SECTOR ASSESSMENT (SUMMARY): ENERGY[1]

Sector Road Map

A. Sector Performance, Problems, and Opportunities

1. The Electric Power Corporation (EPC) is a wholly owned government corporation responsible for the generation, transmission, distribution, and retail of electricity in Samoa. It operates as a corporatized entity under the Public Bodies Act, 2001. EPC services about 26,730 residential customers on Upolu and 7,238 residential customers on Savai'i, and about 97% of the population has access to electricity.

2. EPC operates separate power grids on Upolu (89.8% of energy generated) and Savai'i (10.2% of energy generated) and has a small solar power system on Apolima (<0.1% of energy generated).

3. The electricity tariff in Samoa consists of a base tariff and a variable fuel surcharge that adjusts monthly based on fluctuations in the price of diesel. In November 2012, domestic customers were charged $0.36 for the first 50 kilowatt-hours (kWh) and $0.42 for each kWh in excess of 50, based on a monthly billing cycle. All other EPC customers (commercial and government) were charged at 0.42/kWh.

4. **Generation and distribution in Upolu.** Maximum demand on Upolu is about 18 megawatts (MW), with a minimum demand of about 8 MW. Losses (both technical and nontechnical) are estimated at 17.8%. In Upolu, EPC owns and operates a single diesel generating station in Fiaga, with four new 5.77 MW base load diesel generators. The generators, installed in early 2013, have upgraded the facility's fuel efficiency to 4.474 kWh per liter—a significant improvement from system-wide engine efficiencies of 3.784 kWh per liter from December 2011 to November 2012. This increased efficiency is estimated to reduce fuel usage by 2.2 million liters per year, which would result in an estimated annual fuel saving of $2.87 million.

5. EPC also operates five hydropower plants at Alaoa, Samasoni, Fale o le Fee, Lalomauga, and Taelefaga, for a combined installed capacity of 11 MW. The Taelefaga hydropower station has a pair of 2 MW hydro turbines, with a total installed capacity of 4 MW. This station is located on the coast of Fagaloa Bay and uses river flow from the Afulilo River basin, which is fed by a dam reservoir. The other stations are run-of-river facilities that utilize the natural flow of the rivers and small head ponds.

6. Given the limited water storage capacity, the amount of electricity generated from hydropower annually is heavily dependent on rainfall levels. There are two distinct seasons in Samoa—a wet season from November to April and a dry season from May to October. About 75% of total annual rainfall occurs during the wet season. The hydropower stations generated 38.5% of the electricity produced in 2012.

7. **Generation and distribution in Savai'i.** The island of Savai'i accounts for about 10% of Samoa's annual electricity generation. Maximum demand on Savai'i is around 2.8 MW, with a

[1] This summary is based on ADB. 2012. *Technical Assistance to Samoa for Preparing the Renewable Energy Development and Power Sector Rehabilitation Project.* Consultant's report. Manila (TA-8308). Available on request.

minimum current demand of about 0.6 MW. The entirety of the Savai'i peak load is generated by the six diesel generators at Salelologa.

B. Government's Sector Strategy

8. Energy policy in Samoa is the responsibility of the Ministry of Finance, through its Energy Division. In 2012, the Government of Samoa adopted the new Energy Sector Plan, 2012–2016. The plan provides a comprehensive strategy for the energy sector to deliver outcomes consistent with the overarching Strategy for the Development of Samoa, 2012–2016 and its vision of Improved Quality of Life for All. The plan underscores the link between development and the availability of efficient, reliable, safe, affordable, and sustainable electricity services.

9. The plan's vision is sustainable energy supply, and it highlights the need to reduce dependence on imported fossil fuels, develop indigenous renewable energy sources, and enhance energy efficiency. To deliver on its goals in the electricity subsector, the plan focuses on (i) strengthening service delivery focused on end users, (ii) setting an appropriate tariff structure, (iii) continuing to encourage private sector involvement in electricity production, (iv) promoting electricity generation from proven renewable energy technologies, (v) promoting demand- and supply-side management strategies for all consumers and EPC, (vi) promoting energy efficiency strategies across all consumer sectors, and (vii) reducing greenhouse gases through renewable energy.

C. ADB Sector Experience and Assistance Program

10. The Asian Development Bank (ADB) has recent experience in supporting the energy sector in Samoa through the Power Sector Expansion Project.[2] This project received cofinancing from the Australian Agency for International Development (AusAID) and Japan Bank for International Cooperation (JBIC), and was designed to support EPC's identified generation and infrastructure investment plan for 2008–2016. EPC's investment plan was comprised of a series of individual subproject investments in power generation and transmission. The Project will improve the capacity of the power sector to meet growing electricity demand and improve quality, reliability, and cost-effectiveness of power supply by (i) improving the financial performance of EPC, (ii) supporting EPC's investment plan to meet growing demand, (iii) improving the operational efficiency of EPC, and (iv) establishing effective regulation of the power sector.

11. The Power Sector Expansion Project has improved governance in the electricity subsector and modernized the electric infrastructure of Samoa. EPC had a poor financial track record but its sustainability has been enhanced since 2009 thanks to the introduction of a two tranche tariff (base charge plus fuel surcharge) and a prepayment metering system. The project is in line with ADB's country operations business plan, 2014–2016 for Samoa, in which deployment of renewable energy sources is a priority area of support.[3]

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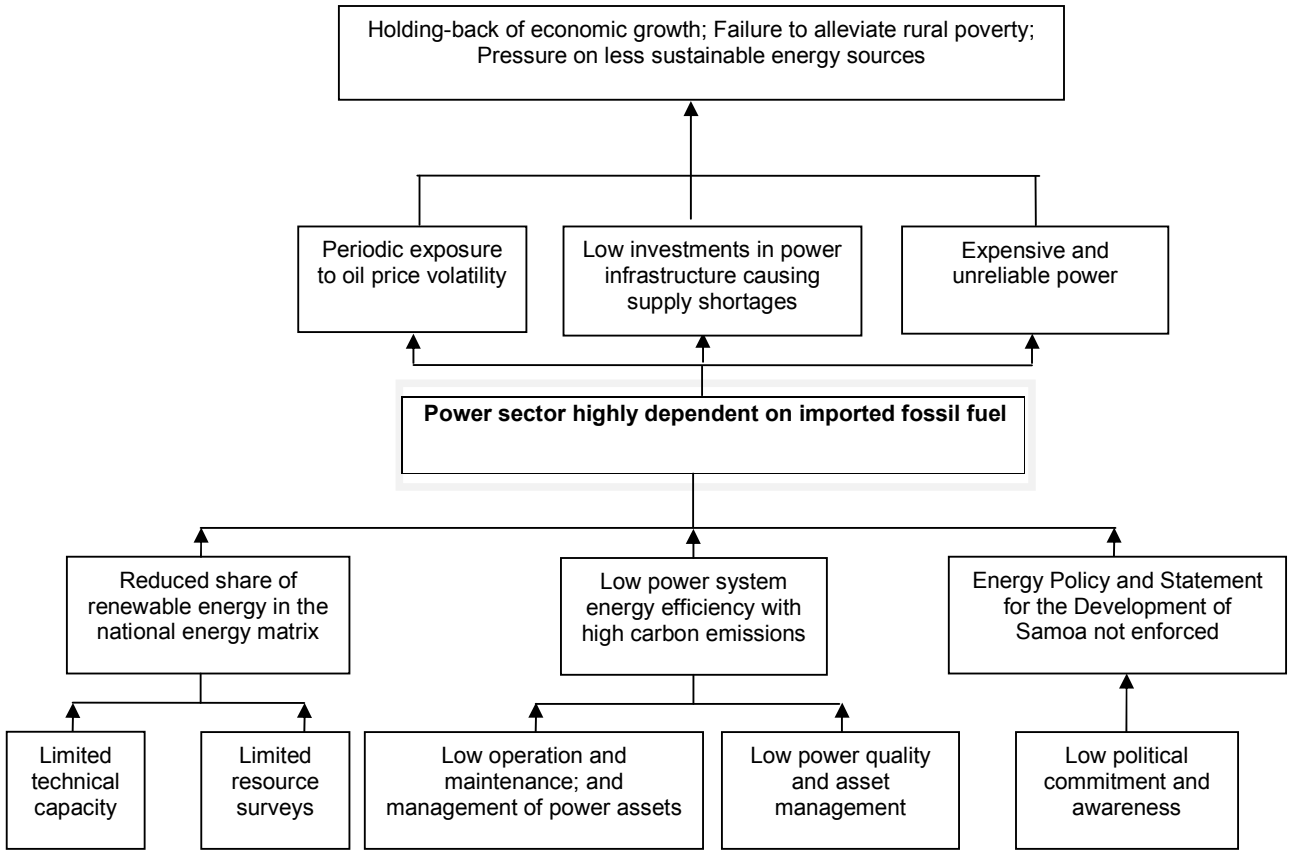
[2] ADB. 2006. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Independent State of Samoa for the Power Sector Expansion Project*. Manila.

[3] ADB. 2013. *Country Operations Business Plan: Samoa, 2014–2016*. Manila.

Problem Tree for Energy



Sector Results Framework (Energy, 2010–2014)

Country Sector Outcomes		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contribution	**Indicators with Targets and Baselines**	**Outputs with ADB Contribution**	**Indicators with Incremental Targets**	**Planned and Ongoing ADB Interventions**	**Main Outputs Expected from ADB Interventions**
Customers within the project area have access to a higher share of electricity generated by hydropower.	Annual diesel imports for power generation are reduced by at least 4.23 million liters yearly. 16,93 GWh of community-based hydropower electricity is supplied to customers every year, avoiding at least 13,667 tons of carbon dioxide per year.	1. EPC implements 6.58 MW of hydropower capacity in the project area 2. Operation and maintenance knowledge transferred through training 3. Project implemented and managed efficiently	Constructed and installed new small hydropower plants: (i) a total of 1.34 MW connected to the existing electricity distribution network in Upolu (0.73 MW, Fuluasou Plant; 0.19 MW, Faleaseela Plant; and 0.42 MW, Tafitoala Plant) (ii) the 0.55 MW Faleata Plant connected to the existing electricity distribution network Savai'i Rehabilitated small hydropower plants: (i) a total of 4.69 MW connected to the existing electricity distribution network on Upolu Island (1.74 MW, Fale ole Fee Plant; 1.05 MW, Alaoa Plant; and 1.9 MW, Samasoni Plant) (i) Manual for hydropower electromechanical, hydro-mechanical, and electric equipment is finalized (ii) Knowledge of hydropower electromechanical, hydro-mechanical, and electric equipment is transferred during 2 years after commissioning of systems (i) Consultancy services provided through single-source selection of the project preparatory technical assistance consultants as the project management consultants: one electromechanical specialist (project manager); one hydropower-civil specialist; one geotechnical specialist; one financial (power) specialist; one social development specialist; one national safeguard specialist; one environmental safeguard specialist (ii) Continuous capacity development program is conducted for 2 years after systems commissioned	**Planned key activity areas** **Ongoing projects with approved amounts** Power Sector Development Project ($100 million)	Hydropower capacity expanded Dependence on imported fossil fuels for power generation reduced Supply-side efficiencies of diesel power generation improved Technical capacity of project administrative technical personnel increased **Planned key activity areas** Renewable energy generation (hydropower). Capacity development

ADB = Asian Development Bank, EPC = Electric Power Corporation, GWh = gigawatt-hour, MW = megawatt.
Source: Asian Development Bank estimates.