

FINANCIAL ANALYSIS

A. Methodology and Major Assumptions

1. Financial analysis has been prepared in accordance with *Asian Development Bank's (ADB) Financial Management and Analysis of Projects*.¹ The financial analysis was conducted to determine the financial viability and sustainability of the proposed project consisting of: (i) the construction of the 400kW Brenwe Hydropower Plant (HPP) which would displace an estimated 90% of the diesel generation in Malekula and (ii) extending the distribution grid to an estimated 450 households in Malekula and 600 households in Espiritu Santo. The new assets will be owned by the Government of Vanuatu, however, it is proposed that the assets will be operated and maintained by the private sector.

2. The financial analysis, including the determination of financial internal rate of return (FIRR), is based on streams of costs and benefits or revenues resulting from the construction, operations and maintenance of works (assuming a 30-year economic lifetime), measured in mid-2017 prices and in real terms. The project investment returns are gauged by comparing the benefit or revenue and cost streams of with-project and without-project scenarios.

3. The “without project” cashflows were developed using the following assumptions: (i) continued operation of existing diesel generators (396 kW on coconut oil, 429 kW on diesel); (ii) replacement of 2 x 120 kW of the older generators in 2022 and the other generators in 2033; (iii) fuel consumption at 0.33 litres/kWh the existing consumption rate; (iv) fuel price of VUV 112.52/litre (\$1.07/litre) delivered; (v) fuel price increase in real terms of 1.85% per annum;² (vi) operations & maintenance (O&M) costs at 5% of replacement cost for diesel plant; in Port Olry the continued operation of the diesel mini-grid where 100 households are connected.

4. The project involves construction of the 400kW Brenwe HPP and the Malekula and Port Olry grid extensions. The “with project” cashflows was developed on the basis of: (i) displacement of diesel with hydro based on generation modelling where diesel is largely displaced; (ii) operation and maintenance of hydro plants at 3% of capital costs; and (iii) construction of 12.7kV distribution extension (44km) to Port Olry in Espiritu Santo. It will predominantly displace thermal generation, and the extent of such displacement has been developed using generation modelling. Thus, the significant reduction in thermal generation under “with project” is the main financial benefit.

B. Financial Cost-benefit Analysis

5. **Project Costs.** The financial cost–benefit analysis compares the costs and benefits of the project from the viewpoint of project owner/operator. The financial analysis is based on the following assumptions: (i) 30-year project economic life; (ii) no residual value assumed at the end of the 30-year period; (iii) all costs and revenues based on mid-2017 constant prices; and (iv) zero taxation of income in Vanuatu. Taxes and duties will be exempted by the government for ADB projects although taxes and duties will form counterpart funding contribution.

6. **Project Revenues, Tariff and Regulation.** Electricity tariff is independently regulated in Vanuatu by the Utilities Regulatory Authority (URA). The URA tariff regulatory model is based on the “building blocks” approach to ensure that the tariff set for the regulatory period (usually 5 years) is sufficient to cover the operator’s costs over that period based on the level of service the

¹ ADB. 2005. *Financial Management and Analysis of Projects*. Manila.

² The analysis assumes a real oil price increase of 1.85% per year, based on fuel price projections published by the Energy Information Agency.

concessionaire is required to deliver including demand and customer numbers. Based on the required revenue for the concession areas operated by UNELCO Vanuatu Ltd, including Malekula, the reference base price (P_0) in July 2017 was VUV46.76/kWh (\$0.44/kWh) and in Port Olry consumers pay a base tariff of VUV 36.29/kWh (\$0.34/kWh). In both areas a consumer mix of 90% low consumers (30 kWh/month) and 10% (200 kWh/month) is assumed. The reference base price is adjusted through an indexation formula on a monthly basis during the regulatory period for input prices (fuel, wages and materials) which are beyond the control of the concessionaire. Therefore, there is a significant cross subsidy between the low consumption domestic and higher consumption domestic/commercial sector.

7. **Weighted Average Cost of Capital (WACC)** of 5.2% has been calculated in real terms for the project. The grants and government contribution is assumed to have a cost of 10%³ per annum to recognize the opportunity cost of such funds in other financially attractive projects for the country. ADB forecasts a grant long term annual local inflation rate of 2.6% and foreign inflation of 1.6%.

Table 1: Weighted Average Cost of Capital (WACC)

	ADB Loan	Grants	GOV	Total
A Amount (USD million)	5.0	7.0	3.1	15.1
B Weighting (%)	33%	46%	21%	100%
C Nominal Cost (%)	1.38%	10.0%	10.0%	
D Tax Rate	0%	0%	0%	
E Tax Adjusted Nominal Cost [$C*(1-D)$]	1.4%	10.0%	10.0%	
F Inflation Rate (%)	1.6%	1.6%	2.6%	
G Real Cost	-0.2%	8.3%	7.2%	
Weighted Rate	-0.1%	3.8%	1.5%	
WACC (Real)				5.2%

Source: PPTA Consultant WACC = Weighted Average Cost of Capital

Table 2: FIRR and FNPV Base Case and Sensitivity Analysis

Indicators	Brenwe Hydropower Plant ¹ .
Total cost	\$12.6 million
WACC	5.2%
FIRR	7.2%
FNPV	\$3.4 million
20% increase in costs – FIRR	5.3%
20% increase in costs – FNPV	\$0.9 million
20% reduction in revenues – FIRR	5.9%
20% reduction in revenues – FNPV	\$1.5 million
10% increase in costs and 10% reduction in revenues – FIRR	4.0%
20% increase in costs and 10% reduction in revenues – FNPV	\$0.8 million

Source: PPTA Consultant

³ Equity Risk Premiums: Determinants, Estimation and Implications, 2014, Aswath Damodaran, Stern New York University who applied Capital Asset Pricing Model in his analysis.

¹ Does not include Malekula or Port Olry grid extensions.

FIRR = Financial Internal Rate of Return, FNPV = Financial Net Present Value, WACC = Weighted Average Cost of Capital

**Table 3: FIRR and FNPV Computation of Brenwe HPP excluding grid extensions
(constant 2017 VUV million)**

Year	Net Cashflow (incremental)			
	Capital Cost	Revenues	Costs	Net Cashflow
2017	-	-	-	-
2018	-	-	-	-
2019	(119.4)	-	-	(119.4)
2020	(403.3)	-	-	(403.3)
2021	(403.3)	-	-	(403.3)
2022	(75.5)	-	1.3	(74.2)
2023	-	42.9	15.2	58.0
2024	-	44.5	16.3	60.8
2025	-	46.3	17.5	63.7
2026	-	48.1	18.6	66.7
2027	-	49.9	19.8	69.8
2028	-	51.9	21.0	72.9
2029	-	53.9	22.2	76.1
2030	-	56.0	23.4	79.4
2031	-	58.1	24.6	82.8
2032	-	60.4	25.8	86.2
2033	25.3	62.8	27.0	115.1
2034	-	65.2	28.2	93.4
2035	-	67.7	29.4	97.1
2036	-	70.4	30.6	100.9
2037	-	73.1	31.6	104.7
2038	-	75.9	32.7	108.7
2039	-	78.9	33.8	112.7
2040	-	82.0	34.8	116.8
2041	-	85.1	35.8	120.9
2042	-	88.4	36.7	125.2
2043	-	91.9	37.6	129.5
2044	-	95.5	38.5	133.9
2045	-	99.2	39.2	138.4
2046	-	103.0	39.9	143.0
2047	-	107.0	40.6	147.6
2048	-	111.2	39.9	151.0
2049	-	115.5	39.0	154.5
2050	-	120.0	38.1	158.1
2048	-	124.7	37.1	161.7
2049	-	129.5	35.9	165.4
			FIRR	7.2%
			FNPV (\$ m)	3.4

8. The incremental FIRR of Brenwe HPP excluding grid extensions is 7.2% and FNPV is \$3.4 million. The sensitivity analysis for Brenwe HPP excluding grid extensions indicates FIRR below WACC for both 20% increase in costs and 20% reduction in revenues, indicating the project is sensitive to these changes. The Malekula grid extension and the Port Olry grid extension components have a negative FNPV. This is due to a large number of low energy consumption households in the grid extension areas making investment in grid extensions financially unviable. These components should be considered for financing through transparent allocation of funding

as a community service obligation.

C. Financial Management Assessment (FMA)

9. The FMA for this project was focused on: (i) review of country diagnostic studies, including the country financial accountability assessment, country procurement assessment report, country governance assessment; (ii) evaluation of the EA's and IA's financial management arrangement based on financial management assessment questionnaire (FMAQ) of the EA and IA; (ii) review of audit reports of financial statements of ADB-funded ongoing projects in Vanuatu.⁴

10. Vanuatu public financial management arrangements have improved significantly since 2000. The FMA established that the government's policies and procedures are clear, unambiguous and focused on the control and accounting for revenue inflows and expenditure outflows. The government operates a centralized payments and payroll system using SmartStream financial software. The Ministry of Finance and Economic Management (MFEM) also established a financial management information system (FMIS) that is generic to all government ministries in Vanuatu in 2002. Line ministries and some provincial offices in Espiritu Santo Island, have direct access to the system through a wide area network. Comprehensive and detailed in year budget execution reports can be extracted as required by all users and financial accounts are now being prepared on an accrual basis and in accordance with most International Public Sector Accounting Standards.

11. The EA of the proposed project will be the MFEM. MOCC-DOE will be the IA with day-to-day implementation activities delegated to the Vanuatu Project Management Unit (VPMU). The \$65.69 million Millennium Challenge Compact with the government signed in 2006 supported Vanuatu in rehabilitating roads on Efate and Espiritu Santo Islands. As the Vanuatu Compact came to close in 2010, the government has taken up steps to ensure that the broad management experience gained by MCA-Vanuatu over the life of the compact is retained. As a result, the Council of Ministers approved the establishment of the VPMU on 1 November 2010, supplemented by Council decision of 25 of August 2011. It acts as an EA of the government to oversee and manage major development projects. The VPMU, an entity within the Prime Minister's Portfolio with its Steering Committee has dual reporting responsibilities to the Prime Minister's Office (PMO) and the MFEM. VPMU currently oversees three major projects—Inter-island Shipping Project (funded by ADB and New Zealand Government), Port Vila Urban Development Project (funded by ADB and Australian Government), and Port-Vila Lapetasi International Multi-Purpose Wharf Project (JICA).

12. VPMU is a steering committee comprised of the Director Generals of the Office of the Prime Minister, MFEM, the Ministry of Infrastructure and Public Utilities, the Ministry of Foreign Affairs, the Director of Department of Finance and Treasury, the Director of the Department of Strategic Policy and Planning, the Secretary General of the Public Service Commission. The Steering Committee provides oversight into the overall implementation of all development projects and the performance of the VPMU.

13. Financial management assessments were conducted for both VPMU and MOCC-DOE. The MOCC-DOE consists of Director, Program Manager, technical staff and support staff such as Finance and Procurement Officer and Finance Administrator. MOCC-DOE has the capacity to handle only simple bookkeeping transactions, such as raising vouchers. Therefore, it does not have sufficient capacity to handle complex financial management tasks needed for the proposed project implementation. VPMU has an experienced financial management specialist, and has

⁴ Vanuatu Interisland Shipping Support Project and Port Vila Urban Development Project

acceptable capacity to manage fund flow for the proposed project. A Project Management Unit (PMU) will be established within the VPMU to implement the project. Specific measures to address identified issues include capacity building support to ensure timely and rigorous reconciliations, orderly record keeping, and adherence to financial management policies and internal controls.

14. **Asset management and planning.** There is a need for a comprehensive and accurate Asset Register for all assets purchased or constructed under the project. This register must identify the useful life of the separate significant components of the infrastructure assets in accordance with International Public Sector Accounting Standards – IPSAS 17: Property Plant and Equipment. The asset register is required to be maintained, updated and reported quarterly as part of project reporting requirements during construction, and will be audited annually. An Asset Management Plan specifying the technical requirements and resourcing to carry out the ongoing maintenance and ultimate replacement of each asset or asset component at the end of its useful life will be prepared by the VPMU.

15. **Auditing.** Neither VPMU nor MOCC-DOE have internal auditors. VPMU will subject the detailed consolidated project financial statements to be audited in accordance with International Standards on Auditing by an auditor acceptable to ADB. The audited project financial statements will be submitted in the English language to ADB within 6 months of the end of the fiscal year by VPMU. VPMU will appoint the external auditors to review the project financial statements. The costs of annual audits to be undertaken by independent auditors will be funded by the project. The government has been made aware of ADB's policy on delayed submission, and the requirements for satisfactory and acceptable quality of the audited accounts. ADB reserves the right to verify the project's financial accounts to confirm ADB's financing is used in accordance with ADB's policies.

16. **Public Disclosure.** ADB's revised Public Communication Policy (2011) requires uploading of audited financial statements in ADB website: (i) subject to government's approval, (ii) relevant to project only with audit report, not financial statement of IA; (iii) management letter, not disclosed; and (iv) disclosed within 30 calendar days upon receipt by ADB.

17. **Fund Flow Mechanism.** Loan disbursement is a key element in the project cycle. Loan proceeds from ADB will be disbursed in accordance with ADB's Loan Disbursement Handbook (2012, as amended from time to time),⁵ and detailed arrangements agreed upon between the government, ADB and SREP Secretariat.

18. **Anticorruption.** As has been explained and discussed with the government, ADB will include anticorruption provisions in the loan provisions and the bidding documents of the project, consistent with its commitment to good governance, accountability and transparency. ADB will reserve the right to investigate, directly or through its agents, any alleged corrupt, fraudulent, collusive, or coercive practices relating to the Project. The IA will establish a grievances mechanism and committee to deal with any concerns arising from project implementation. All contracts financed by ADB in connection with the project shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all contractors, suppliers, consultants, and other service providers as they relate to the project.

⁵ Available at: http://www.adb.org/Documents/Handbooks/Loan_Disbursement/loan-disbursement-final.pdf.