What can Japan do for Capacity Buildings in Countries with Economies in Transition?

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This paper discusses "the capacity building in Countries with Economies in Transition (EIT Parties)". Chapter 1 focuses on capacity building in EIT Parties in general, then in Chapter 2 the situation in Japan toward implementing the Kyoto Protocol is explained. In Chapter 3 the author discusses potential role of Japan for capacity building and, in Chapter 4 touches upon newly published report of Committee for the Promotion of Cooperation for which the author is the chairman. In Chapter 5 methodologies to select most efficient Joint Implementation (and CDM) projects are discussed and in the last chapter relationship between risk avoidance and capacity building is considered.

1. Capacity Building in EIT Parties

Capacity building in EIT Parties is described in Decision 3/CP.7 of the Marrakesh Accords. According to the decision, objective of capacity building is "to build the capacity of EIT Parties to enable them to effectively implement the objective of the Convention and to prepare for their participation in the Kyoto Protocol when it comes into force". Though priority areas vary by country, several examples are listed in the Decision (Decision 3/CP.7 Annex C); they are;

(a) National greenhouse gas (GHG) inventories;
(b) Projections of GHG emissions;
(c) Policies and measures, and the estimation of their effects;
(d) Impact assessment and adaptation;
(e) Research and systematic observation;
(f) Education, training and public awareness;
(g) Transfer of environmentally sound technologies;
(h) National communications and national climate action plans;
(i) National systems for estimation of GHG emissions;
(j) Modalities for accounting relating to targets, timetables and national registries;

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(k) Reporting obligations;
(l) Joint implementation projects and emissions trading.

From the view-point of promoting Joint Implementation (JI) projects, there exists substantial difference between countries that meet the eligibility requirements set out in paragraph 21 of the Annex to Decision 16/CP.7. For those countries that are qualified to the requirements (track 1 countries), a host Party can enjoy much simplified procedure, i.e. a host country may verify reductions in GHG emissions or enhancements of removals and may issue the appropriate quantity of ERUs. On the other hand, any EIT Party which is not qualified to the requirements (track 2 countries) are obliged to follow almost the same procedure as CDM projects, that are very time-consuming and costly. There should be big differences in transaction cost, hence must lead to reduction of numbers of JI projects.

The qualification requirements mentioned above include, for example, having national system for the estimation of GHG emissions and removals, national registry, having submitted annually the most recent required inventory, etc. If readers look again several examples of priority areas in capacity building in EIT Parties, they will immediately find these items there. Therefore, in order to be qualified as “track 1” countries for JI, capacity building in general priority areas is also essential.

2. Japan's situation to implement Kyoto Protocol commitment

Japanese government has decided to ratify the Kyoto Protocol during this session of the Diet. Though ratification issue is under discussion at the Congress it is expected that Japan will finally ratify the Protocol in due course. In November 1997, one month before the Kyoto Conference (COP3), a joint committee on climate change agreed to stabilize energy-origin CO2 emissions in 2010 at 1990 level. The model used showed CO2 emissions will increase by 20% during this period if no new policies or measures are adopted. This means BAU (business as usual) emissions in 2010 will be 20% higher than that of 1990. In order to implement this target (20% reduction in comparison to BAU level), various measures, including strengthening of energy efficiency standards (so-called top runner methods), promotion of nuclear power plant capacity and introduction of voluntary action plans of industries, have been proposed (actually voluntary action plan had been launched in June 1997).

However, in December 1997, the Kyoto Protocol was adopted and Japan's emission reduction commitment was set as 94% of 1990 GHG emissions. To cope with the new situation, Japanese Government adopted “The Climate Change Policy Programme” and

introduced additional measures to reduce its emission for further 6%. Among them 1.8% reduction by utilizing Kyoto mechanism was included. Since 1998, laws have either been introduced or revised as follows.

•Law Concerning the Promotion of the Measures to Cope with Global Warming (1998)

•Revision of Law Concerning the Rational Use of Energy (1998)

However Japan's GHG emission has been continuously increasing, due to mainly increase in transportation and commercial/household sectors, and in 1999 Japan's GHG emission has increased 6.8%. In submitting to the Diet the Kyoto Protocol for approval, the Government adopted "The New Climate Change Policy Programme" in March 2002 to ensure Japan's compliance to the Protocol (refer to Annex B, tentative translation by the Japanese Government). According to the Programme, further strengthening of above two laws as well as introduction of a new law have been submitted to the Diet. In view of the above, it is clear that Japan will implement its commitment mainly through domestic measures. As Japan's marginal abatement cost is among the highest in the world, it is also clear that without utilizing the Kyoto mechanisms it will be impossible to achieve its target under the Protocol. At this moment, it is expected, that it is necessary to acquire annual average of at least 1.6% (approximately 20 Mt, CO2 equivalent) of AAU, ERU, CER and RMU. It is possible that the 1.6% may increase due to the economic/social situation. Therefore, Kyoto mechanisms will play an important role to achieve the Japanese target of GHG reduction.

3. What can Japan do for Capacity Building in Countries with Economies in Transition

In December 2001, "Committee for the promotion of co-operation in CDM activities as part of climate change measures (Committee for the Promotion of Cooperation)" was established and the author of this paper was nominated as a chairman of the committee. JICA (Japan International Cooperation Agency) serves as secretariat and committee members consist of experts from academia, think tank, NEDO (New Energy and Industrial Technology Development Organization) and JBIC (Japan Bank for International Cooperation)[2]. So far as AIJ (Activities Implemented Jointly) is concerned, NEDO was one-step ahead of other organizations. It is enough to show just one example, i.e. all AIJ projects formally registered UNFCCC are the ones NEDO supported financially. However scope of activities of NEDO is limited in that it is confined to either energy efficiency improvement or development of alternative energy than oil (excluding

[2] In addition, several government officials from Ministry of Environment, Ministry of Economy, Trade and Investment, Ministry of Foreign Affairs and other stakeholders including JETRO (Japan External Trade Organization) attended as observers.

power generation sector). The purpose is to disseminate existing technologies in Japan to developing countries through a “model” project. This means NEDO cannot try to disseminate the same type of technology in the same country once it has been introduced.

On the other hand JICA is the agency to assist developing countries as well as EIT Parties in tackling climate change issues mainly in technical cooperation field. Just to mention a few examples; to send technical cooperation experts for research activities or training, to accept human resources from other countries for education and training, to advise developing countries and EIT Parties to form a national strategic plan etc. During the year 2000, 17,513 persons were invited to Japan for training, 9,428 members of study team were dispatched and 3,381 experts were sent from Japan (and other countries). Though numbers are rather small, 948 among them are to/from EIT Parties. Please refer to Table 1 on page 9 where you will find several concrete examples of JICA's cooperation toward climate change capacity buildings (sending experts or inviting relevant people for training in Japan etc.) in Countries with Economies in Transition.

JBIC is the bank in charge of both ODA (Official Development Assistance) and OOF (other official flow). Its outstanding amount in 2000 is almost as big as the World Bank (¥21,057 billion for the former and ¥21,708 for the latter). As shown in table 1 (OOF) and 2 (ODA), JBIC has contributed directly or indirectly for reduction of GHG emissions through loans for energy efficiency improvement, fuel switching and promotion of non-renewable energy projects. It is clear that JBIC concentrated its efforts on developing countries. However this does not mean it excludes loans to EIT Parties. As a matter of fact there are a few JBIC-supported projects in these countries. In addition there is a scheme called “Special Assistance for Project Formation”. This scheme, as well as JICA experts and/or study team, can be utilized for capacity building in EIT Parties.

Through these agency or organizations, Japan can contribute both for capacity building in EIT Parties and for promotion of GHG emission reduction or removal enhancement projects. However, it is a rather recent phenomenon that these agency and organizations put priority on climate change issues, and communication and cooperation among them are not as smooth as expected. This is the background of establishing a Committee for the Promotion of Cooperation (among them).

4. Committee Report

After intense discussions of the Committee, a report was published (English version should be available shortly at JICA URL http://www.jica.go.jp). The purpose of this committee is to explore how JICA and other government related organizations will be

able to promote CDM project activities in developing countries and how well they can co-operate each other. However, most part of the report can be applicable to EIT Parties as well. For example, it is important, the report says, to choose a project that helps not only to reduce GHG emissions but also has ancillary benefit of reducing air and water pollutants. This is because developing countries have to cope with economic growth, air/water pollution and climate change simultaneously. In this respect, situation may be the same in EIT Parties.

The report puts emphasis on the important role of the Kyoto mechanisms for Japan to implement its commitment. Then it discusses the role of public fund and ODA toward promotion of CDM (as mentioned above, the discussion can also be applied to JI). As to role of public fund, the report argues, first of all, that public fund should be used for “capacity building”. For that purpose it is important to remove technical, organizational and institutional barriers and only public fund can be of great assistance for this purpose. Also, providing information and educational opportunity on climate change (and JI) related issues are among urgent needs, and public fund can play a pivotal role in this field. Another assistance public fund can provide is to dig up potential projects and to make private investments less costly.

Then the report discusses what role can ODA play. Similar points are repeated here. They are; enhancement of communication with all stakeholders in host countries through, for example, workshop or seminar, and capacity building through technology transfer and training/education. The latter include data collection for national GHG inventories, monitoring methodologies and national strategy studies in cooperation with host country. Another point mentioned in the report is to assist organization/institution in charge of national GHG inventories, national communications, projections of GHG emissions, monitoring, etc. All issues mentioned here are categorized as “capacity building”. And JICA, with its hundreds of experts and past experience to have accepted more than 200,000 trainees from overseas, must be one of the most reliable organization for this purpose. The report also describes that it is an important role of ODA to provide training personnel in private entities in host countries that are potential candidates for JI/CDM.

As shown above, the report first explains the importance of the Kyoto mechanisms for Japan to comply with the Protocol, then, attracts readers' attention to the roles of public funds and ODA, that is, to assist capacity building of host countries in a broad sense.

5. Methodologies to select most efficient JI projects

For the past three years the author and its group, with Chinese colleagues' cooperation, are engaged in research project in search of methodologies to select most efficient CDM projects in China. As it is expected that the interim study outcome will be of some use to JI projects in EIT Parties, essence of the study, though very briefly, is presented here. The subject of the study is the power generation plant in the Northern District of China.

According to the data provided by Chinese colleague and the data obtained through Chinese web sites, there exists 293 units of coal-fired power stations in China's major power generation plants (the capacity of which is more than 1,000 MW) and their total capacity is 82,122 MW. The author's group has not been able to obtain detailed data of Northern power plants yet. However this does not affect our methodology. Each unit's capacities vary from 50 MW to 600 MW. With the help of a skilled engineer from Hitachi (the person who actually designed still-operating several power stations in China), and also taking Chinese Government policy into consideration (for example, the Government have already decided all 50 MW stations should be scrapped as scheduled), all power stations are classified into 2 categories and 8 groups. For example all 50 MW and superannuated 100 MW stations are classified into category 1 and all other stations (but built before early 1980s) into category 2. The remaining stations that are neither classified into category 1 nor category 2 are rather new and efficient ones therefore it is supposed that there are no rooms for CDM projects. To calculate CO2 emission reduction, it is assumed that all stations in category 1 should be scrapped and newly built under CDM projects. However, for newly built plants, two different kinds of stations are assumed; one to replace with Gas-Steam Turbine Combined Cycle Plant and the other is to replace with coal-fired larger capacity and high efficiency equipment with Japanese advanced technology. For category 2 stations, they are not so obsolete but not efficient enough. This means it is inappropriate to scrap them immediately but there are rooms for CDM as certain amount of CO2 reduction can be expected by modification. Again the power stations in this category are classified into two groups by their size then divided them again into two sub groups; one type is suitable for major modification and another type for minor modification. Accordingly 8 different groups with different CDM options are available.

Using these options, and assuming baseline emissions remain unchanged throughout the project period[3], it is now possible to calculate cumulative CO2 emission

[3] In calculating baseline emissions for scrap & build cases (50MW and 100MW equipments), we assumed equipments with China's most advanced technology will be introduced if CDM projects would not have been introduced.

reduction for each option but with three different crediting periods, i.e. 7, 14 and 21 years (refer to paragraph 49 of the Annex to Decision 17/CP.7). As calculation has not finished yet due to lack of data, the author would like to present here the methodology for choosing the most cost-effective CDM (JI) option. As explained in Annex A Figure 2, cumulative CO2 emissions for baseline case and several different CDM options are calculated firstly. The difference between cumulative baseline emissions and that of each option is the amount of cumulative emission reduction, therefore this difference should be deemed as "credit". Then using data provided by our Chinese colleagues, current values of cumulative profits for baseline and other option cases are calculated (Figure 1). The difference between baseline cumulative profits and that of each option is a "cost". Suppose this cost is borne by investors. By dividing credit by cost, reduction cost per 1 ton of CO2 can be obtained. Investors can choose the best option among 8 cases and 3 crediting periods.

This is the methodology the author and its group have been studying. The feature of this study is that this is based on detailed and precise data and also on the way of classifying CDM options that will be most likely. Though we are at the stage of gathering data for all existing power stations in Northern District of China, it is author's intention to expand the scope of research to other energy intensive sectors in the same district, and if data are available, to other districts of China. This research outcome, if completed, will be of great use for potential investors to China as well as Chinese central/local governments and enterprises. However this methodology can be used by any host country governments/enterprises and investors. In this sense, this research activity is expected to contribute for the promotion of JI projects activities in Hungary and other EIT Parties.

6. Case study – Coping with Risks

The last subject of this paper is to examine the risks peculiar to JI and to point out that it is absolutely important for all interested parties to reduce them in order to promote JI projects. Currently one Japanese enterprise is planning to invest in JI project here in Hungary. The enterprise carried out a feasibility study. In the process of the study, they found various risks that are either ordinary risks accompanying to any project or risks peculiar to Kyoto Mechanisms. The former risks include, for example, completion risk (whether the project can be completed within a period), permission risk (whether the project may be able to obtain permission to proceed), counter-part's bankruptcy risk, political risk (project may be forced to be suspended due to political instability) etc. etc. However there are other kinds of risks that are peculiar to the

Kyoto Protocol and the Kyoto mechanisms. What kind of risks are they?

First of all, what will happen to the investors if the Protocol will become invalid or the host country governments will withdraw from the Protocol for some reason? In these cases investors cannot obtain any CERs. These situations surely affect investors' decision.

The second type of risks is closely related to JI provisions. Here are some examples. There is a risk that a host country, that is expected to meet the eligibility requirements described in paragraph 21 of the Annex to Decision 16/CP.7, may be deemed not to meet them (for example, it has not in place by the end of the year 2006 a national system for the estimation of GHGs' emissions or removals). If the host countries meet the requirements, the country can verify emission reductions or enhancement of removals by sinks as being additional, and upon such verification, the host country can issue ERUs (paragraph 23 of the same Annex). However once the country is deemed not to be qualified, verification procedure of emission reductions and/or enhancements of removal by sinks shall, as discussed in Chapter 1, be subject to article 6 supervising committee and whether the reductions and/or enhancements are "additional" or the project's baseline is appropriate etc. are subject to accredited independent entity's decision. In this case, new procedure will become almost the same one as CDM projects and become costly and time-consuming than what it otherwise would be. Even in this case, unless three conditions (host country is a Party to the Protocol, its assigned amount has been calculated and recorded, and it has national registry as described in the applicable provisions) can be met, no CERs shall be issued nor transferred to investors (paragraph 24 of the above mentioned Annex). Another risk falling into the same category is the possibility that a host country's commitment period reserve will become less than 90% of the assigned amount or 100% of five times its most recently reviewed inventory. In this case it is prohibited for that country to transfer any ERU and investors are not able to receive any credit (paragraph 8 of the Annex to Decision 18/CP.7).

The third type of risks peculiar to the Kyoto mechanisms is a fluctuation of the price of ERUs. However, this can be considered as ordinary commercial risk.

To promote JI projects in EIT Parties, investors are recommended to assess the risks associated with projects prudently. But it is also necessary for governments of both host and home countries to take necessary steps to reduce those risks. And, as shown above, especially in order to reduce the second type of risks, capacity building in EIT Parties should play an important role. Hence from almost all aspects, it is clear that cooperation toward capacity building is the key for the Kyoto mechanisms to bring about expected benefits both for investors and host countries.

Table 1 Example of JICA Activities for the Global Warming Prevention in Countries with Economies in Transition (FY 2000)

Country	Field		Cooperation Type
Albania	Thermal Power Generation	Energy Conservation/ Alternative Energy	Group Training in Japan
	Environmental Administration	Environmental Administration & Management	Country Focus Training in Japan
	Energy Conservation	Energy Conservation/ Alternative Energy	Country Focus Training in Japan
Bulgaria	Environmental Administration	Environmental Administration & Management	Country Focus Training in Japan
	Energy Conservation	Energy Conservation/ Alternative Energy	Country Focus Training in Japan
	Energy Conservation	Energy Conservation/ Alternative Energy	Group Training in Japan
	Energy Conservation Center	Energy Conservation/ Alternative Energy	Project Type Cooperation
Croatia	Energy Conservation	Energy Conservation/ Alternative Energy	Country Focus Training in Japan
Czech	Environmental Administration	Environmental Administration & Management	Country Focus Training in Japan
Slovakia	Environmental Impact Assessment (Forest)	Forest Conservation & Management	Dispatch Experts
	Environmental Administration	Environmental Administration	Group Training in Japan
	Environmental Mapping		Group Training in Japan
	Environmental Impact Assessment and Forest Conservation	Forest Conservation & Management	C/P Training in Japan
Estonia	Conservation of Wetland Ecosystems and Biological Diversity	Biodiversity Conservation	Group Training in Japan
	Energy Conservation	Energy Conservation/ Alternative Energy	Country Focus Training in Japan
Latvia	The Study on the Environmental Management Plan for Lubana Wetland Complex in the Republic of Latvia	Biodiversity Conservation	Development Study
	Wetland Conservation	Biodiversity Conservation	C/P Training in Japan
Lithuania	Environmental Administration	Environmental Administration	Country Focus Training in Japan
	Energy Conservation	Energy Conservation/ Alternative Energy	Country Focus Training in Japan
Romania	Environmental Conservation Advisor	Environmental Management Capability	Dispatch Experts
	Environmental Conservation	Environmental Management Capability	Dispatch Experts
	Energy Conservation	Energy Conservation/ Alternative Energy	Country Focus Training in Japan
	Environmental Administration	Environmental Administration	Country Focus Training in Japan
	Environmental Conservation	Environmental Management Capability	C/P Training in Japan
Hungary	Environmental Management (ISO)	Environmental Administration	Dispatch Experts
	Assistance of Global Warming Prevention	Environmental Management Capability	Dispatch Experts
	Environmental Administration	Environmental Administration	Country Focus Training in Japan
Poland	Energy Conservation	Energy Conservation/ Alternative Energy	Country Focus Training in Japan

Table 2 Climate Change related loans from Other Official Flow (April 1998 – June 2001)

NO.	Date of L/A	Country	Amount (¥million)	Project name
Environmental Conservation and Improvement				
1	Sep-99	Korea	121,520	Two Step Loan for Infrastructure, Environment and Energy Conservation Projects
2	Sep-00	Venezuela	48,300	Puerto La Cruz Oil Refinery Modernization project
3	Jun-98	Brazil	1,000	Environmental Improvement Project for Pelletizing Plant
4	Sep-98	Brazil	133	Waste Liquid Combustion Project
Cogeneration Projects				
5	Jul-98	China	9,100	Jinlin Hadawan Wan Cogeneration Project
6	Jul-98	China	7,800	Jinlin Cogeneration Project
7	Jan-99	China	9,380	Baqiao Cogeneration Power Plant Renovation Project
Natural Gas Exploitation, Energy saving				
8	Sep-98	Thailand	9,036	Krabi Thermal Power Plant Project
9	Sep-98, Sep-99	Thailand	26,066	Ratchaburi Thermal Power Plant Project
10	Sep-98, Sep-99, Sep-00	Thailand	27,034	Ratchaburi Combined Cycle Power Plant Project
11	Nov-00	Philippines	22,480	Ilijan Combined Cycle Power Plant Project
12	Oct-98	India	6,979	Combined Cycle Power Plant Project
13	Jun-99	Tunisia	9,782	Combined Cycle Power Plant Project
14	Jun-98	Mexico	8,247	Mérida III Combined-cycle Gas-fired power plant Project
15	Sep-00	Mexico	11,401	Chihuahua Combined Cycle Power Generation
16	Mar-01	Mexico	14,062	Tuxpan II Combined Cycle Power Plant Project
17	Jun-99	Argentina	6,856	Natural Gas-Fired Power Plant (826MW) Project
18	Feb-99	Korea	25,669	Loans to Support Korea's Energy Sector (LNG)
19	May-99	Colombia	18,035	Medellin City Electricity and Natural Gas Distribution Project
New and Renewable Energy				
20	Jun-99	Philippines	12,000	Leyte Mindanao Geothermal Plant Improvement Project
21	Jun-00	Philippines	22,000	Leyte Mindanao Geothermal Plant Improvement Project
22	Jun-00	Mexico	4,760	Cerro Prieto Geothermal Power Plant Project
Emission Reduction by Mass Transit				
23	Nov-98	China	26,000	Shanghai Urban Looproad Project
24	Jul-99	Hong Kong	19,924	Hong Kong Special Administrative Region Railway Expansion Project
25	Sep-99	Hong Kong	950	Hong Kong Special Administrative Region Railway Expansion Project
26	May-01	Egypt	6,257	Cairo Subway Expansion Project

Table 3 Climate Change related ODA loans

List of Projects for Energy Efficiency, Renewable Energy etc(FY1990～FY2000)			
Country	**Project Name**	**Date of L/A**	**Amount of Environmental Project (\ million)**
(a) Energy and Resource Saving			
Thailand	Promotion of Electricity Energy Efficiency Project	22-Sep-93	\2,800
Thailand	Local Cost Financing Program (MRTA Initial System Project)	31-Jul-98	\29,792
Philippines	Metro Manila Strategic Mass Rail Transit Development (Line 2) Project (PhaseIII)	10-Sep-98	\23,668
Thailand	MRTA Initial System Project (Blue Line) (III)	30-Sep-98	\23,343
Bosnia	Emergency Electric Power Improvement Project	17-Dec-98	\4,110
China	Power Distribution System Rehabilitation Project (Chongqing)	25-Dec-98	\13,754
Malaysia	Port Dickson (Tuanku Jaafar) Power Station Rehabilitation Project	4-Mar-99	\49,087
Bangladesh	Ghorasal Urea Fertilizer Factory Project (2)	15-Jul-99	\5,443
Turkey	Bosphorus Rail Tube Crossing Project	17-Sep-99	\12,464
Thailand	MRTA Initial System Project (Blue Line) (IV)	29-Sep-99	\64,228
Malaysia	Port Dickson Power Station Rehabilitation Project (2)	31-Mar-00	\53,764
Philippines	LRT Line 1 Capacity Expansion Project (Phase II)	7-Apr-00	\22,262
Thailand	MRTA Initial System Project(Blue Line) (V)	22-Sep-00	\45,818
China	Beijing Urban Railway Construction Project	23-Oct-00	\14,111
Mongolia	Rehabilitation Project of the 4th Thermal Power Plant in Ulaanbaatar	26-Mar-01	\6,139
China	Chongqing Urban Railway Construction Project	30-Mar-01	\27,108
China	Wuhan Urban Railway Construction Project	30-Mar-01	\2,894
(b) New and Alternative (Renewable) Energy			
Brazil	Ceara State Wind Power Plant Construction Project	1-Aug-97	\6,020
Azerbaijan	Servernaya Gas Combined Cycle Power Plant Project	27-Feb-98	\20,699
Philippines	Metro Iligan Regional Infrastructure Development Project	10-Sep-98	\1,164
China	Henan Panshitou Reservoir Construction Project	25-Dec-98	\298
China	Hunan Yuanshui River Basin Hydropower Development Project	25-Dec-98	\17,664
Vietnam	Phu My Thermal Power Plant Project (IV)	30-Mar-99	\13,090
Vietnam	Dai Ninh Hydropower Project (I)	30-Mar-99	\4,030
Azerbaijan	Servernaya Gas Combined Cycle Power Plant Project	14-Oct-99	\18,332
Malaysia	Kenyir Hydroelectric Power Plant Project II	31-Mar-00	\16,994
Vietnam	Dai Ninh Hydropower Project (II)	30-Mar-01	\10,000
China	Zipingpu Multi-Purpose Dam Construction Project	30-Mar-01	\8,648
China	Shandong Tai'an Pumped Storage Power Station Project	30-Mar-01	\18,000
China	Hubei Small-Sized Hydropower Project	30-Mar-01	\9,152
China	Gansu Small-Sized Hydropower Project	30-Mar-01	\6,543
(c) Monitoring			
Indonesia	The Bapedal Regional Monitoring Capacity Development Project	29-Nov-94	\2,935
Philippines	Environmental Equipment Project for Power Plants	20-Dec-94	\457
India	Industrial Pollution Control Project (Institution building portion and technical assistance portion)	28-Feb-95	\1,525

Annex A

Methodology for Choosing JI/CDM Projects

Purpose of this study

We develop a methodology for choosing JI/CDM projects

Basic Assumptions

Consider a power plant in China that is using coal as fuel.

In what follows, we call the Plant X.

We assume that Plant X keeps using coal as fuel without JI/CDM.

JI/CDM options are as follows:

(a) Scrap & build and fuel switching to natural gas

(b) Scrap & build and keeps using coal as fuel,

(c) Keep using coal as fuel and improves the efficiency (no scrap & build)

Options for project credit period are 7years, 14years and 21years.

Discount sum of cumulative profits of each project is drawn as in Figure 1.

Cumulative CO2 emission reduction of each project is drawn as in Figure 2.

Figure1 Discount sum of cumulative profits of each project

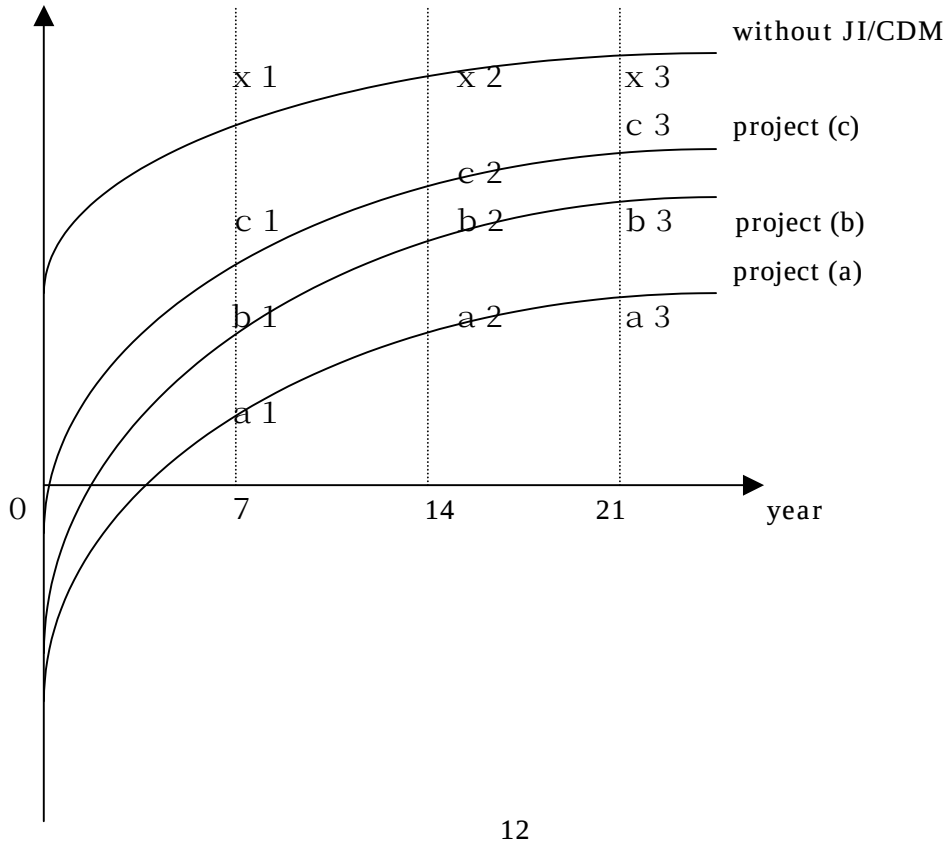
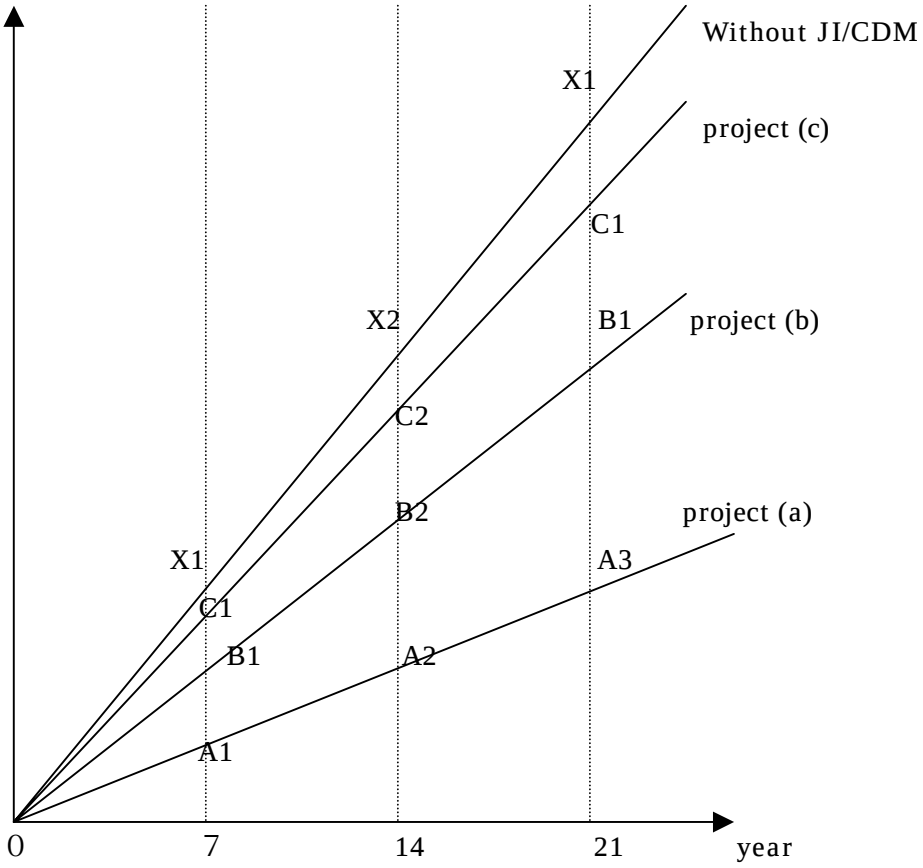


Figure2 Cumulative CO2 emission reduction of each project



Costs for JI/CDM

We can express the costs for each JI/CDM project as follows:

	project(a)	project(b)	project(c)
7years project	x1a1	x1b1	x1c1
14years project	x2a2	x2b2	x2c2
21years project	x3a3	x3b3	x3c3

Amount of CO2 reduction

We can express the amount of CO2 reduction for each JI/CDM project as follows:

	project(a)	project(b)	project(c)
7years project	X1A1	X1B1	X1C1
14years project	X2A2	X2B2	X2C2
21years project	X3A3	X3B3	X3C3

Cost to reduce 1 ton of CO2

Combining costs for JI/CDM and CO2 emission reduction, we can have cost to reduce 1 ton of CO2 for each JI/CDM project as follows:

	project(a)	project(b)	project(c)
7years project	$\frac{x1a1}{X1A1}$	$\frac{x1b1}{X1B1}$	$\frac{x1c1}{X1C1}$
14years project	$\frac{x1a2}{X1A2}$	$\frac{x1b2}{X1B2}$	$\frac{x1c2}{X1C2}$
21years project	$\frac{x1a3}{X1A3}$	$\frac{x1b3}{X1B3}$	$\frac{x1c3}{X1C3}$

Project of which CO2 cost is the lowest is the project we should choose.

N.B. The above methodology is the outcome of our research activities, and special thanks to Messrs. Yasunori FUJITA, Assistant professor, Keio University, Kuniyuki NISHIMURA senior staff researcher, Mitsubishi Research Institute, and Minoru FUJII, Senior Technical Advisor, Hitachi Engineering Co., Ltd.

Annex B

The New Climate Change Policy Programme Tentative Translation

19 March 2002

Decision by the Global Warming Prevention Headquarters
Government of Japan

The Government of Japan has adopted the New Climate Change Programme on 19 March, 2002, which aims to stipulate policies and measures necessary for the achievement of the 6% emissions reduction commitment under the Kyoto Protocol. The Government of Japan also submitted to the Diet the Bill on Amendments of Climate Change Policy Law as well as the Kyoto Protocol for its approval to becoming a Party to the Protocol. After the passage of the Bill as well as Diet's approval, the Government of Japan will become a Party to the Protocol and upgrade the New Climate Change Policy Programme into the Statutory Kyoto Target Achievement Plan.

(Key Points of the Programme)

The Fundamental Principles

i) ***Contribute to Both the Environment and Economy*:** Climate change policy shall be developed and implemented so as to contribute to both of the environment and economy with the aim of revitalizing the Japanese economy through innovative initiatives of industry.

ii) ***Step-by-Step Approach***: The period between 2002 and 2012 shall be divided into three terms, and the progress of domestic policies and measures and the state of greenhouse gases emissions shall be assessed and reviewed before the start of the each term. Based on the analyses and reviews, the Programme shall be revised where necessary so as to take additional policies and measures, where necessary, on a step-by-step basis.

iii) ***Shared Responsibility***: All state and local governments, industries and the general public must share in efforts to prevent the global warming.

iv) In***ternational Co-operation in Climate Change Policy*:** In order to ensure the effective of actions against global warming, it is important to establish a common rule in future in which all countries including the United States and developing countries participate. The Government of Japan continues its maximum efforts for the establishment of a common rule.

Main Points of the Programme

i) ***More than a Hundred Policies and Measures:*** The new Programme stipulates all the policies and measures necessary for the achievement of the 6% reduction commitment under the Kyoto Protocol. The Programme stipulates more than 100 domestic measures and policies to

achieve the commitment. The statutory Kyoto Protocol Target Achievement Plan shall be drafted based on the new Programme according to the Bill on Amendments of the Climate Change Policy Law.

ii) ***Quantitative Targets for the Achievement of the 6% Reduction Commitment:*** To achieve the 6% emission reduction commitment, the new Programme establishes quantitative emission reduction targets (see the table below).. In attaining these targets, the Government shall continue its emission reduction efforts beyond these targets where possible.

Table: Quantitative Targets for Greenhouse Gases and Sectors

CO2 emissions from energy use	±0%
CO2 emissions from non-energy use, methane emissions, and nitrous oxide emissions	−0.5%
Emissions of HFCs, PFCs and SF6	+2.0%
Reductions by innovative technologies and change of lifestyle	−2.0%
The use of Sinks	−3.9%

The Government shall also study the way to use the Kyoto Mechanisms with due consideration to their supplementary nature and the fact that it is the government that is legally responsible for the achievement of the 6% emission reduction commitment.

iii) ***Follow-ups and Revision:*** The Government shall conduct comprehensive review of the progress of the Plan in 2004 and 2007. Based on the results of these reviews , the Government shall revise the Plan, where necessary, to ensure the achievement of the 6% emissions reduction commitment.

iv) ***Public Consultation:*** While the Programme was drafted taking into account results of public consultations by government advisory councils, the Government shall further consult with various stakeholders and the general public before it adopts the Kyoto Target Achievement Plan based on the new Programme.

Measures for reduction of GHGs Emissions（main examples）

① CO2 emissions from energy use（Targets: ±0% compared to the 1990 level）

	Industry Sector	Domestic Sector (commercial and residential)	Transport Sector
Energy Conservation 22mt-CO2	• Solid implementation and follow-ups of Voluntary Action Plans by industries (Emission level in 2010: below ± 0% compared to the 1990 level) • R&D of high efficient boilers and lasers • Promotion of high efficient industrial furnace	• Application of energy management system to the large commercial buildings etc. based on amendment of the Energy Efficiency Law ・Scope expansion of appliances to "Top Runner Standards" (e.g. gas appliances) ・Promotion of high efficiency water heating ・ Promotion of HEMS and BEMS	・Accelerated introduction of vehicles achieving "Top Runner Standards" ・Acceleration of R&D and dissemination of low emission vehicles including clean energy vehicles ・Traffic flow management by promotion of ITS etc ・Promotion of efficient Logistics systems Including shift of transport modes from trucking to shipping ・Promotion of public transport utilisation
New Energy 34mt-CO2	・Add biomass and snow and ice cryogenics to energy which is promoted by Law concerning promotion of the use of New Energy ・Proposal of the Bill concerning the Use of New Energy by Electric Utilities. ・Subsidies to promote introduction of Photovoltaic power, Solar thermal, wind power ,waste power, biomass energy etc. ・Strengthen R&D and demonstration tests on fuel cells, photovoltaic power, biomass energy, etc.		
Fuel switching 18mt-CO2	・Assist fuel switching from coal to natural gas for old power generation ・Assist fuel switching for industrial boilers ・Develop safety standards on natural gas pipelines		
Nuclear Promotion	・Promotion of nuclear power under assurance of safety ・Assist economic development of municipalities hosting nuclear fuel cycle		
（*1）	approx 462mt-CO2（▲7%）	approx 260mt-CO2（▲2%）	approx 250mt-CO2（+17%）

（*1） （…） is percentage of reduction compared to base year 1990 of each sector

※Quantities of emissions (% of increase/decrease) referred as targets in each sector are not compulsory targets but the expedient estimations through the model simulations under certain conditions.

※Evaluation of measures shall be conducted taking consideration of Japanese energy supply and demand structure.

※It is expected that Kyoto mechanism is utilized for industries to reduce GHG cost effectively.

②Reduction of CO2 emissions from non-energy use, methane emissions and N_2O emissions.（Reduction Target：0.5% reduction below the baseline year level compared to the aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases in Japan）

Control of CO2 emissions from non-energy use	Reduction of waste incineration by reduction, reuse and recycling of waste material.
Control of Methane emissions	50% reduction of waste material to be buried in the ground R&D of agricultural sector GHG reduction
Control of N_2O emissions	Voluntary measures by industry (necessary measures have been already taken and substantial reduction has been achieved)

③Promotion of Innovative technology development and climate change protection activities by every sector of society.（Reduction Target : Emissions reduction equivalent to 2% of the Japanese target under the Kyoto Protocol）

Innovative technology development	R&D of energy efficient industrial processes; development of materials for light weight vehicles, energy efficient electric appliances; and development of low energy loss energy distribution systems for low electric power less.
Further efforts by various sectors and the general public	Reductions by innovative technologies and change of lifestyle

④Containment of emissions of HFCs, PFCs, SF6（Targets: contain the increase of their emissions to less than a 2% increase above the baseline year level compared to the aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases in the baseline year in Japan）

・The follow-up of voluntary action plans by industries ・Development of new alternative substances ・Low cost and compact technology for reusing and decomposing fluorine gasses ・Steady implementation of Recycling of specified Domestic Appliances Law and Fluorocarbon Recovery and Destruction Law

⑤Sinks（Target: 3.9% of the total Japanese emission allocation under the Kyoto Protocol）

Promotion of activities for sound forest management including plantation, thinning and rehabilitation of forests, promotion of timber and wood biomass use and the greening of urban areas