## *"USAID/EPRC Assistance in Energy Regulation in Mongolia"*

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Ladies and Gentlemen:

I would like to thank the organizers of this meeting for inviting me to address this esteemed gathering and to make presentation on USAID/EPRC's recent technical assistance provided with respect to energy regulation and our thoughts on energy regulation in the near future.

The energy sector is unusually important for Mongolia because of the extreme climatic conditions that prevail here. About one-third of Mongolia's population lives in the capital city of Ulaanbaatar. Like all of urban Mongolia, Ulaanbaatar relies on coal-fired power plants for both heat and electricity, and the demand for heat and power is growing rapidly because of high rural-urban migration rates. Energy demand is also growing rapidly due to the expansion of the mining and construction sectors.

There are significant problems with Mongolia`s energy sector. Old assets are close to or beyond the end of their useful lives; tariffs do not reflect the cost of service provision and full recovery of coal costs and transport. Mongolia is in danger of a serious energy shortfall as early as 2012, at which point the maximum imported capacity of 255 megawatts (MW) from Russia may not meet demand. In addition, Russian power has become more expensive, with another raise in March 2010. This shortfall will grow with rapid expansion of the country's mining sector. The GoM will need to attract private investment to build new power facilities and to upgrade and improve existing capacity. To do so, it must make the Energy Regulatory Authority (ERA) more independent; insert private investment favoring provisions in the Energy Law, enable Public-Private Partnership (PPP) mechanisms for the sector; strengthen energy regulations; and commercialize energy companies, including improved corporate governance. Passing of a Concession Law in February 2010 and the Privatization Guidelines for 2010-2012 approved by the Parliament are steps in the right direction to attract private investment in energy sector. The Privatization Guidelines include privatization of electricity distribution companies, concession of two power plants and partial divestiture in one of the coal mines supplying power plants.

USAID is the primary donor providing technical support to Energy Regulatory Authority (ERA), and it has had some important successes in energy sector reform. With USAID

assistance, a new Uniform System of Accounts that is compliant with International Financial Reporting Standards (IFRS) has been put into place, ERA auditors have been recruited and trained, market rules for the new bilateral contract electricity market have been prepared, public hearings have been introduced, benchmarking system has been established, performance agreements between ERA and licensee companies have been signed and successfully implemented, the Tariff Reform Plan has been initiated and being implemented, and a two-part generation tariff methodology has been developed.

**Summary of major technical assistance provided recently with respect to energy regulation**

Recent favorable actions in the sector include recent tariff increases in 2008 and 2010 as proposed by the ERA in concert with the Tariff Reform Plan and, for the first time, an explicit allocation of MNT 15 billion of subsidies to the Central Energy System (CES) in the 2010 state budget.

EPRC has been currently developing a financial model that will help potential users identify true revenue requirement for generation of heat and electricity in CES, tariff revenues, and required subsidies from the state budget in order to facilitate the Tariff Reform Plan implementation. The model is based on the ERA's assumptions for determination of the revenue requirement, sales and revenues generated by tariffs for the heat and electricity sectors effective May 1, 2010. Current tariffs are inadequate to generate the necessary revenues. Owing to social considerations, tariffs can only be raised gradually over time. As a result, a number of the ERA's assumptions are inconsistent with current industry practice. For example, maintenance costs are being capitalized rather than expensed annually, maintenance is being deferred, interest payments owing to Government are being deferred and depreciation is not being fully recovered. Adjustments are made to the current ERA-determined revenue requirement to account for these inconsistencies. Another important consideration is that profits are far below levels necessary to generate returns commensurate with risk, and important consideration if the Government plans to proceed with the privatization of energy companies. This financial model enables determination of the revenue requirement, and the combination of tariffs and Government subsidies necessary to meet the revenue requirement under different financial scenarios. The scenarios include: changes in tariffs, coal prices, mazout/petroleum prices, coal transport costs, labor rates, inflation, return on investment and depreciation. This financial model is not meant to replace the detailed revenue requirement and tariff calculations developed by the energy companies and audited by the ERA. Its purpose is to provide Government entities and the ERA with a quick and simple means for estimating the impact of policy decisions on revenue requirement, tariffs and Government subsidies necessary to enable the energy companies to maintain financial solvency. The model demonstrates a subsidy need of MNT 90 billion compared with actual MNT 15 billion in 2010.

In 2009, the ERA concluded performance agreements with PP4, the largest power plant in CES, and 4 biggest electricity distribution companies, which resulted in efficiency

improvement and better performance by licensees in terms of reduced accounts receivable collection period, distribution losses and power interruption rates, improved payments to the single buyer and reduced numbers of boiler and turbine-generators' failure[1]. The set of key performance indicators and benchmarking system being used by the ERA may serve as a basis for Balanced Scorecard System to be developed in the nearest future by the Government for improving performance, efficiency and corporate governance at SOEs.

Although required under the Energy Law and the documents governing Mongolia's power sector, Mongolia is not currently practicing economic dispatch, and National Dispatch Center (NDC) does not have dispatch optimization software. This is costing Mongolian heat and electricity consumers dearly. While it is difficult to estimate without detailed system modeling software, it is roughly estimated that dispatch optimization software could save annual coal consumption on the CES by 324,000 Tons. Based on 2010 fuel costs, economic dispatch is estimated to save 8.8 billion MNT annually. In terms of greenhouse gas emissions, economic dispatch is expected to result in $CO_2$ emissions reductions of over 886,000 Tons annually.[2] In order to facilitate introduction of the merit order dispatching, EPRC just recently has assisted the ERA to revise the energy and capacity tariffs of generating licensees and recommended procurement of an Energy Management System (EMS) software module, which was not included in the initial procurement and installation of SCADA owing to budget limitations. According to our latest information, the procurement of this module is affordable and may cost USD 250-500 thousand compared with our initial assumption of USD 1.0 million. Reflecting a shorter payback period and benefits resulting from reduced air pollution, optimized energy production and medium term system planning, procurement of EMS and economic dispatch certainly have the greatest benefit-to-cost ratio of any energy efficiency initiative in Mongolia.

[1] 4 licensees are subject to the following remunerations:

1. Erdenet Bulgan Electricity Distribution Network (EDN) is subject to MNT67.6 million bonuses due to an improved payment rate to the Single Buyer (SB) of 103.1% and an average accounts receivable collection period of 21 days;
2. Baganur South Eastern Region EDN is subject to MNT 162.4 million bonuses due to reduced distribution losses (down to 11.6%), accounts receivable (by 21.3%), accounts payable (by 38.6%) and an improved payment rate to SB (102.2%);
3. Ulaanbaatar EDN is subject to MNT 339.3 million bonuses due to reduced distribution losses (down to 22.1%), improved consumer services, reduced interruption rates and an improved payment rate to SB (100.02%); and
4. Ulaanbaatar PP-4 is subject to MNT 209.6 million bonuses due to lowered short term payables (by MNT 2,505 million), reduced numbers of boiler failure (by 10) and turbine-generators failure (by 12) and station internal use (by 0.35%).
5.

[2] See November 14, 2008 paper entitled *About the Bank Carbon Footprint Calculator: Sources and Methodologies*, by Bill Barclay, Global Finance Campaign (www.ran.org), which states that the average carbon content of coal is 0.746 tons carbon per ton of coal. As each ton of carbon is converted to 3.664 tons of $CO_2$, the $CO_2$ emission factor of coal is 3.664 * 0.746 = 2.733 tons of $CO_2$ per ton of coal.

**Looking Ahead: Energy Regulation in the Near Future**

Much, however, remains to be done. Especially important is the building of political will and a national consensus on energy sector policy and strategy. Building on past successes, we do hope that USAID will continue to provide technical assistance to help build a national consensus on energy sector policy and strategy; make the regulatory environment more transparent and market-oriented; and improve the commercial orientation of, and practices at, state-owned energy enterprises, including their preparation for privatization/concession as appropriate.

The main area of energy regulation in the nearest future should relate to maximizing value of existing assets because Mongolia will be very much dependent on them until addition of new generating capacities. The system efficiency improvement and demand side management would be the priority along with attraction of private investment in energy sector through PPP/Concession and creation of enabling environment for private investment. We suggest that the activities would include the following:

1. Energy sector efficiency improvement and demand side management:

    - Carry out peak load study and improve the price signal in tariffs particularly to large industrial consumers by incorporating a demand charge (peak and off-peak) to lessen contribution to the peak load. This component requires procurement of demand meters;
    - Implement true economic dispatch for both heat and electricity. This component requires procurement of EMS software to determine a dispatch regime that minimizes costs of production over each 24-hour period and capacity building at the NDC;
    - Continue to improve the generation two-part tariffs (heating and non-heating season energy tariffs and elaborated capacity component that provides incentives for improved performance, quality of repair and maintenance work and etc);
    - Maximize the value of the interconnection with Russia by looking for ways to integrate Russia into the market as a means for cost reduction; and
    - Revise the retail tariff design aimed at providing price signals for energy conservation through adjusted increasing blocks and time of use tariffs

2. Commercial operation and practices of energy and coal sector entities improved:

    - Continue with tariff reform plan, increasing tariffs to levels reflecting the full cost of power and reducing cross-subsidization reflecting budgetary space for subsidies;
    - Develop midterm performance agreements to be concluded by and between the ERA and sector licensees to provide incentive to make more investment for performance improvement and to allow investment payback by licensees before sharing the benefits with consumers during the next performance

agreement period; It requires introduction of incentive tariff regulation by the ERA to make the power companies provide value for the additional revenue; and

- Develop and have approved by respective parties a midterm coal purchase agreement between a coal mine and a power plant with escalators to predict coal cost to be passed through consumers.

3. Facilitation of procurement of new generating capacities, privatization and restructuring of sector entities

    - Build the capacity with respect to PPP/Concession project proposals, feasibility studies, identification, assessment, effective allocation and mitigation of risk and etc,

4. Continuation of the Power Market Reform

    - As a result of privatization, concession and new private investors the composition of power market participants will change and the private sector pressure on reforming the power market by shifting from the current Single Buyer to Bilateral Contract/Price or cost based pool market will be strengthened. Reflecting such demand and political will, the ERA should continue implementation of power market reform.

**Summary:**

- Fact: Mongolia is running out of electricity and heat demand side supply as early as 2012. To avoid this, cost covering payments for these services will have to be made by consumers, or the government will have to significantly increase subsidies to the system to achieve economic viability of the sector. Not meeting the revenue requirements will contribute to the eventual failure of the system – and we all know what that can mean from the 1991- 1995 period. While there is talk of inviting private investment to replace existing, outdated equipment, this can only happen if inventors see that they can recover their operating costs and make a fair, market risk adjusted profit.
- Present energy supply can be stretched through demand side measurements which can be encouraged by sending the proper tariff signals to large industrial, commercial and residential users. This will require changes in tariff setting methodology and the installation of sophisticated demand meters, and investment which will be recovered in very short order from savings from moving current peak demand to off-peak periods.
- More sophisticated demand/supply and dispatching software is needed. If economic dispatching can be implemented by the NDC, energy supply can be reduced, life of existing equipment will be extended, estimated demand for coal can be reduced resulting in more efficient mining, reduced fuel costs and to reduce harmful greenhouse emissions.

Thank you for your attention.