

1. Name of the Project

Country: India

Project: Haryana Distribution System Upgradation Project

Loan Agreement: March 31, 2014

Loan Amount: 26,800 million yen

Borrower: The President of India

2. Background and Necessity of the Project**(1) Current State and Issues of the Energy Sector in India**

With its recent fast-paced annual economic growth of more than 8%, energy consumption in India has been increasing, which has made the country become the fourth largest energy consumer in the world. However, energy supply has not met the energy demand (FY2012: April 2012 - March 2013): there are serious electricity supply shortages of 8.7% of total requirements, and 9.0% of peak demand. In addition, the high rate of power transmission and distribution losses (FY2011: estimated at 23.7% on an average for all of India) has become serious problems with respect to the power supply.

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

Under the Twelfth Five-Year Plan (April 2012 to March 2017), the Government of India plans to develop new power sources of 88,537 MW, establish power transmission and distribution facilities, and reduce transmission and distribution losses. In the state of Haryana, as of the end of FY2012, there is a power supply shortage of slightly more than 7.7% of total requirements (total energy supply: 38,209 GWh) and a shortage of 9.5% of peak demand (peak met: 6,725 MW). As such, the Government of Haryana set a goal to develop 2,002 MW of new power sources within the Twelfth Five-Year Plan. In response to the new power sources, there is a plan to develop and strengthen the distribution networks, which aims to reduce the distribution loss rate to 20.9% (44.0% in FY2012) in Northern Haryana and to 17.7% (24.8% in FY2012) in Southern Haryana by FY2016. The Haryana Distribution System Upgradation Project (hereinafter referred to as "the Project") aims to improve Haryana's distribution facilities as part of the plans promoted by the Government of India and Haryana State Government to strengthen the distribution sector as well as to increase the efficiency of the sector.

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

In Japan's Country Assistance Programs for India (May 2006), "Promotion of Economic Growth" has been identified as one of the priority areas. Accordingly, in its Country Analysis Paper (March 2012), JICA has set "Promotion of Sustainable Growth through the Development Assistance to the Infrastructure" as a priority area. In order to deliver a stable and efficient power supply, strengthening the power supply capacity as well as the power transmission capacity is necessary. JICA's primary assistance includes the establishment of highly efficient power supply facilities (power stations and transmission/distribution systems), the improvement of efficiency of the existing old power facilities, and the reduction of transmission/distribution losses, which are all consistent with the objective of the Project. As for the past Japanese ODA loan projects in the energy sector, there were 73 projects totaling 1,094.4 billion yen. With regard to the distribution system improvement projects, JICA extended ODA loans to the "Rural Electrification Project" in FY2005, the "Bangalore Distribution Upgradation Project" in FY2006, and the "Andhra Pradesh Rural High Voltage Distribution System Project" in FY2011. As for technical cooperation, JICA conducted the development study titled the "Andhra Pradesh Power Distribution Improvement Planning Study" from FY2001 to FY2003 and the "Thermal Power Generation Management Improvement Planning Study" from FY2008 to FY2010.

(4) Other Donors' Activities

The World Bank and the Asian Development Bank (ADB) have been supporting not only the power sector reforms in India, but also projects related to the establishment of transmission and distribution systems, strengthening of the capacity of state electric power corporations, development of hydroelectric power generation, and energy efficiency improvement. The World Bank has provided assistance to states including Odisha, Haryana, Andhra Pradesh, Uttar Pradesh, and Rajasthan, while the ADB has provided assistance to Gujarat, Madhya Pradesh, Kerala, Assam, and Uttarakhand.

In the state of Haryana, in 2009, the World Bank provided loan of USD 250 million to Haryana Vidut Prasaran Nigam Limited (Haryana Transmission Company) and USD 70 million to Dakshin Haryana Bijli Vitran Nigam Ltd. (southern Haryana Distribution Company) in order to develop urban distribution networks with the objective of strengthening the transmission network and reducing distribution losses.

(5) Necessity of the Project

With faster progress in reforming its energy sector than in other states, the state of Haryana has been promoting the participation of the private sector in order to implement efficient facility management as well as market mechanisms. However, due to the lack of sufficient power supply facilities, the state of Haryana has been facing frequent power outages and an unstable power supply. Numerous local and overseas companies, including Japanese companies, have offices and factories in Haryana, particularly in industrial parks (as of January 2014, the number of Japanese companies operating in Haryana was 325, the third largest number in any state after Tamil Nadu and Maharashtra). To avoid power outages and voltage fluctuations, many of these companies have installed private power generators and “separate feeders,” which are distribution lines laid directly from a substation to an office or factory. However, such measures are costly and affect profit margins. Furthermore, power theft and meter tampering are frequently observed in Haryana, resulting in more than 50 percent in distribution loss in many areas. Due to such serious problems in Haryana, immediate measures for the existing power distribution system need to be taken.

Under these circumstances, by implementing and improving distribution systems, the Project aims to achieve stabilization of the power system in Haryana, reduction of the distribution loss rate, and stable power supply. Therefore, the aim of the Project is in line with the development policy of the Government of India as well as the foreign aid policy of the Government of Japan and of JICA. Consequently, JICA’s assistance for the Project is necessary and relevant.

3. Project Description

(1) Project Objective

The objective of the Project is to facilitate the reliability and quality of power supply to the state of Haryana and reduce distribution losses by augmenting existing electrical infrastructure, laying additional infrastructure, as well as introducing Automatic Meter Reading, thereby contributing to securing the stable energy supply in the State and improving the economic development and living standards of the residents of the State.

(2) Project Site/Target Area

All 21 districts of the state of Haryana

(3) Project Components

- 1) Procurement of materials and equipment needed for new construction and enhancement for distribution lines (11kV, total of approximately 4,359 km) and civil work
- 2) Procurement of materials and equipment for construction of 75 new substations and 74 augmented substations and civil work
- 3) Installation of Automatic Meter Reading (total of approximately 63,000) and 2 AMR servers (only in northern Haryana)
- 4) Installation of meter pillar boxes (total of approximately 131,000) and electronic meters (1,705,000)
- 5) Revamping of existing Meter Testing Labs (total of 10 labs) and setting up of 2 new testing labs for materials
- 6) Procurement of 33/11kV power transformers and allied equipments
- 7) Consulting services (financed by the Executing Agencies; TOR including basic design, tender preparation, and project supervision)
 - Method of procurement: Local Competitive Bidding for both project components and consulting services

(4) Estimated Project Cost (Loan Amount)

32,756 million yen (Loan Amount: 26,800 million yen)

(5) Project Implementation Schedule

April 2014 – June 2019 (63 months). Project completion is scheduled in June 2019, which is the expected time for the commencement of commercial operation.

(6) Project Implementation Structure

- 1) Borrower: The President of India
- 2) Executing Agencies: Uttar Haryana Bijli Vitran Nigam Ltd. and Dakshin Haryana Bijli Vitran Nigam Ltd.
- 3) Operation and Maintenance System: Same as 2)

(7) Environmental and Social Considerations/Poverty Reduction/Social Development

- 1) Environmental and Social Considerations
 - (i) Category: C

- (ii) Reason for Categorization: The project is likely to have minimal adverse impact on the environment under the Guidelines for Environmental and Social Considerations (April 2010) in terms of its sectors, characteristics and areas.
- 2) Promotion of Poverty Reduction: Improvement in the standard of living in rural areas (reduction in power outage times).
- 3) Promotion of Social Development (e.g. Gender Perspective, Measures for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for Persons with Disability, etc.): None

(8) Collaboration with Other Schemes or Donors

The World Bank is implementing a project that installs AMRs in southern Haryana. JICA plans to be in close communication with the World Bank for the project's progress.

(9) Other Important Issues

The Project aims to improve energy efficiency by reducing distribution losses, and therefore it will contribute in controlling Greenhouse Gas (GHG) emissions. The estimated annual GHG emissions reduction by the Project is approximately 329,509 ton-CO2 equivalent per annum.

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

Indicators		Baseline (2012)	Target (2021) (2 Years after Project Completion)
Augmented Substation Capacity (new & augmented substation capacity) (MVA)	North	0	1,161
	South	0	744
Total			1,905
Number of Meters Tested in Labs (units/year)*	North	176,973	335,000
	South	241,611	381,000
Total		418,584	716,000
AMR Successful Connection Rate (%)**	North	N/A	100
Distribution Loss Rate (%)***	North	44.00	14.60
	South	24.84	12.18

* Present (FY2012) figures are yearly average of past 5 years.

** Rate = [number of successful connections with AMR installed under the JICA Loan]/63,000 total number of AMR meters to be installed

*** Targets are based on the Executing Agencies' "Financial Restructuring Plan" approved by India's Ministry of Power.

2) Internal Rate of Return

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) for the Project is 16.7% and the Financial Internal Rate of Return (FIRR) is 14.0%.

EIRR:

Cost: Project cost (excluding tax) and operation and maintenance expenses

Benefit: Decrease in economic cost due to reduction of distribution losses

Project Life: 15 years

FIRR:

Cost: Project cost, operation and maintenance expenses

Benefit: Increase in the income level

Project Life: 15 years

(2) Qualitative Effects

Economic growth in the state of Haryana, improvement of the power demand/supply situation in the state due to increased distribution efficiency, and mitigation of climate change

5. External Factors and Risk Control

Deterioration of political and economic situation and natural disasters in India and the areas around the Project area

6. Results of Evaluations and Lessons Learned from Past Projects

(1) Evaluation Results of Similar Projects

From the ex-post evaluation of previous energy project named "Power System Improvement and Small Hydro Project," the project's challenge with sustainability was pointed out partially due to the weak financial structure of state transmission companies and distribution companies that were in charge of operation and maintenance.

(2) Lessons for the Project

In order to reduce the amount of uncollected bills resulting from nontechnical losses such as by meter tampering, as well as to increase the income level of the Executing Agencies, AMRs and meter pillar boxes will be installed by the Project. In addition, under the initiative of the Ministry of Power, the Executing Agencies are currently implementing the Financial Restructuring Plan, which aims to transform the financial structure of the Executing Agencies into a profit-generating structure by FY2016 by preventing thefts and reducing their liabilities. JICA plans to conduct monitoring on the progress towards their turn-around target on a periodical basis.

7. Plans for Future Evaluation

(1) Indicators To Be Used

- 1) Augmented Substation Capacity (new & augmented substation capacity) (MVA)
- 2) Number of Meters Tested in Labs (units/year)
- 3) AMR Successful Connection Rate (%)
- 4) Distribution Loss Rate (%)
- 5) Economic Internal Rate of Return (EIRR) (%)
- 6) Financial Internal Rate of Return (FIRR) (%)

(2) Timing

Two years after project completion