

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

# **Feasibility Study for Project Development of a Solar Power Supply for a Thermal Power Plant in Chile**

New Energy and Industrial Technology Development Organization (NEDO)

Chiyoda Corporation

Feasibility Study for Project Development of a Solar Power Supply for a Thermal Power Plant in Chile

Conducted by: Chiyoda Corporation

Integrated solar combined cycle (ISCC) is a type of hybrid power plant in which concentrated solar power (CSP) is integrated with a thermal power plant. Supplying steam from a CSP system to a thermal power plant can increase generation capacity and reduce fossil fuel consumption and CO<sub>2</sub> emissions.

### Study Summary

This study will survey the following: specific technical and institutional issues in applying ISCC to a thermal power plant, power plant candidates for project implementation, project evaluation, establishment of valuation techniques such as emissions reductions, financing in accordance with project implementation, other institutional and environmental improvement measures, and greenhouse gas (GHG) emissions reduction potential such as when ISCC becomes widely used.

### Study Items

- ① Chile's status and policy toward climate change, and an overview of its market and policies relevant to the technology
- ② Business assessment, financing, and other investment conditions required for project implementation
- ③ Establish Measuring, Reporting and Verification (MRV) methodology for the project
- ④ Expected GHG emissions reduction amount using the established MRV methodology, and economic effects from the project

### Partner/Site

- Partner: To be determined
- Site: Chile

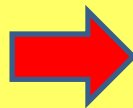


### Estimated Reduction Amount

Approximately 14,000 tons CO<sub>2</sub>/year

#### Reference Emission

The Central Interconnected System has the most conservative CO<sub>2</sub> coefficient in Chile at 0.655 tons CO<sub>2</sub>/MWh. This value is therefore used as the reference emission.



#### Project Emission

Generation capacity: 5 MW  
 Annual power generation: 21,900 MWh/year  
 21,900 (annual power generation) x 0.655 (CO<sub>2</sub> coefficient)  
 = 14,345 tons CO<sub>2</sub>/year

The net amount of energy generation will be calculated based on the mass, flow rate, and entropy of steam to be supplied.

## Proposed Project and Technology by Chiyoda

### ● Integrated solar combined cycle

Chiyoda proposed solar boost technologies for coal or gas-fired power stations based on **Molten Salt Parabolic Trough CSP (MSPT-CSP)** technology.

### ● Merits of MSPT-CSP system for ISCC:

MSPT-CSP produces high temperature and high pressure (550°C, 100 bar) steam compared to a conventional synthetic oil CSP system and realizes:

- 1) **High efficiency** in power generation;
- 2) Power generation by **renewable energy (RE)** and **fuel saving**;
- 3) **Low impact** on the heat balance of the existing power station.



Chiyoda demonstration plant in Italy

