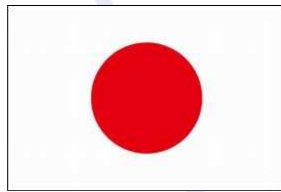




Global situation of Coal-fired power and NEDO's role in Clean Coal Technology (CCT)



8th Nov, 2019 @ Delhi

Aoki Noboru / Tanimura Yasuaki

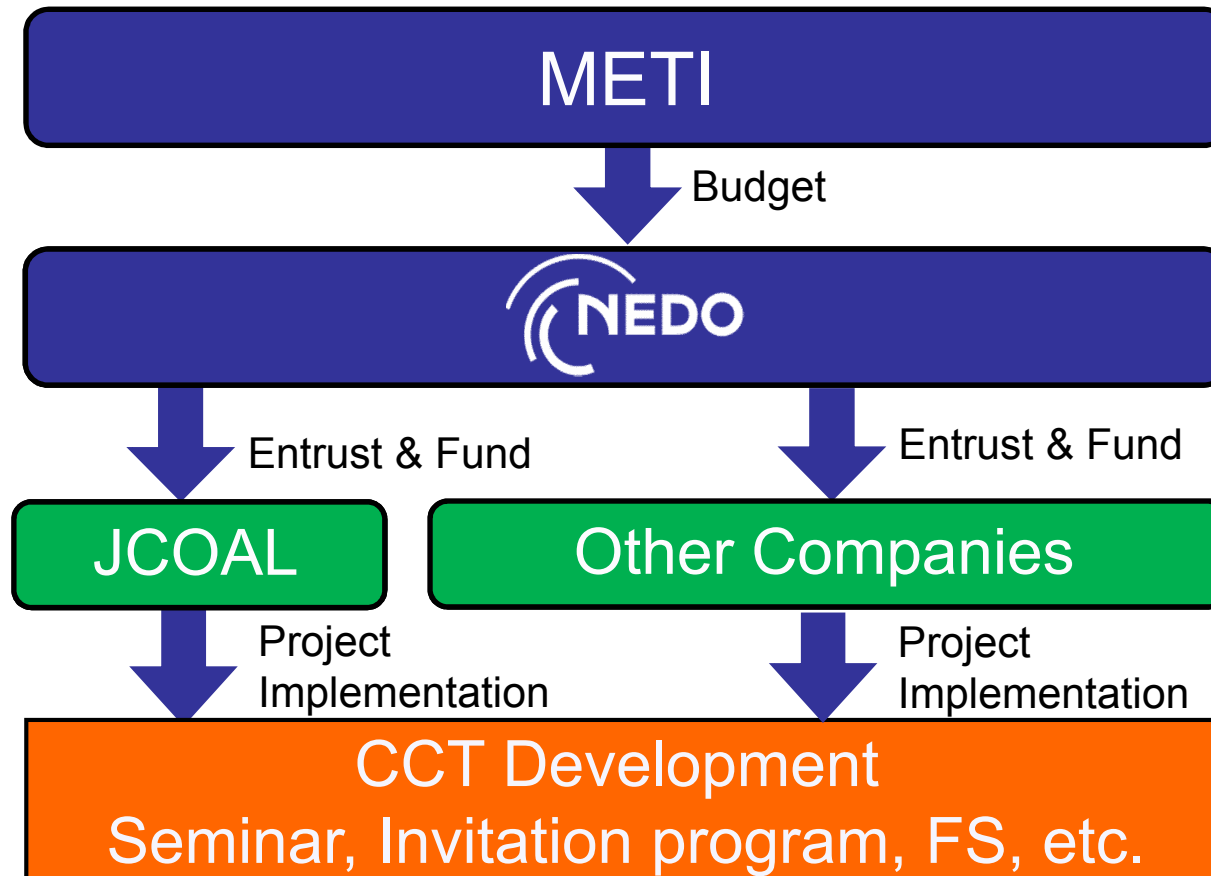
Environmental Department

New Energy and Industrial Technology Development Organization (NEDO)

NEDO's Role in CCT (1/3)



- NEDO conducts clean coal technology (CCT) development by entrusting companies.
- NEDO conducts CCT dissemination activities to contribute to resolution of climate change issues in Asian countries with METI's support and advise.



NEDO's Role in CCT (2/3)



New Energy

Demonstration for Marine wind power generation



Ultra-high Eff. PV Cell

Rechargeable Batteries and Energy System



State-of-the-art Analysis Facilities for Rechargeable Batteries (RISING2)

Clean Coal Technology (CCT)

- High Eff. Tech. for coal power plant
- CO2 Capture, Utilization & Storage (CCS/CCUS)
- Utilization Tech. for low rank coal



Demonstration plant for Oxy blown IGCC (Osaki CoolGen)

NEDO

Global warming

- Support for Expansion of Global warming prevention technology

Energy Conservation



Test Facilities for Superconducting Cable

- Energy supply conversion
- Industrial
- Home · Store
- Transportation
- Cross Functional

International Expansion

- Smart Community
- High Eff. Technology for international energy consumption



Smart Grid Demonstration with EV (Hawaii Maui of USA)

Environment and Resource Conservation

- Water recycle
- Environmental chemistry
- 3R (Reuse · Reduce · Recycle)
- CFC measures



Pilot Plant for Low Energy Consumption Tech. by MBR (Membrane Bioreactor)

Development of CCT occupies the important position in NEDO's activity

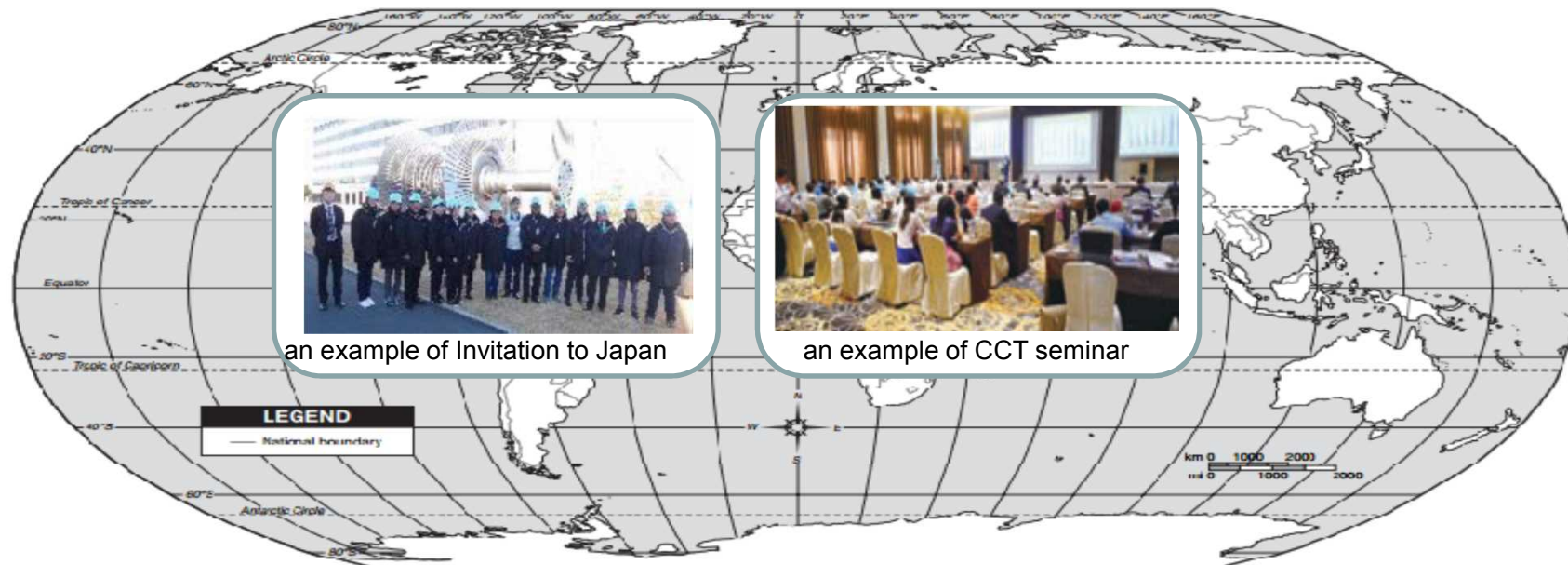
NEDO's Role in CCT (3/3)

- NEDO is promoting the CCT dissemination activities in countries, which have needs for advanced CCT in order to decrease emission of CO₂ and other air pollutants.

**Invitation to Japan
for foreign
countries' experts**

**Seminar & Work Shop
in partner countries**

**Feasibility Study for
introduction of
Japanese CCT into
specific countries**



Dissemination Activities in India

- NEDO supports and organizes the dissemination activities such as annual workshops in Delhi and training programs in Japan for experts as follows;

CEA-JCOAL Workshops in Delhi:

(DATE) (TOPIC)

- Nov, 2017 : Environment Technology, O&M
IoT monitoring, Finance
- Nov, 2018 : Environmental Technology,
biomass co-firing, IoT monitoring, Finance



CCT Training Program for Indian government experts:

- NEDO & JCOAL invited the experts of MOP, CEA, NTPC and the local power authorities in 2017, 2018 and 2019.
- Observation at Japanese advanced thermal stations
- Discussion with the experts of GOJ, NEDO and companies



**Oct, 2019,
Hibikinada**



Oct, 2019, Reihoku

i) Optimization of Operation with IoT

- Flexible operation of coal-fired thermal power is referred in Roadmap of Japan-India Energy Dialogue in 2018.
- NEDO promoted a feasibility study for flexible operation, entrusting to JERA, MRI and JCOAL in 2018.
- Improvement of flexibility of individual power unit and optimization for all power units in VSTPS were evaluated.

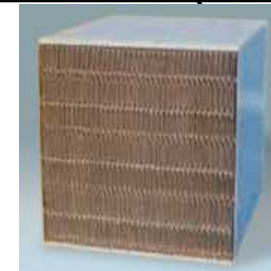
Power Controlling



ii) Environmental System

- NEDO promoted the **De-NOx demonstration test** for durability with flue gas from existing boiler in 2017, using **SCR system and plate catalyst** developed by MHPS, entrusting to MHPS and JCOAL.

Selective Catalytic Reduction (SCR)



iii) Biomass Co-firing

- GOI is eager to decrease air pollution around Delhi by open-burning of agricultural waste. NEDO is promoting feasibility study for the **utilization of biomass by co-firing with coal**, entrusting to JCOAL since 2018.

Biomass Co-firing Boiler

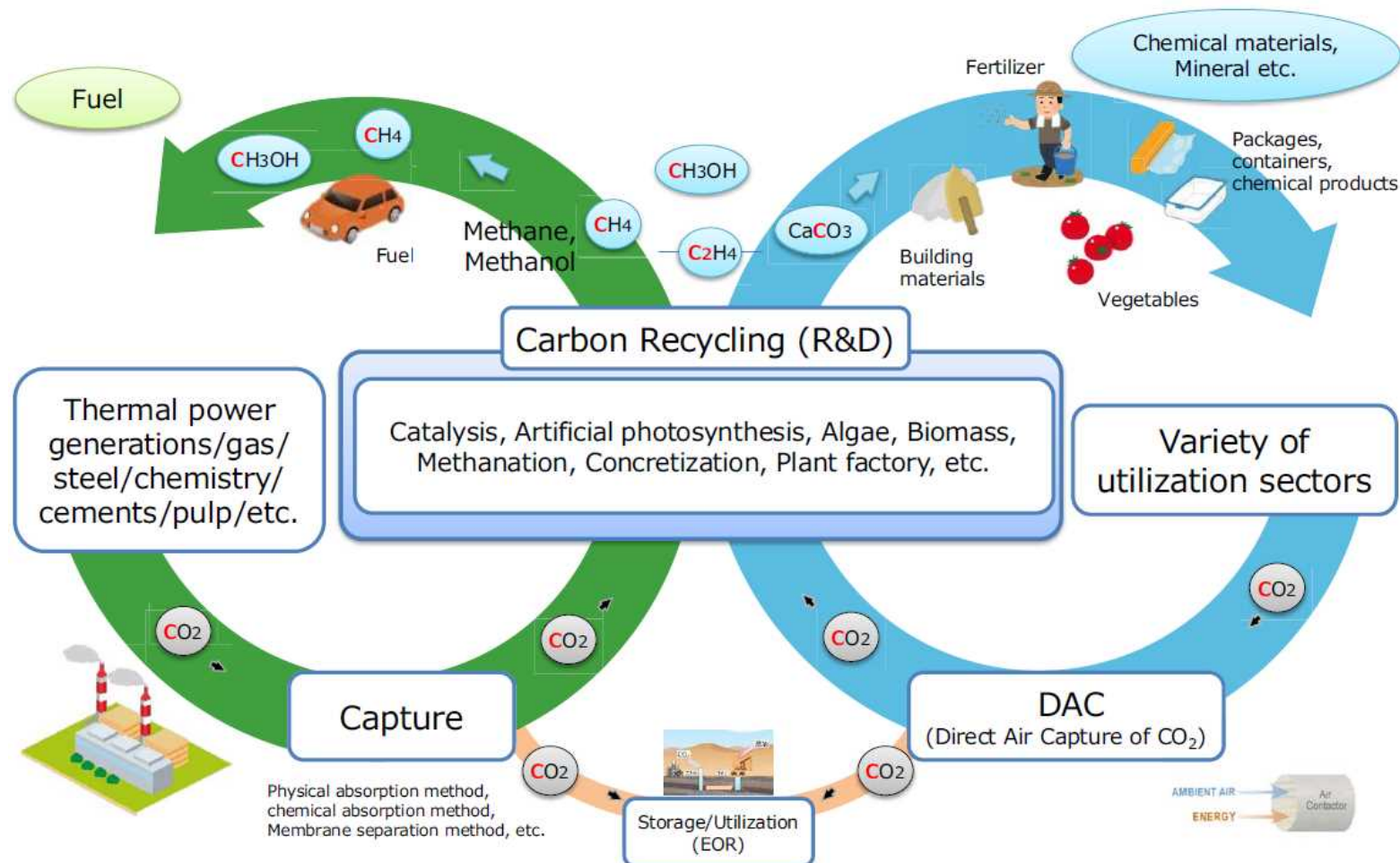


Japan's New initiative for Carbon Recycling (1/2)



New Energy and Industrial Technology Development Organization

The “Carbon Recycling Promotion Office” has been recently established by the Agency for National Resources and Energy (ANRE), aiming to promote technological innovations involving capture and utilization of carbon dioxide.



Japan's New initiative for Carbon Recycling(2/2)



New Energy and Industrial Technology Development Organization

Carbon Recycling is one of key technologies for the society, together with energy saving, renewable energy and CCS.

