Report and Recommendation of the President to the Board of Directors

Project Number: 43452
November 2016

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

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 26 October 2016)

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

€1.00	=	$1.09
$1.00	=	€0.92
A$1.00	=	$0.76
$1.00	=	A$1.31
T$1.00	=	$0.46
$1.00	=	T$2.16

ABBREVIATIONS

ADB	–	Asian Development Bank
MFNP	–	Ministry of Finance and National Planning
TPL	–	Tonga Power Limited
FIRR	–	financial internal rate of return
WACC	–	weighted average cost of capital
EIRR	–	economic internal rate of return

NOTE

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

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PROJECT AT A GLANCE

1. Basic Data — **Project Number:** 43452-024

Project Name	Outer Island Renewable Energy Project - Additional Financing	**Department /Division**	PARD/PATE
Country	Tonga	**Executing Agency**	Ministry of Finance and National Planning
Borrower	Government of Tonga		

	2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓	**Energy**	Electricity transmission and distribution	5.00
		Total	**5.00**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Adaptation ($ million)	0.75
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	Climate Change impact on the Project	Low

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Private sector development (PSD)	Public sector goods and services essential for private sector development	Effective gender mainstreaming (EGM)	✓

5. Poverty and SDG Targeting		**Location Impact**	
Geographic Targeting	No	Nation-wide	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG1		

6. Risk Categorization: Low

7. Safeguard Categorization **Environment:** B **Involuntary Resettlement:** C **Indigenous Peoples:** C

8. Financing

Modality and Sources	Amount ($ million)
ADB	**5.00**
Sovereign Project loan: Asian Development Fund	2.50
Sovereign Project grant: Asian Development Fund	2.50
Cofinancing	**0.00**
None	0.00
Counterpart	**0.60**
Government	0.60
Total	**5.60**

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 loan, and (ii) a proposed grant, both to the Kingdom of Tonga for the additional financing of the Outer Island Renewable Energy Project.[1]

2. The proposed additional financing will support the scaling up of the current project by 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.

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) grids in 2016 was about 11.1 megawatts, and yearly demand totaled about 55 gigawatt-hours.[2] An estimated 13 million liters of diesel were 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 total value of 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 original 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 became effective in June 2014. The original project planned to (i) construct and install solar power systems with a total capacity of 1.32 megawatt-peak; (ii) provide operation and maintenance training and knowledge transfer to the implementing agencies for at least 5 years after commissioning of the solar systems, including development of a program manual for operation and maintenance of solar generation and distribution systems; and (iii) assist the implementing agencies to implement the project in an efficient and effective manner by recruiting project management consultants for at least 5 years after commissioning of the solar systems.

5. The original project encountered initial implementation delays for a variety of reasons, including significant damage caused by the most powerful storm ever recorded in Tonga.[3] 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 damaged electricity network and school facilities on the island group. After ADB approved

[1] 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 to the Kingdom of Tonga for the Outer Island Renewable Energy Project*. Manila.

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

[3] 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.

the Cyclone Ian Recovery Project in May 2014, activities on the original project resumed, and the government requested ADB's support to rehabilitate TPL's power distribution system on 'Eua and Vava'u. [4]

6. The power distribution system (grid) is part of the electricity supply chain and requires considerable investment and operation and maintenance 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%, yet the rate is more than twice as high in Tonga at 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 paramount importance for the government.

7. To address dual challenges of reducing high technical losses and incorporating climate resilience features for the grids in the outer islands of Tonga, ADB approved the first additional financing on 20 October 2015, which became effective on 30 November 2015. Under the first additional financing, 80% of the existing grid network on 'Eua and 20% of existing grid network on Vava'u are being rehabilitated and upgraded. [5] The current project, [6] especially the grid-rehabilitation component, will allow Tonga to reduce power distribution losses and fuel consumption while delivering the same amount of electricity to consumers; and improve the climate resilience feature of TPL's grids. This will be achieved by rehabilitating old and inefficient grid assets, i.e., cables, poles, distribution transformers, and switchgears.

8. To expand the scale of the current project and deliver increased benefits by reducing power distribution losses, the government has asked ADB for a loan and a grant of $2.5 million each from ADB's Special Funds (Asian Development Fund) resources[7] to expand the ongoing grid network upgrading and rehabilitation works in (i) 'Eua from 80% to 100% of the existing grid network; and (ii) Vava'u from 20% to 50% of the existing grid network.[8]

9. The current project meets all the eligibility criteria for additional financing. 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 September 2016, (i) cumulative contract awards for the current project is at $9.8 million, or 80.0% of ADB financing; and (ii) cumulative disbursements for the current project has reached $4.3 million, or 30% of ADB financing. The current project has also conducted all necessary safeguards due diligence

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

[5] ADB. 2015. *Report and Recommendation of the President to the Board of Directors: Proposed Grant and Administration of Grant for Additional Financing to the Kingdom of Tonga for the Outer Island Renewable Energy Project*. Manila. ADB and the Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas provided $2.19 million and the European Union provided €3.00 million, all on a grant basis. TPL will provide $0.67 million as an in-kind contribution.

[6] The current project includes the original project and the first additional financing.

[7] 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 50:50 of its Asian Development Fund allocation as a loan and a grant.

[8] The first additional financing only covers 80% of existing grid networks on 'Eua and 20% of existing grid networks on Vava'u due to the limited Asian Development Fund allocation for Tonga in 2015. In early 2016, the government requested to allocate some remaining 2016 Asian Development Fund allocation to expand the project scope on both islands.

and is noted to be in compliance with ADB's Safeguard Policy Statement (2009). Since the third quarter of 2015, the current project has been rated *on track* in the project performance rating system and is, therefore, considered to be a well-performing project.[9] Project performance and associated issues are described in more detail in the summary of project performance.[10]

10. 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.[11] It is included in ADB's Tonga draft Country Operations Business Plan, 2017–2019, which makes energy a priority area of support and sets a primary goal of reducing the country's dependence on imported fossil fuels through energy efficiency and conservation operations, including support for power generation from renewable energy sources. [12]

11. 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 impact and outcome of the project, as well as ADB's contribution to power sector development in Tonga.

B. Impact and Outcome

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

C. Outputs

13. Output 1 under the current project is the construction and installation of solar power systems with a total capacity of 1.32 megawatt-peak on nine outer islands and the rehabilitation by TPL of the existing grid network on the islands of Vava'u and 'Eua by replacing cables, poles, distribution transformers, switchgears, and other equipment. Under the proposed additional financing, the rehabilitation by TPL of the existing grid network will be expanded in (i) 'Eua from 80% to 100% of the existing grid network and (ii) Vava'u from 20% to 50% of the existing grid network. The current output 2 and output 3 will remain unchanged with the additional financing.

D. Investment and Financing Plans

14. The additional financing will be provided through a loan of SDR1.809 million ($2.5 million equivalent) and a grant of $2.5 million from ADB's Special Funds resources as well as an additional contribution from TPL of $0.60 million. This will raise investments by about 42% from

[9] ADB. 2011. Additional Financing. *Operations Manual.* OM H5/OP. Manila. The current project was performing well for longer than 12 months before the cross-departmental circulation of Report and Recommendation of the President to the Board of Directors.
[10] Summary of Project Performance (accessible from the list of linked documents in Appendix 2).
[11] ADB. 2009. *Energy Policy*. Manila.
[12] ADB. Forthcoming. *Country Operations Business Plan: Tonga, 2017–2019*. Manila.

the $13.23 million for the current project to $18.83 million for the overall project. The revised investment plan is in Table 1.

Table 1: 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		6.17
2. Administrative costs	0.30		0.30
3. Goods, works, and services (power distribution network)	5.97	4.94	10.91
Subtotal (A)	**12.44**	**4.94**	**17.38**
B. Contingencies[d]	0.79	0.49	1.28
C. Financing Charges		0.17	0.17
Total (A+B+C)	**13.23**	**5.60**	**18.83**

[a] Comprising (i) $3.44 million grants from ADB's Asian Development Fund; (ii) A$4.50 million grant from the Government of Australia, administered by ADB; (iii) €3.00 million grant from the European Union; (iv) $0.75 million grant from the Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas, and (iii) the government's contribution of $0.97 million as an in-kind contribution.
[b] ADB will provide a loan of SDR1.809 million and a grant of $2.50 million. Tonga Power Limited will provide $0.60 million as an in-kind contribution.
[c] In 2016 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.

15. The government has requested an additional (i) loan in various currencies equivalent to SDR1.809 million, ($2.5 million equivalent); and (ii) grant not exceeding $2.50 million equivalent, both from ADB's Special Funds resources (Asian Development Fund) to help finance the project.[13] The loan will have a 32-year term, including a grace period of 8 years, an interest rate of 1.0% per annum during the grace period and 1.5% per annum thereafter (the interest during construction as applicable to be capitalized in the loan), and such other terms and conditions set forth in the draft financing and project agreements.

16. Tonga is an Asian Development Fund 50:50 (loan: grant) eligible country. The grid rehabilitation work in outer islands is largely driven by the government's priority to (i) reduce Tonga's fuel consumption for power generation by reducing technical losses; (ii) improve the overall climate resilience features of Tonga's power distribution network; and (iii) extend the network rehabilitation to remote parts of the country. TPL would be unlikely to undertake the proposed grid rehabilitation on a commercial basis as it offers only marginal commercial incentive. Therefore, the government has decided to provide the loan and grant proceeds to TPL as a grant and will make the proceeds of the loan and grant available to TPL under a subsidiary financing agreement upon terms and conditions satisfactory to ADB.[14] The revised financing plan is in Table 2.

[13] Additional Financing will cover the cost of all works and associated services for upgrading the existing power distribution networks.
[14] A new subsidiary financing agreement is expected to be signed after approval of the proposed additional financing. In addition to the proposed additional financing, the government also requested for ADB's funding support of $8.0 million in grant and loan for TPL's proposed 6-megawatt solar project development. However, since this will be a commercially driven project, the government will on-lend the entire $8.0 million to TPL as 100% loan. This funding is expected to be processed in 2017.

Table 2: Revised Financing Plan
($ million)

Source	Current[a] Amount	Current[a] Share of Total (%)	Additional Financing Amount	Additional Financing Share of Total (%)	Total Amount	Total Share of Total (%)
Asian Development Bank	**3.44**	**26.0**	**5.00**	**89.2**	**8.44**	**44.8**
Special Funds resources: ADF (grant)	3.44	26.0	2.50	44.6	5.94	31.5
Special Funds resources: ADF (loan)			2.50	44.6	2.50	13.3
Government of Australia[b]	4.50	34.0			4.50	23.9
European Union[c]	3.57	27.0			3.57	19.0
Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas	0.75	5.7			0.75	4.0
Government of Tonga[d]	0.97	7.3	0.60	10.7	1.57	8.3
Total	**13.23**	**100.0**	**5.60**	**100.0**	**18.83**	**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] As per the Electricity Amendment Act 2010, dated 24 September 2010, all plant and machinery required for setting up a power plant in Tonga is exempted from all kinds of taxes and duties. Government in-kind contribution, $0.30 million, will be in administration costs; included exemption from income taxes (other than citizens or nationals of the recipient country) on salaries, consulting fees and benefits. Tonga Power Limited will provide $1.27 million as its in-kind contribution for additional financing.
Source: Asian Development Bank estimates.

E. Implementation Arrangements

17. The government will be the loan and grant beneficiary. The executing agency will be the Ministry of Finance and National Planning (MFNP). TPL will be the implementing agency of the grid rehabilitation component to be financed by the proposed additional financing. The Energy Department under the Ministry of Meteorology, Energy, Information, Disaster Management, Climate Change, and Communications will be the implementing agency for the mini and off-grid solar component of the overall project. The existing project steering committee will remain for the implementation of the overall project, including the proposed power distribution network.

18. 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, updated for the additional financing are summarized in Table 3 and described in detail in the project administration manual.[15]

[15] The revised financing arrangement will be effective upon effectiveness of the financing and project agreements for the additional financing. 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		
Loan and grant closing dates	30 June 2020		
Management			
(i) Oversight body	Outer Island Renewable Energy Project Steering Committee 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 roadmap implementing unit (members)		
(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 (additional financing)[a]	ICB	1 contract	$2.30 million
	NCB	1 contract	$0.80 million
	Shopping	5 contracts	$0.37 million
	Direct contracting[b]	1 contract	$0.42 million
	Force accounts[c]	1 contract	$0.44 million
Retroactive financing and/or advance contracting	Advance contracting will be undertaken.		
Disbursement	All loan and grant proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (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 the existing contractor will be used for the procurement of electric equipment to ensure the standardization with existing equipment.

[c] The proposed additional grant and loan 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 and the current project on 'Eua and Vava'u, using force account.

Source: Asian Development Bank.

III. DUE DILIGENCE

A. Technical

19. 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 the current project and ADB's Cyclone Ian Recovery Project. The selection of equipment has been carefully analyzed based on best engineering practices. The equipment is specifically designed 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 lifecycle.

B. Economic and Financial

20. The proposed power distribution network to be funded by the additional financing is considered financially viable because the estimated financial internal rate of return (FIRR) of (4.69%) is greater than the weighted average cost of capital (WACC) of 4.13%. The overall project is considered to be financially feasible since the FIRR is 4.30%, greater than the WACC (3.60%). The overall project was financially feasible under all the scenarios tested, with the FIRR remaining greater than WACC or very close to WACC.[16]

21. The additional financing is also considered economically viable, since the estimated economic internal rate of return (EIRR) of 10.39% is within the acceptable level between 10% and 12%, with unvalued benefits that are expected to exceed unvalued costs. The EIRR of 12.25% for the overall project including the proposed additional financing is greater than the economic discount rate of 12%. Under several adverse scenarios during sensitivity testing, the overall project has maintained an acceptable level of EIRR between 10% and 12% with unvalued benefits that are expected to exceed unvalued costs. Thus, the project is considered economically feasible.

C. Governance

22. **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 under the original project concluded that Tonga's public financial management system is based on a sound legal and regulatory framework and underpinned by a set of well-established expenditure control procedures that cover wages and salaries, non-salary items, and procurement.[17]

23. **Procurement.** The project management consultant has assisted the implementing agencies in procuring all project goods, works, and services under the current project. 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 international competitive bidding, 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. Direct contracting with the existing contractor will be used for procurement of electric equipment to ensure compatibility with the existing equipment, such as cables and transformers. Direct contracting will also minimize the time for the supply and delivery of equipment and its subsequent installation by TPL. Completion of 20% of the remaining works will ensure the timely commissioning of the grid to supply power to the population of the outer islands. The proposed additional grant and loan will finance the incremental labor costs of TPL to carry out construction and rehabilitation of high-voltage and low-voltage power distribution network on 'Eua and Vava'u islands. The force account is proposed because the number of works is small (about $0.40 million) and scattered across the islands. TPL has been successfully implementing similar works under previous projects and it is capable of carrying out the construction without disrupting the grid's functioning. The use of

[16] While the FIRRs are below the WACC under a couple sensitivity cases, the EIRRs of the overall project are on feasible levels, and are considered justified on economic grounds.
[17] Government of Tonga. 2010. *Public Financial Management Performance Report*. Nuku'alofa.

direct contracting and force account has been justified based on ADB's Procurement Guidelines.[18]

24. Advance contracting for some packages using international competitive bidding, national competitive bidding, shopping, and direct contracting methods will be undertaken in conformity with ADB's Procurement Guidelines (2015, as amended from time to time). 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, MFNP, and TPL. The specific policy requirements and supplementary measures are described in the project administration manual.

D. Poverty and Social

25. The primary beneficiaries of the overall project will be the people of the outer islands of Tonga who will benefit from an alternative, cheap, and reliable means of power supply. They will include low-income households relying on existing lifeline electricity tariffs. Under the proposed additional financing, the people of 'Eua and Vava'u will particularly gain from reliable electricity supply. It is expected to result in more efficient electricity consumption and provide incentives to households and local businesses to maximize power supply for income-generating and productive activities. Provision of social services, such as health and education, are also expected to improve through consistent power supply.

26. Rural women in Tonga perform multiple roles often with limited resources and challenging work environments, such as lack of access to electricity. The provision of an affordable, reliable power supply to beneficiary households will enable women to perform their roles more efficiently. The women's lack of opportunities for paid employment (51% women employment in 'Eua and 53% in Vava'u) would also be potentially addressed by growth in enterprises dependent on reliable electricity supply and employment opportunities during project implementation. The activities proposed under the additional financing will not require any changes to the existing gender action plan of the overall project, which is categorized as *effective gender mainstreaming*. The project management consultant with the assistance from the gender focal points from TPL and the Ministry of Meteorology, Energy, Information, Disaster Management, Climate Change, and Communications will continue to satisfactorily implement the proposed activities and targets under the gender action plan.[19] TPL has successfully brought to the current project sites, 8 women out of 15 trained workers. Four of these women previously completed the same tasks on Ha'apai under the Cyclone Ian Recovery Project. TPL's effort may create a long-term employment opportunity for these female workers. The implementation progress of the gender action plan will continue to be reported quarterly to ADB and the government.

[18] The guidelines state, in paras. 3.6 to 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.

[19] It will actively promote the involvement of women in employment such as hiring at least 30% women in local construction contracts and 50% female participation in training rolled out during project implementation.

E. Safeguards

27. **Environment**. The two areas to be affected by activities under the additional financing are classified as *category B* for the 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.

28. **Involuntary resettlement and indigenous peoples**. The proposed additional financing is *category C* for involuntary resettlement and indigenous peoples per ADB's Safeguard Policy Statement (2009). The increased rehabilitation of the grid in 'Eua and Vava'u will be carried out through the replacement of existing power distribution assets located on public land. The due diligence, including stakeholder consultations, confirmed that it will not require any additional land, displace people, and impact on any assets and livelihood. No distinct and vulnerable indigenous peoples will be affected. All the activities in the overall project will be implemented in a culturally appropriate and participatory manner.

F. Risks and Mitigating Measures

29. 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.[20]

IV. ASSURANCES

30. The government, the MFNP, and TPL have assured ADB that implementation of the project shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the project administration manual and the loan and grant documents.

31. The government, the MFNP, and TPL have agreed with ADB on certain covenants for the project, which are set forth in the financing agreement and project agreement.

V. RECOMMENDATION

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

(i) the loan in various currencies equivalent to SDR1,809,000 to the Kingdom of Tonga for the additional financing of the Outer Island Renewable Energy Project, from ADB's Special Funds resources, with an interest charge at the rate of 1.0% per annum during the grace period and 1.5% per annum thereafter; for a term of 32 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft financing and project agreements presented to the Board; and

(ii) the grant not exceeding $2,500,000 to the Kingdom of Tonga, from ADB's Special Funds resources, for the additional financing of the Outer Island Renewable Energy Project, on terms and conditions that are substantially

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

in accordance with those set forth in the draft financing agreement presented to the Board.

Takehiko Nakao
President

18 November 2016

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 2020: At least 2,103 MWh 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 Niuas. About 2,010 tons of annual carbon dioxide emissions are avoided: 'Eua and Ha'apai – 1,380 tons; Ha'apai outer islands and Niuas – 630 tons. (Baseline: None).	TPL annual report TPL annual report	The site selection process is politicized. Environmental issues delay implementation.
Overall project Unchanged	**Overall project** Overall, about 2,483 MWh of solar electricity (2,103 Mwh original project + 380 MWh additional financing)supplied to customers annually. Overall, about 2,310 tons (2,010 tons original project + 300 tons additional financing) of annual carbon dioxide emissions are avoided.		
Outputs **Output 1** **Current project** The project will construct and install solar power systems with a total capacity of 1.32 MWp on nine outer islands of Tonga, and the existing grid network on the islands of Vava'u and 'Eua	1a. **Current project** By the end of 2017: (i) solar photovoltaic generators are installed and 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 installed and connected to existing	1a. 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.

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
rehabilitated by TPL.	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); (iii) installation of 23 kWp SHS capacity in Niuafo'ou and 160 kWp SHS in Niuatoputapu; (iv) rehabilitation of 80% of existing grid networks on 'Eua and 20% on Vava'u. At least 65 households headed by women in Ha'apai outer islands (50 households) and Niuas (15 households) will benefit from the project. (Baseline: all 350 existing households) Women make up a targeted 30% of the workforce for local construction contracts for solar power installations.		The project management unit is not established in a timely manner and has rapid staff turnover. Counterpart staff lack of interest in O&M training. Counterpart staff and communities lack interest in the training program. Counterpart support, performance, and coordination are weak and inadequate.
Overall project In addition to the current project output 1, the rehabilitated grid network portions on Vava'u and 'Eua are expanded.	**Overall project** By the end of 2019: Output 1: Original Project: Construct and install 1.32 MWp solar system (output indicators (i)-(iii) on nine outer islands Additional Financing: Rehabilitation of 100% of the existing grid system on 'Eua and 50% on Vava'u.		
Output 2 **Current project** O&M knowledge transferred through training.	2a. **Current project:** By the end of 2019: (i) the manual for solar electric equipment is finalized; (ii) knowledge of solar electric and hybrid equipment is transferred in the 5 years after commissioning of the systems.	2a. Project progress reports, TPL annual report, training attendance sheets, and ADB's project completion report Annual asset maintenance plan	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Overall project Unchanged	**Overall project** Unchanged		
Output 3 **Current project** Project implemented and managed efficiently.	3a. **Current project** By the end of 2019: (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 financial and procurement specialist, and one social safeguards specialist; (ii) continuous capacity building program conducted for each group of islands for 5 years after systems commissioned. Training includes: (i) project planning and asset management and maintenance for the staff of the Energy Department and TPL and existing community electric societies (with an expected minimum 50% female participants); (ii) procurement, anticorruption, safeguards, and O&M training for solar–diesel hybrid energy systems (expected minimum of 50% female participants); (iii) asset management concepts, theories, and practical project applications for the staff of TPL and electric societies; (iv) asset management program for staff of TPL and electric societies (expected minimum of 10% female participants);	3a. Project progress reports, TPL annual report, semiannual safeguards monitoring reports, training attendance sheets, and ADB's project completion report	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	(v) efficient use by management of solar power services for customers of TPL and electric societies; (vi) consumer training on power budget management for each of the nine outer islands (expected minimum of 50% female participants); and (vii) demand-side management for customers of TPL and electric societies (expected minimum of 50% female participants).		
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 (Jan–May 2015) (complete)
1.2 Carry out tender process for turnkey contract (package 2) for 0.57 MWp mini off-grid solar photovoltaic system (Sep 2016–Jan 2017) (changed)
1.3 Evaluate and report on bids, and award contracts: package 1 (Jun–Dec 2015) (complete)
1.4 Evaluate and report on bids, and award contracts package 2 (Jan–May 2017) (changed)
1.5 Install, test, and commission systems, including trial operation of on-grid solar photovoltaic plants (Apr –Dec 2016) (changed)
1.6 Install, test, and commission systems, including trial operation of mini and off-grid solar photovoltaic system (Jun 2017–Jun 2018) (changed)
1.7. Carry out tender process for rehabilitation of power distribution network on ‘Eua and Vava’u: (Jan 2016–Dec 2017) (changed)
1.8 Install, test, and trial operation of the rehabilitated power network (Jan 2016–Dec 2019) (changed)

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 (Q1 2017–Q4 2019) (changed)

3. Provide efficient project implementation and management.
3.1 Recruit and field PMC team (Q1 2014) (complete)
3.2 Prepare detailed project implementation schedule, technical designs, safeguards, and gender action plan components (Q3 2014–Q2 2017) (changed)
3.3 Develop and implement a capacity-strengthening program for staff of Energy Department, TPL, community electricity societies, and TPL customers (every year until 2019).
3.4 Evaluate training programs and report (once a year until 2019)
3.5 PMC teams prepare final report after 5 years of activities (Q4 2019)

Inputs

ADB:	$3.44 million (current) $5.00 million (additional) $8.44 million (overall)

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Government of Australia:	$4.50 million (current) $0.00 (additional) $4.50 million (overall)		
European Union:	$3.57 million (current) $0.00 million (additional) $3.57 million (overall)		
Second Danish Cooperation Fund for Renewable Energy and Energy Efficiency for Rural Areas:	$0.75 (current) $0.00 million (additional) $0.75 million (overall)		
Government of Tonga:	$0.97 million (current) $0.60 million (additional) $1.57million (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.

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Director General
Pacific Department

LIST OF LINKED DOCUMENTS
http://www.adb.org/Documents/RRPs/?id=43452-024-2

1. Financing Agreement
2. Project Agreement
3. Sector Assessment (Summary): Energy
4. Project Administration Manual
5. Summary of Project Performance
6. Contribution to the ADB Results Framework
7. Development Coordination
8. Financial Analysis
9. Economic Analysis
10. Country Economic Indicators
11. Summary Poverty Reduction and Social Strategy
12. Gender Action Plan
13. Initial Environmental Examination: ‘Eua Island
14. Initial Environmental Examination: Vava’u Island
15. Risk Assessment and Risk Management Plan