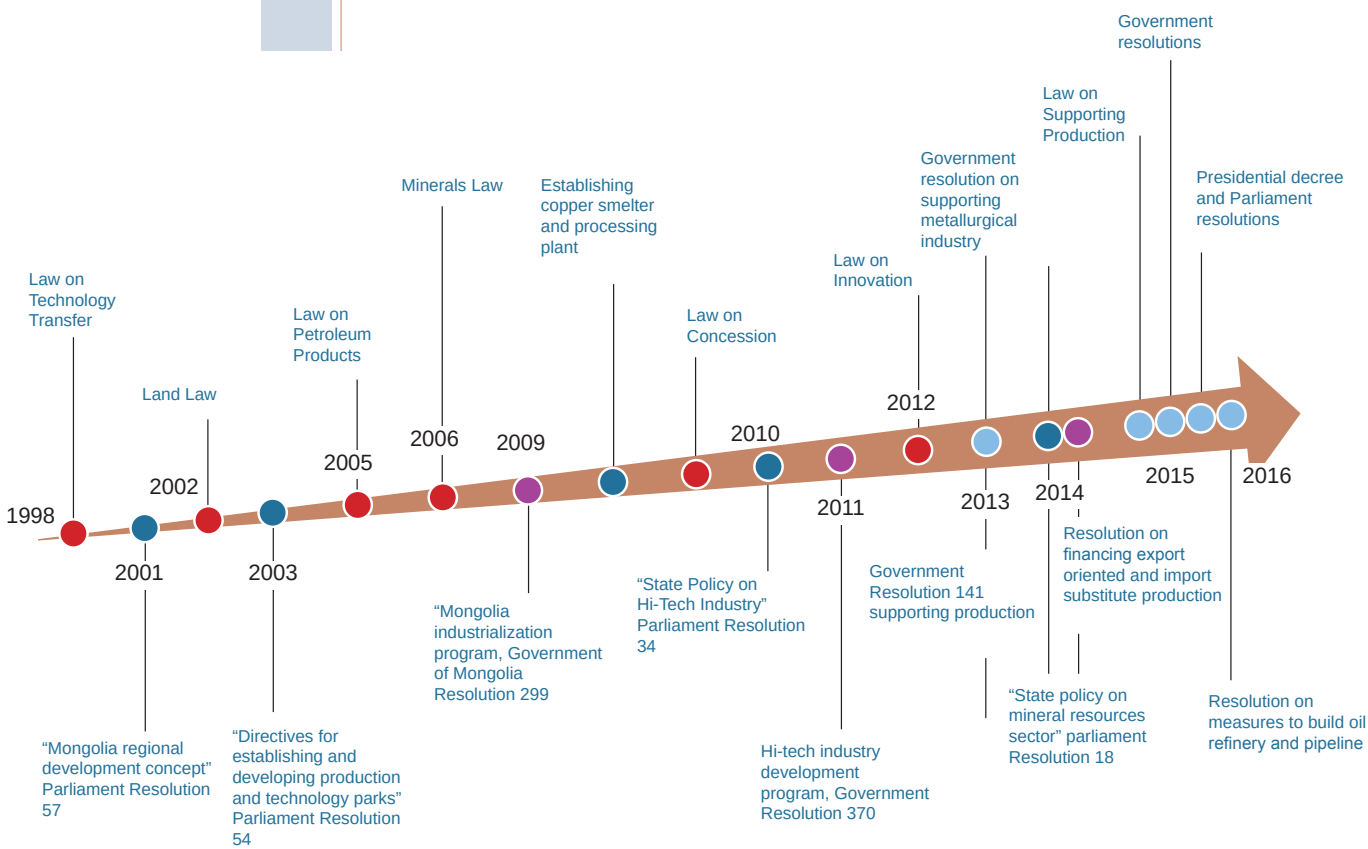
2.6 HEAVY INDUSTRY

The percentage, importance and impact of the heavy industry sector in Mongolia's social and economic development has been increasing consistently. Mongolia is a country with a rapidly growing mining industry. Value-adding economic activities of mineral commodities would have a radical effect on social and economic development.

2.6.1 LEGAL FRAMEWORK FOR HEAVY INDUSTRY SECTOR

The Law on Technics and Technology was adopted in Mongolia in 1998, the heavy industry sector was established as a subsidiary unit of the central state administrative agency in charge of mining. The government established the stand-alone Ministry of Industry in 2014. As the Ministry of Industry showed its value, the State Great Khural (Parliament) passed the State Policy on Industrial Sector, with emphasis on heavy industry.

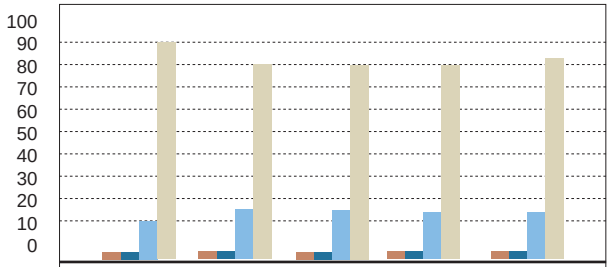
Figure 48. Legal framework for heavy industry sector



2.6.2 PRODUCTION VOLUME OF HEAVY INDUSTRY SECTOR

Policy papers on heavy industry development have set the government support, taxation and other types of promotion for export-oriented production. Domestic heavy industry products such as copper, steel and cement must be competitive against imports. Most of Mongolia's heavy industry is mining and agricultural raw materials, using simple technology. The figure below shows that mining commodities make up 81.9% of exports, of which 97% are low-tech products.

Figure 49. Technological sophistication of export products (%)



	2012	2013	2014	2015	2016
Hi-tech products	0.02	0.04	0.06	0.05	0.05
Medium hi-tech products	0.56	1.57	1.63	1.54	1.21
Medium-tech products	0.49	0.57	0.86	0.65	0.55
Low-tech products	9.11	15.16	13.8	15.1	12.85
No technology sophistication products	89.82	82.66	83.65	83.25	85.25

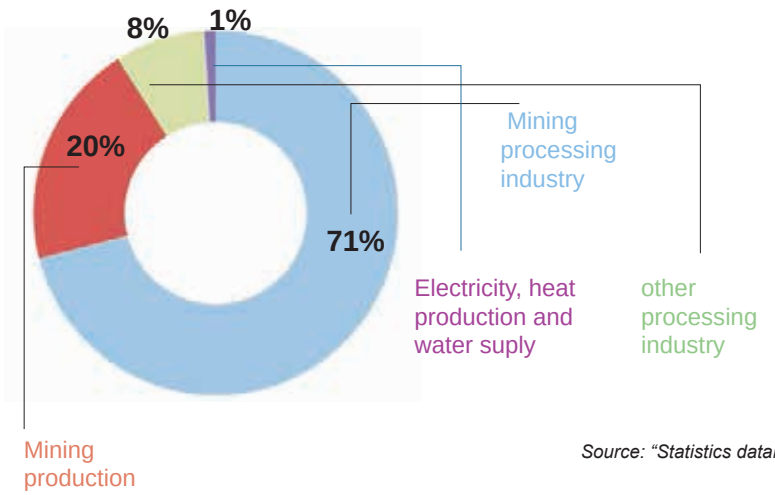
Source: "Industrialization" magazine, Ministry of Industry

Mongolia's heavy industry sector accounts for 5% of the GDP. Global financial crises, mineral commodity price volatility and a slow-down of the Chinese economy have had adverse impacts on the Mongolian economy. This has hampered GDP growth, while leading industrial countries like Japan, Korea, the US and Taiwan are global top-ranked in terms of innovative production. To work towards comprehensive industrial development, Mongolia must exploit their advantages including abundant resources and opportunities, say experts.

International studies of Mongolia's business environment and industrial development show some negative findings; public and private cooperation and engagement would play an important remedial role . A World Economic Forum report ranks Mongolia at 109 of 133 countries for competitiveness. In the case of the processing sector, low-tech production makes up 5.3%, which is roughly 4 times lower than Russia and 8 times lower than China.

The Government of Mongolia has issued various wide-range sector development policies, from the processing sector to cultural production . With effective policy and decision implementation, the contribution from the processing sector to GDP growth could increase. Similarly, the productivity of the heavy industry sector should improve. It is estimated that the processing industry contribution to GDP could double . At present the mining processing industry accounts for 29.5% of all industrial sector output.

Figure 50. Percentage in industrial output



Source: "Statistics database".

The industrial sector (processing, mining, energy and thermal supply) makes up about 30% of GDP. There is a need for a clear policy for increasing this percentage and encouraging value-added and high-tech production, particularly of mining products. Extensive study and assessment are currently underway into theimplementation of state policy for the industrial sector.

Table 28. Key processing industry in the heavy industry sector

Products	Unit	Production (semi-annual as of 2016)
Cathode copper 99%	Tonne	7,284,611.00
Metal semi-products	Thousand tonnes	7,623.2
Metal wire/cast steel	Thousand tonnes	8,511.29
Electricity cable	Tonne	29.62
Cement	Thousand tonnes	68.7
Lime	Thousand tonnes	6.30

Source: "Statistical database"

Table 29. Total production of industrial sector

Industrial sector	Unit	2015	2016	
		As of August	As of August	Average growth
Mining and extractive sector	MNT billion	5 589.7	5 931.8	-6.1%
Processing sector	MNT billion	3 726.7	4.122.5	+10.6
Unprocessed and semi-processed gold	Tonne	-	9,6	-

Source: "Statistical database"

Table 30. Current situation of heavy industry sector, production from processing industry

Products	Unit	Indictors as of first half of 2016
Cathode copper, 99.9%	Tonne	7,284,611.00
Steel	MNT million	13,719.20
Unprocessed and semi-processed gold	Kg	8,511.29
Petroleum products	Tonne	-
Chemical products	MNT million	3,719.0
Cement production	Tonne	

Source: "Statistical database"

Medium and long-term policy interventions and legal reform have accelerated domestic industry development and the societal atmosphere has changed. For instance, more and more Mongolians are consuming domestically-made products. In the last few years, large-scale projects worth US$ 2.3 billion (MNT 4.6 trillion) have been implemented; four of these projects are within the heavy industry sector. Real investment by national investors totaled US$ 963.1 million (MNT 1.9 trillion) as of 2015.

Table 31. Foreign market conditions for Mongolia's products

Producers	Key products exported new or added to current line	Monetary Amount	Country
Altayn Khuder, Boldtumur Yeruu Gol LLC	Iron ore, concentrate	220 000 tonnes US$ 10.0 million	Singapore
Erdenes Tavan Tolgoi LLC	Coking coal	442 000 tonnes US$ 9.6 million	
Major Drilling Mongol LLC	Steel tube and drilling tubes	24 tonnes, US$ 137 000	Indonesia
Achit Ikht LLC	Copper and alloy	99 tonnes US$ 496 000	

Source: "Industrialization" Magazine, Ministry of Industry

Table 32. Production volumes for key metallurgical products of Mongolia

Products	Number of plants	Installed capacity (year)	Production volume
Steel grinding balls, steel rods, semi-processed steel, alloy	19	390.1 thousand tonnes	141.0 thousand tonnes
Cathode copper	2	12.0 thousand tonnes	10.8 thousand tons
Cable wire	2	4680.0 thousand tonnes	2574.0 thousand meters
Molybdenum oxide	1	3.6 thousand tonnes	0
Buses and electric cars	1	120 pieces	36 pieces
Car parts	2	1860.0 thousand pieces	1860.0 thousand pieces
Assembly of motorcycles	1	700 pieces	700 pieces
Motorcycle parts, wheels	1	30.0 thousand pieces	9.0 thousand pieces
Equipment and machinery (agricultural, heavy machinery and mini machinery)	3	70 pieces	3 pieces
Trailer	2	40 pieces	4 pieces
Electric motor assembly	1	200 pieces	80 pieces
Engine parts	1	14 pieces	3 pieces
Car glass	1	132.0 thousand meter^2	92.4 thousand meter^2
Air filter	2	810.0 thousand pieces	81.0 thousand pieces
Stoves and oven	1	1320 pieces	924 pieces
Electric and aluminum buckets	1	27000 pieces	22950 pieces
Catering equipment	1	240 pieces	240 pieces
Metal fence	1	144.0 thousand meters	14.4 thousand meters
Lighting poles	1	1500 pieces	225 ø
Metal wares	3	10.5 thousand tonnes	2.4 thousand tonnes
Concrete rail sleepers	2	368.0 thousand pieces	35.0 thousand pieces

Source: "Industrialization" Magazine, Ministry of Industry

Mongolia annually imports 60-100 types of metalwares including steel, alloy and steel rods, cast items, production equipment and spare machinery parts. With incremental development of the metallurgical sector as a basis of industrial development, it will be possible to supply at least some of these products within the domestic market.

Table 33. Market supply of metalware (2012-2016, (thousand tonnes/US$ million)

Product name	2012		2013		2014		2015		2016 (as of November)	
	Quantity	Price	Quantity	Price	Quantity	Price	Quantity	Price	Quantity	Price
1. All types of metal rods for construction and other steel products	293,4	271,6	365,4	277,5	388,2	291,2	252,4	164,1	325,8	760,2
2. Reinforced metal structures for construction	87,02	170,75	64,34	121,23	75,2	112,8	43,2	74,0	109,5	543,4
3. Steel for various equipment and alloy parts	11,9	28,6	18,6	33,5	22,5	35,0	19,6	28,45	11,0	25,6
4. Spare parts of alloy and steel for machinery	30,7	55,4	37,2	68,75	40,5	75,0	48,1	65,4	233,4	170,1
5. All types of metal wares	106,67	148,72	99,09	183,26	105,32	173,04	85,4	136,64	88,1	56,3
TOTAL	**529,69**	**675,05**	**584,6**	**684,2**	**631,7**	**687,04**	**448,7**	**468,59**	**767,8**	**1555,6**

Source: Bulletin "Cluster development for metallurgical industry, needs and solutions", p. 44

As of today, Mongolia's installed capacity of metallurgical factories is an aggregate of 180 000 tonnes, but these factories use only 50-60% of capacity because of limited raw materials, different levels of applied technology and lack of skilled workforce and qualified engineers.

Table 34. Capacity of steel makers, types of products

Key products	Number of plants	Capacity, thousand tons/year
Construction steel rods	14	180,0
Spare parts of equipment and machinery	3	20,0
Steel grinding ball and steel rods	8	40,0
Steel and alloys	3	5,0

Source: Bulletin "Cluster development for metallurgical industry, needs and solutions", p. 48

2.6.3 OIL PROCESSING INDUSTRY

Potential sites for an oil processing plant (refinery) were researched in a feasibility study, including Choir, Sainshand, Bor-Undur and Choibalsan locations. Factors for choice refinery location included deposit location, infrastructure, logistical considerations for crude oil and final products and market proximity. The Government of Mongolia resolved on an oil refinery in Sainshand soum, Dornogobi aimag. One of the five available refining technologies will be selected, considering the properties of crude oil, output (final product) properties and product standards.

Building an oil refinery will cost US$ 1 billion, 0.7% for the processing plant and an additional US$ 264.5 million for transmission pipelines. The plant will generate an estimated US$ 1.2 billion revenue annually, with an annual net profit of US$ 160 million, and an investment recoup period of 8-10 years.

The planned refinery will process 1.5-2.0 million tonnes of crude oil annually. It will produce 560 000 tonnes of gasoline of Euro-4 and Euro-5 standards, 670 000 tonnes of diesel, and 107 000 tonnes of liquefied gas as well as other chemical by-products.

If the price for crude oil (per barrel) stays at around US$ 40-60, the price for the plant's final products is estimated at MNT 866-1244 per liter.

Social and economic impacts:

- Petroleum product imports are predicted to fall by US$ 1.2 billion, thereby improving the trade balance.
- A 20% decline in foreign exchange outflow and depreciation of foreign currency by 18-25%.
- US$ 150 million in taxes and fees will be paid to the central and local governments.
- Creation of over 600 direct new jobs.
- An estimated 30 types of other factories will be established, producing paints, cleaning materials, chemicals, perfumes, cosmetics, pharmaceuticals etc.
- Finance for the oil refinery will be resolved and provided.

2.6.4 COAL PROCESSING PLANTS

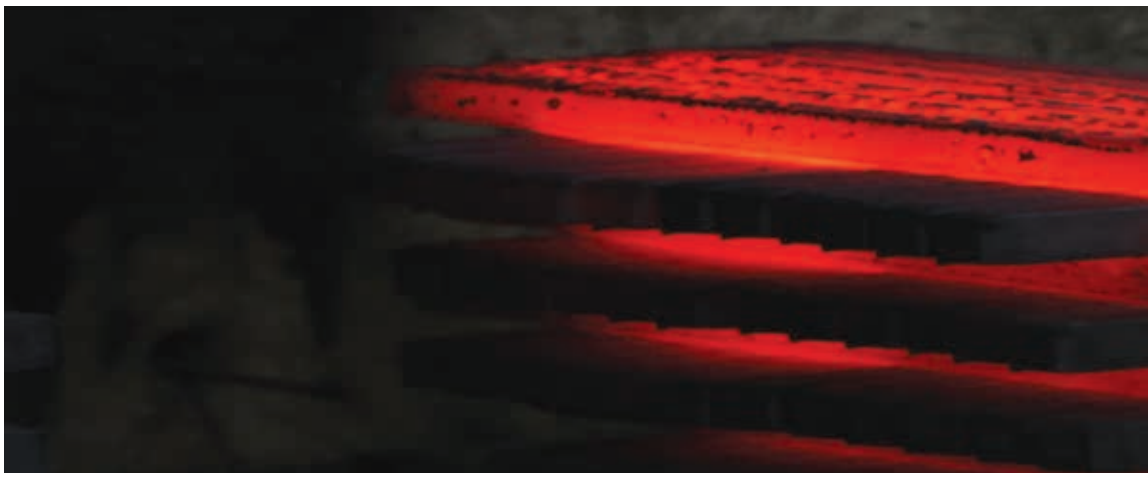
Five coal-to-liquid and coal-to-gas projects have had their feasibility study approved and are moving towards implementation. Their locations have been selected according to several criteria, including raw material availability, logistics for delivery of products and potential market proximity. One is at the Aduunchuluun coal mine in Dornod aimag, one at the Tugrug Nuur coal deposit in Tuv aimag, and one at the Baganuur coal mine, in central and eastern Mongolia.

These plants will have the most suitable technologies (eg the Fischer Tropsch process, the Bergius process, SRC-I and SRC-II), depending on coal properties, output volume and compliance with standards.

These plants will need investment of USD$ 1.1-2.4 billion, and are expected to process 2.5- 3 million tonnes of coal per year. They will produce 0.4-1.2 million tonnes of engine fuel, 50-100 000 tonnes of liquefied gas, 200-300 megawatts of electricity and other by-products. Investment recoupment is estimated between 8 to 15 years.

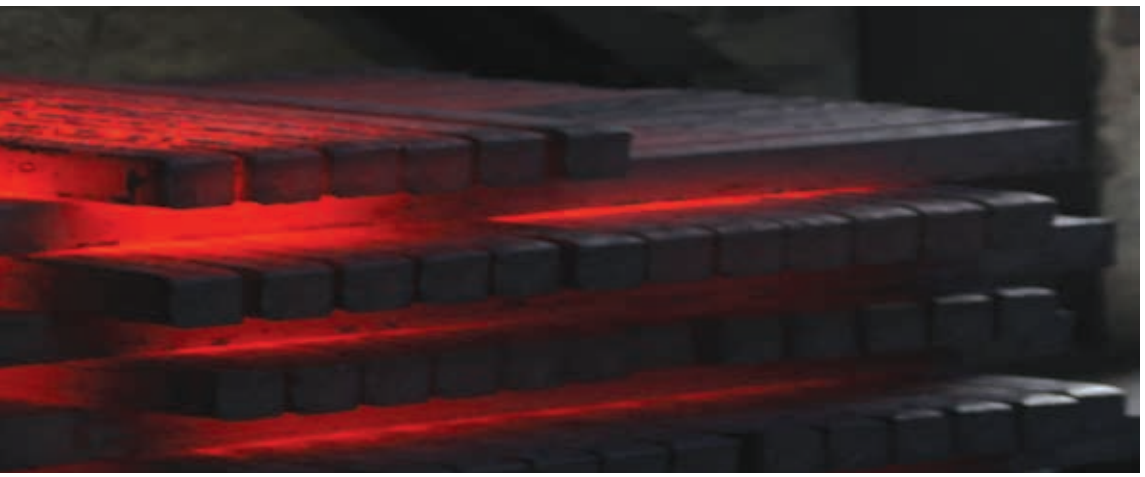
Social and economic impacts :

- Increased GDP by up to 15% and double processing sector output.
- Decreased imports of petroleum products (gasoline, diesel and gas) worth US$ 1- 1.5 billion, with improved trade balance.
- Reduced outgoing currency flow by 15- 20%, coupled with a 18-25% depreciation of foreign exchange rates.
- US$ 150-300 million in taxes and fees will be paid annually to central and local governments.
- Creation of 400-1000 direct jobs and 1000-1500 indirect jobs



2.6.5

FERROUS METAL INDUSTRY



The Targeted Program for Development of the Ferrous Metal Industry aims to ensure the implementation of objectives in the State Policy on the Mineral Resources Sector, and to support national exports by developing production of high quality steel and special purpose alloys. This program implementation involves activities in a wide variety of areas, including: search and extraction of steel supplements (chromium and manganese) and fire-resistant materials; beneficiation of these materials to produce various metal wares, alloys (ferrosilicone, ferrochrome, ferrotungsten, ferromolybdenum, ferrotitanium, ferrovanadium); high quality steel production; metallurgical coking coal production; fluorspar, limestone, synthetic gas and oxygen; electricity and water supply; transport; logistics; product marketing and public procurement.

Six primary objectives and activities have been defined. Program implementation is expected to result in: a conducive environment for production and sales, increased contribution of the metal industry to GDP, a favorable environment for domestic and foreign investment, accelerated trade turnover, expansion of export markets, increasing quantity and type of products compliant with standards, more domestic and foreign investment in certain sectors, improved competitiveness, reduced risks, and a foundation for national exports of high quality steel and alloys. Metal processing and machinery and equipment plants will be established so that production of value-added, highly competitive products will increase and a skilled and professional workforce will have a longer, more stable and better working life in their native country.

A bid evaluation committee was formed by Resolution 273 of the State Secretary of the Ministry of Industry. This committee is responsible for the selection of consultants to develop a feasibility study for a metallurgical complex and required infrastructure in Darkhan-Selenge region. It has since receieved and evaluated bids. The Canadian company, “HATCH”, was selected as the consultant for developing a feasibility study for a metallurgical complex and required infrastructure in Darkhan-Selenge region.

A pre-feasibility study for the construction of a metallurgical complex and required infrastructure in Darkhan-Selenge region will be submitted to the Heavy Industry Policy Department, Ministry of Mining and Heavy Industry, in December 2016.

Under the Mining and Metallurgical Complex project, the Darkhan Metallurgical Factory shareholding company has carried out the following construction work:

1) Completion of the Yeruu electricity sub-station in Selenge aimag's Yeruu soum; 50km of overhead 110kw transmission line to supply Tumurtei mine with electricity; and the 16 megawatt Tumurtei sub-station (2012-2014).

2) Installation and full operation of magnetic concentration plans with a capacity of 750 tonnes/hour at Tumurtei mine (2014).

3) Preparatory work has begun for open-cut mining at the eastern part of the Tumurtei deposit including purchase of necessary machinery and equipment, opened Eastern mine in 2004, and commenced overburden stripping.

4) The Darkhan Metallurgical Plant, upgraded its 45 megawatt sub-station to 10 megawatts at its Tumurlug section (2013-2014).

5) Construction of the Khandgait railway station terminal in Selenge aimag's Yeruu soum for carrying 2.5 million tonnes of iron ore annually (2014).

6) Competed construction of wet magnetic concentrator, with annual capacity of 1 million tonnes processing and 700 000 tonnes of wet concentrate production, with tailings facilities (2013-2014).

7) Construction of railway terminal with a capacity to transport 2 million tonnes concentrate/year at the Darkhan Metallurgical Plant (2014).

8) Finished construction of a second magnetic separation concentrator (capacity 500 tonnes/hour) at the Tumurtei mine; formally accepted by the State Commission (2014).

9) Commenced construction of 104.5km of paved road connecting Khuder soum (Selenge aimag) with the Dulaankhaan national road intersection, with completed road wall work (2015).

10) Completed the construction of a railway connecting the Tumurtei deposit, Khandgait station and the Tumurtei railway terminal and station with annual capacity of 2.5-8 million tonnes of iron ore concentrate; this was handed over to the State Commission (2014-2015).

US$ 300 million has been spent on construction of the above infrastructure under the Mining and Metallurgical **Complex project.**

• Financing:	National investment.
• Total required investment:	US$ 800 million.
• Key products:	350 000 tonnes steel bars, wires and grinding balls.
• By-products:	500 000 tonnes of steel rods and pellets.
• Raw materials:	Supplied from Tumurtei iron ore mine in Selenge aimag's Khuder soum, and Tumurtolgoi iron ore mine in Khongor soum, Darkhan-Uul aimag.
• Sales:	Supplying to domestic market meeting 100% demand.
• Jobs created:	Over 800 new jobs.
• Project period:	2016-2018.
• Contribution to central budget:	Estimated US$ 30 million taxes and fees per annum.

2.6.7

NON-FERROUS METALLURGICAL INDUSTRY

The Government of Mongolia's plans appear in a number of documents, such as: the State Great Khural (Parliament) Resolution 247 (Measures to Overcome Economic Crisis, 2015) and its Article Financing the Copper Smelter; State Great Khural (Parliament) Resolution 21 (Establishing a Copper Smelter, 2010); the Objective in the Government of Mongolia Action Plan for 2012-2016 on establishing a copper smelter; Article 14.17 of the Mongolia Industrialization Program, approved by Government Resolution 229 (2009); and Article 3 of the Priority Mega Project to be Implemented by the Government of Mongolia.

In response to a request from Erdenet Concern LLC, the Chinese Volant Industry and Central Engineering Institute for Nonferrous Metallurgical Industries (ENFI) developed a feasibility study for a copper smelter and refinery. The Technology Council of the Ministry of Industry approved the feasibility study (9 July 2015).

The Cabinet meeting on the of 15th of June 2015 endorsed Resolution 247 headed On Establishing a Copper Smelter and Refinery in Bor-Undur Soum, Khentii Aimag. The Minister of Industry issued Decree 134 (21 July 2015), establishing a Project Implementation Unit. The Government also approved Resolution 318 (13 June 2016) headed Entitling Selection of Investors for the Copper Smelter and Refinery and Representation of the Government of Mongolia".

The Project Implementation Unit was established byGovernment Resolution 107 on 29 September 2016. Relevant agencies are now working to resolve financial and operational costs for the Project Implementation Unit.

The copper smelter and converter (SKS furnace-SKS smelter) is a horizontal cylinder with rotating equipment, and uses Oxygen Bottom-Blown Smelting Technology, feeding hot oxygen-enriched air into the smelter, which is lined with fireproof materials and equipped with a sectional cooling system.

Project info:

• Financing:	Investor to be selected through open bidding.
• Total required investment:	US$ 798 million.
• Capacity:	Processing 530 000 tonnes of copper concentrates annually.
• Key products:	120 000 tonnes of cathode copper per annum.
• By products:	170 000 tonnes of sulfur and 200 000 tonnes of sulfuric acid.
• Number of new jobs:	759.
• Project period:	2017-2019

AUSTRALIA-MONGOLIA EXTRACTIVES PROGRAM

The Governments of Mongolia and Australia have an agreement through the Australia-Mongolia Extractives Program. This program is to assist Mongolia to sustainably manage its resource-led growth, and to help ensure that Mongolian citizens experience equitable and sustainable growth from their mineral resources.

The Australian Department for Foreign Affairs and Trade appointed Adam Smith International as the implementing Service Provider to implement the program in 2015-2018. AMEP provided the following technical assistance to MRPAM in 2015-2016.

- Technical assistance to Mongolia in establishing a National Geological Survey.
- Support for development of strategy for gold sector development 2015- 2025.
- Renewal of safety regulations for mineral concentration plants.
- Optimizing mineral deposit/asset evaluation.

AMEP plans to provide technical assistance in response to MRPAM's request for support for establishing a national geoscientific database through 2017. Furthermore, AMEP will cooperate in developing an Internet-based cataloguing system (WebGIS) for the Mineral Resource Information Technology Center.

MONGOLIA: ENHANCING RESOURCE MANAGEMENT THROUGH INSTITUTIONAL TRANSFORMATION (MERIT) PROJECT

The Mongolia: Enhancing Resource Management through Institutional Transformation project (MERIT) is funded by Global Affairs Canada to l help to revive Mongolia's economy and establish sustainable growth in 2016-2022 by building the capacity of the public sector and local community groups for effective management of the Mongolian extractive sector.

The Ì ERIT project aims to enhance public sector management of the Mongolian extractive sector so as to maximize its contribution to sustainable economic and social development.

Key activities include:

- Transfer of skills and best practice of international standards in the extractive sector, including environmental management, laboratory upgrades, risk management, responsible business practice, corporate social responsibility, EITI reporting etc.
- Project management, monitoring and evaluation.
- Human resource, organizational and financial management (including leadership training).
- Strategic planning.
- Information management (knowledge management, IT and GIS skills, software and technical support).
- Communications, improved public relations and multi-stakeholder consultations, increased awareness in the local community and civil society of impacts and opportunities from extractive sector activities.
- Support improved participation of women in the extractive sector.

СЕСМИМ
Төсөл

STRENGTHENING EXTRACTIVE SECTOR MANAGEMENT IN MONGOLIA (SESMIM) PROJECT (WITH FINANCING FROM THE GOVERNMENT OF CANADA)

The Strengthening Extractive Sector Management in Mongolia (SESMIM) project, funded by the Canadian Government, aims to build Mongolian public sector capacity for transparent and effective policy implementation in supporting sustainable growth in the extractive sector in 2015-2020. The objective is to improve public sector governance in the extractive sector through three intermediate outcomes: improved implementation of extractive sector policies and regulations; improved coordination between ministries and key stakeholders in the extractive sector; and stronger evidence-based decision-making that supports extractive sector management in a gender-sensitive, socially and environmentally sustainable way.

The project will be implemented by Agriteam Canada Consulting Ltd (Agriteam); counterparts in Mongolia include the Ministry of Mining and Heavy Industry; the Ministry of Environment and Tourism; the Ministry of Finance; and the Minerals Resources and Petroleum Authority of Mongolia. Other partners include the Government of Alberta, the University of Alberta and the University of Calgary.

3D GEOLOGICAL STRUCTURES AND METALLOGENY OF NORTH, CENTRAL AND EASTERN ASIA - INTERNATIONAL PROJECT (MONGOLIA, RUSSIAN FEDERATION, PEOPLE'S REPUBLIC OF CHINA, REPUBLIC OF KOREA AND KAZAKHSTAN)

This is an international project involving 5 countries that seeks to create a modern integrated geological basis for Northern, Central and Eastern Asia and an atlas of general geology by collecting geological and mineral data on overall geological structures that is reflective of the comprehensive level of geology in the area.

In this project, Mongolia is processing its regional geophysical survey data (magnetic and gravity) to develop its 1:5 000 000 general geological map that will be integrated with Russian and Chinese maps.

Geological, tectonic and metallogenic maps will be developed for area A1 (Mongol Altai Zone,M-45, M-46 and L-46) and area 1-2 (the Mongol- Agnurian regions, M-45, M-46, L-46) of Mongolia at a scale of 1: 1 000 000, as digital data, that will be integrated with the Russian and Chinese map of the same scale.

SOUTHERN AND EASTERN MONGOLIA 1:50 00 GEOLOGICAL MAP AND MINERAL RESEARCH

The KIGAM project is conducted in cooperation with the Republic of Korea and aims to provide r 1: 50 000 geological mapping and mineral surveying in southern Mongolia.

Project Parties signed a cooperative agreement (31 March 2016) that officially kicked off the project in southern Mongolia . .

MRPAM, in partnership with KIGAM, have completed a second year field survey in Tsogttsetsii soum, Umnugobi aimag. Materials collected from the field survey have been transferred for processing.

Schweizerische Eidgenossenschaft
Confederation suisse
Confederazione Svizzera
Confederaziun svizra

Swiss agency for Development and Cooperation SDC
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SUSTAINABLE ARTISANAL MINING PROJECT

In partnership with MRPAM, the Swiss Development Cooperation have been implementing a Sustainable Artisanal Mining Project, with financing from the Swiss Government, starting in 2005. The project targets small-scale artisanal miners and aims to contribute to learning international best practice on artisanal small-scale mining and bring benefits to the target group. It will be implemented until 2018.

Project objectives:

- To support the establishment of a transparent and straight-forward regulatory framework for artisanal mining, setting favorable conditions to legalize informal mining activities and to establish a transparent and fair regulatory and policy framework for artisanal mining.
- To transfer skills and know-how to artisanal miners and other stakeholders for better performance and safer operations; to encourage the formation of institutional structures and organizations within artisanal mining and related sectors; and to encourage cooperation at all levels.

Expected outcomes:
Outcome 1: Human rights-based artisanal small-scale mining policy and community mining.
Outcome 2: Economic strengthening of all formal supply chain stakeholders.
Outcome 3: Knowledge sharing and knowledge hub for artisanal miners.

MONGOLIA – CAPACITY DEVELOPMENT IN MINERAL RESOURCES ECONOMICS OF THE MINERAL RESOURCES AUTHORITY OF MONGOLIA (MRAM) - TECHNICAL ASSISTANCE PROJECT BY BGR

This project formally began with parties signing an agreement on the 17th of September, 2014.

The project is to support the MRPAM in increasing their capacity as a professional service provider for the Mongolian mineral resources sector and to comply with the mandate to regulate and promote the sector.

There have been several important activities in phase 1 of the project, such as building MRPAM staff capacity, professional training, studies of minerals types, publication of an information bulletin and creation of databases.

Phase 2 is planned to start in the second quarter of 2017, and the following interventions have been proposed:

- To introduce ways of economic valuation of exploration projects and build staff capacity.
- To Improve the development of feasibility studies of mineral projects, identifying their scope and increasing knowledge and skills of staff responsible for accepting feasibility studies.
- To support of development of geological and mining database.
- Field survey and in-depth mineral research (on some types of minerals).
- Build capacity of external market studies and analysis.
- Other necessary training.

MONGOL ALTAI-50 PROJECT FOR 1:50000 SCALE GEOLOGICAL MAPPING AND GENERAL SURVEY IN COOPERATION WITH CZECH REPUBLIC; 1:50 000 SCALE GEOLOGICAL MAPPING; GENERAL SURVEY FOR STUDYING MINERAL DISTRIBUTION STRUCTURE; AND ASSESSING PERSPECTIVES IN KHASAGT KHAIRKHAN AREA, IN COOPERATION WITH POLAND

The final results of the Mongol Altai-50 project for 1:50 000 scale geological mapping and general survey in cooperation with the Czech Republic, financed by the government and external partner agency, was discussed on the 11th and 12th of April, 2016, followed by formulation of all necessary documents such as inspection meeting notes, project introduction, staff-related data and other info. The final report was revised and sent on to the National Mineral Reserve Council, which discussed the report at its third meeting (22 September 2016).

Final reports for the Khasagt Khairkhan-50 project, jointly implemented by Mongolia and Poland, was received and sent on to the Central Geological Archive of MRPAM.

CHAPTER III.
MAIN OUTCOMES AND ACTIVITIES OF GEOLOGY, MINNG AND PETROLEUM SECTOR IN 2017-2020

Mineral Resources and Petroleum Authority of Mongolia's main goal is to implement State Policy on Minerals, 2014-2025, and policy guidelines reflected in Government of Mongolia Action Plan 2016-2020. Based on these documents, the Agency has developed Initial Overview of Geology, Mining and Petroleum Sector in 2017-2020 and long term workplan with specific outcomes to be achieved.

3.1 STATE POLICY ON MINERALS

The Parliament of Mongolia has approved the State Policy on Minerals, 2014-2025, with its Order No.18 of January 16, 2014. The main objective of the policy is to establish stable environment for investment, to improve minerals exploration, exploitation and processing qualities by introducing advanced technologies and innovation that have minimal impacts on the environment, produce value added products and improve competitiveness at international market.

Mineral Resources and Petroleum Authority of Mongolia, the implementing agency of Law on Minerals, Law on Petroleum and policies of Ministry of Mining and Heavy Industry, has issued the Agency's work overview for 2017-2020 based on State Policy on Minerals and other policies mentioned above. Key provisions of the policy document have been attached to this report.

3.2 KEY MEASURES REFLECTED IN THE GOVERNMENT ACTION PROGRAMME 2016-2020

The Parliament of Mongolia has approved the Government of Mongolia Action Programme for 2016-2020 with its Order No.45 of September 9, 2016. The Mineral Resources and Petroleum Authority of Mongolia, the Government Implementing Agency, will implement the Government Action Programme in next four years. The key measures reflected in the Government Action Programme for implementation in 2017 are summarized in below table.

Table 35. The key measures reflected in the Government Action Programme for implementation in 2017*

Measures in the Action Programme	
CONCERNING MINING AND HEAVY INDUSTRY	
Boost the operations of Erdenes Mongol LLC and the Oyu Tolgoi project and start exploitation of the Tavan Tolgoi and other deposits of strategic Importance.	Create conditions to construct a metallurgical complex in Darkhan and Selenge region.
Implement one-stop shop policy on exports and reduce red tape by providing customs, tax and specialized inspection services online or at one-stop service centers.	Boost the operations of Erdenes Mongol LLC and the Oyu Tolgoi project and start exploitation of the Tavan Tolgoi and other deposits of strategic Importance.
Create a favourable legal enviornment to attract invesment in geology and mining sectors and joinly implement mutually beneficial projects and programmes.	Industrialization Map of Mongolia is developed and Heavy industry development programme will be developed and implemented.
Improve the legal environment for creating cooperations in artisinal mining sector for individuals as stipulated in the Article 3.1.2 of the State Policy on Minerals.	Create a favourable legal enviornment to attract invesment in geology and mining sectors and joinly implement mutually beneficial projects and programmes.
Formulate a long term mining infrastucture development plan and improve interaction among sectors.	Formulate a long-term mining infrastructure development planning and improve coherence among sectors.
Establish a mining research institute and create a favourable investment environment in the minerals sector.	Create a legal environment to exploit secondary mineral resources and bring the process of mine rehabilitation and the closure up to the international standards.
Create a legal environment to exploit secondary mineral resources and bring the process of mine site rehabilitation and the closure up to the international standards.	Steadily increase oil extraction and construct an oil refinery.
Resolve required funding for the implementation of “Gold-2” program in cooperation with the Central Bank of Mongolia (Mongol Bank).	Support the construction of copper concentrate smelter and refinery.
	Create conditions to construct a metallurgical complex in Darkhan and Selenge region.
Increase gold production and create a legal environment to purchase extracted gold from artisanal miners.	Render policy support to setting up a coal washing and deep processing plant and coal gas extracting plant.
	Render policy support to setting up a plant for liquefied fuels and lubricants.
Support the construction of copper concentrate smelter and refinery.	Develop a metal component and assembly factory.

Measures in the Action Programme	
CONCERNING GEOLOGY AND EXPLORATION	
To further expand geological scientific work, thematic research, mapping and volume of exploration that are conducted with state budget to identify geological structure and geological formation and distribution of minerals, and steadily increase of state budget financing. Moreover, to provide policy support to involve private sector in order to increase scope and quality of geological research, and promote private investment in such work.	Within the scope of geological mapping and general prospecting activities run by state budget to do complete geophysical, geochemical and mining and drilling activities, then to carry out more specific researches in some areas with ore and occurrences;
	To strengthen the nationwide consolidated geo-ecological research and to perform specialized geo-ecological research in certain cities, provinces and soums;

Measures in the Action Programme	
CONCERNING PETROLEUM AND PETROLEUM PRODUCTS	
To reduce price pressure in relation to price of petroleum at world market.	
Intensify research, exploration and exploitation in conventional and non-conventional oil industry and increase oil deposits;	

Measures in the Action Programme	
“GOLD-2” PROGRAM	
• Cabinet decided to adopt a resolution to realize ‘Gold II’ national program. A working group to ensure the implementation on national level will be formed with Minister of Mining and Heavy Industry as head.	• As a result, the amount of annual gold extraction is expected to stably increase by 2-3 tons, gradually reaching 25 tons by 2020.
• n realization of the Cabinet’s 2016-2020 action plan and in order to recover the economy, the ‘Gold II’ program will be realized through two phases until 2020.	• With realization of the program, MNT 33-59 billion will be collected to state budget in the form of charge for exploitation of mineral resources, and following geological explorations, Mongolia’s gold resources will be increased by 100-150 tons

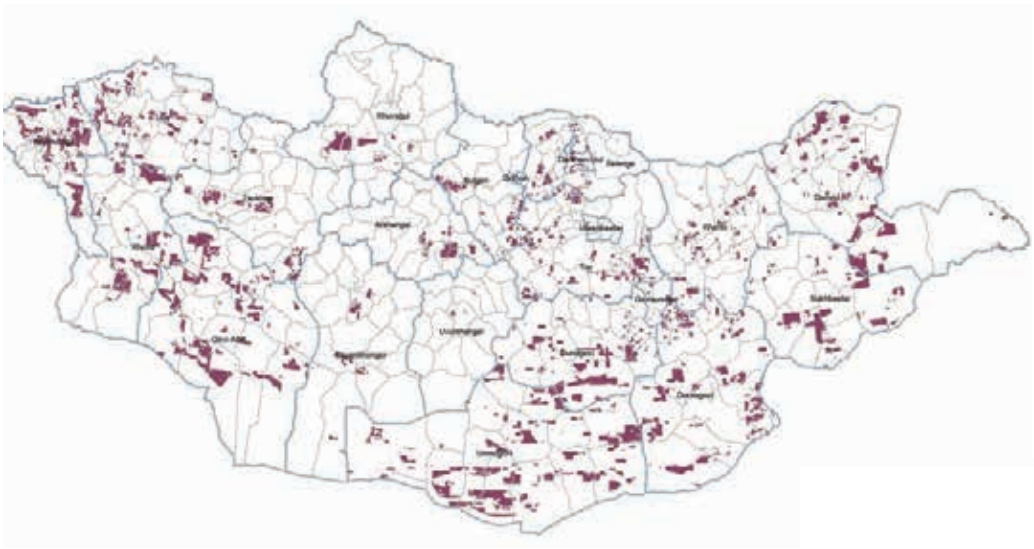
* http://legalinfo.mn/law/details/12120

The Cadastre Division issues a license upon receiving application. The selection process will be done in accordance with Law on Licensing. The Government Resolution No.239 of July 28, 2014 has identified the coordinates of land where geological exploration license can be issued. This Order was amended and changed with the Government Resolution No. 511 of December 21, 2015.

Issuing a license through a competitive selection process

As specified in the Law on Minerals, licenses shall be issued through a competitive selection process for areas with mineral concentration identified by state funded geological . The areas should be put together as a package before competitive selection process has started, and bidding announcement shall be published on daily newspapers for public attention at least 30 days before the closure of acceptance of applications.

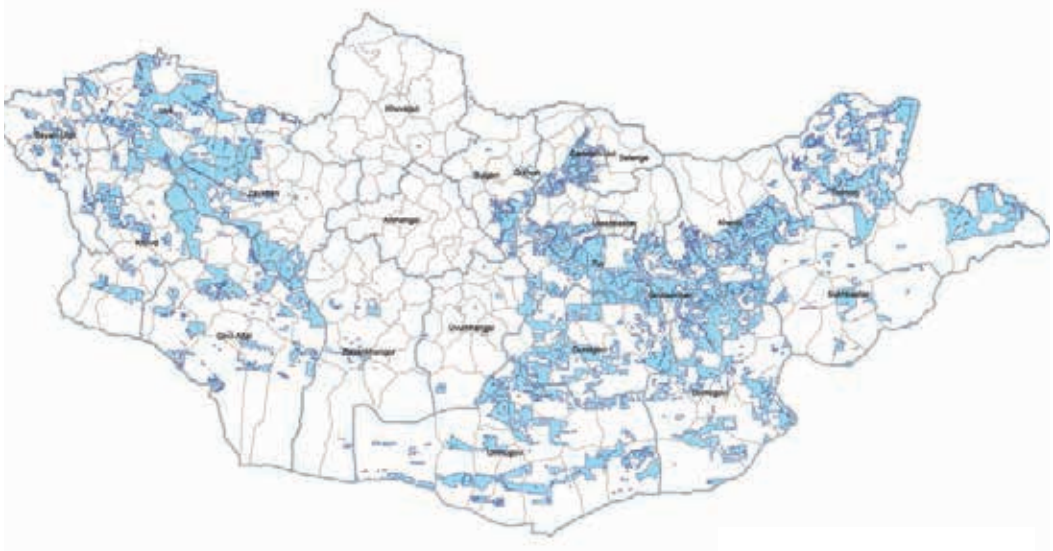
Figure 51. Land locations where an exploration license will be issued through competitive selection process.



Issuing a license based on an application

The Cadastre Division shall disclose to the public openly and in a transparent manner, the information about the land that can be given based on an application on local daily newspapers, MRPAM website and on the display located outside of the office. The application received will be electronically numbered, and the application will be reviewed and processed in first come, first served principle.

Figure 52. Land locations where an exploration license will be issued based on an application



3.4

MINERAL AND PETROLEUM EXPLORATION AND RESOURCE MANAGEMENT

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA

Mongolia has approximately 1000 deposits of 80 different minerals known to date and it studied 9000 occurences of minerals in details including their location and types.

To expedite the exploration work and increase foreign direct investment it is important to issue licenses within the permitted land. Even though the work of issuing a license has been temporarily halted as of today, exploration work is expected to increase with resumption of licensing, both through competitive process and by application, in 2017. It is observed that the fallen price of minerals tends to increase.

Geological mapping at 1:50000 scale of land for license through competitive selective process has been revised, and the future we are planning to issue a Government Resolution to increase land size with future prospects and mineral concentration. With the Government Resolution, we will develop the future prospects with state budget, which will in its turn encourage exploration work in licensed areas.

International research institutes announced the quantity of funds invested in exploration work in past 4-5 years globally. The data reveals that approximately USD 15-20 billion is spent in exploration of minerals such as gold, copper, zinc and spar. Out of which, Australia and Canada account for 8%, Russia 2%, China 3% and Kazakhstan 2%. Mongolia has a great potential for minerals exploration due to of the geological formation of minerals. Therefore, if we can establish an environment to attract foreign direct investment to Mongolia, it is to estimate approximately USD 0.5-2.0 billion can be spent in the exploration sector.

There are growing number of medium to large companies interested in investing in the geology and mining sector at international level. With an improved sustainablelegal environment , our competitiveness will also improve. Compared with other countries, Mongolia's tax environment and minerals royalty policy have improved substantially.

It is also planned to develop an information package to attract foreign direct investment in the area of precious metal or gold open-pit mine, rare earth elements, non-ferrous metals, uranium and petroleum, and to revise legal environment to open up the sector to foreign investors.

The below table shows information about key minerals registered in Mongolian State System of Mineral Reserve.

Table 36. Mineral Reserve of Mongolia

Mineral type	Measuring unit	Reserve	World Rank
Gold	Tons	Gold 425tons, sub-products 850tons	-
Copper	Tons	30 574.1	-
Coal	Billion tons	37.1 (predicted reserve 173.1)	7th place*
Uranium	Tons	180 783	11th place**

* USGS data 2012

** www.worldatlas.com

3.5

MINERAL AND PETROLEUM EXPLORATION AND EXPORT FORECAST

Table 38 provides an overview of Geology, Mining and Petroleum Sector in 2017-2020 and export forecast for 2017-2020 was developed based on state policies on minerals, petroleum and petroleum products, radioactive minerals and heavy industry sectors and action plan to implement the Government Action Programme for 2016-2020.

Table 37. Minerals Resource and Petroleum Production Forecast for 2017-2020 *

Minerals	Measuring unit	2017	2018	2019	2020
Gold	tons	15.1	16.5	24.8	9.2
Copper	thous.tons	1,326.0	1,064.8	1,220.8	1,255.9
Cathode copper	tons	2,300.0	2,300.0	2,300.0	2,300.0
Coal	mln.tons	31,241.5	37,058.0	41,186.0	44,191.0
Iron ore	mln.tons	11.0	11.0	11.0	11.0
Zinc thous.	tons	94.0	90.0	90.0	90.0
Molybdenum	thous.tons	4.5	4.5	4.5	4.5
Spar	thous.tons	200.0	250.0	240.0	250.0
Tungsten	tons	298.0	330.0	280.0	240.0
Enriched tin	tons	85.0	85.0	85.0	85.0
Petroleum	thous.tons	995.0	1,002.0	940.0	940.0
Silver	thous.tons	39.0	29.2	37.7	37.0

Figure 53. Copper, Cathode Copper and Petroleum Extraction Forecast

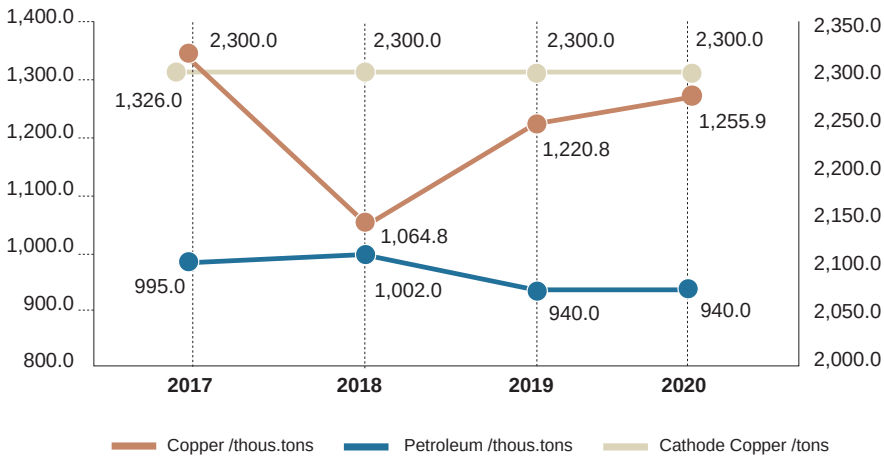
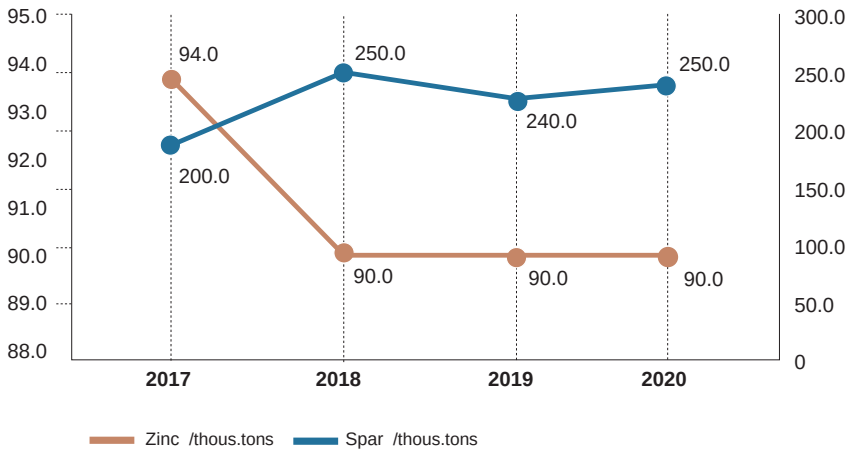


Figure 54. Zinc and Spar Extraction Forecast



* www.mram.gov.mn

Figure 55. Coal Extraction and Export Forecast

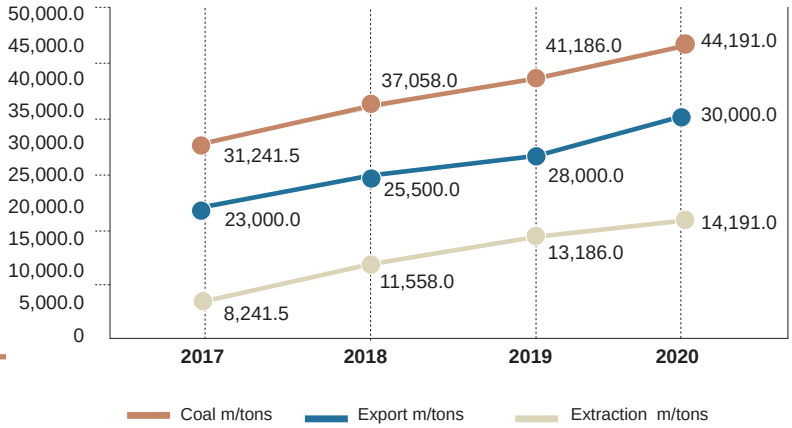


Figure 56. Silver, Tin and Tungsten Extraction Forecast

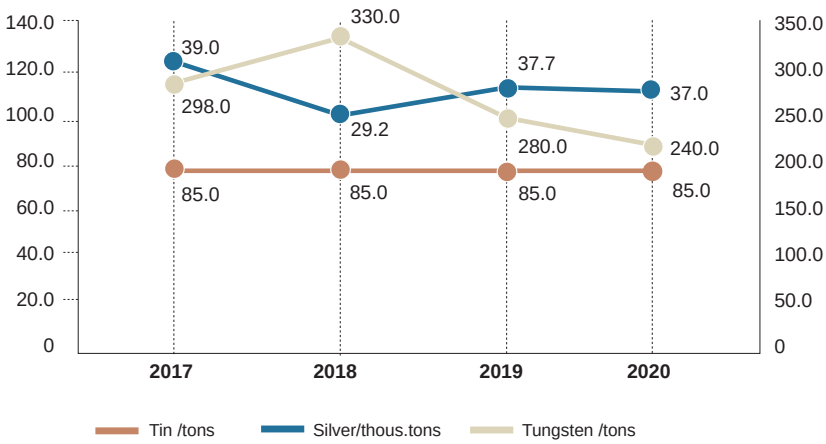
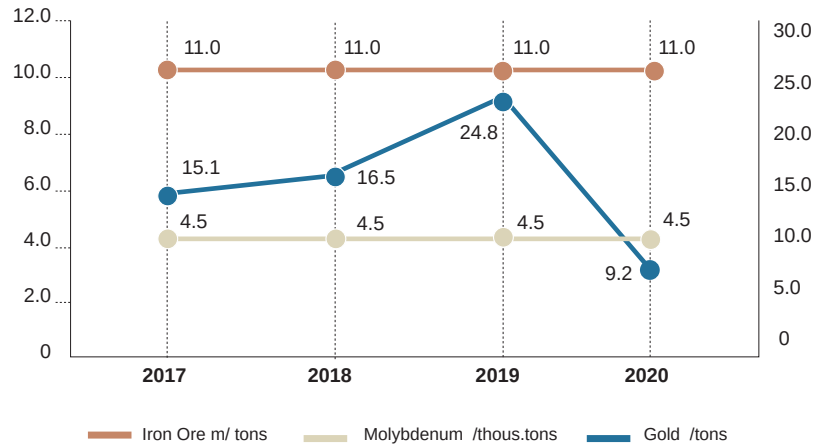


Figure 57. Gold, Molybdenum and Iron Ore Extraction Forecast



According toresearch released in 2016 (as it was mentioned in earlier chapter) Mongolia's investment attractiveness index has weakened, and foreign direct investment has plummeted. MRPAM is planning to implement the following 17 activities in 2017 to attract foreign investment as mentioned in the Government Action Programme and based on conclusions drawn in the above mentioned study.

Table 38. Key Activities to attract Foreign Direct Investment in Geology, Mining and Petroleum sector in 2017 *

Activities
1. Boost geological research along the border areas and intensify mineral prospecting and exploration
2. Disclose mineral research information and provide information to investors
3. Increase size of land for licensing through a competitive selection process, and organize the selection process effective and more competitive.
4. Public awareness of activities of the sector and encourage communities to support mining activities, and improve monitoring at the same time (Communities have true and correct understanding about investment activities)
5. Provide support to companies established Production Sharing Agreements and encourage increase in investment.
6. Improve economic efficiency of lots where petroleum is extracted or in pre-operational phase.
7. A methodology to select a lot for Production Sharing Agreement on traditional and non-traditional petroleum prospecting and exploration for will be developed based on geological detailed research findings.
8. Involve scholars and researchers in the study of oil blocks and produce scientific reports and articles in every area of the study, which will become a good source of information for investors, and at the same time, will be a good advertisement for investment.

* www.mram.gov.mn

Activities
9. Increase accountability of companies of Production Sharing Agreement in petroleum sector.
10. Oil companies are very much interested in establishing a stability agreement as a guarantee to their investment. Therefore, it is important to study again the possibility of establishing a stability agreement.
11. The MRPAM website will run a new page to give information to investors and to receive feedback from them.
13. Minerals demand and supply information and research will be disclosed, and particularly, opportunity for prospecting and exploration should be allowed.
14. To condut research on dividend, and potentally submit a proposal to reduce tax rate on dividend.
15. Establish favourable environment for investment.
16. Translation of legislation will be published on the website. (websites to include Promotion Mongolia, Mining Mongolia, Invest Mongolia)
17. National Geo-information database will be improved with a view to attract foreign and domestic investors in geology and mining sector in line with international standards and quality.

3.7 ESTABLISHMENT OF SECTORAL INTEGRATED DATABASE; PROCESSING AND DELIVERY OF INFORMATION TO CUSTOMERS

We are currently studying legal and technological possibilities of converting paper reports and other documents into an electronic version.

The work will commence to enter all information in the database using Report Registration Programme and making it operational, show earth strata in all types of geological research in overlaps with GSP programme, and enable a search engine based on WebGIS programme.

Activities concerning the database: The current database stored in an MS Access system will be upgraded to SQL type of programmes, which will lead to further activities such as improving safety and security of the data, improving data access, developing a new product that links each strata to GIS data, and putting the database for online use. A new software will be developed for registering the movement of mineral reserve and keeping a balance . The registration and bookkeeping will be transferred to an electronic format.

Activities concerning GIS data: The GIS data will be grouped by types within the same scale and then linked to the database, so that a thematic map (a product) is developed. For aerial survey and to ensure safety and security, the data will be transferred to Spatial database (PostgreSQL/PostGIS) should be transferred. When to access, ArcGIS and other Open source programmes can be used. Moreover, it is important to start developing and using programmes for registration of data, Metadata, information about the information, and information mapping or cartogram.

3.8 MINERAL AND PETROLEUM PRODUCTS PRICE FORECAST

MRPAM will start publishing on its website the prices of mineral products on monthly basis, and income generated from the minerals export.

Table 40 provides price forecasts from the mineral and petroleum sector of Mongolia are presented below using the World Bank forecast of world price of mineral products,.

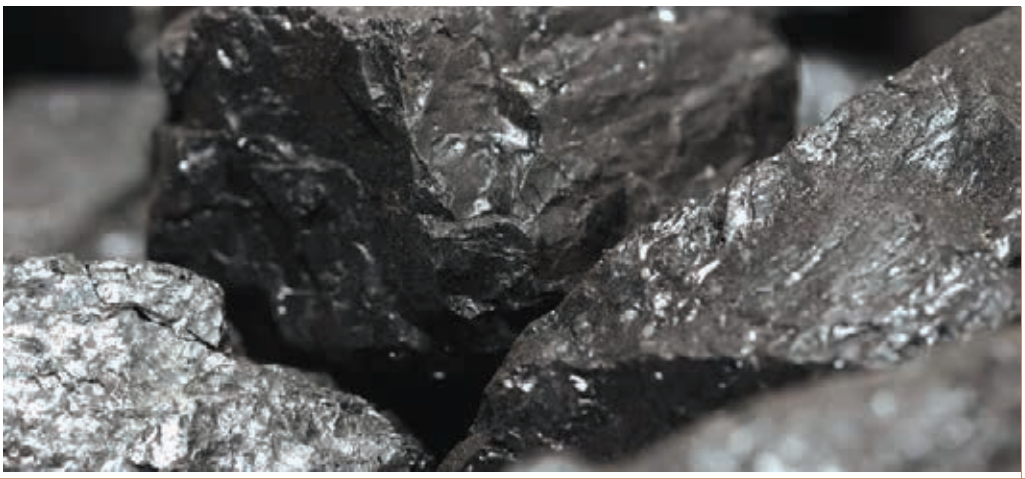
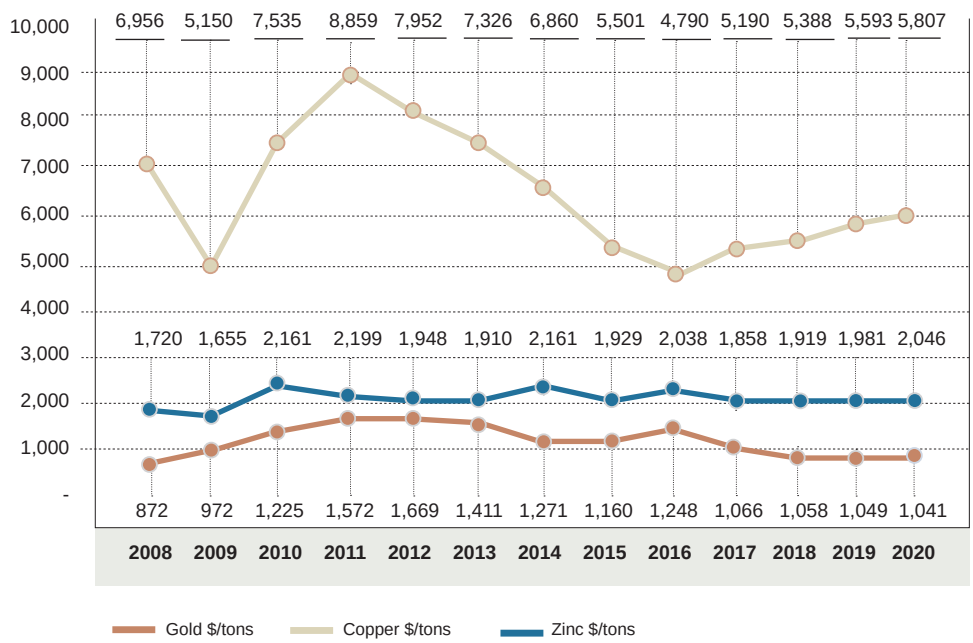


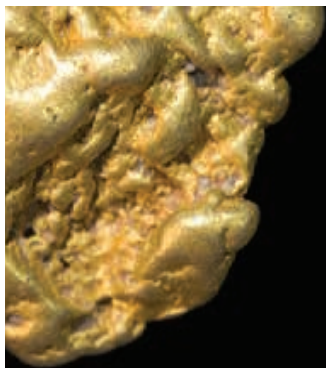
Table 39. Price Forecast of key mineral products

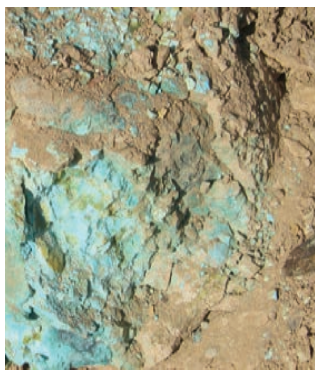
Minerals	Measuring unit	2017	2018	2019	2020
Gold	USD/ounce	1,213.0	1,171.0	1,137.0	1,108.0
Copper	USD/t	5,694.0	5,669.0	5,678.0	5,703.0
Coal	USD/t	73.8	61.7	55.6	55.1
Iron ore	USD/t	68.5	56.6	56.0	55.5
Zinc	USD/t	2,794.0	2,881.0	2,793.0	2,715.0
Molybenum	USD/t	13,588.0	13,073.0	12,558.0	12,043.0
Flourite	USD/t	237.0	213.0	189.0	165.0
Tungsten	USD/t	9,439.0	9,333.0	7,227.0	6,121.0
Tin	USD/t	21,089.0	20,804.0	20,648.0	20,547.0
Crude oil	USD/t	58.0	61.7	62.1	62.6

Source: World Bank

Figure 58. Price of gold, copper and zinc







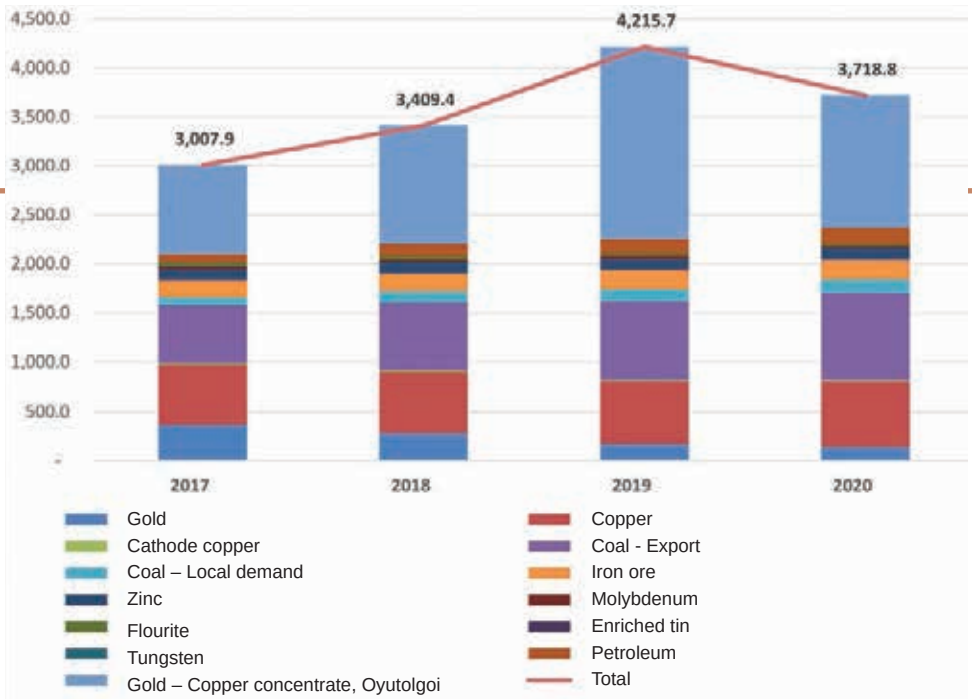
3.9 MINING, PETROLIUM INCOME CONTRIBUTION TO STATE AND LOCAL BUDGET

The contribution of mining and petroleum sector to Mongolian economy and export income from minerals have been estimated using minerals export and mineral price forecast in the World Bank report of January 2016.

Table 40. Production forecast of mining and petroleum sector, by mln.USD

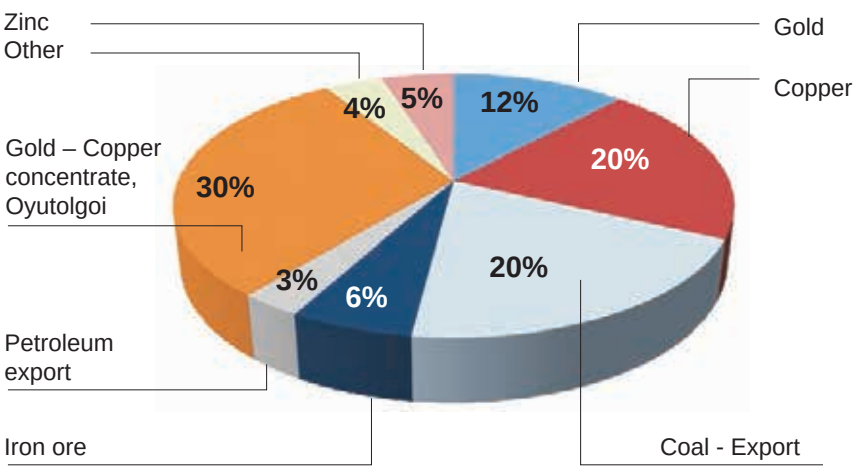
Minerals		2017	2018	2019	2020
Gold		371.8	284.8	172.4	144.3
Copper		597.9	620.7	644.3	669.0
Cathode copper		11.9	12.4	12.9	13.4
Coal - Export		596.9	687.2	782.6	871.5
Coal – Local demand		82.4	115.6	131.9	141.9
Iron ore		172.8	181.1	190.3	199.5
Zinc		113.5	112.3	115.9	119.7
Molybdenum		28.7	27.6	26.6	25.5
Flourite		28.4	32.0	27.2	24.8
Tungsten		2.8	3.1	2.0	1.5
Enriched tin		1.3	1.4	1.5	1.5
Petroleum		87.5	128.5	142.6	160.5
Gold – Copper concentrate, Oyutolgoi		911.8	1,202.7	1,965.6	1,345.8
Total	**mln.$US**	**3,007.9**	**3,409.4**	**4,215.7**	**3,718.8**

Figure 59. Production forecast of mining and petroleum sector, by mln.USD *



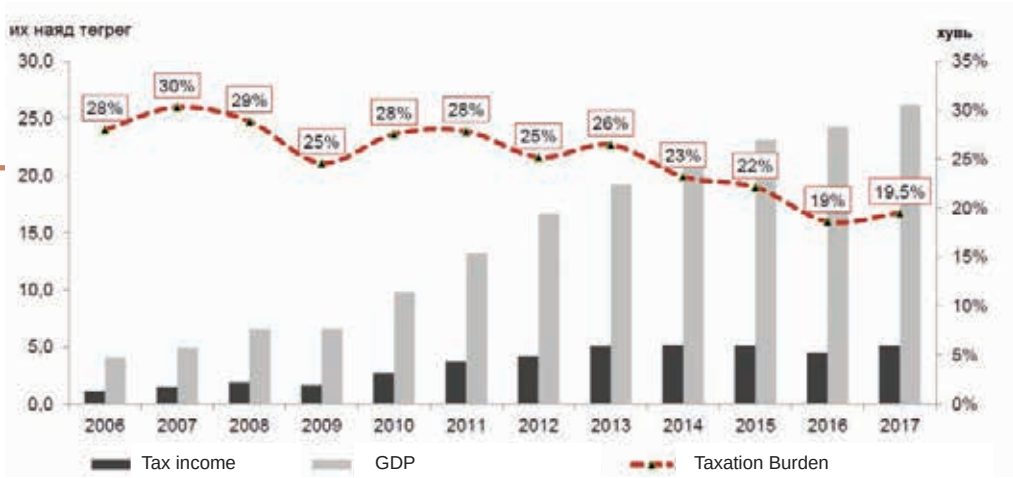
Mining and petroleum sector production will fluctuate around USD 3-3.7 bln in 2017-2020. Income generated from Oyu tolgoi gold-copper concentrate will account for 30%, copper concentrate 20%, coal export 20%, and coal 12%. Copper and coal export income will generate approximately 70 percent of total income .

Figure 60. Percentage share of mineral products, by types of minerals



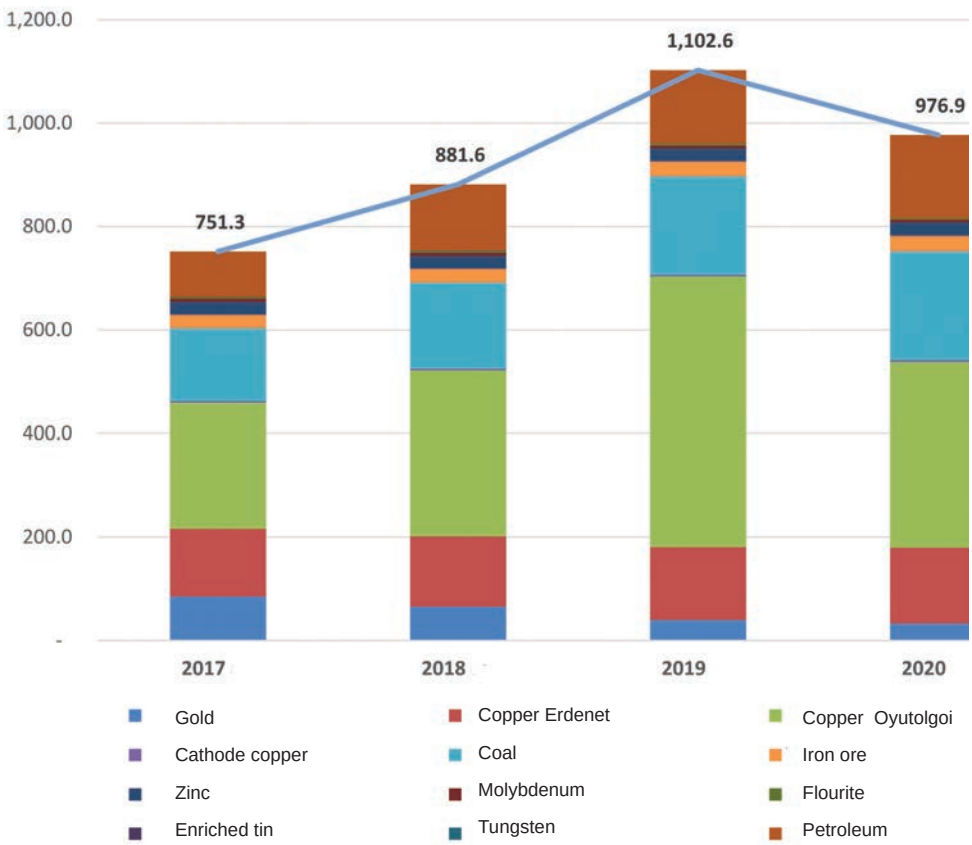
* www.mram.gov.mn

Figure 61. Tax burden in Mongolian economy*



Income generated from mining and petroleum sector to the state budget has been estimated for each type of minerals considering the different levels of tax burden.

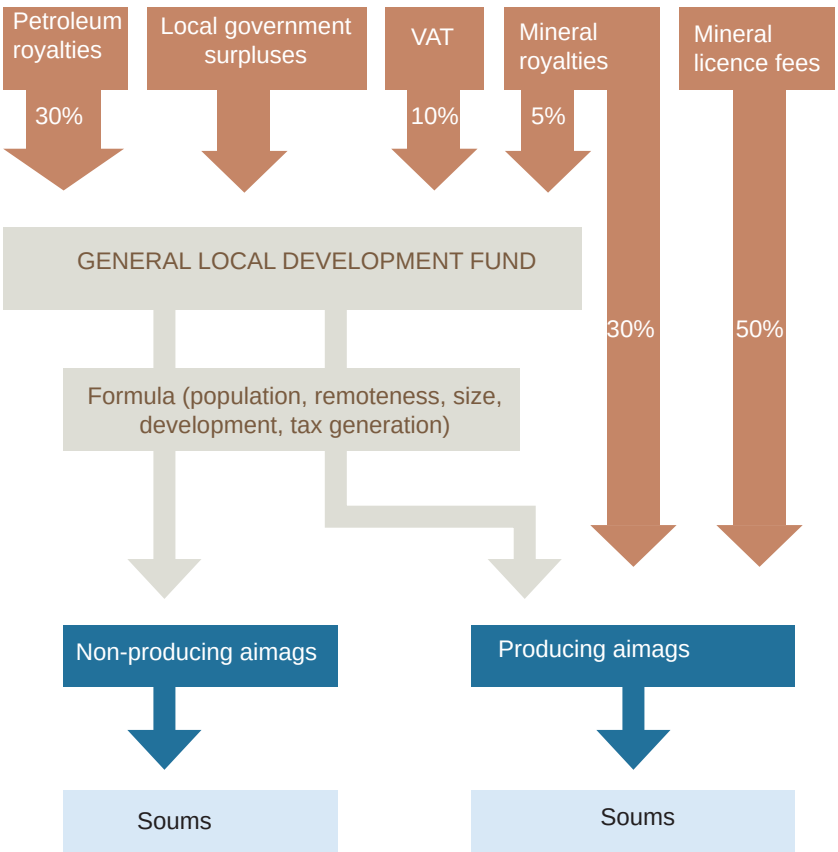
Figure 62. Contribution of mining and petroleum sector to the state budget in 2017-2020, by million USD



* https://mof.gov.mn/

Figure 64 shows distribution of income generated by the Mining and Petroleum sector of Mongolia

Figure 63. Income distributions scheme of Mongolian mining and petroleum sector *



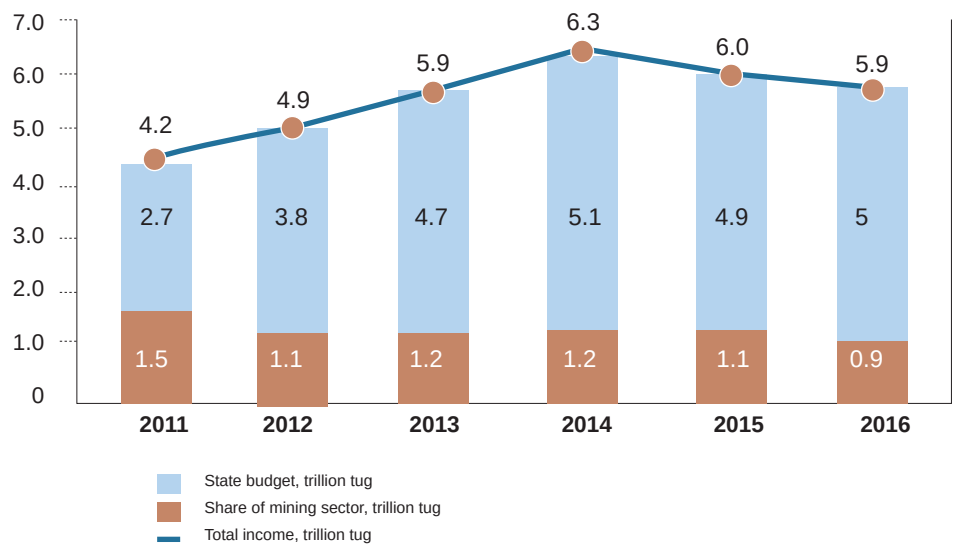
Law on Integrated Budget of Mongolia includes a provision on revenue management generated from the mining and petroleum sector.

State integrated budget surplus cannot exceed more than 2 percent of the GDP.
If income generated from the minerals exceeds the 3 percent growth of the GDP, then the excess income shall be deposited to “Stability Fund”
State debt cannot exceed 40 percent of the GDP.
State budget expenditure cannot exceed percentage increase in any income, except mining and petroleum

* www.resouresgovernance.org Natural resources revenue sharing

Share of mining sector in the state budget is shown below.

Figure 64. State Budget income of Mongolia and percentage share of mining sector *



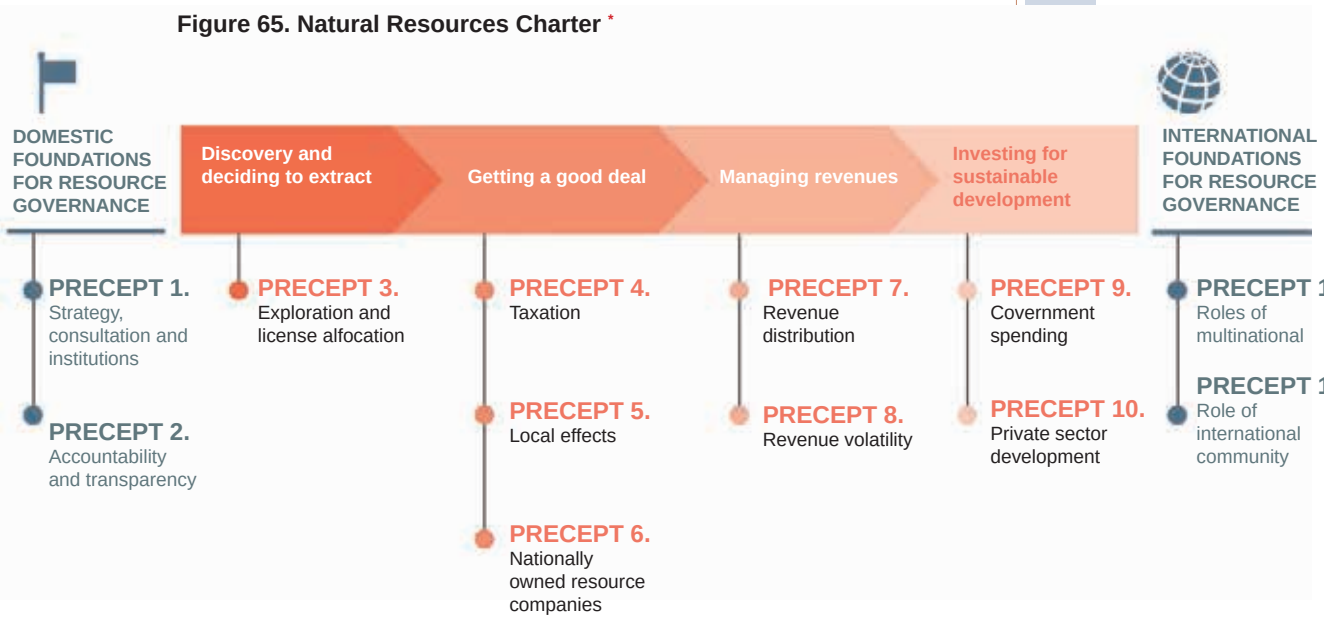
National Development Bank needs to be established in order to monitor, manage and expend stability fund so as to prevent economic instability due to change in the price of mineral products . Although Human Development Fund was established in Mongolia and managed by the National Development Bank, the Parliament and Government used this fund for long term, high-risk infrastructure projects such as building auto road connecting aimags, railroad and hydro-power stations.

Natural Resource Charter's 12 principles will be observed which are widely used in natural resource-rich countries. These principles are important in reaching our objective to attract foreign investors by managing the natural reserve and mining income based on international practice and experience, improving institutional cooperation and coordination, ensuring information transparency, developing responsible mining, and improving competitiveness of the sector.

* www.mram.gov.mn

Natural Resource Charter - Decision making chain

Figure 65. Natural Resources Charter *



Each precept is explained in the case of Mongolia to improve natural resource governance.

* www.resourcesgovernance.org Natural resources charter

Table 41. Twelve precepts to improve mineral resource governance*

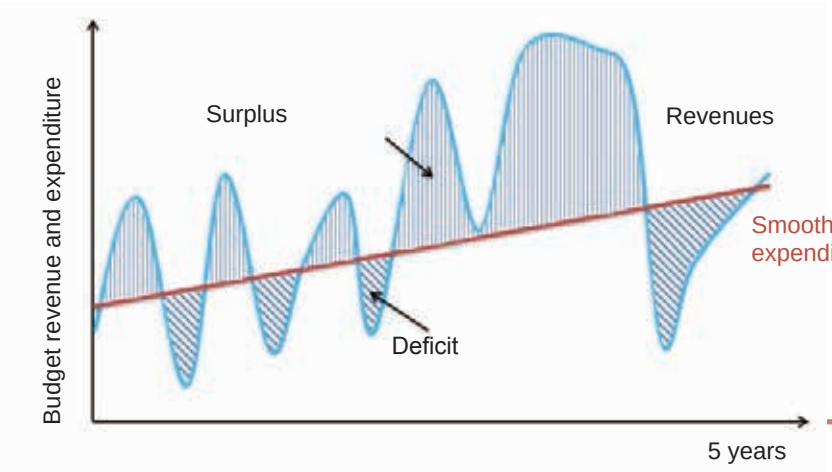
PRECEPT	REMARKS	ACTIVITIES
PRECEPT 1: Strategy, consultation and institutions	Resource management should secure the greatest benefit for citizens through an inclusive and comprehensive national strategy, a clear legal framework, and competent institutions.	• Consider the long term • Include the public in consultation • Ensure the strategy is comprehensive • Decide whether to open areas for exploration • Early Formulation of a strategy that is cognizant of future uncertainty • Translated strategy into a clear and coherent institutional framework • Create competent institutions with a unified objective
PRECEPT 2: Accountability and transparency	Resource governance requires decision makers to be accountable to an informed public.	• Provide transparency of information along the entire chain of decisions • Provide clear roles for institutions • Support a critical mass of informed citizens to demand good governance • Select appropriate methods to allocate power to issue a license • Enforce the rules • Ensure development plans conform to government objectives and approve them in a timely manner. • Maintain accounts of physical resource
PRECEPT 3: Exploration and license allocation	The government should encourage efficient exploration and production operations, and allocate rights transparently.	• Verify jurisdiction over areas to be licensed • Build and maintain a good understanding of the resource base • Secure property rights and decide on areas to open exploration
PRECEPT 4: Taxation	Tax regimes and contractual terms should enable the government to realize the full value of its resources consistent with attracting necessary investment, and should be robust to changing circumstances.	• Consider the function, not the form, of the tax regime • Impose royalties • Identify how to tax income and rent • Avoid tax incentives and simplify tax regimes • Avoid using state equity to increase government returns • Establish transparency, stability and robustness • Ensure competent tax administration and implement tax avoidance rules
PRECEPT 5: Local effects	The government should pursue opportunities for local benefits, and account for, mitigate and offset the environmental and social costs of resource projects.	• Involve the local community in decision making and assessment • Measure and mitigate the negative effects of extraction • Take opportunities to develop local benefits from extraction • Communicate with members of local government and strengthen their capacity • Manage changes in roles and responsibilities

* www.resourcesgovernance.org Natural resources charter

PRECEPT	REMARKS	ACTIVITIES
PRECEPT 6: **State owned resource companies**	State owned resource companies should be accountable, with well-defined mandates and an objective of commercial and operational efficiency.	• Decide on an operational role for the national company • Consider the governance roles in the national company • Establish checks and balances
PRECEPT 7: **Revenue distribution**	The government should invest revenues to achieve optimal and equitable outcomes, for current and future generations.	• Ensure equitable revenue distribution for future generations • Consider equity amongst today's citizens • Ensure investment is efficient
PRECEPT 8: **Government spending**	The government should smooth domestic spending of revenues to accommodate revenue volatility.	• Consider how the extractive industry tax regime affects volatility • Consider using hedging contracts • Consider accumulating foreign assets and borrowing in the short terms • Make changes to investment expenditure before recurrent expenditure • Establish checks to ensure appropriate use of instruments
PRECEPT 9: **Government spending**	The government should use revenues as an opportunity to increase the efficiency of public spending at the national and sub-national levels.	• Manage spending policies to avoid economic deterioration • Improve public spending management
PRECEPT 10: **Private sector development**	The government should facilitate private sector investments to diversify the economy and to engage in the extractive industry.	• Establish an enabling environment for private investment • Decide whether to provide targeted support to business • Decide whether to use local content regulations
PRECEPT 11: **Roles of international companies**	Companies should commit to the highest environmental, social and human rights standards and contribute to sustainable development.	• Abstain from corrupt practices • Contribute to sustainable development outcomes • Provide relevant project information
PRECEPT 12: **Role of international community**	Governments and international organizations should promote an upward harmonization of standards to support sustainable development.	• Promote, monitor and enforce public disclosure requirements of the extractive industry • Ensure that extractive industry projects comply with internationally recognized human rights standards • Ensure that extractive projects comply with environmental and social standards • Reduce illicit financial flows and corruption • Support the exchange and extension of extractive industry skills.

According to the recommendations prescribed in **Precepts 7, 8, and 9 of the Natural Resources Charter,** the revenue generated from mining and petroleum sector will be managed as countries with good governance in natural resources sector.

Figure 66. Principles used in revenue management of mineral resources *

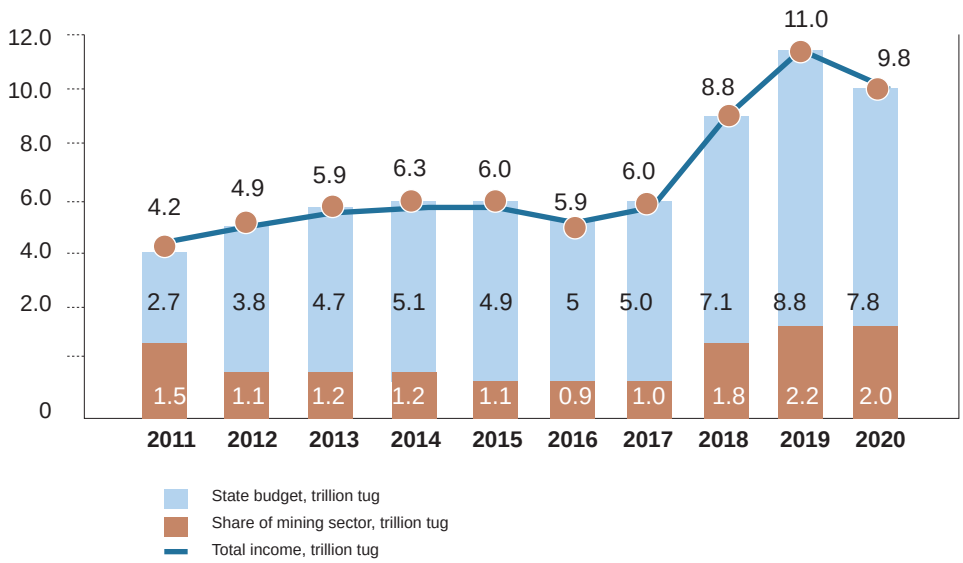


3.11

SALES OF MINING AND PETROLEUM PRODUCTS, CONTRIBUTION TO THE ECONOMY AND GDP FORECAST

Figure 68 provides a forecast of budgetary income of Mongolia that was estimated based on price forecast of mineral products and production forecast of mining and petroleum sector,

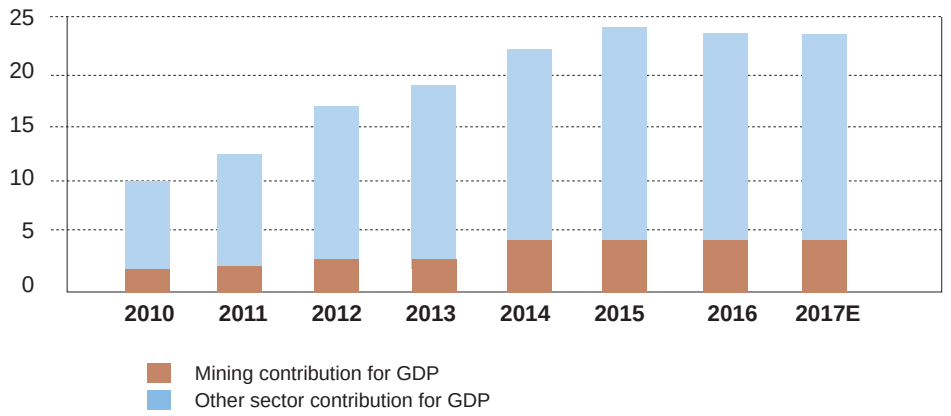
Figure 67. State budget and mining revenue forecast for 2017-2020, by trillion tug



The 2016 expected performance of GDP of Mongolia is expected to reach 23 trillion MNT, and 23.1 trillion MNT in 2017. The mining and extractive industry accounts for 3.9 trillion MNT at the end of 2016, and will probable to reach 4 trillion MNT in 2017, thus the mining sector's contribution of 17 percent can be kept as before.

* Andrew Bauer: Revenue Management: Macroeconomic frameworks and monetary policy

Figure 68. Share of mining sector in GDP



Industrial sector performance reached MNT 9.6 trillion in 2016 and output may remain same in 2017. Mining and extractive industries share in industrial sector is MNT 6.8 trillion at the end of 2016, and it may possible to reach MNT 6.9 trillion in 2017. The percentage share of mining and extractive industry in industrial sector is 72 percent.

Export volume, as expected, in 2016 was USD 4.8 billion. It may increase slightly in 2017 reaching USD 4.9 million. Mining export reached USD 4.2 million in 2016, and is projected 4.3 million in 2017, thus comprising 88 percent of the total export.

Figure 69. Share of mining sector in Gross Industrial Products

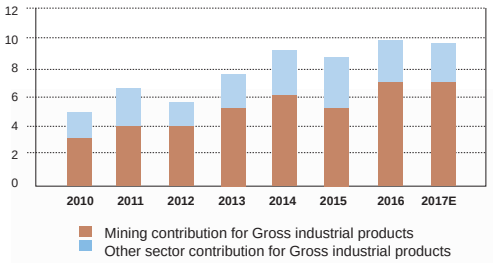
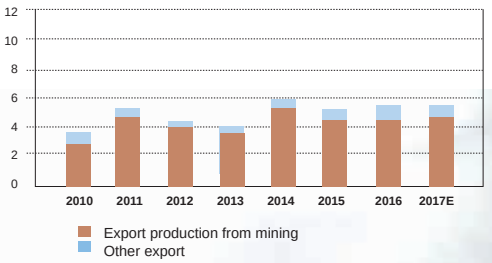


Figure 70. Share of mining sector in exports



3.12 EXTERNAL ENVIRONMENT OF GEOLOGY, MINING AND PETROLEUM SECTOR OF MONGOLIA. FORECAST OF INDICES OF INTERNATIONAL PRESTIGIOUS RESEARCH INSITUTES

MRPAM is aiming to strengthen investment environment in the geology, mining and petroleum sector, thus to improve indices released by international research institutes by implementing key provisions reflected in the state policies concerning minerals sector and government action programme. The forecast of key indices released by international institutions is as follows.

According to Mongolia's Investment Attractiveness Index released in 2015 by the Fraser Institute, an independent and non-partisan research institute, it is currently ranked at 85 out of 109 countries. The recent objective is to move up Mongolia's rank by twenty countries, thus ranked at 65.

In order to reach such a goal, it is important to improve the key indicators where points are lost. For example, attention and efforts should be given to improved coordination between state institutions, removal of overlaps in law and legislation, better trans parency, and increased number of base studies in infrastructure development.

Table 42. Key indicators where improvement is needed for better Investment Attractiveness Index

Factors	Percentage	2015 Ranking	2016 assumption
Regulatory duplication and inconsistencies (includes central and provisional institutions, and inter-departmental overlap, etc.)	11%	101/109	81/109
Legal system (legal process that are fair, transparent, non-corrupt, timely, efficiently administered, etc.)	11%	92/109	76/109
Infrastructure (includes access to roads, power availability, etc.)	6%	107/109	101/109
Political stability	13%	92/109	85/109

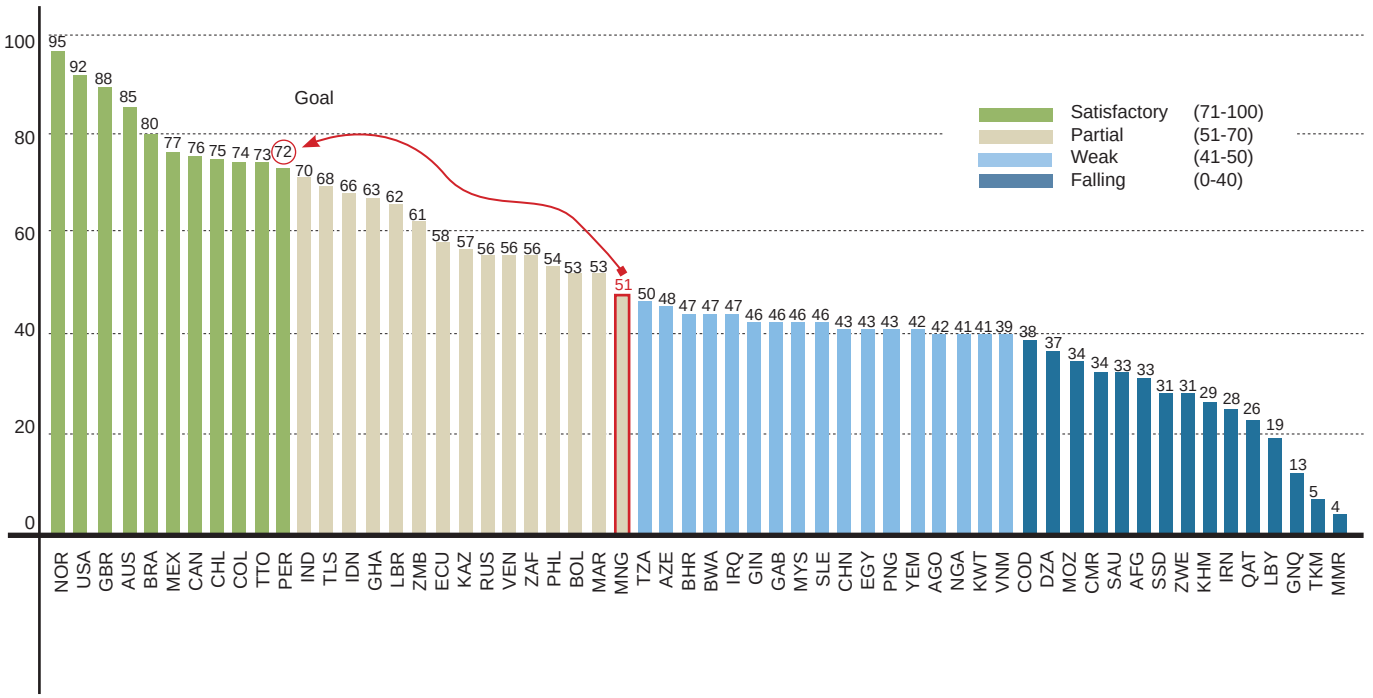
Resource Governance Index measures the governance of oil, natural gas and mining sector of resource-rich countries.

The below factors that have negatively impacted on Mongolia's RGI need to be improved.

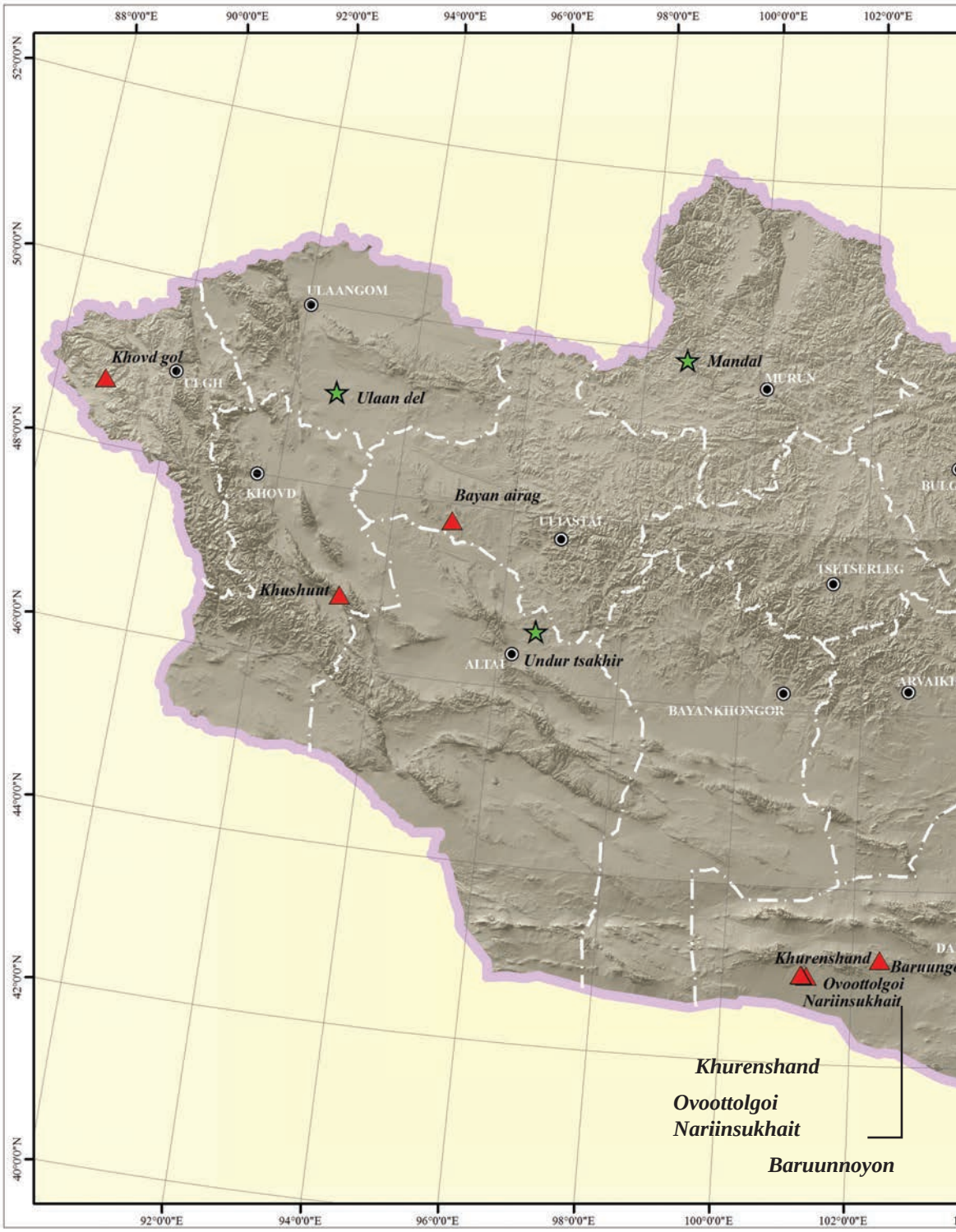
- Information about the research conducted on the area to be licensed is not available to public.
- License agreements are not accessible for public.
- Environmental impact assessment is conducted by onlt usiness enterprises with regular operations.
- The state administrative organization responsible for the sector does not report on revenues and taxes.
- The state administrative organization responsible for the sector publishes information about the operations of the license holders, but without comparative years.
- Public monitoring on state owned mining companies is weak.
- Low global rankings for corruption control and the government effectiveness contribute.
- The government established Erdenes MGL to represent the state's interest in strategically important mineral deposits. Almost no information is available on the functioning of the company.

Mongolia received a score of 51, ranking 26th. Having improved above factors, Mongolia aims at receiving "satisfactory" or 70 or higher score.

Figure 71. Goal in Resource Governance Index



CHAPTER IV. APPENDIX



POTENTIAL EXPLORATION AND MINING PROJECTS IN MONGOLIA

4.1

POTENTIAL
EXPLORATION
PROJECTS

BAYANTSOGT WOLFRAM AND MOLYBDENUM MINE

Name of the project	Bayantsogt Wolfram-Molybdenum Deposit
Location	Bayantsogt Wolfram-Molybdenum Depositis located in Tsenkhermandal soum, Khentii aimag approximately located 195 km east of Ulaanbaatar city, 68 km east of Baganuur city and 18 km from Tsenkhermandal soum There are 20 km from paved road of Ulaanbaatar to Undurkhan highway.
Current situation of the deposit	Owns mining licenses. Has not started mining operation have not started.
	Ore mineralization was evolved from greisen rich and porphyria granites in Janchivlan area.There are quartz muscovite greisen, veins of layered quartz-spar as well as 100 meter long 0.2 m thick veins and dikes of quartz molybdenum. Mineralization consists of quart-muscovite and greisen alterations forming stock shaped bodies. Greisen alteration zones contains wolfram, molybdenum, pyrites, chalko pyrite and arsenopyrite particles.
Deposit reserve	According to the pre-feasibility study, the minimum equivalent content of wolfram (Eq.WO3) is 200 grams per ton. There are 4 blocks of proven grade reserve and 5 blocks of probable grade reserve in the 550 deep from the surface. The probable grade reserve of minerals is is 275.51 g/t of WO3, 206.28 g/t of Mo, 141.88 g/t of Sn, 1.55 g/t of Ag. The probable grade reserve is 74,296.4 tons of metal wolfram and 55,627.4 tons of molybdenum, 38,261.9 tons of metal tin, 417.63 tons of silver and the total equivalent reserve of 137,831.2 tons of metal wolfram in the 269.67 million tons of ore.
Infrastructure	Average
Owner	Undur Bayantsogt LLC, Olympic Street-12, Sky Plaza Business Center, 4th floor.
Contact information	tuvdendorj.g@bayantsogtmining.mn Phone: 327525 Fax: 976-11-327525

URANIUM PROJECT OF ZUUVCH OVOO

Name of the project	Urinium project /Dulaan Uul, Zuuvh Ovoo Mine /
Location	Ulaanbadrakh soum of Dornogobi aimag
Ownership	AREVA bought the East Asia Minerals Energy company in 2007 and renamed it AREVA Mongol in March 2008. AREVA Mongol is in charge of business development and all aspects of cooperation with national and local authorities. Its headquarters is located in Ulaan Baatar.
Company owners	Mongolian “Mon Atom”, French “Areva” and Japanese “Mitsubushi”
Address	3rd floor of ICC Tower, Jamyan Gun Street, 1st khoroo, Sukhbaatar district.
Contact	cogegobi@magicnet.mn Phone number:320698, 323400 Fax: 976-11-329037
Current situation of the deposit	Mining operation have not yet started. Mining licenses in Dornogobi aimag is registered under AREVA and Exploration licenses in Sukhbaatar and Dornogobi Aimag is registered Under Cogigobi LLC.
Type of minerals	Uranium
Deposit reserve	Dulaan Uul Uranium Mine. Mine has 58,117,825,63 tons of proven and probable grade ore reserve (B+C) with average content of 217.69 gram/tons. The estimated metal uranium reserve is 11,894.44 tons. Zuuvch Ovoo Uranium Mine. Mine has 288,698,781,25 tons of proven and probable grade ore reserve (B+C)with average content of 234,52 gram/tons. The estimated metal uranium reserve of 67706,77 tons.
Infrastructure	Weak

"SELENGE" IRON ORE PROJECT

Name of the project	"Selenge" Iron Ore Project
	Location Selenge Darkhan Uul aimag This area is located 336.1 km Northwest of Ulaan baatar, 113.1 km from Northeast of Darkhan City of Darkhan-Uul aimag, 101.2 of Southeast of Sukh baatar city of Selenge Aimag, 24 km of Southwest of Yuruu Soum
Owner	Kharanga Khuder LLC, DB Building 502, Ulaanbaatar
Kharanga Resource Company Postal Address Telephone Email Contact telephone	Street address: Level 1, 330 Churchill Avenue, Subiaco WA 6008, Australia PO Box 540, Subiaco WA 6904, Australia + 61 8 9200 4415 Fax: + 61 8 9200 4469 admin@haranga.com saruul.p@haranga.com 77077711 Fax: 976-11321914
Current situation of the deposit	The company owns 5 exploration licenses and 1 mining license.
Ore body description	The Bayantsogt deposit is composed of 8 individual ore bodies plus and other small lenses. The ore bodies are parallel to each other and trend NE 40º-50º and dip northwest at 70º-80º. The dimensions of the deposit are 350 m in width, 820 m in length and 80 m. in thickness Dundbulag is the largest deposit with a massive banded magnetite structure. It has a slightly iron lower content than the compared to Bayantsogt mines. The deposit that strikes about 1091 m long and 603 m wide with associated 11 ore bodies. Four (4) ore bodies were outlined for the Undur Ukhaa deposit. The iron ore body is 217 m in width and 434 m in length and 100 thick of iron ore body The Bayantsogt deposit has an average iron content 0f 20.14% and average sulfur content is 1.49% in , while in Dundbulag deposit average iron content is 16% and sulfur content is 0.37%. In Undur-Ukhaa deposit, iron content is 14.5% and sulfur content is 0.2%.
Deposit reserve	Bayantsog Iron Ore cluster of mines has B grade proven reserve of 39.3 million tons of iron in 238.80 million tons of ore and probable reserve of 1.8 million tons of iron in 10.6 million tons of ore. The company estimates that there is additional 50-100 million tons of discoverable iron ore reserve after exploration at the Khuiten Gol section of the project.
Infrastructure	Relatively good.

KHARMAGTAIN COPPER-GOLD PROJECT

Name of the project	Kharmagtai Copper and Gold Project
Location	Tsogttsetsii Soum, Umnugobi aimag, Kharmagtai Copper and Gold Project is located 420 km from Ulaanbaatar, 120 km from north of Oyutolgoi, 100 km west of Tsagaansuvarga
Current situation of the deposit	Presently holds mining license. Working to increase the reserve amount in the future.
Type of Minerals	Gold-Copper
Ore body description	Kharmagtai consists of multiple co-genetic gold-rich porphyry copper centers and tourmaline breccia pipes occurring within the Lower Carboniferous Kharmagtai Igneous Complex. The deposit consists of ore bodies of Altan Tolgoi, Zesen Uul and Tsagaan sudal with gold and copper mineralization. These three ore bodies are similar two each other in terms of its geology, evolution and mineralization, however they have significantly different grades of mineralization. The average Au content is 0.4-4.1g/t content, the average Ag content is 5-23g/t , the average Cu content is 0.64-0.84%. Tsagaan sudal deposit consists of multiple lenses with average content of 0.281g/t gold, 0.318% copper. Altantolgoi is located 200m below the surface and contains 0.392g/t gold and 0.450% copper. Deposit reserve Kharmagtai Gold and Copper Porphyry deposit has mineable measured, proven and probable (A+B+C) reserve of 13.428 tons of gold, 88,475.0 tons of copper 18,031,254.0 tons of ore. Measured, proven and probable reserve of mineable resources is 25.008 tons of gold, 259,525 tons of copper reserve in 68,535,851.0 tons of ore. The Gold and Copper porphyry deposit ore has measured, proven and probable reserve of 38.436 tons of gold and 348,000.0 tons of copper in the 86,567,105.0 tons of ore.
Infrastructure	Weak
Owner	Oyut-Ulaan
Contact information	Position: Chief Executive Officer Address: 2nd Khoroo, AOS Street, Military Town, Bayanzurkh District, Ulaanbaatar Telephone: + 976 70 120 211 Fax: + 976 70 130 211 Email: andrew.stewart@xanadumines.com info@xanadumines.com

KHUREL UNEG COPPER PROJECT

Name of the project	Bronze Fox Project
Location	Mankdah soum, Dornogobi aimag Bronze Fox Project is located 480 km from Ulaanbaatar and 190 km from Chinese border. The project is one of the biggest copper deposit discovered in the Southern region of Mongolia and is located in the same region as the Oyu Tolgoi and Tsagaan Suvarga deposits.
Current situation of the deposit	Ivanhoe Mines Mongolia Inc LLC has conducted intensive exploration work on the deposit between 2004 and 2009. This includes geochemical samples, mapping, ground magnetics, stream sediment sampling, extensive soil and rock chip sampling and trenching and drilling operations. In 2012, Kincora Copper LLC took ownership of the exploration licenses and started in depth exploration works.
Ore body description	During the above-mentioned exploration, three types of mineralization with prospect were found in the deposit. This includes Cu-AU-Mo rich porphyry, type of structural Hydrothermal AU and types of shear zone related gold. Of which, the project focused on porphyry type of findings. Deposit reserve Copper ore sample with 0.5 to 1.5 percent copper content was discovered during operation. There is also a high potential for large amount of gold reserves. Deep drilling discovered that there is 1.5 grams of gold per ton. Future drilling could potentially discover more gold content in the deposit.
Infrastructure	Relatively good
Owner	“Nadmin” LLC is 100% owned by “Êincora Clustered Limited”. “Kincora Copper” LLC registered at Toronto Venture Stock Exchange owns several exploration licenses in the Dornogobi and Umnugobi aimag.
Contact information	Phone: +976 70 100 095 Fax: +976 70 100 097 Email: altantuya@kincoracopper.com enquiries@kincoracopper.com

BAYAN-UUL GOLD CORE MINE

Name of the project	Bayan-Uul Gold Core Mine
Location	Buren Soum, Delgerkhaan, Tuv aimag
Current situation of the deposit	Millinium Storm LLC presently has exploration license. Conducted exploration works were conducted in 2001 to 2003 at the sites of "Universal Minerals" LLC. Bayanuul site of the Canadian "Ivanhoe Mines Mongol" LLC conducted exploration works during 2003 to 2005. Exploration work is now done. It is necessary to conduct further exploration work at the mineralized zone 2 to 7 in order to find core gold mine and copper and molybdenum rich porphyries at the depth of the deposit.
Type of Minerals	Gold
Ore body description	Bayan-Uul core gold mine site consists of mineralized zone number 1, 2 and 3. Currently ore bodies with identified reserve amount are ore body numbers 1 and 2, which are located in the mineralized zone number 1. Central, interval and northwest section of the 1st ore body of the mineralized zone number 1 of Bayan-Uul deposit and second ore body strikes over 1 km and the ore body is 6 to 15 m thick. The widest sections in the center of the zone, the thickness reaches 170 m.
Deposit reserve	Seven (7) mineralized zones in the Bayan-Uul deposit were located. A reserve evaluation was conducted in the Central and Northwest section of 1st ore body of 1st mineralized zone as well as 2nd mineralized zone. The proven and probable reserve amount in the 1st ore body is 24.29 tons of gold, while 5.3 tons of gold reserve. The average gold content in remaining areas of the deposit is 0.28 g/ton.
Infrastructure	Weak
Owner	Millinium Storm LLC Has 100 percent of foreign investment from Virgin Islands. Golden Spring management limited
Contact information	enkhtuvshin.yu@bayanairag.com Phone:329360 Fax:976-11-318088

ULAANBULAG GOLD CORE MINE

Name of the project	Ulaanbulag Core Gold Deposit.
Location	Mandal and Bornuur soum in Selenge and Tuv aimag The Ulaanbulag Core Gold Deposit is located at the border of Bornuur soum of Tuv aimag and Mandal soum of Selenge aimag approximately 130-140 km west of Ulaanbaatar city. THe mine is located near the highway connecting Ulaanbaatar and Altanbulag soum.
Current situation of the deposit	Boroo Gold LLC presently owns mining license. Mining operation has not started.
Type of Minerals	Gold
Deposit reserve	The Ulaanbulag core gold deposit is located from 30 to100 meters from the earth surface. The Ulaanbulag core gold mine has average content of 1.14 g/t gold in the oxidized ore of the mineable reserve and 1.39 g/t gold in the partially oxidized ore. The gold content is 1.51 g/ton. and there is 4243.9 kg gold in the primary gold ore in the 3284.5 thousand tons of oreThe proven reserve amount is 3765.4 kg gold in the 2841.5 thousand tons of ore and probable reserve of 478.4 kg of gold in 443 thousand tons of ore.
Infrastructure	Relatively good
Owner	Boroo Gold LLC (100 percent investment from Bahamas Island Country).
Contact information	turbold.b@centerragold.mn, john.kazakoff@cen

ALTAN TSAGAAN OVOO GOLD CORE MINE

Name of the project	Core Gold Mine of Altan Tsagaan Ovoo
Location	Core Gold Mineis located in Tsagaan Ovoo soum, Dornod aimag which is 650 km east of Ulaanbaatar city, 180 km northwest of Dornod aimag center and 38 km from the Tsagaan Ovoo soum center.
Current situation of the deposit	Mining operation has not yet started.
Type of Minerals	Gold and mixed metal.
Ore body description	Altan Tsagaan Ovoo gold and mixed metal deposit consists of three main mineralized pipes namely pipe I, II, IV, which are located 40-60 cm apart from each other. Each pipe area has oxidized zones and oxidized zones become thinner from pipe number II to pipe number IV. Oxidized zone is the thickest in the pipe II (70 m deep), while the oxidized zone is 10 m deep in the pipe IV. The Pipe I Ore body is 350 m long and 275 m width with oval shape and is cone shaped. The Pipe II is located 160 m north of the pipe I. The pipe is oval shaped with 225 m length and 170 m width.
Deposit reserve	Total reserve of the deposit is 21.842,20 thousand tons of ore with 28.1 tons of gold.
Infrastructure	Weak
Owner	Centerra Gold Gold Mongolia LLC Centerra Gold Inc. John W. Pearson Vice President, Investor Relations (416) 204-1241 john.pearson@centerragold.com
Contact information	turbold.b@centerragold.mn, john.kazakoff@centerragold.mn

ZIRCONIUM AND HEAVY RARE EARTH ORE PROJECT OF ULAAN DEL

Name of the project	Zirconium and heavy rare earth ore project of Ulaan Del
Location	Zavkhan soum, Uvs aimag
Current situation of the deposit	Exploration survey was conducted on this deposit and found an estimated reserve. The report is being produced.
Type of Minerals	Zirconium and heavy rare earths (key minerals: zirconium, elpidite, xenotime, synchysite, apatite, monazite, malachite, parisite, ilmenite, magnetite)
Deposit reserve	The reserve is currently being estimated (According to preliminary estimates, the reserve is 6.3 million tons of Zr-REE ore 1000 ppm REE in 100 m deep)
Infrastructure	Weak
Owner	Geo-Infor LLC- Mongolian National Geology Consultancy Company. Consultancy, information services, mining, gold extraction and exploration.
Contact information	gis@geo-info.mn Contact information: 98110919

HUH DEL LITHIUM MINE

Name of the project	Huh Dely lithium mine
Location	Huh Dely lithium mine is located in the Ulziit Soum, Dundgobi aimag approximately 550 km southwest from Ulaanbaatar and 98 km east of Mandalgobi city.
Current situation of the deposit	Received mining licenses for the areas with reserve estimation from the exploration license area. Currently, the mining operation hasn't yet starte.
Deposit size and content	Huh Del sedimentary lithium deposit is located in the Tugrug Valley Southwest of Tsagaan Nuur valley. The identified ore body deposit is 6000 m long, 5000.0m wide and 51.11 m thick. In addition to core mineral elements, the deposit also has supplementary minerals such as potassium, lithium and supplementary elements such as cesium, rubidium and light rare earth minerals. Lithium content varies from 793ppm to 3480 ppm with average content of 1656 ppm, n=5.
Deposit reserve	The deposit reserve measured (A), proven (B), probable (Ñ) grade is 443.6 thousand tons of lithium in 283,9 million tons of ore with an average content of 0.156%. The measured ore reserve (A) is 23.5 million tons proven, the Â grade ore reserve is 98,7 million tons In another words, measured reserve amount is 37.7 thousand tons of metal lithium and proven reserve amount is 151,3 thousand tons. In addition, measured and proven reserve has 173.3 thousand tons of strontium with average content of 0.145%, 4 970.5 thousand tons of potassium with average content of 3.7 %. Identified inferred mineral is 992.2 thousand tons of lithium metal in 644.3 million tons of ore with 0.153 % average content of lithium .
Infrastructure	Relatively weak
Owner	Alkali Metal Mongolia LLC
Contact information	Picuris_mn@gmail.com

LITHIUM DEPOSIT OF MUNKHT TSAGAAN DURVULJIN

Name of the project	Munkhtyn Tsagaan Durvuljin Lithium Deposit.
Location	Munkhtyn Tsagaan Durvuljin Lithium Deposit is located in Shiveegobi, Bayanjargalan soum, Gobisumber and Dundgobi aimag
Current situation of the deposit	Has mining license. Mining operation hasn't started yet.
Type of Minerals	Lithium, rubidium, cesium
Deposit reserve	The proven and probable reserve amount is 2,276,989 tons of ore with average content of 0.65% Li2O, which is able to produce 14,575 tons of pure lithium. There is 4,286.1 tons of rubidium with average content of 0.15 % and 0.622 tons of cesium reserve with average content of 0.03 %.
Infrastructure	Located relatively close to infrastructure
Owner	Lithium Mining LLC
Contact information	r_djorj@yahoo.com

MANDAL MOLYBDENUM-WOLFRAM DEPOSIT

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA

Name of the project	Mandal Molybdenum-wolfram deposit
Location	Mandal Molybdenum-wolfram depositis located in Tsagaan Uul Soum, Khuvsgul aimag
Current situation of the deposit	Mining operation has not started yet. The company has exploration license.
Ore body description	Granite sill, diorite and basalt veins cuts though small and medium size parts of intrusive rock formation. molybdenum and wolfram mineralization have been f found. One (1) large ore body was discovered in the Mandal deposit. This ore body strikes from southeast to northwest and contains stock of granites with almost no mineralization in the centre and the mineralized bodies are located around this section.
Deposit reserve	Measured, proven and probable (A+B+C) reserves of mineable resource in the Mandal deposit is 331,523.96 tons of Mo equivalent, 283,708.52 tons of Molybdenum, 71,412.67 tons of wolfram in the 294,949,392.65 tons of total ore. . Measured, proven and probable (A+B+C) reserves of mineable resource under certain conditions in the Mandal deposit is 4,873.66 tons of Mo equivalent, 3,003.68 tons of Molybdenum, 2,792.83 tons of wolfram in the 19,874,107.98 tons of total ore with average content. equivalent Mo-245.23 g/t, Ì î-151.14 g/t, W-140.53 g/t. According to preliminary survey findings of Baruun Mandal, the reserve amount of Baruun mandal is 57000 tons of wolfram and 3500 tons of molybdenum.
Infrastructure	Weak
Owner	Mongolia Resource Corporation LLC Operates in mining sector
Contact information	Email: info@mongolianresource.com., Saraa_gua@yahoo.com Phone:70135599, 99099513 Fax: 976 -70125599

UNDUR TSAKHIR MOLYBDENUM-WOLFRAM DEPOSIT

Name of the project	Undur Tsakhir Molybdenum and Wolfram Mine
Location	The Undur Tsakhir Molybdenum and Wolfram Mine is located in Taishir soum of Gobi-Altai aimag and is approximately 1050 km from Ulaanbaatar city, 45 km from Gobi-Altai aimag and 300 km from Burgastai port.
Current situation of the deposit	Owns exploration and mining licenses. Extractive operations have not yet started.
Type of Minerals	Molybdenum and wolfram
Deposit reserve	According to the exploration survey of the deposit, the total proven and probable reserve amount is 18757,09 thousand tons of ore with average content of Molybdenum. of 0.083% Thus molybdenum reserve is 156,453 thousand tons of metal. Supplementary mineral reserve in the deposit is 7,465 thousand tons of rhenium with an average content of 0.04g/tons of rhenium 187575,09 thousand tons measured ore amount. There is 38,887 thousand tons of wolfram with average content of 0.015 % in the 187,575,09 thousand tons measured ore amount.
Infrastructure	Weak
Owner	Sodgazar LLC, Room 16, 5th Floor, Shuren Building, Olympic Street, 1st khoroo, Sukhbaatar district, Ulaanbaatar, UB-14210 Import, Mining, Gold extraction and exploration
Contact information	sodgazar@yahoo.com, gtumur@hunnucoal.com Phone: 319952, 99055756 Fax: 976-11- 319952

4.2
OPERATING MINES

EAST AND WEST MINES OF TSANKH

Name of the deposit	East/West of Tsankh
Location	This deposit is located Tsogttsetsii soum, Umnugobi aimag
Owner	Erdenes Tavan Tolgoi JSC
Website	www.erdenestt.mn
Start of mining	2010/ 2013
Type of coal	Coking
Coal reserve	1.5 billion tons
Coal mining capacity per annum as reflected in the feasibility study	15,000,000.0/ 20,000,000.0 tons/annum
Infrastructure	Mine is connected to Gashuun Sukhait port with 254 km of paved road. Mine is also connected to central electricity grid. Electricity is supplied by diesel power stations.

UKHAA KHUDAG MINE

Name of the deposit	Ukhaa Khudag
Location	This mine is located in Tsogttsetsii Soum, Umnugobi aimag
Owner	Energy Resources LLC
Website	www.energyresources.mn
Start of mining	2009
Type of coal	Coking
Coal reserve	435.7 million tons
Coal mining capacity as reflected in the feasibility study	15,000,000.0 tons/annum
Infrastructure	The mine is connected to Gashuun Sukhait port with 245 km of paved road. It is also connected to central electricity grid. Electricity is supplied from its own power station of 18 MegaWatts. The mine has its own coal washing and processing facility for 15 million tons of coal.

TAVAN TOLGOI MINE

Name of the deposit	Tavantolgoi
Location	Tavantolgoi is located in the Tsogttsetsii soum, Umnugobi aimag
Owner	Tavantolgoi JSC
Website	www.tavantolgoi.mn
Start of mining	1966
Type of coal	Coking
Coal reserve	218.7 million tons
Coal mining capacity as reflected in the feasibility study	1,000,000.0 tons/annum
Infrastructure	Connected to Gashuun Sukhait port with 245 km of paved road and is also connected to central electricity. Electricity is supplied by diesel power stations.

BARUUN NOYON UUL- 1 MINE

Name of the deposit	Baruun Noyon Uul- 1
Location	Baruun Noyon Uul- 1 is located in Noyon soum, Umnugobi aimag
Owner	Tsagaan Uvuljuu LLC
Website	www.terracomresources.com
Start of mining	2014
Type of coal	Coking coal
Coal reserve	18.1 million tons
Coal mining capacity as reflected in the feasibility study	1,500,000.0 tons/annum
Infrastructure	The mine is 140 km from the Shiveekhuren Port. There is 98.4 km of dirt road and there are plans to construct paved road to connect to paved road of Nariin sukhait coal deposit. Electricity is supplied from diesel power generator.

OVOOT TOLGOI MINE

Name of the deposit	Ovoot tolgoi
Location	Ovoot tolgoi is located in Gurvantes soum, Umnugobi aimag
Owner	South Gobi Sands LLC
Website	www.southgobi.com
Start of mining	2008
Type of coal	Same sort
Coal reserve	136.7 million tons
Coal mining capacity as reflected in the feasibility study	9,000,000.0 tons/annum
Infrastructure	Mine is connected to Shiveekhuren port with 44.8 km paved road. It receives electricity from electricity grid of China and it also has diesel power generator.

NARIIN SUKHAIT MINE

Name of the deposit	Nariin Sukhait
Location	Nariin is located in Gurvan tes soum, Umnugobi aimag
Owner	Mongolian Gold MAK LLC
Website	www.mak.mn
Start of mining	2008
Type of coal	Same type
Coal reserve	587.5 million tons
Coal mining capacity as reflected in the feasibility study	14,000,000.0 tons/annum
Infrastructure	Mine is connected to Shiveekhuren port by 44.8 km paved road. Receives electricity from electricity grid of China PRC .

KHUREN SHAND MINE

Name of the deposit	Khurenshand
Location	Khurenshand is located in Gurvantes soum, Umnugobi aimag
Owner	Usukh Zoos LLC
Website	
Start of mining	2014
Type of coal	Same sort
Coal reserve	42.8 million tons
Coal mining capacity as reflected in the feasibility study	3,000,000.0 tons/annum
Infrastructure	Mine is connected to Shiveekhuren port by 44.8 km paved road. Electricity is supplied from its own diesel power station.

KHUSHUUT MINE

Name of the deposit	Khushuut
Location	Darvi Soum, Khovd aimag
Owner	Moenco LLC
Website	www.moenco.mn
Start of mining	2011
Type of coal	Coking coal
Coal reserve	171.1 million tons
Coal mining capacity reflected in the feasibility study	3,000,000.0 tons/year
Infrastructure	Mine is connected to Bulgun Port in Khovd Aimag with 310 km of paved auto road for coal transportation. Energy is supplied through diesel power station. Mine has dry processing plant for core, which has capacity to produce 2.8 million tons.

MANDAKHNUUR MINES

Name of the deposit	Mandakh Nuur
Location	Mandakh soum, Dornogobi aimag
Owner	Ikh Gobi Energy LLC
Website	www.ikhgobienergy.mn
Start of mining	2013
Type of coal	Partial hard coal/ coal
Coal reserve	54.8 million tons/ 8.6 million tons
Coal mining capacity as reflected in the feasibility study	1,000,000.0 tons/annum
Infrastructure	Mine is connected to Khangi port of Dornogobi Aimag with 145 km dirt road. Electricity is supplied by diesel power generators.

KHOVD RIVER TUNGSTEN MINE

Name of the deposit	Khovd River Tungsten Deposit
Location	The mine is located Tsengel Soum, Bayan-Ulgii aimag
Owner	“SS Mongolia” LLC
Contact information	www.ssm.mn
Start of mining	Intensive underground mining at the of Khovd River Tungsten mine started from 2014. .
Type of Minerals	Tungsten
Deposit reserve	The updated, proven tungsten reserve estimate is 4,176.5 tons in 69.8 thousand tons of ore. The average tungsten is 6 %. Theprobable reserve is 1,246 tons of tungsten trioxide in 18.7 thousand tons in 3 blocks with average content of 6.1%, thus total reserve amount is 5,422.5 tons of tungsten trioxide in the 88.5 thousand tons of ore.
Mining capacity reflected in the feasibility study	150 tons of ore/day
Product	Produces tungsten trioxide concentrate with 65-70 % tungsten content.
Infrastructure	Mine is connected to central electricity grid with 136.5 km long electricity line with 15 kW capacity. Daily capacity of the processing plant is 5 tons of tungsten concentrate.

BAYAN-AIRAG GOLD MINE

Name of the deposit	Bayan Airag
Location	Bayan Airag is located in Durvunjil soum, Zavkhan soum
Owner	“Bayan Airag Exploration” LLC
Contact information	www.bayanairag.com/
Deposit mining status	Started operation of open cut mining from 2014.
Type of Minerals	Gold and Silver
Deposit reserve	The proven reserve is 16.79 tons of gold and 109.297 tons of silver in 15,896 thousand tons of ore. The gold content is 1.06 g/ton of ore and silver content is 7.88 g/ton of ore. The probable re serve amount is 1.33 tons gold and 9.24 tons of silver in the 2143 thousand tons of ore with 0.62& percent gold content 4.31 g/tons of silver content. The total reserve amount is 18.22 tons of gold and 118.54 tons of silver in the 18040 thousand tons of ore with 1.1 g/ton content of gold and 6.57 g/tons of silver content.
Mining capacity reflected in the feasibility study	
Infrastructure	

TUMURTEIN OVOO ZINC MINE

Name of the deposit	Tumurtein Ovoo
Location	Tumurtein Ovoo is located in Sukhbaatar soum, Sukhbaatar aimag
Owner	“Tsairt Mineral” LLC
Contact information	www.tsairt.mn
Deposit mining status	Mining operations started in 2005.
Type of Minerals Zinc	
Deposit reserve	Tumurtein Ovoo zinc deposit reserve was estimated to have Â+Ñ1+Ñ2 grade 7,689,4 zinc ore reserve and 885.4 thousand tons of metal reserve in 1980. Between 2005 and 2012, 3,056 thousand tons of ore was extracted from open cut mine. As of end of 2012, the remaining reserve amount is 4,632 thousand tons of ore with 508.97 thousand tons of metal.
Mining capacity reflected in the feasibility study	Estimated to extract 400 thousand tons of ore.
Product	Producing zinc concentrate with 50 percent content.
Infrastructure	Electricity supply for the mine is provided by Baruun-Urt and Choibalsan 110 kW electricity grid with T connection with 16 km long electrical wires. The water resource for the Tumurtei Ovoo Zinc Mine was estimated with 8 levels and calculated that it will have 25-years water reserve with 3000 cube meter water use per day. Four large wells have been drilled for the water supply of the mine in optimum locations to supply water to the mine.

ERDENET COPPER-MOLYBDENUM MINE

Name of the deposit	Erdenet Mine
Location	Khangal Soum, Bulgan aimag
Owner	“Erdenet” JSC
Contact information	www.erdenetmc.mn
Deposit mining status	Erdenet extracted and produced 4 million tons of ore in 1978, 8 million tons of ore in 1980, 16 million tons of ore in 1981, 20 million tons of ore in 1989, 26 million tons of ore in 2006 and 30 million tons of ore in 2012.
Type of Minerals	Copper-Molybdenum
Deposit reserve	According to updated reserve estimates, “Northwest” section has 1,823,953.80 thousand tons of geological reserve with 0.382% average copper content and 0.0155% of average molybdenum content and 1,108,393.2 thousand tons of mineable reserve with 0.044% average copper content and 0.019% of average molybdenum content. This has increased the geological reserve with 260,657.53 thousand tons, (copper content with 0.021%, molybdenum content with 0.0049%), metal reserve with 1,722.44 thousand tons as well as mineable reserve with 216,260.413 thousand tons. As for the “Central” Section, 201,472.63 thousand tons of ore reserve with 0.410% copper content and 0.173% of molybdenum content is remaining from 2013 estimates, which shows 0.072% decrease in copper content and 0.003% of molybdenum content and increase of ore reserve with 216,008.27 thousand tons.
Mining capacity reflected in the feasibility study	30 million tons/year ore
Product	Produces copper concentrate of 23% content and molybdenum concentrate of 47% content.
Infrastructure	Erdenet city was established as a base for Erdenet Ovoo’s copper and molybdenum mine. It is a mining city with well- developed road and communication infrastructure.

OYU-TOLGOI COPPER AND GOLD MINE

Name of the deposit	Oyutolgoi mine
Location	Khan Bogd Soum, Umnugobi Aimag
Owner	“Oyutolgoi” LLC
Contact information	www.ot.mn
Deposit mining status	Currently the open cut mine is operating with the 100,000 tons per day capacity. First vertical entry to the underground mine was completed and second entry is currently under construction. 700 meter entry of parallel entry to 1300 m level ore body.
Type of Minerals	Copper and gold
Deposit reserve	Mineable A+B+C grade copper reserve is 25368,0 thousand tons and reserve amount is 1,028 thousand tons, Molybdenum is 81,6 thousand tons, silver 6,144 thousand tons, mineable reserve under certain conditions with A+B+C grade copper ore is 19664,0 thousand tons, gold 0,810 thousand tons, Molybdenum 75,5 thousand tons, silver 5,905 thousand tons. Total of 45032,0 thousand tons of copper, 1,838 thousand tons of gold, 157,0 thousand tons of Molybdenum, 12,049 thousand tons of silver were registered.
Mining capacity reflected in the feasibility study	Open and underground mine with capacity to extract 26.0-43.0 million tons of ore and processing plant with capacity to produce 100000-150000 tons of ore per day.
Product	Processing plant has capacity to produce 5 tons concentrate with 65 to 70 percent trioxide tungsten content.
Infrastructure	Oyu tolgoi project imports its power supply from PRC, according to the contract made with Inner Mongolian Power Supply Company. There is 3250 m long airplane landing area that has direct flight to Ulaanbaatar located 11 km north of the Oyu tolgoi mine. There is paved road from Oyutolgoi project site to Gashuun sukhait.

TUMURTEI IRON ORE MINE

Name of the deposit	Tumurtei Mine
Location	Khuder Soum, Selenge aimag
Owner	“Darkhan Metallurgical Plant” JSC
Contact information	www.dmp.mn
Deposit mining status	Started, mining west side of east section from October 2011 Started, mining east side of east section from September 2014.
Type of Minerals	Iron ore
Deposit reserve	According to 01-2 directive of the Mineral Council in 1995, the total reserve with Â+Ñ1+Ñ2 grades in Tumurtei deposit is 229.0 million tons, of which 73.8 million tons is oxidized ore and 137 million tons is sulfuric ore. East part of the deposit consists of East, West and North ore bodies.
Mining capacity reflected in the feasibility study	Annual mining capacity of eastside of east section is 8000 thousand tons. Annual mining capacity of west side of east section is 3000 thousand tons.
Product	Dry magnetic processing plant has capacity to process 750 tons of ore per hour with 65% yield with 73.15% metal content. Talc concentrate particle has -10+0 mm with 54% content, while hard concentrate particle has -40+10 mm with 58% content,
Infrastructure	• Completed expansion of 110/10 KW Yuruu sub- station expansion with comprehensive modern security system, 110/6 Kw sub-station of Tumurtei deposit and 50 km line from the substation to Tumurtei mine. • Completed 34.5 km railway track from Tumurtei mine of “Darkhan Metallurgical Plant” JSC to Khangait Railway Station of Bold Tumur Yuruu Gol LLC complete with loading and uploading terminals. • Completed 104.5 km paved road to Yuruu Khuder soum from intersection of Dulaankhan. • We’ve also built a dry magnetic concentrator plant. Soon, the wet concentrator plant will be commissioned and we’ll use its iron ore concentrations for the steel mill. We’re planning to produce steel domestically by 2017.

TUMUR TOLGOI IRON ORE MINE

Name of the deposit	Tumurtolgoi deposit
Location	The Tumurtolgoi is located in the Khongor soum, Darkhan-Uul aimag
Owner	“Darkhan Metallurgical Plant” JSC
Contact information	www.dmp.mn
Deposit mining status	Mining started in the east and west sections in October 2009.
Type of Minerals	Iron Ore
Deposit reserve	The proven reserve with B-grade is 10345.1 thousand tons and probable reserve with C1 grade is 10,839.7thousand tons and c2 grade is 3,683.3 thousand tons, making the total reserve estimate 24868.1 thousand tons. according to the of the Ministerial Bureau of MPR, the
Mining capacity reflected in the feasibility study	Annual capacity to extract 1000 thousand tons of ore.
Product	The Dry magnetic processing plant has the capacity to produce 550 tons per hour with total outcome of 65 percent, 73.15 percent of metal content. Powder concentrate particles is 10+0 mm with content of 54 percent and solid concentrate particle is -40+10 mm with 58 percent content.
Infrastructure	The deposit is connected to “Darkhan Metallurgical Plant” JSC by 28 km improved road.

KHUST MOUNTAIN IRON ORE MINE

Name of the deposit	Khust-Uul Mountain
Location	Khust-Uul mine is located in Yuruu soum, Selenge aimag
Owner	“Darkhan Metallurgical Plant” JSC
Contact information	www.dmp.mn
Deposit mining status	Mining has not yet started
Type of Minerals	Iron ore
Deposit reserve	According to detailed exploration conducted in 2010, the proven reserve amount is 10675.2 thou sand tons and the probable reserve amount with Grade c1 is 994.3 thousand tons and with C2 grade is 936.5 thousand tons. The total reserve amount is 12606.1 thousand tons.
Mining capacity reflected in the feasibility study	Annual mining capacity is 1000 thousand tons of iron ore.
Product	None
Infrastructure	Improved dirt road to Bugant Village Mine is connected to electricity with 380 kW high voltage line from the electricity grid for Bugant Soum.

UNDUR NARAN GOLD MINE

Name of the deposit	Core gold mine of the Undur Naran
Location	Undur Naran mine is located in Saikhan Dulaan Soum of Dornogobi aimag
Owner	“Freegood Eri” LLC
Contact information	Soyolerdene.u@gmail.com
Deposit mining status	Preparations for the open cut mine operations started in 2016.
Type of Minerals	Gold
Deposit reserve	The mine has 3,012,990,76 tons of proven and probable grade (B+C) gold ore reserve with the average content of 3.79 g of gold per ton of ore and and a total of 11,432.52 kg of gold according to an updated estimation as of Jan 01, 2013. The proven and probable reserve of gold reserve is 302.38 kg of l gold in 86,515 tons oxidized ore. The average content of 3.5 grams per ton of ore The minable gold reserve under specific conditions is 696.92 kg of metal gold in the 320,152.86 tons of ore with the average content of 2.18 grams of gold per ton or ore.
Mining capacity reflected in the feasibility study	36,000 tons/year ore
Product	Processing plant is planned to produce 1260 kg of pure gold by processing 36,000 tons of gold ore with average content of 3.74 grams of gold per tonne with 96.15 percent metal content.
Infrastructure	Mine has two options to connect to electricity. I could receive electricity from 110/35/15kW sub stations of Sainshand or 35/15KW sub station in Zuunbayan soum. The project plansto connect to 35/15 kW ZuunBayan power station with a 44 km electrical line..

ZAAMAR EKH PLACER GOLD MINE

Name of the deposit	Zaamar Ekh Placer Gold Mine
Location	Zaamar Ekh Placer Gold Mine is located in Zaamar soums, Tuv aimag
Owner	“Uuls Zaamar” LLC
Contact information	bayarbaatar@uulszaamar.mnhttp://www.ssm.mn
Deposit mining status	Intensive mining operation started in 2013 at the Zaamar Ekh Mine.
Type of Minerals	Gold
Deposit reserve	The proven geological reserve is 946.12 kg of placers with the average content of 367.5 mg/m^3 and net gold reserve is 869.77 kg according to updated reserve estimates
Mining Capacity reflected in Feasibility Study	450 000 m^3/year earth
Product	Processing metal recovery is 91.96%, re-usage of the technological water is 80%, assay for raw gold is 920
Infrastructure	Mine is connected to central power grid. The mine receives electricity from 35kW sub-station in Zaamar through 35 kW high voltage lines from 110kW sub stations in Bornuur. 35/6kW sub station is located 1 km from the 35kW sub-station of the “Altan Dornod Mongol” mine in Zaamar.

MIXED METAL DEPOSIT OF ULAAN

Name of the deposit	Ulaan mixed metal deposit
Location	Ulaan mixed metal deposit is located in Dashbalbar soum, Dornod aimag
Owner	“Xin Xin” LLC
Contact information	77334411
Deposit mining status	Xin Xin Company extracted 371 thousand tons of ore and produced 317.1 thousand tons of ore with average content of 2.06% Pb 2.6 % Zn in 2016 and is producing metal concentrates.
Type of Minerals	Mixed metal
Deposit reserve	Exploration-evaluation, pre-exploration and de tailed exploration were conducted on the deposit with government funding from 1973 to1986. The approved reserve amount for B+C1+C2 grade mixed metal ore was 39,253.2 thousand tons and approved C1+C2 grade uranium reserve was 241.8 thousand toons according to Directive 22 of the State Mineral Commission under the Ministerial Bureau of Mineral professional councul MPR dated November 30, 1989,
Mining capacity reflected in the feasibility study	900,000 tons /year
Product	The facility produced 11.0 thousand tons of zinc concentrate and 7.8 thousand tons of lead concentrate, exported to China with by railroad.
Infrastructure	Connected to Central Electricity Grid with 130 km long high voltage lines of 110 kWs.

4.3

INFORMATION ON MINING PROJECTS DEVELOPED IN 2016.

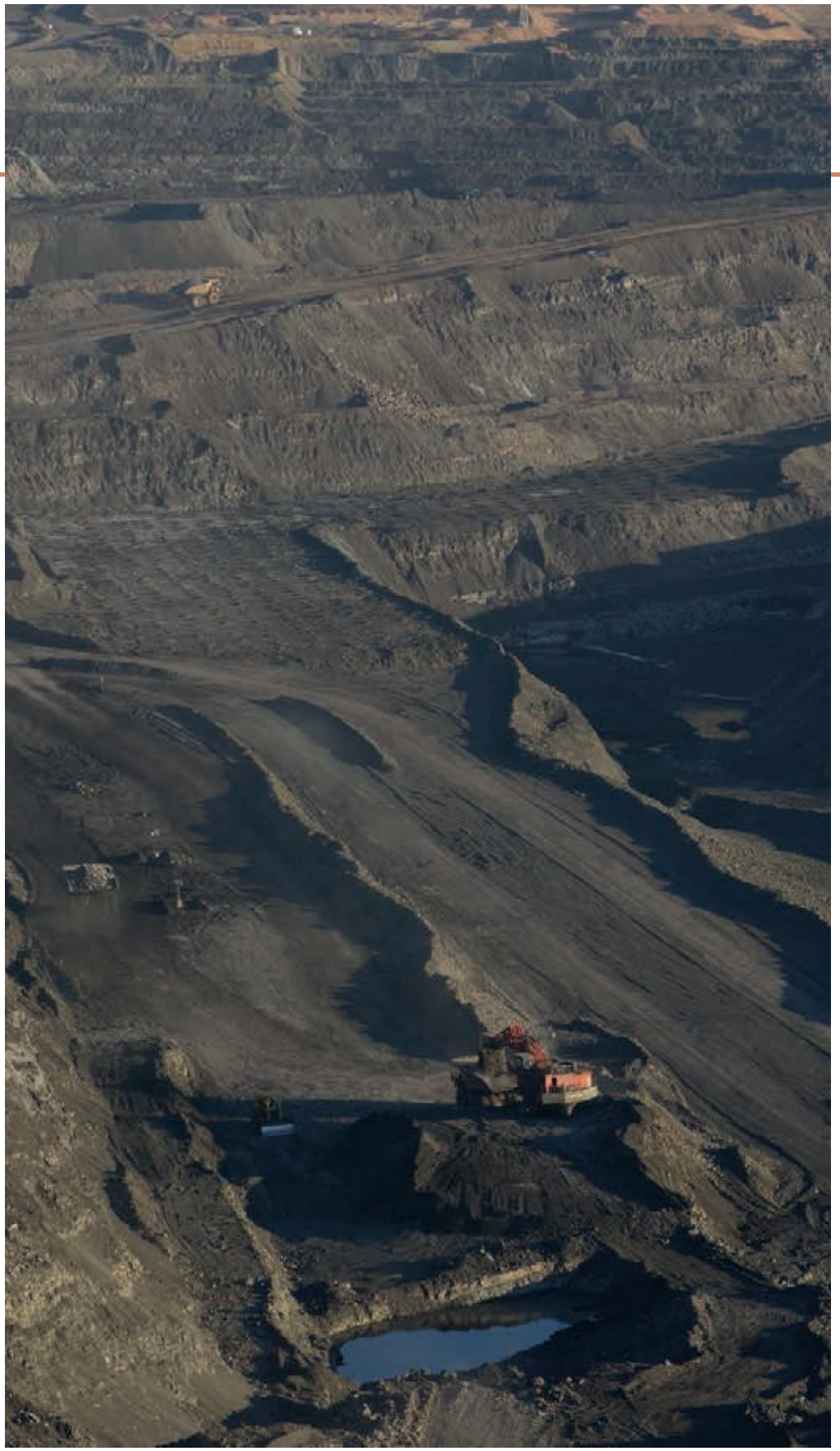
	Name of the entity	Location	Type of minerals	Date of request	Mine Capacity /Thousand cube meter and thousand tons /	Investment /million MNT/	Number of new jobs
1	Irmuun Bosgo LLC	Orkhontuul soum, Selenge aimag	Gold	2016.04.20	124.0	1550.0	31
2	MGL Resources LLC	Zaamar soum, Tuv aimag	Gold	2016.04.25	86.1	634.3	29
3	Tod Undarga LLC	Bayangol Soum, Selenge aimag	Gold	2016.04.29	80.0	4300.0	65
4	Erdenyn Tsamirmaa Tal LLC	Bayan Soum, Tuv aimag	Gold	2016.05.06	50.0	1056.0	35
5	Magic Bridge LLC	Ulziit Soum, Dundgobi aimag	Fluorspar	2016.05.24	28.0 tons	1300.00	43
6	Ideal systems LLC	Must soum, Khovd Aimag	Gold	2016.06.07	200.0	369.7	46
7	SBF LLC	Zaamar Soum, Tuv aimag	Gold	2016.06.08	80.0	1000.0	41
8	Pantaterra LLC	Bayangol soum, Selenge aimag	Gold	2016.06.09	76.7	1211.7	78
9	Altandornod Mongolia LLC	Zaamar soum, Tuv aimag	Gold	2016.05.30	67.5	1400.0	124
10	Uuls Zaamar LLC	Zaamar soum, Tuv aimag	Gold	2016.06.13	150.0	6100.0	61
11	LMO Mining LLC	Lun Soum, Tuv aimag	Gold	2016.06.16	100.0	1200.0	41
12	Altan Zaamar LLC	Zaamar, Bulgan and Buregkhangai, Tuv aimag	Gold	2016.07.19	1691.1	10380.0	116
13	Miray Flouride LLC	Gurvansaikhan soum, Dundgobi aimag	Fluorspar	2016.07.26	100.0 tons	446.00	100
14	Orient Mining Investment LLC	Buregkhangai soum, Bulgan aimag	Gold	2016.07.25	100.0	3970.0	83
15	Shine Sansar LLC	Bumbuger soum, Bayankhongor aimag	Gold	2016.07.21	68.6	1000.0	32
16	E-Trans LLC	Bayantsagaan soum, Tuv aimag	Limestone	2016.07.20	1500.0 tons	1770.0	31
17	Dunshinhenie LLC	Dalanjargalan soum, Dornogobi aimag	Fluorspar	2016.08.04	100.0 tons	800.00	100
18	Bolor Shur LLC	Bayan-Uul soum, Dornod aimag	Gold	2016.08.04	40.0	2200.0	44
19	FGPM LLC	Tumentsogt soum, Sukhbaatar aimag	Fluorspar	2016.08.11	140.0 tons	1800.00	101
20	Uguuj Bayan Khangai LLC	Orkhontuul soum, Selenge aimag	Gold	2016.08.11	90.0	1560.0	53
21	Shin Shin LLC	Dashbalbar soum, Dornod aimag	Mixed metal	2016.11.07	900.0 tons	212.2	738

GATSUURT CORE GOLD MINE

Name of the deposit	Gatsuurt
Location	Selenge Mandal
Owner	“Centerra Gold” LLC
Contact information	Turbold.b@centerragold.mn
Deposit mining status	Mining preparation work started in 2016.
Type of Minerals	Gold
Deposit reserve	Minable B+C grade reserve is 50 tons gold per 17.1 million tons of ore and B+C+P grade mineable reserve is 26.1 tons of gold from 10.6 million tons of ore.
Mining capacity reflected in the feasibility study	150 tons/year ore
Product	The total registered mineable reserve of Gatsuurt deposit is 50 tons of precious metals of which 42.3 tons of gold and 3.7 tons of silver. Extraction will continue for 9 years, production will continue for 10 years, environmental monitoring and assessment will continue for 11 years. Environmental rehabilitation will continue for another 3 years and monitoring of the environmental rehabilitation will continue for 5 years. Therefore the total duration of the mining operation 17 years.
Infrastructure	Ore will be transported using a 50 km road and will be processed at the Boroo Processing Plant.

BAYANTSOGT IRON ORE MINE

Name of the deposit	Bayantsogt Iron Ore Clustered Mine
Location	Yuruu and Khongor Soum, Selenge and Darkhan-Uul aimag
Owner	“Kharanga Khuder” LLC
Contact information	www.haranga.com
Deposit mining status	Preparation work for the opening open cut mine is underway.
Type of Minerals	Iron
Deposit reserve	Proven and probable grade (B+C) reserve in the Bayantsogt clustered iron ore deposits is 41.1 million tons of iron in the 249.4 million tons of iron ore with 16.49 % of average content. Of which proven and probable reserve of the Bayantsogt deposit is 40.8 thousand tons of iron ore, Dundbulag deposit is 186.1 million tons of iron ore and Undur-Ukhaa deposit is 22.5 million tons of iron ore.
Mining capacity reflected in the feasibility study	1500-2000 thousand/tons of ore
Product	By processing the iron ore with average content of 18.3 percent with wet magnetic processing method and produce iron ore concentrates with minimum of 63.1 percent of iron content.
Infrastructure	Electricity will be supplied from a 110kW power station in Yuruu soum with 35 km long high voltage electrical wire. Annual average capacity is 223 thousand tons of concentrate.



MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA

4.5

SIGNIFICANT INTERNATIONAL AND DOMESTIC CONFERENCES AND EVENTS RELATED TO GEOLOGY, MINING AND PETROLUEM SECTOR OF MONGOLIA

Significant international and domestic conferences and events will be organized in 2017 in relation to geological, mining sector of Mongolia, and web links

JANUARY

METALS INVESTOR FORUM

Vancouver, Canada
2017.01.20-21
2017.05.06-07

www.metalsinvestorforum.com

JANUARY

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Ulaanbaatar, Mongolia
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www.mmhi.gov.mn
www.mram.gov.mn
www.erdenesmongol.mn

MARCH

ROUNDTABLE DISCUSSIONS WITH FOREIGN INVESTMENT PARTNERS

Ulaanbaatar, Mongolia
2017.03.23-24

mmer.mn, info@mmer.mn

MARCH

PDAC

Toronto, Canada
2017.03.05-08

PDAC 2017

www.pdac.ca/convention

MARCH

MINING INVESTMENT ASIA

Singapore
2017.03.28-31

www.mininginvestmentasia.com

MARCH

GLOBAL MINING FINANCE CONFERENCE
/Spring, Autumn/

/Spring, Autumn/
London, UK

Spring 2017.03.22
Autumn 2017.10.12

www.global-mining-finance.com

MARCH

MONGOLIA ECONOMIC FORUM

Ulaanbaatar, Mongolia
2017.03

meforum.mn

APRIL

MINES AND MONEY

ASIA:
Hong Kong, China
2017.04.05-07
asia.minesandmoney.com

NEW YORK:
New York, USA
2017.05.03-04
www.minesandmoney.com

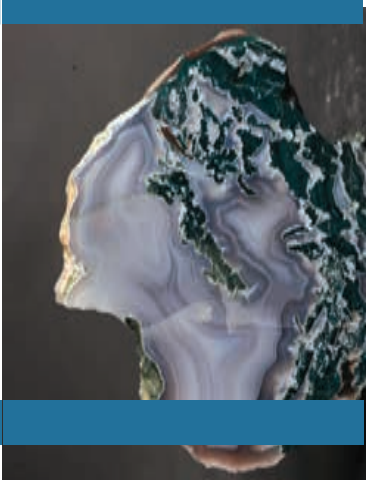
LONDON:
London, UK
2017.07.05-06
london.
minesandmoney.com

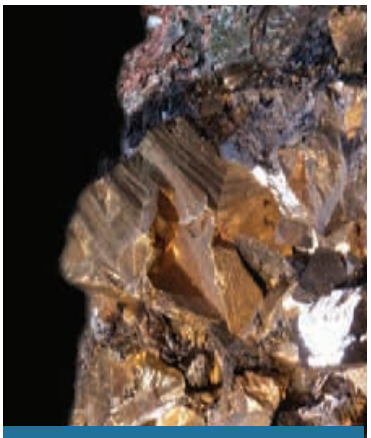
AMERICAS:
Toronto, Canada
2017.10.02-04
americas.minesandmoney.com

AUSTRALIA /IMARC/:
Melbourne, Australia
2017.10.30-11.02
imarcmelbourne.com

MONGOLIA MINERAL EXPLORATION ROUNDUP 2017

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA





MAY

COAL & METALS MONGOLIA

Ulaanbaatar, Mongolia
2017.05

www.coalandmetals.mn

SEPTEMBER

DISCOVER MONGOLIA

Ulaanbaatar, Mongolia
2017.09

discovermongoliaforum.com

SEPTEMBER

INVEST MONGOLIA

Ulaanbaatar, Mongolia
2017.09

Tokyo, Japan
2017.12

www.frontier.mn

OCTOBER

CHINA MINING

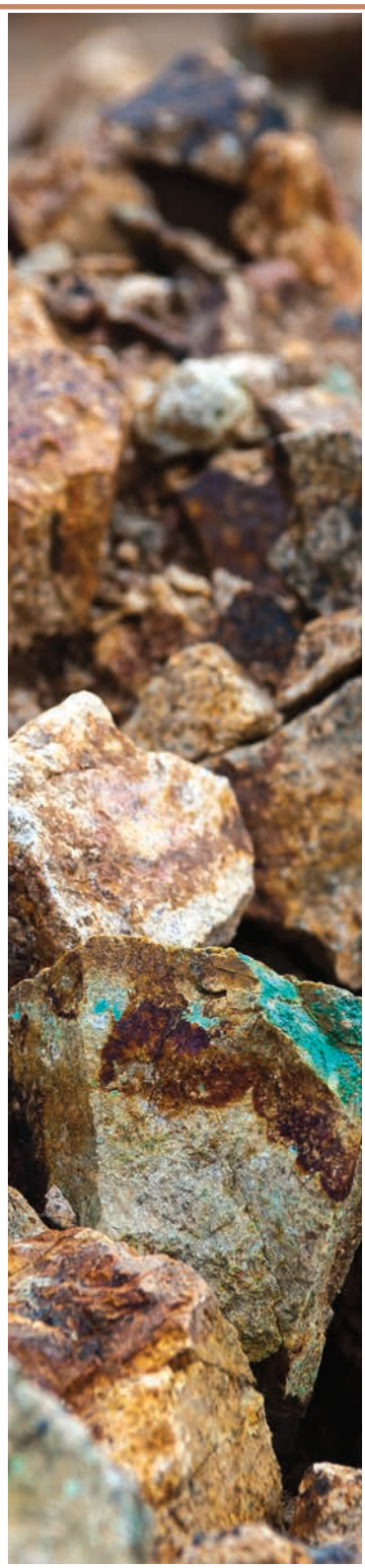
CHINA
2017.10

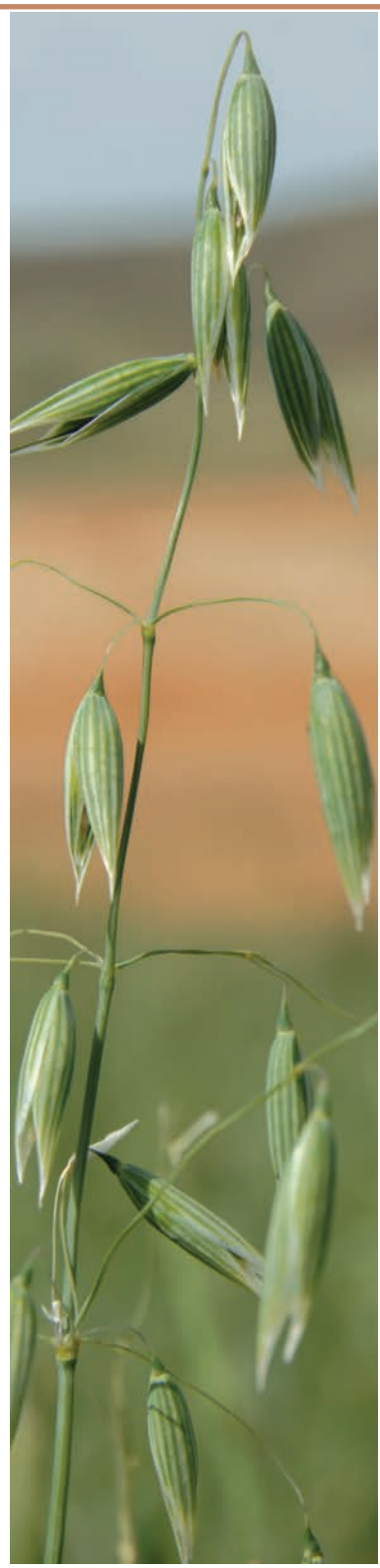
NOVEMBER

MONGOLIA INVESTMENT SUMMIT

Hong Kong, China
2017.11

mongoliainvestmentsummit.com





STATE POLICY ON MINERAL RESOURCES SECTOR

TWO. PRINCIPLES IN THE MINERAL RESOURCES SECTOR

ARTICLE/ Provisions	Content
2.1.1	To provide long-term sustainable Minerals Policy, ensure it is based on research and investigation and there is no breach of stakeholder's legal interests in any decision with regard to the legal and tax environment.
2.2.2	To introduce and encourage healthy, environmentally-friendly and advanced modern technology, techniques and innovations in the extraction and processing industries.
2.2.3	To ensure state organizations and companies work transparently, responsibly and accountably in developing the minerals sector.
2.2.4	Minerals sector investors comply with the law, work for mutual benefits and support the policy of good company governance.
2.2.5	To ensure that the State provides equal terms and conditions for minerals sector investors and does not discriminate by ownership type when implementing a State Minerals Policy.
2.2.6	To make all information open to the public even that is not legally restricted concerning geological exploration, mining and processing activities at all levels, whether funded by the state or the private sector.
2.2.7	To improve occupational health and safety laws and regulations in the mineral sector, to meet international standards and to implement them accordingly.

THREE. POLICY GUIDELINES FOR THE MINERAL RESOURCES SECTOR

ARTICLE/ Provisions	Content
3.1	Within the scope of improving the legislative environment for the minerals sector:
3.1.1	To create a specific legal environment for exploration and mining of commonly occurring minerals deposits.
3.1.2	To support cooperation and joining of institutions and legal structures of artisanal miners by state policy and improvement of related legislative regulation.
3.1.3	To improve registration and supervision of the transfer and acquisition of entities and companies controlling shares/minerals exploration and mining licenses.

3.1.4	To improve laws and regulations to strengthen control of gold mining and sale.
3.1.5	To develop and follow long- mid- and short-term programs for mining and production and to mineral resources management by conducting regular research and investigation into current situations and future projections of the world-wide and regional economies.
3.1.6	To introduce and encourage international initiatives such as responsible mining and extractive sector transparency initiatives and social and environmental impact assessments.
3.1.7	To provide a legislative environment in which a professional organizations with a qualified engineering research team shall perform research in the minerals sector.
3.1.8	To adopt international standards for evaluation of resources and reserves.
3.1.9	To provide a legislative environment so that deposits important to state and regional development shall be used in an integrated ways.
3.1.10	To form a Mineral Resources Council system that meets international standards by transferring rights and obligations to professional associations and qualified experts.
3.3	EXTRACTIVE SECTOR:
3.3.1	The objective is to adopt a policy that develops responsible mining and processing industry that is environmentally- friendly and export-oriented, meets all health and safety considerations, supports economic growth and more importantly complies with international modern standards forMongolia's future development.
3.3.2	To maximize state control, regulation and responsibility for strategically important minerals deposits as in Resolution 27 (Ikh Khural, 2007), to improve their exploitation for economic benefit and to develop better cooperation between the state and the private sector.
3.3.3	To help organizations work in a transparent and responsible way using technology that is the least harmful to human health and the environment.
3.3.4	To accurately plan production and processing volume consistent with the national economy, industrial situation and future perspectives of both internal and external markets.
3.3.6	To support manufacturing of products to substitute minerals-based imported goods and materials.
3.3.7	To introduce scientific and technological advances to the mining industry for better productivity and maximum competitiveness.
3.6	ENVIRONMENTAL PROTECTION AND REHABILITATION.
3.6.1	To provide healthy and environmentally-friendly conditions in mining and processing that are least harmful to human health and ensure ecological and environmental balance.
3.6.2	State-owned entities shall operate as customers, giving contracts to build public and private sector partnerships.
3.6.3	To develop post-mining rehabilitation and mine closure standards and regulations meeting international standards.
3.6.4	Surface water shall predominantly be used instead of underground fresh water In mining and processing . Processed water shall be re-cycled; for mining consumption, gray water shall be used; and advanced technology for water-use will be supported as indicated by law.
3.6.5	To support efficient and environmentally healthier technology, with re-cycling and re-processing of mining waste.

3.7	Management of mining industry, organization and human resources:
3.7.1	The state shall establish and operate a Policy Board with a balanced representation of state organizations, investors, professional associations and civil society organizations. The Board shall consult and support implementation of the State Minerals Policy.
3.7.2	State-onwed companies into public companies step by step. To prepare converting state-onwed companies's shares into public companies step by step.
3.7.3	To uphold good corporate and company governance principles when selecting management of state-owned entities.
3.7.4	To establish special funds from mining industry revenue to the state budget. These funds will be used to establish economic diversity and stability, support export-oriented production, protect and rehabilitate the environment and improve national competitiveness.
3.7.5	To sell minerals products in internal and external markets using explicit , accurate and highly effective marketing methods. To establish a mineral stock market/ commodity exchange to set fair prices, to develop a domestic stock market and to develop a comprehensive export policy.
3.7.6	To make state organization services plain, publicly open and effective, and to help civil society control with public information about operational structure of minerals sector-related and all level Governmental organizations, license authorizations, standards and license durations.
3.7.9	To develop and update the key minerals export product classification in compliance with customer demand and comply with international standard requirements, at all levels.
3.7.10	To incrementally reduce the export of raw minerals; support the production of value-added, semi-processed and final products; support their marketing at the international market prices; and improve valuation methods for minerals deposit use payment (royalty) to maximize income from the minerals industry.
3.7.11	To make central government and municipal organizations actions more consistent with support for private sectors within the minerals sector;
3.7.12	Special attention shall be paid to training national human resources in the mining industry; qualified engineers and technical workers shall be trained at domestic and foreign universities.

FOUR. IMPLEMENTATION METHODS, STAGES AND EXPECTED RESULTS OF THE STATE MINERALS RESOURCE POLICY

ARTICLE/ Provisions	Content
4.1	Implementation methods for the State Minerals Policy:
4.1.1	Cabinet, the state central organization in charge of mining, all Government agencies and entities shall act in compliance with laws, resolutions, rules, regulations and standards when implementing the State Minerals Policy, and implement accordingly.
4.1.2	Within its operation plan, the government shall coordinate the State Minerals Policy with other sector policies, provide directions on planning and policies, carry out supervisions and inspections and evaluate and react appropriately to results.

4.1.3	The government shall consider the State Minerals Policy purposes and directions in its annual Social and Economic Guidelines of Mongolia, state budget, state monetary policy and fiscal framework.
4.1.6	Define potential risks and take counter-measures as part of mid- and short-term planning.
4.2	Implementation stages for State Minerals Policy:
4.2.1	To improve the legislative environment and develop correspondly appropriate rules, regulations, programs and projects (2014 and 2015).
4.2.2	Implement programs and projects (2014-2025);
4.2.3	Summarize mid-stage achievements of the State Minerals Policy and proceed further towards given goals (2020 and 2025).
4.3	Expected results from the implementation of State Minerals Policy:
4.3.2	To use mineral reserves fully and appropriately and to increase diversity and volume of value-added products by encouraging processing and the use of environmentally-friendly technology.
4.3.3	To minimize industrial incidents and accidents with occupational health and safety at all production levels, applying well-practiced and integrated standards for mining and processing operation.
4.3.4	To apply long-term planning of infrastructure development /road networks, power plants, cities and settlement centers in conjunction with mining projects.
4.3.5	Population over-concentration will be reduced with major industrial center development.
4.3.6	Reduce unemployment with training and employment of Mongolians in the minerals and infrastructure sector.
4.3.7	Environmental protection, mine closure, rehabilitation and long-term monitoring shall becoming more orderly and responsible and be carried out according to laws and international standards,.
4.3.8	To limit mining damage near riverbeds, watershed basins, forested areas, agricultural fields, fertile pastureland, Gobi desert oasis, lakes and ponds for ecological integrity and to help provide healthy eco-food products for people's healthy nutrition and a safe living environment.
4.3.9	All minerals sector activities shall comply with laws and regulations and be open to the public. New laws and big projects shall consider public opinion.

4.7 OIL FIELDS AND BLOCKS WITH PRODUCT SHARING AGREEMENT

Blocks with PSA	Date of PSA approval, Government of Mongolia Resolution number	Contractor company	Operator company
À PRODUCTION BLOCKS			
1 Toson-Uul XIX	1993.04.26	Daquing Oil Field Ltd	Petrochina Daqing Tamsag LLC
2 Tamsag XXI	7 Aug 1996, Government Resolution 183		
3 1997BKhG	19 Feb 1999, Government Resolution 47	Dongsheng Jinggong Petroleum Development Group	Dongsheng Petroleum (Mongolia) LLC
Á BLOCKS WITH PSAS			
4 Matad XX	19 Jul 2006, Government Resolution 170	Petromatad Invest Limited	Petromatad LLC
5 Tariach XV	7 Mar 2007, Government Resolution 47	China Golden Sea Petroleum Investment Co.,Ltd	Golden Dea Petroleum LLC
6 Nyalga XVI	20 Jun 2007, Government Resolution 148	Panàsian Energy Ltd	Shaiman LLC
7 Tsagaan-Els XIII	20 May 2009, Government Resolution 148	DWM Petroleum AG	Gobi Energy Partners Gmbh LLC
8 Zuunbayan XIV			
9 Galba XI	20 May 2009, Government Resolution 147	Zong Heng You Tian Ltd	Zong Heng You Tian LLC
10 Sulinkheer XXIII	22 Jul 2009, Government resolution #224	Shunkhlai Energy LLC	Shunkhlai Energy LLC
11 Borzon VII	29 Jul 2009, Government Resolution 236	Empire Gas Mongolia LLC	Empire Gas Mongolia LLC
12 Khukhnuur XVIII	29 Jul 2009, Government Resolution 238	EnPI LLC	EnPI LLC
13 Tukhum X (north)	29 Jul 2009, Government Resolution 237	Sansaryn Geologi Khaiguul LLC	Sansaryn Geologi Khaiguul LLC

Country of origin of the Contractor	Area size, km^2	Location of blocks
China	650	Dornod aimag- Matad soum
	209,2	Dornod aimag- Matad and Khalkhgol soums
China	239,5	Dornogobi aimag- Ulaanbadrakh, Saikhandulaan soums
British Isle of Man	10343,2	Dornod aimag- Matad soum, Sukhbaatar aimag Erdenetsagaan soum
China	7799,2	Dornogobi aimag- Altanshiree, Urgun, Delgerekh, Ikh Khet, Airag, Saikhandulaan soums, Sukhbaatar aimag- Tuvshinshiree soum
Canadian Nevis Island	9239,4	Tuv aimag- Bayanjargalan, Bayan, Bayantsagaan soums, Khentii aimag- Delgerkhaan, Jargaltkhaan, Murun, Bayankhutag, Bayanmunkh, Darkhan, Galshar soums, Gobi-Sumber aimag-Choir, Bayantal soums, Dundgobi aimag- Tsagaandelger soum
Switzerland	1980	Dornogobi aimag- Saikhandulaan, Khatanbulag Erdene, Mandakh, Ulaanbadrakh soums
	1030,7	Dornogobi aimag – Urgun, Sainshand, Erdene Saikhandulaan, and Altanshiree soums
China	9769,2	Umnugobi aimag – Khanbogd, Manlai and Bayan-Ovoo soums. Dornogobi aimag – Khanatbulag and Mandakh soums.
Mongolia	13576	Dornogobi aimag – Erdene, Khuvsgul, Ulaanbadrakh, and Khatanbulag soums
Isle of Man	31432	Umnugobi aimag – Nomgon, Noyon, Khurmen, Gurvantes, Bayandalai, Khankhongor and Sevrei soums
China	5276	Dornod aimag – Gurvanzagal, Bayantume and Choibalsan soums
Mongolia	9813	Dundgobi aimag – Gurvansaikhan, Ulziit, Bayanjargalan, Undurshil and Mandalgobi soums, Dornogobi aimag- Saikhandulaan, Mandakh and Airag soums

Blocks with PSA	Date of PSA approval, Government of Mongolia Resolution number	Contractor company	Operator company
14 Tsaidam XXVI			
15 Bogd IV	29 Jul 2009, Government Resolution 235	Central Asian Petroleum Corporation Limited	CapCorp Mongolia LLC
16 Î íãè V			
17 Bayantumen XVII	8 Dec 2010, Government Resolution 316	Magnai Trade LLC	Magnai Trade LLC
18 Dariganga XXIV	9 Feb 2011, Government Resolution 39	Apexpro Investment Limited	IPXPRO LLC
19 Tukhum X (South)	25 Jul 2012, Government Resolution 253	Mongolyn Alt (MAK) LLC	Mongolyn Alt (MAK) LLC
20 Sukhbaatar XXVII	5 Jan 2013, Government Resolution 39	Wolf Petroleum LLC	Wolf Petroleum LLC
21 Nomgon IX	9 Feb 2014, Government Resolution 39	Umnud Mongolyn Gazryn Tos LLC	
22 Uvs I	20 Apr 2015, Government Resolution 162	Mongolia Gladvill Uvs Petroleum LLC	Mongolia Gladvill Uvs Petroleum LLC
23 Kherlentokhoi XXVIII	20 Apr 2015, Government Resolution 162	Hong Kong Wellpack Industrial LLC	Hong Kong Wellpack Industrial LLC
24 Khar-Us II	15 Jun 2015, Government Resolution 246	Renova Ilch LLC	Renova Ilch LLC

Country of origin of the Contractor	Area size, km^2	Location of blocks
	11175,2	Ulaanbaatar city – Bagakhangai and Nalaikh district, Khentii aimag - Tsenkhermandal and Delgerkhaan soums, Tuv aimag – Bayandelger, Erdene, Bayanjargalan, Bayan, Sergelen, Arkhust, Baganuur, Bayantsagaan, Bayan-Unjuul, Altanbulag and Mungunmotit soums
British Cayman Island	28998,6	Bayankhongor aimag – Baatsagaan, Bogd Jinst, Ulziit, Khuree maral, Bayan-Ovoo, Bayangobi, Bayan-Undur, Bumbugur, Bayanlig, Bayantsagaan, and buutsagaan soums, Uvurkhangai aimag – Baruunbayan-Ulaan and Bayanteeg soums, Gobi-Altai aimag – Erdene, Tsogt, Taishir, Altai, Chandmani, Delger, Biger and Khaluin soums
	21148,7	Dundgobi aimag – Erdenedalai, Saikhan-Ovoo, Delgerkhangai and Khuld soums, Bayankhongor aimag – Bogd and Bayanlig soums, Uvurkhangai aimag – Nariin teel, Zuunbayan ulaan, Sant, Bayangol, Tugrug, Guchin-Us, Baruunbayan-Ulaan, Bogd, Khairkhan dulaan and Taragt soums, Umnugobi aimag – Mandal ovoo soum
Mongolia	7832	Dornod aimag - Gurvanzagal, Bayan-dun, Bayantumen, Choibalsan, Bulgan, Tsagaan ovoo, Sergelen, Bayan-Uul soums
British Virgin Islands	17178	Sukhbaatar aimag – Asgat, Bayandelger, Ongon, Tuvshinshiree, Khalzan, Dariganga, Naran soums
Mongolia	24706,2	Dundgobi aimag – Ulziit soum, Dornogobi aimag – Saikhandulaan, Mandakh soums, Umnugobi aimag Tsogt-Ovoo, Tsogttsetsii, Manlai, Khankhongor soums
Australia	23047,5	Dornogobi aimag – Delgereh, Ikhkhet, Altanshiree, Urgun, Sukhbaatar aimag – Tuvshinshiree, Munkhkhaan, Uulbayan, Khalzan, Bayandelger soums Khentii aimag – Galshar soum
	29866,8	Umnugobi aimag – Bayan-Ovoo, Khankhongor, Khanbogd, Tsogttsetsii, Tsogt-Ovoo, Nomgon, Manlai soums
Hong Kong	19720	Uvs aimag – Sagil, Turgen, Tarialan, Davst, Umnugobi, Tes, Malchin, Khyargas, Naranbulag, Zuungobi, Baruunturuun, Zuunkharaa, Ulaangom, Ulgii, Zavkhan soums
Hong Kong	14280	Dornod aimag - Bulgan, Choibalsan, Matad, Khulunbuir soums, Sukhbaatar aimag – Sukhbaatar soum
China	27409,3	Uvs aimag – Umnugobi, Naranbulag, Zavkhan, Ulgii, Tsagaankhairkhan soums, Khovd aimag – Durgun, Chandmani, Myangad, Buyant, Darvi, Must, Mankhan, Zereg, Erdeneburen soums, Gobi-Altai aimag - Khukhmorit soum, Zavkhan aimag – Urgamal, Zavkhanmandal, Durvuljin soums

CHAPTER V.
LIST OF GOVERNMENT AND NON-GOVERNMENT ORGANIZATIONS, WHICH WORK IN GEOLOGICAL, MINING AND HEAVY INDUSTRY SECTOR
(LINKS AND RESOURCES)

5.1
GOVERNMENT ORGANIZATIONS

Ministry of Mining and Heavy Industry	www.mmhi.gov.mn
Ministry of Environment and Tourism	www.mne.mn
Ministry of Energy	energy.gov.mn
Ministry of Road and Transportation Development	mrtd.gov.mn
Ministry of Finance	www.mof.gov.mn
Ministry of Foreign Affairs	www.mfa.gov.mn
Ministry of Justice and Home Affairs	mojha.gov.mn
Ministry of Construction and Urban Development	mcud.gov.mn
Ministry of Labour and Social Protection	www.khun.gov.mn
Mineral Resources Authority of Mongolia	mram.gov.mn
Customs General Administration	www.ecustoms.mn
Mongolian General Taxation Authority	www.mta.mn
General Authority for Specialized Inspection	inspection.gov.mn
Authority for Fair Competition and Consumer Protection	www.afccp.gov.mn
National Emergency Management Authority	nema.gov.mn
General Authority for Border Protection	bpo.gov.mn
Mongolian Agency for Standardization and Metrology	www.masm.gov.mn
National Development Agency	nda.gov.mn
General Authority for Intellectual Property and State Registration	www.burtgel.mn
Mongolian Immigration Agency	immigration.gov.mn
Administration of Land Affairs, Geodesy and Cartography	www.gazar.gov.m n
Mongolian Civil Aviation Agency	www.mcaa.gov.mn
Health and Social Insurance General Office	www.ndaatgal.mn
Mining Rescue Unit of NEMA	fb/u.u.a.alba
Extractive Industries Transparency Initiative of Mongolia	www.eitimongolia.mn

5.2 NON GOVERNMENT ORGANIZATIONS

National Association of Mining of Mongolia	www.miningmongolia.mn
Mongolian Geological Association	www.geosociety.mn
Mongolian Association of Production Geology.	www.monseg.mn
Mongolian Coal Association	www.coalmining.mn
Petroleum Exploration and Extraction Association	
Mongolian Business Council	bcmongolia.org
Open society forum	www.forum.mn
Mongolian National Chamber of Commerce and Industry	www.mongolchamber.mn
Mongolian Trade Union of Electricity, Geology and Mining Sector	www.megm.energy.mn
Mongolian Geology and Mining Club	fb/mongmclub
Mongolian Association of Metallurgical Plants	
Mongolian Association of Gold Production	mongoliagold.org
Mongolian Association of Construction Material Producers. Mongolian association of sand, gravel and pebble producers.	
Geology Women's Club	
Dornod Exploration Club	

MINERAL RESOURCES AND PETROLEUM AUTHORITY OF MONGOLIA

5.3 RESEARCH ORGANIZATIONS

School of Geology and Mining, MUST	www.guus.edu.mn
Central Geology Laboratory	cengeolab.com
Mining Institute of MUST	mimongolia@gmail.com
Mineral Processing Center of Institute of Chemistry and Chemical Technology.	www.icct.mas.ac.mn
School of Mining Engineering of NUM	mnu.edu.mn

5.4 PROJECTS AND PROGRAMMES

Sustainable Artisanal Mining Project of Swiss Agency for Development and Cooperation (SAM)	sam.mn
Mining Infrastructure Investment Support Project of World Bank (MINIS)	www.minis.mn
Strengthening Extractive Sector Management in Mongolia by Canadian Government (SESMIM)	fb/SESMIM-Project
MERIT Mongolia: Enhancing Resource Management through Resource Management Project by Canadian Government	fb/MERIT.mn
Integrated Mineral Resources Initiative of GIZ (IMRI)	www.giz.de
Australia Mongolia Extractive Programme (AMEP)	oyunbileg@amep.mn

5.5 PROFESSIONAL ASSOCIATIONS

Council of Professional Mining Associations	d.tsogbaatar@gmail.com
Members of CPMA: National Association of the Specialized and consultant Engineers of Mining Sector of Mongolia.	sukhee_59@yahoo.com
Mongolian Association of Mining Mapping and Planners	mining-design.mn
Mongolian Markshader Association	mine-surveying.mn
Mongolian Association of Professional Engineers for Underground Mines	mr.dukapl@gmail.com
Mongolian Engineers Association for Open Cut Mines	ulaanbaatar888@must.edu.mn
Association of Blast Operation and Service Provider.	jamiyanj@gmail.com
Association of Blast Engineers	purev_l@yahoo.com
Mongolian Exporters Association	www.exportmongolia.mn
Association of technological engineers for manual extraction of minerals	enkhee_0501@yahoo.com
Mongolian Mining Production Electrical Mechanical Association	nanzad_57@yahoo.com
Mongolian Association of Mineral Processors.	mmpa.mn
Association of spar miners, producers and exporters.	zooch_86@yahoo.com
Mongolian Association of Mining Consultant Engineers.	avzaga@gmail.com
Center of Professional Mining Engineers	ariunongi933@yahoo.com
Mongolian United Association of Chemical Engineers	www.macce.mn
Mineral Resource Association	khunda_vladimir@yahoo.com
Mongolian National Rare Earth Element Association	mendsaikhan@mnrecd.mn
Mongolian Association of Mineral License Holders	tumee_jaa@yahoo.com
Mineral Research and Information Center	khaumdas@gmail.com
Mongolian Professional Institute of Geology and Mining Mongolian Association of Mineral Economy and Management	mpigm.com
Mongolian Association of Petroluem Engineers	www.mspe.mn
Mongolian Association of Geophysicists.	sites.google.com/site/geophysicalass
Mongolian Drilling Association Mongolian Association of Hydro geologists	mda.mn mah.mn
Mongolian Engineer Geologists Association	
Mongolian flour spar miners and researchers association	dan.erdene.=@yahoo.com
Mongolian association of underground miners	
Mongolian Association of Metallurgical Experts.	

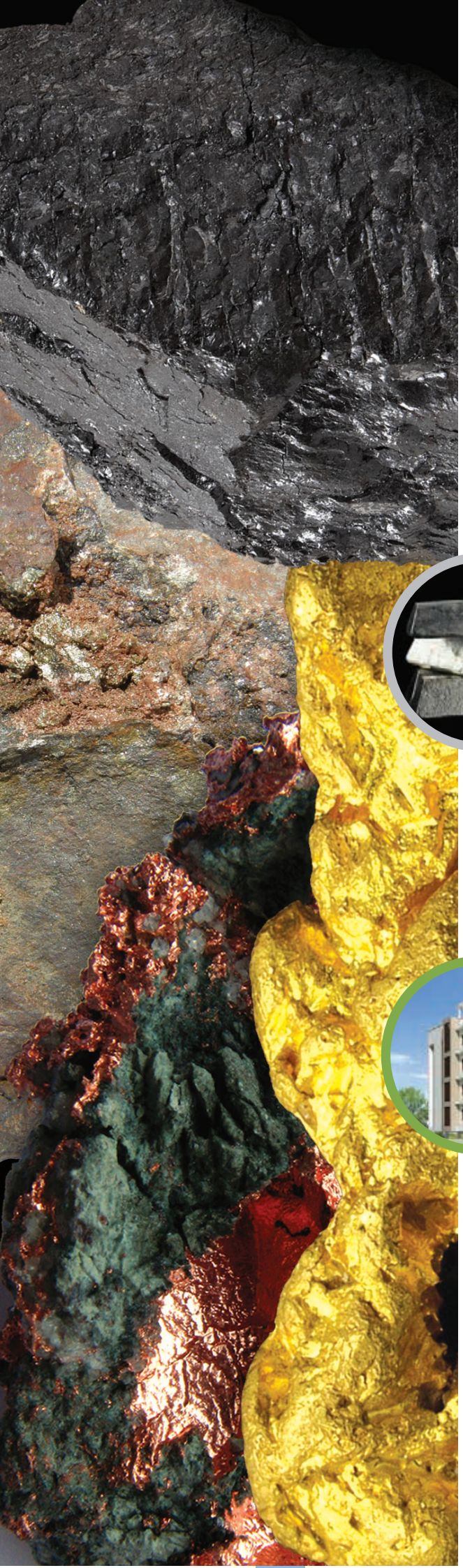
5.6

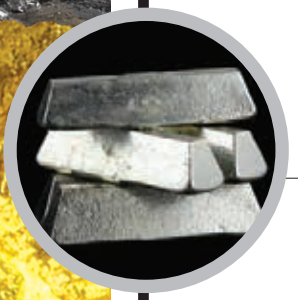
PROFESSIONAL NEWSPAPERS AND JOURNALS (NEWS AND MEDIA)

Mongolian Mining Journal	www.mongolianminingjournal.com
Mongolian Economy Journal	www.mongolianeconomy.mn
Geology and Mining News Newspaper.	www.guum.mn
Mongolian Mining Exchange	www.infomine.mn

LIST OF REFERENCES

www.mongolbank.mn
www.1212.mn
www.fraserintitute.org
www.resourcesgovernance.org
www.ikon.mn
https://cmcs.mram.gov.mn/cmcs#cid=1
www.mram.gov.mn
https://cmcs.mram.gov.mn/cmcs#cid=1
www.mongolbank.mn
www.customs.gov.mn Used export statistics as of November 2016 from the General Customs office
http://legalinfo.mn/law/details/12120
https://mof.gov.mn/
www.resouresgovernance.org Natural resources revenue sharing
www.resourcesgovernance.org Natural resources charter
Andrew Bauer: Revenue Management: Macroeconomic frameworks and monetary policy





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