Project Summary

Project Objectives
The project covers analysis of Central Energy System (CES), reviews current energy infrastructure and examines technical issues related to power storage applications. The objective is to design technical feasible heat storage options and assess financial viability of proposed energy storage technologies.

Tasks include:
1) Update of demand forecasting models of the CES power and heat system.
2) Determination of the demand components by energy and by transmission zone.
3) Optimization of the heat / power system by application of battery and hot water storage - long-term optimization, of the power system, will be modelled using an open source software that supports ‘what-if’ scenario analysis.
4) Determination of the impact of storage will be used to guide a technology selection and siting process. The impact will be determined in conjunction with the National Despatching Centre using DlgSILENT software.
5) Determination of the financial and economic cost / benefits of battery and hot water storage.
6) Environmental Impact Analysis will be assessed in full compliance with the ADB’s Safeguard Policy, with preliminary and final phases assessments.
7) Recommending of a time-of-use tariff regime for heat and power will consider the need to incentivize electric heating in the Ger Districts. For this a combined heat and power tariff model will be developed. Elasticity of consumption will be a feature of the model, to support examination of how the benefits of electricity and hot water storage can be captured through time-of-use tariff practices by consumer class.

Services Provided
• Analysis of historical and current power load curves in the Central Energy System (CES) at different temporal scales;
• Review of current energy infrastructure and examination of technical issues related to power storage applications, including but not limited to, peak-shaving and valley-filling, frequency regulation, voltage control, and transmission and distribution congestion relief;
• Provision of an overview of current used power storage technologies;
• Preparation of technological solutions to address identified issues;
• Design of heat storage options;
• Assessment of the financial viability of proposed energy storage technologies;
• Identification of investment needs with possible financing sources;
• Undertake a cost-benefit analysis and action plan;
• Development of a proposal enabling support policy (including tariff reform and other financial incentives) and viable commercial solutions for deployment of power storage technologies;
• Analysis of environmental impacts of proposed energy storage technologies;
• Preparation of an Environmental Impact Assessment (EIA);
• Elaboration of a mid- and long-term power storage deployment strategy for greater renewable energy penetration towards 2030; and
• Preparation of a pre-feasibility study on deployment of power storage technologies in CES grid.

Mongolia

Power and Heat Storage Option for Accelerating Renewable Energy Penetration

Client
Asian Development Bank (ADB)

Duration
12/11/2018 - 31/03/2020

Personnel
• 4 internat. STE (9 PM; TL / Power Storage Specialist, Heat Storage Specialist, Financial Analysis Specialist, EIA Specialist)
• 4 national STE (16 PM; DTL / Energy Specialist, Grid System Specialist, Financial Analysis Specialist, EIA Specialist)