

Ex-ante Evaluation

1. Name of the Project

Country: The Islamic Republic of Pakistan

Project: Punjab Transmission Lines and Grid Stations Project (I)

(Loan Agreement: May 3, 2008; Loan Amount: 11,943 million yen; Borrower: The President of the Islamic Republic of Pakistan)

2. Necessity and Relevance of JBIC's Assistance

Based on the Poverty Reduction Strategy Paper (December 2003), the government of Pakistan is tackling “acceleration of economic growth” and “poverty reduction.” In terms of power sector, it is acknowledged that more reliable and affordable power supply is important. Additionally, in its Medium Term Development Framework 2005-2010 (May 2005) stipulates that transmission lines would be installed on need basis and grid system would be upgraded continuously.

Challenges facing Pakistan's power sector include: (1) responding to the surge in power demand (average annual growth of about 6% from 2000–2005) with rapid economic growth; (2) promoting sector reform; (3) efficiently combining thermal power generation (mainly as a base-demand response) and hydroelectric power generation (mainly as a peak-demand response); and (4) reducing power loss rates in power transmission and distribution (22.4%: the average power loss rate for all power transmission and distribution systems from 2005–2006, including non-technical loss).

Power consumption in Punjab Province, located in northeastern Pakistan, accounts for 67.3% of the total power consumption of Pakistan (2006), and is expected to increase on average by more than 7% during the 10 years between 2005 and 2015, the fastest pace among all provinces in Pakistan.

Industrial sector and agricultural sector are the main economic activities in Punjab Province, and power consumption in agricultural sector is the largest in Pakistan. In agricultural sector, power is used primarily to pump groundwater. Power consumption is also seen in the production of cotton and the processing of agricultural products.

In Punjab Province, because of a sharp increase in power demand, grid stations are expected to be overloaded within a few years. Amidst prediction of further increase in power demand, construction of transmission and transformation facilities will become indispensable in the days to come. Even at this moment, sometimes end-consumers face load shedding of about 10 hours a day at a maximum. Insufficient capacity of transmission and transformation facilities is hindering the development of the agricultural sector as well as other industrial sectors in the Punjab region.

The power loss rate of the local power distribution companies (LESCO, GEPCO, MEPCO) in charge of the area supported by this project are lower than those of other power distribution companies (in 2004–2005, the power loss range of the three companies are 10.6–16.0% as opposed to average power loss of 16.9% for all other power distribution companies). Additionally, each of the three companies are working out plans to increase distribution capacity in the target area; thus giving rise to expectations of improvement in the rate of electrification and expansion of communities that will benefit from this project.

In its Medium-Term Strategy for Overseas Economic Cooperation Operations (April 2005), JBIC sets forth “foundation for sustained growth” as one of its priority areas. Thus, this project, which helps stabilize and enhance power supply, is consistent with the medium-term strategy. Consequently,

it is highly necessary and relevant that JBIC should support the project.

3. Project Objectives

This project aims to stabilize power supply in Punjab Province by installing of 500 kV transmission lines and 220 kV transmission lines as well as installing of a 500 kV grid station and 220 kV grid stations; thereby contributing to the revitalization of the local economy and improvement of local infrastructure in Punjab Province.

4. Project Description

(1) Target Area

Punjab Province

(2) Project Outline

- (a) Construction of new grid stations and expansion of existing transformation installations
- (b) Installation of new transmission lines
- (c) Consulting services: Construction work, project monitoring and supervision, etc.

(3) Total Project Cost / Loan Amount

23,481 million yen (Japanese ODA Loan Amount for Phase I: 11,943 million yen)

(4) Schedule

August 2007–June 2012 (59 months). Project completion is defined as when civil work is completed.

(5) Implementation Structure

- (a) Borrower: The President of the Islamic Republic of Pakistan
- (b) Executing Agency: National Transmission & Despatch Company Ltd. (NTDC)
- (c) Operation and Maintenance : Same as (b)

(6) Environmental and Social Consideration

(a) Environmental Effects / Land Acquisition and Resident Relocation

(i) Category: B

(ii) Reason for Categorization

This project is not likely to have significant adverse impact on the environment due to the fact that the project sector and project characteristics are not likely to exert impact and the project is not located in a sensitive area under the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (April 2002). Thus, this project is classified as Category B.

(iii) Environmental Permit

Approval for the Environmental Impact Assessment (EIA) report concerning this project by the Environmental Agency of Punjab Province has not been obtained (as of December 2007).

(iv) Anti-Pollution Measures

Domestic environmental standards in Pakistan are expected to be met through the use of

appropriate machinery.

(v) Natural Environment

The area targeted by this project is not located in or around sensitive areas such as national parks, and so adverse impact on the natural environment is assumed to be minimal.

(vi) Social Environment

This project will involve the acquisition of about 34 ha of land on which the proposed grid stations and steel towers for the new transmission lines will be constructed. The acquisition will be carried out in accordance with the domestic procedures of Pakistan. Resident relocation will not be required. As for phase I of the project, no land acquisition will be involved.

(vii) Other/Monitoring

In this project, the executing agency will monitor noise and other types of pollution.

(b) Promotion of Poverty Reduction

None

(c) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases Including AIDS, Participatory Development, Consideration for the Handicapped, etc.)

HIV/AIDS measures by contractors targeting construction workers will be stipulated in the bidding documents.

(7) Other Important Issues

None

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Baseline (2006)	Target (2013, 2 years after completion)
Availability factor (%)* ¹	-	below 100%
Load shedding (MW)* ²	33	0
Voltage drop at end user (%)* ³	23	Within $\pm 10\%$ from 100% rated voltage

*1 Availability factor expresses the availability of the electric transformers installed in the grid stations.

*2 Adopted as the standard value for the maximum load shedding at the 220 kV Bahawalpur Grid station and the 500 kV Guddu Grid station related to the 500 kV Rahimyar Khan Grid station.

*3 Adopted as the standard value for the voltage drop at the end user at the 132 kV Fatehgarh Grid station related to the 220kV Shalamar Grid Station.

(2) Number of Beneficiaries

NTDC will supply electric power to power distributing companies, and since the latter is responsible for directly providing beneficiaries with power, the number of direct beneficiaries of the project cannot be determined. However, in Punjab Province, the number of indirect beneficiaries is approximately 73.62 million.

(3) Internal Rate of Return (Financial Internal Rate of Return)

Based on the conditions indicated below, the financial internal rate of return (FIRR) is 8.3%.

- (a) Cost: Project cost, operation and maintenance expenses
- (b) Benefit: Revenue from the sale of electricity
- (c) Project Life: 30 years

6. External Risk Factors

None

7. Lessons Learned from Findings of Similar Projects Undertaken in the Past

A lesson learned from the ex-post evaluations of similar projects in the past is that the project site cannot be adequately patrolled because the proposed transmission lines are being constructed about 10–20 km away from main roads, resulting in the loss of construction material due to theft and difficulties in accessing the sites when trouble develops with the transmission lines and steel towers, which takes a long time to resolve. Based on this lesson, measures are being taken to prevent these problems from occurring through installation of the bulk of the transmission line route along an arterial road.

8. Plans for Future Evaluation

(1) Indicators for Future Evaluation

- (a) Availability factor (%)
- (b) Load shedding (MW)
- (c) Voltage drop at end user (%)
- (d) Internal rate of return: FIRR (%)

(2) Timing of Next Evaluation

Two years after project completion