22 MONGOLIA

22.1 Summary of Coal Industry

22.1.1 ROLE OF COAL IN MONGOLIA

Coal accounts for 73 percent of total national energy consumption in Mongolia (EIA, 2007). Mongolia presently ranks 29th worldwide in production of coal. Coal production in Mongolia has more than doubled since 2000 (EIA, 2010). Table 22-1 provides proven coal reserves and recent coal production data for Mongolia.

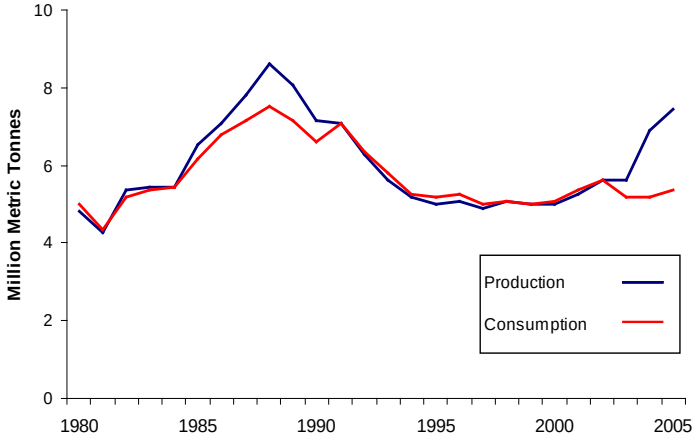
Table 22-1. Mongolia's Coal Reserves and Production

Indicator	Anthracite & Bituminous (million tonnes)	Sub-bituminous & Lignite (million tonnes)	Total (million tonnes)	Global Rank (# and %)
Estimated Proved Coal Reserves (2008)			12,200	
Annual Coal Production (2008)*	1.10	9.01	10.1	

Source: Ganbaatar (2008); *EIA (2009)

In recent years, Mongolia's coal consumption has remained relatively constant while production has increased, indicating that Mongolia is shifting from a coal importing nation to an exporter. Increased production is attributed in part to privatization of several state-owned mines and expanded output to meet increasing coal demand in China (Tse, 2007). Figure 22-1 below shows Mongolia's production and consumption from 1980 to 2005.

Figure 22-1. Mongolia's Coal Production and Consumption (million tonnes)



Source: Modified from EIA (2008)

Mongolia has vast coal reserves estimated at a total of 152 billion tonnes (Purevsuren and Drebenstedt, 2004). Preliminary and detailed exploration activities estimated economically recoverable reserves of 22.3 billion tonnes. Proved coal reserves are 12.2 billion tonnes, including 2 billion tonnes of coking coal

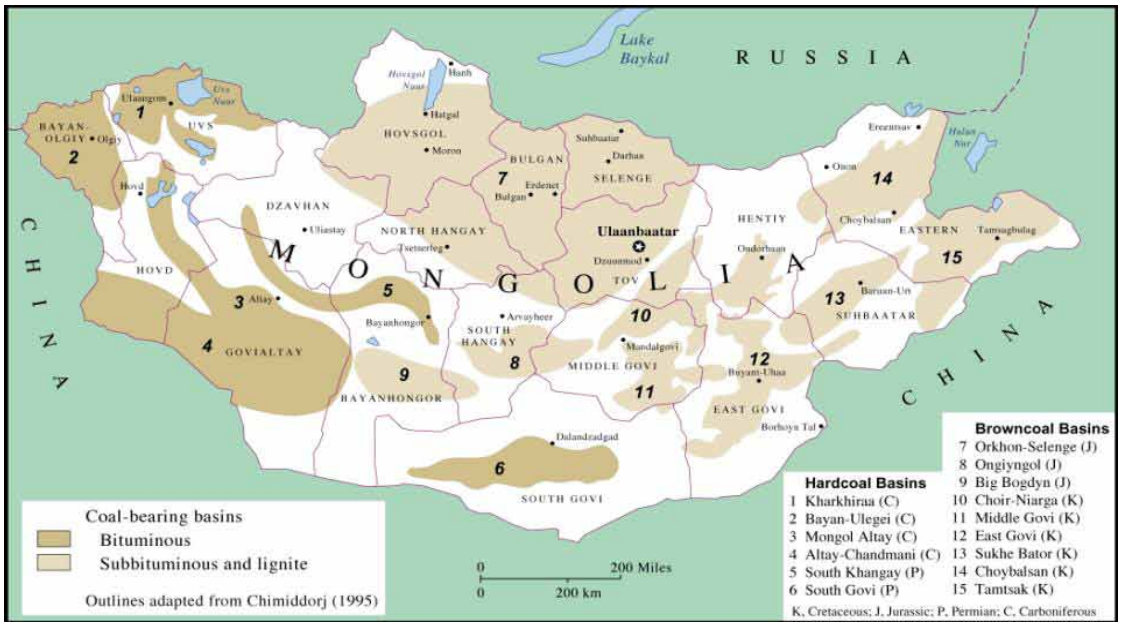
and 10.1 billion tonnes of thermal coal (Ganbaatar, 2008). Table 22-2 summarizes the reserves found in major coal deposits of Mongolia. There are 200 coal deposits within 15 coal basins in Mongolia (shown in Figure 22-2).

Table 22-2. Proven Coal Reserves Found in Major Coal Deposits

Region	Coal Deposit	Estimated Reserves (tonnes)	Mineable Reserves (tonnes)	Coal Rank	Coal Basin
Central Mongolia	Shivee Ovoo	2.7 billion	564.1 million*	Brown	Choir-Nyalga
	Tevshiin Govi		587.7 million*		Choir-Nyalga
	Tugrugnuur and Tsaidannuur	2 billion		Brown	Choir-Nyalga
	Baganuur		511.4 million*	Brown	Choir-Nyalga
	Khoot		85.0 million*		Choir-Nyalga
	Sharyn Gol		32 million*		Orkhon-Selenge
	Ulaan-Ovoo		23.6 million*		Orkhon-Selenge
East Mongolia	Adduunchuluun		230 million*	Brown	Choybalsan
	Tugalgatai	3 billion		Sub-bituminous	Choir-Nyalga
	Chandgana Tal		122.9 million*		Choir-Nyalga
	Talbulag		48.6 million*		Sukhbaatar
West Mongolia	Hushuut	300 million		Bituminous and metallurgical	Mongol Altay
	Uvurchuluut		3.7 million*		Big Bogdyn
South Gobi	Tavan Tolgoi		7.5 billion	Bituminous	South Gobi
	Baruun Naran	155 million		Thermal and metallurgical	South Gobi
	Nariin Sukhait	250 million	220 million†	Bituminous	South Gobi
	Ovoot Tolgoi	150 million			South Gobi

Source: Ganbaatar (2008); *Purevsuren and Drebenstedt (2004); †Mongolyn Alt Corporation (2010)

Figure 22-2. Mongolia's Coal Basins



Source: Schwochow (1997), modified from Chimiddorj (1995)

22.1.2 STAKEHOLDERS

Table 22-3 identifies potential key stakeholders in coal mine methane (CMM) development in Mongolia.

Table 22-3. Key Stakeholders in Mongolia's CMM Industry

Stakeholder Category	Stakeholder	Role
Mining companies	▪ QGX, Ltd. ▪ Tethys Mining LLC ▪ SouthGobi Energy Resources ▪ Red Hill Energy, Ltd. ▪ BHP Billiton Mongolia LLC ▪ Leighton Mining & Infrastructure Mongolia LLC ▪ MAK/Qinhua ▪ Baganuur Joint Stock Company ▪ Erdenes Mongol ▪ Sharyn Gol JSC ▪ Mongolyn Alt MAK Group ▪ Mongolian Holdings Corporation ▪ Rio Tinto ▪ Peabody ▪ Sodgazar LLC ▪ Mon En Co LLC ▪ Energy Resources LLC ▪ Xanadu Mines Mongolia LLC ▪ SGS LLC	Project hosts

Developers	▪ KOGAS	Project opportunity identification and planning
Engineering, consultancy, and related services	▪ Geomaster Engineering LLC ▪ MegaWatt Company Ltd. ▪ Center of Mongolian Mining Professional Engineers ▪ Sproule	Technical assistance
Universities, Research Establishments	▪ National University of Mongolia ▪ Mongolian University of Science and Technology ▪ Mongolian Technical University	Technical assistance
Regulatory Agencies and Government Groups	▪ Ministry of Mineral Resources and Energy ▪ Ministry of Nature, Environment, and Tourism ▪ Mineral Resources and Petroleum Authority of Mongolia ▪ Ministry of Trade and Industry ▪ Millennium Challenge Account – Mongolia ▪ National Development and Innovation Committee	Project identification and assessment support
Non-governmental Organizations	▪ Mongolian Nature and Environment Consortium ▪ Mongolian National Mining Association ▪ Mongolian Coal Association ▪ Federation Of Energy, Geology And Mining Workers' Trade Unions Of Mongolia – MEGM	

Source: MRPAM (2008); MNMA (2008); CMUC (2008); UNFCCC (2005)

22.1.3 STATUS OF COAL AND THE COAL MINING INDUSTRY

Mongolia produced a total of 10.1 million tonnes (Mmt) of coal in 2008 (Table 22-1). There are more than 30 surface (or open cast) mines in Mongolia, providing almost 99 percent of Mongolia's coal production. Three large coal mines—Baganuur, Shivee Ovoo, and Sharyn Gol —provide Mongolia's greatest quantity of coal, supplying fuel to five combined heat and power plants in Ulaanbaatar, Darkhan, and Erdenet (Davaatsedev and Tunga, 2005).

In Mongolia, many of the more substantial deposits of proven coal reserves remain undeveloped due to the lack of infrastructure (APO, 2006). Several infrastructure improvements are planned to accommodate an increase in coal mining as well as mining of other vast and valuable mineral reserves such as copper and gold. A 220-kV DC power transmission line is planned for construction and will connect Ulaanbaatar to the southern mining regions. A power plant is also planned for construction in order to meet the electricity demands of the mining developments (Tserenpurev, 2008). These measures, including the gradual elimination of electricity generating plants in Ulaanbaatar due to concentrated air pollution problems in the city, are identified as long-term objectives of the South Gobi Power Development Corporation (Homma, 2009).

Mongolia's Ministry of Fuel and Energy has outlined a number of policy goals including increased government support in coal export, reductions in customs taxes for coal export, reduction of rail transport tariffs and appropriate changes in relevant laws, all of which will encourage increased coal production (Ganbataar, 2005).

Several new surface coal mine developments are planned. The Tavan Tolgoi deposit, located in the South Gobi Basin in the Umnugovi province of southern Mongolia, has estimated reserves of 1.9 billion tonnes of coking coal out of a total of 7.5 billion tonnes of reserves. This deposit is expected to produce as much as 20 Mmt per year (Ganbaatar, 2008; MIT, 2008). A number of international coal mining companies are involved in negotiations with the Mongolian government hoping to invest and develop the reserves. Other

potential coal deposits for development include Tevshiin Govi, Tsaidam, and Tugrong Nuur, located in Central Mongolia (Tse, 2007).

QGX Ltd. of Canada acquired license to the Baruun Naran deposit adjacent to the Tavan Tolgoi deposit in 2002. The exploration program began in 2005 and continues at present (QGX, 2008).

Tethys Mining LLC recently announced that it has discovered a large coal deposit, Tugalgatai, in Murun, the eastern Mongolian province of Khentii (spelled Hentiy on the map in Figure 22-2), with recoverable reserves estimated at 2.7 billion tonnes, which would make it the country's second-largest deposit, exceeded only by Tavan Tolgoi (Daly, 2008).

South Gobi Energy Resources is planning a surface mine project to be supplemented by underground mining at the Ovoot Tolgoi coal project also located in the Umnugovi province. The project is next to the existing MAK/Qinhua coal mine, approximately 45 kilometers north of the Mongolian/Chinese border and the Chinese town of Ceke. South Gobi plans to use Ceke as the main distribution center for Ovoot Tolgoi coal, as Ceke is home to a new automated coal-loading terminal and existing railway infrastructure (Edgar Online, 2008).

The Mongolian government is presently funding a study of the Kharkhiraa coal basin in northwestern Mongolia. The study will collect coal quality and gas content data down to 1,800 meters (m) depth and delineate the best deposits for exploitation.

Mongolia's largest underground coal mine, Nalaikh, near Ulaanbaatar, was closed in 1993 due to a major mine fire (World Bank, 2004). Official underground mining in this area ceased at this time; however, a number of the displaced miners began informal or artisanal mining in the area. The World Bank estimates that around 1,000 people are working at informal operations near Nalaikh. These operations often involve digging more than 100 m underground, which poses a significant safety concern (GEUS, 2004). There is interest in CMM recovery and utilization at the Nalaikh mine, particularly when commercial underground mining activities resume as planned in 2011. Plans call for a design production capacity of 600,000 tonnes per year for a 17-year mine life.

Although the Sharyn Gol mine is principally an opencast mine, the mining company began some underground exploration and development in 2005. Since that time, between 60 and 70,000 tonnes of coal have been mined underground. Maximum annual underground production has been 20,000 tonnes. At times, gas build up in the underground workings has been serious enough to cause work to stop until methane concentrations are reduced. Presently the mine is carrying out initial research on coalbed methane (CBM) resources to identify the best extraction technology and how to best transition from surface to underground mining.

22.2 Overview of CMM Emissions and Development Potential

Other than the minor production from the Nalaikh mine (still formally closed), all of Mongolia's coal production is from surface mines. Thus, CMM development potential in Mongolia lies predominantly in pre-mine drainage in advance of surface mining operations. Underground CMM recovery and utilization at the Nalaikh mine may occur if a project proves to be economically feasible.

22.2.1 CMM Emissions from Operating Mines

In Mongolia's first National Communication under the United Nations Framework Convention on Climate Change (UNFCCC), the analysis of greenhouse gas (GHG) emissions by fuel type estimates that methane emissions released during coal mining activities, coal mining, and post-mining activities comprise 1.6–3.5

percent of all methane emissions (UNFCCC, 2001). As new mining areas are developing, this is expected to increase. Table 22-4 summarizes Mongolia's estimated CMM emissions from 1990 to 2010.

Table 22-4. Mongolia's CMM Emissions (million cubic meters)

Year	CMM Emissions
1990	13.7
1991	12.4
1992	9.7
1993	8.1
1994	7.1
1995	6.8
1996	6.5
1997	6.8
1998	6.8
2000	4.7*
2005	3.7*
2010 (projected)	2.9*

Source: UNFCCC (2001); *USEPA (2006)

At present, a detailed calculation of methane emissions for Mongolian coal mines and coal deposits is not possible, because this information has not been made public (UNFCCC, 2001). Some limited data for the Nalaikh coal deposit is available; the methane content for this mine is estimated to be 3–5 cubic meters (m^3) per tonne (Chimiddorj, 1995; MNEC, 2010).

A pre-feasibility study has been completed for the Nalaikh mine, assessing the potential for power generation using the CMM once underground mining operations resume, scheduled for 2011 (MNEC, 2010). Based on a 3.6-megawatt (MW) capacity design using two internal combustion engines, GHG emissions reductions for this project are estimated to be about 96,000 tons of carbon dioxide equivalent (CO_2e) annually for such a power generation project, for a 17-year project life.

The expected increases in Mongolia's coal production due to planned infrastructure improvements and policy incentives identified by the Ministry of Fuel and Energy, as well as several upcoming surface mine developments could lead to an increase in CMM emissions unless pre-mine drainage is implemented.

22.2.2 CMM Emissions from Abandoned Coal Mines

Emissions estimates from the closed Nalaikh coal mine indicate that the mine workings are now completely flooded and there are negligible emissions from the abandoned mine (MNEC, 2010). When the mine was operating, the excess mine gas was vented. Emissions rates from the mine prior to its closure (for the period from 1988 to 1993) have been estimated to be as high as 355 liters methane per second (MNEC, 2010).

22.2.3 CBM from Virgin Coal Seams

As no natural gas infrastructure exists in Mongolia, CBM activity is in its infancy. Currently neither conventional natural gas nor CBM is produced or consumed in Mongolia. Based on coal characteristics, the South Gobi, Kharkhiraa, and Altay-Chamandi basins in southern and western Mongolia appear to be the most likely areas for future CBM development, should it become a viable resource (Schwochow, 1997).

A Canadian company, Storm Cat Energy Corp., acquired a CBM exploration license in the Noyon Uul region of the South Gobi basin in 2004 through a Production Sharing Contract (PSC) with the Petroleum Authority of Mongolia. Results of coring and desorption revealed a total coal thickness of 76.6 meters and gas contents ranged from 2.34 m^3/tonne to 11.8 m^3/tonne. Storm Cat estimated the potential CBM resource of the area to range from 17 billion m^3 to 34 billion m^3, with a best estimate of 25.5 billion m^3 (Storm Cat, 2005). This resource estimate was based on the volume of coal estimated at depths shallower than the 1,500-meter drill depth, combined with average gas contents obtained from desorption analyses. While the potential resource is relatively large, no gas production has occurred. Storm Cat has determined that further geological review is necessary. Sproule, a Canadian consulting company, also reports to have evaluated CBM resources in Mongolia (Sproule, 2010). The Ministry of Mineral Resources and Energy has signed a Memorandum of Understanding with Korean Gas (KOGAS) of South Korea to evaluate CBM potential in Mongolia.

22.3 Opportunities and Challenges to CMM Recovery and Use

Mongolia is a signatory to the UNFCCC (Table 22-5). As a Non-Annex I Party to the Kyoto Protocol, Mongolia has no national emissions targets. Mongolia is eligible to host GHG mitigation projects under the Clean Development Mechanism (CDM). The CDM may create additional revenues for CMM projects in Mongolia through carbon credits trading.

Table 22-5. Mongolia's Climate Change Mitigation Commitment

Agreement	Signature	Ratification
UNFCCC	June 12, 1992	September 30, 1993
Kyoto Protocol		December 15, 1999

Source: UNFCCC (2005)

The greatest challenge to CMM recovery and utilization in Mongolia is the lack of current markets or infrastructure to support it. With no natural gas production or imports, other fuel sources, primarily coal, are on the principle sources for heat and power. Possible markets for onsite heat and/or power generation include industrial sites and coal mines, based on both their intense electricity demands and extremely harsh winter weather conditions. For example, the Tavan Tolgoi coal mine development will require an estimated 100 MW (Tserenpurev, 2008). In addition, high and steadily increasing costs of petroleum imports to Mongolia may create potential new market demand for liquefied natural gas (LNG) as a vehicle fuel.

From a policy and regulatory standpoint, Mongolia is favorable for foreign investment. The Mongolian Parliament adopted the Law on Foreign Investment in 1993. According to the law, at the request of the investor intending to undertake a project, the Mongolian Cabinet Member responsible for taxation policy may sign either of two kinds of Stability Agreements, depending on amount of investment (the categories are not less than US$2 million and US$10 million). The Agreement provides the investor a legal guarantee for a stable fiscal environment for 10–15 years. This protects the contractor from any changes of taxation policy (Chimiddorj, 2006).

The Parliament also passed Resolution #140 on June 27, 2001, which approves a list of favored industries in which foreign investment and involvement will be encouraged. Of these, oil and gas production as well as transmission pipeline construction are included. Mongolia's Department of Fuel Regulation Policy has outlined various development goals that include extraction of petroleum products from coal (Ganbaatar, 2005).

The Constitution of Mongolia indicates that mineral resources in Mongolia are owned by the state. Coal exploration and production are regulated by the Law of Mineral Resources while natural gas and CBM are regulated by the Petroleum Law (Tumurbaatar and Altanchimeg, 2009).

In 1991, the Petroleum Law of Mongolia was ratified by the Parliament. The Law established a legal foundation for new development of petroleum exploration in Mongolia. In 2004, the Mineral Resources and Petroleum Authority of Mongolia (MRPAM) was formed and authorized by the Government of Mongolia to enter into contracts on the matters of oil and gas exploration, development, production, processing, marketing and supply of petroleum products in Mongolia, and to exercise supervision and assistance towards the implementation of such contracts (MIF, 2006). According to Parliament Resolution #43 and Government Resolution #64, MRPAM has been reorganized and divided into the Mineral Authority and Petroleum Authority under the Ministry of Minerals and Energy (MRAM, 2009).

The primary form of petroleum exploration contracts are PSC. A contractor shall submit an application to the Petroleum Authority which shall sign a PSC with the contractor on the recommendation of the National Security Council and with permission of the Mongolian Government. All materials and equipment necessary to conduct petroleum operations, imported by contractors, are exempt from all customs taxes, value-added taxes and excise taxes. The earnings of contractors from their share of petroleum are also exempt from income taxes (Chimiddorj, 2006).

22.4 Profiles of Individual Mines

Table 22-6 below identifies the largest mines currently operating in Mongolia. Mineable reserves are estimated as of 2004 and production is for 2004 or 2005.

Table 22-6. Major Mines Currently Operating in Mongolia

Mine Name	Coal Basin	Mining Method	Annual Production (million tonnes)
Sharyn Gol	Orkhon-Selenge	Surface	0.7*
Baganuur	Choir-Nyalga	Surface	3.0***
Adunchuluun	Choybalsan	Surface	0.25**
Shivee-Ovoo	Choir-Nyalga	Surface	1.3**
Chandgana Tal	Choir-Nyalga	Surface	0.02†
Tevshiin Govi	Choir-Nyalga	Surface	
Talbulag	Sukhbaatar	Surface	
Ulaan-Ovoo	Orkhon-Selenge	Surface	
Uvurchuluut	Big Bogdyn	Surface	
Khoot	Choir-Nyalga	Surface	
Eldev	Choir-Nyalga	Surface	0.5††
Nariin Sukhait	South Gobi	Surface	

Source: Purevsuren and Drebenstedt (2004); *Davaatsedev and Tunga (2005); **Ganbaatar (2005); ***BusinessMongolia.com (2009); †Red Hill (2010); †† Mongolyn Alt Corporation (2010)

22.5 References

APO (2006): Mining Background Sector Brief, presented by Asia Policy Research Co. Ltd., Central Asia Regional Economic Cooperation Business Development Forum, October 16–17, 2006. http://www.adb.org/Documents/Events/2006/CAREC-BDF/

BusinessMongolia.com (2009): Coal Industry Update (2): Baganuur Coal Mine has Debt of ₮89.9 billion, BusinessMongolia.com, November 19, 2009. http://www.business-mongolia.com/?p=5334

Chimiddorj (1995): Coal Resources in Mongolia and Some Probably Potential Areas for Coalbed Methane, presented by Ayurzana Chimiddorj, International Conference on Coalbed Methane Development and Utilization, Proceedings – Beijing, China, October 17–21, 1995: United Nations Development Programme and PRC Ministry of Coal and Industry, Volume B, Paper B102.

Chimiddorj (2006): Petroleum Potential of Mongolia and Government Policy on Petroleum Exploration, presented by Battumur Chimiddorj, Head, Production Sharing Contracts and New Ventures Department, Mineral Resources and Petroleum Authority of Mongolia (MRPAM), presented at the Mongolia Investors Forum, September 14–15, 2006. http://www.investmongolia.com/forum/proj.htm

CMUC (2008): Consortium of Mongolian Universities and Colleges, http://www.cmuc.edu.mn/cmuc_m2.htm

Daly (2008): Mongolia, coal, and inflation, by John C. K. Daly, United Press International, May 14, 2008. http://www.upi.com/International_Security/Energy/Analysis/2008/05/14/analysis_mongolia_coal_and_inflation/1654/

Davaatsedev and Tunga (2005): Coal Mining and Transportation Situation in Mongolia and Infrastructure Development Issues, presented by L. Davaatsedev and G. Tulga, Mongolian Coal Association, at JAPAC (Japanese Committee for Pacific Coal Flow) International Symposium, September 26, 2005.

Edgar Online (2008): Excerpt from 6-K SEC Filing by Ivanhoe Mines LTD, January 3, 2008. http://sec.edgar-online.com

EIA (2007): Data obtained from *International Energy Annual 2005*. U.S. Energy Information Administration, Washington, DC, tables posted September 21 and 17, 2007, respectively; http://www.eia.doe.gov/pub/international/iealf/tablee1.xls (total consumption) http://www.eia.doe.gov/pub/international/iealf/tablee4.xls (coal consumption)

EIA (2009): International Energy Statistics. U.S. Energy Information Administration, Independent Statistics and Analysis. 2009. http://tonto.eia.doe.gov/cfapps/ipdbproject/IEDIndex3.cfm

EIA (2010): Mongolia Energy Profile. Updated May 18, 2010. http://tonto.eia.doe.gov/country/country_energy_data.cfm?fips=MG

Ganbaatar (2005): Energy Policy and Coal Policy of Mongolian Government presented by B. Ganbaatar, Department of Fuel Regulation Policy at Mongolia Ministry of Fuel and Energy, at JAPAC (Japanese Committee for Pacific Coal Flow) International Symposium, September 26, 2005.

Ganbaatar (2008): Current Status and Prospects for Energy Resources and Infrastructure Development of South Gobi in Mongolia. Presented by Mr. Ganbaatar Badgaa, Department of Fuel Policy and Regulation, Ministry of Fuel and Energy Mongolia. Presented at International Symposium on 'Energy Resources Cooperation and Corporate Strategy in Northeast and Central Asia,'. July 3, 2008, http://www.keei.re.kr/keei/download/seminar/080703/s1-4.pdf

GEUS (2004): Small-scale mining in Mongolia, Geological Survey of Denmark and Greenland, Report 2005/4. http://www.geus.dk

Homma (2009): The Current State of Electricity in Mongolia, Kunioki Homma, Representative Director, South Gobi Power Development Corporation, December 1, 2009, Economic Research Institute for Northern Asia (ERINA). http://www.erina.or.jp/en/Opinion/2009/Russia/homma.htm

IEA (2005): Data obtained from International Energy Agency Energy Statistics - Coal. Table posted 2005, http://www.iea.org/Textbase/stats/coaldata.asp?COUNTRY_CODE=MN

MIF (2006): Introduction of the Petroleum Sector of Mongolia, Government Investment Project Brief Profiles, presented at the Mongolia Investors Forum, September 14–15, 2006, http://www.investmongolia.com/forum/proj.htm

MIT (2008): Minerals and Infrastructure Development in the South, presented by Mongolia Ministry of Industry and Trade, at the Infrastructure Strategy for Southern Mongolia Round Table Discussion of the World Bank, May 15, 2008, http://go.worldbank.org/GLQKP25890

MNEC (2008): Information provided to Methane to Markets by Mongolia Nature and Environment Consortium, 2008.

MNEC (2010). Mongolia Nature and Environment Consortium. Final Technical Report of a Pre-Feasibility Study of Methane Recovery and Utilization in the Nalaikh Mine Area, Mongolia, under Cooperative Agreement XA-833970 with US Environmental Protection Agency. January 2010.

MNMA (2008): Mongolian National Mining Association. www.miningmongolia.mn

Mongolyn Alt Corporation (2010): Mongolyn Alt Corporation "Mak." Accessed February, 2010. http://www.mak.mn/

MRAM (2009): Organization History, Mineral Resources Authority of Mongolia, 2009, http://mram.gov.mn/en/index.php?option=com_content&task=view&id=43&Itemid=37

MRPAM (2008): Mineral Resources and Petroleum Authority of Mongolia, website: http://mrpam.gov.mn/en/

Purevsuren and Drebenstedt (2004): Actual aspects of lignite mining in Mongolia, in *Mine Planning and Equipment Selection*, edited by Monika Hardygora, Gabriela Paszkowska, and Marek Sikora, Thirteenth International Symposium on Mine Planning and Equipment Selection, Proceedings – Wroclaw, Poland, September 1–3, 2004.

QGX (2008): Baruun Naran Coal Project. http://www.qgxgold.com/html/shtml/bn_baruun_naran.shtml

Red Hill (2010): Chandgana Tal & Khavtgai. Accessed February, 2010. http://www.redhillenergy.com/projects/coal/chandgana_tal/

Schwochow (1997). The International Coal Seam Gas Report, Cairn Point Publishing, Stephen Schwochow, editor, 1997.

Sproule (2010): Sproule Projects Asia. Accessed February, 2010. http://www.sproule.com/Asia#title

Storm Cat (2005): Storm Cat Energy Corporation News Room, July 13, 2005 Press Release, www.stormcatenergy.com/news

Tavan Tolgoi (2010): Tavan Tolgoi Incorporated Company. Accessed February, 2010. http://www.tavantolgoi.mn/?lang=english#153622MetawiseCMS

Tse (2007): US Geological Survey Minerals Yearbook 2005, Mongolia-2005, US Department of Interior, USGS, Pui-Kwan Tse, June, 2007.

Tserenpurev (2008): Energy Development in the South Gobi Region, presented by Tserenpurev T., State Secretary of the Ministry of Fuel and Energy, at the Infrastructure Strategy for Southern Mongolia Round Table Discussion of the World Bank, May 15, 2008. http://go.worldbank.org/GLQKP25890

Tumurbaatar and Altanchimeg (2009): Law and Regulation for Coal Mine Methane Utilization and Expect, Z. Tumurbaatar and D. Altanchimeg Ph.D., Mongolia Ministry of Fuel and Energy, Methane Recovery and Utilization Opportunities, Methane to Markets Partnership, Ulaanbaatar, 2009. http://www.methanetomarkets.org/documents/partners_mongolia_methane_opportunity.pdf

UNFCCC (2001): Mongolia. Mongolia's First National Communication, National Agency for Meteorology, Hydrology, and Environment Monitoring, http://unfccc.int/essential_background/library/items/3599.php?rec=j&priref=3195

UNFCCC (2005): Parties and Observer States: Mongolia, http://maindb.unfccc.int/public/country.pl?country=MN

USEPA (2006): *Global Anthropogenic Non-CO_2 Greenhouse Gas Emissions: 1990–2020*, U.S. Environmental Protection Agency, Office of Atmospheric Programs, Climate Change Division, June 2006. http://www.epa.gov/nonco2/econ-inv/downloads/GlobalAnthroEmissionsReport.pdf (Appendix B-2).

World Bank (2004): Mongolia Mining Sector Sources of Growth Study, prepared by the World Bank East Asia and Pacific Region, April 2004. http://go.worldbank.org/EXUFR17XZ1