Copenhagen Accord

APPENDIX II

Mongolia: Nationally appropriate mitigation actions of developing country Parties

Non-Annex I	*Actions*
Mongolia	**1. Energy supply: Increase renewable options**
	a. PV and solar heating
	Mongolia is located in a region with abundant sunshine, typically between 2,250 to 3,300 hours per year. The PV systems have been shown to be the less expensive option compared to small gasoline generators. At present, small-scale PV systems (10 to 1,000 W) are used in remote areas. It has been assessed that PV power systems are competitive with conventional energy sources for small power applications for nomadic families and communities in Mongolia.
	The installation of large scale PV systems in the Gobi region of Mongolia, may contribute to both protecting against air pollution and supporting regional development. It is necessary to implement pilot research projects in the areas along the railways and consider PVs in the Mongolian Gobi desert and steppe areas in the future.
	b. Wind power generators and Wind farms
	As in the case of solar energy, there is a potential to supply nomadic herders and farmers in rural areas with small, portable wind generation systems. Renewable energy development is included in the Government Action Program, and it will serve as the principal way to provide electricity to remote areas and nomadic families. Turbine generators (100-150 kW) could be placed in provincial centers in the southern part of Mongolia. The most promising sites should be prioritized according to technical and economic feasibility of operating 100-150 kW wind turbine generators in parallel with existing diesel generators.
	Also, large scale wind farm projects could be implemented in Mongolia. Mongolia has an experience for establishing a wind farm with total capacity of 50 MW in Mongolia.
	c. Hydropower plants
	Hydropower development is one of the best options for electricity supply in remote and consumers with limited demands. A number of promising hydropower sites have been identified in Mongolia. Currently Taishir (11 MW) and Durgun (12 MW) hydropower plants are in operation, and more than 20 hydropower sites have been identified, with capacities ranging from 5 MW to 110 MW. Developments of these plants are in moderate feasible in Mongolia. The Government of Mongolia encourages the use of small and medium sized hydro developments. The emissions reduction potential of this option is high, and its local benefits are expected to outweigh the negative impacts.
	Taishir and Durgun HPPs were registered as CDM projects with CER of 29600 and 30000 tons CO_2 per year respectively.
	In near future, the 220 MW Egiin gol Hydroelectric power generation project

with potential CER of 192500 tons per year is in the project development stage.

2. Energy supply: Improve coal quality

a. Coal beneficiation

Mongolia has substantial coal reserves. Coal will continue in the future to be the most economic fuel for power and heat generation in the Central Energy System (CES) and for heat generation in provincial centers. There exists no provision for coal preparation at mining sites, and as a result there is no quality control in the supply system. Coal quality often does not meet the minimum standard requirements, and in many cases, emergency situations at the power stations are caused by the low quality of coal.

Coal washing can be introduced at the biggest coal mines in Mongolia, such as Baganuur , Shivee-Ovoo and Tavantolgoi. This option is technically feasible; there are low institutional barriers. This option is already included in the Mongolian Environmental Action Plan.

b. Coal briquetting

Coal is one of the significant sources of environmental pollutions, especially air pollution. Therefore, to introduce the coal briquetting technology may well be an efficient way to mitigate GHG emissions and reduce air pollution. Some studies and investigations on conventional formed coal briquettes have been carried out by several Mongolian organizations. But the quality of coal briquettes does not meet standards.

Feasibility study on production of conventional coal briquettes which carried out by the Mining Institute of Mongolia with support of UNDP, shows that production cost was estimated at 14000 tug/tonne i.e 13.5 US$/tonne.

According to estimations by Hashimoto Sangyo Company of Japan in Mongolia, the initial capital cost for small scale (5-6 thousand tons per year) coal briquetting plant runs about 9.6 million US$. Compared with other technologies (e.g. liquidification and gasification) for production of clean fuel from coal, the coal briquetting technology has several advantages such as less investment is required and lower life cycle cost.

3. Energy Supply - Improve efficiency of heating boilers

a. Improve efficiency of existing HOBs and Install boilers with new design and high efficiency

One of climate features of Mongolia is that long lasting winter season with extreme cold temperatures which typically drops to (-30) - (-40) ^{0}C. Hence heating is an absolute requirement for sustaining life. Typical small heating boiler in provincial centers use 800-1200 tonnes of coal a year in average in order to produce 0.8-1.2 MW power and heating.

These boilers provide heating for schools, hospitals, kindergartens and other public institutions with very low efficiency (0.4-0.5) due to outdated equipment. Use of 12 efficient boilers with capacity of 25 MW will give 91000 tons/year of CO_2 emission reduction. Installation of 260 new boilers with capacity of 1MW will reduce CO_2 emissions by 340000 tons/year.

b. Convert hot water boilers into small capacity thermal power plants

This option will convert hot water boilers to thermal power plants with capacity of 5-10 MW. This will allow heating and power supply for the province centers

	and nearby province units. Converting of steam boilers into small capacity thermal power plants (5 x 10MW) will reduce CO_2 emissions by 190000 tons/year.
	4. Energy Supply - Improve household stoves and furnaces
	a. Change fuels for household stoves and furnaces Stoves of households in cities have poor energy efficiency, and pollute environment and threaten human health due to insufficient fuel burning. One of potential options to reduce environment pollution and greenhouse gas emission is to change raw coal used in stoves by LPG and Coal briquette. ***b. Modernize existing and Implement the new design for household stoves and furnaces*** The modernization of 250000 stoves and furnaces will reduce CO emissions by 920,000 tons/year.
	5. Energy Supply - Improve CHP plants
	Improve efficiency and Reduce internal use At present, 6 CHP are operating in Mongolia with total installed electrical capacity of 824 MW, steam production capacity of 7100 tonne/h and annual load factor of 71.4 %. Station own use for electricity is 22.3% and for heat production is around 15%. Total CO_2 emissions by the CHP sector amounted to 6,372 Gg. Therefore, CHPs contribute an important part to total national GHG emissions. Especially efficiency improvement including reduction of own use should be seriously considered for greenhouse gas mitigation. Implementation of this options will give 185,000 tons CO_2 reductions per year.
	6. Energy Supply - Increase use of electricity for local heating in cities
	Use of electricity from grid for individual households in cities The main purpose of this option is to reduce air pollution and GHG emissions in Ulaanbaatar city. The government of Mongolia pays attention on reduction of air pollution in Ulaanbaatar and investigates many alternative options including use of electricity for heating in ger (traditional tent houses) districts. But there are no detailed research and projects have been carried out yet.
	7. Building - Building Energy efficiency Improvement
	a. Improve district heating system in buildings Energy loss is high in heat distribution systems of Mongolia. Urgent actions are required to reduce the loss such as minimizing leakage and replacement of valves and compensators. Also, residential consumers need to save energy by regulating room temperatures. ***b. Install heat and hot water meters in apartments*** In Mongolia, about 30 percent of population lives in apartment complexes which connected to the central heat supply network. Many apartments have not heat meters and their heating fee and price is calculated based on fixed tariff

that does not reflect the actual amount of heat used.

c. Make insulation improvements for existing buildings and implement new energy efficient standards for new buildings

The study on heat losses concluded that nearly 40% of the heat supply for houses and buildings are lost. The heat losses occur through windows, walls and doors. To compare these paramethers with current standards, it is lower by 2-3 times; this fact shows that most of the houses have a higher than average rate of heat loss.

d. Improve lighting efficiency in buildings

This demand-side management option concerns the use of energy-efficient compact fluorescent lamps (CFL) to replace inefficient incandescent light bulbs (ILB). Lighting demand of households and service sectors accounted for 380 GWh and it is expected to increase in future. Currently, most households and about 30% of service and commercial buildings have incandescent bulb lamps and rests are using fluorescent bulbs.

8. Industry - Energy Efficiency Improvement in Industry

a. Improve housekeeping practices

Mongolian industries have big potential to save energy through energy use management. The energy saving potentials in industries can be divided into "easy" (no- and low-cost) savings, medium-cost savings and long-term possibilities. Energy saving potential by "easy" (good housekeeping and energy management) savings is 15-25 % with a pay- k period less than 1 year.

Implementation of this option could give about 300000 tons of CO_2 reductions per year.

b. Implement motor efficiency improvements

Mongolia is relying very much upon motor systems to power the operations of industrial sectors. Motor systems consume about 70% of industrial electricity in Mongolia. These motor systems are often less efficient than the ones in industrialized countries. Motor efficiency improvement technology includes energy-efficient motors; variable speed drives; improved operation and maintenance; correction of previous over-sizing; improved mechanical power transmission, efficiency of driven equipment. It is estimated that the electricity saving potential equals 20 % of electricity consumption by industrial motors. Implementation of this option could give about 240000 tons of CO_2 reductions per year.

c. Introducing dry-processing in cement industry

Changing the wet-processing of cement to dry-processing saves a large amount of energy. Feasibility studies show that 25% of all industrial coal is used for cement production. Wet-processing of cement requires of 1,500 to 1,700 kcal/kg.cl of heating whereas dry processing may require 1,000 to 1,200 kcal/kg.cl. This shows that saving potential of coal consumption in the cement sector is about 40%. The reduction of CO_2 emissions from implementation of this option will be about 147,000 tons per year.

9. Transport

Use more fuel efficient vehicles

Total of 200,288 vehicles were registered in Mongolia only in 2007 which has significant increase of 1.9 times more than the registered vehicles in 2000. This rapid growth of traffic and transportation load have intensified negative impacts on the public health and environment pollution. To promote import of fuel efficient vehicles, it can be used economic measures such as implementation of used vehicle import standards and vehicle registration tax to improve overall fuel efficiency of vehicles.

10. Agriculture

a. ***Limit the increase of the total number of livestock by increasing the productivity of each type of animal, especially cattle***.

Mongolia is one of the few countries with a pastoral nomadic economy with historical traditions of animal husbandry. Pastureland is the primary source of the forage and feed needed to support extensively managed livestock in Mongolia. One of the features of Mongolian animal husbandry is seasonal movement among different pastures so the manure of the animals is managed under aerobic conditions or just as a solid on pastures and ranges. Animal breeds are small and less productive than breeds in other countries. Mongol livestock program is under discussion at the parliament. The program includes five directions such as ensuring sustainable development and creating a good governance at animal husbandry's sector by arranging a good environment of economics and infrastructure for the sector; making products and raw materials of biological high quality and improving the market competitiveness by refining upon livestock breeding and service in accordance with social needs; ensuring health of Mongolian livestock and protecting the social health by bringing the veterinary works and service into international standards; developing livestock husbandry adapted to various changes of climate, nature and ecology and improving the abilities of bearing risks; creating a network of meat procurement and sale by developing the goal-directed market of livestock, livestock raw materials and products, and accelerating the economic circulation.

11. Forestry

a. Improve forest management

Mongolian forests provide a multitude of services in regard to climate change and other environmental problems, including serving as carbon sinks, sources of renewable energy, watershed protection and soil erosion protection. Many of these services have been lost, or will be lost, due to the extreme pressure exerted on Mongolia’s forest resources.

The following major mitigation options are identified for the forestry sector:

- *Natural regeneration*
- *Plantation forestry;*
- *Agro-forestry;*
- *Shelter belts; and*
- *Bioelectricity*

	b. ***Reduce emissions from deforestation and forest degradation, improve sustainable management of forests and enhance forest carbon stocks in Mongolian forest sector.*** There are a certain amount of potential of reduction of GHG emissions from deforestation and forest degradation in Mongolia. Therefore, it is possible to initiate and implement a REDD project in Mongolia through reforestation activities by community based forest management improvement and sustainable use of forest resources.
