Case Study Report on Capacity Development

Analysis from a Capacity Development Perspective

Energy Conservation Sector

March 2008

Institute for International Cooperation
Japan International Cooperation Agency

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Published by: Research Group, Institute for International Cooperation (IFIC),
Japan International Cooperation Agency (JICA)
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Foreword

Although the term “capacity” used in “capacity development” originally refers to the “ability,” JICA defines it as the ability of developing countries “to set and attain goals, and to identify and solve the development issues of their own countries;” in other words “problem-solving abilities.” JICA also regards capacity development (CD) as “the ongoing process of enhancing the problem-solving abilities of developing countries by taking account of all the factors at the individual, organizational and societal levels.”

Based on the idea that CD is a useful concept in reexamining the nature of its projects, JICA attempts to systematically incorporate the idea of CD into its projects. In fiscal 2005, it conducted research activities chiefly for (i) a review on the concept of CD, (ii) an analysis of the trends of other donors and (iii) analysis of the case study of JICA projects from a CD perspective. The emphasis is placed on continuous analysis of past examples of cooperation for systematization and accumulation of project experience.

JICA has a substantial track record in technical cooperation in the Energy Conservation Sector. It has carried out technical cooperation projects in seven countries, namely China, Argentina, Bulgaria, Turkey, Thailand, Iran and Poland. This research assesses these cooperation projects in the field of energy conservation and in terms of CD perspective to serve the purpose of creating educational materials for understanding CD and a checklist in capacity assessment for CD for the purpose of planning and implementing projects.

The findings of the case study discussed in this research will be used by JICA as training materials for staff training, pre-dispatch training for experts and expert development training, which has been renamed “capacity development training” in fiscal 2006. I sincerely hope that the analysis in this research will be extended with on-site practice and discussion. I would like to take this opportunity to express my sincere gratitude to everyone who has worked on energy conservation projects for their cooperation in the interviews conducted as part of this research.

November 2006
Toru TAGUCHI
Director General
Institute for International Cooperation
Japan International Cooperation Agency

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List of Abbreviation

CIPURE	The Rational Use of Energy Research Center, Argentina (Centro de Investigación y Desarrollo para el Uso Racional de Energía)
C/P	Counterpart
DEDE	Department of Alternative Energy Development and Efficiency, Thailand
DEDP	Department of Energy Development and Promotion, Thailand (later renamed to DEDE)
ECCJ	The Energy Conservation Center, Japan
EEC	Energy Efficiency Center, Bulgaria
ENCON Act	The Energy Conservation Promotion Act, Thailand
ENCON Fund	The Energy Conservation Fund, Thailand
EIE	General Directorate of Electrical Power Resources Survey and Development Administration, Turkey
ESCO	Energy service company, which engages in energy conservation assessment and other services
EU	European Union
FONTAR	Argentine Technological Fund (El Fondo Tecnológico Argentino)
G to G	Government to government
IDB	Inter-American Development Bank
INTI	National Institute of Industrial Technology, Argentina (Instituto Nacional de Tecnología Industrial)
ISO 14000	A series of international standards on environmental management systems set forth by the International Organization for Standardization (ISO) for minimizing environmental impacts caused by enterprises and organizations
NECC	National Energy Conservation Center, Turkey
OJT	On the Job Training
PCM	Project Cycle Management
PDM	Project Design Matrix
PEMTC	Practical Energy Management Training Center, Thailand
PRE	Person Responsible for Energy
RC	Registered Consultant
R/D	Record of Discussion
TP	Training Provider
TOE	Ton Oil Equivalent
TOT	Training of Trainers

Source: International Development Journal (2004) *Lexicon of International Cooperation*, JICA's reports and others

Summary

Background to the Research

In recent years, questions about past development aid have been raised and an active debate on how to improve the situation has been taking place in the international community. The questions include whether or not the technical assistance failed to give full consideration to the consistency of cooperation and, as a result, placed an excessive burden on developing nations, and whether individual projects were run in a manner which led them to fail to take root in the local regions and impeded the initiative of developing nations themselves. Given these circumstances, the concept of capacity development (CD) is attracting growing attention, backed by the idea that aid is essentially expected to bolster the overall capabilities of developing countries to deal with their own issues by themselves and to promote sustainable development.

The Japan International Cooperation Agency (JICA) defines CD as a process of upgrading the overall capabilities of a developing nation to address its own issues, as an entity consisting of players at different levels including individuals, organizations and society. With the conviction that CD is beneficial to its review of the styles and methods of implementing its own projects, JICA is seeking to systematically incorporate the concept of CD into its projects. This research analyzes the technical cooperation in the Energy Conservation Sector from the CD perspective, with the objective of developing educational materials for understanding CD as well as creating a checklist for capacity assessment for CD for planning and implementing projects.

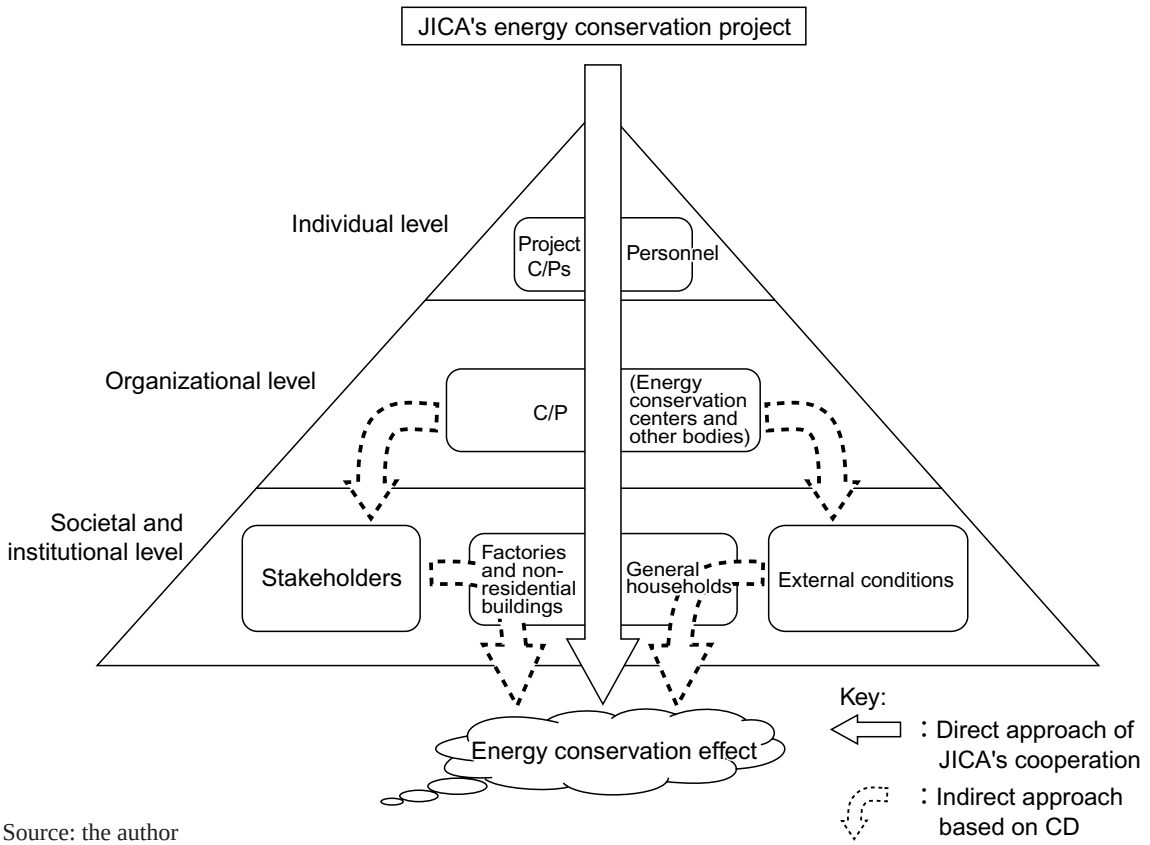
JICA's Initiatives in the Energy Conservation Sector

JICA's efforts to address development issues in the energy and mining sectors include support for the constant supply of electric power, the use of renewable energy and energy conservation. Among these efforts, energy conservation support is provided in the form of a technical cooperation project with the energy conservation center as the project counterpart (C/P) to help create statutory systems for energy conservation, cultivate energy administrators and improve energy conservation assessment technologies as well as to provide energy conservation information for the industrial sector.

Positions of CD and JICA's Cooperation in the Energy Conservation Sector

Figure 1 portrays the actors and factors involved in energy conservation projects and the position of JICA's cooperation. In the context of CD in the Energy Conservation Sector, special attention should be paid to stakeholders and external conditions for the project at the institutional and societal levels. The diagram shows that the main stakeholders are factories, non-residential buildings and general households as end users of energy. Normally classified as the external conditions of projects, statutory systems and policy changes are among those that are key factors influencing the energy conservation of a country involved. In energy conservation projects, although the input from the Japan side is directly offered to project C/Ps, the final goal is to produce an energy saving effect by stimulating end users of energy such as factories. In this sense, it is possible for these projects to strongly encourage certain factories by offering training for energy administrators through project C/Ps and the implementation of energy conservation assessment of factories and other energy consumers, as shown with the solid-line arrow in the chart. However, a comprehensive approach to factories requires voluntary action to boost the ability to promote energy conservation policies

Figure 1 Positions of CD and JICA's Cooperation in the Energy Conservation Sector



Source: the author

on the part of aid receiving nations, as shown by the broken-line arrows in the diagram. It is anticipated that the private sector will take the initiative in creating a mechanism, in which equipment manufacturers, one of the stakeholders, invent new equipment with significant energy savings effects and energy service companies (ESCOs) providing energy conservation assessments and other services flourish, consequently lowering the assessment fee and boosting their technical strength, giving factories an incentive to adopt energy saving measures. It is also thought that a mechanism for encouraging the entire community, including factories, to work towards energy conservation will be established with the help of stronger legislation and institutions that make energy conservation assessment compulsory, the development of a new system for energy administrators and the emergence of a political issue, namely accession to the European Union (EU), as can be seen in Turkey and Bulgaria. However, little action has been taken to create this kind of mechanism in the past. This is because, in principle, JICA engages solely in government-to-government (G to G) cooperation. JICA's projects do not directly target business activities in the private sector. Legislation is also often treated as an external condition of projects. Herein lies the significance of new efforts in formulating, implementing, monitoring and evaluating projects to which the concept of CD is introduced.

Review of Case Study

This study looks at JICA's energy conservation projects in four countries, namely Turkey, Thailand, Bulgaria and Argentina, and examines the position of JICA's cooperation from the CD perspective, and maintenance of the sustainability of CD. The following outlines the achievements in terms of CD perspective produced by the four separate projects.

(1) Turkey

The project in Turkey was the most successful of the four in terms of achieving the project purpose, and from a CD perspective. It attained two results essential to the promotion of energy conservation. The first was the transfer of technologies at individual and organizational levels and the second is institutional development at societal and institutional level. With the strong ownership of the C/P, the sustainability of CD is expected.

(2) Thailand

Quantitative achievements of technology transfer were observed at individual and organizational levels while legislative enhancement, namely an amendment to the Energy Conservation Promotion Act, was unsuccessful at the societal and institutional level. The two aspects may therefore not be well balanced. There remains some uncertainty about the robustness of CD sustainability.

(3) Bulgaria

The transfer of technologies failed to produce adequate results because of the declining motivation of C/P personnel. On the other hand, Bulgaria quickly set up the Energy Efficiency Center and enacted the Energy Efficiency Act so that it could be better prepared for EU accession (as at Nov. 2006). The project produced major achievements in institutional development. However, it was done so quickly that there is still some uncertainty about CD sustainability.

(4) Argentina

With a delay in the setup of a mini plant, the transfer of technologies was insufficient. However, the country already had an ESCO market and local companies had a strong interest in the environment, especially in the ISO 14000 standards. Some factories introduced energy conservation measures, which brought tangible results. Given that Argentina receives inquiries about energy conservation assessments from neighboring countries, CD is expected to maintain its sustainability in the future.

Suggestions for Improvement of JICA's Projects

The following summarizes the suggestions for improving JICA's projects on the basis of the discussions above.

(1) Clarification of CD Perspective in the Project Design Matrix (PDM)

Many of JICA's energy conservation projects define the transfer of technologies to C/Ps as a project purpose and the production of energy savings effects in countries to which assistance is offered as the overall goal. In the context of CD, achieving the overall goal is seen as more significant. In other words, the

transfer of technologies to C/Ps does not mean that the energy conservation effect takes place. The key is to encourage factories and other end users of energy to implement energy conservation measures. From the CD perspective, therefore, the scope must be broadened to encompass the social and statutory systems, which are classified as external conditions in the project design matrix (PDM), and it is imperative to clarify the order: namely, the project purpose comes first, external conditions next and then the overall goal as final. At the moment, however, it is difficult to say that this order is sufficiently examined at the time of creating PDM in the project formulation. More specifically, the key to energy conservation projects is the methodology of how to stimulate factories and other energy consumers (end users) as explained above. There are issues that can be directly and/or immediately addressed within the present scope of energy saving projects, issues that can be addressed merely in an indirect manner and issues that require a long time to resolve. Full deliberations should be made among the parties concerned to create a PDM in consideration of external conditions and overall goals.

(2) Implementation of Capacity Assessment

No specific technical cooperation project can be developed without performing a capacity assessment to study the background, understand the problems that confront the aid recipient countries, and obtain information on their current capacities and the circumstances surrounding the issues in solving the problems. In the Energy Conservation Sector, technical cooperation is centered on the transfer of technologies to C/P organizations. To enjoy a greater effect from CD, it is essential to involve stakeholders and talk them into constructing systems to facilitatee use of the transferred technologies. To do this, it is important to accurately understand the capacity of the recipient country. Capacity assessment is useful for monitoring the level of achievement not only at the stage of project formulation but also at the stage of implementation. It also provides a framework for evaluation at the stage of appraisal.

(3) Creation of a Roadmap (Program Approach)

To bolster the overall ability of developing countries to deal with their own challenge of promoting energy savings initiatives (from the CD perspective), there are in fact many potential things that can be done at the societal and institutional level in the energy conservation area, in addition to the four approaches towards factories described above. Initiatives may, for instance, be classified into different types, such as (a) policies and legal systems, (b) financial support and subsidization systems and (c) public relations, including the provision of information, education and activities to raise awareness. Naturally, it will be necessary to carry out different strategies to implement initiatives according to each individual developing nation. The roadmap is a chronological action plan of what activities or projects should be carried out first in what aspects to achieve the future desired vision, as well as what should be carried out next, given the circumstances surrounding the developing country. Creating the roadmap is helpful for (i) sharing the future vision and the perception of overall picture among those involved in the project both from Japan and from the developing country, (ii) clarifying what issues to address and what issues not to address within the project and what measures to adopt to tackle those issues, (iii) specifying external conditions for projects and (iv) determining the order of separate activities and projects. The roadmap is also a key tool in the program approach, referred as a methodology in which multiple projects are implemented to tackle the issues in an integrated and sustainable manner that JICA is actively addressing at present.

(4) New Developments in Energy Conservation Assistance: Cultivation of ESCO Markets and Expansion from the Industrial Sector to the Consumer Sector

As mentioned in the case study, JICA's energy conservation projects are aimed at promoting energy conservation activities mainly in the industrial sector, such as factories, by transferring technologies to the energy conservation centers of developing countries. This is because first technologies must be transferred to government organizations to promote energy conservation by setting up a structure centered on such centers. Next, to generate effective exertion of energy conservation impacts, factories, as the end users of energy, were designated as the primary target. As the next phase in JICA's assistance, those projects that have completed this first phase will then need to consider the targets among end users in the consumer sector, namely commercial and business buildings and general households, and cultivating ESCO markets by opening the energy conservation assessment market to the private sector. From the viewpoint of CD, these developments are essential.

A Checklist for Capacity Assessment in the Energy Conservation Area

In developing countries, the progress of energy saving initiatives varies depending on the stage of national development. A checklist for capacity assessment containing specific study items is a powerful tool for implementing capacity assessment at individual, organizational and societal levels in the most comprehensive manner. The checklist must be created as a framework for the specific stage at which it is used, such as the stage for identifying issues to address, formulating a project, or the preliminary survey. This study shows two examples of the checklist. One is for the stage of a preliminary survey after an energy conservation project has been identified, for example, after formulating a policy to designate an energy saving center as a C/P. The other is for the stage at which the framework of the project has yet to be determined and where a project is being formulated by examining a wide range of options.

Introduction Overview of this Research

1. Background to the Research

In recent years, questions about past development aid have been raised and an active debate on how to improve the situation has been taking place in the international community. The questions include whether or not the technical assistance failed to give full consideration to the consistency of cooperation and thus placed an excessive burden on developing nations, and whether individual projects were run in a manner in which they failed to take root in the local areas and impeded the initiative of developing nations. Given these circumstances, a number of initiatives to boost the effect and efficiency of the assistance are introduced, such as cooperation based on financial assistance and result-based management based on the sector program. In addition, emphasis is being placed on the concept of capacity development (CD), based on the idea that aid is essentially expected to build up the overall capabilities of developing countries themselves to deal with their own issues and to promote sustainable development.

The Japan International Cooperation Agency (JICA) defines CD as "the ongoing process of enhancing the problem-solving abilities of developing countries by taking account of all the factors at individual, organizational and societal levels."[1] Based on the idea that CD is a useful concept in reexamining the nature of its projects, JICA attempts to systematically incorporate the idea of CD into its projects. In fiscal 2005, it conducted research activities chiefly for (i) a review of the concept of CD, (ii) an analysis of the trends of other donors and (iii) an analysis of the case study of JICA projects from a CD perspective. The emphasis is placed on a continuous analysis of past examples of cooperation for systematization and accumulation of project experience.[2]

JICA has a substantial track record in technical cooperation in the Energy Conservation Sector. It has carried out technical cooperation projects in seven countries, namely China, Argentina, Bulgaria, Turkey, Thailand, Iran and Poland. Mainly held at energy conservation centers, the projects started with the transfer of technologies, required for energy conservation assessment of factories and non-residential buildings, to personnel of the centers. This was followed by the centers conducting training activities for the development of energy administrators.[3] However, societal and institutional factors that are the external factors for the projects have had a considerable impact on the process in which the development of personal skills would lead to enhanced organizational capabilities[4] and evolve into energy saving efforts at the

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[1] JICA (2006)

[2] For theoretical details about CD, see Appendix, the summary in JICA (2006).

[3] In Japan, energy administrators are responsible for improving fuel efficiency at those factories with energy consumption above a predetermined level. The appointment of an energy administrator is compulsory under the Law Concerning the Rational Use of Energy. The energy administrator is designated from among candidates holding a national qualification as a certified energy administrator.

[4] There are two possible interpretations of "individual" and "organizational" *either* "staff members of energy conservation centers" and "energy conservation centers" *or* "energy administrators designated by factories and other facilities" and "factories and other facilities responsible for the final consumption of energy." This research adopts the first option for its CD analysis, i.e. "personnel at energy conservation centers" as "individual" and "energy conservation centers" as "organizational," given that JICA works with such centers as its C/P in its energy conservation projects.

individual level, such as factories and other end users of energy.

The project in Turkey provided limited cooperation to project stakeholders, such as factories and office and commercial buildings, ESCO companies[5], the government, factory equipment manufacturers and electric power suppliers. However, external factors created some synergy among themselves to successfully reduce annual energy consumption in the industrial sector by nearly one percent after the five-year cooperation period.[6] Such factors included prerequisites such as political and economic stability and infrastructure improvement, statutory systems, public subsidization, an incentive for enterprises to carry out energy conservation, the ESCO market, awareness of energy saving among businesses and individuals and a partnership between the government and industrial associations to promote energy conservation. In Turkey, there were external factors that had a remarkably positive impact. High electric power rates strongly motivated the business sector to reduce energy consumption (cost cutting). To meet a requirement for EU accession, the Turkish government adopted a policy of strengthening its energy conservation policy by improving its legislation and subsidization scheme. As one of the external factors, the local ESCO market was burgeoning, which generated a positive impact. The key to this success was how the JICA project encouraged the government and enterprises to take action, that were the mediators for translating the results of technical cooperation or the transfer of technologies into the implementation of practical energy conservation at the factory level.

2. Objective of the Research

By analyzing the causes of success and failure in the energy conservation projects carried out in the past with a focus on stakeholders and relevant external factors from the CD perspective, it will be possible to draft a checklist that reflects the prerequisites that should be examined in the course of selecting and formulating technical cooperation projects and the measures to be taken at the implementation stage. These case studies will be a means of stimulating JICA's thinking about how it provides technical cooperation based on the concept of CD, not to mention technical cooperation in the sector concerned.

Given the importance of the matters discussed above, the objective of this research is to review historical technical cooperation in the Energy Conservation Sector from a CD viewpoint, enabling the creation of educational materials to help with understanding CD and a checklist concerning capacity assessment for CD for the purpose of formulating and implementing projects.

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[5] The ESCO business refers to energy conservation carried out as a private corporate activity to provide comprehensive energy services for customers. An ESCO business operator is referred to as an ESCO company. In Japan, ESCO companies provide factories as well as offices and other commercial buildings with comprehensive services: energy savings assessment, design and construction for policy introduction, maintenance and operational management of equipment introduced and raising of financial resources for operation. They also undertake renovation work for energy conservation without damaging the existing environment, guarantee an energy saving effect brought about as a result, and receive as remuneration part of the energy saving benefits enjoyed by their customers. For further details, see http://www.eccj.or.jp/esco/index.html

[6] For details, see JICA (2005b).

3. Research Framework

3-1 The Framework of Case Analysis

Figure 0-1 illustrates the framework of case analysis in this research. JICA have already conducted a case analysis of its CD-based cooperation for separate sectors, such as strengthening of mathematics and science in secondary education and waste control. This research adopts the following framework for its case study, since it is identical to the framework used for these past studies.[7] It will then be possible to make a comparative analysis with other sectors.

(1) Analysis 1: Position of JICA Cooperation (Chapter 1)

JICA defines CD as an ongoing process of enhancing the problem-solving abilities of developing countries, by taking account of all the factors at individual, organizational and societal levels as a whole. JICA's CD-based cooperation is also redefined as cooperation for building, strengthening and maintaining the capabilities of developing countries to address their specific development issues in a self-reliant manner. In other words, JICA provides cooperation designed to solve the problems that confront developing countries. However, JICA's cooperation projects are not meant to directly resolve the issues of developing countries. Rather, they focus on the process of boosting the capacity of developing nations to deal with their own difficulties, in anticipation of developing nations eventually being able to address their own issues.[8]

The objective of the case study is to learn from the specific past experiences in cooperation, to determine which assistance approach is effective for which issue, and by approaching which actorto improve the problem solving capacity of developing countries in a self-reliant manner.[9] To achieve this goal, this research examines the case studies from three viewpoints, namely the actual state of issues, the future vision after the problem is solved and the method of reaching the future vision from the actual state. In this manner, the research attempts to trace the path of formulating the project design matrix (PDM) in the project cycle management (PCM) approach, which includes an analysis of the parties involved, an analysis of issues, an analysis of the objective and project selection. In this process, it examines the level of consideration given to CD when the projects are devised. At the time of reviewing this, the research sums up which actors were approached at three different levels, namely the individual, organizational and societal/institutional levels.[10]

Specifically, the analyses are conducted from the following points of view:

(i) Actual state of issues
- What are the issues?
- Capacity required for solving them
- Awareness of the actual state (risk)
- Capacity to be strengthened intensively

(ii) Future vision
- What will the situation be like after development issues have been sorted?

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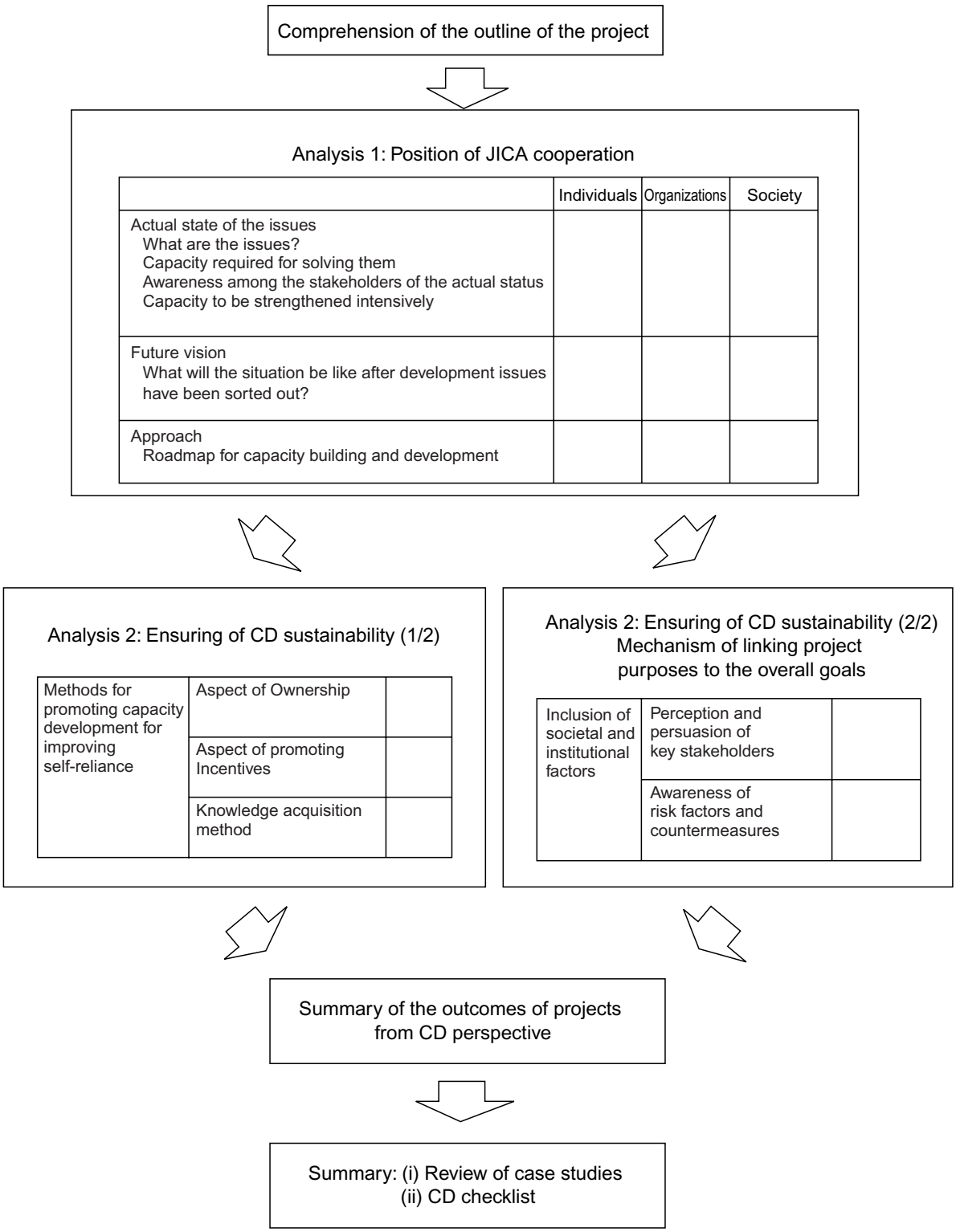
[7] JICA (2006)
[8] *Ibid.*
[9] *Ibid.*
[10] For capacity, stakeholders and relevant factors to be considered at the individual, organizational and societal/institutional levels, see Section *1-1-2 Positions of CD and JICA's cooperation in energy conservation projects.*

Figure 0-1 Framework of Case Studies



Source: the author

(iii) Approach (process of moving from (i) to (ii))

- Roadmap for capacity building and development

(2) Analysis 2: Ensuring of CD Sustainability (Chapter 1)

On the basis of the "roadmap for capacity building and development" created in Analysis 1, the research assesses what innovative measures were taken in the individual projects to ensure CD sustainability in two aspects: the methods of promoting the improvement of capacity in a self-reliant manner and the efforts to address the factors at societal and institutional levels.

(i) Methods of promoting the improvement of capacity in a self-reliant manner

From the perspective of autonomy, the methods for increasing the incentive for corporate actors to engage in energy conservation through technology transfer will be analyzed with a focus on the following aspects:

- Aspect of Ownership
- Aspect of promoting Incentives
- Knowledge acquisition method

(ii) Initiatives to address the factors at societal and institutional levels – a mechanism of linking project purposes to the overall goals

An analysis is performed on what advice relating to policies and systems, excluding technology transfer, was given to which stakeholders in a bid to scaling up the project effect and in improving the incentives for society in general. This analysis places an emphasis on the following factors:

- Perception and persuasion of key stakeholders
- Awareness of risk factors and countermeasures

(iii) Summary of the outcomes of projects

Based on the findings of these analyses, the research sums up the project outcomes in terms of CD perspective.

(3) Review of Case Studies (Chapter 2)

In light of the results of the above analyses, the research provides a review in two aspects described as follows:

(i) Review of case studies in the Energy Conservation Sector from a CD perspective

To review the case studies, the research looks at the impact the approach of different energy conservation projects run by JICA and major changes to the external conditions had on CD in the sector of energy conservation at each level of individuals, organizations, institutions and society, to demonstrate the direction for improvement in JICA projects.

(ii) CD checklist

The formulation of projects in the Energy Conservation Sector requires the organization of specific survey items to perform a prior check or assessment of the actual capacity at each level and the future expected situations in this area in the best possible way. A checklist for capacity assessment is created for this purpose.

3-2 Projects Targeted for Case Studies

These case studies target four completed projects listed below, which are selected from those specified in *Table 1-1: Overview of JICA's Energy Conservation Projects* in Chapter 1. Among the projects that are currently underway and those that are at the stage of project formulation study, some noteworthy examples that offer lessons in capacity development will be mentioned in the conclusion of this research.

(i) Turkey: Energy Conservation Project, carried out for five years from August 2000 to July 2005

(ii) Thailand: Project on the Energy Conservation Administrator Training Center, carried out for three years from April 2002 to April 2005

(iii) Bulgaria: Energy Conservation Project, carried out for five years from November 1995 to October 2000

(iv) Argentina: Project for Energy Conservation in the Industrial Sector, carried out for five years from July 1995 to June 2000

4. The Research Team

The research team for this case study consists of the members listed below. The member responsible for authoring this report reviewed documents on CD and reports on the projects published by JICA and conducted interviews with Japanese personnel involved in the projects, including experts who had returned to Japan, domestic committee members and JICA personnel in charge of the programs. Study members consist of JICA staff members responsible for projects in the Natural Resources and Energy Team under the Economic Development Department and those involved in capacity development studies. They examined the framework of analyses and provided the author with advice on the process of compiling this report.

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* Positions as of Nov. 2006.

Chapter 1 Case Study on Capacity Development in the Energy Conservation Sector

1-1 Overview of Energy Conservation Projects

1-1-1 JICA's Action towards the Energy Conservation Sector[11]

JICA provides support for the stable supply of electric power, use of renewable energy and energy conservation in the energy sector, a part of energy and mining, which forms one of the development issues. Total global energy consumption is climbing rapidly, which is a reflection of economic growth in developing countries. If fossil fuel consumption continues to grow at the current pace, resource shortages, global warming and other issues are likely to become more serious. With growing awareness of these global environmental issues and a recent rise in energy prices, developing nations increasingly realize the importance of efficient consumption of energy or energy conservation. Meanwhile, after experiencing two oil shocks, Japan is now a leader in energy conservation. Japan's use of its own experience to provide assistance is invaluable to developing countries.

Broadly speaking, there are two different forms of assistance in energy conservation. The first is a technical cooperation project approach and the second is a group training approach. In the technical cooperation project approach, a center facility responsible for training, assessment and public relations activities in energy saving is set up in the recipient country and assistance is provided until the country becomes capable of operating it by themselves. For example, the energy conservation project in Turkey included the following activities and inputs:

(i) Training: The project offered practical energy conservation techniques to factory personnel responsible for energy management. It also provided training for training instructors and introduced a mini plant for hands-on training on energy conservation to the National Energy Conservation Center (NECC).

(ii) Examination: The project identified the status of energy consumption in factories and buildings, and gave them advice to encourage efficiency. Measuring instruments that were essential to the assessment were provided, together with technical guidance.

(iii) Public relations: The project helped construct a website of the NECC and held seminars and workshops on a number of different topics.

In the group training approach, personnel working in the area of energy conservation from different countries are invited to Japan so that they can learn the Japanese legal system and the practice of energy conservation in factories and other facilities. The training runs for a period of about one month.

Table 1-1 is a list of major energy conservation projects conducted by JICA. The projects for Turkey, Thailand, Bulgaria and Argentina already reached completion, while those for Poland and Iran are still underway. The study of the development of similar projects is now being conducted in Indonesia and Saudi Arabia. JICA has thus provided developing countries with different kinds of assistance, including

[11] See JICA's website at http://www.jica.go.jp/infosite/issues/energy_mining/index.html

Table 1-1 Overview of JICA's Energy Conservation Projects

Country	Project Overview: (i) Title, (ii) Period, (iii) C/P	Descriptions: (i) Overall goals, (ii) Project purposes, (iii) Outcomes
Turkey	(i) Energy Conservation Project (ii) Five years from Aug. 2000 to Jul. 2005 (iii) National Energy Conservation Center (NECC), General Directorate of Electrical Power Resources Survey and Development Administration (EIE)	(i) Unit energy consumption will be reduced in factories and other facilities after the energy assessment (ii) Capacity of the NECC in training, energy conservation assessment, policy making, public relations and dissemination will be increased (iii) 1) Operations and management system of the NECC were established for energy conservation activities. 2) The management skills of C/P was upgraded using training materials and measuring instruments offered to them. 3) The C/P acquired the overall skills and knowledge necessary to conduct energy administrator training. 4) The C/P acquired the techniques and knowledge required for energy conservation assessment of factories and other facilities in different industries. 5) The capacity of NECC to provide information with different industry sectors, to raise public awareness of energy conservation and to prepare policy suggestions was enhanced.
Thailand	(i) Energy Administrator Training Center (ii) Three years from Apr. 2002 to Apr. 2005 (iii) Practical Energy Management Training Center (PEMTC), Department of Alternative Energy Development and Efficiency (DEDE)	(i) Effective energy control will be performed by the persons responsible for energy (PREs) at designated factories and buildings in accordance with the Energy Conservation Promotion (ENCON) Act (ii) High quality PRE education system will be developed (iii) 1) The PEMTC was set up and the system for implementation was established. 2) The state exam system for PRE certification was lauched. 3) An energy conservation technology training course for PREs was inaugurated. 4) The structure for running the PRE state exam system and the training course was set up. 5) A PRE support system was proposed.
Bulgaria	(i) Energy Conservation Center (ii) Five years from Nov. 1995 to Oct. 2000 (iii) Energy Efficiency Center (EEC), Ministry of Economy and Energy (formerly Ministry of Industry)	(i) Energy consumption of the Bulgarian industry will be improved (ii) Functions of the EEC will be boosted to independently make proposals on energy conservation policies and guidance on energy conservation technologies will be given to the industrial sector (iii) 1) The C/P was trained to conduct energy conservation assessment. 2) Energy conservation assessment and consulting on improving the guidance given to factories and other facilities were put into operation. 3) The structure of energy conservation policies was studied and energy conservation measures were proposed. 4) Public relations activities concerning energy conservation are implemented.
Argentina	(i) Energy Conservation in the Industrial Sector (ii) Five years from Jul. 1995 to Jun. 2000 (iii) The Rational Use of Energy Center (CIPURE), National Institute of Industrial Technology (INTI)	(i) Energy conservation will be promoted in the Argentine industrial sector (ii) Functions of INTI/CIPURE will be upgraded for adequate instructions and promotion of energy consumption to the industrial sector (iii) 1) The C/P was trained to promote and give guidance on energy conservation. 2) The C/P now provides training to energy administrators in the industrial sector. 3) The C/P raises awareness of energy conservation and spread the practice in the industrial sector.
Poland	(i) Energy Conservation Technology Center (ii) Four years from Jul. 2004 to Jul. 2008 (iii) Energy Conservation Technology Center (ECTC), the Polish National Energy Conservation Agency (KAPE)	(i) Energy conservation in Poland will be promoted (ii) The ECTC will be launched as an energy conservation promotion body (iii) 1) The ECTC management structure will be established. 2) The ECTC will offer training courses to factories and others. 3) The ECTC will introduce professional examiners to factories for the purpose of energy conservation assessment. 4) The ECTC will support energy conservation of businesses. 5) The ECTC will provide energy conservation information for factories and others.
Iran	(i) Energy Conservation Promotion Project in Iran (ii) Four years from Mar. 2003 to Mar. 2007 (iii) Azerbaijan Higher Education and Research Complex for Water and Electrical Industry (AERCT), Energy Efficiency Office (EEO), Ministry of Energy	(i) Rational use of energy will enable energy control to be established in the industrial sector (ii) The energy conservation training center will contribute to energy control in the industrial sector (iii) 1) Coordination will be made among policies and relevant administrative bodies to ensure effectiveness of the project. 2) Instructors in the project C/P, namely the training center, will be capable of operating and maintaining the facility's equipment for training. 3) Theoretical and practical training will be constantly provided for energy-related engineers.

Note: "C/P" refers to a project partner (counterpart), which is an organization on the part of the recipient country that is responsible for implementing the project.

Source: the author, based on study reports on each project listed in the References

improvement in statutory systems relating to energy consumption, training for energy administrators, improvement in energy conservation assessment technologies, offering of information regarding energy conservation to the industrial world and support for increasing and expanding awareness of the importance of energy conservation. In the future, JICA will continue to strategically provide assistance for the establishment of energy conservation systems, implementation of administrative services relating to energy conservation and the revitalization of energy conservation markets.

1-1-2 Positions of CD and JICA's Cooperation in the Energy Conservation Sector

The Japan International Cooperation Agency (JICA) defines CD as the ongoing process of enhancing the problem-solving abilities of developing countries by taking account of all factors at the individual, organizational and societal levels as a whole.[12] This section reviews the perception of CD and the status of JICA cooperation in the Energy Conservation Sector prior to the case studies in the area.

(1) JICA Cooperation in the Energy Conservation Sector from the Perspective of Entry Points[13]

JICA explains the stance of its cooperation from the viewpoint of CD with the use of three entry points to be tackled first, as mentioned below.

1) Approach Focused on Empowering the Community and Local Society

According to this approach, the primary objective of the cooperation is to set up and stabilize the expertise, the framework and the mechanism for empowering members of the local community so that they can address issues in community development and poverty reduction and solve their own problems by themselves, through activities in the predetermined pilot areas. Subsequently, support is provided to broadly introduce the knowledge and successful experience obtained from the activities. Generally, this model envisions such processes as (i) developing know-how and systems for addressing the challenges in the pilot areas, (ii) stabilizing the know-how and systems and (iii) gathering successful examples and introducing them to other areas (scale up). The systems may be institutionalized in the processes of (ii) or (iii). It is also possible that successful examples may naturally be propagated at the initiative of local people.

2) Approach Focused on Developing Hub Functions

With this approach, JICA works to construct and strengthen the functions to provide human resource development, information on technology for diffusion and research and development services, chiefly at the operating sections of governments. Knowledge and skills that meet the needs of practitioners are developed and introduced to the worksite where they are required. A sustainable mechanism that may produce the expected outcomes is constructed.

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[12] JICA (2006)

[13] See the essay entitled "Approaches of JICA's Technical Cooperation from the Perspectives of Entry Points of Cooperation" provided as a reference material in JICA (2006) and Mabuchi and Kuwajima (2005).

3) Approach Focused on Building and Strengthening Systems and Policies

According to this approach, JICA provides direct assistance in formulation of specific policies, legislation, system and implementation structures, which are to be extensively applied on a national-level for example, and in strengthening their operations. Possible steps to be taken are (i) improving the capacity to make policies and systems, (ii) acts of parliament or other legislative bodies for legislation of policies and reflection of policies by government authorities responsible for policies into state plans and (iii) improving the capacity to execute the policies and systems.

JICA's past projects on energy conservation were designed to strengthen the functions of the organizations on the side of C/P, by transferring technologies to personnel at energy conservation centers so that these organizations would conduct activities at the societal-level to create a mechanism that encourages end energy users, including factories and general households, to rationalize their energy consumption and produce energy conservation effects. The energy saving assistance conducted by JICA in the past has adopted the second approach focused on developing hub functions.[14] This approach is considered to have certain problems discussed below. The case studies in the following part of this report assess the factors behind successful and unsuccessful outcomes in the context of these matters.

(i) The technologies and expertise must match the needs of the recipient.
(ii) The mechanism of diffusion and provision must be extensive and sustainable. The quality of the services provided must also be ensured.
(iii) The organization playing a central role must be given adequate responsibilities or authority.
(iv) The practice of energy conservation must offer an incentive to use the technology and expertise introduced and offered.
(v) There should be an environment in which trained human resources can be effectively deployed for practical operations.

(2) Promotion of CD in JICA's Energy Conservation Projects

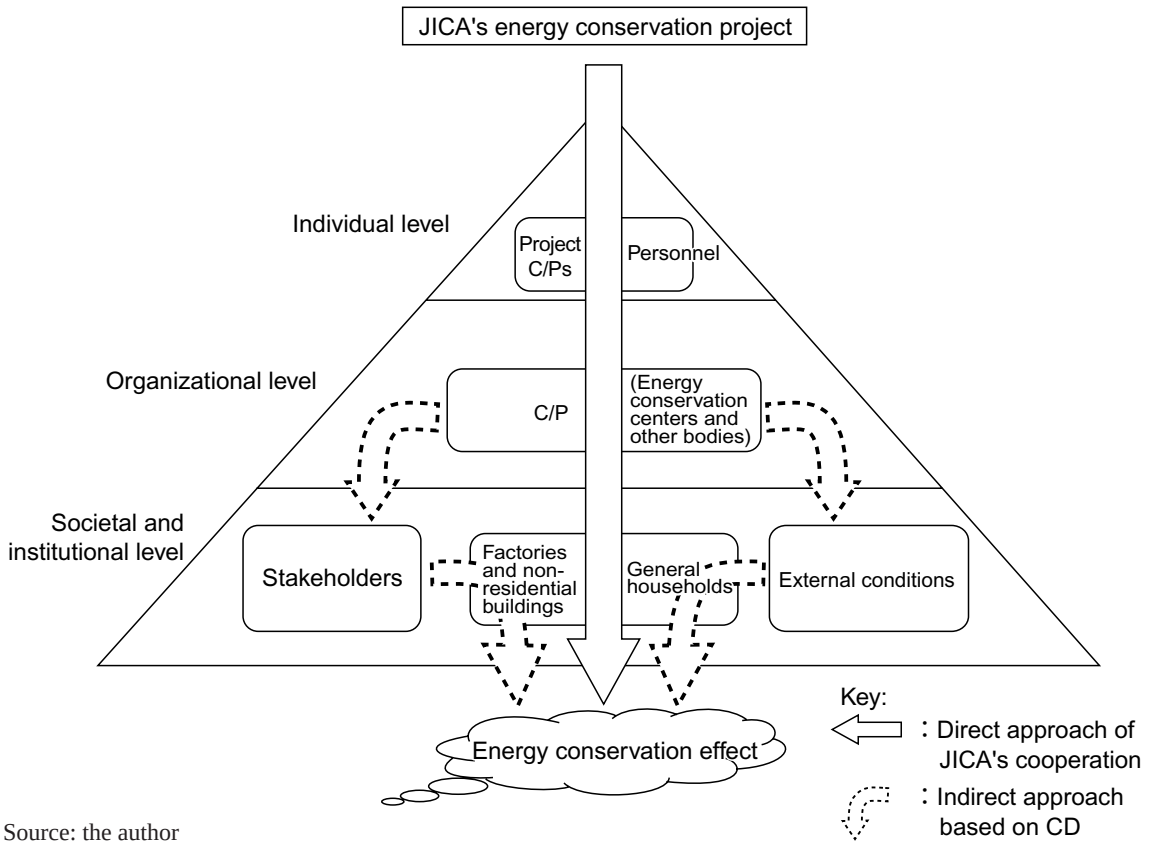
Figure 1-1 schematically shows the actors and factors involved in energy conservation projects and the position of JICA cooperation.

In the debate over CD in the energy conservation sector, it is critical to pay attention to stakeholders and project external conditions, that are included in the factors at the societal and institutional levels. As Figure 1-1 shows, it is factories, non-residential buildings and general householders, the final consumers of energy, who are central stakeholders at this level. Apart from these, manufacturers of equipment used in factories and office buildings and ESCO companies are also stakeholders involved in the approach to energy conservation, although they are not directly involved in project activities. The energy saving trend of a specific county also depends on the statutory system and policy changes, which are normally classified as project external conditions.

In energy conservation projects, input from the Japanese side is directed at C/Ps, although the ultimate

[14] Not all projects for energy conservation are based on *2) Approach focused on developing hub functions.* For example, if any future energy conservation promotion project is designed to directly target the general public, who number among the end users of energy, it may fall under the category of *1) Approach focused on empowering the community and local society.* If any project is meant to support the construction of an ESCO market, it could conform to *3) Approach focused on building and strengthening systems and policies.*

Figure 1-1 Positions of CD and JICA's Cooperation in the Energy Conservation Sector



Source: the author

goal is to stimulate final consumers of energy to produce energy conservation effects in some form. JICA's energy saving projects principally target factories and office buildings associated with industrial activities as end users of energy. Vital to such projects is persuading them to introduce energy saving measures. It may be envisioned that such schemes will in the future encompass energy conservation that can be practiced at general households as well.

Figure 1-1 suggests that projects may provide some factories and office buildings as final users of energy with strong assistance in the form of training for energy administrators and energy saving assessment through C/Ps, as marked with the solid-line arrow. However, extensive promotion of energy conservation directed at factories and other facilities requires an approach to improve the capabilities of C/Ps to proceed with their energy saving actions on their own, as marked with the dotted-line arrows. In other words, when equipment manufacturers, who are among the stakeholders, develop new equipment with greater energy saving effects or when ESCO companies attain growth and reduce their fees for energy conservation assessment or increase their technical capabilities, a private-sector driven mechanism to motivate factories and other facilities to take energy conservation initiative is expected to materialize. Moreover, it is believed that a mechanism encouraging not only factories but also the entire community to participate in energy conservation may be created with the help of statutory and institutional reinforcement to make energy conservation assessment compulsory, the establishment of a new energy administrator

program or the emergence of political issues such as in the cases of the accession of Turkey and Bulgaria to the European Union (EU).[15] JICA has offered little direct assistance in the creation of mechanisms mentioned above. This reflects the stance that JICA takes, for instance that JICA's cooperation is basically provided on a government to government (G to G) basis and is targeting government organizations as C/Ps, meaning it has not directly targeted business activities in the private sector. In addition, projects have treated legislation as external conditions. Therein lies the significance of new initiatives to design, implement, monitor and evaluate projects, from the CD perspective.

1-1-3 Capacity to be Considered in the Energy Saving Sector

Table 1-2 outlines different elements of the capacity to be considered at the Energy Conservation Sector at three levels: the individual level, the organizational level and the societal level. The following part of the report looks at the capacity to be examined in the context of CD at three separate levels.

(1) Capacity at the Individual Level

The capacity at the individual level includes knowledge, skills and a sense of responsibility for solving issues, such as promotion of energy conservation action in factories and other facilities, possessed by individual staff members working for the organization in charge of energy conservation with which JICA works in its project as C/Ps.

The organization in charge of energy conservation has clerical personnel responsible for planning, management and operation as well as engineering personnel in charge of training and energy conservation assessment. Engineering staff members need to have technical knowledge in engineering because they must give lectures in the training and perform energy conservation assessment. For the purpose of technology transfer in JICA's technical cooperation projects, they also need language skills sufficient to communicate with Japanese experts. Especially in training projects, technical personnel must also have ample experience and an aptitude for delivering lectures.

Clerical staff must have the basic technical knowledge needed to draw up laws, orders and regulations, even though they are not asked to give any lecture or conduct energy conservation assessment. For appropriate administrative operations, ethical factors such as a sense of responsibility or mission are vital.

Capacity at the individual level is a fundamental constituent of capacity at organizational or societal level. In terms of CD, the strength of ownership at the organizational and societal levels is significant to strengthening of overall capacity. The sense of responsibility and mission at the individual level is a key element for this.

In the past, technical cooperation projects in the sector of energy conservation provided, training, guidance and instructions on energy conservation assessment focused solely on improvement in capacity at individual level.

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[15] Turkey currently aspires to EU accession. Generally, new EU member states must meet the criteria for accession known as *acquis communautaires* and Turkey is no exception. The *acquis* include policy integration with the EU in political, economic, military, agricultural and other areas of negotiations, which also includes the energy sector. The EU policy in the energy area places top priority on energy security. The European Commission has been endeavoring to improve the energy self-sufficiency throughout the EU. Member states are obliged to reduce their annual energy consumption by one percent per year and to submit reports on their oil stockpile. Given that encouraging energy conservation helps reduce energy consumption and bolsters self-sufficiency, the European Commission is asking each member state to lower its energy consumption rate. Turkey is working to introduce energy conservation legislation as part of its efforts to meet the criteria for EU accession. (JICA (2004b))

(2) Capacity at the Organizational Level

Capacity at the organizational level refers to physical, human and intellectual resources, ownership, a structure of organizational management and organizational culture that are given to an organization or that are necessary to attain the objectives that it imposes on itself to meet its challenges.[16]

The organization is required to be capable of implementing and operating training for energy administrators of factories and other facilities, implementing energy conservation assessment concerning energy consumption and promotional activities for increasing awareness of the importance of energy saving efforts. Physical, human and intellectual resources are one of the constituents of this capacity. No training, assessment or public relations activities on energy conservation can be implemented without hardware resources such as training facilities and assessment devices. It is also true that these resources must be fully maintained. The organization must also think of how many of the employees will stay employed and how long they have served and will serve, given that the organization is a group of individuals and that it takes any organization a long time to reach a sufficient number of personnel as well as an adequate level of staff skills. For intellectual resources, the organization must have the technical information essential to assessment, information on factories and facilities to be assessed, databases on energy conservation assessment results, operation manuals for energy conservation assessment, and relevant laws and regulations.

The organization should also have a framework for operation control and management for effective use of the hardware, software and human and intellectual resources noted above. Energy conservation policies are normally part of the basic policies of states for reasons of its importance in economic policies and measures for environmental protection. The organization must also have specialist knowledge in energy conservation. All these lead to a strong sense of ownership of the organization. It is best that it has the function of implementing energy assessment and other energy conservation measures, in addition to the authority to make policies in the area of energy conservation so that it can perform smooth energy conservation administration. Moreover, it must have an adequate budget, which means salary, or "local cost" as it is called in JICA's projects, to keep its personnel motivated to carry out their duties.[17]

At the organizational level, in addition to the resources and management discussed above, it is necessary to take into consideration the element of ownership or leadership that promotes the CD as a whole. This specifically refers to a sense of mission or ownership to engage in energy conservation and to the strong leadership shown by the leader.[18] While this depends heavily on individual capacity, whether or

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[16] As discussed below, a key to success in the energy conservation project in Turkey was the fact that the C/P had a strong sense of ownership. Those on the Japan side involved in the project affirm that it was a long-standing institution with long-serving personnel who have an accumulation of operation expertise, that it had a strong commitment to energy conservation and a pride as a leader in Central Asia and that there was also a robust solidarity based on the leadership of its leader. In contrast, C/P bodies that were launched for projects in sync with the commencement of a project supported by aid organizations, the staff tend to have poor organizational solidarity with personnel insufficiently motivated and having a weak sense of ownership.

[17] JICA projects occasionally face the issue with remuneration to be paid to the workforce of the C/P. In developing countries, the basic salary of public officials is limited due to the weak state budget and it is common that additional pay is offered to those engaged in special duties. In the event of an assistance project from any donor, there often arises a question over whether the donor or the aid recipient countries should cover the cost of the extra pay for the duties. In JICA projects, it is determined that assistance recipients are in principle liable for salaries paid to the employees of project C/Ps. If this is not fully ensured, the motivation of these workers may decline. Moreover, there may be similar problems with the running costs of projects, such as electric power charges, telephone communication charges and other office expenses.

[18] For instance, in many successful examples of regional development, there was a key person with strong leadership, who may occasionally be seen as eccentric. Powerful leadership is essential to uniting different stakeholders with intricately entangled interests and to direct society to an integrated orientation. On the other hand, there is a risk that sustainability of the project is severely undermined if this person is gone.

not it evolves into organizational capacity is very important to overall success in capacity development. In the Energy Conservation Sector, the training of energy administrators and the energy conservation assessment both target private enterprises. They adopt the benefit principle and earn training participation fees and energy conservation assessment charges. It is important to maintain the transparency and stability of the organization for appropriate treatment of these revenues. They can ensure financial independence in development efforts to promote energy conservation.

(3) Capacity at Societal and Institutional Levels

Capacity at the societal and institutional levels involves the persuasion of stakeholders needed to resolve issues beyond the capacity of aforementioned levels of individuals and organizations, as well as the circumstances, conditions and mechanisms required to promote sustainable energy conservation efforts. It is roughly split into “stakeholders” (“factories and other facilities” and “other stakeholders”) and “external conditions” (“statutory systems and mechanisms” and “other external conditions”). These are normally treated as external conditions in terms of PDM. In other words, they have some impact on the success or failure of projects although they cannot be controlled within the framework of the projects.

The following institutions and organizations may be envisioned as stakeholders concerned with energy conservation in the industrial sphere:

- Factories and other facilities, including energy administrators that they appoint
- Other government organizations, including ministries and agencies responsible for energy saving policy-making
- ESCO companies, which provide energy conservation services
- Manufacturers of equipment, which engage in the development and marketing of energy conservation equipment
- Electric power companies, in the respects of stable supply of electric power and lowering energy prices

Introduction of energy conservation measures is induced by the capacity of factories and other facilities among stakeholders to have a sense of social responsibility for tackling environmental issues, awareness of energy costs and an interest in improving their corporate image. Other stakeholders strengthen their problem solving capabilities in their own ways to make it easier for factories and other facilities to make decisions. Specifically, ESCO companies provide energy conservation assessment services and equipment manufacturers develop new energy conservation equipment and electric power suppliers work to ensure a stable supply of electric power and to lower the power prices. On the other hand, these stakeholders have their own factories. In this sense, they are regarded as part of the factories and other facilities under the category of final consumers of energy.

JICA projects treat the following elements, which are normally classified as external conditions, as capacity to be considered at the societal and institutional level. Energy conservation efforts are commonly given high priority by individual countries. It is imperative to set up legislation and environmental policies for energy conservation for the purpose of supporting these efforts, as well as to create public funds for promoting energy saving efforts and measures that offer incentives:

- Statutory system, such as energy conservation laws
- State policies, including energy, environmental and economic development policies

Table 1-2 Elements to be Treated as Capacity in the Energy Conservation Sector

Level	Definition of capacity	Target of capacity		Descriptions of capacity
Individuals	Personal knowledge on, skills and responsibilities for solving issues	C/Ps		- Skills for energy conservation assessment and technical capabilities to provide advice - Aptitude to serve as training instructors - Language skills - Sense of responsibility and mission
Organizations	Physical, human and intellectual resources, ownership, a structure of organizational management and organizational culture that are given to an organization or that are necessary to achieve the objectives it imposes on itself for meeting its challenge	C/P organizations		- Human, physical and intellectual resources (adequate number of personnel, long service of personnel, internal training scheme, training facilities, devices for assessment, database of factories and other facilities to be assessed) - System for task and operation management (specialization of the energy conservation section, existence/absence of authorities to formulate policies, procurement of necessary budget) - Ownership and leadership (sense of commitment to energy conservation, leadership of leaders, transparency and stability of the organization)
Society and systems*1	Persuasion of stakeholders, circumstances and conditions that are necessary to solve problems beyond the individual and organizational levels	Factories and other facilities*2	Factories and non-residential buildings	- Installation of energy administrators - Awareness of energy costs - Interests in improvement of corporate images - Awareness of social responsibility for environmental issues
		Other stakeholders*3	Other governmental bodies	- Degree of cooperation from other relevant institutions
			ESCO companies	- Scale of the ESCO market - Cost competition after a competitive market is established
			Equipment manufacturers	- Development of the energy conservation equipment market - Managerial trend
			Electric power companies	- Awareness of the cost concerning power generation efficiency
		Statutory system and mechanism*4	Statutory system	- Energy conservation law - High priority placed on energy conservation promotion policies in national development plans
			Public funds	- Subsidies, preferential taxation, low interest loans and other programs for investment in energy conservation sector
		Other external conditions	Incentives	- Goal of boosting energy price competitiveness in the international market - Energy self-sufficiency goal - Other national policies on energy conservation promotion as state policies (such as meeting the criteria for EU accession) - Leadership over neighboring states
			Awareness of energy conservation	- High awareness of energy conservation in the society - Level of comprehension of energy conservation effects - Interests in environmental issues
			Partnership among the government, enterprises and local citizens	- System of guaranteeing that the opinions of residents and communities are incorporated in policies (good governance)
			Donors	- Long-term strategic support
Preconditions*5	Different factors based on which energy conservation projects are to be studied	Preconditions		- Proximity to Japan's technologies - Status of development of infrastructure - Economic system (market economy) - Political and economic stability

Notes: *1 Society and its systems are roughly divided into "stakeholders" ("factories and other facilities" and "other stakeholders") and "statutory systems and other external conditions." ("statutory systems and mechanisms" and "other external conditions") The PDM regards them as part of the external conditions.

*2 "Factories and other facilities" refer to end users of energy, encouraged by JICA energy conservation projects to implement energy conservation practice.

*3 "Other stakeholders" refer to promoters of energy conservation excluding factories and other facilities. They are also seen as part of the "factories and other facilities" that make a final consumption of energy, given that they own plants by themselves.

*4 "Statutory system" includes the laws concerning energy saving and relevant state policies.

*5 "Preconditions" are factors that provide a basis for a consideration of energy conservation projects.

Source: the author, based on "Capacity Development Study Group Materials" attached to JICA (2005c) and JICA (2005d)

- Public funds, including a loan program for encouraging energy conservation efforts
- Incentives, such as acquisition of the ISO 14000 certification and fulfillment of criteria for EU accession

Apart from these institutional upgrades, the overall energy saving capacity grows in proportion to the awareness of energy conservation in the broader community. If there is good governance or a system ensuring that the voices of residents and communities are heard, it means that the society has a sense of ownership and adequate capacity.

(4) Preconditions

Presumptions refer to different factors that are necessary for a consideration of energy conservation projects, which include the actual state of the political and economic systems. They differ in definition, such as the prerequisites in the context of the project design matrix (PDM). They refer to conditions for the implementation of projects, such as the establishment of training facilities.

1-2 Case study 1: Energy Conservation Project in Turkey[19]

1-2-1 Project Overview

(1) Background

Turkey is heavily dependent on energy imports. Its energy self-sufficiency ratio failed to reach 50 percent in 1997 and continues to fall each year in line with recent rapid growth in energy consumption in the industrial sector. Specifically, consumption has increased 20 percent in the past five years. The Turkish government has been working to achieve energy conservation to address the issue of global warming and boost the international competitiveness of Turkish businesses in the European market.

The National Energy Conservation Center (NECC) has launched an energy administrator scheme that encompasses more than 500 factories with large plants consuming 2,000 TOE[20] or more of energy to encourage energy conservation efforts. In accordance with the regulation issued in 1995 on “the measures to be taken to increase energy efficiency in industrial establishments,” the scheme obliges major plant businesses to assign energy administrators for energy saving. The NECC additionally engages in activities for energy conservation assessment and proposals to factories and other facilities, and in propagation of energy saving technologies. However, it has fallen short of the targeted energy saving level, because of inadequacy in the systems of the NECC and the business sector to carry out energy conservation activities and the lack of technical capabilities.

In response, the Turkish government asked Japan for project-type technical cooperation aimed at improving energy conservation by fostering the capacity of the NECC under the General Directorate of Electrical Power Resources Survey and Development Administration (EIE).

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[19] This section is based on JICA (1999),(2000a),(2000b),(2003c),(2005b), Techno Consultants and Mitsubishi Chemical Engineering (1997) and interviews with JICA personnel.

[20] TOE stands for Ton Oil Equivalent.

(2) Descriptions of the Cooperation

1) Targets

(i) Overall goal

Specific energy consumption at the factories and other facilities, where energy assessment is conducted, will be reduced.

(ii) Project Purpose

The capacity of NECC in training, energy conservation assessment, policymaking, public relations and propagation will be developed.

2) Activities

(i) An operation and management structure was set up in the NECC for energy conservation activities.

(ii) The C/P became better skilled at using and managing the training materials and measuring instruments provided.

(iii) The C/P acquired overall skills and knowledge necessary for the energy administrator training.

(iv) The C/P acquired skills and knowledge requisite to energy conservation assessment of factories and other facilities in different industrial sectors.

(v) The NECC became equipped with enhanced capabilities to offer information to different industries, to raise public awareness of energy conservation and to prepare policy suggestions.

3) Period

Five years from August 2000 to July 2005

(3) Parties and Factors Concerned in CD Analysis

Table 1-3 demonstrates different parties and factors concerned with the project in CD analysis.

(4) Results and Evaluation

1) Results

The purpose of this project was to increase NECC's capacity to provide training, to conduct energy conservation assessment, to make policies and to carry out public relations and promotion activities. This objective was successfully achieved, as the results below show. Moreover, the project succeeded in bolstering the functions of the NECC and eventually reduced the total energy consumption of the industrial sector in Turkey by an estimated maximum of five percent.

(i) Training activities

Eighteen sessions of energy administrator training were conducted.

Among 345 trainees participating in the training, 168 obtained qualification certificates.

(Including those with conventional qualification certificates, 78 percent of the factories and facilities subject to the energy regulations have the certificates.)

Three sessions of international training joined by neighboring countries were conducted.

(ii) Energy conservation assessment

A total of 118 energy conservation assessments were carried out, including 19 detailed assessments.

Table 1-3 Parties and Factors Concerned in CD Analysis – Project in Turkey

Level	Parties and factors concerned	Elements to be considered for the project
Individuals	Personnel of the C/P	- NECC staff
Organization	C/P (governmental body responsible for the project)	- National Energy Conservation Center (NECC) of the General Directorate of Electrical Power Resources Survey and Development Administration (EIE)
Society and systems	Other governmental bodies	
	Factories and other facilities	- Energy administrators - Factories and other facilities owning large plants consuming at least 2,000 TOE - Other factories and facilities
	ESCO companies	
	Equipment manufacturers	
	Electric power suppliers	
	Statutory system	- Energy regulations (1995) - Energy conservation laws (to be enacted in Dec. 2005)
	Public funds	
	Incentives	- Training and assessment fee revenues to EIE/NECC - A sense of leadership in Central Asia - EU accession developed into a political issue
	ESCO market	
	Awareness of energy conservation	- Boosting of international competitiveness of businesses in Europe
	Partnership	
	Donors	- World Bank
	Preconditions	

Source: the author

(It produced an energy saving effect of cutting the total energy consumption of factories and facilities subject to the regulations by 9.52 percent.)

(iii) Public relations

The project saw 136 seminars and other events held.

2) Conclusion of the Evaluation at the Time of Completion

The project was successfully carried out and can be deemed to have produced substantial outcomes. It was confirmed that the predetermined goals would be met prior to the termination of the project period. Among the numerous achievements attained within the project targets, what was particularly remarkable was that the personnel of the NECC reached the necessary level of operational capabilities defined in the project. While the technical cooperation was provided, they acquired new skills and knowledge and learned to use them in NECC operations. The improved capacity of individual personnel of the partner institution is organically integrated into the organizational capacity.

(5) Major Issues Influencing the Project Implementation

There was no major issue that affected the project implementation.

1-2-2 Position of JICA Cooperation

Table 1-4 provides an organized chart of cooperation activities in the energy conservation project in Turkey classified into (i) the status of issues, (ii) future visions and (iii) methods of attaining the vision, namely JICA's action and approach in the process of shifting from (i) to (ii), and sorted by levels, individual (C/P personnel), organization (C/P) and society. The next part of this section examines the position of JICA cooperation at each of the three different levels.

(1) Individual Level

At the individual level, the focus is cast on staff members of the National Energy Conservation Center (NECC).

1) Status of Issues

The personnel of the C/P had a certain level of specialized and technical knowledge but lacked the hands-on experience at factories and facilities. They therefore lacked the ability to provide practical training in the energy administrator training or to carry out energy conservation assessment. Before the project was initiated, the NECC had no mini-plant for training purposes. Training was conducted in the form of classroom lectures alone, without any opportunity for hands-on practice. On the occasion of performing the energy conservation assessment, NECC staff members appeared to lack confidence. The capacity required for solving the issue, then, was the ability to offer hands-on training and to perform energy conservation assessment as NECC personnel.

2) Future Vision

The project envisioned that NECC personnel would have ample skills and knowledge to handle hands-on training equipment, or a mini-plant, and measuring instruments offered by JICA, to conduct energy conservation assessments in a confident manner, to gain trust in the assessment results from factories and facilities and finally to motivate them to make decisions to start energy conservation efforts.

3) Approach

With respect to the activities of capacity building and enhancement for the purpose of shifting from the actual state to the future vision, JICA personnel emphasize the following points.

- The performance of the mini plant provided by JICA proved very strong.[21] Designed to be used for hands-on training in the energy administrator training, it had the right scale and functions for training and experimentation and running costs were also low. It improved the quality of hands-on training and earned high marks from the participants. After the practical instruction provided by JICA experts to NECC personnel with the use of this mini-plant, they began to have confidence in their energy conservation assessments.

[21] The Energy Conservation Center, Japan (ECCJ), a Japanese collaborative body with JICA's energy conservation project, points out that the mini-plant was an improved version of what was introduced to earlier energy conservation projects for Argentina and Bulgaria. The equipment used in the project for Turkey was close to the perfect form for a mini-plant. The plant introduced by the project in Argentina was too large, had high running costs and functionally unsuitable for training.

Table 1-4 Position of JICA Cooperation from the CD Perspective – Project in Turkey

	Individuals	Organization	Society and institutions
(i) Status of issues			
What are the issues?	- Because of the lack of practical experience in energy conservation assessment, NECC personnel are unable to provide practical training and energy conservation assessment in a confident manner.	- Because of inadequacy in the system of energy conservation assessment and technical capabilities, there are few factories where the energy conservation measures are conducted and the target level of energy conservation is not attained.	- At the moment, the energy regulations are not a law and they have poor binding force against businesses. - Factories and facilities have little awareness of energy conservation. - Factories and facilities make inadequate energy saving efforts.
Capacity required for solving them	- Capacity to provide hands-on training and to perform energy conservation assessment	- The NECC's functions to offer training, carry out energy conservation assessment, to formulate policies and to operate public relations activities - Equipment for energy conservation assessment - Provision of energy conservation information to factories and facilities	- Establishment of legislation on energy conservation - Cultivation of energy administrators - Raising of the awareness of energy conservation
Awareness of the actual state	- Lack of past experience in energy conservation assessment	- No practical training provided (Nothing but classroom lectures is offered in the training.) - There is no past experience in energy conservation assessment	- Large plants alone are subject to the energy regulations. They do not cover small and medium enterprises. - Given the poor binding force of the regulations, few people participate in energy administrator training.
Ability to be developed intensively	- Capacity to provide hands-on training and to perform energy conservation assessment	- The NECC's functions to offer training, carry out energy conservation assessment, and to operate public relations activities	- Establishment of legislation on energy conservation - Raising of the awareness of energy conservation - Upgrading of the policy to offer incentives to carry out energy conservation
(ii) Future vision			
What will the situation be like after the development issues have been solved?	- The skills to operate training materials and measuring instruments provided will be developed. - With the improved capabilities to conduct energy conservation assessment, trust in the assessment results will be obtained from factories and facilities.	- Responsible personnel from factories will join the training. Factories and facilities will undergo the NECC's energy conservation assessment and introduce energy saving efforts. - The NECC will independently run energy conservation assessment services and promotional activities. - Energy conservation policies will be autonomously implemented by the NECC.	- An energy conservation law will be enacted and all factories and facilities will appoint trained and certified energy administrators. - The society will have better awareness of energy conservation and the Turkish government will develop a structure of energy conservation policies. - Turkey will act as leader of energy conservation efforts in Central Asia.
(iii) Approach			
Roadmap for capacity building and enhancement	- NECC personnel learn to perform assessment using the mini-plant for training provided by JICA. The obtained skills are applied to hands-on training and energy conservation assessment. - JICA's domestic assistance committee offers detailed specialist and technical information. - With the help of this committee, a technology transfer monitoring sheet (for determination of level of skills acquired) is created and used for operation. - Short-term experts in five sectors engaging in energy conservation assessment, namely steelmaking, ceramic, food, textile and paper and pulp industries, are dispatched to give guidance on specific assessment techniques.	- The C/Ps had a strong sense of ownership. Respecting this ownership, JICA merely played a role of the facilitator. - Different policies implemented in Japan were explained to boost the promotional functions for public relations. (The NECC is also responsible for policy making.) - An approach to improve the existing organization, mechanism and technologies that Turkey has, instead of the start from nothing. - JICA experts give guidance on sharing of techniques and operational knowledge by means of personnel reshuffle within the partner body.	- Initiated in 1989, long-term assistance in energy conservation is incessantly offered to Turkey. - For establishment of legislation on energy conservation, presentations and reference materials are provided on the actual state of energy conservation efforts in Japan, including the technical and institutional aspects of the efforts, attitudes of the industrial sector and the overall social system, as well as on key concepts in Japan's Law Concerning the Rational Use of Energy. - With an experience of overcoming oil crises, Japan transferred its proven and superior technologies.

Key: A solid-line arrow indicates a direct approach by the JICA project, particularly at individual and organizational levels. A dotted-line arrow suggests an indirect approach of the JICA project. Particularly at societal and institutional level, it is necessary for the recipient country to work towards its future vision with a sense of ownership. Japan's approach is unavoidably limited.

Source: the author, based on JICA (1999), (2000a), (2000b), (2003c), (2005d), Techno Consultants and Mitsubishi Chemical Engineering (1997) and interviews with JICA personnel

- JICA's domestic assistance committee[22] offered detailed technical information. This allowed specialist information that went beyond the specialist knowledge of JICA's locally stationed experts to be provided for the Turkish side. In addition, the committee searched Japan for specialists in five sectors subject to energy conservation assessment and technology transfer, namely steelmaking, ceramics, textile, food and paper and pulp, and dispatched them as short-term experts for specific guidance on energy conservation assessment. Japan's painstaking technical guidance and offering of technical information served the purpose of building up the capacity at the individual level.
- The aforementioned domestic assistance committee invented a tool for monitoring the status of technology transfer for determining the level of acquired skills. Called a Monitoring Sheet[23], it was used throughout the project. JICA experts, staff members of the C/P body and their superiors joined the operation of the tool so that evaluation could be made on the same basis. This ensured the impartiality of the results of technology transfer and offered incentives for NECC personnel to hone their own skills.

(2) Organizational Level

At the organizational level, the focus of analysis is on the C/P, namely the National Energy Conservation Center (NECC) under the General Directorate of Electrical Power Resources Survey and Development Administration (EIE).

1) Status of Issues

Prior to the project, the NECC already conducted energy administrator training but it consisted solely of classroom lectures and offered no hands-on practice. Few people participated in the training and the NECC was unable to provide the training that would attract the business sector. The technical capabilities for energy conservation assessment were so inadequate that there was no track record of performing any such assessment and the targeted level of energy conservation was not reached. Consequently, the capacity for intensive achievement was associated with the basic functions of the NECC, namely the capacity for training, energy conservation assessment and promotion of energy conservation to the public.

2) Future Vision

The project envisioned the following process. First, private factories would send staff to the energy administrator training organized by the NECC. Next, on their return, the trainees would explain the effect and necessity of energy conservation efforts to other people at the factories to win their understanding. Third, energy conservation assessments would be either independently performed by

[22] The Energy Conservation Center, Japan (ECCJ), which acted as an administrative office of the domestic assistance committee, explains that the committee had 11 expert members including those from private companies and held regular meetings on a biannual basis. Without contenting itself with that, it set up a subcommittee to meet regularly. Different committee members offered active cooperation in (i) offering of sector-specific technical information to local experts, (ii) recruiting short-term experts in specific sectors in Japan and (iii) creation of the monitoring sheet.

[23] The monitoring sheet is a tool for all involved to define the current level and the target level to be reached at the end of the project in terms of the skills to be acquired by the C/P and to monitor the degree of achievement while the project is underway.

factories or outsourced to the NECC. Finally, they would institute energy conservation measures on the basis of the findings of the assessment. This process can be facilitated solely by the NECC independently running the training, energy conservation assessment and public relations activities. There must also be a situation in which the EIE, an organization at a higher level than the NECC, autonomously manages Turkey's energy conservation policy, including energy saving legislation in harmony with the NECC activities.

3) Approach

With respect to the capacity building and development activities for attaining the future vision from the actual state, JICA staff underlined the following points.

- The NECC had a very strong sense of mission, responsibility and ownership. For instance, it was the Turkish side that had taken the initiative in controlling the project at all stages from planning to operation. In addition, with intense awareness of its duty to be the Central Asian leader in energy conservation, Turkey had a strong wish to hold international training annually with the participation of invited neighboring countries as part of the project activities. JICA respected its strong sense of ownership to avoid foisting any guidance on Turkey and ran the project in accordance with the needs of the C/P.
- The C/P body had a large number of employees with many years of service and with a high level of knowledge of energy conservation technologies. JICA aimed its cooperation at improving the existing organization, structure and technologies, rather than starting from nothing.
- The C/P organization used to control the operations by assigning one duty to each employee. The Japan side found it necessary to share the skills and operational knowledge of individual personnel within the organization. Within the project, the staff members of the institution were reshuffled, so that they could acquire skills in other areas.

(3) Societal and Institutional Level

At the societal and institutional level, the analysis focuses on external conditions such as stakeholders including factories and other facilities, as well as ESCO companies, the statutory system[24], public funds and incentives.

1) Status of Issues

Instituted in 1995, the existing regulation issued in 1995 on "the measures to be taken to increase

[24] At the moment, Turkey has no legislation that would correspond to Japan's Law Concerning Rational Use of Energy. It has nothing but the Regulations and Circulars on Energy Efficiency enforced by the NECC in November 1995. It has much in common with the Law Concerning Rational Use of Energy in Japan, since it was developed on the basis of that law. They stipulate that every factory with annual energy consumption of 2,000 TOE or more must set up an energy management committee and energy administrators and that energy administrators have an obligation to receive training offered by the NECC. However, they are treated not as a law but as a regulation set out by a government institution without penalty provisions nor strict binding force on businesses. Few business managers are even aware of its existence.
The NECC has been studying a bill concerning energy conservation for more than two decades, but the bill has never been approved by the national parliament nor by any other governmental ministry or agency and it has not become law. After the commencement of the project, EU accession emerged as a political issue and energy conservation became increasingly important in policy terms for the Turkish government. The energy law is being revised to cover all types of industry, consumers and buildings. The NECC is working to establish an energy law in December 2005 (See the supplementary materials of JICA (2004b) and JICA (2005b)).

energy efficiency in industrial establishments" merely obliges relatively large factories and facilities to have energy administrators. It does not cover small and medium enterprises. It is a mere "regulation" without penalty provisions nor strict binding force on enterprises. Factories are not properly encouraged to introduce energy conservation measures, with the consequence that their energy saving efforts are insufficient.

2) Future Vision

It was envisioned that an energy conservation law would be enacted and that energy administrators, who are trained and certified by the NECC, would be assigned to all factories and facilities. All of Turkish society would be better aware of environmental issues and energy consumption. The government would establish a scheme of its energy conservation policies. Turkey would play a leading role in energy conservation in the Central Asian region.

3) Approach

With regard to the activities of capacity building and development for the objective of attaining the future vision from the current state, JICA personnel stress the following points:

- Japan began to offer energy conservation assistance to Turkey when the Energy Conservation Center, Japan (ECCJ) first accepted NECC personnel for energy conservation training held in Japan in 1989. Since then, Japan has been providing Turkey with continuous cooperation in the energy conservation sector. This cooperation has consistently been aimed at improving the capacity of the EIE/NECC. As a result, it helped improve the relationship of trust between the two countries and create a strong sense of ownership on the Turkish part. It also enabled all those concerned to share comprehensive understanding and knowledge about the actual state of energy conservation in Japan, including technical and institutional aspects and overall social systems such as the stance of the business sector to address the issue of energy conservation.
- Given that Turkey's energy conservation law was based on Japan's Law Concerning Rational Use of Energy, the Japanese side presented the actual practice of energy conservation in Japan mentioned above, explained key terms and offered reference materials to back the NECC's activities to pass the law.
- The project transferred proven and superior technologies of Japan with the experience of overcoming oil crises. It is well known that Turkey is very friendly towards Japan. The Turkish side placed strong trust in the project only because it involved technical guidance from Japan.

1-2-3 Ensuring of CD Sustainability

Tables 1-5 and 1-6 both review the process towards self-sustaining development of CD in the energy conservation project for Turkey. Table 1-5 focuses on the methods of promoting the autonomous improvement of capacity while Table 1-6 on the initiatives to address the factors at societal and institutional level. The next part of the report examines who introduced what methods and action, whether such methods were set out within the project or perceived as external conditions of the project or as unexpected factors, and whether or not there was anything that hampered the CD.

(1) Methods of Promoting Independent Improvement of Capacity (Table 1-5)

This section studies the methods of promoting autonomous improvements of capacity, which is to be enhanced from three perspectives: ownership, incentive enhancement and the knowledge acquisition method.

1) Ownership

In this project, the Japanese side was astonished by the high sense of ownership and autonomy of the project partner, the NECC. This was decisive to the success of the project. Possible factors behind the development of the NECC's strong sense of ownership are as follows:

(i) According to Japanese project members, the Japanese side was at first thinking of taking the initiative in determining the specific activities of the project and later realized that this approach would not work. It then took a stance of providing cooperation at the request of the recipient and paid attention to encouraging the Turkish side to have a higher sense of ownership, as the party to this issue. (Efforts made in the project)

(ii) Prior to the launch of the project, Japan had been providing continuous assistance for Turkey in forms of training, dispatch of individual experts, development studies and the like since 1989. It consequently produced some positive effects, For example, the Turkish side, namely the NECC,

- understood what it was missing, specifically a lack of capacity to perform energy conservation assessments,
- acknowledged the level of energy conservation technologies on the Japanese side in advance, and
- successfully formed a relationship of trust with the Japanese side and its experts.

The NECC staff who took part in the training in Japan realized the responsibility that the NECC has as the organization promoting energy conservation in Turkey when they had a close look at the reality of energy conservation efforts in Japan.(Within the expectations ofthe project)

(iii) In view of the falling self-sufficiency of energy and the rising energy consumption, the Turkish government puts top priority on energy conservation in its eighth national five-year plan for 2001-2005 to exert its state ownership. Before the project, the country was hit by a major earthquake in August 1997. At that time, the government halted most of the public work projects and diverted its money to anti-seismic measures. However, the energy conservation project was regarded as a project with great urgency and importance and the State Planning Organization (SPO) allowed its budget to be executed as planned. This attitude of the state helped develop the ownership of the NECC. (External conditions)

(iv) After inauguration of the project, it became necessary to make an energy conservation law as part of the efforts to meet the requirements for EU membership. This increased the responsibility of the NECC as an institution playing a central role in formulation of the law. (Unexpected)

The NECC was operated in the manner in which the first head of the energy conservation industry division, who was the woman who led the C/P, exercised strong leadership to share her understanding of issues with other staff and thus ensured a sense of unity. As a relatively new section within the General Directorate of Electrical Power Resources Survey and Development Administration (EIE), the NECC independently secured human resources from within the EIE. Prior to the project launch, the EIE held a

Table 1-5 Ensuring of CD Sustainability (1) – Project for Turkey

Methods of promoting autonomous improvement of capacity	
Ownership	- The C/P had such a strong sense of ownership that it did everything possible and asked JICA to do things that required more capacity than it had. The Japanese side therefore avoided a forceful style and rather offered assistance to suit its needs. A large proportion of NECC staff remained employed and reassignments were limited. - After Japan had provided long-term continuous support in the forms of training, dispatch of individual experts and development studies since 1989, the Turkish side, namely the NECC, (i) fully understood its own issues, (ii) acknowledged Japan's technical level and (iii) built a relationship of trust with Japan. This long-term cooperation led the NECC to be aware of its responsibility as the energy conservation promotion body in Turkey. - The NECC's strong sense of ownership partly reflects the fact that energy conservation is one of the top priority challenges of the Turkish government in the national plan. - Leaders of the C/P showed strong leadership and created an atmosphere in which they share an awareness of issues with the other personnel.
Incentive enhancement	- Objective evaluation of individual skill levels with the use of the monitoring sheet motivated individual staff to develop their skills in the NECC. - The NECC had pride in playing a leadership role in the sector of energy conservation in the Central Asian region. To add incentive, three international energy conservation training sessions were held within the framework of the project with the participation of invited neighboring countries. Another incentive for the NECC was the system under which the revenues from training fees and energy conservation assessment charges went directly into the treasury of the NECC. - As the EU accession issue emerged, it served as a major incentive for the NECC to institute an energy conservation law. It also acted as a major driving force for CD in the energy conservation sector. - The project merely offered factories and other facilities an incentive to engage in energy conservation in an indirect manner of winning trust from them through CD run by the partner organization. - Although falling under the category of external factors, the future enacted law concerning energy conservation and the EU membership issue were an incentive for factories, ESCO companies and other stakeholders willing to address energy conservation.
Knowledge acquisition method	- For hands-on practice and training on energy conservation assessment, the project offered a mini-plant, modified on the basis of the past experience, and related materials. Among others, the mini-plant was of very good quality. - To share the knowledge and acquired skills among the members, the JICA expert proposed a reshuffle of human resources within the NECC. - The progress of technology transfer was examined for a long time with the use of the monitoring sheet for determining the level of acquired skills. - The domestic assistance committee based in Japan provided detailed technical information. It was helpful for providing guidance on specific methods of carrying out the energy conservation assessment or process assessment in five sectors, namely steelmaking, ceramics, textile, food and paper and pulp.

Source: the author, based on JICA (1999),(2000a),(2000b),(2003c),(2005b), Techno Consultants and Mitsubishi Chemical Engineering (1997) and interviews with JICA personnel

debate on integration of the NECC with the section responsible for agricultural dams as part of its organizational reform. At that time, the NECC demonstrated strong solidarity to successfully maintain its independence. As a result, the NECC had strong organizational cohesion before the project started. The division chief in question was transferred with the change in Turkish government that took place during the project period. Her subordinate continued her style of work and strengthened ties with the EIE deputy chief to further energize the activities of the organization. Project personnel on the Japanese side felt that they had been fortunate to have worked with such a good C/P The capacity of project members is also behind the success of the project. (Within expectations)

2) Incentive Enhancement

Approaches to improving incentives can be reviewed at each of the three levels, namely the individual, organizational and societal levels.

- At the individual level, there was an active incentive for NECC staff to strive in a friendly rivalry to acquire skills within the group of engineers in the NECC. In light of this, the project adopted the use of the monitoring sheet. The NECC budget, including the portion for personnel expenses was secured as planned. In this project, there was no situation that would be common in other developing countries, in which the personnel are dissatisfied with the treatment in salary terms and lose their morale. (Efforts made in the project)
- At the organizational level, the NECC had pride in playing a leading role in the sector of energy conservation in the Central Asian region. To increase this incentive, it held three international training sessions on energy saving with the participation of invited neighboring states as part of the project activities. In addition, the NECC had access to revenues from training participation fees and energy conservation assessment charges and ensured that it developed as an independent organization. With this background, it secured its budget as planned, which served as an incentive for the organization. (Efforts made in the project)
- The rise of the EU accession issue was a major incentive for the NECC to institute legislation for energy conservation. It also propelled the CD in the energy conservation sector. (Unexpected)
- At the societal and institutional level, Japan's technical guidance within the project boosted the NECC's ability to conduct training and energy conservation assessment. This led to greater trust placed by factories and other facilities in the technical capacity of the NECC and to an incentive for them to commence energy saving efforts. (Efforts made in the project)
- Among the external conditions at the societal and institutional level, the future law concerning energy conservation and the EU membership issue are thought to give factories and ESCO companies a significant incentive to engage in energy saving activities. Emerging while the project was underway, the EU accession issue is thought to have been a powerful driver for the NECC's long-sought establishment of a statute on energy conservation and to encourage ESCO companies in their energy saving assessment business because the demand for such assessment will increase after the enactment. Provided within the legislation on energy conservation, it is deemed that tax incentives and the loan program for energy conservation assessment and energy saving efforts will motivate general enterprises to conduct energy saving activities. (External conditions)

3) Knowledge Acquisition Method

A number of different kinds of measures were introduced to the transfer of technologies on the basis of past experience in similar projects on energy conservation. They contributed in particular to increasing the capacity of the NECC to perform an energy conservation assessment:

- A mini-plant and related materials were offered for hands-on practice and training in energy conservation assessment.
- The Japan-based domestic assistance committee offered detailed technical information and guidance on specific manners of performing energy conservation assessment (process assessment), especially in five sectors of steelmaking, ceramics, textile, food and paper and pulp.
- The progress of the technology transfer was examined with the use of the monitoring sheet (for determining the level of skills acquired).
- Personnel of the partner organization were reshuffled to ensure that the acquired skills are shared among them.

(2) Initiatives to Address the Factors at the Societal and Institutional Level (Table 1-6)

This section looks at how key potential stakeholders were attracted to the project and how the initiatives to address the impediments and risks to CD were implemented in the project from the following two perspectives:

1) Identification and Involvement of Key Stakeholders

It was factories and other facilities, the EIE as a supervisory body of the NECC and ESCO companies that were perceived as key stakeholders in this project.

- The NECC is mandated to develop policies and to implement them. Basically, it does not need to coordinate such operation plans with other governmental bodies. It is possible for the NECC to maintain its independence by keeping favorable relations with its supervisory organization, namely, EIE. In fact, NECC personnel formed a good relationship with the EIE.
- The most important stakeholders for the NECC were factories and other facilities. In business terms, the NECC faced the challenge of winning their trust and encouraging them to place orders for energy conservation assessment. It is for this purpose that the C/P endeavored to develop its own technical capacity in the project. As a result, hands-on practice using plant materials was added to the training course that formerly consisted only of classroom lectures. The stronger and more comprehensive training program enjoyed a dramatically improved reputation among trainees. A follow-up study on 23 factories that underwent the NECC's energy conservation assessment confirmed that 19 of them carried out some form of energy conservation measures. The project thus helped the NECC to win clients.
- Enactment of an energy conservation law will pave the way for preferential taxation and financial support for the implementation of energy saving efforts as set out in the bill. This will be an incentive for factories and facilities to introduce energy conservation measures.
- Achievement was slow in terms of the approach to such stakeholders as ESCO companies, equipment manufacturers and electric power suppliers.
- With respect to CD in the area of energy conservation, a major issue is to foster ESCO companies: private enterprises engaging in the business of energy conservation assessment. Turkey had

Table 1-6 Ensuring of CD Sustainability (2) – Project for Turkey: A Mechanism of Linking Project Achievements with Overall Goal

Initiatives to address the factors at societal and institutional level	
Identification and involvement of key stakeholders	- After the mini-plant for practical training upgraded the energy conservation assessment capacity of the NECC, the NECC became more highly regarded by factories and other facilities and an increasing number of them asked NECC to conduct the energy conservation assessment. (Inducement of the most important stakeholders) - Establishment of an energy conservation law, expected at the end of 2005, will pave the way for preferential taxation and financial assistance in energy conservation efforts. They serve as incentives for factories and other facilities to introduce energy conservation measures. - The NECC was on good terms with the EIE, a supervisory organization of the NECC. - Poor progress is made in terms of promotion to ESCO companies, equipment manufacturers, electric power suppliers and other stakeholders.
Identification of risk factors and responses	a) Risk 1: No legislation concerning energy conservation has been set forth. The obligation to assign energy administrators is imposed solely on large enterprises. Little progress has been made in introduction of preferential taxation and low-interest loan schemes for energy saving efforts. (i) Response requirement: Strengthening of the statutory system by instituting an energy conservation law is essential to promotion of energy conservation. (ii) Countermeasures taken within the project – Based on Japan's Law Concerning Rational Use of Energy, the project provided explanations on key terms and reference materials. (iii) Other measures: The energy saving legislation was in a state of deadlock, although it has been studied for more than 20 years, because it failed to obtain the approval of the authorities. (iv) Change in external conditions: After the launch of the project, the EU accession issue emerged. One of the criteria for the EU membership is the establishment of an energy conservation law. (v) Outcome: The Turkish government adopted a policy of enacting the law at the end of 2005. b) Risk 2: At the initial stage of the project, progress was slower than previously expected. (i) Response requirement: A closer relationship of trust between the parties of the two countries is essential for achieving the project purpose. (ii) Countermeasures taken within the project: At first, the Japanese side thought that none of the members were familiar with technical cooperation projects, because they had no experience in such activities. After some change in members, the project switched the policy from a unilateral style of technical cooperation to technology transfer suited to the needs of the partner body. (iii) Other measures: None (iv) Change in external conditions: None (v) Outcome: From the third year, the relationship of trust between the two sides started to be fortified and project operation became smoother.

Note: When a risk in a project has been detected, risk factors have been analyzed from the following perspectives: (i) how the need for action was determined, (ii) what action was taken in the project if the need for action was confirmed, (iii) whether any other action was taken outside the project, such as requests made to other donors, (iv) whether or not any unintended changes occurred in external conditions of the project and (v) what the results were.

Source: the author, based on JICA (1999),(2000a),(2000b),(2003c),(2005b), Techno Consultants and Mitsubishi Chemical Engineering (1997) and interviews with JICA personnel

hitherto seen few ESCO companies. The NECC anticipates, however, that the energy conservation law will boost the needs of private companies to conserve energy and that a market for satisfying such needs will naturally come into being. The NECC will be continuing its energy saving assessment service for some time after the end of the project and later seeking a way to hand the service over to the private sector. Specifically, prospective companies that are suited to performing energy conservation assessment include the subsidiaries of large enterprises, individual consultants who have retired from large companies, engineering businesses and equipment companies. The EIE has a vision in which private companies will be certification bodies for energy conservation assessment services in the industrial sector.[25]

2) Identification of Risk Factors and Responses

The project identified two risk factors, detailed as follows. This section reviews what action was taken to deal with them.

(i) Absence of established legislation concerning energy conservation

No law governing energy conservation had been enacted at the beginning of the project although such legislation had been studied for more than 20 years and that the C/P had long wished for it to be instituted. The existing energy regulation imposes an obligation to appoint energy administrators solely on major enterprises. No incentives to introduce energy conservation measures such as preferential taxation and low-interest loans can be offered at the moment.

- Response requirement: Strengthening the statutory system by instituting an energy conservation law is essential to promotion of energy conservation.
- Countermeasures taken within the project: Given that the energy regulation set forth by NECC in 1995 was based on Japan's Law Concerning Rational Use of Energy, the Japanese side provided explanations on key terms and reference materials.
- Other measures: The energy saving legislation was in a state of deadlock although it had been studied for more than 20 years because it failed to obtain the approval of the relevant authorities.
- Changes in external conditions: After the launch of the project, the EU accession issue emerged. One of the criteria for the EU membership is the establishment of an energy conservation law.
- Outcome: As a result, there was some progress in coordination with relevant ministries and agencies and the law is set to be instituted at the end of 2005.

(ii) Lack of experience in technical cooperation projects and resulting unfamiliarity with them

At the initial stage of the project, the progress was slower than expected.

- Response requirement: A closer relationship of trust between the parties of the two countries is indispensable to achieving the project purpose.
- Countermeasures taken within the project: At first, the Japanese side thought that none of the members had any experience in and were used to technical cooperation projects. As a result, there was a change in some members. According to Japanese members of the project, at the beginning it was the Japanese side that determined the details of technology transfer and

[25] See the attachment to JICA (2004b) and JICA (2005b).

operated the project in a somewhat unilateral manner, but this style turned out to be unsuccessful. So it changed its stance. It listened to the needs of the NECC before working to satisfy them.

- Other measures: None
- Change in external conditions: None
- Outcome: From the third year, the relationship of trust between the two sides started to be fortified and project operations became smoother. Every year, the Turkish side issued a strong request to make no change to the experts during the project term.

(3) Outcomes of the Project from the Perspective of CD

On the basis of the above analyses, Table 1-7 outlines the outcomes of the JICA project from the perspective of CD. They are sorted by two levels, namely "individuals and organizations" and "society and institutions." At each level, they are further divided into two categories: tangible outcomes and CD sustainability.

Table 1-7 Outcomes of the Project from the Perspective of CD – Project for Turkey

Level	Item	Outcomes
Individuals/ Organization	Tangible outcomes (technology transfer)	◎ The transfer of technology was done successfully. The project serves as a model example of individual and organizational capacity development. - Expertise has been accumulated by existing operations. - The Japanese side made highly effective contributions, such as a mini-plant, expertise in process assessment and intra-organizational personnel reshuffle.
	CD sustainability	◎ CD is expected to be sustainable. - C/Ps demonstrate ownership and solid organizational management. - Two functions are covered: formulation and implementation of energy conservation policies. - Promotion of energy conservation is of growing its importance due to the EU accession issue.
Society institutions	Tangible outcomes (energy conservation effects, improvement in statutory systems, etc.)	◎ The specific effects of energy conservation has already been measured. - Direct promotion of energy conservation assessment to factories and other facilities through the JICA technical cooperation project encouraged them to carry out energy conservation efforts. ○ Backed by the EU membership issue, the energy conservation legislation is finally on track towards enactment. ○ The approach to the ESCO market and to equipment manufacturers was limited.
	CD sustainability	◎ CD sustainability can be expected. - The energy conservation law is set to be enacted at the end of 2005. - Preparation for the accession to EU continues ○ It will take some time to put into operation the preferential taxation and a low-interest loan scheme for energy conservation efforts.

Key: ◎ major progress ○ certain progress □ limited progress △ negative progress
Source: the author

The project produced good achievements, especially in terms of technology transfer. At the individual and organizational levels, CD was consequently boosted. Moreover, some factories and facilities that underwent energy conservation assessment introduced energy saving measures. The project successfully made the tangible effect of energy conservation. In consideration of the strong sense of ownership of the C/P, the NECC, it can be said that CD sustainability at the individual and organizational level is ensured.

At societal and institutional level, the energy conservation law sought by the NECC finally became set to be instituted at the end of 2005 after difficult coordination with relevant authorities and resultant slow progress. This breakthrough was brought by the emergence of the EU membership issue. The enactment is expected to increase the number of factories and facilities that will engage in energy conservation measures.

From the standpoint of CD, the transfer of technologies and the institutional development including statutory improvement, work together to boost the overall problem solving capabilities of developing countries at the individual, organizational, and societal levels. JICA projects basically serve the purpose of increasing the capacity of recipient countries by means of technology transfer while the recipient countries work on institutional development with a sense of ownership. This is how a well-balanced combination of the two driving forces is formed. The project for Turkey successfully produced a combination of technology transfer and institutional development to enable the country to take the initiative in pursuing energy conservation by themselves.

1-3 Case Study 2: Energy Conservation Project for Thailand[26]

1-3-1 Project Overview

(1) Background

Primary energy consumption in Thailand rose at an approximate annual growth rate of 10% following rapid economic development in recent years. Since Thailand imports a large majority of the primary energy that it consumes, control of energy demand is now a critical policy issue. It is of growing importance in the context of reducing global warming gas emissions.

In this environment, the Thai government introduced the Energy Conservation and Promotion (ENCON) Act in 1992. This law obliges specified factories and buildings consuming a certain level of energy or higher to appoint Persons Responsible for Energy (PREs) in charge of energy control, who in turn have an obligation to report their energy management status and their energy conservation plans to the government on a regular basis. PREs play a core role in the creation of the documentation and materials to be submitted. Although taking steps to promote energy conservation in this framework, Thailand faced a lack of people qualified to act as PREs and an inadequacy of skills. As a result, energy conservation had yet to fully progress in this country.

In the light of this situation, the Thai government set up the Practical Energy Management Training Center (PEMTC) under the Department of Energy Development and Promotion (DEDP) of the Ministry of Science, Technology and Environment, which has now been reorganized into the Department of Alternative Energy Development and Efficiency (DEDE). It had a plan to train and cultivate PREs and PRE instructors at this center and to introduce a system of PRE qualification examination. The project was commenced in

[26] This section is based on JICA (1984), (2002), (2005a) and interviews with those concerned.

April 2002 to provide the institutional support and assistance for human resource development, essential to ensure the operation of the system.

(2) Descriptions of Cooperation

1) Project Purpose

(i) Overall Goal

Energy control in specified factories and buildings by their PREs will be effectively implemented in compliance with the ENCON Act.

(ii) Project Purpose

A high quality system for PRE education will be created.

2) Activities

(i) The PEMTC was set up and the implementation system was established.

(ii) A state examination scheme for PRE certification was launched.

(iii) Energy conservation skill training courses for PREs were set up.

(iv) A system was established for running the state examination and training courses.

(v) A PRE support system was proposed.

3) Period

Three years from April 2002 to April 2005

(3) Parties and Factors Concerned with This Project in CD Analysis

Table 1-8 provides a summary list of stakeholders and related factors of the project in CD analysis.

With regard to this particular project, the following points must be noted. The Thai side had a policy of outsourcing PRE training. Stakeholders at the individual level were not confined to the personnel of the C/P but included outside contracted consultants to whom technologies were transferred. Those at the organizational level included outside training providers as well as the partner body.

(4) Results and Evaluation

1) Results

The project successfully launched the four training and examination courses listed below to develop a high quality PRE education system, and to construct an implementation system on the Thai side.[27] The project submitted a draft on the PRE support system that would complement the training courses. The project also provided training courses on a trial basis to give PRE education to a cumulative total of 738 trainees.

(i) Senior PRE Course (Heat): For large enterprises / With lectures for five days, examination for one day and hands-on training for five days

[27] In Thailand, there had been only one PRE training course and trainees were able to obtain the state qualification for PREs simply by taking the course. This system was revised to launch four separate training courses and to set up a new PRE scheme to certify those who complete the courses (i) and (ii) mentioned on the following page and pass the state examination as senior PREs and those who complete courses (iii) and (iv) as conventional PREs. Courses (i) and (ii) include compulsory five-day hands-on training at a mini plant.

Table 1-8 Parties and Factors Concerned in CD Analysis – Project for Thailand

Level	Parties and factors concerned	Elements to be considered for the project
Individuals	Personnel of the C/P	- PEMTC staff for control of project operation - Outside contracted consultants to whom technologies were transferred
Organization	C/P (governmental body responsible for the project)	- PEMTC and DEDE - Outside contracted training providers
Society and systems	Other governmental bodies	- Bureau of Energy Regulation and Conservation (BERC) in the DEDE
	Factories and other facilities	- Persons Responsible for Energy (PREs) - Factories and other buildings subject to energy conservation assessment
	ESCO companies	- Specified DEDE-registered consultants undertaking the assessment
	Equipment manufacturers	
	Electric power suppliers	
	Statutory systems	- Energy Conservation Promotion (ENCON) Act, 1992
	Public funds	- ENCON Fund stipulated by the ENCON Act
	Incentives	- Budget for the DEDE and the PEMTC - A sense of leadership in the ASEAN
	ESCO market	
	Awareness of energy conservation	- Percentage of companies that appoint PREs
	Partnership	
	Donors	
	Preconditions	

Source: the author

(ii) Senior PRE Course (Electricity): For large enterprises / With lectures for five days, examination for one day and hands-on training for five days

(iii) Conventional PRE Course (for Factories): For small and medium enterprises / With lectures for five days and examination for one day

(iv) Conventional PRE Course (for Buildings): For small and medium enterprises / With lectures for five days and examination for one day

2) Concluded Evaluation at the Time of Completion

The project was so successfully carried out that the objective was expected to be met by the project's conclusion. Although some minor problems were noted, the project endeavored to solve them flexibly. The project orientation was in line with the rising momentum on the Thai side for the promotion of energy conservation and it made effective inputs to produce results respectively as planned. These two facts proved more helpful to the success in the project among many other contributory factors.

(5) Major Issues that Affected the Project Implementation[28]

In the implementation of the project, there was disagreement between the two countries in the two aspects explained below.

[28] See the attachment to JICA (2003b) and JICA (2005a).

1) Outsourcing Policy of the C/P

The Thai side, namely the DEDE, had a plan to contract with outside consultants to carry out new energy administrator training courses prepared by the project, especially for hands-on practice using a mini-plant and lectures. With the conviction that it was important from the perspective of sustainability and development to ensure the outcomes of technology transfer concerning hands-on training and education with a mini-plant, the Japanese side entered into consultations with the Thai side on its outsourcing policy. As a result, it was determined that the technologies be transferred to five personnel from DEDE's training section and 30 outside contracted consultants and that the focus of technology transfer to the personnel through the training section be placed on management of the system, including outsourcing of PRE training and outsourcing of the examination program and especially on development of contract management capabilities.

2) Stance on Aamendment of the Energy Saving Legislation

Given that the project covered preparations for launching training courses and examinations for new PRE qualifications in the project, the Japanese side thought that it was imperative to amend the law to provide for positions of the new PRE system and for obligations to participate in it.[29] On the other hand, the Thai side was thinking of providing pilot training for the new PRE qualifications and calling for factories and facilities without PREs to join it, so that they could understand the effect of the new PRE scheme within the project framework while the existing PRE scheme would still be continued. As a result of deliberations between the two parties, it was decided that the stance taken by the Thai side be respected for the time being and that both parties would hold close consultations with each other during the project implementation process to ensure the effectiveness of the new PRE system as well as its sustainability.

1-3-2 Position of JICA Cooperation

Table 1-9 provides an organizational chart of the cooperation in the energy conservation project for Thailand. Its elements are classified into (i) the actual state of issues, (ii) future visions and (iii) methods of attaining the vision, namely JICA's action and approach in the process of shifting from (i) to (ii), and further categorized into three levels, namely the individual level, meaning staff members of the C/P; the organizational level, which refers to the partner organization itself, and the societal level. The subsequent part of this section examines the position of JICA cooperation at each of these three different levels.

(1) Individual Level

At the individual level, the scope of analysis is the workers of the Practical Energy Management Training Center for operation and management of the project and outside contracted consultants to whom technologies were transferred.

- The PEMTC personnel had a duty to supervise outside contractors commissioned to operate training

[29] The Japanese side speculated that the (i) absence of any statutory obligation imposed on factories might result in few voluntary candidates taking the examination since the state qualification examination under the new PRE scheme was designed to be technically challenging for ensuring quality and that (ii) managers of energy consuming factories could not be encouraged to have their employees receive PRE training or take the test after comparing the advantages and burdens of appointing PREs unless they are obliged to do so by law.

Table 1-9 Position of JICA Cooperation from the CD Perspective – Project for Thailand

	Individuals	Organization	Society and institutions
(i) Actual state of issues			
What are the issues?	- Lack of capabilities to design and implement sophisticated training courses with the use of a mini-plant - Inadequate ability to conduct subcontract management	- Lack of technical knowledge and specialist abilities to deal with dissatisfaction among factories and other facilities with training courses - Delay in DEDE's handling of energy audit reports	- PREs have limited authority, no work incentive and an insufficient level of knowledge in energy conservation. - Factories and facilities are poorly motivated to appoint their PREs because of poor cost effectiveness.
Capacity required to solve them	- Capacity to design and implement training courses using a mini-plant - Subcontract management capacity	- Improvement in PRE training - Promotion of energy conservation to corporate managers	- Further publicity and promotion of energy conservation effects - Enforcement of new energy conservation legislation - Public funds and other incentives
Awareness of the actual state	- Lack of experience in hands-on training with the use of a mini-plant	- The capabilities of the training provider are not taken into account because the lowest price bidder wins the contract to offer training courses.	- There is no incentive for factories and facilities to carry out energy conservation plans in line with the existing energy conservation law. (Energy conservation is poorly implemented under the current PRE system.)
Capacity to be developed intensively	- Capacity to provide training courses using a mini-plant - Subcontract management capacity	- Enhancement of the subcontract management system (in terms of efficiency, transparency and cost cuts)	- Development of PRE skills and a training and state examination system for ensuring the quality of their skills (new energy conservation legislation)
(ii) Future vision			
What will the situation be like after development issues have been solved?	- The state examination system for PRE certification will be put into operation by 2005 and accepted by the industrial sector. More than 80 percent of specified factories and buildings will have appointed PREs by 2008. - Factories and other facilities will submit their energy conservation plans created by their PREs or consultants to the DEDE. Energy conservation measures will be implemented and monitored in accordance with the plans.		
(iii) Approach			
Roadmap for capacity building and enhancement	- Carrying out TOT. - Development of materials for TOT. - Implementation of trial training courses.	- Design and implementation of new PRE training courses, with construction of a new state examination system in mind. - Development of expertise in subcontract management through on-the-job training in actual training.	- A suggestion for legislating PRE training and the state examination program. (At least, creation of an environment for mutual consultations.) - Provision of four PRE training courses.

Key: A solid-line arrow indicates a direct approach by the JICA project, especially at the individual and organizational levels. A dotted-line arrow suggests an indirect approach by the JICA project. Particularly at the societal and institutional level, it is necessary for the assistance recipient country to work towards its vision with a sense of ownership. Japan's approach is inevitably limited.

Source: the author, based on JICA (1984), (2002), (2005a) and interviews with those involved

courses. Prior to the project, there had been only one training course. The project aimed to provide four courses at different technical levels and for two separate categories of companies, namely large enterprises and small and medium enterprises. Management of outsourced operation of these training courses required specialist knowledge for assessing the technical capabilities of contractors. Given that the PEMTC had no experience in running the four training programs mentioned above, the project provided on-the-job training (OJT) for acquiring subcontract control skills.

- Outside contracted consultants for training courses must have more technical knowledge than was taught in the past training course. They had no practical experience in running the hands-on training using the mini-plant offered by Japan. The project therefore provided training of trainers (TOT) as well as OJT in actual training sessions for their skill development.

(2) Organizational Level

At the organizational level, the focus of analysis is on the Practical Energy Management Training Center (PEMTC) and the Development of Alternative Energy Development and Efficiency (DEDE).

- Despite its basic policy of outsourcing the training itself, the PEMTC must have technical knowledge of the course details and the capacity to improve the content as a training implementation body. In the past, commissioned training providers were selected only on the basis that they put in the lowest bid. It is therefore necessary to maintain a system to check their technical levels. The project designated five PEMTC personnel in addition to thirty outside consultants as the targets of technology transfer.[30]
- In Thailand, energy conservation measures are put into operation after funds are supplied from the Energy Conservation Promotion (ENCON) Fund to individual factories and facilities on the basis of DEDE's approval on energy audit reports prepared by DEDE registered consultants (RCs) on contract with the PREs of factories and facilities. The DEDE monitors the operation of this cycle. However, because of delays in processing energy audit reports, it is hard to realize this process. The project took no specific action to remedy this situation.

(3) Societal Level

At the societal level, the analysis is conducted chiefly on PREs, factories and facilities and the legal system.

- There is a problem at present, which lies in the fact that the cost effectiveness of compliance with the aforesaid cycle of energy conservation measures based on the ENCON Act is so low[31] that it offers little incentives to factories and buildings to appoint their PREs. They are actually given limited

[30] The scheme conceived by the Thai side had three steps. At Step 1, five personnel in the training division of DEDE, direct partner of the project, and 30 in-house consultants selected from outside candidates would receive technical training from the Japanese side in the first two years for the purpose of increasing future PRE trainers. At Step 2, a public hearing would be held prior to the completion of the JICA project to assess the result of Step 1 and to confirm the effect of the new PRE system. And at Step 3, those who received the training at Step 1 would be invited to apply to become Training Providers (TPs) responsible for training future in-house consultants and prospective PREs. TPs would not serve any specific organization. Upon expiration of their one-year contract, new TPs would be newly appointed from among candidates trained to be in-house consultants in the previous year.

[31] In Thailand, the ENCON Act obliges specified factories and buildings to produce an energy conservation audit report in accordance with a three-year cycle. They have no access to the fund that covers their expense on preparing the report until DEDE grants its final approval for the report. However, none of the specified factories or buildings have completed this cycle even now, five years after the law was enforced.

authority in factories and buildings and have little motivation to do their duty and scarce knowledge of energy conservation.

- Although the country has an ENCON fund as a public means of financing energy conservation efforts, very few factories and facilities take advantage of it. In the five years since the ENCON Act came into effect, none of the specified factories or buildings have actually achieved the cycle using the ENCON Fund. The Thai side was so negative about revising the ENCON Act that the project took no specific action to encourage use of the public fund. It is left to the ownership on the Thai part.

1-3-3 Ensuring of CD Sustainability

(1) Methods to Promote Independent Improvement of Capacity

Table 1-10 reflects an analysis of the process towards self-sustaining development of CD in the energy conservation project for Thailand with respect to the methods to promote independent capacity improvement.

1) Ownership

The Thai side showed its reluctance to amend the ENCON Act, including the PRE system. It had a basic stance of (i) first putting the current PRE system on the right track and (ii) then carrying out a trial project for the new PRE system to verify its effect. For this reason, the JICA project was regarded as a pilot project for examining the effect of the new PRE system. Respecting ownership on the Thai side, the project was run in accordance with Thailand's policy to seek stronger promotional efforts instead of a revision to the ENCON Act. The Thai side has a plan to train 600 senior PREs and 5,000 conventional PREs in a five-year period following this project.

Table 1-10 Ensuring CD Sustainability (1) – Project for Thailand

Methods to promote independent improvement of capacity	
Ownership	- The PRE system needs to be revised to cause factories and facilities to actually adopt energy conservation measures. However, the Thai side is negative about making amendments to the ENCON Act, which is necessary to the revision. Respecting Thailand's ownership, the project was run in accordance with the Thai policy to seek stepped-up publicity efforts as an alteration to the ENCON Act.
Incentive enhancement	- Aspiring to be an ASEAN leader in the energy conservation sector, Thailand allocates ample financial resources and appropriate personnel to the body responsible for implementing energy conservation, namely DEDE. It serves as an incentive for DEDE and PEMTC staff.
Knowledge acquisition method	- A mini-plant and related materials and equipment were offered for advanced training and hands-on courses. - Thailand has a policy of employing outside contracted consultants to be the instructors. The project thus conducted a technology transfer to 30 outside contracted consultants selected as training instructors rather than to staff members of the project partner body.

Source: the author, based on JICA (1984),(2002),(2005a) and interviews with those concerned

2) Incentive Enhancement

On the Thai side, the momentum is growing towards promotion of energy conservation. The country is also determined to be an ASEAN leader in energy conservation. These two facts act as an incentive at the individual and organizational level to encourage energy conservation. An ample budget and considerable human resources allocated to DEDE is another incentive for the C/P.

At the societal level, the ENCON Fund, which is already in place under the country's existing ENCON Act, is a major incentive as it finances or provides low-interest loans for energy conservation programs carried out by factories and buildings. However, this Fund is in fact left unused. JICA's project design report[32] gives three reasons. First, DEDE is so understaffed that an endorsement of energy audit reports, development of a format for such reports and the PRE certification process are delayed. Second, energy audit reports are of poor quality since PREs and designated consultants have insufficient knowledge. And third, specified factories and buildings suffer a shortage of engineers and there is a scarcity in human resources for PREs. These problems interact with one another to form a vicious circle that makes it more difficult to operate the system. To cope with these issues, there must be a system of training and certification for helping develop the skills of PREs. Even though there exists a public fund program that acts as an incentive, it is imperative to check if it is in effective operation.

(2) Initiatives to Address the Factors at Societal and Institutional Levels

Table 1-11 portrays an analysis of the process towards self-sustaining development of CD in the energy conservation project for Thailand with regard to the initiatives to address the factors at societal and institutional levels.

1) Identification and Involvement of Key Stakeholders

- The Thai government has switched its policy on functions of governmental organizations to maximize outsourcing of technical services and similar operations and to assign supervision of outsourced operations to government personnel. Its outsourcing policy was set to be applied to training instructors in the project. To ensure the effect and sustainability of technology transfer through the training, the project offered guidance particularly with respect to the hands-on practical course with the use of a mini-plant, to 30 outside contracted consultants as well as to five staff members of the training center. Even for projects with the focus of assistance placed on the transfer of advanced technologies, as in the sector of energy conservation, outsourcing at the individual level of the C/P is consistent with the worldwide trend towards small government and is expected to expand in the future. In the future, it will be necessary to discuss a methodology for ensuring both substantial results from the project and self-sustaining development while respecting the policy of the assistance recipient countries.
- Although the project was very susceptible to trends with respect to legal systems in Thailand, the section in charge of legal systems on energy conservation was not included in the partner body of the project. Coordination was attempted so that it could be included as a C/P during the project implementation. As a result, no progress was made in terms of the revision to the ENCON Act

[32] JICA (2002)

Table 1-11 Ensuring CD Sustainability (2) – Project for Thailand: A Mechanism of Linking Project Achievements with Overall Goals

Initiatives to address the factors at societal and institutional levels	
Identification and involvement of key stakeholders	- Given that DEDE had a policy of hiring outside contracted consultants, technology transfer, especially that of hands-on practice using a mini-plant, was conducted for 30 outside contracted consultants as well as to five staff members of the training section to ensure the results of the technology transfer. - Although the project was very susceptible to the trend in statutory systems on the Thai side, the Bureau of Energy Regulation and Conservation (BERC) in the DEDE was not defined as part of the project partner at the beginning. Coordination was made by including it as a project partner while the project was underway.
Identification of risk factors and countermeasures	a) Risk 1: Thailand attempted to avert amendments to the ENCON Act, although they were necessary for the introduction of a new PRE scheme. (i) Response requirement: This issue was part of the external conditions of the overall goal. It was necessary for Japan and Thailand to share a common perception. (ii) Countermeasures taken within the project: As a result of consultations between Japan and Thailand in the survey on operation and guidance in 2003, it was decided that JICA respects the Thai stance and that the project merely suggest legislation of the state examination system. (iii) Other measures: None (iv) Change in external conditions: None (v) Outcome: It is almost confirmed that the conventional PRE courses will be defined as a state qualification. The Thai side now adopts a policy to consider turning the senior PRE courses into a state qualification provided that they are highly regarded by the industrial world. b) Risk 2: DEDE's policy was to outsource training to outside instructors. The Japan side understood that it would directly affect achievements of the project purpose and self-sustaining development. (i) Response requirement: It was necessary for Japan and Thailand to share a common view on the methods of achieving the project purpose and ensuring sustainability of the project. (ii) Countermeasures taken within the project: As a result of consultation, the DEDE chief pledged that a) DEDE supervise and operate the new PRE system with a sense of ownership, that b) five personnel of DEDE's training section receive technology transfer and that c) DEDE assume responsibility for selection of outside contract consultants. In response to that, JICA respected the Thai stance of outsourcing technical services and supported the policy to hire outside training instructors. (iii) Other measures (such as collaboration with other donors): None (iv) Change in external conditions: None (v) Outcome: At the initiative of the C/P, four new PRE training courses were run on trial and a cumulative total of 738 trainees joined them. Future monitoring is required for the establishment of a PRE training system in accordance with Thailand's stance.

Note: When a risk in a project has been detected, risk factors have been analyzed from the following perspectives: (i) how the need for action was determined, (ii) what action was taken in the project if the need for action was confirmed, (iii) whether any other action was taken outside the project, such as requests made to other donors, (iv) whether or not any unintended changes occurred in external conditions of the project and (v) what the results were.

Source: the author, based on JICA (1984),(2002),(2005a) and interviews with JICA personnel

proposed by Japan.

- The training center had a policy of contracting with outsiders to provide the training. PEMTC personnel were responsible for supervision of organizations that provide training. The outsourcing of administrative services based on the aspirations of small government is likely to expand. It is necessary to study offering cooperation including involvement of local resources, which differs in content from conventional G to G cooperation

2) Identification of Risk Factors and Responses

The project identified two risk factors as examined below.

(i) Difference in stance towards amendment of the ENCON Act

Revision to the ENCON Act is indispensable to the introduction of a new PRE system for boosting the effectiveness of the system. Thailand however attempted to avert the amendment to the law.

- Response requirement: The procedure for officially stipulating the position of the new PRE system in a law is related to the attainment of the overall goal of the project. It is essential for the Thai side to implement the procedure.
- Countermeasures taken within the project: Prior to initiation of the project, the Japan side asked the Thai side, namely DEDE, to set up a legal regulation on the acquisition of PRE qualifications and reception of training on the occasion of research on "environmental conservation technology researchers for proactive environmental conservation cooperation (environmental action for Asia)" in February 2001. In answer to that request, the head of DEDE vowed that it would work for formal legislation. In the project consultation in 2003, consultation between Japan and Thailand was conducted to decide that Thailand's stance be respected given that legislation is part of its internal affairs and that the scope of this technical cooperation cover nothing more than suggestion on legislation of the state examination system.
- Other measures: None
- Change in external conditions: None
- Outcome: It has almost been confirmed that the conventional PRE courses will be set up as a state qualification. Thailand has now adopted a policy that is looking at turning the senior PRE courses into a state qualification provided that they are highly regarded by the industrial world.

(ii) Policy to use outside contracted instructors for training

The C/P, DEDE, had a policy of hiring outside contracted consultants. The Japanese side understood that this would have a direct impact on the achievement of the project purposes and sustainability.

- Response requirement: Even though the Thai ownership was to be respected, it was still necessary for Japan and Thailand to share a common view on the methods of achieving the project purposes and ensuring sustainability of the project.
- Countermeasures taken within the project: As a result of consultation in the project consultation in 2003, the DEDE chief pledged that DEDE supervise and operate the new PRE system with a sense of ownership. In response to that, the JICA devised the following approach.
  (i) The technology transfer to the training section of DEDE should focus on providing supervising expertise in relation to the outsourcing of training to outside instructors.

(ii) Technology to conduct training would be transferred to 30 outside consultants and to five staff members of DEDE's training section.

(iii) Several training providers (TPs) should be selected from among the aforementioned outside consultants. A system should be created under which the new TPs provide training and guidance for prospective TPs that would inherit them, while also playing the lead role in selecting the following TPs in the third round.

- Other measures: None
- Change in external conditions: None
- Outcome: At the initiative of the project partner, four PRE training courses were run on trial and a cumulative total of 738 trainees took part. Future monitoring is required to establish a PRE training system in accordance with the Thai approach.

(3) Achievements of the Project from the Perspective of CD

On the basis of the analyses reviewed above, Table 1-12 outlines the achievements of the JICA project from the perspective of CD. They are sorted by two levels, namely "individuals and organizations" and "society and institutions." At each level, they are further divided into two categories: tangible achievements, and ensuring CD sustainability for the future.

The project is observed to have made progress in the quantitative aspect of CD at individual and organizational levels. As is discussed above, however, there remains some uncertainty about CD

Table 1-12 Outcomes of the Project from the Perspective of CD – Project for Thailand

Level	Item	Outcomes
Individuals/ Organization	Tangible outcomes (technology transfer)	○ The transfer of technology was conducted to 33 personnel of C/P. - Trial run of the new PRE training courses by the Thai side - High marks given by participants - No problem with Thailand's implementation structure in view of mini-plant installation work
	CD sustainability	○ Uncertainty about CD sustainability due to a policy of employing outside contracted consultants. - The partner body, namely the PEMTC, is a new organization. - A majority of those subject to technology transfer were some 30 outside instructors. - The training provider (TP) system had little track record.
Society & institutions	Tangible outcomes (energy conservation effects)	□ Revisions to the ENCON Act were not achieved although Japan encouraged them. - New PRE training courses accepted 738 trainees. □ There was limited approach to the ESCO market and to equipment manufacturers.
	CD sustainability	□ The effectiveness of the new PRE system has not been ensured. - The existing ENCON Act has not been functioning effectively. - No progress was made in amendments to the ENCON Act. ○ Thailand is eager to promote energy conservation. - It has a positive attitude towards working on the new PRE system. - It has awareness as a leader within ASEAN.

Key: ◎ major progress ○ certain progress □ limited progress △ negative progress
Source: the author

sustainability in light of Thailand's policy of outsourcing training to outside instructors. Specifically, the project partner of PEMTC was launched in conjunction with this project and lacks operational experience and expertise. It is presumed that it will take some time for the organization to forge a sense of ownership. There is no track record for the institutionalization of training providers. It is necessary to check for some time whether or not the technology transferred from Japan will be smoothly handed over to future personnel.

At the social and institutional level, the project failed to produce outstanding results. Thailand did not grant its consent for the revision of the ENCON Act sought by Japan. There was also no development that would lead to the emergence of any specific effect of energy conservation. It is doubtful how effective the new PRE system could be without the support of a revised ENCON Act, given that this legislative amendment is inseparable from the new PRE system in the sense of institutional development for promoting energy conservation, from the perspective of CD sustainability.

1-4 Case Study 3: Energy Conservation Project for Bulgaria[33]

1-4-1 Project Overview

(1) Background

After the collapse of the Eastern European socialist bloc from the late 1980s to the early 1990s, Eastern European countries became obliged to import energy at international prices based on market transactions. Energy can no longer be obtained by means of barter trade under the COMECON regime. Energy procurement thus became a heavy burden on the Bulgarian economy. In the previous era of the planned economy, the country enjoyed an abundant supply of low-cost energy from the former Soviet bloc. It therefore had limited energy conservation technologies and little knowledge about them. It had yet to streamline energy consumption. That was an impediment to industrial revitalization.

Under these circumstances, the Bulgarian government made a request to Japan in July 1991, asking it for assistance in a feasibility study on energy conservation. In answer to this request, JICA carried out a development research under the energy conservation project for Bulgaria in the period from February 1992 to January 1994.

Based on the suggestion from the development research, the Ministry of Industry devised a plan to set up an Energy Efficiency Center (EEC) that would comprehensively promote streamlined energy consumption. Bulgaria asked Japan for a project-type technical cooperation given that Japan was a world leader in the area of rationalized energy utilization.

In response, JICA dispatched a fact-finding team on cooperation for energy conservation in Eastern Europe in January 1994, a team for preparatory study in November 1994, long-term researchers in May 1995 and a project design team in July 1995. Also in July 1995, both countries signed a Record of Discussion (R/D). The project was carried for five years from November 1995, based on this R/D.

[33] This section is based on JICA (1994b),(1995b),(1995d),(1996b),(1997c),(2001), the Energy Conservation Center, Japan (1994) and interviews with those concerned.

(2) Description of the Cooperation

1) Targets

(i) Overall goal

Energy consumption of Bulgaria's industrial sector will be improved.

(ii) Project purpose

The functions of the EEC to independently make proposals on energy conservation and to provide the industrial sector with guidance on energy conservation technologies will be strengthened.

2) Activities

(i) The C/P was trained to perform energy conservation assessment services.

(ii) Energy conservation assessment and consulting for guidance on factory improvement was conducted.

(iii) The structure of energy conservation policies was studied and the establishment of facilities was proposed.

(iv) Promotional activities for public relations relating to energy conservation were carried out.

(3) Parties and Factors Concerned in CD Analysis

Table 1-13 provides a summarized list of stakeholders and related factors of the project in CD analysis.

Table 1-13 Partiers and Factors Concerned in CD Analysis – Project for Bulgaria

Level	Parties and factors concerned	Elements to be considered for the project
Individuals	Personnel of the C/P	EEC staff
Organizations	C/P (governmental body responsible for the project)	Energy Efficiency Center (EEC) under the Energy Efficiency Agency, the Ministry of Economy and Energy (formerly Ministry of Industry)
Society and institutions	Other governmental bodies	Energy conservation bodies in other ministries and agencies
	Factories and other facilities	Factories and facilities subject to energy conservation assessment
	ESCO companies	ESCO companies set up by Japanese trading companies, private operators of energy conservation assessment
	Equipment manufacturers	
	Electric power suppliers	
	Statutory systems	Energy Efficiency Act (1999)
	Public funds	
	Incentives	Accession to the European Union
	ESCO market	
	Awareness of energy conservation	Rising of energy prices
	Partnership	
	Donors	
	Preconditions	Political climate (change of government, reform of governmental bodies) Alteration to the organizational structure (privatization)

Source: the author

(4) Outcomes and Evaluation

1) Outcomes

- The project created 124 different educational materials for the training for C/P.
- The project paid 198 visits to factories, conducted energy conservation assessments for 95 companies and formed a model factory agreement with five companies.
- The project conducted an energy assessment in 15 industrial sectors. The first model factory achieved energy conservation ratios of 5% in electricity and 10% in natural gas in the initial year.
- With regard to publicity activities, the project issued two different PR brochures and set up an Internet website in March 1998. It held six EEC seminars to attract 187 participants and delivered 17 presentations. The project was mentioned in 14 media articles. It also engaged in the production of goods with the EEC/JICA logo.

2) Concluded Evaluation at the Time of Completion

The project was largely successful and its project purpose is expected to be met prior to the expiration of the cooperation period. Although some processes were behind schedule and there were several problems, they were resolved through flexible responses. The EEC is equipped with sufficient capacity for self-sustaining operation but it must make further efforts for extra development. The overall goals cannot be met in the future without strengthening the EEC's capabilities to operate and administer the organization, techniques to acquire client factories and facilities and overall skills to encourage large factories and other facilities to introduce energy conservation.

(5) Major Issues that Affected the Project Implementation

While this project was in progress, the Bulgarian government entered a period of fiscal austerity after introducing the currency board in July 1997. This resulted in a shortage of salaries for staff of the Bulgarian partner in the project and in a decline in their motivation. One staff member left for a foreign-capital company before the project was complete. The project fell two short of the initially expected number, namely eight, of personnel from the C/P. This deficiency represented a serious obstacle to the operation of activities. The EEC failed to cover the local costs to be borne by the Bulgarian side. It was partly covered by Japan's local operating expenses.

1-4-2 Position of JICA Cooperation

Table 1-14 provides an organizational chart of cooperation in the energy conservation project for Bulgaria. Its elements are classified into (i) the actual state of issues, (ii) future visions and (iii) methods of attaining the vision, namely JICA's action and approach in the process of shifting from (i) to (ii), and sorted by three levels: the individual level, meaning staff members of the C/P; the organizational level, referring to the partner organization itself, and the societal level. The subsequent part of this section examines the position of JICA cooperation at each of the three different levels.

(1) Individual Level

- Personnel of the C/P were recruited and assigned concurrently with the project launch. They had thus poor experience in practical operation and in energy conservation assessments. For their acquisition of such skills based on hands-on experience, on-the-job training was provided at factories and other

Table 1-14 Position of JICA Cooperation from the CD Perspective – Project for Bulgaria

	Individuals	Organization	Society and institutions
(i) Status of issues			
What are the issues?	- Insufficient hands-on experience of energy conservation assessment - No incentive for energy conservation personnel	- The organization, namely the EEC, has an unstable position within the government as it was set up concurrently with the project. - Underdeveloped capabilities for operating and managing the organization - Lack of transparency of the EEC's balance sheet	- The country still has an underdeveloped structure for promoting energy conservation, consisting of an agency for energy conservation, energy conservation legislation and energy conservation assessment bodies. - Factories and other factories do not have basic energy conservation technologies.
Capacity required for solving them	- Technical skills for energy conservation assessment - High incentives	- Technical skills for guidance on energy conservation assessment - Capacity to make energy conservation policies - Capacity to increase publicity of energy conservation - Capacity to operate and manage the organization	- Setup of the Energy Efficiency Agency and institution of the Energy Efficiency Act
Awareness of the actual state	- Insufficient technical capabilities on energy conservation assessment - Low level of salary and lack of any incentive system, such as performance-based remuneration	- There is competition with energy conservation sections of other ministries and agencies. - EEC personnel are poorly motivated by their low salary. - Opacity of management practices	- In the chaotic situation in a transitional economy, factories and facilities do not feel motivated to implement energy conservation. - New organizations and laws are being developed.
Ability to be developed intensively	- Technical capabilities on energy conservation assessment - Incentives	- Capacity to perform energy conservation assessment and to give guidance on energy conservation - Capacity to operate and manage the organization	- Setup of the Energy Efficiency Agency and institution of the Energy Efficiency Act
(ii) Future vision			
What will the situation be like after the development issues have been solved?	- EEC personnel will have enhanced technical skills for energy conservation assessment and for providing guidance. - EEC personnel will do their duties with strong motivation and ownership.	- The EEC will have boosted its capacity to conduct energy conservation assessments and to give guidance, and will win the trust of factories and facilities. - EEC personnel will be motivated and will stay in the organization, and transparency of its revenues and spending will be increased.	- More companies will receive energy conservation assessments in accordance with the guidance from the EEC.
(iii) Approach			
Roadmap for capacity building and development	- Technical capacity development through on-the-job training - Suggestion on improving treatment of staff in the partner body	- The EEC was advised not only to develop its technical capabilities but to improve its relations with its watchdog, namely the EEA, and to boost its activities for increasing sustainability as an energy conservation assessment operator. - Technical guidance was provided to establish the EEC's superiority over other competitive bodies. - Training on public relations skills was offered in Japan. Acquired skills were used for receiving orders for assessment from factories. - A proposal was given for human resource management based on remuneration that serves as incentives.	- Close links between the EEC's efforts to promote energy conservation and environmental improvement are stressed to the industrial sector. - On occasions such as energy conservation assessment, the Japanese side explained the need for an organized system for promoting energy conservation. - The model factory achieved a major energy saving effect. - Bulgaria launched the Energy Efficiency Agency and enforced the Energy Efficiency Act with a sense of ownership. - The project had semi-regular exchange of information and opinions with the executive director of the EEA to incorporate the EEC's position into the legislation for energy conservation.

Key: A solid-line arrow indicates a direct approach of the JICA project especially at individual and organizational levels. A dotted-line arrow suggests an indirect approach of the JICA project. Particularly at societal and institutional levels, it is necessary for the assistance recipient country to work towards its vision with a sense of ownership. Japan's approach is unavoidably limited.

Source: the author, based on JICA (1994b),(1995b),(1995d),(1996b),(1997c),(2001), the Energy Conservation Center, Japan (1994) and interviews with those concerned.

facilities.

- The tight budgetary policy of the Bulgarian government hampered the funds from being allocated to the EEC as planned and kept remuneration for staff of the C/P at a low level. Their pay is about one third the salaries usually paid to employees of foreign owned companies. Without any salary incentive, such as payments based on the performance of energy conservation assessment, personnel may quit the EEC to work for other employers. Actually, one staff member of the C/P moved to a foreign affiliated firm. While the project was underway, Bulgaria was experiencing tight fiscal conditions in the midst of transition from its old regime. The Bulgarian C/P failed to take appropriate action to provide incentives to its employees.

(2) Organizational Level

- Set up in tandem with the project, the EEC has an unstable position within the government and still has inadequate capabilities to operate and administer the organization. There was thus some lack of transparency in revenues and expenses in energy conservation assessments. With respect to human resource management, the low salary level created a risk of losing workers. The organizational capacity cannot be developed in a short period of time. The Japanese side offered some guidance and suggestions through project experts and made a request to improve the visiting guidance.
- In Bulgaria, other ministries and agencies have sector-specific sections in charge of energy conservation and there are some ESCO companies. In the light of this, the project focused its efforts on enhancing skills in energy conservation assessment so that the EEC could establish its superiority over other contending bodies.

(3) Societal and Institutional Level

- When this project was initiated, Bulgaria's central framework for promotion of energy conservation, which consisted of an agency for energy conservation, legislation on energy efficiency and energy conservation assessment operators, was still underdeveloped. In conjunction with the execution of the project, the country set up the Energy Efficiency Center in 1995 and the Energy Efficiency Agency in 1997 and introduced the Energy Efficiency Act in 1999. In the meantime, the Bulgarian side worked to develop its energy conservation promotion system with a sense of ownership, although there were some delays in improving the treatment of EEC personnel.

1-4-3 Ensuring CD Sustainability

(1) Methods to Promote Independent Capacity Improvement

Table 1-15 reflects an analysis of the process towards self-sustaining development of CD in the energy conservation project for Bulgaria with respect to the methods to promote independent capacity improvement.

1) Ownership

As is mentioned in the preceding section 1-4-2 Position of JICA cooperation, Bulgaria established its energy conservation promotion structure in a short period of time with its strong sense of ownership by (i) declaring the strategic significance of the energy sector in the national plan for 1995-1998, (ii) setting up the EEC in 1995, (iii) erecting the Energy Efficiency Agency (EEA) in 1997 and (iv)

Table 1-15 Ensuring of CD Sustainability (1) – Project for Bulgaria

Methods of promoting autonomous improvement of capacity	
Ownership	- The Bulgarian government constructed the energy conservation system with a sense of ownership by (i) defining the energy sector as one of the priority areas in its national plan for 1995-1998, (ii) inaugurating the Energy Efficiency Agency in May 1997 and (iii) instituting the Energy Efficiency Act in 1999. These moves are in line with the project implementation. External conditions helped carry out the project. - The project had semi-regular exchange of information and opinions with the executive director of the EEA to incorporate the EEC's position into the legislation for energy conservation.
Incentive enhancement	- Soaring energy prices resulting from economic restructuring and weakening of the local currency and the EU accession issue gave a greater incentive for the government and factories to engage in energy conservation.
Knowledge acquisition method	- On the job training for assessment using various types of measuring equipment. - On the job training at the model factory, in expectation that success in energy conservation assessment and efforts in the model factories will exert a strong appeal to the industrial sector. (This project did not include hands-on training using a mini-plant as was conducted in other projects.)

Source: the author, based on JICA (1994b),(1995b),(1995d),(1996b),(1997c),(2001), the Energy Conservation Center, Japan (1994) and interviews with those concerned

introducing the Energy Efficiency Act in 1999. These elements fall under the category of capacity at the societal and institutional levels in the context of CD. In this process, the project held semi-regular talks with the executive director of the EEA to exchange views so as to incorporate the intent of the EEC into the energy conservation legislation.

2) Incentive Enhancement

Among the external conditions, economic restructuring and weakening of the local currency gave rise to a hike in energy prices. The EU accession issue emerged as a political issue. They boosted the incentive for the government and factories to engage in energy conservation.

(2) Initiatives to Address the Factors at Societal and Institutional Levels

Table 1-16 shows an analysis of the process towards the self-sustaining development of CD in the energy conservation project for Bulgaria with respect to initiatives to address factors at the societal and institutional levels.

1) Identification and Involvement of Key Stakeholders

- Promotion of energy conservation is closely related to environmental issues. It should not only be left to the voluntary efforts of the private sector; it should also be implemented by the state government as part of its national policy. On the government initiative, Bulgaria erected an energy conservation framework. To ensure that the framework works with sufficient effectiveness to produce energy conservation effects, the EEC must remain on good terms with the Energy Efficiency Agency, the EEC's supervisory body, or with other relevant institutions with a view, for example, towards instituting a low-interest loan scheme and preferential taxation to provide

Table 1-16 Ensuring of CD Sustainability (2) – Project for Bulgaria: A Mechanism of Linking the Project Purpose with Overall Goals

Initiatives to address the factors at societal and institutional levels	
Identification and involvement of key stakeholders	- By holding semi-regular exchanges of opinions and information with the new executive director of the Energy Efficiency Agency, the EEC's views were incorporated into the energy saving legislation. - The running organization for the project did not include anybody from the industrial sector, which is the beneficiary party in the overall goal. As a consequence, it took time and effort to designate a model factory and factories subject to assessment. The project had the target factories of the assessment referred by the Energy Efficiency Agency. On the occasion of factory visits, Japanese experts explained the necessity of an organized system for promotion of energy conservation to boost understanding. - To expand the activities of the new EEC, it remains necessary in the future to strengthen ties with the Energy Efficiency Agency, the government authority responsible for energy conservation policies.
Identification of risk factors and responses	Risk: Staff members of the partner organization had poor motivation. Because of the limited budget allocated by the Bulgarian government to the project, the salary of EEC staff was so low that they could not be motivated. One staff member left the EEC for a private company. The Bulgarian side covered a low percentage of the local cost. (i) Response requirement: The Bulgarian government budget was so tightly constrained that it was difficult to improve the treatment of EEC staff. It had a direct impact on the effect of technology transfer and it was imperative to remedy the situation. (ii) Countermeasures taken within the project: Different levels of priority were assigned to individual project activities when conducting the project. For instance, top priority was placed on technology transfer for energy conservation assessment and second priority on construction of information systems. With regard to achievements at the time of completion, outcome indices and their realistic goals that could be reached by the partner's understaffed team were defined. The shortfall of the local cost was covered by Japan. (iii) Other measures (such as collaboration with other donors): None (iv) Change in external conditions: None (v) Outcome: The project successfully accomplished the target of technology transfer although it failed to make any improvement in the long-lasting shortage of staff members in the partner body during its period.

Note: Risk factors have been analyzed from the perspectives of (i) how the necessity to take action was examined and determined, (ii) what action was taken in the project if the necessity to take action was confirmed, (iii) whether or not any other action was taken outside the project, such as requests made to other donors, (iv) whether or not any unintended changes were made to external conditions of the project and (v) what the results were.

Source: the author, based on JICA (1994b),(1995b),(1995d),(1996b),(1997c),(2001), the Energy Conservation Center, Japan (1994) and interviews with those concerned

incentives for cooperation in efforts to address energy conservation.

- The project engaged in publicity activities to approach its final beneficiaries - individual factories and buildings. If anything like the project operation committee in the energy conservation project for Argentina[34] had been set up and attracted the participation of representatives of factories and

[34] The energy conservation project for Argentina set up a project steering committee within the C/P organization. It consisted of some personnel from the partner body and its supervisory institution, the Secretariat of Energy, as well as private-sector companies as representatives of clients.

buildings, an active exchange of opinions and information would have been held between the demand and supply sides of energy conservation assessment.

2) Identification of Risk Factors and Countermeasures

The risk factor identified in this project was poor motivation among the C/P staff. The Bulgarian government allocated such a low amount of funds to the project that the remuneration for the EEC staff was too limited to be sufficiently motivated. One EEC staff member left the organization for a private firm. In addition, Bulgaria paid a low percentage of local costs.

- Response requirement: The Bulgarian budget was so tightly constrained during the project implementation period that it was difficult to improve the treatment of EEC staff. It could have a direct impact on the effect of technology transfer, so that it was imperative to remedy the situation.
- Countermeasures taken within the project: Different levels of priority were assigned to individual project activities and implemented. For instance, top priority was placed on technology transfer for energy conservation assessment and second priority on the construction of information systems. With respect to achievements at the time of completion, outcome indices and their realistic goals that could be reached by the partner's understaffed team were defined. The shortfall of the local cost was covered by Japan.
- Other measures (such as collaboration with other donors): No measures were implemented other than those taken within the project.
- Change in external conditions: None
- Outcome: The project successfully accomplished the target of technology transfer although it failed to make any improvement in the lasting shortage of staff members in the partner body during its period.

(3) Achievements of the Project from the Perspective of CD

On the basis of the aforementioned analyses, Table 1-17 outlines the achievements of the JICA project from the perspective of CD. They are sorted by two levels, namely "individuals and organizations" and "society and institutions." At each level, they are further divided into two categories: tangible achievements and CD sustainability.

Unlike the project for Turkey, this project failed to facilitate the smooth transfer of technologies at the individual and organizational levels. The Bulgarian government adopted tight fiscal policies which restricted any improvement in remuneration and other treatment of personnel serving for the project partner body. The EEC suffered a chronic shortage of personnel and a loss of one staff member. With respect to CD sustainability, there is uncertainty about whether or not the staff will stay with the EEC given that most of them work on a part-time contract and that their salary is limited.

In contrast, the project made substantial achievements at societal and institutional levels. The EU accession issue contributed to quick establishment of a framework for promoting energy conservation. The Energy Efficiency Act was enacted to make energy conservation assessment compulsory. The EEC is now of higher importance and the energy conservation assessment business may grow. Although there is some downside in terms of technology transfer (as a JICA project), the project made greater progress in CD than expected. The EEC has now been reorganized into an independent institution. It is anticipated that capacity development in the sector of energy conservation will be further advanced in Bulgaria provided that the

Table 1-17 Outcomes of the Project from the Perspective of CD – Project for Bulgaria

Level	Item	Outcomes
Individuals/ Organization	Tangible outcomes (technology transfer)	□ Motivation of the staff of the C/P body declined and one of them left. - Its salary level is lower than that of private firms. - The EEC is chronically understaffed limiting any expansion in function. ○ The assessment technology is highly regarded by factories and facilities.
	CD sustainability	□ CD sustainability is overshadowed by the low percentage of staff who stay with the EEC. - Low salary level for staff members. - Most of the staff are on part-time employment contracts. - No incentive (or performance-based remuneration) is authorized.
Society & institutions	ITangible outcomes (energy conservation effects, improvement in statutory systems, etc.)	◎ Institutional enhancement gained momentum as the Energy Efficiency Agency was set up and the Energy Efficiency Act was instituted. - EU accession issue emerged as a helpful factor. ○ The number of factories undergoing energy conservation assessment steadily grows and the assessment gains high marks from the industrial sector.
	CD sustainability	○ Enactment of the Energy Efficiency Act made energy conservation assessment compulsory and increased the significance of the EEC. The energy conservation assessment business may expand.

Key: ◎ major progress ○ certain progress □ limited progress △ negative progress
Source: the author

EEC upgrades its organizational management and builds up its track record in operation of the energy conservation promotion system.

1-5 Case Study 4: Energy Conservation Project for Argentina[35]

1-5-1 Project Overview

(1) Background

Argentina is rich in fertile soil and in natural resources, but its oil reserve, which covers half of its primary energy, will remain recoverable for only 15 years. In the meantime, domestic energy consumption is constantly rising. As a result of the long-term slowdown of economic activities, industrial equipment is so aged that energy consumption efficiency is low. Given the need to save energy, the National Institute of Industrial Technology (INTI) and other institutions embarked on guidance and energy consumption surveys for factories and other facilities in the industrial sector but there were numerous problems with implementation, assessment technologies and equipment.

In this situation, the Argentine government made a request to Japan for a development study on the applicability of specific energy conservation technologies to the industrial sector in August 1982. In response to this request, JICA carried out a study on master plan for energy conservation for factories from

[35] This section is based on JICA (1989),(1994a),(1995a),(1996a),(1997b),(1998),(2000c) and interviews with those concerned.

December 1987 to January 1989.

As the Argentine government defined economic stability as its top priority challenge, energy conservation was becoming of greater significance given that it would be beneficial to the reduction of production costs, maintenance of international competitiveness of industrial products, improvement in the foreign currency revenue and expenditure after reduced domestic oil consumption, revitalization of sluggish industrial activities and reduction of the environmental impact with lower total energy consumption.

In response to suggestions based on the development study, the Argentine government made a request to Japan for technical cooperation to launch an energy administrator training center in July 1991. On receiving this request, JICA dispatched individual experts in February 1992 to conduct a follow-up study on the development study as well as an investigation on the circumstances behind the request for a project-type technical cooperation. In April 1994, JICA dispatched a preparatory study team to investigate the details of the cooperation requested by the Argentine side and on the appropriateness of the implementation system and technical cooperation. Four months later, long-term researchers were dispatched to study the detailed plan on technology transfer. In March 1995, Japan sent a project design team for consultations on the implementation. A record of discussion (R/D) was produced and signed by both parties.

In accordance with the record of discussion, the project provided cooperation for a five-year period starting in July 1995.

(2) Descriptions of the Cooperation

1) Targets

(i) Overall goal

Energy conservation will be promoted in Argentina's industrial sector.

(ii) Project purpose

Function of the Rational Use of Energy Center (CIPURE) under INTI will be expanded and enhanced to provide sufficient guidance on energy conservation and to promote energy conservation.

2) Activities

(i) Cultivation of C/P to promote and give guidance on energy conservation.

(ii) Cultivation by C/P of energy administrators in the industrial area.

(iii) Activities by the C/P to improve energy-saving awareness and encourage energy conservation in the industrial sector.

3) Period

Five years from July 1995 to June 2000

(3) Parties and Factors Concerned with This Project in CD Analysis

Table 1-18 shows a summarized list of stakeholders and related factors of the project in CD analysis.

(4) Outcomes and Evaluation

1) Outcomes

- A course designed for energy administration engineers was offered six times to a total of 89 participants.

Table 1-18 Parties and Factors Concerned in CD Analysis – Project for Argentina

Level	Parties and factors concerned	Elements to be considered for the project
Individuals	Personnel of the C/P	Personnel of the Rational Use of Energy Center (CIPURE)
Organizations	C/P (governmental body responsible for the project)	- Secretariat of Energy in the Ministry of Economy and Production and the Rational Use of Energy Center (CIPURE) under the National Institute of Industrial Technology (INTI) - Project operation committee, consisting of the CIPURE, the Secretariat of Energy and private companies
Society and institutions	Other governmental bodies	
	Factories and other facilities	- Factories and other facilities (in connection with energy conservation assessment) - Energy administrators
	ESCO companies	Energy conservation assessment consultants
	Equipment manufacturers	
	Electric power suppliers	Electric power suppliers (with demand for their boiler and turbine efficiency tests)
	Statutory systems	
	Public funds	A program on low interest loans from the Argentine Technological Fund (FONTAR) for energy conservation
	Incentives	Leadership among MERCOSUR nations
	ESCO market	Energy conservation assessment business
	Awareness of energy conservation	Companies interested in environmental issues to endeavor for ISO 14000 certification
	Partnership	Universities and other donors (in joint utilization of assessment instruments)
	Donors	Loans from the Inter-American Development Bank (IDB), the European Union (EU), the German Agency for Technical Cooperation (GTZ) and others
	Preconditions	Construction of training facilities (with the use of IDB loans)

Source: the author

- Boiler training was held nine times with the participation of 199 trainees.
- Orders for energy conservation assessment were received from 17 companies. There were visits and other consultations with more than 84 companies.
- Twenty-four seminars and lecture meetings were held to attract 761 participants.
- CIPURE was improved in terms of human resources, facilities and equipment to earn high marks from companies that received the assessment and those participating in the training. The reputation of CIRURE's activities spread by word of mouth. The number of participating companies is expected to increase in the future.

2) Concluded Evaluation at the Time of Completion

When it was launched, the project was troubled by delayed construction of training facilities, by the delay in equipment delivery and by a problem with staff assignment of the partner body on the Argentine side. Later efforts made by both countries placed the project activities in orbit. Although there still remains a challenge of proper staffing, a conclusion was reached that the project largely attained its goal.

(5) Major Issues that Affected the Project Implementation

1) Delayed Construction of the Building for Practical Training and Defective Materials and Equipment

The project signed the R/D on the condition that a new building equipped with a practical training plant and a training room would be constructed. This construction was set to be financed by the Inter-American Development Bank (IDB). However, the loaning procedures were delayed both on the part of IDB and on the Argentine Technological Fund as a borrower. The building was completed in May 1998, some 22 months later than expected at the time of executing the R/D. It had thus a severe negative impact on the progress of the project.

In addition, materials and equipment offered by Japan were in part found to be faulty. As a result, large percentage of the time and labor in the overall activities of long-term dispatched experts was spent on the servicing of equipment. Forty percent of the planned input of short-term experts was for the installation and trial running of plant equipment. Although equipment defects slightly damaged the balance of the expert input scheme, infrastructure development for the project was completed. Because of the delay in the construction of facilities to be offered by Argentina, trial operation of the plant equipment for practical training provided by Japan reached completion 18 months behind schedule. It was put into operation for training courses in the fourth year of the project.

1-5-2 Position of JICA Cooperation

Table 1-19 provides an organizational chart of the cooperation in the energy conservation project for Argentina. Its elements are classified into (i) the actual state of issues, (ii) future visions and (iii) methods of attaining the vision, namely JICA's action and approach in the process of shifting from (i) to (ii), and sorted by three levels: the individual level, meaning staff members of the C/P; the organizational level, referring to the partner organization itself, and the societal level. The subsequent part of this section examines the position of JICA cooperation at each of the three different levels.

(1) Individual Level

At the individual level, the scope of analysis is the staff of the C/P organization, namely the Rational Use of Energy Center (CIPURE).

- What is essential at the individual level is the capacity to act as training instructors and to perform energy conservation assessment. However, as in other projects, the CIPURE staff particularly lacked practical experience in factories. The project was thus set to help develop these skills. A number of measuring devices for energy conservation assessment and the training plant offered by Japan proved helpful, especially in improving the capacity to conduct energy conservation assessment.

(2) Organizational Level

At the organizational level, the analysis focuses on the partner organization: CIPURE. There were other organizations that jointly worked on promotion of energy conservation: the Secretariat of Energy, the body responsible for supervising CIPURE, and the CIPURE steering committee. They are included within the scope of examination at this level.

- CIPURE itself is a new organization set up concurrently with the project. To fulfill its objectives, it needed to have the capacity to run energy administrator training courses and the technical skills to

Table 1-19 Position of JICA Cooperation from the CD Perspective – Project for Argentina

	Individuals	Organization	Society and institutions
(i) Actual state of issues			
What are the issues?	- Poor technical skills to conduct energy conservation assessment - Inadequate experience of the C/P in practical experience	- CIPURE was set up as the project was launched. It is still not ready to build up its staff's technical skills and it had no basic capacity in organizational management. - Poor technical skills to perform energy conservation assessment	- The Argentine government places the focus of its energy policy on stable supply. It has no energy conservation policy for consumers.
Capacity required for solving them	- Capacity to serve as training instructors - Capacity to perform energy conservation assessment	- Building closer ties with the Secretariat of Energy, supervisory body of CIPURE - Managerial functions (public relations and organizational management) - Technical capacity for energy conservation assessment (with high precision measuring instruments for assessment)	- Legislation for energy conservation - Interest in energy conservation - Incentives for small and medium firms to address energy conservation
Awareness of the actual state	- The partner organization has few core personnel with a university education - Some of the staff quit the organization to seek alternative employment.	- Poor collaboration with the Secretariat of Energy - Poor business awareness to run the energy conservation assessment business (See right) - The energy conservation assessment business competes with the services of private consultants.	- Small and medium businesses put lower priority on energy conservation measures given that energy is available at low cost and that assessment is not free of charge. - Interest in environmental issues
Ability to be developed intensively	- Capacity to serve as training instructors - Capacity to perform energy conservation assessment	- Closer ties with the Secretariat of Energy, supervisory body of CIPURE - Managerial functions (public relations and organizational management) - Technical capacity for energy conservation assessment (with high precision measuring instruments for assessment)	- Incentives for small and medium firms to receive energy conservation assessment - Interest in energy conservation
(ii) Future vision			
What will the situation be like after development issues have been solved?	- CIPURE staff will be able to independently provide training courses and energy conservation assessment.	- CIPURE under INTI will expand and enhance its functions to offer full energy saving guidance and make promotion of energy conservation to the industrial sector.	- Energy conservation will be promoted in the energy sector in Argentina. - Energy conservation measures for energy consumers will be implemented, including legislation on energy conservation.
(iii) Approach			
Roadmap for capacity building and enhancement	- Measuring equipment for energy conservation assessment is used in a very effective manner. - Advice was given to confine energy conservation assessment to the furnace, steam equipment, computer control and other common technologies that can be used in other business sectors.	- The Secretariat of Energy took part in the project operation committee to act as a supporting member. - For improving the fee system, advice was given to adopt the ESCO concept. - Guidance was given to produce successful cases of energy conservation effects in specific assessment and other activities to stress the achievements to INTI. - Experts provided support for sales activities in energy conservation assessment, an area in which Argentina lacked competence. - To attract clients, it was proposed that some of the services, which are all offered for a price at the moment, be provided free of charge.	- Five private companies were invited to the project steering committee. Leaders on the Japanese side participated in the committee as appropriate. - To further promote energy conservation, the project suggested the necessity of assistance in statutory and budgetary aspects. - The relationship between the government and the private sector concerning energy conservation efforts in Japan was explained to executives of the C/P.

Key: A solid-line arrow indicates a direct approach of the JICA project especially at personal and organizational levels. A dotted-line arrow suggests an indirect approach of the JICA project. Particularly at societal and institutional level, it is necessary for the assistance recipient country to work towards its vision with a sense of ownership. Japan's approach is unavoidably limited.

Source: the author, based on JICA (1989),(1994a),(1995a),(1996a),(1997b),(1998),(2000c) and interviews with those concerned

perform energy conservation assessment. In addition, it was considered essential for the organization to have the managerial capacity, which encompassed sales, public relations and organizational management capabilities, to establish its training and assessment as business. At the moment, this organization is so new that it has been thought to have weak managerial capabilities. To develop the capacity of this body, the project offered diverse advice and guidance through Japanese experts, including support for sales activities on energy conservation assessment and introduction of the concept of the ESCO business as a business providing assessment services.

- In the second year of the project, 1997, there was an organizational change in Argentina. CIPURE was reorganized and made into an independent body. A steering committee was set up, and Secretariat of Energy, CIPURE's supervising body, had a seat on the committee. It is anticipated that CIPURE will form favorable relations with the Secretariat of Energy to make it easier to obtain support from its regulatory authority. This move was based on the ownership on the part of Argentina. It also had an organizational structure favorable to Japan in the sense of taking action for energy conservation measures.

(3) Societal and Institutional Levels

At the societal level, there were a large number of stakeholders and related factors involved in the promotion of energy conservation.

- In institutional terms, energy was available at relatively low cost in Argentina and the government focused its interest on stability of energy supply. The energy consumption issue, or energy conservation, was thus given low priority in the policy agenda. Argentina had neither a law concerning energy conservation as was found in other countries nor legal qualification for energy administrators. This made it unlikely that the incentive for enterprises to engage in energy conservation would be increased.
- In addition, CIPURE's energy conservation assessment was performed at cost. As a result, small and medium businesses put low priority on their energy conservation efforts.
- On the other hand, there was a growing interest in environmental issues and an increasing number of companies aspired to ISO 14000 certification. A market was thus generated for the energy conservation assessment business. This development was not anticipated by project personnel.
- Members of CIPURE's steering committee included not only representatives of private firms but Japanese leaders as well where appropriate. The Japanese side therefore suggested the need for institutional and financial improvement to further promote energy conservation initiatives. The project gave a presentation to executives of the partner body on the relationship between the government and the private sector in Japan's energy conservation projects. This was meant to spur them to address the capacity factors at societal level.

1-5-3 Ensuring of CD Sustainability

Table 1-20 reflects an analysis of the process towards self-sustaining development of CD in the energy conservation project for Argentina with respect to the methods to promote independent capacity improvement.

Table 1-20 Ensuring of CD sustainability (1) – Project for Argentina

Methods to promote independent improvement of capacity	
Ownership	- CIPURE, under INTI, has such a sense of mission that it is committed to the continued promotion of energy conservation technologies at the risk of its own sustainability. - Without confining its effort to diffusion of energy conservation to the entire country, Argentina had a strong ambition to spread the activities of energy conservation technologies to other MERCOSUR countries. Japan considers offering assistance in the form of third-country training. Energy conservation assessment was already carried out in Paraguay and Chile. - [External condition] Amid the structural reform, CIPURE was reorganized into an independent institution and its steering committee with the participation of the private sector was set up in 1997.
Incentive enhancement	- CIPURE receives orders from private companies for energy conservation assessment, power station efficiency assessment, examination for energy conservation labeling on household electric products and other services to use the revenues from these services for running the organization. It is a basic incentive for CIPURE personnel. CIPURE bears no burden in repaying IDB loans, so its future business management would not be affected. It is INTI, not CIPURE that is liable for paying off the loans. - There is a low-interest loan program under which FONTAR finances a maximum of 80% of the cost of the introduction of energy conservation equipment by private companies. The FONTAR loans are inaccessible to any firm without producing a technical application report. It offers CIPURE a business opportunity of providing assessment, evaluation and application documentation services. - After the project launch, there was a growing interest in environmental issues and an increasing number of companies aimed to achieve certification to the international environmental standard ISO 14000. This trend produced an unexpected effect of boosting the number of clients commissioning CIPURE to perform energy management inspection. - Electric power suppliers had growing needs for boiler and turbine efficiency tests after spread of the principle of competition in the electric power wholesale market and deregulation of electric power transmission and distribution.
Knowledge acquisition method	- Short-term experts transferred technologies on energy conservation assessment in three specific business sectors. - Technology transfer was mainly done by classroom lectures although it also involved on-the-job training through energy conservation assessment. Practical guidance in the form of on-the-job training proved effective. - The concept of Japan's ESCO business was explained to stimulate some improvement in the fee structure. - The team of experts provided active support in sales activities on energy conservation assessment, at which the Argentine side was weak.

Source: the author, based on JICA (1989),(1994a),(1995a),(1996a),(1997b),(1998),(2000c) and interviews with those concerned

(1) Methods to Promote Independent Capacity Improvement

1) Ownership

- Falling under the category of the external conditions of the project, reorganization of CIPURE into an independent body after structural reform by the Argentines helped cultivate a sense of ownership, and CIPURE is now pursuing energy conservation as its own business.
- Not only working to introduce energy conservation nationwide, Argentina also had a strong ambition to expand energy conservation technologies to other MERCOSUR nations. CIPURE

already performed energy conservation assessment in Paraguay and Chile. Argentina asked Japan to provide support for it. Japan's assistance in the form of third-country training is now under consideration.

2) Incentive Enhancement

- The incentive to promote energy conservation is now essential to CIPURE in the sense of securing its source of income since the organization has become literally independent in financial terms. CIPURE personnel have to perform sales activities directed at different companies in an attempt to solicit their understanding of energy conservation effects and to win orders for energy conservation assessment. It is also necessary to earn high marks from client companies for the assessment service performed by engineering personnel. To boost CD at the individual level, the project conducted a transfer of technologies. In fact, those companies that have received the assessment or participated in training show their satisfaction with the services. CIPURE's activities are becoming more widely known by word of mouth to different business sectors. It is anticipated that the number of participating companies will continue to increase in the future.
- Enterprises are motivated to make energy saving efforts by the existence of binding regulations, such as an obligation to appoint energy administrators instituted by legislation for energy conservation, and by public funds in the form of low-interest loans and subsidiaries to cover the costs. Argentina is underdeveloped in the area of statutory systems. With regard to public finds, the Argentine Technological Fund (FONTAR) is setting up a low-interest loan scheme for energy conservation.
- New users of energy conservation assessment were emerging. In Argentina, there was growing interest in environmental issues among businesses and CIPURE was approached by an increasing number of clients seeking to place orders for energy management inspection with a motivation to obtain certification with ISO 14000 international standards for environmental management. On the supply side of energy, there was a rise in the number of electric power companies asking CIPURE to perform the test on the efficiency of boilers and turbines after the principle of competition became widespread in the electric power wholesale market and following deregulation of electric power transmission and distribution.

(2) Initiatives to Address the Factors at Societal and Institutional Level

Table 1-21 portrays an analysis of the process towards self-sustaining development of CD in the energy conservation project for Argentina with regard to the initiatives to address the factors at societal and institutional levels.

1) Identification and Involvement of Key Stakeholders

- The Secretariat of Energy and representatives of private businesses were appointed as members of CIPURE's steering committee. The Secretariat of Energy is the supervising, parent body of CIPURE while private companies are customers of CIRURE's energy conservation assessment services. In other words, the CIPURE business incorporates key stakeholders that support the organization in terms of operation and business execution. This ensures sustainability of the project in these two respects.

Table 1-21 Ensuring of CD Sustainability (2) – Project for Argentina: A Mechanism of Linking the Project Purpose with Overall Goals

Initiatives to address the factors at societal and institutional levels	
Identification and involvement of key stakeholders	- The Secretariat of Energy, which is responsible for policymaking, became a supporting member of CIPURE and a member of the project steering committee along with representatives of private companies that benefit from energy conservation. - Assistance from the European Union, Germany and other donors in activities to boost awareness and implementation of energy conservation is concentrated on the Secretariat of Energy. It is hoped that CIPURE will be involved and that the collaborative relationship with the Secretariat of Energy will be strengthened. - For Japan-donated equipment to be used more effectively in the future, CIPURE should loan such equipment to universities and other institutions involved in energy conservation, including donors to bolster its use. This will help promote energy conservation.
Identification of risk factors and countermeasures	Risk 1: Construction of training facilities, which was part of the preconditions of the project, was about 22 months behind the initial schedule. (i) Response requirement: It was essential to take some action given that the lack of any action would have had a serious impact on the progress of the project. (ii) Countermeasures taken within the project: On the Japanese side, dispatched experts and the team of visiting guidance and investigation made a strong request for early completion. Japan ran the training program in an efficient manner by narrowing its focus and carried out other urgent measures. Japan's long term experts worked to install plant equipment in the training facilities. Japan dedicated 40% of its short-term expert input plan to this matter. (iii) Other measures (such as collaboration with other donors): None (iv) Change in external conditions: None (v) Outcome: The plant went into trial operation nearly 18 months later than planned. Its operation in the training course was started in the fourth year of the project. Risk 2: The C/P had more personnel than initially planned but few were university graduates sufficiently skilled to work as lecturers, that would play a central role in the activities. CIPURE failed to obtain competent human resources. (i) Response requirement: Some action needed to be taken because the shortage of personnel would have impacted the result of technology transfer. (ii) Countermeasures taken within the project: The Japanese side repeatedly called for improvements in staffing on the occasion of visiting guidance. (iii) Other measures: None (iv) Change in external conditions: None (v) Outcome: Twenty percent of the personnel left the organization. The project finally failed to achieve the goal of appropriate staffing.

Note: Risk factors have been analyzed from the perspectives of (i) how the need to take action was examined, (ii) what action was taken in the project if the need for action was confirmed, (iii) whether or not any other action was taken outside the project, such as requests made to other donors, (iv) whether or not any unintended changes were made to external conditions of the project and (v) what the results were.

Source: the author, based on JICA (1989),(1994a),(1995a),(1996a),(1997b),(1998),(2000c) and interviews with those concerned

- For the purpose of the energy conservation project for Argentina, it is imperative to take into consideration other donors, including the European Union and the Germany Agency for Technical Cooperation (GTZ)[36], as well as other stakeholders such as locally based universities. The Secretariat of Energy is responsible for energy conservation assistance projects with different donors. This makes it easy for CIPURE to form collaborative relationships with donors. Universities may provide technical support for energy conservation. It is advisable to consider loaning to them Japanese equipment offered through the project to jointly push ahead with energy conservation. Building relationships with these stakeholders is vital to CD at the societal level.

2) Identification of Risk Factors and Countermeasures

There are two risk factors identified in the project. One is the delay in the construction of training facilities prerequisite to the project and the other is the scarcity of competent staff at the partner body.

- The greatest risk factor of the project was the construction of training facilities that was one year and ten months behind schedule. This construction was financed by the loans of another donor, namely the Inter-American Development Bank (IDB). A delay in procedures resulted in a two-year delay in construction. On the Japanese side, a strong request for early completion was made not only by long-term experts but also by the team of visiting guidance and investigation. To deal with this delay, the Japanese side took emergency action. For example, the focus of training was narrowed to increase its efficiency. Although there was a delay, Argentina was serious about addressing the problem. Japan intensively deployed its experts to install the plant in the completed facilities to minimize the setback. To deal with these kinds of circumstances, it is desirable to reach a prior agreement with the cooperation recipient on the order of priority of activities in the cooperation and their allocation.
- The C/P secured more human resources than initially planned, but they included few university graduates with skills adequate to give lectures and play a central role in the activities. This personnel shortage is counted as another risk factor. Although the Japanese side repeatedly appealed for better staffing, the placement of the right person in the right job was ultimately not achieved.

(3) Achievements of the Project from the Perspective of CD

On the basis of the aforementioned analyses, Table 1-22 outlines the achievements of the JICA project from the perspective of CD. They are sorted by two levels, namely “individuals and organizations” and “society and institutions.” At each level, they are further divided into two categories: tangible outcomes and CD sustainability.

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[36] Aid is concentrated on the Secretariat of Energy. The following provides some examples of related projects implemented by the Secretariat of Energy.
a) The European Union (EU):
- Cooperation program on effective use of energy (aimed at promoting overall energy conservation for all business sectors)
- Other activities (region-specific surveys on energy conservation, energy saving technology training, co-generation and others)

b) GTZ: A program on the promotion of energy conservation control and effective use of energy for small and medium businesses started late in 1999
c) The Organization of American States (OAS): Energy policies (use of clean energy, promotion of energy conservation and others) for Central and South American states

Table 1-22 Outcomes of the Project from the Perspective of CD – Project for Argentina

Level	Item	Outcomes
Individuals/ Organization	Tangible outcomes (technology transfer)	○ Despite a delay in the construction of training facilities, CIPURE became more widely known for energy conservation and its technical capabilities improved. - A good reputation with those companies that ordered assessment services or took part in training courses spread by word of mouth.
	CD sustainability	○ After transformation into an independent institution, CIPURE's sense of ownership is expected to be maintained for its own sustainability. - Argentina's pride in being a leader among the MERCOSUR states. - CIPURE's steering committee was set up.
Society and institutions	Tangible outcomes (energy conservation effects, improvement in statutory systems, etc.)	◎ Some companies started to make energy conservation efforts. - Some companies introduced energy conservation measures suggested by CIPURE at their own expense. - With rising interest in environmental issues and the ISO 14000 certification, some companies commissioned CIPURE to perform energy conservation assessment for them. - There were some requests from electric power suppliers for boiler and turbine efficiency assessment.
	CD sustainability	○ With a hike in orders for energy conservation assessment, the ESCO market is expected to expand. - There are some requests from the neighboring countries for assessment. - The Argentine Technological Fund (FONTAR) is launching a low-interest loan program for energy conservation efforts. □ No legislation for energy conservation has been instituted.

Key: ◎ major progress ○ certain progress □ limited progress △ negative progress
Source: the author

This project failed to carry out technology transfer as successfully as initially expected because of the delay in the construction of training facilities provided by Argentina. However, it helped make the C/P organization better known. Its training and assessment services gained such high marks that some companies introduced energy conservation initiatives. The project thus produced some tangible outcomes. After becoming an independent institution, the partner body is required to operate itself with a sense of ownership. CD sustainability is thus ensured at individual and organizational levels.

At the societal and institutional levels, there is emerging demand not merely from general businesses but also from electric power suppliers and neighboring countries for energy conservation assessment. Mounting interest in environmental problems spurred more companies to seek to be accredited to the international environmental standard ISO 14000. Unexpectedly, an increasing number of enterprises are commissioning CIPURE to perform energy management inspection. This demonstrated the strong sustainability of CD. Even so, Argentina places higher priority in its energy policy on the stability of supply and other issues on the supply side. The country still has no legislation for energy conservation on the part of consumers. It will be part of the future challenges to be addressed by Argentina in the energy conservation sector.

Chapter 2 Summary of Case Studies on CD in the Energy Conservation Sector

2-1 Summary of Case Studies in the Energy Conservation Sector from the Perspective of CD and Suggestions

2-1-1 Summary of Case Studies

The preceding chapter reviewed JICA's energy conservation projects for four countries, namely Turkey, Thailand, Bulgaria and Argentina, to examine the position of JICA cooperation and steps to ensure CD sustainability from the CD perspective.

To draw a conclusion from these case studies, this chapter discusses the impacts the activities in JICA's energy conservation projects and changes in external conditions such as statutory systems and societal mechanisms had on capacity development in the energy conservation sector at individual, organizational and societal or institutional levels. Next, it sums the results of these four JICA projects with respect to CD to make a suggestion on the direction of improvements in JICA projects.

Table 2-1 portrays the activities in JICA cooperation and changes in external factors that produced the difference in CD elements at individual, organizational, societal and institutional levels between before and after each energy conservation project. These activities and changes are examined below on a level-by-level basis.

(1) Individual and Organizational Levels

- Most of the activities conducted in JICA's projects were targeted to individuals and organizations. CD achievements at individual and organizational levels are thus a principal focus of project evaluation based on the project design matrix (PDM).
- At the individual and organizational levels, capacity development was carried out by a basic package of support containing the provision of equipment such as a mini-plant from Japan and the transfer of technologies for energy conservation assessment and other operations through experts. In accordance with the circumstances surrounding individual recipient countries, special CD assistance was also offered. For instance, those approaches particularly taken in the project for Turkey included the monitoring of technology transfer and resulting skill levels with the use of the monitoring sheet, respect for Turkey's ownership, inter-organizational personnel transfer for sharing operational knowledge. The level of achievements made by the project depends on how these efforts are carried out.
- The project in Turkey successfully pushed CD ahead at individual and organizational levels. Among the factors that helped promote CD, the partner's sense of ownership, strong leadership exercised by leaders and ample incentives to engage in the activities backed by the secured income of personnel and the organization are notable. Japanese project personnel comment that the project partner was excellent. It is necessary to examine whether or not the C/P has any capacity factor, such as ownership and leadership by performing the capacity assessment, which is, as discussed below, a

Table 2-1 Activities of JICA Projects and Impacts of External Conditions from the Perspective of CD

Level		Recipient country	Problems before the project	Project approaches	Risk factors and unexpected changes	Circumstances after the project
Individuals/organizations		Turkey	[-] Strong ownership [+] Strong leaders [-] No practical experience in assessment [-] Inadequate sharing of knowledge and expertise [+] Revenues earned from training and assessment	- Respect for ownership - Packaged support including provision of a mini-plant - Monitoring sheet - Personnel transfer within the workplace - Technical information provided from JICA's domestic assistance committee - Dispatch of short term experts	None	[+] Strong ownership [+] Boosted trust in JICA [+] Strong incentives for operations [+] Increased confidence in its assessment skills
		Thailand	[-] Poor capacity to provide practical training	- Packaged support including provision of a mini-plant	Difference in stance towards revision to the ENCON Act	Continuation of the current system of providing training
		Bulgaria	[-] A start-up of a partner body with newly hired personnel [-] Revenues earned from training	- Packaged support including provision of a mini-plant - Advice on improvement of organizational operation at the time of visiting guidance	Bulgaria's fiscal austerity (external condition) The establishment of the organization	[-] Decline in motivation of partner personnel
		Argentina	[-] Poor capacity to perform assessment [-] A new partner body	- Packaged support including provision of a mini-plant	Delay in plant installation The organization is new Inadequacy in placing the right human resources in the right positions	Ownership boosted after turning into an independent institution
Society and institutions	Factories and other stakeholders	Turkey	[-] Poor energy saving incentives for factories	- Support for energy conservation assessment		[+] Growth in participation after training earns a good reputation [+] Increase in number of energy administrators [+] Growing needs for energy conservation assessment [+] Energy conservation effect coming into being
		Thailand	[-] Poor energy saving awareness due to no penalty for statutory offenses			[+] Increase in PREs
		Bulgaria	[-] Poor awareness of energy conservation resulting from the mindset under the old regime	- Strengthening of publicity activities		[-] Difficulties in securing factories for assessment [+] Improved communications with the Energy Efficiency Agency
		Argentina	[-] Poor awareness of energy conservation among enterprises	- Holding of project steering committee meetings involving the Secretariat of Energy and private companies - Assistance in sales activities for assessment business	Transformation into an independent institution	[+] Rise in number of firms seeking assessment after booming interest in environmental issues and the ISO 14000 certification [+] Assessment service highly regarded
	External conditions	Turkey	[-] No legislation for energy conservation (Turkey merely has energy regulations.) [+] Pride as leader in Central Asia	- Provision of technical information concerning energy saving legislation - Support for organization of international training	EU accession issue	[+] Energy conservation legislation set to be soon instituted [+] International training held to win high marks from other countries [+] Expansion of the ESCO market and inauguration of the loaning program for energy conservation assessment after institution of energy saving law
		Thailand	[-] Poor incentives to comply with the ENCON Act [+] Pride as leader of ASEAN	- Suggestion on amendment to the ENCON Act		Continuation of the existing legislation on energy conservation
		Bulgaria	[-] No law for energy conservation [-] No government authority responsible for energy conservation established	- Information exchange with the executive director of the Energy Efficiency Agency at semi-regular meetings	EU accession issue	[+] Secretariat of Energy set up in 1997, followed by enactment of the Energy Efficiency Act in 1999
		Argentina	[-] No law for energy conservation [+] Great interest in environmental issues [+] Pride as leader of MERCOSUR countries	- Information on facts of energy conservation in Japan provided through the project steering committee - Consideration of support in the form of third-country training	Rising trend towards acquisition of ISO 14000 certification	[+] Emergence of new clients from those firms which aspire to ISO 14000 certification and electric power companies [+] Requested by Paraguay and Chile to perform an assessment

Note: This table integrates individual and organizational factors given that these two categories have many in common.

Factors marked with[+]are beneficial or favorable to CD while those marked with [-] are detrimental or negative to CD.

Source: the author

preliminary analysis of the partner's capabilities.

- Capacity development at individual and organizational levels made great progress in the project for Turkey. However, the projects for Thailand, Bulgaria and Argentina produced limited achievements. This is believed to largely reflect the involvement of risk factors.

(2) Societal and Institutional Levels

- From the standpoint of CD, the scope of analysis of project activities must be expanded to societal and institutional factors that are normally classified by the PDM into the category of external conditions. Alternatively, it is necessary to review the methodology of accomplishing a sequence of steps from the project purpose, through external conditions to the overall goal. However, many societal and institutional elements are connected with the internal affairs of the recipient nation. Japan's assistance cannot go any further than respecting the ownership of the beneficiary state and making preparations for its CD. JICA's projects are subject to limitations on its activities exerting any effect on such factors.
- JICA projects have no fixed methodology for taking action with respect to societal and institutional stakeholders or with respect to external conditions. In the energy conservation sector, they took forms that included information provision on the energy conservation situation in Japan, assistance in publicity activities concerning energy conservation, support for sales activities in energy conservation assessment, aid in the promotion to neighboring countries by means of third-country training hosted by the recipient country, and monitoring and suggestions during visiting guidance.
- What is significant with regard to stakeholders includes the activities that are effective for factories and facilities as final consumers of energy and the activities that helped promote CD. The case studies confirmed that the projects for Turkey and Argentina successfully led some factories to initiate tangible energy conservation measures. In Turkey, the project commenced with technology transfer to its partner body. This was followed by an improvement in its energy conservation assessment technologies, then by the growing trust of factories and facilities in the project partner body. Finally, implementation of energy conservation efforts was achieved. In this case, the JICA project adopted a direct or straightforward approach and the ownership of the C/P helped achieve the success. In the project for Argentina, the proactive initiatives of factories and facilities spurred by the trend towards acquisition of ISO 14000 certification were significant. The assessment service offered by the project partner was so well received that its reputation was spread by word of mouth and it eventually obtained new clients in energy conservation assessment services. In contrast, in the projects for Thailand and Bulgaria, no factory or facility had implemented specific energy saving action by the time the projects were finished. Thailand had legislation to promote energy conservation but its provision to oblige factories and facilities to implement energy conservation action had little force and the legislation has no penal provisions. The ENCON Act is unlikely to prompt factories and other facilities to introduce energy saving measures, as they are not provided with any incentives. The project for Bulgaria was troubled by poor awareness of the importance of energy conservation among factories and facilities because the country had enjoyed a low-cost energy supply from the former Soviet Union in its socialist era. In Thailand and Bulgaria, energy consumers are given so little incentive, thus tightening regulations by means of energy saving legislation or its amendment will be effective.

- Changes in external conditions may either be helpful to CD or generate new risks for it. In Turkey and Bulgaria, the increasing momentum towards EU membership produced a positive effect of stepping up the construction of statutory systems, including legislation for energy conservation, as well as energy conservation promotion frameworks. In Argentina, rising interest in environmental issues has prompted more and more firms to try for energy conservation assessment and be certified to the international environmental standard ISO 14000, and is leading to the development of the ESCO market. The EU accession issue also involves readiness to the EU's environmental policies. The environment may serve as one of the key subjects that help promote energy conservation.

(3) Outcomes of JICA Projects from the Perspective of CD

Table 2-2 sums up CD outcomes of the four JICA projects on the basis of the aforesaid analysis. The following takes an overall look at each of these four projects.

1) Turkey

Both in terms of the outcomes as compared to the project purpose and in the respect of CD, the project for Turkey was the most successful. Technology transfer at individual and organizational levels and institutional development at the societal and institutional levels functioned well as twin driving forces essential to energy conservation. The C/P had such a strong sense of ownership so that the CD sustainability is anticipated.

2) Thailand

In the project for Thailand, technology transfer made quantitative achievements at individual and organizational levels. However, at the societal and institutional levels, there was little progress in statutory systems, namely in the revision to the ENCON Act. The twin driving forces may fail to interact in a balanced way. There is uncertainty about the degree of CD sustainability.

3) Bulgaria

The staff members of the C/P organization became so poorly motivated that the technology transfer did not produce the full effect. In a bid for EU accession, the state set up the Energy Efficiency Agency and quickly enacted the Energy Efficiency Act. In terms of institutional development, there was a considerable progress. However, it was done in such haste that there lies uncertainty about CD sustainability.

4) Argentina

With the delay in the installation of a mini-plant, technology transfer was inadequate. However, the country already had an ESCO market and the corporate sector has a strong interest in environmental issues and acquisition of ISO 14000 certification. Given that some factories already carried out energy saving measures, the project achieved tangible results. With orders from neighboring countries for energy conservation assessment, Argentina is expected to sustain its future CD.

Table 2-2 Overall Table of the Outcomes of JICA Projects from the Perspective of CD

Level	Item	Turkey	Thailand	Bulgaria	Argentina
Individuals/ Organization	Tangible outcomes (technology transfer)	◎	○	○	○
	CD sustainability	◎	○	□	○
Society and institutions	Tangible outcomes (energy conservation effects)	◎	□	◎	◎
	CD sustainability	○	□	○	○

Key: ◎ major progress ○ certain progress □ limited progress △ negative progress
Source: the author

2-1-2 Suggestions for Improving JICA Projects

Based on the above reviews, some suggestions for improving JICA projects are made below.

(1) Clarify the CD Perspective in the PDM.

Normally, JICA's energy conservation projects define technology transfer to its C/P as their project purpose, and are implemented to achieve the overall goal of producing energy conservation effects in recipient countries. However, the degree to which the overall goal is met is more important in the sense of capacity development. In other words, technology transfer to the C/P does not mean that an energy conservation effect has been realized. The key lies in how to persuade factories as the final consumers of energy to engage in energy saving efforts. In terms of CD, the perspective must be enlarged to cover societal and statutory systems, which are classified by the PDM into external conditions. It is important therefore to make clear the roadmap under which the project purpose should first be addressed, then external conditions and finally the overall goal. However, it is difficult to say that at the moment this roadmap has been sufficiently studied in the process of creating a PDM for project formulation.

More specifically, with regard to projects intended for energy conservation, it is necessary, as noted, to scrutinize the methodology of motivating factories and other facilities as end users of energy. Some typical approaches listed below may be inferred from the case studies. Some can be directly or immediately taken in a project while others can only be done indirectly or require some time. It is vital to hold full consultations among the parties to set out a PDM that considers the external conditions and the overall goals.

1) A Conventional Approach to Factories and Facilities through Technology Transfer Activities for C/P

It is a direct approach by means of support for energy conservation assessment and promotional activities to factories and facilities within a JICA project. The project can adjust its input volume. (Direct approach)

2) Invitation of Factory Representatives to the Project Steering Committee to Incorporate Their Needs

This approach was adopted for the project for Argentina. Generally, enterprises are essentially unwilling to actively work on energy conservation and environmental issues given that they do not

directly produce any rise in sales or profits. It is therefore necessary to take a number of actions aimed at improving enterprises' understanding of energy conservation. This approach envisions that representatives of different industrial sectors take part in the project steering committee to boost their understanding of the project and that they will make the outline of the government's energy policy and the JICA project widely known to their respective industrial associations to win support from more companies. It also paves the way for asking corporate representatives to pilot their facilities as model factories for energy conservation assessments, to turn this experience into a track record. (Direct approach)

3) Tightening of Energy Conservation Related Legislation

Technology transfer and statutory enhancement are the two keys to capacity development in the energy conservation sector. The technology transfer may be directly controlled in the project while statutory enhancement is left to the ownership of the project recipient country. The project should take action to stimulate statutory change to ensure that the two factors advance in a balanced manner. (Indirect approach)

4) Establishment of a Public Fund Program for Energy Conservation Efforts and Other Activities

Similarly to item 3) mentioned above, an indirect approach is required. (Indirect approach)

(2) Implementation of Capacity Assessment

Capacity assessment is necessary for the development of a specific technical cooperation project. It is to conduct a preliminary study on the background to understand the problems facing the recipient country and to obtain information on the current level of its capacity to solve the problem, and on the circumstances surrounding the issues. In the energy conservation sector, technical cooperation projects are centered on activities at individual and organizational levels, namely the transfer of technologies to the partner body. To reap greater CD effects, it is essential to involve stakeholders at the societal and institutional levels and to endeavor to build a system, and for those purposes it is critical to properly understand the capacity of the cooperation recipient nation. Capacity assessment is an effective means of monitoring the achievement level not merely at the stage of project identification and development but at the stage of project implementation. In addition, it provides a framework of evaluation in the phase of evaluation.

(3) Creation of a Roadmap (Program-type Approach)

In energy conservation, apart from direct action towards factories and other end consumers of energy, possible methods of building up overall capabilities of developing nations to deal with their issues and to promote energy conservation from the perspective of CD in fact include many different approaches at societal and institutional levels. They may be classified into groups, such as (i) policies and statutory systems, (ii) financial and subsidy-based support systems and (iii) public relations activities for providing information, education and raising awareness. Naturally, the strategy for addressing the challenge varies depending on the developing country for which the project is implemented. The roadmap is a chronological timetable of activities and operations based on the actual conditions of the developing country in which the project is to be conducted, with a specific stance in a bid to transform the country into a future ideal form.

Working out a roadmap is beneficial in the following aspects.

- It enables project personnel on both sides, i.e. from Japan and from the developing country, to share a common perception about future desirable practice and the overall picture of energy conservation.
- It clarifies the issues, responses and necessary activities covered by the project being planned as well as the issues and challenges that are not addressed by the project.
- It determines those external conditions of the project which should be noted.
- It sets a definite order of activities and operations to be conducted.

The roadmap also serves as a key tool of the program approach, on which JICA is working intensively at the moment. According to this approach, multiple projects in a problem area are implemented in an organized and continuous manner.

(4) Opening of a New Horizon for Assistance in Energy Saving: Cultivation of the ESCO Market and Expansion from the Industrial to Consumer Sector

As explained in the case studies, JICA's energy conservation projects are designed to stimulate energy conservation chiefly in the industrial sector, or among factories, by means of technology transfer to the energy conservation centers in developing countries. Once the roadmap described in (3) above is created, it is evident that the top priority is to transfer technologies to the governmental institution responsible for promoting energy conservation for creating an energy conservation promotion structure centered on this organization. Moreover, JICA defined factories–final energy consumers–as the primary target of its projects to effectively exert the energy conservation results.

For those projects which have completed this first stage, it will be necessary to consider, as a subsequent step in JICA assistance, making promotional efforts targeted to the consumer sector, including buildings and general households, and fostering the ESCO market by opening the door of the energy conservation assessment business to the private sector. This development will essentially be required from the perspective of CD.

2-2 CD Checklist for the Energy Conservation Sector[37]

2-2-1 Capacity Assessment

The development of assistance or cooperation projects and the definition of its specific assistance goals are significant steps that are decisive to the success or failure of the project. The content of aid requests from governments or institutions of developing countries are more or less vague. It is often the case that they are not necessarily aware of what specific issues they have. No tangible technical cooperation project can be worked out without studying the background in advance to understand what problem is faced by the recipient nation as well as the current level of its capacity to sort out the problem. This process of analysis is called capacity assessment.

It is possible by performing the capacity assessment to identify what capacity owned by who acts as an impediment, which capacity has already been obtained to a certain degree and what capacity of which personnel should be intensively developed. The process essentially brings to the surface a specific target to be achieved by the project.

[37] JICA (2006)

Capacity assessment is also a process of designing the details of a technical cooperation project itself. In the energy conservation sector, such projects are centered on activities at the individual and organizational levels, namely technology transfer to the C/P. In past projects, Japan's contribution was provided in the form of a package that included the offering of a plant and measuring equipment for hands-on practice of assessment, dispatch of short- and long-term experts, the transfer of knowledge and technologies for running the training and performing energy conservation assessment, provision of information on Japan's energy conservation promotion structure and other elements. However, initiatives to encourage the involvement of stakeholders and institutional establishment must be made for greater CD effects. For this purpose, it is vital to obtain appropriate information on the capacity of different stakeholders on the part of the project recipient country.

Capacity assessment is effective not only in the processes of identifying and developing a project but also in monitoring the level of achievement during the project implementation. At the stage of evaluation, it offers a framework of evaluation.

2-2-2 Checklist for Capacity Assessment in the Energy Conservation Sector

The status of energy conservation promotion varies among developing nations depending on the progress of their development. If a checklist for capacity assessment with specific items to be inspected is created in advance, it will be useful for the implementation of overall capacity assessment at individual, organizational and societal levels in as comprehensive a manner as possible. Similar to the questionnaire that was traditionally used in the preparatory study, the standardized checklist has an advantage in that anyone can perform the assessment on all aspects of capacity. JICA already devised a checklist for the area of the environment and waste and it was used on a trial basis for actually developing several projects. As a result, it was found likely to increase efficiency and effectiveness in the following three respects:[38]

(i) The inspection can be performed with uniform quality by project formulation advisor and local consultants who are not necessarily familiar with the area of waste.
(ii) As a result, it serves as a project finding tool that makes the recipient country aware of their issues.
(iii) That makes it possible to identify from among multiple projects those with high priority to the donor.

It is necessary to study different frameworks suited to separate stages at which the checklist is used, such as problem identification, project formulation and preparatory studies. This paper shows two sample checklists. One is designed for the process of problem identification and project formulation. In this process, although an energy conservation project is presumed, there is no fixed project outline and the target of assistance based on technology transfer is determined from among a wide range of options. The other is intended for preparatory study after identifying an energy conservation project and deciding on the policy on what specific institution to work with on the project. This chapter devotes more space to examination of the checklist for preparatory study than of the other.

(1) Checklist to be Used at the Stage of Project Formulation

Table 2-3 is a checklist for performing a project formulation study. In response to an unspecified request from a developing country, the survey is carried out to determine whether or not to launch a

[38] JICA (2006)

conventional type of project with the energy conservation center as its partner. Its major difference from Table 2-4 shown below lies merely in the classification of elements into individual, organizational and societal levels and the two checklists are basically identical in terms of detailed check items.

1) Capacity at the Individual Level

In the phase of problem finding and project formulation, the scope of examination at the individual level should not be limited to the personnel of the C/P. Capacity of the following individuals, who may be deeply involved in the project, needs to be assessed.

- Personnel of the C/P
- Those who draw up and make decisions on laws and institutions
- Managers and energy administrators of factories and facilities

2) Capacity at the Organizational Level

Similarly, at the organizational level, a broad survey scope is defined as follows and the capacity of each organization falling under that scope should be checked on the assumption that no governmental organization that acts as a C/P is specified.

- Governmental organizations: the ministry responsible for energy and related ministries and agencies including those in charge of industry, construction, transport and the environment, energy conservation centers, ESCO associations, research and development institutes, educational institutions and local governments
- End consumers of energy: factories, buildings, steelmakers' associations and cement associations
- Companies engaged in consulting relating to energy conservation
- Equipment and facility manufacturers
- Energy supplying organizations

3) Capacity at the Societal and Institutional Levels

Given that stakeholders are covered by the aforesaid survey at the individual and organizational levels, the inspection at societal and institutional levels examine the statutory systems and mechanisms as well as other external conditions to obtain information on the actual conditions of the country to which support is offered.

4) Preconditions

Apart from the above elements, the following information should be obtained as fundamental data for implementing an energy conservation project.

- Number of factories and buildings
- Economic and industrial composition
- Energy circumstances
- Culture and history
- Relations with neighboring nations

(2) Checklist to be Used at the Stage of the Preparatory Study

Table 2-4 shows a checklist to be used at the stage of preparatory study subsequent to project

Table 2-3 Checklist for Capacity Assessment to be Used at the Stage of Project Formation

Major item	Medium item	Minor item	Descriptions
Individuals	Capacity of those who draft and make decisions on statutory systems, C/Ps for technology transfer, managers of factories and buildings and energy saving personnel	Knowledge	- Academic background and specialty - Knowledge on energy conservation and practical experience (technical skills) on factory assessment - Experience of participating in training (offered by JICA and other providers)
		Awareness	- Sense of responsibility and mission and attitude towards work - Willingness to join projects (target setting)
		Skills	- Length of service at the current position, experience of serving as training instructors and length of practical experience in assessment
Organizations	Capacity of government organizations, including C/P, ministries responsible for energy, industry, construction and the environment, energy conservation centers, ESCO associations, Research & Development institutes, educational institutions, local governments and autonomous organizations	Human, physical and intellectual resources	- Human resources: Organizational structure and formation, staff sizes of individual sections, ratio of staff staying with the same employer, number of technical staff (university graduates), number of clerical staff, internal training programs and personnel transfer status - Physical resources: Management status of offices - Intellectual resources: Status of introduction of databases on factories subject to assessment and energy administrators, training track records, status of introduction of databases on assessment results
		Operation and management	- Funds: budgetary control status (preparation of budget documents, financial statements and account ledgers) and treatment of revenues from training and assessment (fee structure, regulations on accounting procedures, status of ledger control) - Personnel affairs: Involvement or non-involvement of terms of references (TOR) for staff, remuneration systems and staff appraisal systems - External affairs: Relations with the central government and supervisory authorities - Project operation approach: Presence or absence of a steering committee system
		Organizational culture	- Sense of ownership or mission in the sections responsible for energy conservation and organizational transparency - Leadership of leaders
		Capacity to provide energy conservation training	- Outline of training courses (course details, number of sessions, number of trainees, fees, number of instructors) - Management system: status of control of educational materials, presence or absence of regulations on training implementation and a monitoring system, quantity of training facilities and equipment owned and control ledgers of such facilities and equipment
		Capacity to perform energy assessment	- Management system: Quantity of assessment facilities and equipment owned, control ledgers of such facilities and equipment and presence or absence of renewal plans - Preparation of assessment manuals and stock of spare parts
		Capacity to increase publicity for energy conservation	- Presence or absence of websites, frequency of website updates and creation of brochures - Budget and actual cost for public relations activities and presence or absence of PR activity plans
		Capacity to make policies and suggestions on energy conservation	- Systems for drafting of laws and decision-making - Status of policy evaluation and research status
	Capacity of end users of energy, including factories, buildings, steel associations and cement associations	Awareness of energy conservation and incentive to invest in energy conservation	- Number of factories with energy administrators by sector and by scale - Treatment of energy administrators (presence or absence of incentives) - Proposal and implementation of energy conservation measures and presence or absence and types of group activities
		Energy indicators	- Number of factories subject to assessment by sector and by scale - Awareness of energy costs and the degree of interests in environmental issues
		Management team	- List of energy-related governmental organizations and their scope of responsibility (especially for supply) - Closeness of relations with the C/P

Major item	Medium item	Minor item	Descriptions
Organizations	Capacity of energy conservation consulting firms	(ESCO, energy conservation training institutions and the like)	- Expansion of energy conservation consulting and ESCO businesses and status of implementation of energy assessment - Formation of ESCO markets, number of firms, business conditions and parent bodies of ESCO companies
	Capacity of equipment and facility manufacturers	(Plants, electrical products and others)	- Status of expansion of the energy conservation equipment market and business conditions - Status of development of new energy conservation equipment
	Capacity of organizational energy suppliers	(Electric power, gas, oil refinement and the like)	- Number of electric power suppliers, their respective service territories and their business conditions - Energy saving efforts and cost consciousness with regard to power generation efficiency
Society and institutions	Statutory systems and mechanisms	Policy and legal structure	- Involvement and non-involvement of state development plans, energy legislation, energy conservation law, governmental and ministerial orders, detailed implementation regulations, guidelines, presidential decrees, international arrangements and official reports and their dates of institution and background - Energy policy frameworks and status of energy price policies - Frameworks of environmental preservation policies (such as Clean Development Mechanism (CDM)) and governmental attitudes towards ISO 14000 standards
		Public funds	- Availability of subsidies, tax incentives and low interest loans for investment in energy conservation and their execution
	Other external conditions	Energy conservation initiatives	- Presence or absence of general incentives to energy conservation - Incentives to energy conservation in state policies (e.g. target for energy self-sufficiency) - Energy saving promotion policies as other state policies (e.g. for meeting EU accession criteria) - Presence or absence of a sense of leadership in energy conservation over neighboring nations
		Awareness of energy conservation	- Level of public interests in energy conservation and in environmental issues - Mass media coverage of energy conservation and energy conservation related subjects attracting great interests
		Partnerships	- General relationship of trust between government and the public - Response of the government to complaints from the public - Roles of NGOs, universities and other stakeholders and their significance
		Donors	- Involvement or non-involvement of donors offering assistance in the energy sector and their activities - History of donors' cooperation and their basic cooperation policies-
Factors treated as preconditions in the process of considering energy conservation projects		Information on factories and buildings	- Number of factories, buildings and other facilities by industry and by scale and data on energy management
		Political, economic and industrial composition	- Political regime, internal affairs, economic growth rate, scale of economic activities by industry and unemployment ratio
		Energy circumstances	- Energy consumption rate, amount of energy consumption and carbon dioxide emissions
		Culture and history	- Number of ethnicities, religions, inter-faith conflicts, population, historical facts, friendliness to Japan and natural environment
		Relations with neighboring nations	- Leading country, standing among neighboring countries in terms of economic activities and presence or absence of conflicts

Source: Members of the task force for studies on CD in energy conservation

Table 2-4 Checklist for Capacity Assessment to be Used at the Stage of Preparatory Study

Major item	Medium item	Minor item	Descriptions
Individuals	Capacity of the personnel of the C/P or other individuals concerned to which technology transfer is conducted	Knowledge	○ Academic background and specialty ○ Knowledge on energy conservation and practical experience (technical skills) on factory assessment - Experience of participating in training (provided by JICA and others)
		Awareness	- Sense of responsibility and mission and attitude towards work ○ Willingness to join projects (target setting)
		Skills	○ Length of service at the current position, experience of serving as training instructors and length of practical experience in assessment
Organizations	Capacity of the C/P to implement the project	Human, physical and intellectual resources	○ Human resources: Structure and formation of the project partner, staff sizes of individual sections, percentage of staff staying with the same employer, number of technical staff (university graduates), number of clerical staff, internal training programs and personnel transfer status - Physical resources: Management status of offices ○ Intellectual resources: Status of introduction of databases on factories subject to assessment and energy administrators, training track records, status of introduction of databases on assessment results
		Operation and management	- Funds: budgetary control status (preparation of budget documents, financial statements and account ledgers) and treatment of revenues from training and assessment (fee structure, regulations on accounting procedures, status of ledger control) - Personnel affairs: Involvement or non-involvement of TOR for staff, remuneration systems and staff appraisal systems ○ External affairs: Relations with the central government and supervisory authorities - Project operation approach: Presence or absence of a steering committee system
		Organizational culture	○ Sense of ownership or mission in the sections responsible for energy conservation and organizational transparency ○ Leadership of leaders
		Capacity to provide training	○ Outline of training courses (course details, number of sessions, number of trainees, fees, number of instructors) - Management system: status of control of educational materials, presence or absence of regulations on training implementation and a monitoring system, quantity of training facilities and equipment owned and control ledgers of such facilities and equipment
		Capacity to perform factory assessment	○ Management system: Quantity of assessment facilities and equipment owned, control ledgers of such facilities and equipment and presence or absence of renewal plans - Preparation of assessment manuals and stock of spare parts
		Capacity to increase publicity	○ Presence or absence of websites, frequency of website updates and creation of brochures - Budget and actual costs for public relations activities and presence or absence of PR activity plans
Society and institutions	Factories and facilities	Energy administrators	○ Number of factories with energy administrators by sector and by scale - Treatment of energy administrators (presence or absence of incentives) - Proposal and implementation of energy conservation measures
		Management team	○ Number of factories with energy administrators by sector and by scale - Treatment of energy administrators (presence or absence of incentives) - Proposal and implementation of energy conservation measures
	Other stakeholders	Related governmental organizations	○ List of energy related governmental organizations and their scope of responsibility (especially for supply) - Closeness of relations with the partner organization
		ESCO companies	○ Status of formation of ESCO markets, number of firms and business conditions - Parent bodies of ESCO companies
		Equipment manufacturers	- Expansion status of the energy conservation equipment market and business conditions - Status of development of new energy conservation equipment
		Electric power suppliers	- Number of electric power suppliers, their respective service territories and their business conditions - Cost consciousness with regard to power generation efficiency

Major item	Medium item	Minor item	Descriptions
Society and institutions	Statutory systems and mechanisms	Legislation for energy conservation	○ Presence or absence of legislation for energy conservation, date of institution, background, and stance of the government towards energy conservation ○ A loan program for energy conservation efforts and other measures
		State policy	○ Energy policy frameworks, existing related laws and regulations and energy pricing policies ○ Frameworks of environmental preservation policies and governmental attitudes towards ISO 14000 standards ○ Details and background of state development plans and position of energy policies
		Public funds	○ Availability of subsidies, tax incentives and low-interest loans for investment in energy conservation
	Other external conditions	Energy conservation initiatives	○ Presence or absence of general incentives to engage in energy conservation ○ Incentives to energy conservation in state policies (e.g. target for energy self-sufficiency) ○ Energy saving promotion policies as other state policies (e.g. for meeting EU accession criteria) - Presence or absence of a sense of leadership in energy conservation over neighboring nations
		Awareness of energy conservation	○ Level of public interests in energy conservation and in environmental issues - Mass media coverage of energy conservation and energy conservation related subjects attracting great interests
		Partnerships	- General relationship of trust between government and the public - Response of the government to complaints from the public ○ Roles of NGOs, universities and other stakeholders and their significance
		Donors	○ Involvement or non-involvement of donors offering assistance in the energy sector and their activities - History of donors' cooperation and their basic cooperation policies
Factors treated as preconditions in the process of considering energy conservation projects		Number of factories and buildings	○ Number of factories, buildings and other facilities by industry and by scale
		Economic and industrial composition	○ Economic growth rate, scale of economic activities by industry and unemployment ratio
		Energy circumstances	○ Electricity production by fuel and carbon dioxide emissions
		Culture and history	○ Number of ethnicities, religions, inter-faith conflicts, population, historical facts and friendliness to Japan
		Relations with neighboring nations	○ Leading country, standing among neighboring countries in terms of economic activities and presence or absence of conflicts

Key: An item marked with a circle (○) requires a closer check.
Source: the author

development. It is designed on the assumption that, like JICA's energy conservation projects in the past, the project is conducted to achieve a project purpose of building up the capacity of the C/P organization to promote energy conservation by means of technology transfer to its personnel.

Attention should be paid to the following matters at the time of actually performing capacity assessment with the use of this checklist.

1) Capacity at the Individual Level

Capacity at the individual level includes knowledge, skills and the sense of responsibility of individual personnel and other related individuals, including outside contracted training instructors as in the case of the project for Thailand, who work for organizations responsible for energy conservation measures, namely the C/P of JICA projects, for the objective of solving issues on stimulating implementation of energy conservation efforts in factories.

(i) Knowledge: The preparatory study checks whether or not the individuals assessed have adequate capacity to receive technology transfer. It is desirable that they have academic backgrounds in sciences and engineering.

(ii) Skills: The preparatory study examines whether or not they have ample technical capacity to receive technology transfer by reviewing their length of service in their current position, their past training records or experience in working as training instructors.

(iii) Awareness: Individual capacity is a basic constituent of the organizational and societal capacity. The degree of the sense of ownership at organizational and societal levels is significant to development of overall capacity from the perspective of CD. The personal sense of responsibility and mission is a key factor to this.

2) Capacity at Organizational Level

Capacity at the organizational level refers to the C/P's capabilities to carry out their work. Its current capacity is checked by analyzing its physical, human and intellectual resources given to the organization or requisite to meet the target set by the organization itself for solving the issues, operation management control system, ownership and other organizational culture and its capabilities to perform different operations.

(i) Physical, human and intellectual resources: Physical, human and intellectual resources are one of the components of organizational capacity. It takes long time to check how the offices, as physical resources, are controlled, whether or not an organization, as a mass of individuals, has a sufficient number of human resources and how C/P is structured, and to acquire skills in energy conservation. It is hence necessary to take into consideration the percentage of personnel who stay within the organization and their length of service. With regard to intellectual resources, the database on technical information essential to assessment, information about the factory to be assessed and factory assessment results must also be checked.

(ii) Operation and management: The adequacy of the organizational control system is examined from the perspective of financial standing and personnel affairs. Provided that a policymaking institution for energy conservation can often be different from those in charge of training, assessment or public relations, the scope of responsibility of the C/P and its relations with its

supervisory institution and the central government are examined. Moreover, checks are made as to whether or not there is any project steering committee or the like established in the framework of implementing the project.

(iii) Organizational culture: At organizational level, the factor of ownership and leadership must be given consideration in addition to the resources and the management structure discussed above. Specifically, it refers to the sense of commitment to energy conservation initiatives and the strong leadership of senior people. Although it is dependent on individual capacity, whether individual capacity can develop into organizational capacity is the key factor to overall capacity development. In the energy conservation sector, energy administrator training and factory assessment are both targeted to private companies. The benefit principle is adopted and there are revenues from training participation fees and factory assessment charges. It is thus important to maintain the transparency and stability of an organization for appropriately dealing with these revenues. In so doing, the financial sustainability of energy conservation initiatives is ensured.

(iv) Capacity to provide training: Provision of training is one of the fundamental tasks of the C/P organization. Its capacity to offer training is checked by reviewing the content of existing training courses and the system of operating and managing them.

(v) Capacity to perform factory assessment: Factory assessment is another key duty of the C/P body. How well assessment equipment and materials are maintained and assessment manuals are prepared are examined to monitor its capacity to perform the assessment.

(vi) Capacity to increase publicity: Public relations operations are yet another basic role that the C/P has to play. Its capacity to carry out publicity activities is examined by studying whether or not it owns a website and updates it, how much budget is allocated for publicity activities and how the performance is controlled.

3) Capacity at Societal and Institutional Levels

At the societal and institutional levels, the capacity to be checked includes that of factories and other stakeholders that ultimately implement energy conservation measures and that concerning statutory systems and mechanisms that are normally classified into external conditions of JICA projects.

(i) Factories and other facilities: When a factory has, as its capacity, a sense of social responsibility for addressing environmental issues, an awareness of energy costs and an interest in improving its corporate image, it may eventually embark on energy saving efforts. It is the energy administrator who provides a trigger that encourages the factory to obtain such capacity. To review the capacity of the factory, a check is made to determine whether or not it has any energy administrator or what stance it has towards energy conservation.

(ii) Other stakeholders: Institutions and organizations listed below are presumed to fall under the category of other stakeholders that are involved in energy conservation in the industrial sector. They will be further strengthening their capacity to address their own issues by providing energy conservation assessment services, engaging in the development of new energy conservation equipment and striving to lower electric power prices to facilitate decision making on the part of factories and facilities. The moves towards energy conservation and development of new markets thus should be checked.

- Other governmental organizations, such as ministries and agencies that make policies on energy conservation
- ESCO
- Equipment manufacturers
- Electric power suppliers (which need to make energy conservation efforts, like factories and facilities mentioned above)

(iii) Statutory systems and mechanisms: Normally, national governments give high priority to energy conservation policies. There must be not only energy saving legislation that supports such policies but also public funds available for stepping up energy conservation efforts and various other national policies for providing incentives. The status of such schemes is checked.

- Statutory systems, such as legislation on energy conservation
- Public funds, including a loaning program for promoting energy conservation efforts
- State policies, such as acquisition of the ISO 14000 and other certification, and fulfillment of the EU accession criteria

(iv) Other external conditions: Overall capacity to address energy conservation is in proportion to the level of awareness of energy conservation in society in general as well as to the level of institutional development. If there exists a system ensuring that public and community voices are heard, or simply put, if there is good governance, it means that the society has ownership. Whether or not the capacity of the society is sufficient is examined by focusing attention on the following aspects:

- Incentives to energy conservation
- Awareness of energy conservation and suchlike
- Partnerships
- Assistance from other donors

4) Preconditions

Apart from the above elements, the following information should be obtained as fundamental data for implementing an energy conservation project:

- Number of factories and buildings
- Economic and industrial composition
- Energy circumstances
- Culture and history
- Relations with neighboring nations

References

Fukuda-Parr, S., Lopes, C. and Khalid, M. (eds.) (2002) *Capacity for Development: New Solutions to Old Problems*, London: Earthscan / United Nations Development Programme (UNDP).

Ishii, A. and Kimata, Y. (2005) *Enjo Koka wa Do Sureba Takamerarerunoka (How can the aid effect be improved?): Capacity Development (CD)*, a handout material for expert training at the Institute for International Cooperation for fiscal 2005, February 2006.

JICA (Japan International Cooperation Agency) (1984) *Tai Okoku Sho-Enerugi Purojekuto Kaihatsu Keikaku Chosa Hokokusho -Yoyaku- (Report of the Study on Energy Conservation Project in the Kingdom of Thailand: Summary)*, JICA, December 1984.

——— (1986) *Chukajinmin Kyowa-koku Kojo Sho-Enerugi Keikaku Chosa Hokokusho -Yoyaku- (Study Report on the Factory Energy Conservation Plan in the People's Republic of China (Summary))*, JICA, October 1986.

——— (1989) *Aruzenchin Kyowa-koku Kojo Sho-Enerugi Keikaku Chosa Hokokusho -Yoyaku- (Report of the Study on the Factory Energy Conservation Plan in the Argentine Republic)*, JICA, October 1989.

——— (1992) *Dairen Chugoku Sho-Enerugi Kyoiku Senta Kyoryoku Jigyo Jisshi Kyogi Chosadan Hokokusho (Report from the Mission for Consultation and Research on Implementation of the China Energy Conservation Training Center Cooperation Project in Dalian)*, JICA, December 1992.

——— (1993) *Dairen Chugoku Sho-Enerugi Kyoiku Senta Kyoryoku Jigyo Keikaku Uchiawase Chosadan Hokokusho (Report from the Mission for Prearrangement on the China Energy Conservation Training Center Cooperation Project in Dalian)*, JICA, November 1993.

——— (1994a) *Aruzenchin koku Kogyo Bunya Sho-Enerugi Purojekuto Choki Chosain Hokokusho (Report from Long-Term Experts on the Industrial Energy Conservation Project in Argentina)*, JICA, October 1994.

——— (1994b) *Burugaria koku Sho-Enerugi Senta Purojekuto Jizen Chosadan Hokokusho (Report from the Mission for Preliminary Study on the Enerugi Efficiency Project in Bulgaria)*, JICA, December 1994.

——— (1995a) *Aruzenchin Kogyo Bunya Sho-Enerugi Purojekuto Jisshi Kyogi Chosadan Hokokusho (Report from the Mission for Consultation and Research on Implementation of the Industrial Eergy Conservation Project in Argentina)*, JICA, April 1995.

——— (1995b) *Burugaria koku Sho-Enerugi Senta Purojekuto Choki Chosain Hokokusho (Report from Long-Term Experts on the Energy Efficiency Center Project in Bulgaria)*, JICA, June 1995.

——— (1995c) *Dairen Chugoku Sho-Enerugi Kyoiku Senta Kyoryoku Jigyo Keikaku Uchiawase Chosadan Hokokusho (Report from the Mission for Prearrangement on the China Energy Conservation Training Center Cooperation Project in Dalian)*, Mining and Industrial Development Cooperation Department, JICA, July 1995.

——— (1995d) *Burugaria Sho-Enerugi Senta Purojekuto Jisshi Kyogi Chosadan Hokokusho (Report from the Mission for Consultation and Research on Implementation of the Energy Efficiency Center Project in Bulgaria)*, JICA, September 1995.

——— (1996a) *Aruzenchin Kogyo Bunya Sho-Enerugi Projekuto Keikaku Uchiawase Chosadan Hokokusho (Report from the Mission for Prearrangement on the Industrial Energy Conservation Project in Argentina)*, JICA, April 1996.

——— (1996b) *Burugaria Kyowa-koku Sho-Enerugi Senta Purojekuto Keikaku Uchiawase Chosadan Hokokusho (Report from the Mission for Prearrangement on the Energy Efficiency Center Project in the Republic of Bulgaria)*, JICA, November 1996.

——— (1997a) *Chukajinmin Kyowa-koku Dairen Chugoku Sho-Enerugi Kyoiku Senta Shuryoji Hyoka Hokokusho (Terminal Evaluation Report on the China Energy Conservation Training Center Cooperation Project in Dalian, People's Republic of China)*, Mining and Industrial Development Cooperation Department, JICA, March 1997.

——— (1997b) *Aruzenchin Kyowa-koku Kogyo Bunya Sho-Enerugi Purojekuto Junkai Shido Chosadan Hokokusho (Report from the Mission for Mid-Term Consultation on the Industrial Energy Conservation Project in the Argentine Republic)*, JICA, May 1997.

——— (1997c) *Burugaria-koku Sho-Enerugi Senta Purojekuto Junkai Shido Chosadan Hokokusho (Report from the Mission for Mid-Term Consultation on the Energy Efficiency Center Project in Bulgaria)*, JICA, November 1997.

——— (1998) *Aruzenchin Kyowa-koku Kogyo Bunya Sho-Enerugi Purojekuto Junkai Shido Chosadan Hokokusho (Report from the Mission for Mid-Term Consultation on the Industrial Energy Conservation Project in the Argentine Republic)*, JICA, October 1998.

——— (1999) *Toruko Kyowa-koku Sho-Enerugi Kyoryoku Jizen Chosadan Hokokusho (Report from the Mission for Preliminary Study on the Project of Energy Conservation in the Republic of Turkey)*, JICA, July 1999.

——— (2000a) *Toruko Kyowa-koku Sho-Enerugi Kyoryoku Jigyo Tanki Chosa Hokokusho (Short-Term Study Report on the Project of Energy Conservation in the Republic of Turkey)*, JICA, February 2000.

——— (2000b) *Toruko Kyowa-koku Sho-Enerugi Kyoryoku Jigyo Jisshi Kyogi Chosadan Hokokusho (Report from the Mission for Consultation and Research on Implementation of the Project of Energy Conservation in the Republic of Turkey)*, JICA, March 2000.

——— (2000c) *Aruzenchin Kyowa-koku Kogyo Bunya Sho-Enerugi Kyoryoku Jigyo Shuryoji Hyoka Hokokusho (Terminal Evaluation Report on the Industrial Energy Conservation Project in the Argentine Republic)*, Mining and Industrial Development Cooperation Department, JICA, May 2000.

——— (2000d) *Porando Kyowa-koku Porando Nihon Sho-Enerugi Kiso Chosadan Hokokusho (Report from the Mission for Basic Study on the Poland-Japan Energy Conservation Project in the Republic of Poland)*, JICA, November 2000.

——— (2001) *Burugaria Kyowa-koku Sho-Enerugi Senta Kyoryoku Jigyo Shuryoji Hyoka Hokokusho (Terminal Evaluation Report on the Energy Efficiency Center Project in the Republic of Bulgaria)*, Mining and Industrial Development Cooperation Department, JICA, March 2001.

——— (2002) *Tai Okoku Enerugi Kanrisha Kunren Senta Keikaku Jisshi Kyogi Hokokusho (Report on Consultation on Implementation of the Project on the Practical Energy Management Training Center in the Kingdom of Thailand)*, JICA, December 2002.

——— (2003a) *Iran Isuramu Kyowa-koku Sho-Enerugi Suishin Keikaku Jisshi Kyogi Hokokusho (Report on Consultation on Implementation of the Project on Energy Management Promotion in the Islamic Republic of Iran)*, Mining and Industrial Development Cooperation Department, JICA, January 2003.

——— (2003b) *Tai Enerugi Kanrisha Kunren Senta Purojekuto Unei Shido Chosa Hokokusho (Management Guidance and Study Report on the Project on the Practical Energy Management Training Center in the Kingdom of Thailand)*, Mining and Industrial Development Cooperation

Department, JICA, February 2003.

——— (2003c) *Toruko Kyowa-koku Enerugi Purojekuto Unei Shido (Chukan Hyoka) Hokokusho (Management Guidance Report (Interim Evaluation Report) on the Project of Energy Conservation in the Republic of Turkey)*, Mining and Industrial Development Cooperation Department, JICA, July 2003.

——— (2004a) *Porando Kyowa-koku Porando Nihon Sho-Enerugi Gijutsu Senta Purojekuto Jisshi Kyogichosadan Hokokusho (Report from the Project Design Team on the Project for the Poland-Japan Energy Conservation Technical Center in the Republic of Poland)*, Economic Development Department, JICA, July 2004.

——— (2004b) *Toruko Kyowa-koku Sho-Enerugi Senta Purojekuto Uneishido Chosadan Hokokusho (Report from the Project Consultation Team on the Project for the National Energy Conservation Center in the Republic of Turkey).*

——— (2005a) *Tai Okoku Enerugi Kanrishakunren Senta Purojekuto Shuryoji Hyoka Hokokusyo (Terminal Evaluation Report on the Energy Management Training Center Project for Energy Administrators in the Kingdom of Thailand)*, Economic Development Department, JICA, March 2005.

——— (2005b) *Toruko Kyowa-koku Sho-Enerugi Purojekuto Shuryoji Hyoka Hokokusho (Terminal Evaluation Report on the Project for Energy Conservation in the Republic of Turkey)*, Economic Development Department, JICA, May 2005.

———(2005c) *Kaihatsutojokoku Haikibutsu Bunya no Kyapashity Deberoppumento Shien no Tameni – Shakai Zentai no Haikibutsu Kanrinoryoku no Kojo wo mezashite (Supporting Capacity Development in Solid Waste Management in Developing Countries – Towards Improving Solid Waste Management Capacity of Entire Societies) (Revised Edition)*, Institute for International Cooperation, JICA, June 2005.

——— (2005d) *JICA Kokai Semina Hokokusho: Kyapashity Deberoppumento – Tojokoku no Shutaisei ni tatta Sogotekikadai Taishonoryoku no Kojo wo Mezashite - (JICA Open Seminar Report: Capacity Development – Aiming to Improve Comprehensive Capacity to Address Issues Based on the Initiative of Developing Countries)* Institute for International Cooperation, JICA, August 2005.

——— (2006) *Tojokoku no Shutaisei ni Motoduku Sogoteki Kadai Taishonoryoku no Kojo wo Mezashite – Capacity Development (CD) – CD towa Nanika JICA de CD wo Do Torae JICA jigyo no Kaizen ni Do Ikasuka – (Aiming to Improve Comprehensive Capacity to Address Issues Based on the Initiative of Developing Countries – Capacity Development (CD) – What Is CD? How Does JICA Perceive CD and Use it to Improve its Projects?)*, Institute for International Cooperation, JICA, March 2006.

Komazawa, M. (2005) *"Yorudan Kazoku Keikaku WID Purojekuto no Sogo-teki Kenkyu: Kyapashity Deberoppumento no Shiten ni yoru Bunseki"* (Comprehensive Study on Family Planning and Women in Development Projects in Jordan: Analysis from a Capacity Development Perspective), *Reports from Guest Researchers of JICA Institute for International Cooperation*, November 2005) [An English version of this study was published in 2006].

Mabuchi, S. and Kuwajima, K. (2005) *JICA Kokai Semina Hokokusho Kyapashity Deberoppumento – Tojokoku no Shutaisei ni Tatta Sogoteki Kadai Taisho Noryoku no Kojo wo Mezashite – (JICA Open Seminar Report: Capacity Development – Aiming to Improve Comprehensive Capacity to Address Issues Based on Independence of Developing Nations)*, Institute for International Cooperation, JICA, August 2005.

Miyoshi, T. and Nagayo, N. (2005) *Kyapashity Deberoppumento kara Mita JICA Gijutsu Kyoryoku no Yukosei to Kadai ni Kansuru Ichi Kosatsu: Ghana Kangai Nogyo Shinko Shien no Jirei kara (A Discussion on the Effectiveness and Problems of JICA Technical Cooperation from the Perspective of Capacity Development: Based on the Case Study on the Assistance in Irrigation and Agricultural Promotion in Ghana)*, report from guest researcher of the Institute for International Cooperation, JICA, September 2005.

Techno Consultants Inc. and Mitsubishi Chemical Engineering Corporation (1997) *Toruko-koku Enerugi Riyo Gorika Keikaku Chosa Hokokusho (Yoyaku) (The Study on the Rational Use of Energy in the Republic of Turkey Final Report: Summary Report)*, JICA and the General Directorate of Electrical Power Resources Survey and Development Administration (EIE) of the Republic of Turkey, January 1997.

The Energy Conservation Center, Japan (1994) *Burugaria Kyowa-koku Sho-Enerugi Keikaku Chosa Hokokusho (Yoyaku) (The Study on the Rational Use of Energy in the Republic of Bulgaria: Summary)*, JICA / Ministry of Industry, Bulgaria, March 1994.

The Energy Conservation Center, Japan and the Institute of Energy Economics, Japan (1997a) *Porando-koku Sho-Enerugi Keikaku Masuta Puran Chosa Saishu Hokokusho (Yoyaku) (Summary of the Final Study Report on the Master Plan for Energy Conservation in the Republic of Poland)*, JICA, Ministry of Economy of the Republic of Poland and the Polish National Energy Conservation Agency (KAPE), June 1997.

——— (1997b) *Iran-koku Enerugi Saiteki Riyo Keikaku Chosa Saishu Hokokusho (Yoyaku) (Technical Cooperation on Analysis of Energy Use and Rational Use of Energy in the Social and Economic Sectors of the Islamic Republic of Iran Final Report: Summary)*, JICA and the Planning and Budget Agency of the Islamic Republic of Iran, September 1997.

Appendix
Towards Capacity Development of Developing Countries Based on their Ownership (Summary)
－ Concept of CD, its Definition and its Application in JICA Projects －

1. Capacity Development (CD) of Developing Countries － Summary of the Concept and the Recent Debate

(1) Why Capacity Development Now? (Chapter I, Section 1-2)

During the 1990s, when marked donor fatigue became apparent after the Cold War, it was often argued in the international aid community as to whether development cooperation had actually proven effective in making a difference. In parallel with the rising criticism of the effectiveness of structural adjustment policies thereafter, many donor countries and organizations as well as the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) started to review and evaluate their technical cooperation activities.[1]

In its initiative on reforming technical cooperation, the United Nations Development Programme (UNDP) critically addressed this discussion. Its 2002 report pointed out that technical cooperation can actually be detrimental to the capacity of developing countries for a number of reasons: its donor-driven nature deprives the recipients of their ownership and potential; its disproportionate emphasis on improving the abilities of individuals and establishing new systems impairs the sustainability of the results; funding bypassing the recipients' normal budgetary processes distorts their policies; and different administrative and procurement procedures required for each donor increases their cost burden. The report drew the conclusion that technical cooperation should provide a means to support the capacity development (CD) of developing countries and donors should collectively pool funds instead of carrying out projects separately.[2]

Such criticisms have mainly been directed toward an old type of technical cooperation, which had been adopted by Western donors. It is cited that such cooperation tended to depend upon the dispatch of foreign experts who took over the positions of local experts and the formulation of project implementation units (PIUs) independent of existing organizations. In recent years more and more weight has been placed on recipient-driven development, partnership and alignment to ensure relevancy with respect to the recipients' existing systems, as well as a more comprehensive approach incorporating the civil society and the private sector. Japan is also in a position to review and reexamine its own experience and the comparative advantage it has in providing technical cooperation, which has taken a project-based approach.

The discussion on the concept of CD provides JICA with the perfect opportunity to gain a broader perspective to seek the best way to maximize the effectiveness of cooperation outcomes and ensure their sustainability. JICA could review its project-based approach and its experience of technical cooperation provided to the public organizations of developing countries where JICA has concentrated its assistance. CD also presents a fresh perspective from which to examine the complementarity between JICA's technical cooperation and other modalities in the context of aid harmonization.

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[1] DAC (1991) *Principles for New Orientations in Technical Cooperation* and many other reviews made by donor countries and agencies.

[2] UNDP (2002) *Capacity for Development: New Solutions to Old Problems*

(2) Definition and Characteristics of Capacity Development (Chapter I, Section 1-1)

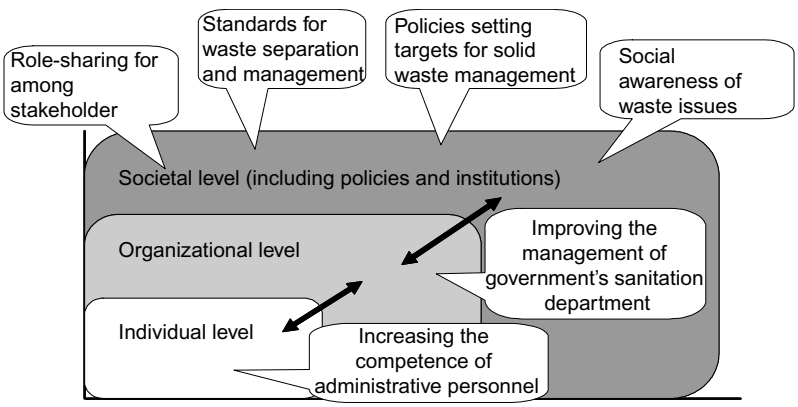
Capacity development (CD) refers to the ongoing process of enhancing the problem-solving abilities of developing countries by taking into account all the factors at the individual, organizational, and societal levels. Defining capacity as the ability of developing countries to solve problems on their own and considering it as a complex of elements including institutions, policies, and social systems, the concept of CD attaches great importance to proactive and endogenous efforts (ownership) on the part of the developing countries.

1) Complexity of Capacity

As the capacity required by developing countries to solve problems on their own is a complex of elements, its analysis must be conducted comprehensively. For example, the capacity required by a large city in a developing country in order to develop a sustainable and effective solid waste management system would not only be limited to the sufficient know-how possessed by the municipal government's sanitation department and its staff, but also extend to various other elements. These include a role-sharing mechanism that involves the private solid waste management sector, communities, citizens, and the government's sanitation department; an institutional setup that determines the standards, including those for waste separation and management, as well as the penalties; policies that set goals, including those for waste reduction; and a society that remains alert and sensitive to the issue of solid waste management.

Technical cooperation, conventionally considered as cooperation for human resources development, has long focused on improving the competence of individuals and organizations in the public sector. However, even if such efforts lead to success, without a mechanism and system enabling the continuation and improvement of such activities in the society, sustainable and effective outcomes cannot be realized. Capacity is formed by the interaction of various elements. Only by recognizing this as a fact and considering the concept of capacity from a broader perspective that transcends the individual and organizational boundaries is it possible to develop suitable strategies, such as which capacity should be given priority for improvement, to what extent is cooperation required, and who covers those areas where no cooperation is provided. The essence of the concept of CD reflects such a comprehensive understanding of capacity.

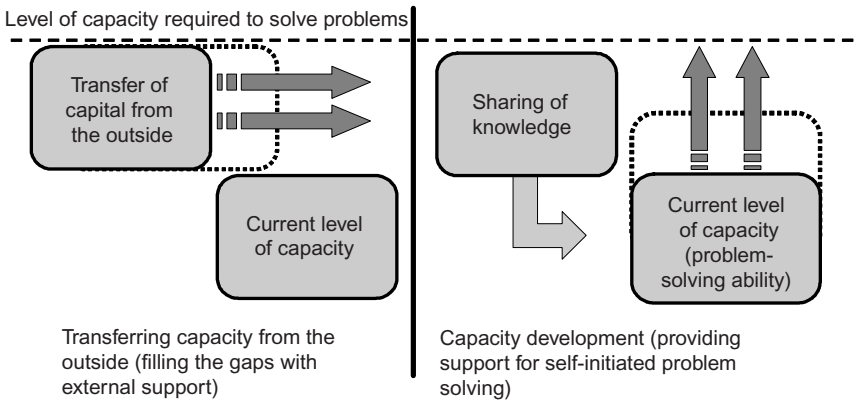
Figure A-1



2) Endogenuity of Capacity

Capacity has conventionally been considered as a type of capital that can be invested or transferred as in the case of infrastructures, technologies, and human resources. However, in the concept of CD, capacity is defined as the ability of developing countries to solve problems on their own. Capacity is not simply transferable and its sustainability is largely dependent on the initiative and ownership of the developing countries involved (see Figure A-2). With this in mind, it can be said that, instead of merely filling the gaps with systems designed in developed countries, the type of aid called for is one that fulfills the needs of developing countries in a catalytic way and facilitates their endogenous efforts, such as knowledge sharing that facilitates decision-making and actions based on the initiative of the developing countries. Some of the key elements that are critical in promoting the CD of developing countries are ***ownership***, an ***enabling environment*** (with favorable policy and regulatory frameworks), ***incentives***, and ***leadership***. Donors are required to remain sensitive to the need or an understanding of the current status of each element and figuring out the most effective way of facilitating their improvement.

Figure A-2



Reference

Technology transfer, which has been central to JICA projects and programs, was intended not just to inject technologies from the outside but to achieve technological adoption and diffusion among the recipient countries. However, JICA's activities that had mainly involved the training of individual counterparts tended to put too great an emphasis on transferring Japanese technology. CD is fundamentally different from capacity building, a term often used within JICA to describe a type of cooperation project that focuses on the development of human resources and the functional improvement of counterpart institutions. Unlike capacity building, CD is a process that the developing countries undertake, rather than an action taken by aid donors. The concept of CD suggests a facilitator's role for aid donors.

2. Findings from the Analysis of JICA Projects (Chapter II)

With regards to 'the possible entry points' that JICA should consider in initiating effective CD support in developing countries, there are three different options: (i) ***local society empowerment***, which designates a specific spatial area such as a community or local society to which CD support is provided; (ii) ***core function development***, which promotes human resources development, technological diffusion and R&D mainly in government operational sections; and (iii) ***policy and institution development***, which involves the

formulation, application, and improvement of the regulatory system or institutions, and specific policies that should be broadly applied, such as on a national level.

Furthermore, recognizing that CD is a process requiring spontaneity on the part of developing countries, there are three significant aspects: nurturing a sense of ownership of the recipient countries; increasing the incentives for recipient countries; and ensuring the proper acquisition of knowledge. Based on the perceptions provided above, the following four cases of cooperation projects, all with different backgrounds and approaches, were analyzed. As a result, three findings were obtained.

JICA cooperation projects for which a case analysis was conducted

(i) ***Core function development for a teacher*** training system: Projects on the training of science and mathematics teachers (Philippines, Kenya, and Ghana)

(ii) ***Core function development*** and ***local society empowerment*** observed in participatory rural development: Sokoine University of Agriculture, Centre for Sustainable Rural Development (SCSRD) project in Tanzania

(iii) Transition from ***core function development*** to ***local society empowerment,*** and to ***institution development:*** Small-scale irrigation projects in Ghana

(iv) Pilot experience of capacity assessment: Waste management sector

Three findings

(1) In order to increase the sustainability of the results, it is important to first identify the capacity required by the recipient country to achieve the overall goal, as well as the elements of capacity where their series of improvements are a priority. In doing so, JICA and its partner country should project the desirable course of action for the country to acquire such capacity, and then clarify the role and positioning of JICA's cooperation in such efforts.

(2) Developing the capacity required to solve problems reflected in the overall goal in a sustainable and integrated manner requires a long period of time for arrangements, such as building a collaborative relationship among stakeholders and institutionalizing a system experimented on as a pilot case. Therefore, it is important to think in terms of a program-oriented approach in selecting and combining different activities under the long-term vision. It also becomes necessary to identify potential risks and external environment factors, address them consciously in the program, and take appropriate measures for implementation.

(3) Aid providers that support problem-solving ability (capacity) are to remain as facilitators, making efforts to help seek the most acceptable and sustainable system and boost the ownership of partner countries as well as provide incentives that encourage their self-initiated actions.

3. JICA's Definition of CD and the Direction for the Improvement of its Technical Cooperation (Chapter I, Section 1-4; Chapter III, Section 3-1)

As mentioned previously, the concept of CD suggests to JICA a facilitator's role in enhancing the endogenous problem-solving abilities of developing countries from a comprehensive standpoint. Based on the concept, looking beyond its focus on support for self-help efforts and human resources development, JICA can redefine its technical cooperation as follows:

- The objective of JICA's technical cooperation is to support 'the ongoing process of enhancing the problem-solving abilities,' that is CD, of developing countries by taking into account all the factors at the individual, organizational, and societal levels.
- JICA should adhere to the role of a facilitator that indirectly supports the CD of developing countries.

It is important for JICA as a CD facilitator to implement a strategic form of cooperation through an understanding of the current capacity of developing countries. A significant factor in this is to accumulate its institutional experience and know-how in enhancing the endogenous capacity of the partner countries. Based on the concept of CD, the direction for improving JICA's aid management is summarized below.

(1) Aid Management Based on a Comprehensive Approach

1) Comprehensive Understanding of Capacity and the Development of a Strategic Scenario for CD (Chapter III, Section 3-2)

- A comprehensive capacity assessment should be conducted to draw a feasible cooperation scenario for each problem. The assessment consists of three major steps: (i) understand the current level of capacity; (ii) identify the elements of capacity required to solve the problem; and then (iii) develop a possible cooperation scenario, which takes into account the priorities of capacity which should be developed (entry points), the course of action, steps to be taken, and the time frame. Accordingly, JICA's cooperation should be strategically positioned within the entire CD framework of a developing country after clarifying the required capacity as well as the course of action to attain such capacity.
- When conducting an assessment to comprehensively understand capacity and develop a strategic scenario, it is useful to prepare a capacity checklist for each sub-sector so that JICA can work according to a standardized format. A capacity checklist can be obtained by first identifying and summarizing the elements of capacity according to the main stakeholders and relevant policies and institutions in the sub-sector. A pilot capacity assessment is currently under progress in the field of waste management, and is also being applied to areas of environmental management. Such a checklist will be an effective tool for the counterpart personnel to better understand the current situation and to help raise their awareness of the problems.

2) Flexible Management through a Program-Oriented Approach (Chapter III, Section 3-3)

- It is necessary to look beyond the traditional human resources development assistance and provide indirect support that encourages the establishment of a mechanism, institution, and policies necessary to continue and enhance individual and organizational activities. Attaining the overall goal has conventionally been left in the hands of the developing countries at project completion. However, in order to ensure that the changes brought about by cooperation are firmly established as sustainable systems, or the results of empowerment take root in the local society and are applied in other regions, it becomes essential to consider JICA's assistance as an organic component that is synchronized and harmonized with other projects and funding, support by other donors, and the initiatives of the developing countries themselves, which altogether constitute a program designed to achieve the overall goal.
- Various types of programs are possible. Instead of seeking a solution to specific development

challenges only within the boundaries of JICA projects or Japan's cooperation, it is necessary to utilize aid coordination frameworks. After identifying the area of capacity that needs improvement, JICA's should link its projects with a local development program and sector program, and take a program-oriented approach to decide how to coordinate other donors as well as the self-help efforts of the recipient countries in order to implement a successful development program.

- Although management of assistance is to be based on each project, in order to make the above harmonization possible, outcomes should be considered in a medium- to long-term framework since the aim is to provide medium-to long-term assistance for the implementation of the recipients' development program. For this reason, it is important to identify the various risk factors that influence the outcome of medium- to long-term cooperation, such as support from other donors, efforts by the recipient countries themselves, the institutional setup, and relationships with stakeholders. Therefore, project management needs to be done with greater flexibility. If there are major and unexpected changes to the overall situation surrounding the project, certain aspects of the project should be redesigned, or in case of more serious changes, project implementation should be suspended or terminated to allow the development of a new scheme, or the entire program should be reconstructed altogether.

(2) Role of Aid Providers as CD Facilitators

1) Setting Progress Indicators of CD

- In order to monitor the progress of CD, appropriate indicators need to be set. The areas of capacity to be improved should be clearly defined by taking into account the proposed attitudinal changes of the counterpart personnel and the main recipients of development efforts, as well as organizations, institutions, and the society. In conducting an effective assessment, referring to a pilot case of waste management may be useful.
- In order to achieve the set CD objective, it is important to break down the necessary steps and clarify the key factors, such as the targeted outcome, the process and course of action to attain such an outcome, and the risks involved. Sharing such information will be vital in facilitating communication among the stakeholders. Using a checklist through capacity assessment as described in (1) above for monitoring purposes will also be beneficial.

2) Sharing Know-how to Facilitate the CD Process

- In accordance with the principles of conduct for experts, consultants, and JICA staff, through activities involved in the processes of consensus building and consultation, project/program formulation, planning and management, and evaluation, aid providers should strive to accumulate and share the know-how to help developing countries raise their awareness and motivation to solve problems. Considerable experience should have already been accumulated through the trial and error process of problem-solving between local counterparts and Japanese experts.
- Lessons learned and findings made through activities devoted to helping developing countries employ an autonomous funding mechanism and encouraging their self-help efforts for the enhancement of CD should be accumulated and applied in future cooperation projects.

4. Future Challenges for the Improvement of JICA Projects

(1) Improving the Methodology for Project Management including Capacity Assessment

In the course of making practical attempts, JICA must fully grasp the current level of capacity possessed by developing countries, work out a methodology in order to develop a strategic cooperation scenario (capacity assessment), and examine the direction of cooperation by taking a program-oriented approach at the field level. In addition, to ensure flexible project management, an effective decision-making process, such as that for risk management and project design adjustment, must be devised and proper indicators to monitor the CD progress in projects must be reviewed. These issues are to be discussed and studied further in the related research projects at JICA's Institute for International Cooperation (IFIC).

(2) Flexible Project Management with a Program-Oriented Approach

JICA must review and redefine its cooperation programs. It is necessary to draw a general picture of the programs by considering such factors as the duration of the entire program, the time period for assessing the current situation and conducting preparatory activities, and the level of detail in the programs at the time of formulation. Based on a critical and realistic analysis of selected case studies, JICA must give proper definition to its programs. Especially called for is field-based management centered around JICA overseas offices and 'the Official Development Assistance (ODA) Task Forces[3],' which should be discussed thoroughly. While looking into actual cases at offices where aid coordination is practiced, it is necessary to clearly define the roles of office staff and experts.

(3) Sharing of Know-How and Accumulation of Experience as Facilitators

The know-how in facilitating self-initiated CD efforts and flexible management can be systemized and accumulated within the organization by summarizing case studies of actual cooperation projects and past project experiences. The sectoral departments, issue-wise task forces, and the research group of JICA need to enhance project analysis, share the results, and diffuse them in the form of training materials for JICA staff and experts.

[3] ODA Task Forces are comprised of members from the Japanese embassy and overseas offices of JICA, and the Japan Bank for International Cooperation (JBIC) (and the Japan External Trade Organization (JETRO) if an office exists). The ODA Task Force aims to strengthen collaborative efforts for more effective and efficient policy making and implementation of ODA at the field-level. Currently there are nearly 70 Task Forces in developing countries.