Feasibility Studies with the Aim of Developing a Bilateral Offset Credit Mechanism FY2011

Studies for Project Exploration and Planning

Study for Introduction of Energy Saving Technologies in South Africa Steel Industry

New Energy and Industrial Technology Development Organization (NEDO)
Nippon Steel Corporation
JP Steel Plantech Co.
1. Study on potential for diffusion of energy saving technologies (CDQ*, TRT** etc.), and their contribution to CO₂ reductions in the South African Steel industry, and Proposal for new MRV methodologies.

(*CDQ: Coke Dry Quenching  **TRT: Top pressure Recovery Turbine at blast furnace)  
2. Preliminary Feasibility Study for introducing a large effective energy saving technology to the South African steel company.

<Significance> Steel industry is a CO₂ intensive sector. The demands for steel in developing countries is increasing rapidly and a large amount of CO₂ reduction could be achieved by the diffusion of Japan's highest effective energy saving technologies.

Overview of the Study

1. Study on potential for diffusion of energy saving technologies (CDQ*, TRT** etc.), and their contribution to CO₂ reductions in the South African Steel industry, and Proposal for new MRV methodologies. 

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2. Preliminary Feasibility Study for introducing a large effective energy saving technology to the South African steel company.

Objectives of the Study

1. Conduct a study to the possibility of diffusion of energy saving technologies for main South African steel companies. 
2. Estimate CO₂ emission reduction potential by introducing Japanese energy saving technologies to the South African steel industry. 
3. Select a concrete project (possibly CDQ) as a case study for the project implementation through the preliminary FS. 
4. Identification of issues with CDM methodologies through the FS and proposal for a new methodology better suited to the reality in the steel industry by modifying the existing CDM methodologies.

Site of the Study

Partner: 
South African Iron & Steel Institute (SAISI) 
Site: Steel Work agreed by SAISI

Potential level of Reductions

1. In the case of focusing on the energy saving technology of Coke-making process (CDQ). 
2. Simple evaluation method for CO₂ reductions based on CDM methodologies. 
   - Project boundary, Calculation method, Emission factor, Setting of baseline etc. -
3. Typical CO₂ reduction potential (this estimation): CDQ: 217,000t-CO₂/year at coke oven of 1.16 mill tons / year. 
   - Annual CO₂ credit revenue (this estimation): $3,255,000/year (CO₂ credit: $15/t-CO₂)
4. Total amount of CO₂ reduction potential as rough evaluation in Sub-Sahara (South Africa and Zimbabwe): 4,600,000t-CO₂/year [If all energy saving technologies considered by the study are installed]
1. Summary of Technology

CDQ recovers waste heat from coke to generate steam and electricity. By introducing CDQ, the steel plant can reduce electricity from the grid and fuel for captive power generation.

2. CDQ Process Outline

Red hot coke is quenched by low temperature inert gas at the closed cooling chamber. Quenched coke is used as the reducing agent for the iron ore in the blast furnace. The heated inert gas is used for generating steam and electricity.

3. Configuration of Facilities