Case Study of Technology Transfer between Japan and China in iron/steel industry

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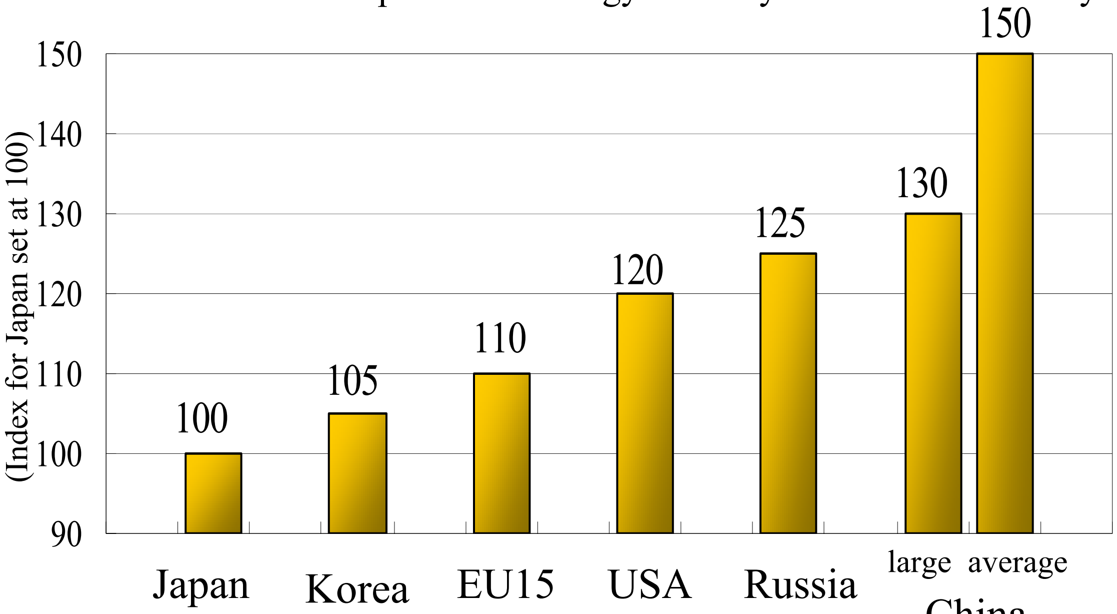
Outline

1. Energy efficiency technologies of iron/steel industry
2. Factors that affect diffusion of energy efficiency technologies
3. Lessons learned

Note: Most of the slides are the excerpt of Prof. Yamaguchi's presentation in the mitigation workshop at SBSTA22

Energy efficiency technologies of iron/steel industry
- international comparison

International comparison of energy intensity of iron/steel industry



Source: Japan Iron and Steel Federation

Potential of CO2 reduction for steel industry in China and Russia

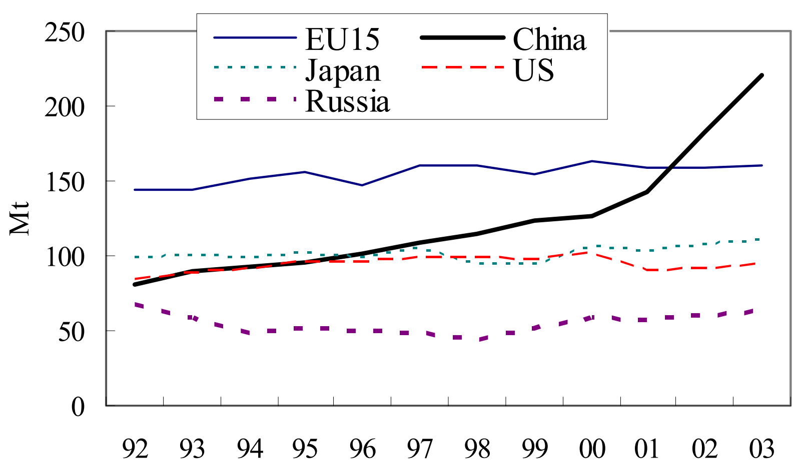
(Assuming national average energy efficiency is improved to the level of Japan)

China: 180 M tons of CO2/year

Russia: 25 M tons of CO2/year

Diffusion rate in Japan
CDQ: 90%
TRT: 100%

Trends in crude steel production



Source: International Iron & Steel Institute

Energy efficiency technologies of iron/steel industry
- typical examples

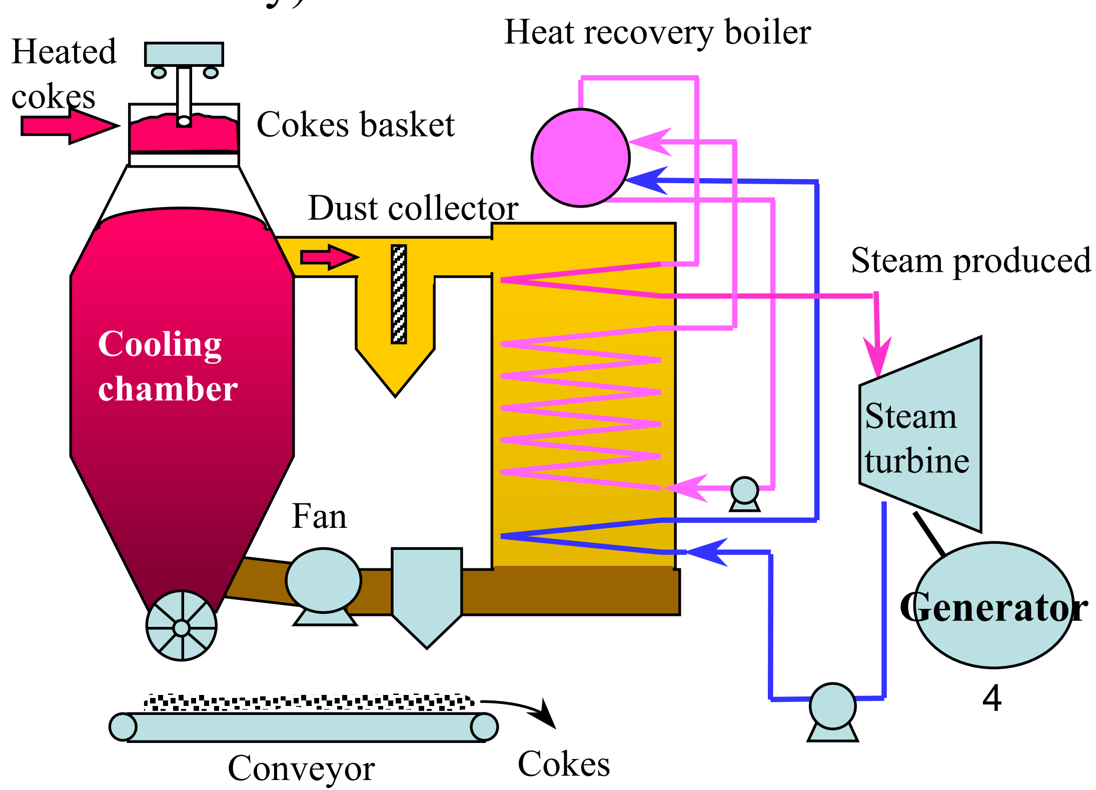
CDQ (Coke Dry Quenching)

➢Heat recovery system in which heated inert gas is used to generate electricity after quenching hot cokes.

➢Effects of CDQ
- Energy conservation (generation of electricity) →CO_2 emission reduction
- Improvement of quality and strength of cokes
- Prevention of air pollution (SOx, dust, etc.)
- Reduction in usage of water

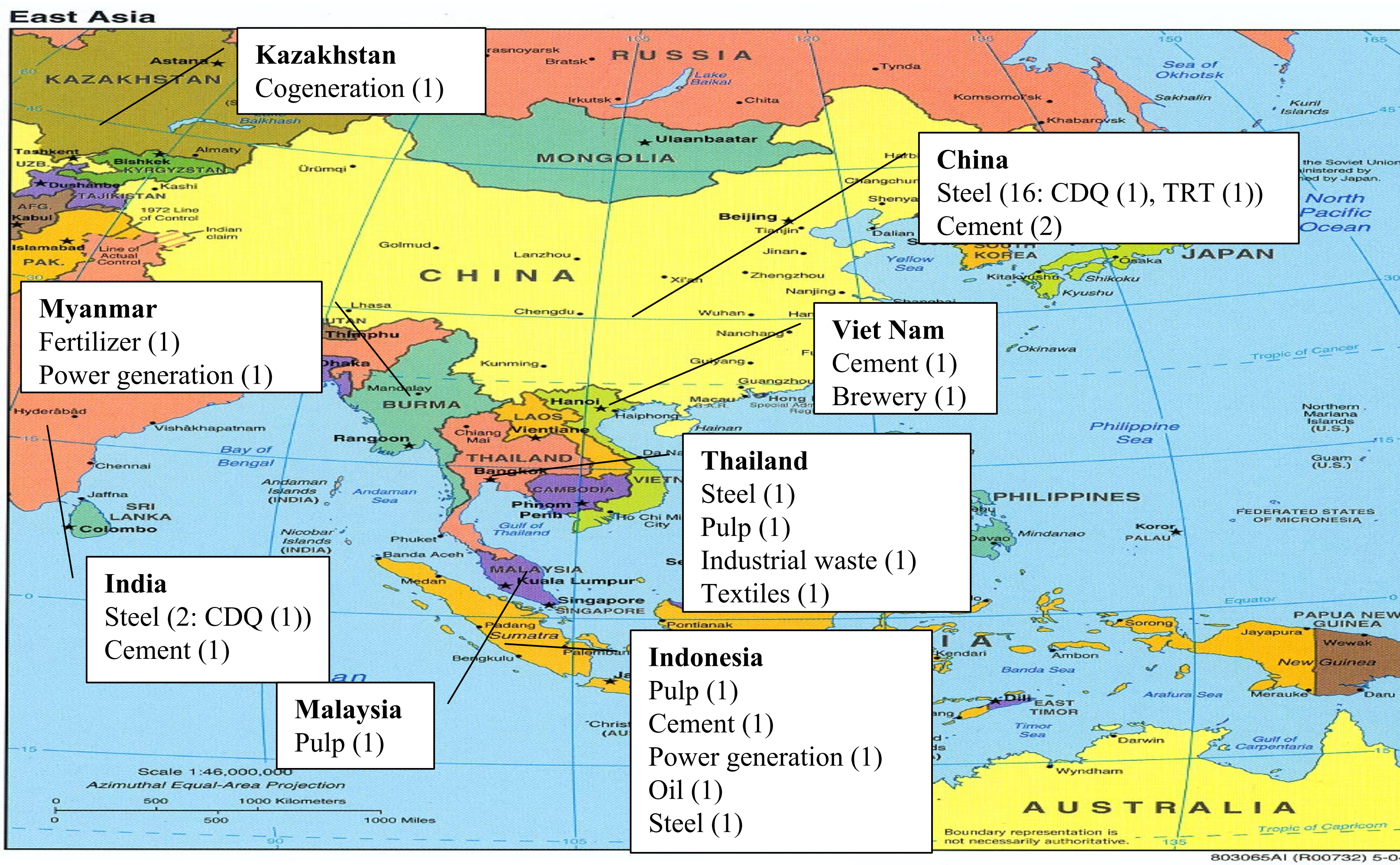
➢Cost of installation
US$ 20-40 million

➢Payback period
3-5 years (model case in China)



Factors that affect diffusion of energy efficiency technologies
- demonstration projects

➢The Ministry of Economy, Trade and Industry has implemented 36 projects since 1993 and contributed to the diffusion of energy efficiency technologies in the Asian region.



*Average project size: approx. US$ 10 -20 million for 2-3 years

Factors that affect diffusion of energy efficiency technologies
-case study of CDQ in China

- Demonstration project at a steel plant in Beijing to install CDQ

Period: 1997-2001
Budget: ¥ 2.97 billion (US$ 28 million)
Site: Shougang Corporation, No.1 Cokes Oven
Technical support: Nippon Steel Corporation
Energy conservation: 24,700 toe/year
CO_2 emission reduction: 68,300 t-CO_2/year

- Follow-up program of the demonstration project (on-site seminars, operational advice, etc.)

- A joint venture between Chinese and Japanese steel companies (Oct 2003) to design, produce and sell CDQ and other energy conservation facilities

8 CDQ will be installed in China because of this demonstration project

Factors that affect diffusion of energy efficiency technologies
- implications from case study of CDQ in China

Keys for success

Local steel manufacturers tend to choose investment to increase production capacity, but this can be changed by:

(1) Awareness of local industry

- Energy-saving effect
- Co-benefits such as better air quality (very visible in CDQ)

(2) Initial cost reduction through localization of manufacturing

- Business strategies, such as IPR, of the investing company from Japan
- Local competitor

(3) Local environmental policy

- 10th 5-year National Plan in China (target of diffusion rate of CDQ: 60% by 2005)
- Pressure from local governments (air quality, water usage, etc.)

Factors that affect diffusion of energy efficiency technologies
- implications from case study of other projects in China

- Best available technologies: high initial cost (high energy-saving)
- Similar but less-effective technologies: low initial cost (low energy-saving)

<Case of oxygen converter gas recovery system>

	BAT in the demonstration project	Similar domestic technologies
Amount of recovered exhaust gas	75-100 m^3/t-steel	50-90 m^3/t-steel
Calorie of recovered gas	2,000-2,200 kcal/m^3	1,500-1,800 kcal/m^3
Dust in exhaust gas	below 50 mg /m^3	80-100 mg /m^3
Cost of facility	approx. 20 million US$	approx. 10 million US$

- *Low initial cost of similar technologies, which are sometimes copied from BAT, may prevent diffusion of BAT*
- *But this can be considered as achievement of the demonstration projects.*

Lessons learned

- The energy-saving potential is enormous. By exploring these opportunities, a win-win situation can be created: energy security, lower energy cost, better air quality, higher competitiveness, etc. This is clear from Japan's experience.

- Technology transfer and diffusion are not unilateral actions but collaboration between developed and developing countries.
  - Business incentives for investment: reform of CDM (next slide)
    IPR protection
  - Local industry's awareness and host government's environmental policy

- Bilateral and multilateral cooperation should have a sectoral focus which would enable us to enhance technology transfer by clearly identifying technology needs and energy-saving opportunities.

Lessons learned

- promotion of CDM activities

- CDM should be designed to facilitate technology transfer by providing business incentives for investment in energy efficient technologies.
- Such CDM projects would contribute best to sustainable development in developing countries.

<Action Plans by METI, Japan>

- Workshop joined by CDM experts (Tokyo, March)
- 1st Meeting of Committee on Future CDM (Bonn, May)

  Five Working Groups established under the Committee:

  Multi-Project Baseline WG, Program Based CDM WG, ESCO WG

  Consolidated Energy Conservation Methodology WG, Transportation CDM WG

(Further Steps)

- Workshop: outcomes of the 5 WGs will be presented (Sep.)
- COP/MOP1: the outcomes will be input (Montreal, Nov.-Dec.)

Thank you for your attention!

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