

SECTOR ASSESSMENT (SUMMARY): ENERGY**1. Sector Performance, Problems, and Opportunities**

1. The Pacific Renewable Energy Investment Facility will finance a series of individual small-value renewable energy projects in the 11 smaller Pacific island countries (PIC-11), which have a combined population of fewer than 1.5 million people.¹ The PIC-11 are members of Small Island Developing States (SIDS), which tend to share similar development challenges, including small populations, limited resources, remoteness, susceptibility to natural disasters, vulnerability to external shocks and excessive dependence on international trade.

2. Overreliance among the PIC-11 on diesel for power generation has resulted in high power tariffs (by international standards), with an average across the PIC-11 of \$0.53 per kilowatt-hour.² This negatively impacts economic growth. The PIC-11 are the smallest developing member countries of the Asian Development Bank (ADB), and their overreliance on imported fuel depletes limited foreign reserves and exposes their economies to diesel price shocks. In response, the PIC-11 have recognized the need to structurally shift power generation from diesel to renewable energy and all have aggressive renewable energy targets of 20% to 100%.

3. Due to the small size of the economies and isolated nature of the islands, the electricity grids of the PIC-11 are relatively small, with peak loads ranging from 0.8 megawatts (MW) to 22.8 MW across 16 separate power utilities in each of the 11 countries, and a combined peak load of 106 MW.³ The PIC-11 are highly dependent on diesel power generation, with only 8.9% of electricity generation coming from renewable energy. However, renewable energy penetration is variable, and 10 of the 16 power utilities in the PIC-11 have less than 1% penetration.⁴ The highest penetration is in Samoa with 26% integration of renewable energy. The PIC-11 are making small but important investments in renewable energy, but progress is slow, as summarized in Table 1.

Table 1: Installed Renewable Energy Generation in the 11 Smaller Pacific Island Countries, 2007–2016
(megawatts)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1. Cook Islands	0	0	0	0	0	0	1	2	2	3
2. Kiribati	2	2	2	2	2	2	2	2	2	3
3. Marshall Islands	0	0	0	0	0	0	1	1	1	2
4. Federated States of Micronesia	0	0	1	1	1	1	1	1	1	1
5. Nauru	0	0	0	0	0	0	0	0	0	1
6. Palau	0	0	0	0	1	1	1	1	1	1
7. Samoa	13	13	13	13	13	13	13	16	16	20
8. Solomon Islands	0	0	0	0	1	1	1	2	2	3
9. Tonga	0	0	0	0	1	2	2	2	3	3
10. Tuvalu	0	0	0	0	0	0	0	0	1	1
11. Vanuatu	1	4	4	4	4	4	7	7	7	8
Total	16	19	20	20	23	24	29	34	36	46

Source: International Renewable Energy Agency. 2017. *Renewable Capacity Statistics 2017*. Abu Dhabi.

4. All power utilities are corporatized state-owned enterprises with the exception of Vanuatu, where there are two private sector concessions. The PIC-11 are endowed with cost-competitive

¹ The PIC-11 comprise the Cook Islands, Kiribati, the Marshall Islands, the Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu.

² Based on 500 kilowatt-hours of consumption per month. Pacific Power Association. 2016. *Performance Benchmarking Report for Pacific Power Utilities, 2014 Fiscal Year*. Sydney.

³ For comparison, the peak load is 210 MW in Papua New Guinea and 161 MW in Fiji.

⁴ Pacific Power Association. 2016. *Performance Benchmarking Report for Pacific Power Utilities, 2014 Fiscal Year*. Sydney

renewable energy resources, but uptake is restricted by lack of funding, capacity barriers, limited private sector investment, and the requirement for sector reform.

5. **Capacity barriers.** Due to the small size of the countries, the government energy units and public utilities have relatively low capacity in managerial and technical decision making. Policy making and coordination of investments are managed by small government energy units, which have low capacity to manage the power sector and absorb donors' support. Further, utilities suffer from a drain of qualified personnel. As a consequence, they develop generalist staff who are experienced in basic power systems but have limited experience in major projects.

6. **Lack of funding.** Rapidly migrating the PIC-11 power sector from diesel to renewable energy will require substantial investments in a short period of time. The ability of the PIC-11 to access public financing for such investments is limited. Current available resources are insufficient to finance the structural shift from diesel generation to renewable energy. The governments of the PIC-11 therefore recognize the need for scaling up private sector investment.

7. **Limited private sector investment.** While there is a growing demand for independent power producers, investors are deterred by small project size, poor financial performance of power utilities (off-taker risk), and perceived political risk.

8. **Sector reform.** While the PIC-11 have undertaken a range of sector reform, additional reform is required across a range of areas to support sustainable development challenges. These include utility reform, regulatory reform to encourage private sector participation, and tariff reform in some countries. For example, although larger countries in the Pacific set tariffs independent of utilities, in the smaller countries the tariffs are typically set by the utility boards. Setting tariffs that do not allow cost recovery sometimes occurs, which results in underinvestment in maintenance and requires premature asset replacement.

2. Regional Sector Strategy

9. **ADB Pacific Approach 2016–2020.** ADB's strategic approach to addressing the unique development challenges in the PIC-11 is outlined in the Pacific Approach.⁵ This includes providing stronger, better, and faster delivery of energy services through (i) higher levels of financial assistance, (ii) expanded use of regional approaches, (iii) increased support for the private sector, (iv) faster delivery mechanisms, and (v) improved sharing of knowledge.

10. **Framework for Action on Energy Security in the Pacific.** The facility will support implementation of the regional Framework for Action on Energy Security in the Pacific (FAESP), which was endorsed by Pacific leaders in 2010.⁶ The FAESP outlines a regional energy plan to achieve secured supply, efficient production, and use of energy for sustainable development. Commitments to achieving regional sector reform, as articulated under the FAESP, are detailed in national sector policies. The facility will help the PIC-11 implement the regional policies under the FAESP as well as national commitments.

11. **National road maps.** Each of the PIC-11 has an individual energy sector road map that details national commitments to achieving regional targets established in the FAESP (Table 2).

⁵ ADB. 2016. *Pacific Approach, 2016–2020*, Manila. The Pacific Approach is the equivalent of a country partnership strategy for the PIC-11.

⁶ Secretariat of the Pacific Community. 2011. *Framework for Action on Energy Security in the Pacific, 2010–2020*. Suva. The FAESP was endorsed by Pacific island leaders at the 41st Pacific Islands Forum, Vanuatu, 4–5 August 2010. The FAESP will be updated in 2019 to cover the period 2020–2030.

Table 2: 11 Smaller Pacific Island Countries Energy Sector Road Maps

	Country	Road Map
1.	Cook Islands	Cook Islands Renewable Energy Chart, 2011–2020
2.	Kiribati	Energy Policy, 2009
3.	Marshall Islands	National Energy Policy and Energy Action Plan, 2009
4.	Federated States of Micronesia	Energy Policy (2012) and State Energy Action Plans, 2013
5.	Nauru	Nauru Energy Road Map, 2014–2020
6.	Palau	Palau National Energy Policy, 2010
7.	Samoa	Samoa Energy Sector Plan, 2012–2016
8.	Solomon Islands	National Energy Policy Framework, 2007
9.	Tonga	Tonga Energy Road Map, 2010–2020
10.	Tuvalu	Plan for Renewable Electricity and Energy Efficiency in Tuvalu, 2012
11.	Vanuatu	Vanuatu National Energy Road Map, 2013–2020

Source: Asian Development Bank.

3. ADB Sector Experience and Assistance Program

12. ADB has strong experience in delivery of energy sector projects in the Pacific, with an existing portfolio of 11 projects (worth about \$244 million) (Table 3) and a growing pipeline of 14 projects (worth about \$377 million) (Table 4).

Table 3: ADB Current Portfolio, Pacific Energy Sector (\$ million)

	Country	Project	ADB	Cofinancing	Government	Total
1	Nauru	Electricity Supply Security	2.00	7.44	0.84	10.28
2	Federated States of Micronesia	Yap Renewable Energy Development	9.04	0.00	2.12	11.16
3	Samoa	Power Sector Expansion	42.00	46.0	12.00	100.00
4	Samoa	Renewable Energy Development	18.21	8.55	5.83	32.59
5	Solomon Islands	Provincial Renewable Energy	12.00	0.00	3.00	15.00
6	Solomon Islands	Solar Power Development	2.24	6.20	6.76	15.20
7	Tonga	Cyclone Ian Recovery	4.52	4.27	1.91	10.70
8	Tonga	Outer Island Renewable Energy	8.44	8.82	1.57	18.83
9	Cook Islands	Renewable Energy Sector Project	11.19	11.52	7.14	29.85
10	Nauru	Tariff and Subsidy Policy Reform	0.23	0.00	0.00	0.23
11	Marshall Islands	Majuro Network Strengthening	0.00	0.69	0.01	0.70
			109.87	93.49	41.18	244.54

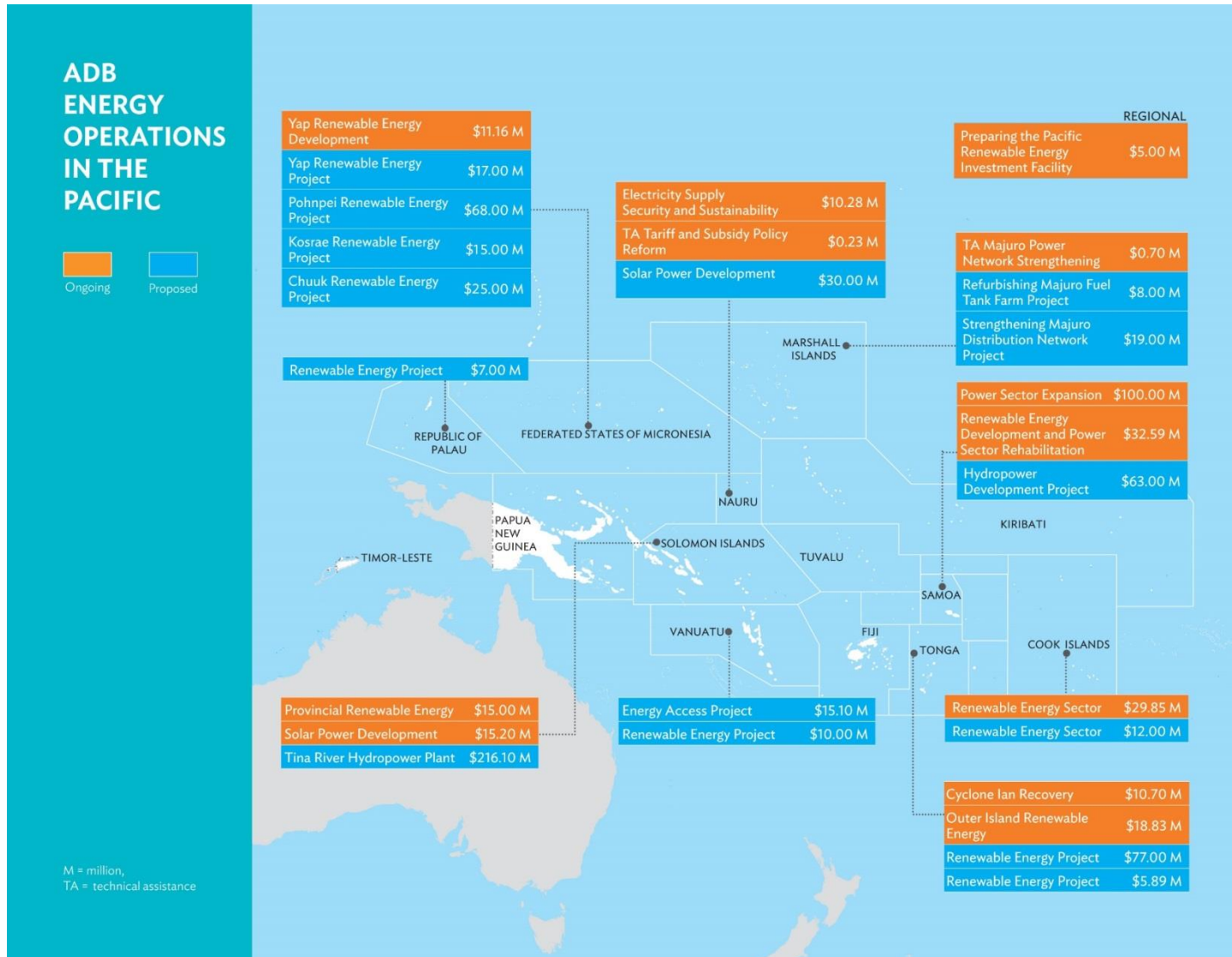
ADB = Asian Development Bank. Source: Asian Development Bank

Table 4: ADB Projected Portfolio, Pacific Energy Sector (\$ million)

	Year	Country	Project	ADB	Cofinancing	Government	Total
1	2017	Cook Islands	Renewable Energy Project	0.00	12.00	4.00	16.00
2	2017	Tonga	Renewable Energy Project	14.00	60.00	3.00	77.00
3	2017	Tonga	Renewable Energy for Outer Islands	3.00	4.00	0.00	7.00
4	2017	Marshall Islands	Majuro Tank Farm Project	7.00	0.00	1.00	8.00
5	2017	Vanuatu	Energy Access Project	5.00	7.00	3.10	15.10
6	2018	Federated States of Micronesia	Yap Renewable Energy Project (Phase 2)	1.00	15.00	1.00	17.00
7	2018	Federated States of Micronesia	Pohnpei Renewable Energy Project	1.00	55.00	12.00	68.00
8	2018	Federated States of Micronesia	Kosrae Renewable Energy Project	1.00	13.00	1.00	15.00
9	2018	Federated States of Micronesia	Chuuk Renewable Energy Project	1.00	23.00	1.00	25.00
10	2018	Marshall Islands	Majuro Distribution Project	2.00	16.00	1.00	19.00
11	2018	Samoa	Hydropower Development	10.00	48.00	5.00	63.00
12	2019	Nauru	Solar Power Development	4.00	24.00	2.00	30.00
13	2019	Palau	Renewable Energy Project	6.00	1.00	0.00	7.00
14	2019	Vanuatu	Renewable Energy Project	7.00	3.00	0.00	10.00
				59.00	277.00	34.10	377.10

ADB = Asian Development Bank.
Source: Asian Development Bank.

Figure 1: ADB Energy Operations in the Pacific



ADB = Asian Development Bank, M = million
 Source: Asian Development Bank

Problem Tree for Energy Sector

