conducted by Georgia Office: May 2025

Country Name	**The Project for Introduction of Clean Energy by Solar Electricity Generation System**
Georgia	

I. Project Outline

Background	More than 80% of Georgia's power generation was hydroelectric, supported by abundant water resources. However, Georgia was unable to meet peak demand due to a decrease in power generation during the winter drought season (November to March), so the country relied on imports from neighboring countries such as Turkey. In addition, the country relied on imports for almost all of its fuel for thermal power generation. In light of this situation, the country was faced with the challenges of securing electricity as a basis for sustainable social development and economic growth, by increasing self-sufficiency through the expansion and diversification of electricity supply sources, and there was a growing need to develop power generation facilities based on new renewable energy sources such as solar power in addition to hydroelectric power.					
Objectives of the Project	To increase power generation capacity, diversify power sources, and raise awareness of people of Georgia for utilization of renewable energy by procurement of photovoltaic (PV) system and related equipment in Tbilisi as well as technical assistance for capacity building of technical personnel, and thereby contributing to demonstration of Japan's initiatives for promoting collaborative efforts by both developed and developing countries against climate change.					
Contents of the Project	1. Project Site: Ilia State University and Tbilisi International Airport (Tbilisi) 2. Japanese side (1) PV generation systems (More than 347 kW, of which 310kW for Tbilisi International Airport) (PV modules, Supporting structure, Power conditioners, Junction box, Grid connecting board, Substation, Capacitor, Data management and monitoring systems, Meteorological observation instruments, Large display, Spare parts, Maintenance equipment, etc.) (2) Technical assistance (soft component): Training on operation and maintenance including basic knowledge, technical characteristics, preventive inspection, and emergency response of grid connected PV system 3. Georgian side: Cutting branches of existing trees (At Ilia State University site, there exist trees. These tree branches should be cut off in order to ensure efficient power generation by the PV system), Removal of existing walls and revetment, Reconnection of existing incoming cables and Installation of security cameras (All at Ilia State University)					
Project Period	E/N Date	June 16, 2010	Completion Date (ex-ante)	March 2013 (10 months)	Completion Date (actual)	July 25, 2016 (Completion date)
	G/A Date	June 16, 2010				
Project Cost	E/N Grant Limit / G/A Grant Limit: : 480 million yen, Actual Grant Amount: 447 million yen					
Executing Agency	United Airports Georgia and Ilia State University					
Contracted Agencies	Main Contractor(s): ITOCHU Corporation Main Consultant(s): Oriental Consultants Global Co., Ltd. Agent: Crown Agents Japan Limited					

II. Result of the Evaluation

1 Relevance/Coherence

[Relevance]

<Consistency with the Development Policy of Georgia at the Time of Ex-Ante Evaluation >

The project was consistent with the development policy of Georgia at the time of ex-ante evaluation. Georgia had ratified the United Nations Framework Convention on Climate Change and the Kyoto Protocol and was actively trying to address climate change. In addition, in 2006, the Government of Georgia formulated an energy policy, "Main Directions of Georgia's Energy Sector Development," which prioritized the development of power sources from renewable energy sources and the upgrading of existing facilities in order to ensure a stable supply of electricity.

<Consistency with the Development Needs of Georgia at the Time of Ex-Ante Evaluation >

The project was consistent with the development needs of Georgia at the time of ex-ante evaluation. As mentioned above ("Background"), expansion and diversification of electricity supply source including renewable energy was needed.

<Appropriateness of Project Design/Approach>

The project design/approach was appropriate. The project plan/approach was designed to provide inexpensive and clean energy, so that the marginalized people would benefit equally.

As for the overall design/approach, no problem attributed to the project design/approach was confirmed.

<Evaluation Result>

In light of the above, the relevance of the project is ③[1].

[1] ④：very high, ③：high, ②：moderately low, ①：low

[Coherence]

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

The project was consistent with the Japan's ODA policy to Georgia at the time of ex-ante evaluation. The priority areas, based on the results of the 1999 policy consultation on economic cooperation and the 2005 consultation on the priority areas, covered economic infrastructure development (especially energy, transportation and telecommunications) and the social sector (especially health, sanitation and medicine, education, and environment). Also, the government of Japan introduced a scheme of "Program Grant Aid for Environment and Climate Change" in 2008 aiming at support for developing countries with lack of implementation capacity and funds for balancing between reduction of CO2 emission and economic growth in order to effectively promote global efforts against climate change. The project was implemented under this scheme as a mitigation measure through the introduction of clean energy.

<Collaboration/Coordination with JICA's Other Interventions>

No collaboration/coordination between the project and JICA's other intervention was clearly planned at the time of ex-ante evaluation or during the project period.

<Cooperation with Other Institutions/ Coordination with International Framework>

No cooperation/coordination with development partners was clearly planned at the time of ex-ante evaluation or during the project period.

<Evaluation Result>

In light of the above, the coherence of the project is ②.

[Evaluation Result of Relevance/Coherence]

In the light above, the relevance/coherence of the project is ③.

2 Effectiveness/Impact

<Effectiveness>

The project objectives were mostly achieved as planned. With regard to the "power generation volume at transmission end" (Indicator 1), data for Ilia State University which is one of the two target sites was not available, but only the generation at the Tbilisi International Airport exceeded the overall generation target. With regard to the power generation data from Ilia State University, the data management and monitoring system has not been functioning due to a software issue that occurred in 2018, and Ilia State University has not been able to take any action to restore the system. In line with the achievement of the target value for the power generation volume at the transmission end, the "estimated reduction of CO2 emission" (Indicator 2) and "reduced electricity cost" (Indicator 3) also exceeded the target value.

It was also expected that public awareness regarding the use of PV systems would be raised through this project. Public awareness of the installed PV systems, especially the Tbilisi International Airport, has increased, as the airport is located in a highly visible location with many users (approximately 820,000 annual users, 2012). In fact, many private companies approached United Airports Georgia with questions about the PV system and its efficiency.

<Impact>

It was expected that the implementation of the project would demonstrate Japan's initiative in encouraging both developed and developing countries to take action on climate change, and JICA conducted activities to promote renewable energy by explaining the project to companies interested in renewable energy at international coordination meetings and meetings with ministries, agencies, NGOs, and others.

No negative impact on environment or, no land acquisition/ resettlement occurred.

<Evaluation Result>

In light of the above, the effectiveness/impact of the project is ③.

Quantitative Effects

Indicators	Baseline 2012 Baseline Year	Target 2016 3 Years after Completion	Actual 2017 1 Year after completion Year	Actual 2018 2 Years after Completion	Actual 2019 3 Years after Completion	Actual 2023 Year of Ex-post evaluation	Source
Indicator 1 Power generation volume at transmission end （MWh/year）		361	438	389	416	412	United Airports Georgia and Ilia State University
(Breakdown)							
Tbilisi International Airport		329	438	389	416	412	United Airports Georgia
Ilia State University		32	Data not available	Data not available	Data not available	Data not available	Ilia State University
Indicator 2 Estimated reduction of CO2 emission (ton/year)		200	243	216	231	229	United Airports Georgia
Indicator 3 Reduced electricity cost (GEL/year)		52,350	63,510	56,405	60,320	59,740	United Airports Georgia

Note: Actual figures for Indicators 2 and 3 are for Tbilisi International Airport only.

3 Efficiency

Although the project cost was within the plan (the ratio against the plan: 88%), the project period considerably exceeded the plan (the ratio against the plan: 730%). The project period exceeded the plan mainly because it took longer time to select the site than expected. The site in front of the State Sub-Agency Department of Environmental Supervision (Former Ministry of the Environment and Natural Resources Protection of Georgia) building, which was originally planned to be selected as the project site, was found to have a basement during the site survey, making it difficult to install PV modules. As a result of the subsequent re-survey, the site in front of Tbilisi International Airport was selected as the new site.

	Project Cost (Japanese side only, yen)	Project Period (months)
Plan (ex-ante)	480 million	10
Actual	447 million	73
Ratio (%)	93	730

Outputs were produced as planned. As for the responsibilities by the Georgian side, although they did not cut down existing trees at Ilia State University site because the Georgian national law prohibits the cutting down of such trees, the solar panels are operating properly. Security cameras have already been installed at Ilia State University to monitor the PV modules.

In the light above, the efficiency of the project is ②.

4 Sustainability

< Institutional/Organizational Aspect>

United Airports Georgia and Ilia State University respectively are responsible for the operation and maintenance (O&M) of the PV systems under the project. As for United Airports Georgia, the group of engineers at Tbilisi International Airport has carried out maintenance of the PV system, which, according to the company, has been and will continue to be fully staffed for O&M. At Ilia State University, the Material Resources Office has been in charge and has been fully staffed with four engineers and electricians.

<Technical Aspect>

According to United Airports Georgia and Ilia State University, both have had the appropriate technology to maintain PV systems. In addition, training programs have been conducted and manuals have been distributed, and it is expected that the necessary knowledge and skills will be maintained in the future.

<Financial Aspect>

United Airports Georgia has not budgeted for the maintenance of the PV system at the time of the ex-post evaluation, but according to the company, there are no negative impacts on the PV system. In the event of a breakdown that would require the replacement of a component, discussions will take place between the Ministry of Economy and Sustainable Development and United Airports Georgia, but the repair time for a breakdown could be longer if the budget is large. At Ilia State University, the university budget has secured funds for the operation and maintenance of the facilities of the department concerned.

<Environmental and Social Aspect>

No issue on environmental and social aspects has been observed, and it has not been necessary to take any countermeasures.

<Current Status of Operation and Maintenance>

The system and equipment of United Airports Georgia have been functioning well. Maintenance activities have been carried out on a regular basis in accordance with the maintenance plan. The spare parts procured under the project are properly stored, and parts are procured as needed.

At Ilia State University, there have been no major problems with the system and equipment. As mentioned above ("2. Effectiveness/Impact"), the Data management and monitoring system has been broken down due to a software problem, which could not be fixed by the university. Regular maintenance activities have been carried out and parts have been procured as needed.

<Evaluation Result>

In light of the above, slight problems have been observed in terms of the financial aspect. Therefore, the sustainability of the project effects is ③.

5 Summary of the Evaluation

The project mostly achieved the project objectives as planned, as the power generation volume at transmission end achieved the target and public awareness regarding the use of PV systems was raised. As for efficiency, although the project period significantly exceeded the plan, the project cost was within the plan.

Considering all of the above points, this project is evaluated to be highly satisfactory.

PV modules installed at Tbilisi International Airport

PV modules installed at Ilia State University