

Current State of International Cooperation

Concomitant with the progress of industrialization and urbanization, developing countries are now facing serious air and water pollution issues. Coal is utilized to produce a significant proportion of the energy consumed in developing countries, particularly in Asia. As their economies have developed, it has become an increasingly significant challenge for these countries to develop and disseminate coal utilization technologies, along with broad environmental conservation measures.

Unfortunately, insufficient capital, techniques and expertise limit how much developing countries can improve environmental conditions on their own. They require the assistance of international organizations and of industrialized countries, including Japan. Japan has therefore promoted international cooperation with a focus on the Green Aid Plan (GAP) with counterpart countries, including China, Indonesia, Thailand, Malaysia, the Philippines, India and Vietnam.

In recent years, the global warming issue has attracted intense international concern. Global warming is a serious problem for the future of the earth and humankind, and is closely related to human economic activity and its accompanying energy consumption. Thus, it is important to address environmental needs during the pursuit of economic development.

The Kyoto Protocol, adopted in Kyoto in December 1997 and which came into effect on February 16, 2005, includes the "Kyoto Mechanisms," an important instrument for international



cooperation. One of the Kyoto Mechanisms, a market mechanism known as the Clean Development Mechanism (CDM), is a new international cooperation system that aims to reduce greenhouse gas emissions through cooperation between developed and developing countries. To address global environmental issues that have continued to worsen worldwide, developing countries are encouraged to maximize their self-help efforts toward improving the environment by stemming the increases in pollution and the worsening of global warming.

Japan has been encouraged to contribute to the economic growth and environmental improvement of developing countries through the active promotion of Japanese Clean Coal Technology (CCT) to Asian countries including China, which is expected to show a continued increase in coal demand. Japan also promotes technological cooperation with Australia in order to make coal a more effective energy resource with even greater cost efficiency and supply stability.

(1) Developing human resources

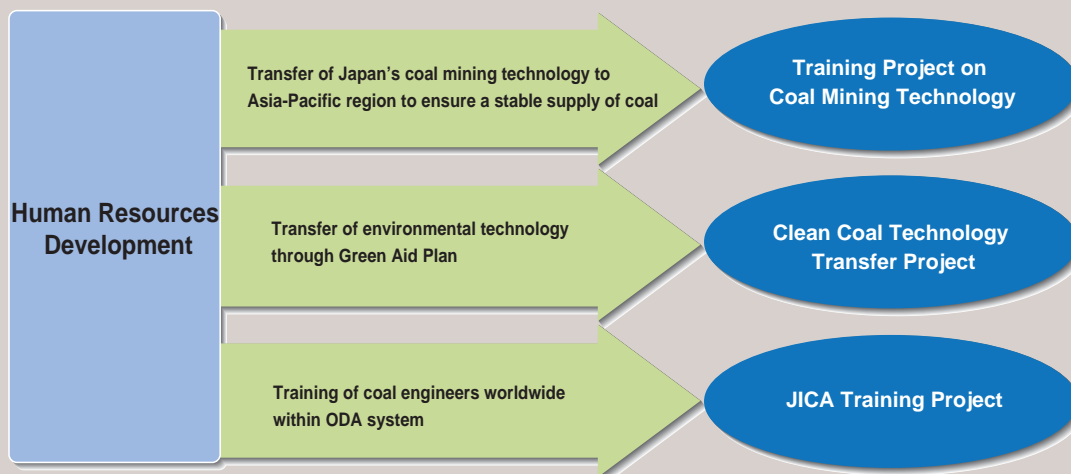
1) Training project on coal mining technology

Domestic mines have developed coal production and mine safety techniques with first-rate underground mining over a long period of time. Making use of these techniques, Japan provides technical cooperation to coal producing countries in the Asia-Pacific region to improve their coal production and mine safety. Japan also provides a human resource training project that accepts engineers from abroad and sends Japanese engineers to overseas coal-producing countries to ensure a stable supply of imported coal. Over 300 manager-level or higher ranking coal engineers from China, Indonesia and Vietnam have participated in the training program in Japan annually to receive face-to-face technical transfer sessions on business management, coal mining, mine safety and mechanical/electrical equipment at Japan's Kushiro mine and the Nagasaki Coal Mine Technology



Training Center.

For overseas training, Japan sends coal engineers to China to provide seminar-style training, and sends coal engineers to Indonesia and Vietnam to provide direct guidance on-site at local mines.



2) Promoting dissemination of clean coal technology

For the purpose of promoting the dissemination of clean coal technology, improving coal utilization technology and deepening the understanding of these technologies, Japan promotes technical transfers on coal utilization and quality management, including pollution countermeasures to reduce SOx, NOx and dust emissions, as well as the promotion of high-efficiency power generation to improve energy usage efficiencies, by inviting engineers from APEC countries to participate in training programs in Japan.

3) Supporting JICA training projects

JCOAL supports or carries out coal-related projects and training programs supported by the Japan International Cooperation Agency (JICA). JCOAL also provides domestic training programs on coal mining and mine safety techniques to engineers from Indonesia and Vietnam.

(2) List of clean coal technologies and model projects relating to GAP

List of clean coal technologies and model projects relating to GAP

Project name	Project period	Target country	Site	Counterpart	
Post-combustion cleaning					
Simplified desulfurization unit	FY1993-FY1995	People's Republic of China	● Weifang Chemical Plant	The State Planning Commission/Ministry of Chemical Industry The State Planning Commission/Ministry of Chemical Industry The State Planning Commission/Ministry of Chemical Industry	
			● Nanning Chemical Industrial Group		
			● Changshou Chemical Works		
	FY1995-FY1997	Thailand	● The Union Paper Public Co., Ltd.	Department of Industrial Works, Ministry of Industry	
	FY1998-FY2001	People's Republic of China	● Hunan Province Xiang Jiang Nitrogenous Fertilizer Industrial Co., Ltd.	The State Development Planning Commission/State Administration of Petrochemical Industry/Hunan Provincial Planning Commission	
Coke oven gas desulfurization unit	FY1999-FY2002	People's Republic of China	● Anyang Iron and Steel Group Co., Ltd.	The State Development Planning Commission/Henan Provincial Planning Commission/The State Administration of Metallurgical Industry	
Cleaning during combustion, improvement of combustion efficiency					
Circulating fluidized bed boiler	FY1993-FY1995	People's Republic of China	● Fangshan Garment Group Co.	The State Planning Commission/Beijing Planning Commission The State Planning Commission/Ministry of Coal Industry	
			● Lingzi Coal Mine Zibo Mining Administration		
			● Batangas Coal-fired Thermal Power Plant		Department of Energy
	FY1995-FY1997	Indonesia	● PT. Kertas Basuki Rachmat	Agency for the Assessment and Application of Technology (BPPT)	
		People's Republic of China	● Chaili Colliery, Zaozhuang Coal Mining Administration	The State Planning Commission/Ministry of Coal Industry	
	FY1996-FY1998	People's Republic of China	● Jinzhou Heat-power General Co., Ltd.	The State Planning Commission/Planning Committee of Liaoning Provinces	
	FY1996-FY1999	People's Republic of China	● Zhejiang Huba Corporation	The State Planning Commission/Zhejiang Provincial Planning Commission	
	FY1997-FY1999	Thailand	● Saraburi factory of Indorama Chemicals (Thailand) Ltd.	Department of Industrial Works, Ministry of Industry	
	FY1997-FY2001	People's Republic of China	● Liaoyuan City Heating Power the Source of Energy Co.	The State Planning Commission/Jilin Provincial Planning Commission	
Pre-combustion cleaning					
Briquette production unit	FY1993-FY1995	People's Republic of China	● Tangzhuang Mine of Linyi Coal Mine Administration	The State Planning Commission/Ministry of Coal Industry	
			● Tanjung Enim Mine		Ministry of Mines and Energy
			● PT. Alas Wiratema Briket		Ministry of Mines and Energy
			● Electricity Generating Authority of Thailand Mae Moh Mine		Department of Industrial Works, Ministry of Industry
			● Filipines Systems Inc.		Department of Energy
Water-saving coal preparation system	FY1994-FY1997	People's Republic of China	● Wangfenggang Coal Preparation Plant of Huainan Coal Mining Bureau	The State Planning Commission/Ministry of Coal Industry The State Planning Commission/Ministry of Coal Industry	
			● Preparation Plant of Dongtan Coal Mine of Yanzhou Coal Mining Bureau		
Desulfurization-type CWM unit	FY1995-FY1998	People's Republic of China	● Beijing Yanshan Petrochemical Corp.	The State Planning Commission	

● : project of Center for Coal Utilization, Japan ● : project of other organizations

Introduction support projects (Model projects)

- Simplified desulfurization unit
- Coke oven gas desulfurization unit
- Fluidized bed boiler
- Briquette
- Desulfurization-type CWM
- Water-saving coal preparation system

