

1. Name of the Project

Country: Republic of Iraq

Project: Al-Akkaz Gas Power Plant Construction Project

Loan Agreement: March 31, 2010

Loan Amount: 29,570 million yen

Borrower: The Government of the Republic of Iraq

2. Background and Necessity of the Project

(1) Current State and Issues of the Electricity Sector in Iraq

The long-term economic sanctions and conflicts had been devastating the economic and social environment of Iraq. However, after the Iraq War in 2003, the country is finally undergoing reconstruction and development with the support from the international society.

The electricity sector is the foundation of various activities of the economy and society, and it is essential for the reconstruction of Iraq. However, due to years of lack of new investments/maintenance management and plunder, the functions in all sub-sectors, such as power generation, transmission, transformation, and distribution, have been extremely deteriorated until today. The average daily power supply which was 9,000 megawatts (MW) in 1990s was declined to lower than 3,000MW right after the Iraq War. After the war, with the support from international society, the Government of Iraq has been making effort for the reconstruction of the electricity sector as one of the priority areas. However, the power supply had recovered only up to 5,500MW as of 2009, while the average daily demand is 12,000MW, and long unplanned power outage are forced regularly accordingly. Thus the reconstruction of the electricity sector in Iraq, especially the improvement of power generation capacity, is one of the top priority issues.

(2) Development Policies for the Electricity Sector in Iraq and the Priority of the Project

In the Third National Development Strategy by the Iraqi Government in February 2007, the following four pillars for the post-war reconstruction and national development for 2007-2010 were announced; 1) Strengthening foundations of economic growth, 2) Revitalizing the private sector, 3) Improving the quality of life, and, 4) Consolidating the good governance security and stability in the country. The prioritized target of this strategy includes reduction of unplanned outage hours, fulfillment of power-supply demand, improvement of power generation performance, and expansion of transmission/transformation performance.

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

At the International Conference on Reconstruction in Iraq held in Madrid, Spain in October 2003, the Government of Japan announced up to 5 billion US\$, that consists of 1.5 billion US\$ in grant aid in reply to the emergency reconstruction demand of Iraq, and up to 3.5 billion US\$ in ODA Loans to meet middle-term reconstruction demand. Since “Revitalizing of the private sector” is one of JICA's priority areas of the reconstruction assistance to Iraq,

electricity sector assistance matches JICA's assistance strategy. Prior to implementation of the Project, ODA Loans projects were provided for the *Al-Mussaib Thermal Power Plant Rehabilitation Project*, *Electricity Sector Reconstruction Project*, and the *Electricity Sector Reconstruction Project in Kurdistan Region* in 2008.

(4) Other Donors' Activity

The United Nations Development Programme (UNDP) mainly assisted for the electricity sector in Kurdistan Region. The United States assisted this sector through the United States Agency for International Development (USAID). The World Bank is implementing the rehabilitation project for the hydropower plant and thermal power plant. Korea is assisting the micro hydropower plant project, etc., through the Korea International Cooperation Agency (KOICA).

(5) Necessity of the Project

Anbar Governorate is located in the Mid-Western area of Iraq and industries such as plants for phosphate fertilizers, ammonia, and cement are active there. However, power supply does not meet its needs through the frequent power outage that reaches around 16 to 18 hours a day on average. The demand of power-supply in the governorate is 293MW, while the average daily power supply was only around 177MW in 2008. Since the gap between power supply and demand is still large, construction of power plant is an urgent need for the development of industries and stabilization of citizen's livelihood. Therefore, the necessity and the relevance of JICA's assistance for the Project are high.

3. Project Description

(1) Project Objectives

The objective of the Project is to increase the amount of power and contribute to the economic and social reconstruction of the country through the construction of a gas power plant in Anbar Governorate in mid-western Iraq.

(2) Project Site/Target Area

Al-Akkaz, Anbar Governorate

(3) Project Components

- 1) Construction of a gas power plant (4 units of 30MW)
- 2) Expansion of related transformation/transmission facilities
- 3) Consulting services (procurement support, construction management, training, etc)

(4) Estimated Project Cost (Loan Amount)

34,305 million yen (Loan amount: 29,570 million yen)

(5) Schedule

The planned implementation schedule of the Project is from March 2010 to July 2015 (65 months in total). The commercial operation of the facilities will be starting in July 2014. Project completion is defined as the starting the commercial operation.

(6) Project Implementation Structure

- 1) Borrower: The Government of the Republic of Iraq

- 2) Executing Agency: Ministry of Electricity (MOE)
- 3) Operation and Maintenance System: Same as 2)
- (7) Environmental and Social Consideration/Poverty Reduction/Social Development
 - 1) Environmental and Social Consideration
 - a) Category: B
 - b) Reason for Categorization: The Project is categorized into Classification Category B, because it does not correspond to the vulnerable area to the environmental impact as listed in “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established April 2002), and its potential adverse impacts is considered to be minor.
 - c) Environmental Permit: An Environmental Impact Assessment (EIA) report as related to the Project has already been approved by the Ministry of Environment of Iraq in January, 2010.
 - d) Anti-Pollution Measures: In the Project, nitrogen oxide occurs upon combustion of natural gas which is the main fuel for the gas power plant. The expected performance of the facilities and the profile of the fuel planned to be introduced to the Project satisfy the environmental and emission standards of Iraq as well as international standards such as World Bank. However, in case the standards are not met, appropriate measures for air pollution substances or reduction of emission must be taken by the contractor or the Executing Agency. It is also expected that the wastewater or wastes are treated appropriately in the wastewater treatment facilities in order to satisfy the standards of Iraq as well as international standards such as World Bank.
 - e) Natural Environment: The Project site is not located in nor surrounded by any sensitive areas such as national parks, and it is not likely to have an adverse impact on the natural environment.
 - f) Social Environment: Since the Project shall be implemented within the territory of the government, site acquisition or resident relocation is not required.
 - g) Other / Monitoring: The Executing Agency shall monitor the air, sound, vibration, wastewater, waste, soil pollution, etc. Moreover, the monitoring result shall be audited by the Ministry of Environment.
 - 2) Promotion of Poverty Reduction: None.
 - 3) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases including HIV/AIDS, Participatory Development, Considerations for Persons with Disabilities, etc.): None.
- (8) Collaboration with Other Donors: None.
- (9) Other Important Issues: None.

4. Targeted Outcomes

(1) Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline	Target (2016) 【Expected value 2 years after Project completion】
Maximum output (MW)	—	120
Plant load factor (%)	—	82
Availability factor (%)	—	91
Net electric energy production (GWh/year)	—	752

(2) Internal Rate of Return

Based on the conditions indicated below, the Financial Internal Rate of Return (FIRR) of the Project is 4.4%. The Economic Internal Rate of Return (EIRR) should not be estimated because reliable data is difficult to obtain in the current domestic situation of Iraq.

【FIRR】 Cost: Construction cost, operation and maintenance cost

Benefit: Increase of income by selling electric power

Project Life: 20 years

5. External Factors and Risk Control

Deterioration in the security situation, etc.

6. Lessons Learned from Past Projects

From the ex-post evaluation in the past, it was learned that establishment of an appropriate operation/maintenance system is essential for the smooth operation and maintenance of the facilities after the start of operation. Therefore, training programs for MOE shall be included in the Project, for the establishment of the operation/maintenance system, and shall be followed up continuously.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Maximum output (MW)
- 2) Plant load factor (%)
- 3) Availability factor (%)
- 4) Net electric energy production (GWh/year)
- 5) Financial Internal Rate of Return (FIRR) (%)

(2) Timing : Two years after the completion of the Project.