

# Development of CO<sub>2</sub> capture technology by chemical absorption “COURSE50 project”

*Chemical Research Group  
Research Institute of Innovative Technology  
for the Earth (RITE)*



# Outline of "COURSE50"

## Objectives

**Development of high performance chemical CO<sub>2</sub> absorbents which enables to reduce CO<sub>2</sub> capture cost of blast furnace gas to ¥2,000/t-CO<sub>2</sub>**

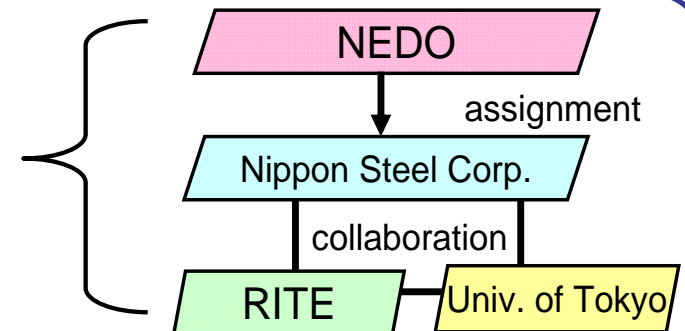
## Background

CO<sub>2</sub> Ultimate Reduction in Steelmaking Process by Innovative Technology for Cool Earth 50 (COURSE50: FY2008-2012), this project aims at technological development on about 30% CO<sub>2</sub> reduction compared with a current exhaust level in the ironworks.

Development of  
excellent CO<sub>2</sub> chemical absorbent

Development of reduction technology of  
CO<sub>2</sub> in blast furnace

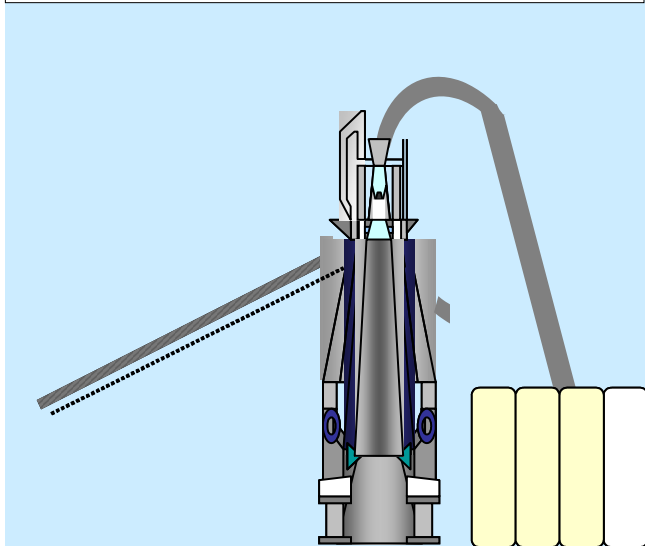
- (1) Target: CO<sub>2</sub> capture energy 2.0[GJ/t-CO<sub>2</sub>]
- (2) Innovation of computational chemistry (Quantum-chemical method, Chemoinformatics, etc.)
- (3) Pilot plant validation of the developed technology



# Outline of CO<sub>2</sub> capture from blast furnace gas

## Steel plant

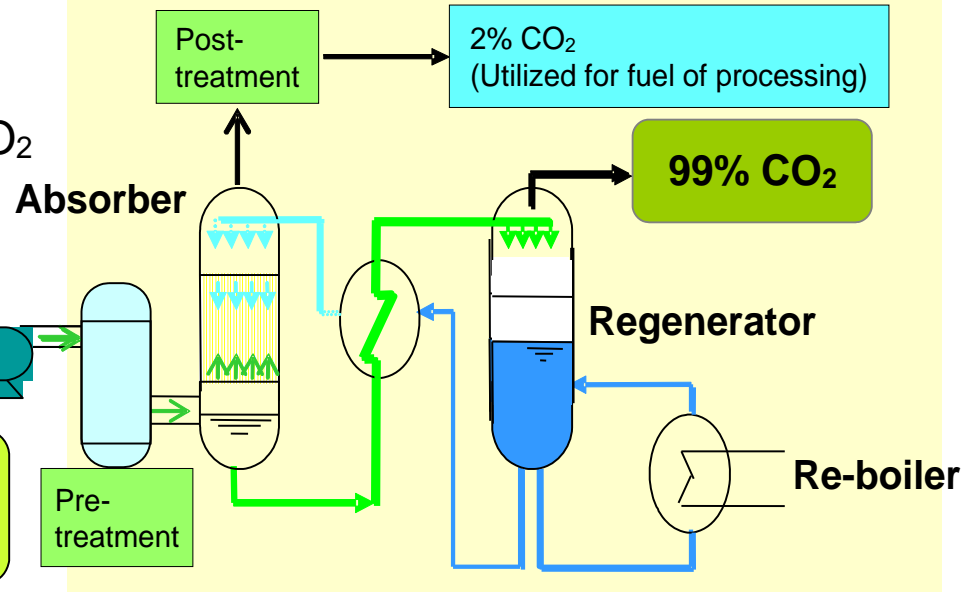
Steel Production size: 3.8 million ton / year  
CO<sub>2</sub> emission: 2.6 million ton / year



## Chemical Absorption

High level CO<sub>2</sub>

**BFG**  
22% CO<sub>2</sub>  
(incl. CO, H<sub>2</sub>)



Low-Cost CO<sub>2</sub> capture technology

less than an half of the current cost

Development of high performance chemical absorbent

Optimization of energy efficiency  
(Utilization of low grade waste heat)

# Development of excellent CO<sub>2</sub> absorbents

## Target Performance

- (1) Improvement of CO<sub>2</sub> capture capacity and higher concentration of absorbent  
→ Reduction of absorbent volume
- (2) Improvement of CO<sub>2</sub> absorption rate
- (3) 30% reduction of Heat of Reaction

## Absorbent Quality

- (1) Higher durability against impurities in BFG
- (2) Lower corrosiveness for equipment
- (3) Lower volatility

