

# Opportunities for Pollution-Free Development: CDM Projects May Surge in Mongolia

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## 1. Introduction

Actions aimed at reducing greenhouse gas (GHG) emissions and promoting pollution-free development are increasingly becoming priority policy agendas not only for industrialized nations, but also the developing world, as concern about the acuteness of the problem of climate change is growing across the globe. Projects implemented under the Kyoto Protocol's flexibility mechanisms, i.e. the clean development and joint implementation mechanisms (CDM/JI), have been accelerating since the Protocol's entry into force on February 16th, 2005. Another mechanism, emissions trading (ET), is expected to fuel the emergence of one of the biggest commodity markets in the world - the carbon market - following the official launch of the European Emissions Trading Scheme (EU ETS) at the beginning of 2005.

It is believed that both developed and developing countries will benefit from the Kyoto Protocol's flexibility mechanisms, as they enable developed nations to mitigate the costs of compliance with their greenhouse gas reduction commitments under the Kyoto Protocol, while at the same time allowing developing countries to acquire funds for clean development projects. Investors in and buyers of carbon credits have begun to look for potential CDM/JI projects not only in such large markets as China and India, as well as Southeast Asia and Eastern Europe, but also in relatively small markets, such as Mongolia.

Mongolia was one of the initial supporters of the Kyoto Protocol and joined the Protocol in 1999. Indeed, there could be a lot of potential CDM projects in Mongolia, each of which would substantially reduce GHG emissions, despite the country's relatively small amount of total emissions. Energy production in Mongolia still relies on coal and most of the industry has inefficient and outdated technology and equipment. Therefore, as a developing country, Mongolia has great opportunities to pursue pollution-free development through the thorough utilization of the Protocol's flexibility mechanisms.

## 2. Climate Change Issues in Mongolia

Mongolia pays considerable attention to climate change, global warming and issues relating to their

mitigation, as well as adapting to resultant changes. Mongolia joined the UNFCCC (United Nations Conference on Climate Change) in 1993 and ratified the Kyoto Protocol in 1999. The Mongolian government approved the "National Action Plan on Climate Change in Mongolia" in 2000, and subsequently established the interdisciplinary and intersectoral National Climate Committee (NCC), led by the Minister for Nature and the Environment, to coordinate and guide national activities and measures aimed at adapting to climate change. Government officials, such as deputy ministers, state secretaries and directors of major departments of all related ministries and agencies are members of the NCC.

A number of studies<sup>1</sup> have reported that global warming will have a significant impact on natural resources, economy and society in Mongolia. Meteorological records from the last 60 years show that the annual air temperature has increased by 1.56°C on average, this increase was greater in the winter (3.61°C) and smaller in the spring (1.4°C - 1.5°C). Projections of future climate change in Mongolia forecast that annual mean temperature will increase by 1.8°C - 2.8°C by 2040 and 2.8°C - 4.6°C by 2070.

As a result of climate change, adverse weather conditions, such as severe winters, droughts, hot summers, strong winds and flooding, have begun to occur frequently in Mongolia of late. All of these natural phenomena have an immense impact on the Mongolian economy due to its nature. Animal husbandry plays a major role in the Mongolian economy and has a daily impact on virtually the entire populace. This sector's output accounted for 21.3% of the country's total GDP in 2004. As Mongolian animal husbandry, which accounts for 80% of the agricultural sector as a whole, has a pastoral character, its production is virtually dependent on natural weather conditions.

For example, the successive *dzud* (severe winters preceded or followed by droughts) in 2000 and 2001 were severe in terms of the area covered, the extent of snow cover and the drop in air temperature. During the *dzud* of 2000, Mongolia lost 3.5 million adult animals, while in 2001, a further 4.8 million were lost. This means that the scale of losses in 2000 and 2001 was equal to 11.5 %

<sup>1</sup> 1990: The first climate change study was carried out under the US Country Studies Program (USCSP); the first GHG inventory for 1990 was prepared and preliminary GHG mitigation analysis was conducted.

1997: A country study of Mongolia was conducted under the Asia Least-Cost Greenhouse Gas Abatement Strategy (ALGAS) project, which included studies of 12 Asian countries, concerning their national GHG emissions and abatement options in different economic sectors.

1999: Mongolia developed its National Action Programme on Climate Change (NAPCC) with assistance from the government of the Netherlands.

2001: Mongolia's Initial National Communication on Climate Change was prepared and submitted to the UNFCCC Secretariat.

2002: A study entitled "Potential Impacts of Climate Change and Vulnerability, and an Adaptation Assessment for Grassland Ecosystems and the Livestock Sector in Mongolia" was carried out with assistance of GEF, START, TWAS and UNEP.

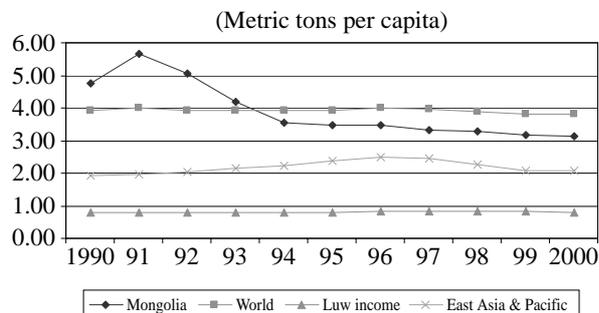
and 18.2 % of the country's total livestock respectively. This left many herdsman households without a source of livelihood: more than 5% of herder households lost all of their livestock, with another 7% of households losing more than 50% of their livestock. In addition, more than 5% of herder households ended up with fewer than 100 head of surviving animals. All this contributed to an increase in rural poverty across the nation. A survey revealed that almost 75% of these losses were attributed to a shortage of fodder (NSO, 2002).

### 3. GHG Emissions in Mongolia

Mongolia's total carbon dioxide emissions accounted for 0.03% of total worldwide emissions and reached 7.5 kt of CO<sub>2</sub> equivalent in 2000, 25% lower than 1990 emissions. This decrease was mainly due to decreases in fossil fuel consumption as a result of the decline of economic activities during the transition from a centrally planned socialist economy to a market oriented one (Table 3.1).

Despite the country's relatively small level of total GHG emissions, Mongolia's per capita emissions are comparable to the global average and largely exceed the averages of the low-income countries and as well as the countries of East Asia and the Pacific region. As of 2000, Mongolia's per capita carbon dioxide emissions were almost four times higher than the low-income countries' averages and 1.5 times higher than those of the East Asia and Pacific countries (Figure 3.1).

**Figure 3.1. Dynamics of Per Capita CO<sub>2</sub> Emissions**



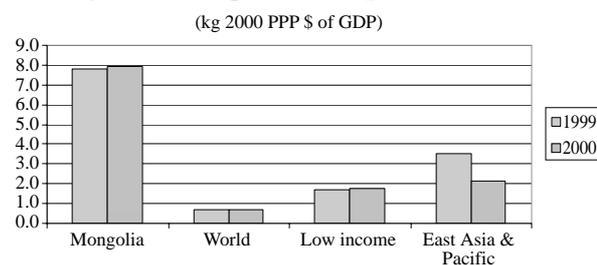
Source: World Bank, 2005.

Moreover, in terms of carbon dioxide emissions per unit of GDP, Mongolia ranks among the top emitters in the world. In 2000, Mongolia emitted 7.9 kg of CO<sub>2</sub> per unit of GDP, with GDP being converted to 2000 constant international dollars using purchasing power parity. It was 12 times higher than the global average figure and 4.5 times

higher than the average for low-income countries, to which group Mongolia belongs based on its level of economic development (Figure 3.2).

Emissions of carbon dioxide from fossil fuel combustion are the largest source of anthropogenic emissions in Mongolia, followed by livestock herding and grassland conversion into croplands; GHG emissions from fuel combustion for the generation of power and heat account for about 60% of total emissions. The cold continental climate, the country's reliance on coal for power and heat generation, as well as the inefficient use of energy, and outdated technologies and equipment in almost all of the industrial sectors contribute to these high rates of carbon dioxide emissions per capita and per unit of GDP.

**Figure 3.2. CO<sub>2</sub> Emissions per Unit of GDP**



Source: World Bank, 2005.

### 4. CDM Promotion Activities in Mongolia

Until recently, there was limited understanding and knowledge about the potential for utilizing the Kyoto Mechanisms, and hosting CDM projects in Mongolia, even though Mongolia had actively participated in climate change negotiations and was one of the earliest countries to join the Protocol. The Mongolian DNA (Designated National Authority) was established at the MNE in 2004. It is anticipated that the domestic coordinating agency for approving CDM projects will be an Interagency Commission (IAC), chaired by a key person from the Ministry of Finance, while the Deputy Chairperson will be a key person from the Ministry of Fuel and Energy; the other members will be key persons from relevant ministries and agencies.

However, until recently, Mongolia's participation in these activities was merely limited to representatives of the Ministry for the Nature and Environment (MNE), lacking the participation of other ministries and the business community. There are only two NGOs devoted to the promotion of CDM in Mongolia: one is the "CDM Centre

**Table 3.1 Comparison of Total CO<sub>2</sub> Emissions**

	1990		2000	
	Amount, kt	World share, %	Amount, kt	World share, %
Mongolia	10.0	0.05	7.5	0.03
Low-Income	1,419.3	6.70	1,764.4	7.69
East Asia & Pacific	3,051.6	14.41	3,752.7	16.36
World	21,172.6	100.00	22,942.1	100.00

Source: World Bank, 2005.

of Mongolia”, an NGO established in 2003 to promote CDM projects in Mongolia, and the other is the “Institute for Future” (IFF)<sup>2</sup>, an NGO established in early 2005 aiming to promote cleaner development and CDM-related activities in Mongolia. Nevertheless, it can be said that that new momentum has been generated since the Protocol’s entry into force in February 2005.

The MNE organized a seminar on CDM issues on February 16th, 2005 - the day on which the Protocol officially entered into force - for representatives of the Mongolian government and business community. The seminar was informative and gave the participants a basic understanding about climate change, the Kyoto Protocol and CDM issues.

One further major step taken by the Mongolian government was a two-day seminar entitled “CDM in Mongolia”, which took place on June 30th and July 1st, 2005, having been jointly organized by the Mongolian Ministry of Industry and Trade of Mongolia and Japan’s Mitsubishi Securities Co. Ltd., with the cooperation of ERINA. It was the first event that was able to attract a broad range of participation from among government agencies (especially such key economic ministries as the Ministry of Industry and Trade, the Ministry of Fuel and Energy and the Ministry of Food and Agriculture), the business community, without whom no CDM project can be implemented, and NGOs. Constructive dialogues were held between a number of Mongolian potential project developers and the CDM specialists from the Mitsubishi Securities Clean Energy Finance Committee.

The first day of the seminar was devoted to informing participants of worldwide experiences and practices relating to CDM activities, as well as the Mongolian government’s initiatives aimed at the implementation of CDM in Mongolia; in addition, there was an opportunity for opinions to be exchanged among the participants. The seminar opened with an address by Mr. Enkhtuvshin, Deputy Minister for Industry and Trade. This was followed by a short UNEP film entitled “Changing Climate, Changing Opportunities”.

After this, Dr. B. Bayasgalan, Director of the Sustainable Development and Environment Department of the MNE, informed those present about Mongolia’s policies relating to the Protocol and CDM. He emphasized that the Mongolian government is keen to promote and host CDM projects, underlining the fact that, given the relatively small GHG emission reduction potential of each project or economic entity, and also with the aim of lowering the transaction costs, the government is considering promoting so-called “umbrella projects”. These include the number of project sites and participants per project. So far, the Mongolian DNA has named five potential umbrella projects, under which potential CDM projects can be identified and approved by the government. These are as follows:

- (i) Pollution prevention or reduction (e.g. the improved household stoves project, which replaces or

improves existing inefficient coal-fired household stoves with efficient ones in *ger*<sup>3</sup> districts of Ulaanbaatar);

- (ii) GHG sinks (afforestation and reforestation projects, e.g. the government-approved national program entitled “Green Belt Eco-Strip”);
- (iii) Renewable energy (solar, wind and hydroelectric power generation projects);
- (iv) Energy and heat efficiency improvements and energy conservation (e.g. the government-led housing project that plans to construct housing for 40,000 householders may be classified in this category);
- (v) Technological improvements in industry and agriculture (the cement production and building materials manufacturing industries, etc.) He emphasized that such activities are lacking attention and are lagging behind the others.

Moreover, Mr. Bayasgalan noted that overall, there are not enough activities being undertaken with the aim of developing CDM projects in Mongolia. He emphasized that activities in the above mentioned areas have a good probability of being approved by the government as CDM projects, with economic entities, researchers, analysts and consultants jointly developing CDM project proposals.

Furthermore, ERINA’s concept paper on the regional application of CDM/JI in Northeast Asia (NEA), which emphasizes that this will become the new dimension in enhancing development cooperation in the region, was presented by the author. It was emphasized that the region’s economic and resource diversities and complementarities encourage cooperation aimed at reducing GHG emissions and promoting investment in clean and best available technologies. The NEA region consists of both Annex I (Japan, Russia) and Non-Annex I countries (China, Mongolia, ROK and DPRK), and five of the region’s countries (the DPRK being the exception) are parties to the Kyoto Protocol, so CDM/JI projects can be implemented within a regional framework. Therefore, NEA has a tremendous opportunity to benefit from the Kyoto Mechanisms (CDM/JI) by integrating their economic development and environmental conservation policies and activities.

A comprehensive presentation on practical CDM applications and experiences was then delivered by two representatives of Mitsubishi Securities, Mr. Junji Hatano, Chairman of the Clean Energy Finance Committee, and Mr. Adrian Stott, Committee CDM Analyst. It was emphasized that, although the Kyoto Protocol’s commitment period is 2008-2012, CDM has already started worldwide, as GHG emissions reductions prior to 2008 qualify for inclusion and can be “banked” for use during the commitment period. They also underlined that the CDM process is less onerous than it seems at first; and it is the host party’s prerogative to confirm whether a CDM project assists in achieving the country’s sustainable development goals. Such confirmation is an essential element for a project to qualify as a CDM

<sup>2</sup> The author is one of the co-founders.

<sup>3</sup> Mongolian traditional felt houses

activity.

The presenters indicated that, if a project qualifies as a CDM project, it will not only benefit from revenue from Certified Emission Reductions (CERs), but will also gain higher project status as a result of CDM designation, in terms of its public value, learning experience and increased attractiveness to both equity investors and lenders.

During the question and answer session, the Mongolian participants indicated that the lack of domestic financial sources for CDM projects is the main barrier to implementing the projects. Therefore, it would be necessary to seek some special external financial sources, such as the Japanese government, to fund such projects. However, it might be more appropriate to register the proposed CDM project first, and then look for potential investors, as it would be a more attractive and financially viable project. In this case, it would be much easier for the project to attract equity investors, lenders, or CER buyers in the growing carbon market worldwide.

This seminar was a good chance for Mongolian project developers to consult with experienced CDM project analysts, such as Mitsubishi Securities, which is one of the few project developers that have two methodologies approved by the CDM Executive Body (EB). Only 22 methodologies worldwide had been approved by the EB at that stage, out of the 115 that had been submitted since the EB was established by a decision at the 8th Plenary Meeting of the Conference of Parties to the UNFCCC (COP8) in November 2001. One of the approved methodologies is biomass power generation, while the other is methane extraction from organic wastewater and its utilization for power generation.

Many attractive proposals and ideas for implementing CDM projects were presented by the Mongolian participants, both from the business community and governmental agencies. Following this seminar, a consultancy agreement was concluded between a Mongolian project developer and Mitsubishi Securities to proceed with a CDM project, and some others are expecting progress soon.

## 5. Potential CDM Projects in Mongolia

Similarly to most of the other countries in the world, the energy sector of Mongolia is the country's largest contributor to its GHG emissions, as noted earlier. Therefore, most of the potential GHG emission reduction projects can be found in the energy sector, in the areas of energy supply and energy demand.

In terms of energy sources, Mongolia is almost completely reliant on coal. In 2004, more than 90% of total electricity generation was produced by coal-fueled combined heat and power (CHP) stations, while 1.2% was generated by off-grid diesel stations and 0.3% by hydroelectric power stations. Transmission and distribution losses account for about 25% of total generation.

The industrial sector is one of the largest energy consumers, consuming about 70% of the electricity and 28% of the heat produced. Erdenet copper mine, owned by Mongolia's mining giant Erdenet Mining Corporation, accounts for about 36% of electricity use and about 15% of peak power demand.

Studies of energy-related GHG emission reduction and mitigation options have been carried out in Mongolia; these options in the areas of energy supply and demand were prioritized according to their emissions reduction potential and their technical and economic feasibility (Table 5.1). For example, in the field of energy supply, small- and medium-scale energy conservation projects, household stove and furnace modernization and improvement projects, and projects involving the installation of new, highly efficient boilers to replace old, lower-efficiency ones have a higher GHG emission reduction potential. At the same time, projects involving the installation of new, highly efficient boilers to replace old, lower-efficiency ones, steam saving technology, and the installation of electric boilers were identified as the most cost-effective of the projects.

On the energy demand side, all the options showed considerable CO<sub>2</sub> mitigation potential in general. Nevertheless, projects in the fields of district heating and the built environment, building insulation improvements, and improvements to the district heating system in buildings have higher GHG emissions reduction potential, while those relating to good housekeeping, building insulation improvements, and lighting efficiency improvements were the most cost-effective.

Another potential field for CDM projects in Mongolia is GHG sinks. One such project could be the government-led afforestation program entitled "Green Belt Eco-Strip" - a national program approved by the Mongolian government in 2005. The objective of this program is to create a "green belt", which completely covers the area where the Mongolian Gobi and steppe regions meet, in an effort to reduce escalating losses of forest reserves, desertification, sand movement, and dust and sand storms caused by climate change and inappropriate anthropogenic activities. The program is planned to be implemented in three phases over a 30-year period. The "Green Belt Eco-Strip" will be 2,500km long and not less than 600m wide, covering a total area of 150,000ha. In addition, sub-strips covering 50,000ha will also be planted in adjacent areas of the Gobi and steppe regions at the same time as the main eco-strip, to prevent sand movement and desertification. The planned location of this "Green Belt Eco-Strip" is shown in Figure 5.1 (MNE, 2005).

## 6. Conclusion

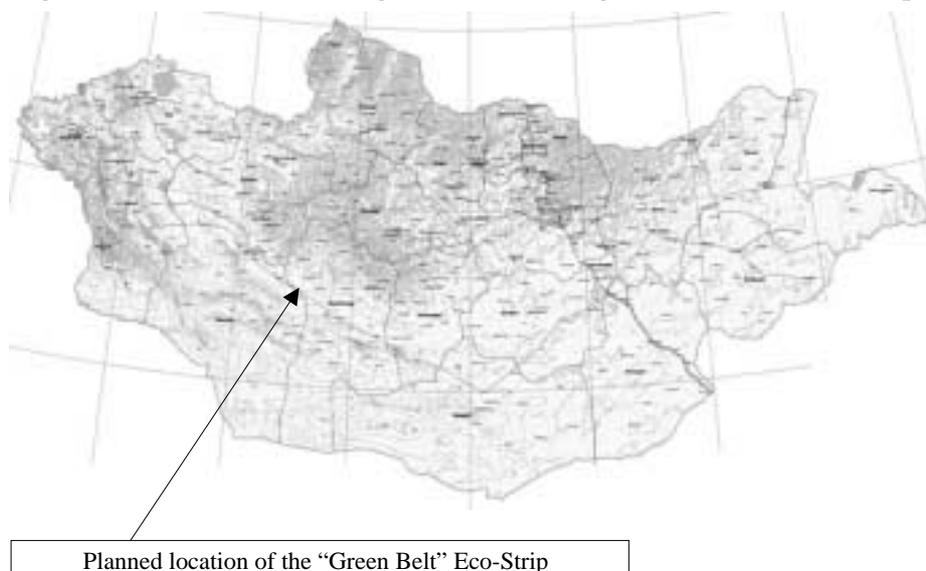
Environmentally friendly and pollution-free development strategies and actions are increasingly becoming priority policy agendas not only for industrialized nations, but also in the developing world; and Mongolia is no exception. The CDM, one of the flexibility mechanisms of the Kyoto Protocol, enables developed nations to mitigate the costs of compliance with their greenhouse gas reduction commitments under the Kyoto Protocol, while also allowing developing countries to acquire funds for clean development projects. This presents a good opportunity for Mongolia to benefit from this mechanism.

Indeed, many attractive CDM projects can be implemented in Mongolia in energy-related activities in almost all industrial, residential and service sectors, as well as transportation and agriculture. GHG sink projects can be found in the afforestation and reforestation sectors. The first

**Table 5.1. Priority of GHG Emission Reduction Projects in Mongolia**

	Priority by Emission Reduction Potential	Priority by Cost-Effectiveness
Energy Supply	<ul style="list-style-type: none"> <li>o Small- and medium-scale energy conservation</li> <li>o Modernization and improvement of household stoves and furnaces</li> <li>o Installation of new, highly efficient boilers to replace old, lower - efficiency ones</li> <li>o Converting steam boilers into small capacity thermal power plants</li> <li>o Improving coal quality</li> <li>o Coal briquetting</li> <li>o Application of effective mining technology and facilities, including selective mining and dewatering system coal handling plants</li> <li>o Renewable energy (hydropower, wind, solar)</li> <li>o Rehabilitation and refurbishment of CHP</li> </ul>	<ul style="list-style-type: none"> <li>o Installation of new, highly efficient boilers to replace old, lower-efficiency ones</li> <li>o Steam saving technology</li> <li>o Installation of electric boilers</li> <li>o Modernization of household stoves and furnaces</li> <li>o Converting steam boilers into small capacity thermal power plants</li> <li>o Renewable energy (hydropower, wind, solar)</li> <li>o Rehabilitation and refurbishment of CHP</li> </ul>
Energy Demand	<ul style="list-style-type: none"> <li>o District heating and built environment</li> <li>o Building insulation improvements</li> <li>o Improvements of district heating system in buildings</li> <li>o Lighting efficiency improvements</li> <li>o Good housekeeping</li> <li>o Engine efficiency improvements</li> <li>o Technology improvements in the cement industry (switching to dry processing)</li> </ul>	<ul style="list-style-type: none"> <li>o Good housekeeping</li> <li>o Building insulation improvements</li> <li>o Lighting efficiency improvements</li> <li>o Improvements of district heating system in buildings</li> <li>o Engine efficiency improvements</li> </ul>

Source: Dorjpurev, 2005

**Figure 5.1. Location of the Mongolian National Program “Green Belt Eco-Strip”**

practical steps have been taken by both the government and private businesses and the first project registered with the CDM EB is expected to be launched in the very near future.

Nevertheless, in order to promote and accelerate

CDM project activities in Mongolia, certain efforts need to be made, especially from the government side. These include, but are not limited to: (i) establishing an inter-agency committee (IAC) for screening and approving

CDM projects, as an urgent priority; (ii) mapping a national concept and action plan for effective implementation of the Protocol and hosting CDM projects; (iii) nurturing and supporting domestic companies to enable them to qualify as national DOE; (iv) practical attempts to promote matchmaking between potential investors and project developers, building public awareness and networking; (v) developing the national GHG emissions inventory system; (vi) preparing a national registry of GHG emissions and CER units; and (vii) preparing for the post-Kyoto negotiations.

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