

Demonstration Projects with the Aim of Developing
Joint Crediting Mechanism FY2013

Demonstration and Verification Project

**The Demonstration and Verification
Project for a High Efficiency and Low
Loss Power Transmission and
Distribution System in Mongolia**

New Energy and Industrial Technology Development Organization (NEDO)
Hitachi, Ltd.

THE DEMONSTRATION AND VERIFICATION PROJECT FOR A HIGH EFFICIENCY AND LOW LOSS POWER TRANSMISSION AND DISTRIBUTION SYSTEM IN MONGOLIA

Entrusted Party: Hitachi, Ltd.,

Mongolian transmission and distribution network has been installed during the Soviet Union era and these are getting old. Development and/or replacements of electrical infrastructures are expected in the future. Therefore, we achieve GHG emission reduction and Power system stabilization through the Japanese High Efficiency Transmission Technology.

Summary

This project's aim is GHG emission reduction under JCM by Adaptability study for Low-Loss transmission system with high tensile strength which is newly developed to use Mongolian inclement weather condition, Measuring and comparison of transmission loss of Low-Loss transmission system and conventional transmission system at the Oyu Tolgoi – Tsagaan Suvraga transmission line and demonstrate the effectiveness of CO₂ emission reduction effect of Low-Loss transmission system. In addition, we will propose solutions to minimize transmission loss by Power Flow Control and Installation of Equipment through confirming Mongolian transmission network stability and consideration the optimal system.

Items

1. Adaptability study of Low-Loss transmission system under peculiar environment in Mongolia
2. Comparative Testing of Transmission loss between Conventional transmission system and Low-Loss transmission system for 220kV Transmission line between Oyu Tolgoi and Tsagaan Suvraga, quantification of amount of GHG emission reduction, registration as JCM project, and MRV for amount of GHG emission reduction
3. Power System Analysis of Mongolian Power network considering development in future to study of Power Stability & Optimum Power system and Propose minimize of Power Loss.

Counterpart

- Mongolian Ministry of Energy (MOE)
- National Power & Transmission Grid (NPTG)
- Appointed operating body by MOE for construction of Transmission line & Substation

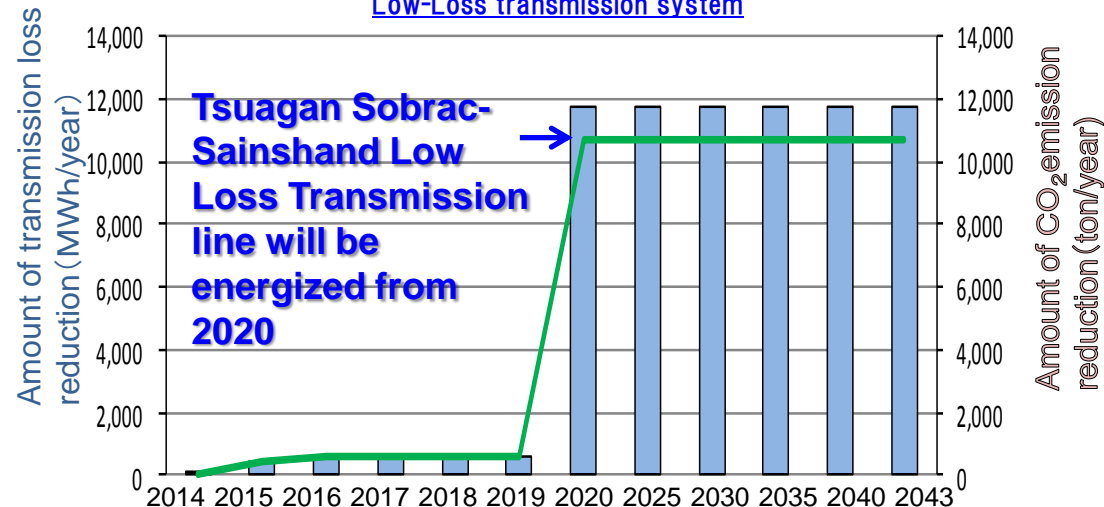
Estimated Reduction amount

$$\begin{aligned} & \text{[Amount of GHG emission reduction (ton/Line)]} \\ & = \text{[Difference of transmission Loss (MWh/Line)]} \\ & \quad \times \text{[GHG emission rate for power (ton/MWh)]} \end{aligned}$$

[Difference of transmission Loss]
Calculated based on measured power at transmission end and receiving end

[GHG emission rate of power]
Use GHG emission rate of power of the central power network(1.103 [ton/MWh]) which published by Mongolian Government

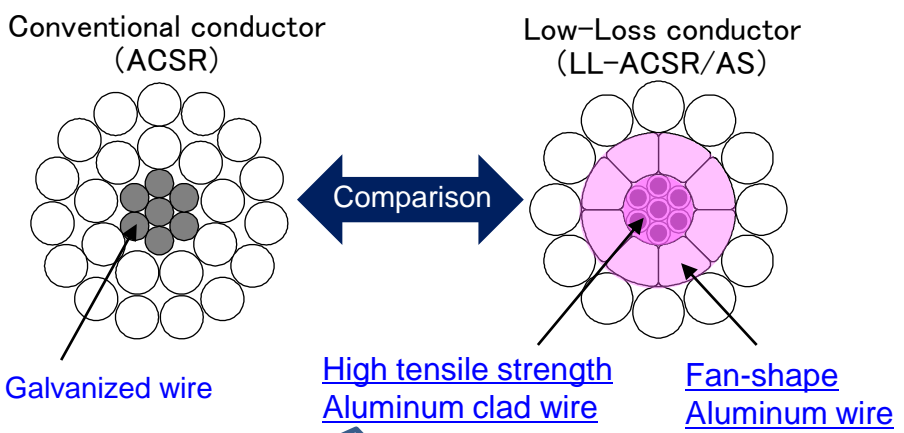
Estimated amount of CO₂ emission reduction by Oyu Tolgoi - Tsagaan Suvraga Low-Loss transmission system



Technical Study Item

- ① Applicability study of Low-Loss conductor which newly developed to much Mongolian environmental condition
- ② Difference of transmission loss between Low-Loss transmission system and Conventional transmission system.

Project Technology



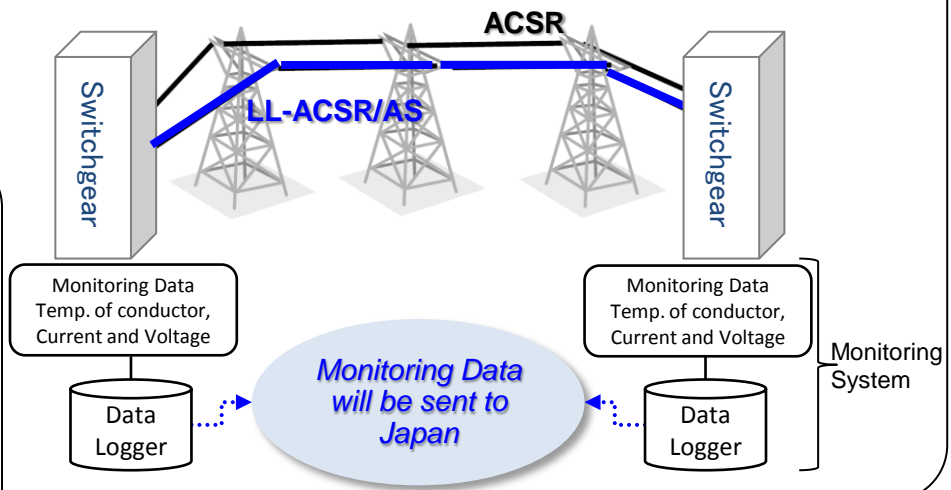
[Tensile strength]
High tensile strength Aluminum clad wire = **1770MPa**
[Galvanized wire = 1340MPa]

[Cross section area]
Fan-shape stranded wire make increase cross section area
→ Become Low-Loss

Advantage of Low-Loss conductor

- 1) Transmission Loss is reduced 10 – 15%
- 2) The Tower which is same design as conventional conductor can be used.
- 3) The expected lifetime of Low-Loss conductor is longer than that of conventional conductor.

Oyu Tolgoi – Tsagaan Suvraga 220kV Transmission Line



Project Site

