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GOVERNMENT SUPPORT TO GEOTHERMAL ENERGY DEVELOPMENT IN MONGOLIA

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ABSTRACT

The Government of Mongolia has decided to create a new future for the development of the energy sector to avoid old traditional energy consumption that is based on coal burning. According to this the Government has developed the National Renewable Energy Programme (2005-2020) for the systematic use of renewable energy resources. After implementation of the programme the percentage share of renewable energy in Mongolia should reach 3-5 percent of the national energy use by the year 2010 and a share of 20-25 percent by 2020.

To speed up renewable energy development and to implement the National Renewable Energy Programme in Mongolia, the Parliament of Mongolia has discussed the Renewable Energy Law, which was approved on January 11, 2007.

Geothermal energy is one of the renewable energy resources that can compete with coal burning heating systems in Mongolia.

1. INTRODUCTION

After the Renewable Energy Programme (2005-2020) and the Renewable Energy Law of Mongolia have become effective, there are many private sector investors in Mongolia that are interested in building renewable energy systems. For instance; a first grid connected 50 MW wind farm is going to be built in 2009; A power purchase agreement has been signed between the Government and the private company. The price of the electricity that is produced by the wind farm will be regulated according to the Renewable Energy Law. This proves that renewable energy systems have an opportunity for development in Mongolia in the near future.

The Government of Mongolia has invested in several renewable energy activities in the past few years. For instance, wind-solar hybrid systems for 12 soum centres (villages) were funded through the government budgets in 2006 and 2007. In total 40,400 herder families have received 50 W solar home systems with a 50 percent subsidised rate, in 2007. The 12 MW Durgun and the 11 MW Taishir hydro power plants have also been constructed during recent years.

2. RENEWABLE ENERGY POLICY OF THE GOVERNMENT

The energy supply of Mongolia is mainly based on coal, which at present accounts for 98% of the total energy consumption. Coal burning is one of the main reasons for air pollution and Mongolia should increase the efficiency levels in energy utilization technologies and consider the use of clean technologies to gradually reduce the coal consumption in the overall energy structure. The Government of Mongolia has developed two key documents to implement this goal:

- Mongolian Sustainable Energy Sector Development Strategy (2002-2010)
- Renewable Energy Programme (2005-2020)

The main objective of the National Renewable Energy Programme is to create conditions for ensuring ecological balance, unemployment and poverty reduction, and sustainable social and economic development by increasing the percentage share of renewable energy in the total energy supply of Mongolia, improving the structure of the energy supply, and by the wide application of renewable energy in the power supply to rural areas.

One of the common goals of the programme is to gradually increase the percentage share of renewable energy in the total energy production and reach 3-5 percent by the year 2010, and 20-25 percent by 2020 (Renewable Energy Programme 2005). Another common goal is to decrease losses on the overall energy system by 3-5 percent of the current level by the year 2010 and more than 10 percent by the year 2020 by introducing advanced renewable energy technology, and by increasing conservation and production efficiency, transmission, distribution and operation. The prospect for renewable energy development in Mongolia is graphically shown in Figure 1.

To speed up renewable energy development, favourable policies should be made on legal, financial and tariff issues. For this reason, the Parliament of Mongolia has discussed the Renewable Energy Law and approved it on January 11, 2007. The law consists of 6 chapters including general provisions, state competence,

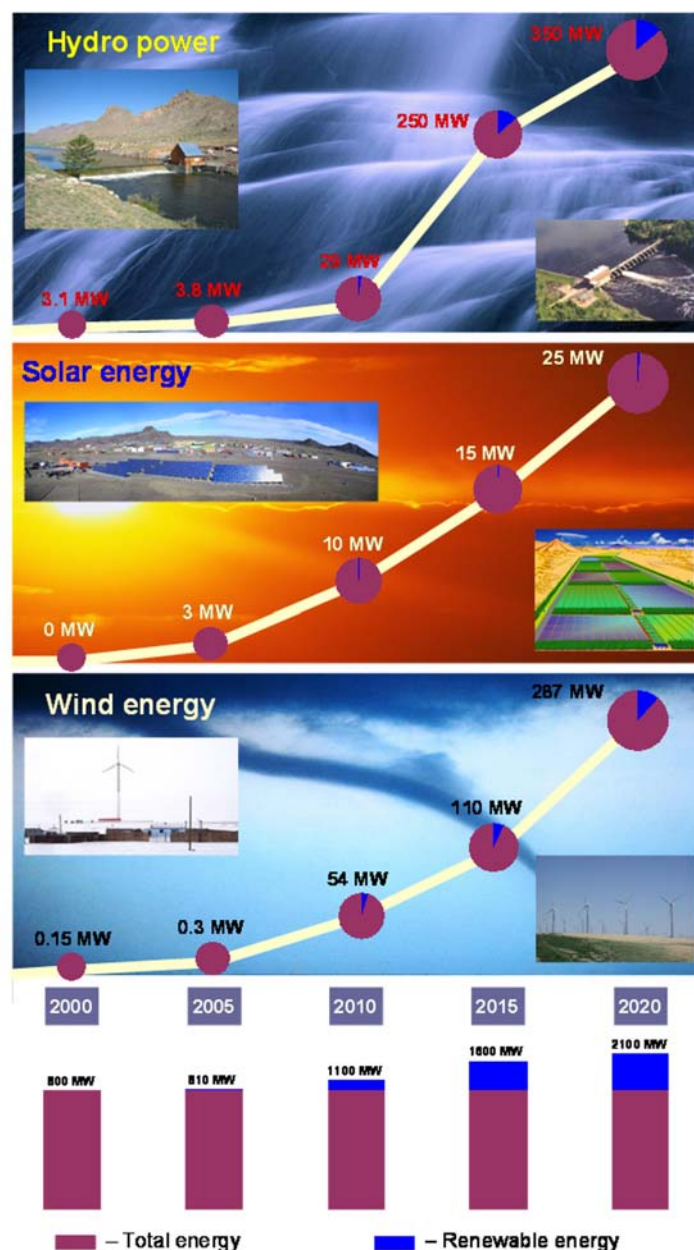


FIGURE 1: The prospect of renewable energy development in Mongolia

licenses, prices and tariffs, renewable energy funding and miscellaneous (Renewable Energy Law 2007).

The importance of the law is to set tariffs and prices of energy generated and supplied by renewable energy power plants connected to a transmission network or by independent renewable energy power plants. The price difference of electricity generated by renewable energy shall be allocated by selling prices of other power generators that deliver to the transmission network. The renewable energy law will form a base for wide scale application of renewable energy, and will increase the share of renewable energy in the total energy production of Mongolia.

3. RENEWABLE ENERGY RESOURCES

Mongolia has vast resources of renewable energy and has favourable climatic and weather conditions for effective use of these resources (Renewable Energy Programme, 2005).

In the Renewable Energy Programme the estimated renewable energy resources are as follows:

- There are 3800 small and big streams and rivers in the country, which could support 6417.7 MW of power and deliver 56.2 billion kilowatt hours of electricity in a year.
- Between 270 and 300 days in an average year on the entire territory of the country are estimated as sunny and the amount of yearly average daylight is estimated to be 2250-3300 hours. The yearly radiation is estimated to be higher than 1200-1600 kW/m² and its intensity is estimated to be more than 4.3-4.7 kW/h..
- As is pointed out in the wind energy atlas of Mongolia, 10 percent of the total territory or an area of 160,000 km² is estimated to be suitable for wind energy application. It is approximated that 13 aimags (provinces) have a wind potential greater than 20,000 MW, other 9 aimags have a potential higher than 50,000 MW, and Omnogobi aimag alone has a wind energy potential of over 300,000 MW.
- There are more than 40 geothermal manifestations on the territory of Mongolia and the sites Tsenkher, Khujirt and Shargaljuut, located in the Khangai region, may be used for energy production purposes.

4. GEOTHERMAL ENERGY DEVELOPMENT

The Government of Mongolia now more than ever pays attention to the use of geothermal energy for direct heating in rural areas. However, only a few efforts have been done by the government and private entities such as National Renewable Energy Centre, Newcom LLC and Megawatt LLC of Mongolia.

As an example of this, the National Renewable Energy Centre of Mongolia has completed general geological, geochemical and geophysical surveys of the Bagashargaljuut geothermal area at the request of NewCom LLC, which has decided to perform exploration drilling in the area based on the promising result of the surveys (Newcom, 2006 and 2007). The Megawatt LLC of Mongolia is now rehabilitating the existing geothermal Shivert resort.

General surveys show that geothermal resources close to Tsetserleg province centre are the most promising geothermal development site in Mongolia. There are approximately 25,000 inhabitants in Tsetserleg province centre and all heat is produced by coal burning stoves and individual boilers.

The first step in a pre-feasibility study and techno-economic analysis of the “Geothermal heating system of Tsetserleg province centre of Mongolia” is completed (Eliasson et al., 2004, Purevsuren, 2005, Gendenjamts, 2003, Burentsagaan, 2004). And efforts were done in years 2005 and 2006 as

collaboration between the Mongolian and the Russian Academies based on geological, tectonical, geochemical and geophysical surveys of the Tsetserleg province centre and surrounding area (Chadraa and Pisarskii 2006). According to the studies, geothermal development in the Tsetserleg is feasible.

The National Renewable Energy Centre has formally had discussions with the Asian Development Bank and the European Bank for Reconstruction and Development on the possibility of financing a feasibility study project on “Geothermal heating system of Tsetserleg province centre of Mongolia”, now that the pre-feasibility study is done. Both banks have informally agreed to finance the feasibility study if a pre-feasibility study done by the Asian Development Bank’s experts will show that the project is feasible.

Among renewable energy only geothermal energy can potentially supply heating for bigger districts and smaller cities. That is why direct geothermal district heating systems should play a significant role in the central Mongolian province centre heating system.

5. DISCUSSIONS

Several possible geothermal development sites have been defined in Mongolia based on general geological, geochemical and geomagnetic surveys, together with preliminary geothermal investigations. More detailed geothermal investigation is needed before a geothermal power plant and a geothermal heating system can be built.

Most of the hot springs are located in the main tourist attraction area of Mongolia, and it is very appropriate to develop a geothermally heated tourist centre with hot pots and swimming pools.

Finally, successful multi- and bi-lateral cooperation with international financial institutes and private sector investors will play a significant role in speeding up geothermal energy development in Mongolia.

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