

## **Ex-Ante Evaluation (for Japanese ODA Loan)**

### **1. Name of the Project**

Country:	India
Project:	New and Renewable Energy Support Project
Loan Agreement:	June 16, 2011
Loan Amount:	30,000 million yen
Borrower:	Indian Renewable Energy Development Agency Limited (IREDA)

### **2. Background and Necessity of the Project**

#### **(1) Current State and Issues of the Energy Sector in India**

In India, with its recent rapid annual economic growth rate of more than 8%, energy consumption has been increasing and India has become the fifth largest energy consumer in the world. Moreover, India's energy consumption is also expected to increase in the future. On the other hand, India has an unbalanced energy supply structure. High dependency of coal thermal power generation (53% of the total power generation as of 2009), and imports of energy resources have been increasing, so India is concerned about the stability of energy supplies. To diversify the energy supply structure, the Indian Government has recently been promoting the development of new and renewable energy (wind power, solar energy, cogeneration, etc.), but the ratio of new and renewable energy to the total power generation capacity has remained at only 9.0% (as of 2009). There is big potential for new and renewable energy development.

#### **(2) Development Policies for the Energy Sector in India and the Priority of the Project**

The Indian Government established the Indian Renewable Energy Development Agency Limited (IREDA) in 1987 to provide finance to new and renewable energy businesses. The Ministry of New and Renewable Energy has established in 2006 to provide policy direction and necessary facilities for new and renewable energy promotion. The Indian Government has stated in the 11th Five-Year Plan (2007-2011) that to develop new generation capacity amounting to 93,577 MW (including new and renewable energy) to meet rapidly increasing energy demand, 15,000 MW is planned to be supplied by new and renewable energy. Moreover, as a part of the National Climate Change Action Plan (2008), the Indian Government established a "National Solar Energy Mission" in 2010, focusing on solar and solar thermal power generation. This Project will support these policies of Indian Government.

#### **(3) Japan and JICA's Policy and Operations in the Energy Sector**

In the Japanese Country Assistance Program for India, "improvement of poverty and environment issues" is identified as a Priority Area. JICA has adopted "Assistance for Tackling against Environment Issues and Climate Change" as a Priority Area for cooperation and been promoting the development of new and renewable energy. This project is consistent with these policies.

With regard to ODA loans to India, Japan has so far provided 73 loan projects totaling 1,051.3 billion yen to the energy sector, however, this project will be the first project to extend support to new and renewable energy.

#### **(4) Other Donors' Activity**

The World Bank provides loans to IREDA with 2 projects and provided technical support. The Asian Development Bank (ADB) also provided loans for new and renewal energy development projects that cover solar thermal power generation, wind power generation, and cogeneration. In addition, the Kreditanstalt fur Wiederaufbau (KfW) and L'Agence Française de Développement (AFD) also provide loans to IREDA.

### **(5) Necessity of the Project**

This Project aims at both environmental conservation and the stable supply and diversification of energy by providing funds for the development of new and renewable energy through IREDA, it is essential and appropriate for JICA to give support.

## **3. Project Description**

### **(1) Project Objective**

The objective of this project is to secure stable and diversified source of power supply against the recent increasing energy demand in India, by promoting new and renewable energy development projects and energy efficiency and conservation in the country, through IREDA financing, thereby contributing to environmental conservation, sustainable economic development in the country and mitigation of global climate change.

### **(2) Project Site/Target Area**

The whole area of India

### **(3) Project Components**

The medium-term and long-term funds required for new and renewable energy development projects are provided to electric power producers by two-step loans scheme from IREDA.

### **(4) Estimated Project Cost (Loan Amount)**

33,535 million yen (including the amount covered by ODA loans: 30,000 million yen)

### **(5) Schedule**

June 2011 – March 2016 (58 months); Project completion is defined as entire amount has been financed (March 2016).

### **(6) Project Implementation Structure**

- 1) Borrower: Indian Renewable Energy Development Agency Limited (IREDA)
- 2) Guarantor: The President of India
- 3) Executing Agency: Same as 1)
- 4) Operation and Maintenance System: Same as 1)

### **(7) Environmental and Social Consideration/Poverty Reduction/Social Development**

- 1) Environmental and Social Consideration
  - (1) Category: FI
  - (2) Reason for the Categorization: According to “JICA Guidelines for Environmental and Social Considerations” (put into effect as of April 2010), this Project is classified as Category FI because the loans are given to financial intermediaries, no sub-projects can be identified before the approval of JICA’s loans (such sub-projects are estimated to have an environmental impact)
  - (3) Other aspects: Under this Project, the executing agency will classify sub-projects into categories according to India’s domestic laws and regulations and the JICA Guidelines. When sub-projects are selected, IREDA will check whether the agencies executing the sub-projects appropriately give consideration to the environment and establish monitoring plans according to the guidelines and standards enacted by the Pollution Control Board, etc. In addition, when monitoring is carried out, IREDA will regularly check the results of environmental monitoring, and the Pollution Control Board, etc., will also carry out monitoring. No sub-project that falls under Category A is covered by this Project.
- 2) Promotion of Poverty Reduction  
None

- 3) Promotion of Social Development (gender perspective, measures for infectious diseases including HIV/AIDS, participatory development, consideration for persons with disabilities, etc.)  
None

**(8) Collaboration with Other Donors**

It is planned to give technical support in order to strengthen IREDA's capacity to appraise loans for solar power generation project and in order to hold seminars to expand cooperation between Japanese and Indian enterprises in the new and renewable energy sector.

**(9) Other Important Issues**

Because the purpose of this Project is to support the development of new and renewable energy resources and promote new and renewable energy introduction and reductions in greenhouse gas emissions, etc., the Project will contribute to the mitigation of climate change.

#### 4. Targeted Outcomes

##### (1) Quantitative Effects

###### 1) Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline (Actual value in 2010)	Target (2018) [2 years after project completion]
<b>Output</b>		
Ratio of non-performing loans to the total amount of loans (%)	–	Fixed at the commencement of the project
Ratio of non-performing loans to the total number of loans (%)	–	Fixed at the commencement of the project
<b>New and renewable energy development project</b>		
Energy substitution in loan-financed projects (Oil equivalent tons/year; power consumption/year, etc.)	–	Fixed when the sub-loan is approved
Reduction in greenhouse gas emissions in loan-financed projects (CO <sub>2</sub> equivalent tons/year)	–	Fixed when the sub-loan is approved
Rate of use of equipment in loan-financed projects (%)	–	Fixed when the sub-loan is approved
Maximum output in loan-financed projects (MW)	–	Fixed when the sub-loan is approved
<b>Projects for promoting energy saving and improvement of energy efficiency</b>		
Reduction in energy consumption in loan-financed projects (Oil equivalent tons/year; power consumption/year, etc.)	–	Fixed on the completion of the sub-loan disbursements
Reduction in greenhouse gas emissions in loan-financed projects (CO <sub>2</sub> equivalent tons/year)	–	Fixed on the completion of the sub-loan disbursements

- 2) Internal Rates of Return  
Not calculated

##### (2) Qualitative Effects

Stable supply of energy; environmental improvement; sustainable economic growth; mitigation of climate change

#### 5. External Factors and Risk Control

Fluctuation risk in the available amount of new and renewable energy resources, system change risk, etc.

#### 6. Lessons Learned from Past Projects

The following lesson has been gained from ex-post evaluation: In the case of a development loan, if the executing agency to which the loan is granted directly provides equipment investment funds to the end user, it is necessary to create a system whereby the status of use of the constructed facilities and equipment and the environmental improvement effect can be regularly monitored. Based on this,

it has been decided that the rate of use of equipment in the facilities should be reported quarterly concerning all the sub-projects of the Project.

## **7. Plan for Future Evaluation**

### **(1) Indicators to Be Used**

- 1) Ratio of non-performing loans to the total amount of loans (%)
- 2) Ratio of non-performing loans to the total number of loans (%)
- 3) Energy substitution in loan-financed projects (oil equivalent tons/year; power consumption/year, etc.)
- 4) Reduction in greenhouse gas emissions in loan-financed projects (CO<sub>2</sub> equivalent tons/year)
- 5) Rate of use of equipment in loan-financed projects (%)
- 6) Maximum output in loan-financed projects (MW)
- 7) Reduction in energy consumption in loan-financed projects (oil equivalent tons/year; power consumption/year, etc.)

### **(2) Evaluation Schedule**

Two years after project completion