

Ex-Ante Evaluation
Middle East Division II, Middle East and Europe Department
Japan International Cooperation Agency

1. Name of the Project

Country: The Republic of Iraq

Project: Electricity Sector Reconstruction Project (Phase 3)

Loan Agreement: October 26, 2017

2. Background and Necessity of the Project

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

In the Republic of Iraq, power infrastructure such as electricity generation, transmission, and distribution facilities, was destroyed and deteriorated due to the three wars and long-lasting economic sanctions after the 1980s. Although the Government of Iraq gradually reconstructed power infrastructure since the Iraq War ended in 2003, the country's installed capacity reached only about 13,300 MW, falling short of the demand of about 21,500 MW as of 2016. It is not uncommon to cut off electricity for more than 10 hours a day. Power supply in Iraq heavily depends on power plants in the central and southern parts of the country, where the security situation is relatively calm. In particular, there is a great need for power development in the central area (around the capital city of Baghdad), which is growing in population due to the influx of internally displaced persons while serving as a hub to deliver electricity generated in the southern area to users across the country through the 400 kV South-North high-voltage transmission line.

Not only because power transmission and distribution networks were destroyed or poorly maintained during the wars but also because substations and other power facilities were damaged due to attacks by Islamic State of Iraq and Levant (hereinafter referred to as "ISIL") starting in June 2014, the power supply has become even more unstable. In particular, western Iraq, including Anbar Governorate, was severely damaged and produced a large number of internally displaced persons. In this area, community facilities, hospitals, water supply systems, and other public facilities have not been supplied with sufficient electricity although people have started to return to their homes since recapture by government forces. In Anbar Governorate, electricity access rate fell below 10% in 2015. Although the hydropower plant in this governorate has never been occupied by ISIL and is still run by the Ministry of Electricity (hereinafter referred

to as the “MOE”), substations have been destroyed or damaged, requiring urgent reconstruction. The inadequate and unreliable power supply has become a cause of social instability (e.g. riots) as well as a major inhibitor to social sector development (e.g. medical, water, and sewage services) and industrial advancement.

The Government of Iraq formulated the National Development Plan 2013-2017 (hereinafter referred to as the “NDP”), which has established targets for the power sector, including (1) strengthening the power supply systems and meeting the electricity demand; (2) increasing the per capita electricity supply; and (3) improving the efficiency of the power systems and preventing deterioration. Moreover, the Master Plan 2013-2017 released by the MOE in 2012 aims to construct 33 new power plants by 2024 and 34 new 400 kV substations by 2019.

This Project, aimed at developing substations mainly in the central and western parts of the country, is to contribute to achieving the development goals of Iraq. The power transmission and distribution networks connected to the substations to be constructed through this Project are being reconstructed by the MOE at its own expense. In Anbar Governorate in western Iraq, 70% of the reconstruction has been completed. In Baghdad in central Iraq, the reconstruction is projected to be completed by the time when the construction of the substations is completed.

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

Japan’s Country Development Cooperation Policy for the Republic of Iraq (June 2012) identifies “strengthening economic infrastructure” as a priority area and particularly focuses on the “electricity sector” as a priority development issue. In the electricity sector, Japan has approved eight Emergency Grant Aid projects and seven Official Development Assistance (ODA) Loan projects. Among them, the Electricity Sector Reconstruction Project (Loan Agreement signed in January 2008), an ODA Loan project aimed at developing transmission and substation facilities, has signed a procurement agreement. The Electricity Sector Reconstruction Project (Phase 2) (Loan Agreement signed in June 2015), launched in 2015 to construct 400 kV substations and reconstruct transmission and substation facilities in central and southern Iraq, is now preparing for competitive tendering. Moreover, JICA organized training courses in the

electricity sector (power plant operation and maintenance, power transmission and distribution development, etc.), accepting over 1,600 participants, which account for approximately 24% of the JICA training participants from Iraq (from FY 2003 to FY 2015).

(3) Other Donors' Activities

The US has provided approximately 4.5 billion USD to support reconstruction in the electricity sector through the United States Agency for International Development, the Department of State and its Iraq Reconstruction Management Office, and the Department of Defense and its Army Engineer Corps.

The United Nations Development Programme has implemented reconstruction projects to rehabilitate power generation, substation, and distribution facilities under the framework of Oil-for-Food Programme since 1997. The World Bank's International Development Association financed emergency electricity reconstruction projects to rehabilitate the Dokan and Derbandikhan hydropower plants in Sulaymaniya Governorate in the Kurdistan Region and the Units 2 and 3 of the Hartha Thermal Power Station in Basra Governorate in southern Iraq. The World Bank also launched Emergency Operation for Development across multiple sectors (including the health, urban development, water supply, and electricity sectors) in 2015 in order to support the areas liberated from ISIL. In the electricity sector, it is planned to provide urgently needed facilities (e.g. 132 kV mobile substations, transformers, and cables) for northern Iraq. Now some of them are under procurement process.

In 2017, Japan Bank for International Cooperation financed the purchase of a set of substation facilities to assist the MOE of Iraq with its substation construction project.

3. Project Description

(1) Project Objectives

By constructing 132 kV substations and developing other substation facilities, mainly in Anbar Governorate, affected by ISIL, as well as Baghdad Governorate and its surrounding areas, this Project aims to improve the stability of electricity supply, thereby contributing to strengthening the basic economic infrastructure of the country.

(2) Project Site / Target Area

Anbar Governorate, Baghdad Governorate, and its surrounding areas. This Project will use the sector loan modality to ensure flexibility against changes in the security situation and reconstruction needs. Sub-projects will be selected through consultation with the executing agency by the start of the tendering process.

(3) Project Components

- 1) Construction of 132kV substations
- 2) Procurement of 132kV mobile substations
- 3) Procurement of 33kV mobile substations
- 4) Consulting services (basic design, procurement support, construction supervision support, environmental and social considerations, etc.)

(4) Estimated Project Cost (Loan Agreement)

31,791 million yen (Loan Amount: 27,220 million yen)

(5) Schedule

March 2017 to December 2020 (total 45 months). This Project will be deemed complete when the service starts (planned in December 2020).

(6) Project Implementation Structure

- 1) Borrower: The Government of the Republic of Iraq
- 2) Guarantor: None
- 3) Executing Agency: The Ministry of Electricity (MOE)
- 4) Operation and Maintenance Agency: Same as 3) above.

(7) Collaboration and Division of Roles with Other Projects and Donors

- 1) Japan's Assistance Activities
None in particular
- 2) Other Donors' Assistance Activities
None in particular

(8) Environmental and Social Consideration / Poverty Reduction / Social Development

- 3) Environmental and Social Consideration
 - i) Category B

- ii) Reason for Categorization: This Project is not located in any of the sensitive areas nor does it have any of the sensitive characteristics or falls under the sensitive sectors listed in the JICA Guidelines for Environmental and Social Considerations (published in April 2010). This Project is therefore unlikely to have a significant adverse impact on the environment.
- iii) Environmental Permit: As for the construction of 132kV substations, an Initial Environmental Examination (IEE) report will be prepared for this Project and submitted to the Ministry of Environment for approval prior to the start of the construction of the facilities.
- iv) Anti-Pollution Measures: This Project is unlikely to have a significant negative impact on air and water quality and noise and vibration levels as it will be implemented within land owned by the MOE. In addition, appropriate anti-pollution measures will be taken during construction in accordance with Iraq's construction guidelines to prevent construction debris from blowing off the sites and keep paint and oil from contaminating the surrounding soil.
- v) Natural Environment: This Project is likely to have a minimal adverse impact on the natural environment since the project site is not located in sensitive areas or their vicinity, such as national parks.
- vi) Social Environment: Sub-projects will be selected from the list of sub-projects agreed upon with the MOE. The listed candidate sites are owned by the MOE. Therefore, this Project will not involve land acquisition or involuntary resettlement.
- vii) Other / Monitoring: Air and water quality and noise and vibration levels will be monitored by the MOE and the contractor during the construction phase.

2) Cross-Cutting Issues

- i) Climate change-related projects: None in particular
- ii) Poverty reduction and considerations: None in particular
- iii) HIV/AIDS and other infectious diseases control: None in particular
- iv) Participatory development / disability accommodation: None in particular

3) Gender Classification: Not subject

Activities / reason for classification: This Project is not subject because it is

unlikely to include specific actions to contribute to gender equality.

(9) Other Important Issues: None in particular

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (2016)	Target (2022; 2 years after project completion)
Annual maximum load (MW)		
Operating rate (%)	A baseline survey will be conducted to set baseline and target values after sub-projects are selected.	
Annual electricity supply (MWh)		
Electrification rate (%)		

(2) Qualitative Effects

Revitalizing the economy and industry, stabilizing people's livelihoods, and strengthening the implementation, operation, and maintenance systems of the Iraqi MOE.

(3) Internal Rate of Return

In this Project, the internal rate of return will be calculated based on the conditions indicated below to quantify the effects of the project implementation after sub-projects are selected.

[Economic Internal Rate of Return: EIRR]

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

Benefit: Electricity revenue

[Financial Internal Rate of Return: FIRR]

Because this Project includes various power transform components, it is difficult to calculate power distribution revenue from total revenue calculated based on power selling prices; therefore, the financial internal rate of return (FIRR) will not be calculated.

5. Prerequisites and External Factors

(1) Prerequisites: None in particular

(2) External Factors: The security situation will not be much worse than it is now.

6. Lessons Learned from Past Projects

The ex-post evaluation of the Transmission Line Construction Project in Java-Bali (I), (II), in the Republic of Indonesia (evaluated in 2002) drew a lesson that in addition to the construction of transmission and substation facilities, the continued expansion of these facilities and the development of new power generation facilities to meet the potential demand after the project completion are required to make full use of the project outputs. In this sense, this Project is likely to remain effective as it will develop substations in line with the power development plan of Iraq to add 25,000 MW of power generation capacity by the end of 2017, as stated in the country's NDP 2013-2017. JICA is planning to monitor the progress of this power development plan on a regular basis.

Meanwhile, a fatal accident occurred (a construction worker was electrocuted) in August 2014 during construction in the Electricity Sector Reconstruction Project in the Republic of Iraq. Therefore, in this Project, the executing agency has agreed to strengthen the safety management system during the project implementation, and JICA is planning to dispatch a safety management expert.

7. Evaluation Results

By constructing substations in target areas, including conflict-affected areas, to contribute to economic and social reconstruction in Iraq, this Project conforms to the development issues and policies of Iraq and the assistance policies of Japan and JICA. This Project is also deemed to contribute to Goal 7 of the Sustainable Development Goals (ensure access to affordable, reliable, sustainable and modern energy for all). Therefore, it is necessary and relevant to implement this Project.

8. Plan for Future Evaluation

(1) Indicators to be Used

Per 4. (1) – (3)

(2) Timing

Ex-post evaluation: 2 years after project completion