Japan's experience of and lessons learned by pro-bono contribution

2017. 8. 30@CTCN AB #10

Kazuhiko HOMBU

Kenichi WADA

Presentation of two examples

1. TA in South Africa

   Substantial GHG emissions reduction in the cement industry by using waste heat recovery combined with mineral carbon capture and utilization

   ※ Presentation by Kenichi WADA,
   Research Institute of Innovative Technology for the Earth (RITE)

2. TA in Thailand

   Concerning Benchmarking energy consumption and GHG emissions of iron & steel industries in Thailand

3. Lessons Learned/Learning

1. TA in South Africa – Project Outline –

- South Africa Technical Assistance Request: Assess the technical feasibility, GHG reduction potential and cost efficiency for a hybrid system of waste heat recovery and mineral carbon capture and utilization (MCC&U).
- Project type is technical feasibility study, which includes chemical components analysis of exhaust gas, financial assessment of domestic market for the bi-products from cement production, and development of strategic business plan.
- RITE was established in 1990 as a center of excellence to develop innovative environmental technologies. It is a nonprofit public foundation with three core areas of research: Quantitative assessment of global mitigation strategy, bioenergy, and CCS.

Timeline

Submission
December 22, 2015

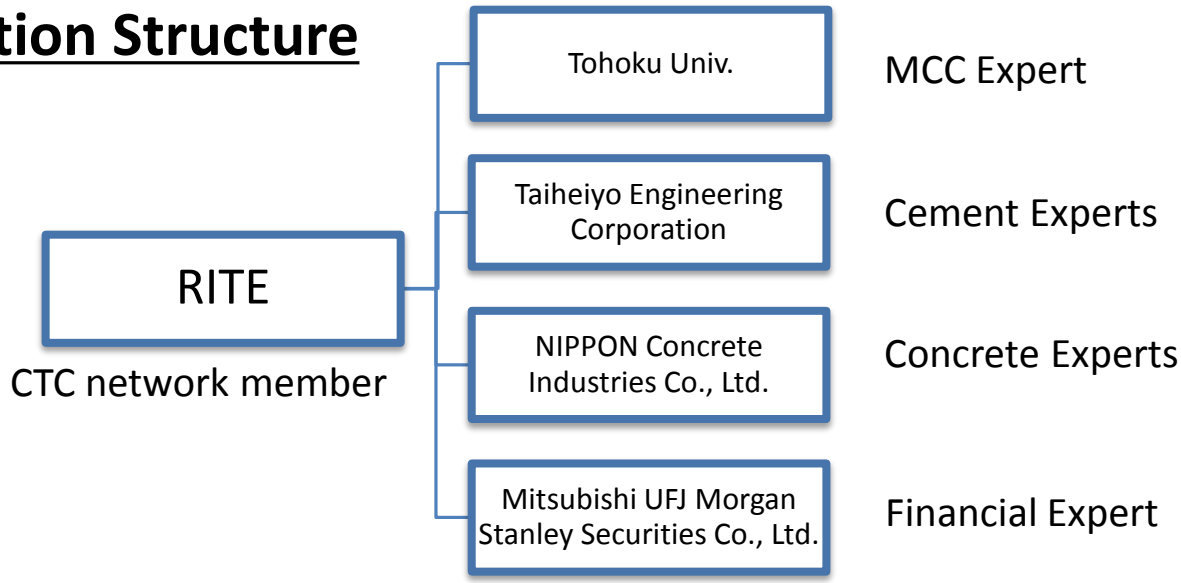
Pre-study
Bidding
Contract

Start
December 28, 2016

Complete
December 28, 2017

1. TA in South Africa – Key Challenges –

- **Implementation Structure**



- **Key challenges in tendering process**
  - Technical Assistance is expected to deliver various aspects of analysis, which requires involvement of many specialists outside.
  - Competitive bidding process involves a risk of not covering the cost at the preliminary stage of project development.
- **Difficulty of deployment**

  MCC&U technology improves energy and resource efficiency and reduces GHG emission, but has no real impact without deployment. Finding a plausible way to lead low carbon investment is required practically.

1. TA in South Africa – Motivations for the Support –

- **Ministry of Economy, Trade and Industry (METI)/RITE**
  - METI supports part of the project with the following motivations;
    - This project is matched with the domestic policy agenda in "the Long-term Climate Change Policy Platform Report" just issued by METI. One of the key strategies is making global contribution to reduce GHG emission, leveraging all support tools such as CTCN and GCF.
    - Japanese government has been supporting CTCN from start-up to make technology mechanism work effectively.
  - Supplemental fund was provided by METI as a technical feasibility study to explore opportunity for potential GCF project, putting CTCN TA in the course of the process.
  - Note that this scheme is tentative, and could be "one-shot" support, if the results are not effective to produce low carbon projects.
- **RITE and private entities**
  - Pro-bono contribution allows us develop network with local stakeholder and involve various specialists outside our institution.

1. TA in South Africa: [Annex] Technical Concept of MCC & U

Hybrid low carbon technology

Resource Efficiency

Concrete Sludge

or

Concrete Wastes

or

Industrial Wastes containing Alkali Earth Metal

GHG emission reduction through Carbo Mineralization

MCC&U plant (reactor)

Waste Heat Recovery

Energy Conservation

Resource Efficiency

$CaCO_3$

Reuse as construction materials, painting, glass, ceramics, paper, rubber, resin, asphalt filler, food, pharmaceutical , colorant, etc.

Resource Efficiency

Removal of toxic materials from wastewater and soil, e.g. phosphorus and arsenic and reuse the materials

Remediation Agents: Adsorbents/Neutralizer

CO_2-rich Exhaust Gas from Cement Kiln

2. TA in Thailand – Project Outline –

- **Technical Assistance Request** by Iron Steel Institute of Thailand (ISIT) :
  1. "Designing specific questionnaires" for different segments of Thailand iron & steel industry
  2. "Undertaking field survey" and off-site survey on energy consumption data
  3. Benchmarking of energy consumption pattern and "developing energy reporting guidelines"
  4. Preparation of "energy efficiency manual" and assessing financing options
- **NDE:** National Science and Technology Innovation Policy Office (Thailand)
- **CTCN network member:**

  The New Energy and Industrial Technology Development Organization (NEDO) is one of the biggest national R&D Agencies in Japan and has responsibility to enhance industrial technologies and to solve energy and environment issues.

Timeline

Preparation

August 2017
Kick-off meeting in Bangkok
STI/ISIT and NEDO/NSRI/JFE-TEC

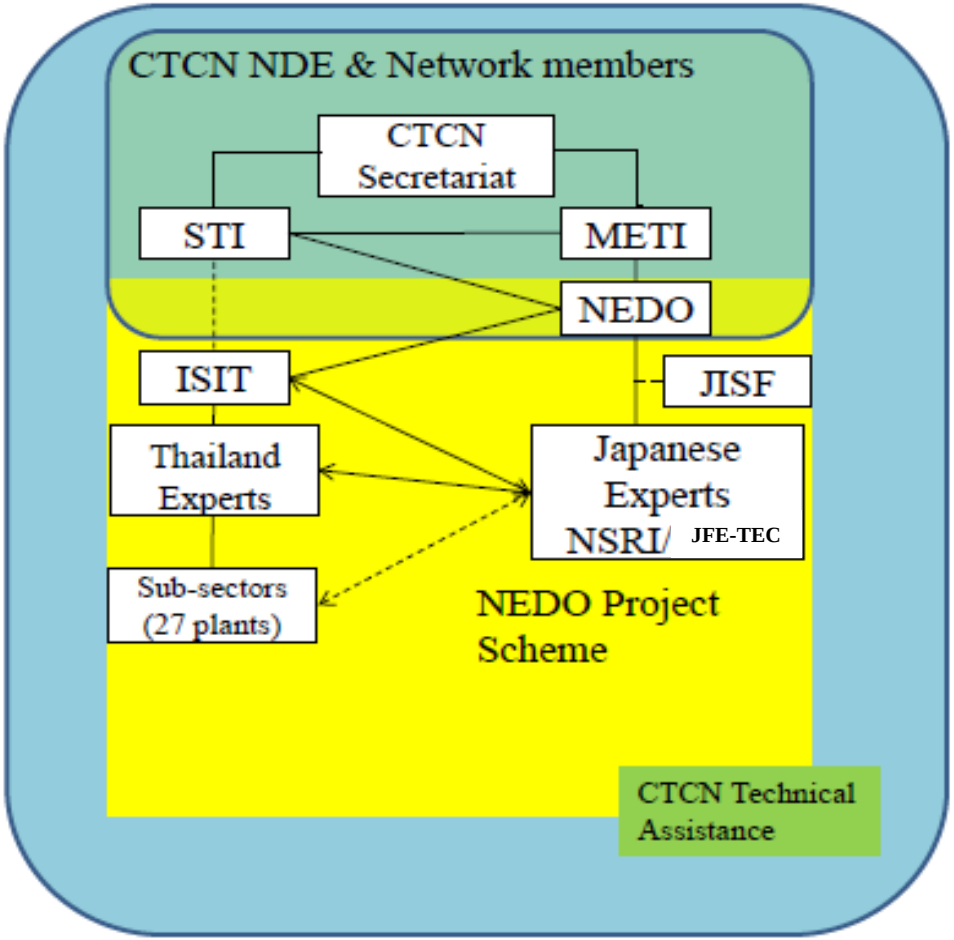
On-site activities (in Thailand)

October 2017
On-site survey
Capacity building

January 2018
Workshop
(information sharing)

February 2018
Completion

2. TA in Thailand – Implementation Structure –



1August 2017, Kick-off meeting between STI and NEDO at STI conference room

2 August 2017, an experts meeting between Thailand and Japan at ISIT conference room

STI: National Science and Technology Innovation Policy Office(Thailand),
METI: Ministry of Economy, Trade and Industry(Japan),
NEDO: New Energy and Industrial Technology Development Organization(Japan),
JISF: The Japan Iron and Steel Federation (Japan)
NSRI: Nippon Steel & Sumikin Research Institute Corporation(Japan)
JFE-TEC: JFE Techno-Research Corporation

2. TA in Thailand – Motivations for the Support –

➢ METI/NEDO

- Tackling climate change and minimizing its negative impact by diffusion of superior technologies is METI/NEDO's policy direction. This project will match with the policy direction and be a tangible trigger for the following actions;
  - ✓ One of the key strategies in "The Long-term Climate Change Policy Platform Report" just issued by METI is making global contribution to reduce GHG emission by leveraging all climate action instruments such as CTCN and GCF.
  - ✓ NEDO, as one of CTCN Network members, wants to collaborate with CTCN to promote superior climate technologies effectively to solve global environment issues.

➢ Japanese steel industry

- In line with JISF's Action Plan for low carbon society toward 2020 and 2030.
- Support diffusion of technologies provided by Japanese suppliers.
- Improve Energy and natural resources securities by global information sharing among steel industries.

3. Lessons Learned/Learning

- **Tentative nature of support scheme**

- The scheme is an "ad hoc" measure, and could be considered how to go forward in another way. (NEDO)
- The scheme is tentative, and could be “one-shot” support, if the results are not effective to produce low carbon projects.(RITE)

- **Network as an incentive and a source of project**

- Pro-bono contribution allows us to develop network with local stakeholders and to involve various specialists outside our institution. (RITE)
- Long-term industry-to-industry/person-to-person basis networking will give more chance to find a seed of technology transfer.

- **Importance of ownership by industry in recipient country**

- Based on the NEDO’s experience, it is essential that the industry in recipient country is responsible to realize impact of technology transfer so that they enjoy the fruit of the project. In order to ensure the ownership of the industry in recipient country, it is reasonable for them to share a certain scope of work such as cost.