FUNDAMENTAL PRINCIPLES OF MONGOLIA'S ENERGY SECURITY STRATEGY

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Abstract

For Mongolia that is located between two giant powers which play significant role in global political and economic policies, external factors including policies pursued by the Russian Federation and People's Republic of China, and cooperation with these two countries impose direct influence on Mongolia's energy policy.

As Mongolia's neighbor countries China, furthermore Japan and Korea are main consumers of petroleum, natural gas, it creates a primary leverage for intensive development of raw material exploration and manufacturing. On the other hand, it shall be deemed another leverage to involve Mongolia into North East Asian political, economic security regional integration. Therefore, in order to increase competitiveness and economic influence balance of two neighbor countries, it is essential to encourage third neighbor involvement. By taking into account the current global development trend carried out environmentally friendly, modern technology based activities, a principle of global market price orientation is maintained, ensuring tax payment, transparency, equality of rights and interest in developing bilateral and multilateral cooperation.

Keywords: energy policy of Mongolia, NEA, Asian super grid, international relations

Conventional hubs of global energy market have changed and new centers have emerged. China and India have developed into biggest global consumer markets, whereas Russia and Kazakstan entered the global energy market as some of the biggest suppliers. World's leading countries have been focusing on the growing importance of energy sources, as well as on the transportation of energy, through transmission pipelines which raise security issues. Therefore, world's great powers such as the USA and China pay attention on creating strategic reserves of petroleum. US energy policy has impacted the energy supplying countries developing into enormous centers of power and authority. On the other hand, inequal distribution of petroleum revenue, worsening political conflict leads to

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regional conflict. Consequently, people started to describe petroleum as ***"wealth abnormal phenomena", "devil shit"*** based on resource-cursed countries' bad experiences. Obviuosly, the problem is not in its nature, but its revenue and wealth distribution.

As for Central Asia, main geopolitical competition surges in setting control on oil, natural gas manufacturing and resource, participating in natural gas transporting pipeline exploitation. Issues of diversifying import market in Central Asia, Caspian region into many channels to strengthen energy security are main the focus of the USA, some countries of Europe and Asia. Although Central Asia and Caspian region have abundant resource of oil and gas, due to landlocked situation, underdeveloped infrastructure, most of pipelines running across the territory of the Russian Federation, the issue of delivering oil and gas to the world market has become an essential geopolitical problem. Actually, one who sets control over transmitting pipeline gets authority to control energy resource of the region and strengthen one's influence. Upon Vladimir Putin's initiation to found Energy Council of the Shanghai Cooperation Organization, Kazakhstan developed energy strategic plan to coordinate member countries energy policies. The President of Kazakhstan is calling for building pipeline through Russia, Central Asia and China.

It is estimated that oil consumption by North East Asian Region, which is capable to compete with the European Union, North America and South East Asian Region by GDP production and to impose profound impacts on regional and global energy market, will exceed by 2-3 times more than European consumption. The Russian Federation has been giving priority to fulfill its historic, extraordinary function to link Europe with Asia and concentrating on increasing natural gas and petroleum manufacturing of Eastern Siberia, Far East that are dependent from solely European market, furthermore taking into account the growing demand in East Asian Region. Rapid growth of military and economic development of the People's Republic of China is urging, not only Japan but also the Russian Federation, and USA to keep away. Russia and Japan consider joining their power to resist growing power of China.

Northeast Asian regional situation of energy security is shaped by the following factors: the eastward expansion of Russian energy transportation network, nuclear power plant accident in Japan, the rise of China and its high demand for energy supply, geopolitical competition between US and China, and North Korean nuclear issue (Seol, In Hyo 2013). The United States is the country not directly connected with this region, but it has huge national interests and influences on the energy issues of the region. Generally, US tend to support this region's multilateral institutions when its national interests are secured. US also recognize

Chinese energy policy as aggressive and provocative, so at some moment the country may try to intervene in political situations originating in energy problem (Seol, In Hyo 2013).

The Russian Federation is strengthening its strategic decisive role in creating international energy relations that is geopolitically beneficial to Eurasian Region with oil and natural gas supplying integrated system joining the Commonwealth of Independent States with Europe; and maintaining a policy to develop into a main exporter of gas and petroleum to Asian market. Russia is considered one of fewer countries capable to supply its energy demand with energy resource and one of leading exporting countries. Moreover, Russia possesses 45 percent of global natural gas resource, 13 percent of petroleum and 14 percent of uranium. And it solely produces 12.4 percent of total petroleum products, and natural gas production. 10-12 percent of natural resource of Russia is located in the western part, 80-90 percent in the northern and eastern part of the country. The 1/3 percent of Russian energy sector's capacity belongs to Siberia (petroleum, natural gas and coal etc). Therefore, within the scope of policy on developing regional integrated centers for energy supply relying on strategic deposits, Russia defined its state policy as developing petroleum and natural gas integrated system in the Eastern Siberia and Far East.

The energy potential of East Siberia and Far East of Russia includes territory – 10.3 km^2 (60 %), population – 16.7 Mln. people (11 %), GDP – 13 %, potential oil resources – 17.8 Bln. t (40 %), potential gas resources – 56.1 Trln m^3 (44 %), potential coal resources – 170Bln. t (85 %), potential hydro resources – 640.0 Bln. kWh (75 %). Therefore, Russia has motivation for energy cooperation with neighbouring countries (Voropai 2015).

For Mongolia that is located between two giant powers, which play significant role in global political and economic policies, external factors including policies pursued by the Russian Federation an People's Republic of China, and cooperation with these two countries impose direct influence on Mongolia's implementation of energy policy. As international relations are freed from ideological influence, competition for natural resource is escalating Mongolia's economic and energy security; related to this, geopolitical issues may exacerbate. For this purpose, it is concentrated on 'strategic partnership' intensively developing between our two neighbor countries. ***"Non aligned, non opposing, non confronting third countries"*** relations between Russia and China favorably influence on neighboring countries, region and international situation. For our country sandwiched between two giant powers constructing market economy, creating favorable external environment to ensure national security are essential targets. Within the framework of economic foreign relations, Mongolia has

been pursuing a key principle of 'achieving success by being mutually beneficial', and as a result, big opportunities of joint development have been opened.

Taking into account fragile condition of Mongolian economy, it mainly focused on external and internal factors influencing oil sector of the country. Policies maintained by the Russian Federation, People's Republic of China, their positive and negative influences constitute main external factors. By maintaining its policy of petroleum, natural gas, electricity and energy export the Russian Federation is pursuing geoeconomic policy to increase political and economic influence in the region and world because it is able to turn into captain of global petroleum and natural gas export. Russia has imposed its complete control over European and Eurasian natural gas transmission network. China, Japan and Korea accept this great reflux of petroleum, natural gas transmitting pipeline.

Mongolia has some oil resources. It is announced about 30 oil exploration blocks for Production Sharing Contract (PSC), and most of them are licenced and the contractors are doing seismic and exploration drilling on some area (Tseveenjav, Odsaikhan, 2013: 12-13).

Mongolia imports 90 percent of petroleum products from the Russian Federation, consequently interruption of fuel and petroleum supply will negatively influence on investment of greater projects that are being implemented in the mining sector. Supplying 90 percent of strategically important products from Russia, which is able to turn off the gas tap because of disagreement with Ukraine on price, making investors of Mongolian mining biggest projects keep away. Rapidly developing People's Republic of China, one of the most populuous country, has scarce resource of petroleum. Therefore it entered into petroleum and natural gas agreement with Russian Federation. It is obviuos that China will remain one of biggest consumer of petroleum and natural gas in the nearest future. In terms of geological and tectonic structure, Mongolian oil deposits Tamsag, Dornogobi are situated in parallel location with China's oil deposits. Owing to the above-mentioned reason, apart from Chinese investors, Mongolia's oil deposits do not attract potential foreign investors. On the other hand, another external factor or China's policy on searching new and reliable resource of energy in neighboring countries in order to meet rapidly developing economic growth and safeguarding security of the country may have led to increasing number of affiliates of Chinese national companies operating in Mongolia. Although the two countries have agreed on greater issues, they have conflict of interest. Precisely, as for the Russian Federation, grandous investment is needed to carry out technological reform and increase transporting channels in petroleum sector, therefore it is cautious about China's investment decline. Secondly, as for China, it

prevents petroleum supply to meet steadily growing demand from interruption. For Mongolia it is important to take its advantage of geopolitical location, favorable condition of foreign market as soon as possible.

As Mongolia's neighbor countries, the People's Republic of China, furthermore Japan and Korea are main consumers of petroleum, natural gas, it creates a primary leverage for intensive development of raw material exploration and manufacturing. On the other hand, it shall be deemed another leverage to involve Mongolia into North East Asian political, economic security regional integration. Therefore, in order to increase competitiveness, and balance economic influence of two neighbor countries, it is essential to encourage third neighbor involvement. By taking into account the current global development trend carried out environmentally friendly, modern technology-based activities maintain a principle of global market price orientation, ensuring tax payment, transparency, equality of rights and interest in developing bilateral and multilateral cooperation.

Opportunities of reducing petroleum products' import, reforming dependence on petroleum import focused on the following two ways. First, opportunities of processing petroleum at home country, for this purpose, initially, build oil refinery factory to process crude oil imported from Russia. Along with considering market demand in order to save investment, domesticate high technologyd produce ecologically friendly fuel, it is rational to construct oil refinery with capacity to produce no less than 1 ton of petroleum a year. Refining imported oil, manufacturing petroleum products have a number of more advantages in technical and economic terms than importing petrol and fuel.

Setting up the oil refinery project in Darkhan with Japanese investment was a top priority, but unfortunately the project failed. We consider that the oil industry in Mongolia may be able to create value added income and ensure tangible percentage of the GDP. At the same time, it may contribute enormously to the revenues of the state budget, as compared to customs tariff on crude and refined oil products, and also reduce foreign trade deficit almost two times. Other positive effects include the creation of hundreds of jobs in chemotechnological industry, in parallel with the training and formation of national specialists in this industry, and the provision of environmentally friendly, high quality standard products. Secondly, exploring and exploiting new sources to reduce importing petroleum products seems to have a promising future. Implementation of above mentioned policies and projects will take long period of time and great amount of money; accordingly, without waiting for their implementation, it is vitally important to search for other sources to reduce

petroleum import. This may comprise producing petrol by liquifying coal, using oil shale and discovering natural gas resource. As of today, reliable enough sources of natural gas and oil have not been discovered yet in Mongolia. Consequently, coal is a key source of energy production and valuable wealth that defines Mongolia's economic perspectives.

Mongolia is rich with fuel energy resource, like coal, oil, gas, CBM, CMM and oil shale. Our total coal resource is more than 170 billion tons, including inferred recources with a potential for further increase. Almost 10 billion tons of proven reserves are established through preliminary and detailed exploration. With 300 deposits and occurences spread through 15 basins, so Mongolia is one of the world's top 15 coal-rich countries (Tseveenjav, Odsaikhan, 2013: 12-13). The shale oil in our country has deposits located over an area of about 312.000 km^2. Only 20 percent of these areas have been studied in detail geologically. It is calculated that the estimated resources of oil shale reach 788 billion t., which is equivalent 22.7 billion of shale oil and is mainly spread on the basins in central and southeast regions of Mongolia (Tseveenjav, Odsaikhan, 2013: 12-13). Although manufacturing various liquid fuel from coal is costlier than processing crude oil, Mongolia has abundant source of its raw material, at the same it is reasonably cheaper. Such circumstances provide opportunities of developing this industry in Mongolia.

So, introducing this technology will create opportunities of supplying petroleum and chemical products' demand of our country, which has abundant source of coal. Along with oil exploration, it is possible to produce petroleum products using oil shale**.** It is necessary to intensify exploration for shale, define reserve of deposits, shale concentration and quality and develop technical and economic rationale. Another important issue is to conduct natural gas deposit exploration mainly in western, central, and northern parts of the country. Discovering natural gas deposits will enable to develop petroleum production

Mongolia's energy generation is 90 percent dependent on fossil fuels, the country is firmly committed to clean energy, exploring coal gasification, coal bed methane use and other options. According to the Energy Master Plan jointly developed with the Asian Development bank, the share of renewables in the country's energy mix shal reach 20 percent by 2020, and 30 percent by 2030. Mongolia is endowed with all kinds of mineral wealth, but it is particularly rich in renewable wind and solar energy resources, while its Gobi is known as a land of Sun. To support the use of renewable energy resources, the country implemented "100.000 solar ger" between 1999-2010, providing power to rural households, adopted National Renewable Energy Policy 2005-2020. "Renewable Energy Law" (2007) regulates the generation and supply of energy utilizing renewable

energy sources. ***Millennium Development Goals*** strategy should be implemented between 2008 and 2021. According to the "National Renewable energy program (2005-2020)", the Government of Mongolia has set the target to increase the share of Renewable energy in total energy supply, reached 3-5% share by the year 2010, is supposed to reach 20-25% share by the year 2020, which implies that an increased use of renewable energy systems will be an important contribution. Due to recent intensive activities in mining sector, in near future Mongolia should become a large producer and exporter of electricity. Mongolia has been importing up to 509.384 million kWh of electricity from various power plants in Inner Mongolia. In 2014, a total 5 applicants have received permits to build renewable generators (wind parks), with combined annual capacity of 450 MW, equivalent to 50 percent of the country's current installed capacity. The development of Eg, Shuren river hydro power stations, complementing Taishir and Durgun hydro power stations with additional solar capacity are under research currently (Purevbaatar 2015).

Mongolia has enormous wind power resources. The amount of wind land using conservative assumptions could support over 1.1 million MW of installed capacity, and could potentially deliver over 2.6 trillion kWh per year. Approximately 270-300 sunny days per year, with the sunlight duration of about 2.250-3.300 hours, are available in most of the territories of Mongolia. An annual average amount of solar energy equals 1.400 kWh/m^2/y with solar intensity of 4.3-4.7 kWh/m^2 per day (Jigjid, Bavuudorj 2015).

Table 1

Installed capacity of renewable power (2015)

Power Plant	Capacity	Share
CHPs	877.3 MW	87 %
Renewable power	81.7 MW	8 %
Diesel stations	46 MW	5 %

Note. B. Amarsanaa, (2013) Development trend of energy Sector in Mongolia, presented at International Conference on Energy Security in North East Asia, Ulaanbaatar, Mongolia

The Mongolian energy system belongs to the Siberian energy. Our current energy system's installed capacity is 862MW, produces 90% of total energy production and supplies energy 70% of population. Mongolia connected 220kV transmission line to Buriad power system. Mongolia imports electricity 325.3 million kWh from Russia through 5 lines (Selendum-Darkhan 220кV, Chadan-Ulaangom 110кV, Oochin-Davst 10кV, Mond-khankh 10 кV, Deed ulikhan – Chuluun khoroot 10кВ). From China, Mongolia imports 335 kV electricity (for instance, Oyutolgoi 220кV, Khovs Bulgan, 35кV, Umnugovi Chinhua MAK 35кV, Sukhbaatar Erdenetsagaan 35кV, Dornod Khalkh gol 10кV) (Amarsanaa 2013).

Table 2

Mongolia's energy reservation

Natural resources in Mongolia	Measurement	Measure
Coal	GW	2400
Wind	GW	4300
Solar	million GW	$2000*10^6$
Natural Gas	GW	6226,65
Hydro	GW	6,42

Source: www.energy.gov.mn

The reforming policy energy aims at ensuring the fully supply of domestic energy consumption through reliable and stable operations and at expanding the existing capacity of power plants. Energy policies also intend to build new power sources, such as thermal and hydro power plants, as well as new power exporting sources.

Mongolia has rich resources of coal, coal bed methane, solar and wind power, the country is poised at supplying full domestic energy needs as well as exporting power to abroad. Economy-wise, producing energy with lower cost with extensive and reliable region-wide supply network will make a unit cost of product lower. The countries in NEA are interdependent on one another in terms of economic integration. This interdependency will be increased in the future. Energy cooperation among NEA countries will be key factor to ensure peace and security in the region.

That's why Mongolia is to get connected with energy system, which is other than the Siberian energy system.

Mongolia initiated the Asian Super Grid[25] research team to widen our energy supply cooperation in NEA region. There are the following main purposes:

- to build Mongolian energy interconnected network and cooperate with North-East Asian countries to build regional power interconnected system
- to promote building a high-voltage, direct current (HVDC) electric power transmission line between Northeast Asian countries through Mongolia
- to establish the Asian super grid in NEA region, which can significantly promote the development of abundant renewable energy and coal resources in Mongolia and help to export electricity to North East Asian countries through HVDC.

The **Asia Super Grid (ASG)** represents the strategy of connecting locations of high energy demand with regions of large renewable energy potential. Therefore, the proposed grid connects renewable energy sources in the Gobi Desert with Irkutsk in the North, incorporating hydropower electricity in the system. It is also connected to the locations of demand in Shanghai and Seoul in the South as well as Tokyo in the East of the ASG region.

The Gobitec concept represents the idea of producing clean energy from renewable energy sources in the Gobi Desert and to deliver the produced energy to regions with a high demand of electric energy. The delivery of the energy produced is planned to be using power corridors: the planned Asian Super Grid (ASG), connecting Russia, Mongolia, China, South Korea and Japan (Tumentsogt 2015). The project is conducive to economic development of the sustainable development in North East Asian region, fosters energy cooperation in the region. Trans-boundary transmission line projects reflect advanced transmission technologies and integration of neighboring countries' transmission networks facilities future planning and sustainability of respective transmission networks. Coordinated use of power stations based at larger thermal coal mines will transform massive but low calorific value coals into electric power, thus resulting in substantial socio-economic benefits (Zorigt 2015).

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[25] "Asian super grid" research team was established under the Ministry of Energy of Mongolia in March, 2014. Memorandum of Understanding was signed among Ministry of Energy of Mongolia (MEM), Russian Energy Institute (REI), Korean Energy and Economic Institute (KEEI), Japanese Renewable energy fund (JREEF) and Energy CHART secretary. MOU aimed to conduct joint research and develop feasibility study on Asian super grid.

Conclusion

There are two key factors of energy cooperation of Northeast Asian countries. First, Russia, Mongolia, Western China have potential energy resources, secondly, Japan, Republic of Korea, Eastern China have deficient in energy resources.

To overcome energy poverty, it is real essential to build big energy projects, which can produce petroleum products by exploring oil shale and intensify exploration for natural gas in pharalel with developing the big renewable energy (wind and solar) stations. All these conditions, factors promise high probability to facilitate to abolish Mongolia's complete dependence on energy import, and develop into energy exporting country. Therefore, it regards oil, coal, and shale as cornerstones of deciding energy problem.

To sum up, establishment of Asia super grid in NEA region can significantly promote the development of abundant renewable energy and coal resources in Mongolia and help to export electricity back.

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