



Report and Recommendation of the President to the Board of Directors

Project Number: 43452-023
September 2015

Proposed Grant and Administration of Grants for Additional Financing Kingdom of Tonga: Outer Island Renewable Energy Project

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 25 August 2015)

Currency units – euro/s (€)/Australian dollar/s (A\$)/ pa'anga (T\$)

€1.00	=	\$1.16
\$1.00	=	€0.86
A\$1.00	=	\$0.72
\$1.00	=	A\$1.40
T\$1.00	=	\$0.48
\$1.00	=	T\$2.06

ABBREVIATIONS

ADB	–	Asian Development Bank
EU	–	European Union
MFNP	–	Ministry of Finance and National Planning
O&M	–	operation and maintenance
PAM	–	project administration manual
PMC	–	project management consultant
PPR	–	project performance rating system
SDCFREEERA	–	Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas
TPL	–	Tonga Power Limited

WEIGHTS AND MEASURES

kWp	–	kilowatt-peak
MWh	–	megawatt-hour
MWp	–	megawatt-peak

NOTE

In this report, "\$" refers to US dollars, unless otherwise stated.

Vice-President	S. Groff, Operations 2
Director General	X. Yao, Pacific Department (PARD)
Director	S. Muramoto, Officer-in-Charge, Transport, Energy and Natural Resources Division, PARD
Team leader	W. Y. Lee, Energy Specialist, PARD
Team members	S. Lee, Principal Social Development Specialist, PARD T. Leono, Project Analyst, PARD M. Melei, Country Specialist, PARD N. Sapkota, Safeguards Specialist, PARD A. Syed, Counsel, Office of the General Counsel J. Williams, Senior Environment Specialist, PARD
Peer reviewer	P. Perera, Principal Energy Specialist, East Asia Department

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PROJECT AT A GLANCE

1. Basic Data		Project Number: 43452-023	
Project Name	Outer Island Renewable Energy Project (additional financing)	Department /Division	PARD/PATE
Country Borrower	Tonga Kingdom of Tonga	Executing Agency	Ministry of Finance and National Planning
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Energy	Electricity transmission and distribution		1.44
		Total	1.44
3. Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG) Environmentally sustainable growth (ESG)	Pillar 1: Economic opportunities, including jobs, created and expanded Global and regional transboundary environmental concerns	Climate Change impact on the Project	Low
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Partnerships (PAR)	Bilateral institutions (not client government) Official cofinancing	Effective gender mainstreaming (EGM)	✓
5. Poverty Targeting		Location Impact	
Project directly targets poverty	No	Nation-wide	High
6. Risk Categorization:	Low		
7. Safeguard Categorization	Environment: B Involuntary Resettlement: C Indigenous Peoples: C		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		1.44	
Sovereign Project grant: Asian Development Fund		1.44	
Cofinancing		4.32	
European Union		3.57	
ATF Second Denmark Renewable Energy		0.75	
Counterpart		0.67	
Government		0.67	
Total		6.43	
9. Effective Development Cooperation			
Use of country procurement systems		Yes	
Use of country public financial management systems		Yes	

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on (i) a proposed grant; (ii) the proposed administration of a grant to be provided by the European Union (EU);¹ and (iii) the proposed administration of a grant to be provided by the Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas (SDCFREEERA),² all to the Kingdom of Tonga for the additional financing of the Outer Island Renewable Energy Project.³

2. The proposed additional financing will support the scaling up of the current project by (i) upgrading the existing power distribution grid in the islands of Vava'u and 'Eua, which will result in additional savings of about 0.12 million liters of diesel per year; and (ii) expanding the project management support services, including assistance for procurement of solar power generation assets and power distribution networks.

II. THE PROJECT

A. Rationale

3. Tonga is a kingdom of 177 islands divided into five island groups—'Eua, Ha'apai, Niuas, Tongatapu and Vava'u. Its 103,000 people inhabit about 36 of these islands. The peak demand of the four Tonga Power Limited (TPL)⁴ grids in 2014 was about 9.7 megawatts, and yearly demand totaled about 55 gigawatt-hours. An estimated 13 million liters of diesel was consumed to generate this electricity at a cost that was equivalent to about 10% of the year's total gross domestic product and about 15% of the value of total 2014 imports. Peak demand is expected to increase to 17.2 megawatts by 2020. Petroleum dependency makes Tonga highly vulnerable to oil price shocks, which affect the affordability of food, goods, electricity, and transport.

4. The Asian Development Bank (ADB) approved the current Outer Island Renewable Energy Project on 27 June 2013 to reduce Tonga's dependence on imported fossil fuel for power generation and give consumers greater access at a reduced cost to electricity generated by solar power. The original project plans were to (i) construct and install solar power systems with a total capacity of 1.25 megawatt-peak (MWp) on nine of Tonga's outer islands, (ii) provide operation and maintenance (O&M) trainings including a program manual for O&M of solar generation and distribution systems to the implementing agencies for up to 5 years after plant commissioning, and (iii) help the implementing agencies implement the project efficiently by recruiting the project management consultant (PMC).

5. Due to the recent changes of the technical environment of a few subproject areas, minor changes in the current project were approved in June 2015. These are expected to increase the total capacity of the current project to about 1.32 MWp and optimize each project cost component. The changes took into consideration (i) the latest solar photovoltaic module cost trends, (ii) an increase of the estimated potential consumers on islands of Ha'afeva and 'Uiha,

¹ Through the European Commission.

² The concurrence from the Government of Denmark was received in the first quarter of 2013.

³ The design and monitoring framework is in Appendix 1. ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Grant and Administration of Grant for to the Kingdom of Tonga for the Outer Island Renewable Energy Project*. Manila.

⁴ TPL is a vertically integrated government-owned public enterprise under the oversight of the Ministry of Public Enterprises and the government's cabinet.

(iii) the lack of a proper grid network on Niuatoputapu, and (iv) a mismatch between the current peak demand and the proposed solar power generation on Vava'u.

6. The current project has encountered implementation delays for a variety of reasons, including damage caused by the most powerful storm ever recorded in Tonga.⁵ Following the devastation caused when Cyclone Ian passed directly over the northeast islands of Ha'apai in January 2014, the government requested a temporary suspension of project activities so that it could focus on emergency assistance needed to reconstruct and strengthen the electricity network and school facilities on the island group.⁶

7. After ADB approved the Cyclone Ian Recovery Project in May 2014, activities on the current Outer Island Renewable Energy Project resumed. The grants were declared effective in June 2014. The PMC was mobilized in June 2014 and recommended in the January 2015 through the inception report that the original single large turnkey contract be split into two smaller turnkey contracts that would better suit existing market conditions.⁷ One of these—the turnkey package for the grid-connected solar photovoltaic plants—was advertised on 22 May 2015 as planned, and the fourth quarter of 2015 was set as the target for contract award.

8. Despite the delays, the progress made on project implementation since effectiveness has been satisfactory overall. The project currently faces no major risks to a successful delivery of its expected outputs or to keeping to its revised implementation schedule. As of July 2015, the project was classified as performing well.⁸ Project performance and associated issues are described in more detail in the summary of project performance.⁹

9. To maximize the distribution of electricity from the solar power systems to be installed under the current project, the government has asked ADB for a grant of \$1.44 million from ADB's Special Funds resources¹⁰ to help it upgrade the existing power distribution grids of 'Eua and Vava'u. To expand the scale of the current project and deliver greater benefits by reducing power distribution losses, the EU has agreed to provide a grant not exceeding €3.00 million

⁵ Cyclone Ian was a category 5 system, with winds of more than 200 kilometers per hour and gusts of about 300 kilometers per hour. About 5,000 people were directly affected—66% of Ha'apai's population. According to TPL, the cyclone damaged 90% of the Ha'apai power network's distribution lines, 40% of the high-voltage poles, 70% of the low-voltage poles, 65% of the transformers, 90% of the transformer structures, one of the two generators, and 95% of the streetlights.

⁶ Asian Development Bank (ADB). 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Grant and Administration of Grant for to the Kingdom of Tonga Cyclone Ian Recovery Project*. Manila. Overall progress of rehabilitating the electricity network on Ha'apai has been satisfactory.

⁷ The original single turnkey package was divided into two separate turnkey packages: one for the grid-connected solar photovoltaic plants and one for both mini and off-grid solar systems. This allowed TPL to begin the design work and tendering process for the on-grid system while a more sustainable O&M mechanism for the mini and off-grid systems was still being developed. The draft O&M report for the mini and off-grid systems was submitted by the Government of Australia to the Government of Tonga on 22 June 2015.

⁸ The current project was rated *on track* in quarters 3 and 4 2014 under ADB's project performance rating system (PPR) after effectiveness in June of that year. However, the rating was changed to *potential problem* in Q1 2015, and to *actual problem* in Q2 2015. Primarily, this was because the division of the single turnkey contract into two smaller turnkey contracts had not been reflected in the current projected timelines for contract awards and disbursements in the PPR. As of July 2015, the current project was classified as *on track* by the PPR.

⁹ Summary of Project Performance (accessible from the list of linked documents in Appendix 2).

¹⁰ A country's eligibility for Asian Development Fund (Special Fund resources) grants under ADB's revised grant framework is determined by its risk of debt distress. The latest debt sustainability analysis in 2014 determined that Tonga had a high risk of debt distress and was therefore eligible to receive 100% of its Asian Development Fund allocation as grants.

(\$3.57 million),¹¹ and the SDCFREEERA has approved a grant of \$750,000. Both grants will be fully administered by ADB as part of overall project administration.

10. TPL is solely responsible for providing grid-connected electricity services in Tonga. It has concessions to operate four independent grids—the largest, which is on the main island of Tongatapu, and three smaller grids on the main islands of the 'Eua, Ha'apai, and Vava'u island groups. TPL generates, distributes, and retails electricity, and provides O&M services.

11. The power distribution system is the part of the electricity supply chain and requires considerable investment and O&M efforts. Power distribution assets typically represent 20%–30% of the required power system investments in electricity industries worldwide, but this figure rises to about 42% for TPL. The standard losses in rural power distribution networks are generally about 5%, and yet the rate is more than twice as high in Tonga (around 13%). Greater losses mean that more fuel is consumed in power generation, which makes improving the efficiency of the country's power system a matter of interest for both TPL and Tonga's consumers.

12. The additional financing for the Outer Island Renewable Energy Project will allow Tonga to reduce power distribution losses and fuel consumption while delivering the same amount of electricity to consumers. This will be achieved by rehabilitating grid assets—i.e., cables, poles, distribution transformers, and switchgears. It will result in additional savings of about 0.12 million liters of diesel per year.

13. The current project meets all the eligibility criteria for additional financing. The overall project will remain technically, financially, and economically viable with the additional financing component. The safeguards categorization of the overall project will also remain unchanged. The additional financing component will enhance the current project's original design and add effective support for its development of the solar photovoltaic plants—one of the government's key priorities. The additional financing component will enhance the outcome and impact of the project, as well as ADB's contribution to power sector development in Tonga.

14. The additional financing is in line with the objectives of ADB's 2009 Energy Policy to promote energy efficiency and renewable energy; provide access to energy for all; and support reform, capacity building, and improved governance in the energy sector.¹² It is included in ADB's country operations business plan for Tonga for 2015–2017,¹³ which makes energy a priority area of support. A primary goal of the plan is to reduce the country's dependence on imported fossil fuels through energy efficiency and conservation operations, including support for power generation from renewable energy sources.

B. Impact and Outcome

15. The impact and outcome of the overall project will remain unchanged with the additional financing. The intended impact will remain the reduction of Tonga's dependence on imported fossil fuel for power generation. The outcome of the overall project will be the optimization of on-

¹¹ A contribution agreement between ADB and the EU was concluded on 24 December 2014. The grants from the EU will be denominated in US dollars pursuant to ADB's standard accounting practices (at the exchange rate as of 7 January 2015). The dollar equivalent amounts may be adjusted for currency fluctuations to match the grant amounts received by ADB.

¹² ADB. 2009. *Energy Policy*. Manila.

¹³ ADB. 2014. *Country Operations Business Plan: Tonga, 2015–2017*. Manila.

grid and off-grid generation systems to provide increased consumer access to electricity generated by solar power at a reduced cost.

C. Outputs

16. The intended output 1 under the current project is the construction and installation of solar power systems with a total capacity of 1.32 MWp on nine outer islands. Under the additional financing, output 1 of the overall project will expand to include rehabilitation by TPL of the existing grid network near the solar power generation systems on the islands of 'Eua and Vava'u by replacing cables, poles, distribution transformers, switchgears, and other equipment. The original second output—O&M knowledge transferred through training—as well as the third—efficient management and implement of the project—will remain unchanged with the additional financing.

D. Investment and Financing Plans

17. The additional financing will come through grants from ADB, the SDCFREEERA, and the EU and an additional contribution from the government of \$0.67 million. This will raise investments by about 95% from the \$6.80 million approved in June 2013 for the current project to \$13.23 million for the overall project. The revised investment plan is in Table 1.

Table 1: Revised Project Investment Plan
(\$ million)

Item	Current Amount ^a	Additional Financing ^b	Total
A. Base Cost^c			
1. Goods, works, and services (solar power capacity for nine outer islands and project management consultant)	6.17	0.00	6.17
2. Administrative costs, including land lease cost	0.30	0.00	0.30
3. Goods, works, and services (power distribution network)	0.00	5.97	5.97
Subtotal (A)	6.47	5.97	12.44
B. Contingencies^d	0.33	0.46	0.79
Total (A+B+C)	6.80	6.43	13.23

^a Comprising (i) \$2.00 million from performance-based allocation of the Asian Development Bank (ADB); (ii) A\$4.50 million from the Government of Australia, administered by ADB; and (iii) the government's contribution of \$0.30 million as an in-kind contribution.

^b ADB and the Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas will provide \$2.19 million and the European Union will provide €3.00 million, all on a grant basis. Includes contingencies of \$0.46 million and the ADB administrative service fee. Tonga Power Limited will provide \$0.67 million as an in-kind contribution.

^c In mid-2015 prices.

^d Calculated considering price contingency of 5% of base cost (excluding administrative expenses and international inflation), 5% of physical contingency, and a local inflation rate of 6.1% for local components. Any cost overrun or cash shortfall will be borne by the Government of Tonga.

Source: Asian Development Bank estimates.

18. The government has requested additional grants not exceeding a total of \$5.76 million to finance project goods, works, and services,¹⁴ of which \$1.44 million will be from ADB's Special Funds resources; \$3.57 million (not exceeding €3.00 million) from the EU;¹⁵ and \$0.75 million from the SDCFREEERA. The government, through TPL, will provide the equivalent of \$0.67

¹⁴ Finance will cover the cost of all works and associated services for upgrading the existing power distribution networks.

¹⁵ The grants from the EU will be denominated in US dollars, pursuant to ADB's standard accounting practices.

million as an in-kind contribution toward administrative and project management costs. The government will make the proceeds of the grants available to TPL under a subsidiary grant agreement upon terms and conditions satisfactory to ADB.¹⁶ The revised financing plan is in Table 2.

Table 2: Revised Financing Plan
(\$ million)

Source	Current ^a		Additional Financing		Total	
	Amount	Share of Total (%)	Amount	Share of Total (%)	Amount	Share of Total (%)
Asian Development Bank ADF (Grant)	2.00	29.4	1.44	22.4	3.44	26.0
Government of Australia ^b	4.50	66.2	0.00	0.00	4.50	34.0
European Union ^c	0.00	0.00	3.57	55.5	3.57	27.0
Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas	0.00	0.00	0.75	11.7	0.75	5.7
Government of Tonga ^d	0.30	4.4	0.67	10.4	0.97	7.3
Total	6.80	100.0	6.43	100.0	13.23	100.0

ADF = Asian Development Fund.

^a Refers to the original amount and any previous additional financing.

^b Administered by the Asian Development Bank (ADB). This amount includes ADB's administration fee, audit cost, and bank charges to the extent that these items are not covered by the interest and investment income earned on this grant, or any additional grant contribution by the Government of Australia. Based on exchange rate on 23 May 2013.

^c Administered by ADB. This amount includes ADB's administration fee, audit cost, and bank charges to the extent that these items are not covered by the interest and investment income earned on this grant, or any additional grant contribution by the European Union. Based on exchange rate on 7 January 2015.

^d Government in-kind contribution, \$0.30 million, will be in administration costs. Tonga Power Limited will provide \$0.67 million as its in-kind contribution for additional financing. Any cost overrun or cash shortfall will be borne by the government.

Source: Asian Development Bank estimates.

E. Implementation Arrangements

19. The government will be the grant beneficiary. The executing agency of the overall project, including the additional financing, will be the Ministry of Finance and National Planning (MFNP). TPL will be the implementing agency for the additional financing. The existing project steering committee will implement the overall project, including the power distribution network.

20. TPL will prepare the final technical and engineering designs, conduct the bidding processes, and be responsible for the installation and supervision of the component to upgrade the power distribution network with the additional financing under the overall project. The implementation and financing arrangements,¹⁷ updated for the overall project (including additional financing) are summarized in Table 3 and described in detail in the project administration manual (PAM).¹⁸

¹⁶ A new subsidiary grant agreement is expected to be made after approval of the proposed additional financing.

¹⁷ The revised financing arrangement will be effective upon effectiveness of the grant and project agreements for the additional financing.

¹⁸ Project Administration Manual (accessible from the list of linked documents in Appendix 2).

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	August 2013–December 2019		
Project completion date	31 December 2019		
Grant closing date	30 June 2020		
Management	Outer Island Renewable Energy Project steering committee:		
(i) Oversight body	CEO of the Ministry of Finance and National Planning (chair), CEO of the MEIDECC, head of Energy Department of MEIDECC, CEO of the Ministry of Public Enterprises, CEO of Tonga Power Limited, head of the Tonga energy road map-implementing unit		
(ii) Executing agency	Ministry of Finance and National Planning		
(iii) Implementing agencies	Energy Department under MEIDECC and Tonga Power Limited		
(iv) Implementation consultant	PMC will be supported by a team of specialized experts.		
Procurement (overall project) ^a	ICB	2 contracts	\$5.58 million
	NCB	3 contracts	\$1.03 million
	Shopping	9 contracts	\$0.49 million
	Direct contracting ^b	11 contracts	\$2.66 million
	Force accounts ^c	2 contracts	\$0.62 million
Consulting services (PMC)	Contract variation	30 person-months (intermittent)	\$1.40 million ^d
Advance contracting	Advance contracting will be undertaken.		
Disbursement	All grant proceeds will be disbursed in accordance with ADB's <i>Loan Disbursement Handbook</i> (2015, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

ADB = Asian Development Bank; CEO = chief executive officer; MEIDECC = Ministry of Energy, Information, Disaster Management, Climate Change and Communications; PMC = project management consultant; ICB = international competitive bidding; NCB = national competitive bidding.

^a Since the overall project is financed with ADB-administered cofinancing resources, universal procurement will apply following ADB. 2013. *Blanket Waiver of Member Country Procurement Eligibility Restrictions in Cases of Cofinancing for Operations Financed from Asian Development Fund Resources*. Manila.

^b Direct contracting with Transnet NZ Limited, Macleans Electrical Supplies, and domestic civil materials supplier will be used for the procurement of electric equipment to ensure the standardization with existing equipment.

^c The proposed additional grants will finance the incremental labor costs Tonga Power Limited incurs in carrying out the project civil works due to the scattered nature of the works to be conducted, using force account. Tonga Power Limited has been successfully implementing the similar project on Ha'apai, using force account.

^d The existing contract value is \$0.75 million. Additional \$0.65 million is expected to be used to support the additional scope of the project, including the power distribution network upgrade to be cofinanced by the Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas.

Source: Asian Development Bank.

III. DUE DILIGENCE

A. Technical

21. The overall project has been assessed as technically viable based on extensive study of the load and energy demand records provided by TPL and field investigations, as well as on experience from ADB's Cyclone Ian Recovery Project (footnote 6). The selection of equipment has been carefully analyzed based on best engineering practices. The equipment is specifically conceived for hard marine environments and remote island conditions. ADB and the implementing agency quantified the equipment necessary for the network refurbishment, assessed the grid condition, and calculated the potential reduction in grid power losses. The

equipment will incorporate adequate climate-proofing measures to increase resilience to climate and disaster risks throughout the project life cycle.

B. Economic and Financial

22. The proposed power distribution network to be funded by the additional financing is considered financially viable because the estimated financial internal rate of return of (4.45%) is greater than the weighted average cost of capital (3.46%). The additional financing is also considered economically viable, since the estimated economic internal rate of return (12.07%) is greater than the economic discount rate of 12.00%. The financial internal rate of return for the overall project with the additional financing is estimated at 7.02%,¹⁹ and the estimated economic internal rate of return is 14.13%. The overall project remained financially and economically feasible under several adverse scenarios during sensitivity testing.

C. Governance

23. **Financial management.** To facilitate cash flow during project implementation, the MFNP, as the executing agency, will approve withdrawal applications from the project management unit and submit them to ADB for direct payment for all project goods, works, and consultancy services. A public financial management performance assessment concluded that Tonga's public financial management system is based on a solid legal and regulatory framework and underpinned by a set of well-established expenditure control procedures that cover wages and salaries, nonsalary items, and procurement.²⁰

24. **Procurement.** The PMC has assisted the implementing agencies in procuring all project goods, works, and services under the current project.²¹ Procurement of goods, works, and related services under the additional financing project will be carried out by TPL, in accordance with ADB's Procurement Guidelines (2015, as amended from time to time). In addition to the national competitive bidding and shopping methods, direct contracting and force account methods will be used for some packages to be funded by the additional financing. The use of both methods has been justified based on ADB's Procurement Guidelines.²²

25. Advance contracting for some packages using national competitive bidding and shopping methods will be undertaken in conformity with ADB's Procurement Guidelines. The executing agency and implementing agencies have been advised that approval of advance contracting does not commit ADB to finance the project. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and the MFNP. The specific policy requirements and supplementary measures are described in the PAM.

¹⁹ The weighted average cost of capital for the overall project was calculated to be 3.68%.

²⁰ Government of Tonga. 2010. *Public Financial Management Performance Report*. Nuku'alofa.

²¹ The existing PMC contract will be extended and funded by the additional financing.

²² The guidelines state in paras. 3.6–3.8 that for direct contracting, (i) no better offer is likely to be received, and that the price to be paid is not more than the original price; and (ii) standardization of equipment or spare parts, to be compatible with existing equipment, may justify additional purchases from the original supplier. Under the guidelines, the use of force account can be justified when (i) quantities of work involved cannot be defined in advance; (ii) works are small and scattered or in remote locations and qualified construction firms are unlikely to bid on them at reasonable prices; (iii) work is required to be carried out without disrupting ongoing operations; and (iv) the risks of unavoidable work interruption are better borne by the recipient or implementing agency than by a contractor.

D. Poverty and Social

26. The current project is expected to have a positive social impact by helping to ease air pollution. By reducing the use of diesel fuel for power generation, it will avoid what would have been a significant amount of damaging emissions each year. The additional financing will help the current project achieve the targeted social benefits by reducing high losses during power distribution, which in turn will lower the diesel fuel consumed by generation while delivering the same end amount of electricity to consumers. The overall project is expected to offer new employment and income opportunities for local unskilled and semiskilled workers in the project areas and to support education by making it possible for local students to study by electric light at night.

27. The current project is classified as effective gender mainstreaming. The majority of its outputs have specific gender design features to ensure that women participate in the project and have access to project benefits. The overall project will actively promote the involvement of women in all its employment and training opportunities.²³ Under ADB's Cyclone Ian Recovery Project, TPL has established a track record of successfully employing new female trainee line persons who have received intensive instruction in field work. This has been done to achieve a greater balance in gender representation on the project's installation work force. TPL plans to bring its six women and two men trainees currently working on Ha'apai under the Cyclone Ian Recovery Project to the sites where the project work to be funded by the additional financing is to be carried out. This may create opportunities for long-term employment for these trainees.

E. Safeguards

28. **Environment.** The two areas to be affected by activities under the additional financing are classified as category B for environment. Initial environmental examinations were prepared in accordance with ADB's Safeguard Policy Statement (2009). No significant environmental impacts will result from the implementation of the overall project.

29. **Involuntary resettlement and indigenous peoples.** The additional financing project is classified as category C for both involuntary resettlement and indigenous peoples. The activities under the additional financing component will use the right-of-way on a government reserve occupied by the existing power distribution network owned by TPL and community electric cooperatives. It is therefore not expected to involve land acquisition or displacement of people or physical structures. No third party or persons will be adversely affected. No distinct and vulnerable indigenous peoples as defined under ADB's Safeguard Policy Statement are expected to be affected by the overall project.

F. Risks and Mitigating Measures

30. No significant issues are expected to arise in implementing the overall project. Key risks and mitigating measures are described in detail in the risk assessment and risk management plan.²⁴

²³ Gender Action Plan (accessible from the list of linked documents in Appendix 2).

²⁴ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

IV. ASSURANCES AND CONDITIONS

31. The government, the MFNP, and TPL have assured ADB that implementation of the additional financing shall conform to all applicable ADB policies and procedures, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and the grant and project agreements.

32. The government, the MFNP, and TPL have agreed with ADB on certain covenants for the project, which are set forth in the grant and project agreements.

V. RECOMMENDATION

33. I am satisfied that the proposed grant would comply with the Articles of Agreement of the Asian Development Bank (ADB) and, recommend that the Board approve

- (i) the grant of \$1,440,000 to the Kingdom of Tonga for the additional financing of the Outer Island Renewable Energy Project, from ADB's Special Funds resources; and such other terms and conditions as are substantially in accordance with those set forth in the draft grant agreement presented to the Board;
- (ii) the administration by ADB of the grant not exceeding €3,000,000 to the Kingdom of Tonga for the additional financing of the Outer Island Renewable Energy Project, to be provided by the European Union; and
- (iii) the administration by ADB of the grant not exceeding the equivalent of \$750,000 to the Kingdom of Tonga for the additional financing of the Outer Island Renewable Energy Project, to be provided by the Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas.

Takehiko Nakao
President

18 September 2015

REVISED DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with			
Current project Reduction of Tonga's dependence on imported fossil fuel for power generation.			
Overall project Unchanged			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome			
Current project On-grid and off-grid generation systems are optimized and provide increased consumer access to electricity generated by solar power at a reduced cost.	Current project By 2018: At least 2,103 MWp of solar electricity supplied to customers: 1,314 MWh on 'Eua and Ha'apai Va'vau, and 789 MWh on Ha'apai outer islands and Niua— About 1,700 tons of annual carbon dioxide emissions are avoided: 'Eua and Ha'apai – 1,063 tons; Ha'apai outer islands and Niua—638 tons. (Baseline: None)	TPL annual report TPL annual report	TPL continues to lack sufficient technical staff to operate and maintain its power-generating assets. The site selection process is politicized. Environmental issues delay implementation.
Overall project Unchanged	Overall project An additional 381 MWh of electricity supplied to customers annually by reducing the technical losses, avoiding at least 308 tons of additional carbon dioxide emissions per annum.		
Outputs			
Output 1	1a.	1a.	
Current project Solar power. The project will construct and install solar power systems with a total capacity of 1.32 MWp on nine outer islands of Tonga.	Current project By the end of 2017: (i) Solar photovoltaic generators are connected to existing electricity distribution networks (0.2 MWp on Eua, repair program on Vava'u and 0.55 MWp on Ha'apai). (ii) Solar photovoltaic generators are connected to existing community-owned and community-managed electrical mini-grids on four Ha'apai outer islands (100 kWp on 'Uiha, 70 kWp on Nomuka, 70 kWp on Ha'ano, and 150 kWp on Ha'afeva).	Project progress reports TPL annual report ADB's project completion report	The price of raw materials and power plant components increases unexpectedly. Government approval processes for procurement are slow. The procurement process is weak. The project management unit is not established in a timely manner and has rapid staff turnover.

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	<p>(iii) Installation of 23 kWp SHS capacity in Niuafu'ou and 160 kWp SHS in Niuatoputapu.</p> <p>At least 65 households headed by women in Ha'apai outer islands (50 households) and Niuas (15 households) will benefit from the project. (Baseline: 350 existing households) Women make up a targeted 30% of workforce for local construction contracts for solar power installations.</p>		<p>Counterpart staff lack of interest in O&M training.</p> <p>Counterpart staff and communities lack interest in training program.</p> <p>Counterpart support, performance, and coordination are weak and inadequate.</p>
<p>Overall project In addition to the current project output 1, existing grid network on the islands of Vava'u and 'Eua rehabilitated by TPL</p>	<p>Overall project By the end of 2019: Output 1: Construct and install 1.32 MWp solar system on nine outer islands, plus rehabilitation of existing grid network on Vava'u and 'Eua.</p>		
<p>Output 2</p> <p>Current project O&M knowledge transferred through training</p> <p>Overall project Unchanged</p>	<p>2a.</p> <p>Current project (i) Manual for solar electric equipment is finalized (ii) Knowledge of solar electric and hybrid equipment is transferred during 5 years after commissioning of systems</p> <p>Overall project Unchanged</p>	<p>2a.</p> <p>Project progress reports, TPL annual report, training attendance sheets, and ADB's project completion report</p> <p>Annual asset maintenance plan</p>	
<p>Output 3</p> <p>Current project Project implemented and managed efficiently</p>	<p>3a.</p> <p>Current project (i) Consultancy services provided through the appointment of the PMC team, comprising one electrical solar engineer to act as project manager, one power electric planning and field engineer to act as deputy project manager, one</p>	<p>3a.</p> <p>Project progress reports, TPL annual report, training attendance sheets, and ADB's project completion report</p>	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	<p>financial and procurement specialist, and one social safeguards specialist</p> <p>(ii) Continuous capacity building program conducted for each group of islands for 5 years after systems commissioned</p> <p>Training includes</p> <p>(i) project planning and asset management and maintenance for staff of Energy Department and TPL and existing community electric societies (with an expected minimum 50% female participants);</p> <p>(ii) procurement, anticorruption, safeguards, and O&M training for solar–diesel hybrid energy systems (expected minimum of 50% female participants);</p> <p>(iii) asset management concepts, theories, and practical project applications for staff of TPL and electric societies;</p> <p>(iv) asset management program for staff of TPL and electric societies (expected minimum of 10% female participants);</p> <p>(v) efficient use by management of solar power services for customers of TPL and electric societies;</p> <p>(vi) consumer training on power budget management for each of nine outer islands (expected minimum of 50% female participants); and</p> <p>(vii) demand-side management for customers of TPL and electric societies (expected minimum of 50% female participants).</p>		
Overall project Unchanged	Overall project Unchanged		

Key Activities with Milestones

1. Install and commission 1.32 MWp solar power capacity in the project areas.

- 1.1 Carry out tender process for turnkey contract (package 1) for 0.75 MWp on-grid solar photovoltaic plants (January–May 2015) (changed)
- 1.2 Carry out tender process for turnkey contract (package 2) for 0.57 MWp mini off-grid solar photovoltaic system (September–November 2015) (changed)
- 1.3 Evaluate and report on bids, and award contracts: package 1 (July–December 2015) (changed)
- 1.4 Evaluate and report on bids, and award contracts package 2 (November 2015–February 2016) (changed)
- 1.5 Install, test, and commission systems, including trial operation of on-grid solar photovoltaic plants (November 2015–June 2016) (changed)
- 1.6 Install, test, and commission systems, including trial operation of mini and off-grid solar photovoltaic system (April 2016–March 2017) (changed)
- 1.7. Carry out tender process for rehabilitation of power distribution network on 'Eua and Vava'u: (January 2016–December 2017) (added)
- 1.8 Install, test, and trial operation of the rehabilitated power network (January 2016–December 2018) (added)

2. Conduct O&M training.

- 2.1 Design O&M program
- 2.2 Conduct O&M training for solar electric and hybrid equipment for 5 years after commissioning (Q2 2016–Q4 2019) (changed)

3. Provide efficient project implementation and management.

- 3.1 Recruit and field PMC team (Q1 2014) (changed)
- 3.2 Prepare detailed project implementation schedule, technical designs, safeguards, and gender action plan components (Q3 2014–Q2 2016) (changed)
- 3.3 Develop and implement capacity-strengthening program for staff of Energy Department, TPL, community electricity societies, and TPL customers (every year until 2019) (changed).
- 3.4 Evaluate training programs and report (once a year until 2019) (changed)
- 3.5 PMC teams prepare final report after 5 years of activities (Q4 2019) (changed)

Inputs

ADB:	\$2.00 million (current) \$1.44 million (additional) \$3.44 million (overall)
Government of Australia:	\$4.50 million (current) \$0.00 (additional) \$4.50 million (overall)
European Union:	\$0.00 (current) \$3.57 million (additional) \$3.57 million (overall)
Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas:	\$0.00 (current) \$0.75 million (additional) \$0.75 million (overall)
Government of Tonga:	\$0.30 million (current) \$0.67 million (additional) \$0.97 million (overall)

ADB = Asian Development Bank, kWp = kilowatt-peak, MWh = megawatt-hour, MWp = megawatt-peak, O&M = operation and maintenance, PMC = project management consultant, Q = quarter, SHS = solar home system, TPL = Tonga Power Limited.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/RRPs/?id=43452-023-2>

1. Grant Agreement: Special Operations
2. Grant Agreement: Externally Financed (European Union)
3. Grant Agreement: Externally Financed (Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas)
4. Project Agreement
5. Project Administration Manual
6. Sector Assessment (Summary): Energy
7. Summary of Project Performance
8. Contribution to the ADB Results Framework
9. Development Coordination
10. Financial Analysis
11. Economic Analysis
12. Country Economic Indicators
13. Summary Poverty Reduction and Social Strategy
14. Gender Action Plan
15. Initial Environmental Examination: 'Eua Island
16. Initial Environmental Examination: Vava'u Island
17. Risk Assessment and Risk Management Plan