

Republic of Iraq

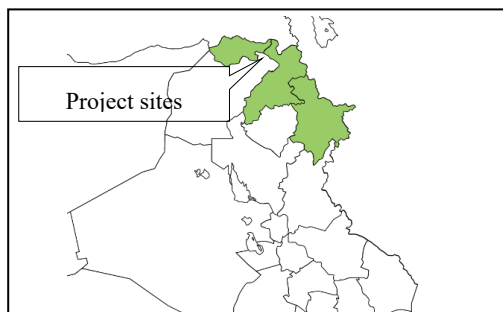
FY2021 Ex-Post Evaluation Report of Japanese ODA Loan
“Electricity Sector Reconstruction Project in Kurdistan Region”

External Evaluator: Ishimoto, Juri/Nishino, Hiroshi/Nomoto, Ayako,
Metrics Work Consultants Inc.

0. Summary

This project was implemented in the Kurdistan Region (Duhok, Erbil, and Sulaymaniyah governorates) to stabilize the electricity supply by providing equipment and materials for substations and distribution, thereby contributing to the economic and social reconstruction of the region. The project is consistent with the development plan and needs of Iraq and the Kurdistan Region at both the time of appraisal and ex-post evaluation, and its relevance can be confirmed. The project is consistent with Japan’s ODA policy for Iraq and with other cooperation of the Japan International Cooperation Agency (JICA). Therefore, the relevance and coherence are high. Additional components were implemented by utilizing the unused balance of the loan, and the outputs were produced, aligning with the revised plan after adding the components. Although the project period slightly exceeded the plan, the project cost was within the plan, and therefore, the efficiency of the project is high. Regarding the effectiveness of the project, an increase in the population with access to electricity was observed. Besides, the stability of the electricity supply, such as improvement of power outages, was improved. In addition, the project strengthened the operation and maintenance capabilities of the technical staff. As for the impacts, the project has contributed to the stabilization of the lives of citizens. Also, it encouraged the revitalization of the economy and industry to a certain extent. Therefore, the effectiveness and impacts are high. Although there are some minor problems in operation and maintenance of the project in terms of institution/organization, finance, and current status of operation and maintenance, the prospects for improvement and resolution are high. Therefore, the sustainability of the project’s effects is high. In light of the above, this project is evaluated to be very high.

1. Project Description



Project Location¹



Chwarta Substation constructed under the project²

¹ Source: 3kaku-K

² Taken during the ex-post evaluation study.

1.1 Background

After years of economic sanctions and conflict that had dealt a severe blow to its economy and society, Iraq had been recovering with the support of the international community since the end of the war. Although the electric power sector is the foundation of all economic and social activities, the lack of new investment and maintenance over the years, as well as looting, had significantly reduced the functionality of all areas of power generation, transmission, substation, and distribution. Its restoration was one of the most critical issues for the country's reconstruction.

Electricity in the Kurdistan Region (population 4.4 million), which consists of three northern Iraqi governorates (Duhok, Erbil, and Sulaymaniyah), was supplied by two hydroelectric power plants and the national grid and was provided through 132 kV, 33 kV, and 11 kV power transmission and distribution networks. However, due to a lack of new investment and maintenance due to chronic budget shortfalls, the electricity supply in the region had decreased from an average of 700 MW in 1991 to 400 MW in 2006, only meeting 40% of household electricity demand. In addition, the average daily power outage was more than 12 hours, and the supply of electricity to citizen's daily lives and essential infrastructures, such as hospitals, continued to be inadequate and unstable. Although other development partners planned to support power generation and transmission facilities in the Kurdistan Region, support for substation and distribution facilities had been delayed. As a result, the significant deterioration of substation and distribution functions became one of the reasons for the deteriorating power supply situation in the region. Therefore, it was necessary to urgently repair and maintain the substation and distribution facilities in addition to the power generation and transmission facilities.

1.2 Project Outline

The objective of this project is to stabilize the electricity supply in the Kurdistan Region (Duhok, Erbil, and Sulaymaniyah governorates) by providing equipment and materials for substations and distribution, thereby contributing to the economic and social reconstruction of the Kurdistan Region.

Loan Approved Amount/ Disbursed Amount	14,747 million yen/ 11,773 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	July 2007/ June 2008
Terms and Conditions	Interest Rate 0.75% (0.01% for the consulting services) Repayment Period 40 years (Grace Period 10 years)

	Conditions for Procurement	General Untied
Borrower / Executing Agency(ies)	Government of the Republic of Iraq/Regional Ministry of Electricity in Kurdistan (hereinafter referred to as “RMEK”)	
Project Completion	August 2018	
Target Area	Kurdistan Region (Duhok, Erbil, and Sulaymaniyah governorates)	
Main Contractor(s) (Over 1 billion yen)	Consortium Luthardt Roland Berger Restrata (Germany), Matelec S.A.L (Lebanon)	
Main Consultant(s) (Over 100 million yen)	United Nations Development Programme (UNDP) (Other)	
Related Studies (Feasibility Studies, etc.)	None	
Related Projects	<Japanese ODA Loan> “Water Supply Improvement Project in Kurdistan Region” (2009-2014)	

2. Outline of the Evaluation Study

2.1 External Evaluator³

Ishimoto, Juri/Nishino, Hiroshi/Nomoto, Ayako⁴ (Metrics Work Consultants Inc.)

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: January 2022 - January 2023

Duration of the Field Study (Third Country)⁵: September 25 - September 29, 2022

2.3 Constraints during the Evaluation Study

For security reasons, a local consultant conducted a field study for this ex-post evaluation. Under the direction of the external evaluator, the local consultant collected necessary information through interviews with the executing agency and field visits. The information obtained from the field study was analyzed and evaluated after confirming and scrutinizing the information with the

³ Ishimoto and Nishino were in charge of the work up to the formulation of the evaluation framework and satellite data analysis, while Nomoto took the lead in data collection and analysis (excluding satellite data analysis) and report writing after the formulation of the evaluation framework.

⁴ Participated as a reinforcement member from the International Development Center of Japan Inc.

⁵ Field study refers to discussions with a local consultant in a third country (Jordan).

local consultant in a third country (Jordan).

3. Results of the Evaluation (Overall Rating: A⁶)

3.1 Relevance/Coherence (Rating: ③⁷)

3.1.1 Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of the Republic of Iraq

The project is consistent with the development plan of the Government of Iraq and the Kurdistan Region, as an investment in power transmission and distribution facilities was emphasized both at the time of appraisal and ex-post evaluation.

At the time of the appraisal, the *National Development Strategy (2005-2007)* stated that investment from both the public and private sectors was needed to restore the devastated postwar economy. The strategy aimed to provide an environment to stimulate private investment through investment in infrastructures such as water, electricity, and roads, as well as to create jobs and improve people's lives through private investment. Investment in electric power facilities was positioned to promote private investment. The medium-term goal was to build a reliable and efficient power supply system. Priorities were set on improving power generation capacity, upgrading the power distribution network, and increasing transmission and substation capacity to secure generating capacity.

At the time of the ex-post evaluation, the *National Development Plan (2018-2022)* aims to achieve an economic growth rate comparable to that achieved by the Iraqi economy in the past. To achieve this goal, the plan calls for increasing infrastructure efficiency, including electricity, through improved asset management and other measures and promoting the productive sectors (industry and agriculture), which are vital to fostering economic growth. The plan's challenges in the power distribution sector include high loads caused by increased demand and aging facilities. To address these issues, the plan sets goals to expand and upgrade the power transmission and distribution network and reduce power losses. In the *Iraq Electricity Masterplan (2010-2030)*, which outlines specific development plans, it is stated that it is necessary to supply fuel to power plants, connect to the power grid, and develop the power grid in parallel to meet Iraq's electricity demand.

The Kurdistan Regional Government, with the support of the United States, is currently developing the master plan for electricity transmission and distribution in the Kurdistan Region (2022-2031), which aims to (1) install 400/132 kV, 132/33/11 kV, and 33/11 kV substations, (2) strengthen the transmission network by connecting new substations, (3) extend the distribution network to new districts, commercial and industrial buildings, and to supply electricity to some villages and rural areas.

⁶ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

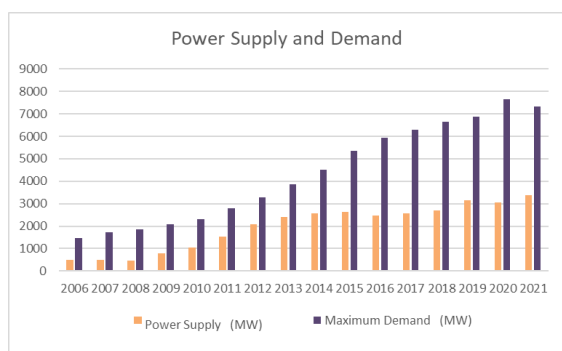
⁷ ④: Very High, ③: High, ②: Moderately Low, ①: Low

3.1.1.2 Consistency with the Development Needs of the Republic of Iraq

Development needs for electricity supply stabilization in the Kurdistan Region are high, both at the time of the appraisal and at the time of the ex-post evaluation.

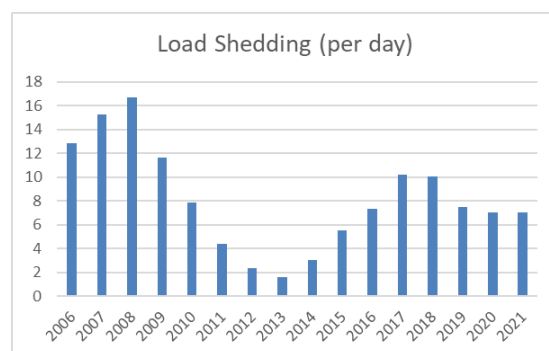
At the time of the appraisal in the Kurdistan Region, the electricity supply in the region (approximately 400 MW) only met 40% of household electricity demand as of 2006. As of 2007, the electricity supply averaged 10-11 hours per day in the Duhok Governorate and 5-6 hours per day in the Erbil and Sulaymaniyah governorates. Support for substation and distribution facilities in the Kurdistan Region had been delayed, and the significant deterioration of substation and distribution functions had aggravated the electricity supply situation in the region. Repair and maintenance of substation and distribution facilities were needed accordingly.

At the time of the ex-post evaluation, supply still needed to keep up with strong electricity demand, as shown in Figure 1. Therefore, although there has been some improvement, load shedding has continued (Figure 2). This is primarily due to a lack of generation capacity, but also due to a lack of transmission and distribution network capacity. Thus, a stable electricity supply is still needed.



Source: Documents provided by the executing agency

Figure 1: Electricity Supply and Demand

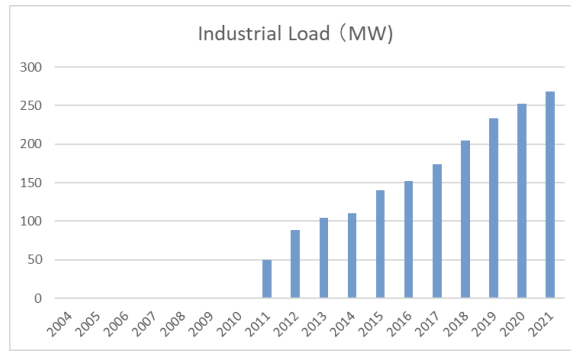


Source: Documents provided by the executing agency

Figure 2: Load Shedding

The increase in demand at the time of ex-post evaluation was due to the rise in the population of the Kurdistan Region (the estimated population in 2020 is 6,171,083 people⁸), the development of new villages, buildings, and factories (see Figure 3: Electricity Supply to Industrial Subscribers), as well as the influx of Syrians from the humanitarian crisis in Syria (2012), and Iraqi Internally Displaced Persons (“IDPs”) in 2014 due to attacks on the governorates of Ninewa and Anbar by ISIS. The increase in the number of IDPs and refugees led to the construction of dozens of IDP and refugee camps, all supplied with electricity, resulting in a rapid increase in electricity demand.

⁸ Source: <https://krso.gov.krd/en/statistics/population> (accessed August 21, 2022)



Source: Documents provided by the executing agency
 Note: No data before 2010.

Figure 3: Electricity Supply to Industrial Subscribers

At the time of the ex-post evaluation, as indicated by the growth in electricity supply to industrial subscribers in Figure 3, the project has addressed the needs for development. At the same time, the project has contributed electricity supply to the growing number of refugee and IDP camps, thus benefiting those who are prevented from equitable participation in society.

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan’s ODA Policy

At the time of the appraisal, this project was consistent with Japan’s ODA policy. In October 2003, at the International Donor’s Conference on the Reconstruction of Iraq held in Madrid, the Government of Japan announced that, in addition to US\$1.5 billion in grant assistance for Iraq’s immediate reconstruction needs, it would provide US\$3.5 billion in ODA loan for medium-term reconstruction needs beginning in 2005. In addition, the *Medium-Term Strategy for Overseas Economic Cooperation Operations* (April 2005) of JICA (then JBIC) also included economic and social infrastructure development for poverty reduction and sustainable growth as priority areas in its policy for assistance to the Middle East, depending on each country’s circumstances. In particular, for Iraq, it was indicated that mid- to long-term reconstruction assistance would be actively promoted toward social stability and the consolidation of peace.

3.1.2.2 Internal Coherence

As an additional component during the project implementation, a dedicated 33 kV transmission line (about 15 km) and an 11 kV distribution line were constructed in Halabja, Sulaymaniyah Governorate. They supply electricity to the water supply facilities (intake, treatment facilities, and distribution facilities) built under the ODA loan “Water Supply Improvement Project in Kurdistan Region” (2009-2014) (see “3.2.1 Project Outputs”). As a result, 93,000 people gained new access to the water supply as described in “3.3.1.1 Quantitative Effects (Operation and Effect Indicators),”

and thus, there is an internal coherence.

3.1.2.3 External Coherence

There are no specific collaborations or outcomes planned or implemented.

Thus, the project is consistent with the development plan of Iraq and the Kurdistan Region and with the development needs (stable electricity supply). There is no external coherence in specific cooperation or outcomes. Meanwhile, it is consistent with Japan’s ODA policy, and internal coherence was found as the access to the water supply of the people improved since the project supplied electricity to the facilities under the “Water Supply Improvement Project in Kurdistan Region” facilities. Therefore, its relevance and coherence are high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

(1) Civil engineering work, equipment procurement

At the time of the appraisal, procurement of testing equipment and materials (subproject 1), procurement and installation of mobile substations (subproject 2), procurement of equipment and materials for power distribution (subproject 3), and construction of a 132/33 kV substation in Erbil Governorate (subproject 4) were planned. The outputs were produced almost as planned.

In addition, the executing agency requested JICA to utilize the unused balance of the ODA loan effectively as mentioned in “3.2.2.1 Project Cost.” JICA agreed to the construction of a 132 kV power transmission line in Sulaymaniyah, Sulaymaniyah Governorate (subproject 5), refurbishment and procurement of equipment of the Central Training Center, construction of a testing facility in each governorate, and implementation of training (subproject 6), construction of a 33 kV overhead power transmission line in Halabja and others (subproject 7), and procurement of mini SCADA (Supervisory Control and Data Acquisition) system and VoIP (Voice over Internet Protocol) communication system for the control center (subproject 8). The outputs were produced as this revised plan.

Table 1 Project Outputs (civil engineering works and procured equipment)

Subproject	Plan at the time of appraisal *1	Revised plan	Actual
1	• Procurement of testing equipment	• No change	• Procurement of fault locators, high voltage testers, testing equipment, and digital measuring instruments
2	• Procurement and installation of mobile substations	• No change	• Procurement and installation of 13 mobile substations of 132/33 kV, 132/11.5kV, and 33/11.5kV

3	<ul style="list-style-type: none"> Procurement of materials and equipment for power distribution 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> Procurement of 250 kVA, 400 kVA, 630 kVA transformers, 630 kVA, and 1,000 kVA kiosk-type substations, etc.
4	<ul style="list-style-type: none"> Construction of 132/33 kV substation (rehabilitation of Azadi substation) (Erbil Governorate)*2 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> Construction of a 132/33 kV substation in Chwarta (Sulaymaniyah, Sulaymaniyah Governorate)
5	<ul style="list-style-type: none"> No initial plan 	<ul style="list-style-type: none"> Construction of 132 kV transmission line Construction of a warehouse for maintenance (in Sulaymaniyah, Sulaymaniyah Governorate) 	<ul style="list-style-type: none"> Construction of a 132 kV transmission line (25.3 km) from the Chwarta substation to Sulaymaniyah Construction of a spare parts storage warehouse
6-1		<ul style="list-style-type: none"> Construction of testing facilities Guest House in Erbil Governorate 	<ul style="list-style-type: none"> Construction of testing facilities Construction of a guesthouse at the Central Training Center in Erbil
6-2-1		<ul style="list-style-type: none"> Refurbishment of Central Training Center (Erbil, Erbil Governorate) 	<ul style="list-style-type: none"> Refurbishment of the Central Training Center
6-2-2		<ul style="list-style-type: none"> Procurement of equipment for Central Training Center in Erbil Provide training to RMEK (Erbil, Erbil Governorate) 	<ul style="list-style-type: none"> Procurement of testing equipment, office furniture, and facilities Training implementation
6-3		<ul style="list-style-type: none"> Procurement of services for the operation, maintenance guidance of the Central Training Center (Erbil, Erbil Governorate) 	<ul style="list-style-type: none"> Operation and maintenance of facilities, training operational guidance
7		<ul style="list-style-type: none"> Construction of overhead transmission lines (Halabja, Sulaymaniyah Governorate) 	<ul style="list-style-type: none"> Construction of a 33 kV transmission line (approx. 15km) and an 11kV distribution line in Halabja to supply electricity to the "Water Supply Improvement Project in Kurdistan Region."
8		<ul style="list-style-type: none"> Procurement of mini SCADA and VoIP communication system for the Kurdistan Regional Control Center, Erbil, Erbil Governorate 	<ul style="list-style-type: none"> Procurement of mini SCADA and VoIP communication systems for 51 power plants, substations, and control centers

Source: Documents provided by JICA and executing agency

Note: *1 For those without a target area listed, installed in Duhok, Erbil, and Sulaymaniyah governorates.

*2: At the time of the appraisal, it was assumed that the existing substation would be rehabilitated. After the project started, an Implementation plan (IP) describing the planned substation construction site, necessity, scope, etc., was to be prepared by the executing agency and finalized after obtaining the consent of JICA (then JBIC). Subsequently, in June 2009, RMEK submitted an IP for constructing the Chwarta Substation near Sulaymaniyah, Sulaymaniyah Governorate, and JICA gave its consent.

The background and reasons for the additional subprojects are described below, all recognized as necessary and appropriate.

<Subproject 5>

The project was originally planned to be self-financed by the executing agency and had already been applied for. However, the new Kurdistan Parliament, which came into being after the July 2009 Kurdistan regional parliamentary elections, drastically revised the budget plans of all ministries and agencies, making it difficult to secure a budget for the year. The transmission line was to connect the Chwarta Substation (subproject 4) to the customers and was considered necessary for the sustained development effects.

<Subproject 6>

The executing agency did not have a systematic training program for operation and maintenance and had inadequate training facilities and equipment to provide adequate training to its staff. Since this additional subproject would improve the situation of the substation and distribution of electricity and contribute to the project objective (stable supply of electricity), its implementation was approved.

<Subproject 7>

The Sulaymaniyah Governorate Government had initially planned to finance the construction of a power transmission line for the construction of a water treatment plant (in Halabja) and the replacement of water pipes (in Sulaymaniyah) under the “Water Supply Improvement Project in Kurdistan Region,” the ODA loan project. Still, the construction became impossible due to budget shortfall. The executing agency of the water project (Ministry of Municipalities and Tourism) requested RMEK, the executing agency of this project, to implement this subproject. It was recognized that the stable supply of electricity through the construction of this transmission and distribution lines was indispensable for the water project to be effective.

<Subproject 8>

A SCADA system for remote monitoring and manipulation of substation data in the Kurdistan Region was required to maintain a balance between supply and demand. However, the implementation of the system was suspended due to a lack of funding. The scope of the proposed

subproject was included in the transmission system, which was the project's main scope. The electricity supply in the Kurdistan Region was unstable and subject to frequent voltage fluctuations, necessitating a reliable and more efficient control system such as SCADA.

(2) Consulting services

Consulting services were implemented as planned.

Table 2 Project Outputs (Consulting Services)

Plan	Actual
• Procurement support (preparation of pre-qualification documents and bidding documents, bid preparation, implementation and evaluation, and contract assistance)	As planned.
• Construction supervision	As planned.

Source: Documents provided by JICA and the executing agency

3.2.2 Project Inputs

3.2.2.1 Project Cost

Table 3 shows the planned and actual project costs. Despite the additional components, the project cost was within the plan at 11,923 million yen actual versus the planned 19,861 million yen (60% of the planned). The lower-than-planned cost was mainly because the contractor/supplier bidding prices were estimated higher, considering the security risks in Iraq; however, the security situation improved during the implementation period, allowing the project to attract more bidders and to make the bidding more competitive. Also, the price escalation and physical contingency became zero.

Table 3 Project Costs

Item	Plan			Actual		
	Foreign currency (Million yen)	Local currency (Million yen)	Total (Million yen)	Foreign currency (Million yen)	Local currency (Million yen)	Total (Million yen)
Equipment Procurement	8,314	1,586	9,900	9,858	0	9,858
Price Escalation	593	658	1,251	0	0	0
Physical Contingency	1,781	448	2,229	0	0	0
Consulting Services	856	174	1,030	1,765	0	1,765
Administration Cost	0	2,436	2,436	0	150	150
Compensation for Temporary Land Use	0	1,876	1,876	0	0	0
Tax	0	802	802	0	0	0
Interest during Construction	337	0	337	150	0	150
Total	11,881	7,980	19,861	11,773	150	11,923

Source: Data provided by JICA for the time of the appraisal and the actual cost of the foreign currency portion; data for the actual local currency portion provided by the executing agency.

Note: Iraqi responsibility: Administration cost, compensation for temporary land use, and taxes = 5,115 million yen

(planned), 150 million yen (actual)

Actual local currency values are converted at the IFS rate (expenditures for each year are converted at the respective 2009-2018 annual average rates).

3.2.2.2 Project Period

The actual project period was 121 months compared to the plan of 116 months after the change (after adding subprojects), slightly exceeding the plan (104% of the plan). The table below shows the planned and actual project period for each item, and it can be said that the project was implemented almost as planned.

Table 4 Project Period

Item	Plan (at the time of appraisal)	Revised plan	Actual
Consultant Selection	September 2008 - August 2009 (12 months)	No change	August 2008 - January 2009 (6 months)
Consulting Services	September 2009 - January 2014 (53 months)	January 2009 - March 2016 (87 months)	January 2009 - August 2018 (116 months)
Subproject 1 (Testing materials and equipment)	November 2009 - August 2011 (22 months)	No change	May 2010 - June 2011 (14 months)
Subproject 2 (Mobile substations)	November 2009 - January 2013 (39 months)	No change	March 2010 - April 2011 (14 months)
Subproject 3 (Materials and equipment for power distribution)	November 2009 - December 2012 (38 months)	No change	September 2010 - October 2010 (14 months)
Subproject 4 (Chwarta 132/33 kV substation)	November 2009 - January 2013 (39 months)	September 2011 - July 2013 (23 months)	April 2012 - April 2014 (25 months)
Subproject 5 (132kV transmission line)	No initial plan	September 2012 - June 2014 (22 months)	November 2012 - August 2014 (22 months)
Subproject 6 (testing facilities, training facility, equipment, training, etc.)		May 2013 - December 2016 (44 months)	February 2016 - July 2018 (30 months)
Subproject 7 (Halabja 33kV overhead transmission lines, etc.)		November 2014 - January 2016 (15 months)	July 2015 - March 2016 (9 months)
Subproject 8 (Mini SCADA systems, etc.)		November 2016 - April 2018 (18 months)	December 2017 - August 2018 (9 months)
Total amount	September 2008 - January 2014 (65 months)	September 2008 - April 2018 (116 months) *1	August 2008 - August 2018 (121 months)

Source: Documents provided by JICA and the executing agency

Note: *1 "Scheduled project start date before the addition of the components to the latest scheduled completion date of the additional component" is defined as the modified planning period.

From the above, outputs were produced as planned, and although the project period exceeded the plan, the project cost was within the plan. Therefore, the efficiency is high.



250 kVA transformer



Mobile substation



132 kV transmission line
from Chwarta Substation

3.3 Effectiveness and Impacts⁹ (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

At the time of the appraisal, the operation and effect indicators of the project and their target values were not set, and the baseline survey for the target area was to be conducted after signing the loan agreement to establish the baseline and target values for the operation and effect indicators. However, at the time of the ex-post evaluation, the implementation status and results of the baseline survey could not be confirmed.

In the report submitted by RMEK at the time of project completion, “Population newly connected to electricity”, “Population with improved quality of electricity,” and “Population benefitted from receiving water under the water supply project (Water Supply Improvement Project in Kurdistan Region) by supplying the electricity” were submitted as indicators of the project’s effectiveness, along with actual values. However, the executing agency did not collect data after the project completion partly due to COVID-19; thus, data was unavailable at the time of the ex-post evaluation.

⁹ When providing the sub-rating, Effectiveness and Impacts are to be considered together.

Table 5 Indicators set upon completion of the project

Indicator	Subproject	Baseline value	Actual value		
		2007	2018 Year of Project Completion	2019 1 Year After Completion	2020 2 Years After Completion
Population newly connected to electricity	2	0	31,909	-	-
	3	0	77,522	-	-
	4 and 5	0	19,333	-	-
	Total	0	128,764	-	-
Population with improved quality of electricity	2	0	287,182	-	-
	3	0	1,400,187	-	-
	4 and 5	0	42,889 *1	-	-
	Total	0	1,730,258		
Population benefitted from receiving water under the water supply project by supplying the electricity	7	NA	1,287,600 *2	-	-

Source: Documents provided by the executing agency

Note: *1 According to the interviews conducted during the field visit under the ex-post evaluation (Directorate of Transmission, RMEK Sulaymaniyah General Directorate), the current electrified population due to subprojects 4 and 5 is 18,300 people.

*2 According to interviews during the field visit at the time of the ex-post evaluation (by a manager of the water directorate in Halabja Governorate), the population who has access to water as a result of the project was 93,000, and water was also supplied to the Halabja Governorate Government Office and national parks.

Alternatively, Table 6 shows the number of domestic households among the total RMEK subscribers since 2016. Where the average household size in the Kurdistan Region is 5.1 persons¹⁰, the population with access to electricity is estimated to be the figures in Table 6. As described in “3.1.1.2 Consistency with the Development Needs of the Republic of Iraq,” the estimated population of the Kurdistan Region is 6,171,083 people in 2020, so the electrification rate is estimated to be almost 100%, and the newly connected population from the project will also contribute. Although data were unavailable, according to RMEK, the distribution equipment (subproject 3) and mobile substations (subproject 2) are providing sustainable electricity to newly developed residential and remote areas that previously had no access to electricity.

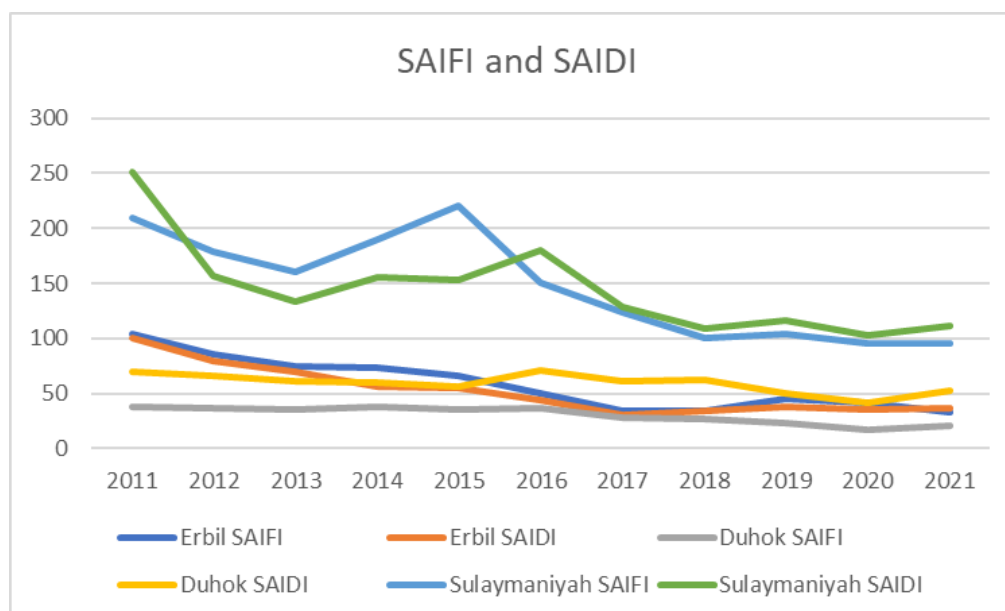
¹⁰ Source: “Demographic survey July 2018”, IMO

Table 6 Estimated Electrified Population

	2016	2017	2018	2019	2020	2021
Domestic Subscribers	430,177	1,256,789	1,295,207	1,356,614	1,414,953	1,472,922
Estimated Electrified Population	2,193,903	6,409,624	6,605,556	6,918,731	7,216,260	7,511,902

Source: Documents provided by the executing agency, <https://krso.gov.krd/en/statistics/population> (accessed August 21, 2022).

In addition, the System Average Interruption Frequency Index (SAIFI) and the System Average Interruption Duration Index (SAIDI) were collected to verify the relationship between the project and the outcome (stabilization of electricity supply). Figure 4 shows SAIFI and SAIDI¹¹. Since 2011, when subprojects 1, 2, and 3 were completed, SAIFI and SAIDI have been improving.



Source: Documents provided by the executing agency

Figure 4: SAIFI and SAIDI for each governorate

As noted in “3.1.1.2 Consistency with the Development Needs of the Republic of Iraq,” there has been a slight increase in load shedding hours due to recent supply and demand conditions (see Figure 1); nonetheless, there has been improvement since 2011 (see Figure 2).

These improvements are brought about partly by the expansion of distribution capacity and elimination of overloads on existing transformer equipment through procurement of mobile

¹¹ SAIFI is the number of power outages per customer per year, expressed in units of the number of outages/household, and SAIDI is the hours of power outages per customer per year, expressed in units of hours/household. The lower the value of both, the better.

substations (subproject 2) and procurement of various distribution equipment such as 250 kVA, 400 kVA, and 630 kVA transformers, 630 kVA and 1,000 kVA kiosk-type substations (subproject 3). In addition, the procurement of testing equipment and materials (subproject 1) and the enhancement of operation and maintenance management techniques through developing training facilities (subproject 6) have contributed to the above improvements.

3.3.1.2 Qualitative Effects (Other Effects)

(1) Strengthening of implementation, operation, and maintenance system of the Regional Ministry of Electricity in Kurdistan

According to RMEK, the project's measurement and testing equipment (subproject 1) has enabled each governorate's technical staff (young technicians, engineers, directors, etc.) to effectively and efficiently perform the routine operation and maintenance tasks in the distribution, substation, and transmission facilities.

In addition, due to the refurbishment of the Central Training Center and the construction of the testing facility in each governorate (subproject 6) under the project, training has continued to be provided, as shown in Table 7. According to the executing agency, the number of training courses has increased, and more advanced training can be conducted than before the project implementation. The staff's operational and maintenance skills have improved through theoretical and practical training. The Central Training Center has appointed a manager and a training manager and conducts training regularly.

Table 7 Number of training courses and participants at each facility

	2019		2020		2021	
	Number of training courses	Number of Participants	Number of training courses	Number of Participants	Number of training courses	Number of Participants
Central Training Center	54	217	41	235	52	246
Erbil Testing Facility	-	-	-	-	11	356
Sulaymaniyah Testing Facility	-	-	-	-	12	164
Duhok Testing Facility	12	150	2	24	12	96

Source: Documents provided by the executing agency

Note: In the ex-post evaluation year (2022), no training was conducted in Sulaymaniyah and Duhok due to budget constraints. Information on the number of training courses and participants for 2019 and 2020 was not available; however in 2019, Erbil offered a variety of training courses, including maintenance and testing of distribution and substation facilities according to international standards, SCADA system, maintenance and testing of 33-11 KV substations, distribution grid design for underground cables and overhead lines, transmission system protection, and others. In 2020, training on high-voltage overhead transmission was provided. Sulaymaniyah provided training on electrical network in 2019.

3.3.2 Impacts

3.3.2.1 Intended Impacts

Among the effects assumed in the ex-ante evaluation sheet, the ex-post evaluation has classified “stabilization of citizens’ lives” and “revitalization of economy and industry” as impacts.

(1) Stabilization of citizen’s lives

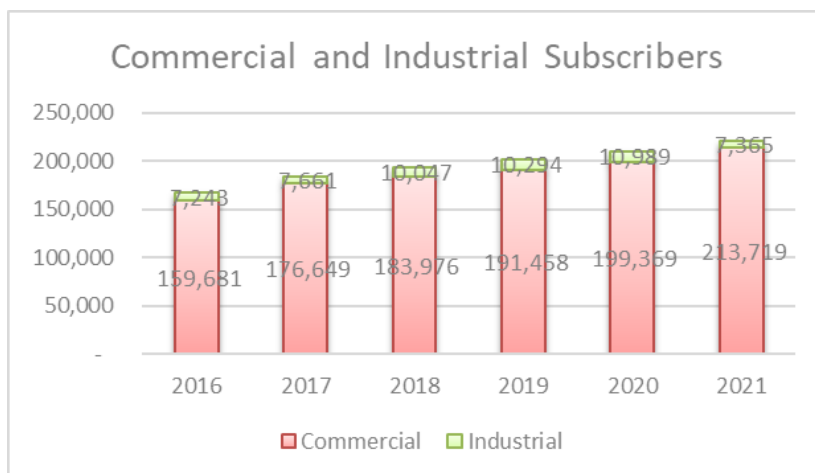
As noted above (“3.3.1.1 Quantitative Effects (Operation and Effect Indicators)”), load shedding remains in place despite improvements. However, large hospitals and water supply facilities are exempted from load shedding as much as possible. In addition, one of the feeders of the mobile substations procured under the project supplies electricity directly to a hospital. In addition, the project’s construction of transmission and distribution lines in Halabja (subproject 7) has provided power to water supply facilities and improved access to the water supply.

Thus, the stabilization of the electricity supply through this project has made a certain contribution to the stabilization of the lives of citizens.

(2) Economic and industrial revitalization

Gross regional product and other data for the Kurdistan Region were not calculated, so data showing specific economic and industrial revitalization were unavailable. Alternatively, changes in electricity supply to the industrial subscribers and nighttime light are analyzed.

As shown in Figure 3 (“3.1.1.2 Consistency with the Development Needs of the Republic of Iraq”), electricity supply to the industrial subscribers has consistently increased. In addition, as shown in Figure 5, the number of electricity subscribers in the commercial and industrial subscribers has demonstrated consistent growth, indicating that the project is also making a certain contribution.



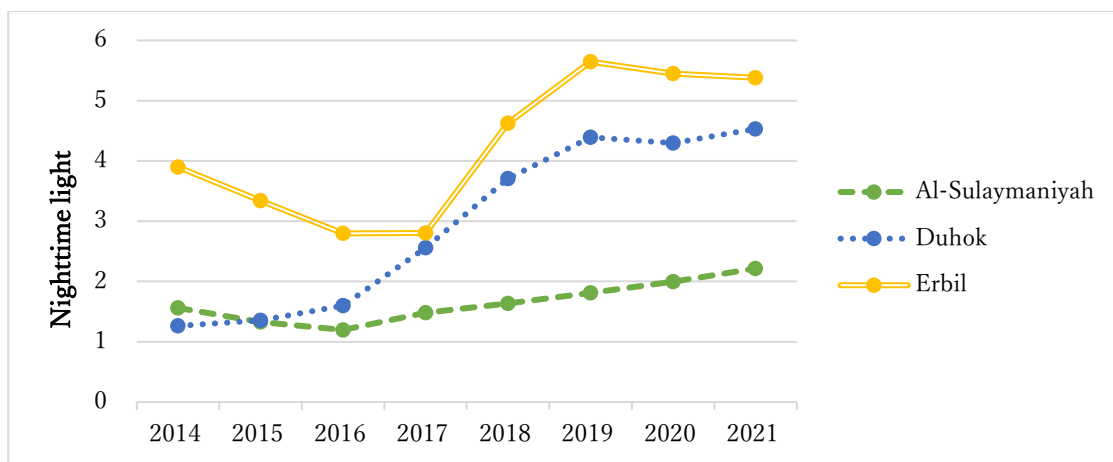
Source: Documents provided by the executing agency

Note: Major commercial subscribers were counted as the industrial subscribers until 2020, but were classified in the commercial subscribers after 2021.

Figure 5: Number of Commercial and Industrial Subscribers

In addition, this ex-post evaluation analyzed nighttime light¹² in the three target governorates as complementary information. Nighttime light has been confirmed to be correlated with local economic activity and can serve as a proxy indicator to measure regional economic and industrial revitalization. Specifically, the analysis examined the realization of economic and industrial revitalization by aggregating the annual average of nighttime light brightness for each of the three governorates and identifying trends from 2014 to 2021.

Figure 6 shows the trend of nighttime light in the three target governorates. In all three governorates, nighttime light has increased since 2016 (when all transmission and substation facilities were installed). In particular, nighttime light has increased significantly in Erbil and Duhok.



Note: The vertical axis of the graph shows the brightness of the light source (radiance), taking the minimum value of -1.5 and the maximum value of 193,564 (units are “nanoWatts/cm²/sr”).

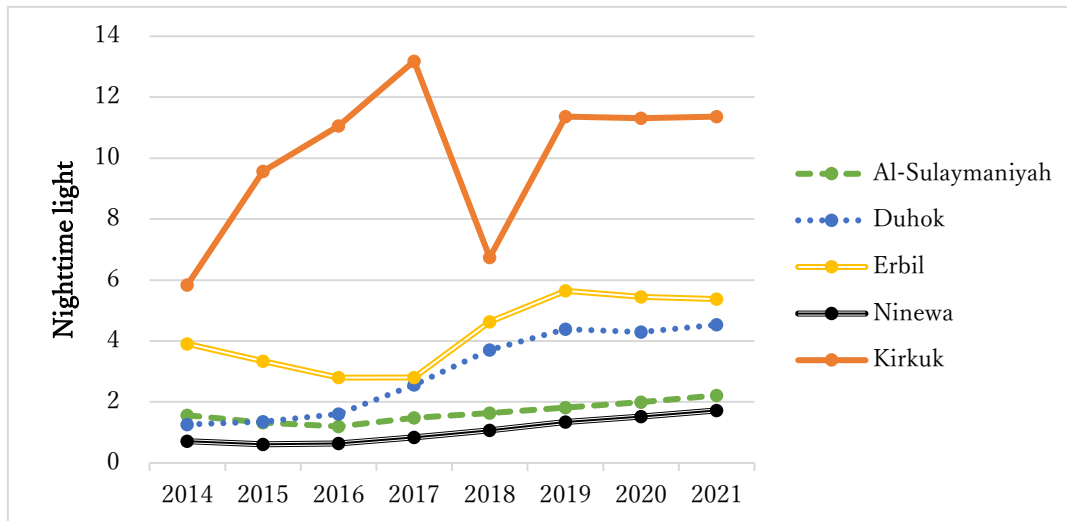
Figure 6: Nighttime light in the three target governorates

To verify the project’s direct impact on economic and industrial revitalization, the changes in nighttime light in the three target governorates are compared with those not covered by the project (comparison group.¹³) (Figure 7). Kirkuk Governorate has seen a significant decrease from 2017 to 2018¹⁴; however, overall nighttime light has increased significantly compared to 2014. Ninewa Governorate has seen a similar, albeit gradual, increase in nighttime light as the three target governorates.

¹² VIIRS Stray Light Corrected Nighttime Day/Night Band Composites Version 1 (2014-2021) (resolution: approximately 500 m).

¹³ The comparison groups were Kirkuk and Ninewa governorates. They are relatively similar to the three target governorates regarding geographic and social conditions (elevation, temperature, annual precipitation, land use, and population).

¹⁴ Nighttime light in Kirkuk and Erbil is decreasing. The evaluation team tried to find the factors through the local consultant but could not determine the contributing factors.



Note: The vertical axis of the graph shows the brightness of the light source (radiance), taking the minimum value of -1.5 and the maximum value of 193,564 (units are “nanoWatts/cm²/sr”).

Figure 7 Comparison of nighttime light with the comparison group

Based on the above results, the possibility that factors other than the project may have affected economic and industrial revitalization cannot be excluded since nighttime light has been increasing in the comparison group that was not subject to the project. This analysis could not clearly demonstrate the causal relationship between the project and economic and industrial revitalization. However, the fact that nighttime light is on an increase trend since 2016 suggests that the project has contributed, at least indirectly to the economic and industrial resurgence in the three target governorates.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

The project was judged not to fall into any of the sensitive sectors/characteristics and sensitive areas listed in the “JBIC Guidelines for Confirmation of Environmental and Social Considerations” (established in April 2002), and the undesirable effects on the environment were judged not to be significant (Category B). The Environmental Impact Assessment Report for the project was not required to be prepared under Iraqi law, and RMEK was to conduct the monitoring based on the environmental monitoring plan, etc., to be prepared with the consultant’s assistance.

For subprojects 4, 5, 6, and 7 that involve construction, measures were taken to minimize adverse environmental impacts during planning and project implementation. For example, routes were established to reduce tree cutting, and retaining walls were constructed to prevent soil erosion and landslides. During the project implementation, RMEK formed a monitoring team with UNDP, the consultant, to closely monitor the environmental impacts. Appropriate monitoring and response measures were taken regarding noise, vibration, dust, and waste. According to

RMEK, there has been no negative impact on the natural environment.

(2) Resettlement and Land Acquisition

The construction of facilities in this project was mainly carried out on the land of each governorate and within the existing RMEK facilities, and therefore, no land acquisition occurred. For subproject 4, the land belonged to the governorate; however, some farmers were cultivating the land, and negotiations were conducted between RMEK, UNDP, the contractor, the local government, and the farmers. Measures were taken accordingly. For subproject 7, the route was set up in coordination with the Ministry of Agriculture and Water Resources, the governorate, farmers, and others. The governorate formed a committee on compensation and estimated the appropriate amount of compensation to 25 farmers in accordance with Iraqi law for crop damage caused by construction under the project. The Council of Ministers agreed to pay the compensation. It issued a formal letter on June 22, 2022, to the Kurdistan Regional Government's Ministry of Finance and Economy to proceed with the payment.

(3) Gender Equality, Marginalized People, Social Systems and Norms, Human Well-being and Human Rights, and others

The project has contributed to the improvement of the living environment of all residents by electrifying un-electrified areas and supplying electricity to the water supply development project to supply water. In addition, the stable supply of electricity to refugees and IDP camps has brought benefits to these people who have been prevented from equitable participation in society.

Thus, among the expected effects, there was an increase in the number of people who has access to electricity, and the stability of the electricity supply was improved, including improvements in SAIFI and SAIDI and load shedding. Regarding qualitative effects, the operation and maintenance capacity of the technical staff was strengthened. Regarding the expected impacts, the project has contributed to the stabilization of the lives of citizens. It also contributed to the revitalization of the economy and industry to a certain extent. It can also be said that the project has brought positive benefits to those prevented from equitable social participation. The project's negative impacts on social, environmental, and economic aspects are considered negligible.

In light of the above, the implementation of this project has generally produced effects as planned, and the effectiveness and impact of the project are high.

3.4 Sustainability (Rating: ③)

3.4.1 Policy and System

As mentioned in "3.1.1.1 Consistency with the Development Plan of the Republic of Iraq," the

expansion of the power transmission and distribution network is targeted in the Iraqi government's *National Development Plan (2018-2022)* and the master plan for electricity transmission and distribution in the Kurdistan Region (2022-2031), ensuring sustainability from a policy and system perspective.

3.4.2 Institutional/Organizational Aspect

The operation and maintenance of the facilities developed under the project is carried out by each general directorate of Duhok, Erbil, and Sulaymaniyah of the executing agency, RMEK. Under each general directorate are the Directorate of Transmission (operation and maintenance of transmission lines and substations), the Directorate of Electricity Distribution (operation and maintenance of distribution lines, transformers, etc.), and the Directorate of Control and Communications (load management and data collection). Furthermore, under each general directorate, technical staff are assigned to regional offices (Districts, Sub-districts, Transmission Team Centers, and Maintenance Centers), which are responsible for the daily operation and maintenance of distribution lines, transformers, and other equipment locally.

In addition, the training departments of the general directorate implement the training programs. After the project was completed, RMEK established a central committee for training, which prepares and implements an annual capacity-building plan in cooperation with the training departments of each governorate. The main training courses are conducted at the Central Training Center, with supplementary courses conducted at the testing facility in each governorate.

The total number of staff in RMEK as of end of December 2021 was 13,844, which is stable from the 12,161 at the time of the appraisal (2006). The number of staff in each general directorate is shown in the table below, including 1,138 engineers and 5,332 technicians. However, no new staff has been hired since 2014 due to the suspension of budget allocation to the Kurdistan Regional Government due to tensions between the Iraqi government and the Kurdistan Regional Government, as well as the Kurdistan Regional Government's rationalization policy. However, there are no problems with the current number of staff in terms of operation and maintenance. In addition, the Kurdistan Regional Government has established the administrative services committee. It has found a mechanism for inter-ministerial flexibility when there are shortages in ministries, especially in technical staff, and the RMEK's request is given top priority, especially in light of the importance of electricity.

Table 7: Number of Staff of the Executing Agency

General Directorate	Number of staff
Headquarters (Dewan Directorate and General Directorate)	385
Directorate of Regional Control Center	110
Erbil General Directorate	4,142
Sulaymaniyah General Directorate	5,896
Duhok General Directorate	1,806
Garmian General Directorate ¹⁵	713
Halabja General Directorate ¹⁶	792
Total	13,844

Source: Documents provided by the executing agency

Based on the above, it is considered that the operation and maintenance system for substations, transmission lines, and distribution facilities has been established, and the necessary number of staff has been secured. Thus, the sustainability of the institutional/organizational aspect is generally ensured.

3.4.3 Technical Aspect

According to RMEK, the technical staff (engineers and technicians) responsible for operation and maintenance are experienced. They have sufficient skills to perform routine maintenance and emergency repairs of the power grid, with capacity strengthening through on-the-job training (OJT). In addition, as described in Section “3.3.1.2 Qualitative Effects (Other Effects),” training is provided at the Central Training Center and the testing facility in each governorate.

The site visit confirmed that the manuals were adequately stored and referenced.

Thus, the sustainability of the technical aspect of the project is generally ensured.

3.4.4 Financial Aspect

Since 2014, the Iraqi and Kurdistan Regional governments have been facing severe financial difficulties. Besides, due to tensions between them, no budget has been approved for the Kurdistan Regional Government, including RMEK. Therefore, RMEK is attempting to devise ways to raise funds to cover the operation and maintenance costs.

RMEK’s revenues for the past five years are shown in Table 8. 2019 and 2020 saw significant increases in revenues as RMEK installed smart meters and began collecting charges based on electricity consumption data collected from smart meters. 2021 saw continued revenue growth as approximately 80% of customers installed smart meters. The revenue is expected to continue to increase in 2022 and beyond.

¹⁵ It belongs to the Sulaymaniyah Governorate but has an independent general directorate.

¹⁶ Halabja Governorate separated from Sulaymaniyah Governorate in 2021.

Table 8 RMEK Revenue

(Unit: million Iraqi dinars¹⁷)

General Directorate	2018	2019	2020	2021	2022
					(as of August 31)
Erbil	103,765	135,715	130,910	176,432	103,840
Sulaymaniyah	130,927	347,313	235,642	324,397	225,702
Duhok	53,427	76,960	57,221	78,037	42,073
Garmian	3,884	8,934	5,243	7,312	5,008
Halabja	-	-	-	-	3,680
Total	292,003	568,922	429,016	586,178	380,303

Source: Documents provided by the executing agency

In addition, concerning maintenance expenditures, on February 8, 2018, the Ministry of Finance and Economy of the Kurdistan Region issued a letter to RMEK authorizing RMEK to spend 8% of electricity sales revenues on operations and maintenance, which RMEK has allocated to operations and maintenance since 2019. The actual operation and maintenance expenditures since 2019 are shown in the table below.

Table 9: Actual Operation and Maintenance Expenditures

(Unit: million Iraqi dinars)

General Directorate	2019	2020	2021
Erbil	6,606	9,787	10,651
Sulaymaniyah	25,115	6,893	21,178
Duhok	4,539	2,653	3,803
Garmian	0	0	585
Halabja	434	77	453
Total	36,694	19,410	36,670

Source: Documents provided by the executing agency

In addition to the 8%, RMEK makes disbursements for emergency rehabilitation, etc., as needed. For example, in Sulaymaniyah General Directorate, a study was conducted for the maintenance of all substations in Sulaymaniyah Governorate in 2020 (including 69 substations

¹⁷ 1 Iraqi dinar=0.100870 yen (October 2022)

and 130 transformers), and RMEK approved a cost of 38,000,000 Iraqi dinars for maintenance and carried out maintenance accordingly. The overall RMEK expenditure trends are shown in Table 10. The below are recurrent expenditures (salaries, maintenance, and general administrative expenses) and capital expenditures. Some investments are made by private capital, such as independent power producers, and are not included in the spending below.

Table 10: RMEK Expenditure

(Unit: million Iraqi dinars)

	2019	2020	2021
RMEK Expenditure	549,892	369,715	555,258

Source: Documents provided by the executing agency

From the above, although there are some budget allocation problems, it can be said that financial sustainability is generally ensured by efforts to improve revenue and a certain level of operation and maintenance expenditures.

3.4.5 Environmental and Social Aspect

No environmental or social concerns were identified at the time of the ex-post evaluation. Therefore, there are no sustainability risks in this aspect.

3.4.6 Preventative Measures to Risks

No other sustainability risks were found.

3.4.7 Status of Operation and Maintenance

The operating conditions of each facility are generally good, as shown in Table 11.

Table 11: Facilities and Equipment

Subproject	Current Status
1: Testing equipment	Testing equipment is located at each general directorate and further down Districts and Sub-districts. The conditions of the test vans and other testing equipment items were good during the site visits.
2: Mobile substations	All six mobile substations (one each in Duhok and Sulaymaniyah and four in Erbil) identified during the site visit are in good condition. According to RMEK, the other mobile substations are also operating well.

3: Materials and equipment for power distribution (transformers, kiosk substations)	Procured equipment is located at each general directorate and further down the Districts and Sub-districts. The condition of the transformers and kiosk-type substations confirmed during the field visits was good. According to those in charge of substations of the Erbil General Directorate, the transformers procured under the project are of good quality. The failure and burnout rate is about 2% yearly (the failure and burnout rate of Duhok was 13.87% in 2009, before the project. That means the failure and burnout rate of the equipment under the project is lower than that of the transformers before the project). In addition, according to the Sulaymaniyah General Directorate's Directorate of Electricity Distribution, more than 90% of the procured transformers are in operation.
4: Chwarta 132/33 kV substation 5: 132 kV transmission line from the above substation	Both facilities are operating in good condition and have not experienced any failures.
6: Central Training Center and the testing facility in each governorate	The Central Training Center, the testing facility in each governorate, and the testing equipment are in good condition.
7: Halabja 33 kV overhead transmission line, etc.	In good condition. They are operating without hindrance.
8: Mini SCADA, VoIP communication system	None of the mini-SCADAs serviced in Erbil, Duhok, and Sulaymaniyah are operational. A full SCADA is being procured with U.S. assistance. VoIP is not used due to changes in fiber connections.

Sources: Documents provided by the executing agency; interviews with general directorates in Erbil, Duhok, and Sulaymaniyah; site visits to each facility.

The following activities were confirmed from interviews with each general directorate regarding daily maintenance.

<Erbil General Directorate>

Directorate of Transmission (transmission lines and substations): Substations, including mobile substations, are maintained when necessary (about once each season). All substations are managed by a substation supervisor who is responsible for monitoring the substations and reporting any faults.

Directorate of Electricity Distribution (transformers, kiosk-type substations): Oil leaks, etc.,

are visually checked, and inspections are recorded.

<Duhok General Directorate>

Visual checks are performed in the Directorate of Electricity Distribution.

Spare parts are stored at each maintenance center for emergency use, and problems are addressed immediately.

<Sulaymaniyah General Directorate>

The daily inspection of transformers is performed by dispatching an engineer to visually inspect the transformers and submit an inspection and daily report.

The maintenance and engineering staff will make repairs to the extent possible within existing spare parts and the monthly recurring budget and, if necessary, apply to Headquarters for transformer repairs to be budgeted for.

As mentioned above, the current status of operation and maintenance is generally good, and no problems are observed where the inactive mini-SCADA is expected to be renewed.

From the above, although there are some minor problems in operation and maintenance of the project in terms of institutional/organizational and financial aspects as well as the operation and maintenance status, the prospects for improvement and resolution are high, and the sustainability of the project's effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented in the Kurdistan Region (Duhok, Erbil, and Sulaymaniyah governorates) to stabilize the electricity supply by providing equipment and materials for substations and distribution, thereby contributing to the economic and social reconstruction of the region. The project is consistent with the development plan and needs of Iraq and the Kurdistan Region at both the time of appraisal and ex-post evaluation, and its relevance can be confirmed. The project is consistent with Japan's ODA policy for Iraq and with other cooperation of JICA. Therefore, the relevance and coherence are high. Additional components were implemented by utilizing the unused balance of the loan, and the outputs were produced, aligning with the revised plan after adding the components. Although the project period slightly exceeded the plan, the project cost was within the plan, and therefore, the efficiency of the project is high. Regarding the effectiveness of the project, an increase in the population with access to electricity was observed. Besides, the stability of the electricity supply, such as improvement of power outages, was improved. In addition, the project strengthened the operation and maintenance capabilities of the technical staff. As for the impacts, the project has contributed to the stabilization of the lives of citizens. Also, it encouraged the revitalization of the economy and industry to a certain extent.

Therefore, the effectiveness and impacts are high. Although there are some minor problems in operation and maintenance of the project in terms of institution/organization, finance, and current status of operation and maintenance, the prospects for improvement and resolution are high. Therefore, the sustainability of the project's effects is high. In light of the above, this project is evaluated to be very high.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

Need to establish appropriate indicators and follow-up

At the time of the appraisal, “a baseline survey for the target area is expected to be conducted after the signing of the loan agreement to set baseline and target values for operation and effective indicators.” However, the baseline survey results could not be confirmed at the time of the ex-post evaluation. The “Population newly connected to electricity,” “Population with improved quality of electricity,” and “Population benefitted from receiving water under the water supply project (Water Supply Improvement Project in Kurdistan Region) by supplying the electricity” , listed as effect indicators in the report submitted by the executing agency at the time of completion, are considered to have been agreed upon by JICA. However, no target values were set, and the definitions were unclear, making it difficult to evaluate the project based on those indicators. In cases where indicators and target values were not set at the time of the appraisal, it is necessary for both the counterpart and JICA to agree on the entity to conduct a baseline survey and the deadline for the survey at the time of the appraisal to ensure that the baseline survey is conducted after the start of the project. Also, JICA needs to confirm the setting of the indicators and target values, and the survey results should be recorded.

5. Non-Score Criteria

5.1. Performance

5.1.1 Objective Perspective

(1) JICA's Contribution

JICA responded to consent requests and inquiries from the executing agency promptly, leading to the smooth implementation of the project.

(2) Cooperation with UNDP

Iraq was unfamiliar with implementing the Japanese ODA loans, and technical assistance on procurement procedures, etc., was essential for smooth implementation. UNDP, having an office in the Kurdistan Region and a long history of supporting the region's electricity sector, was selected as a consultant to facilitate the smooth implementation of this ODA loan project. Based on the track record of extending support to RMEK for a long time, UNDP played an essential role as a consultant in this project throughout the entire project period, including procurement support, implementation support, technical support, financial management, technology transfer (training on power quality, operation, and maintenance), and environmental monitoring, etc. In addition to the enthusiasm and positive attitude of RMEK toward the implementation of the project, the relationship of trust between UNDP and RMEK made it possible for UNDP to provide detailed support for project implementation, leading to the smooth implementation and completion of this project.

End

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs	<p><Civil engineering and equipment procurement></p> <ol style="list-style-type: none"> 1) Procurement of testing materials and equipment 2) Procurement and installation of mobile substations 3) Procurement of materials and equipment for power distribution 4) Construction of 132/33 kV substation <p>(Additional components below)</p> <ol style="list-style-type: none"> 5) Construction of 132 kV transmission line and warehouse for maintenance 6) Refurbishment of the Central Training Center, construction of testing facilities, procurement of training equipment, and implementation of training 7) Construction of overhead transmission line (Halabja, Sulaymaniyah Governorate) 8) Procurement of mini SCADA and VoIP communication system <p><Consulting Services></p>	<p><Civil engineering and equipment procurement></p> <ol style="list-style-type: none"> 1) As planned 2) As planned 3) As planned 4) Identified the subject substation (construction of the Chwarta substation in Sulaymaniyah Governorate) 5) As planned 6) As planned 7) As planned 8) As planned <p><Consulting Services> As planned</p>
2. Project Period	<p>(Revised Project Period)</p> <p>September 2008 – April 2018 (116 months)</p>	<p>August 2008 – August 2018 (121 months)</p>
3. Project Cost Amount Paid in Foreign Currency	<p>11,881 million yen</p>	<p>11,773 million yen</p>

Amount Paid in Local Currency	7,980 million yen (92,575 million Iraqi dinars)	150 million yen (1,780 million Iraqi dinars)
Total	19,861 million yen	11,923 million yen
ODA Loan Portion	14,747 million yen	11,773 million yen
Exchange Rate	1 Iraqi dinar = 0.0862 yen (as of February 2007)	Iraqi dinar = 0.0843 yen (Average between 2009 and 2018)
4. Final Disbursement	October 2018	