FY2015 Feasibility Studies with the Aim of Developing a Joint Crediting Mechanism

High-Efficiency Thermal Power Generation in Thailand

New Energy and Industrial Technology Development Organization (NEDO)
Mitsubishi Research Institute, Inc.
This study will promote widespread use of world-class Japanese low-carbon technology in Thailand to achieve reduced greenhouse gas emissions.

Study Summary

This study aims to install a world-class 500 MW integrated coal gasification combined cycle (IGCC) power plant utilizing air-blown gasifier technology at the Electric Generating Authority of Thailand (EGAT) Mae Moh plant as part of its renewal plan.

Study Items

1. Study of current trends and policies regarding climate change and markets in Thailand.
2. Assessment of business conditions and preparation of a financing and investment environment.
4. Estimation of GHG reduction and other economic effects.

Partner/Site

Counterparts
- EGAT Mae Moh plant
- Local consultants

Project site
- Mae Moh district, Lampang Province, Thailand

Estimated Reduction Amount

Reduction amount: 360,000 tons CO₂/year

Reference Emissions

Current situation
- Weighted average of existing coal-fired power generation units in the Mae Moh region of Thailand
- Assume efficiency increase compared to BaU

CO₂ emissions

Less efficient coal-fired power plants

Present

Reference

Less efficient coal-fired power plants (efficiency increase assumed)

Project

CO₂ emission reductions

IGCC

Project Emissions

- The introduction of an IGCC coal-fired power plant will reduce increased use of less efficient power generation in Thailand.
Summary of Introduced Technology

Features of IGCC System

1) **High thermal efficiency**
Achieves the world’s highest thermal efficiency in verified technology of coal-fired power generation.

2) **Coal flexibility**
System flexibility and capability has already been verified with many types of coal from around the world.

3) **High environmental performance**
Plant efficiency is 10 to 20 percent higher than the net plant efficiency of a USC power plant. Accordingly, the emission intensity of CO₂, SOₓ, NOₓ, and dust is lower due to high thermal efficiency.
Circulating water for cooling is reduced by 30 percent because it uses a gas turbine combined cycle system.

4) **Efficient usage of slag**
Combusted coal is discharged in the form of glassy slag having a volume that is half that of fly ash from conventional coal-fired plants. This slag has potential commercial applications such as road paving materials or a fine aggregate for concrete.