Vanuatu

Country Energy Security Indicator Profile 2009

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Vanuatu Country Energy Security Indicator Profile 2009

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The cooperation of the many contributors to this booklet is gratefully acknowledged. The source note below each table credits the various government and private sector agencies that have collaborated in furnishing the information for the booklet.

Foreword

Solomone Fifita
Deputy Director (Energy)
Economic Development Division, SPC

In August 2010 at the 41st Pacific Islands Forum at Port Vila, Vanuatu, the Forum Leaders' endorsed the *Framework for Action on Energy Security in the Pacific* (FAESP): 2010–2020 as the regional blueprint for the provision of technical assistance to the energy sectors of Pacific Island countries and territories (PICTs). FAESP encompasses the Leaders' vision for an energy secure Pacific, where Pacific people at all times have access to sufficient sustainable sources of clean and affordable energy and services to enhance their social and economic well-being.

The *Implementation Plan for Energy Security in the Pacific* (IPESP) (2011–2015) is a five-year plan for pursuing the vision, goal and outcomes of FAESP. It reflects the priority regional activities that are to be collectively delivered by the participating members of the Council of Regional Organisations in the Pacific (CROP) to support, complement and add value to national efforts on energy security.

In order to better appreciate the impacts of FAESP and its implementation plan on the energy security status of PICTs, baseline energy security indicators must be established, against which performance in future years can be benchmarked.

The energy security indicators in this report derive from a consultative process involving representatives of PICTs, regional organisations, the private sector and development partners. The process culminated in the adoption of IPESP and its monitoring and evaluation framework, the energy security indicators, at the Inaugural Regional Meeting of Ministers for Energy, ICT and Transport in April 2011.

As a first attempt to improve the transparency and accountability in the energy sector, there is obvious room for improvement. Lack of access to reliable and sufficient data is a common problem and this monitoring and evaluation tool can only get better with the kind assistance of the custodians of the energy sector data.

Solomone Fifita
Deputy Director (Energy)
Economic Development Division, SPC

Abbreviations

ADB	Asian Development Bank
ADO	automotive diesel oil
Ave.	average
CO_2	carbon dioxide
DPK	dual purpose kerosene
e.	estimate
EEZ	exclusive economic zone
FAESP	Framework for Action on Energy Security in the Pacific
FICs	(The 14) Forum Island countries (SIS and non-SIS)
GDP	gross domestic product
GHG	greenhouse gases
GJ	gigajoules
HIES	household income and expenditure survey
HFO	heavy fuel oil
IPP	independent power producer
IUCN	International Union for Conservation of Nature
kWh	kilowatt hour
kWp	kilowatt peak
km	kilometre
LPG	liquefied petroleum gas
MJ	megajoules
n.a	(data) not available
N/A	(indicator) not applicable
PICTs	Pacific Island countries and territories
PPA	Pacific Power Association
ppm	parts per million
PRISM	Pacific Regional Information System (Statistics for Development, Secretariat of the Pacific Community)
RE	renewable energy
SHS	solar home systems
SIS	(Forum) smaller island states — Cook Islands, Kiribati, Nauru, Niue, Palau, RMI and Tuvalu. Non-SIS members are Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu.
ULP	unleaded petrol (another name for motor gasoline)
UNELCO	Union Electrique de Vanuatu Limited
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
URA	Utilities Regulatory Authority of Vanuatu

Country profile

Vanuatu National Energy Policy Framework 2009

'... the heavy reliance of the country on imported petroleum fuels is taxing the economy and is a major contributing factor to increasing inflation. The associated increase in the price of basic food items and services, especially in the rural areas, has put a lot of pressure on the Government to put in place measures that will reduce hardships faced by the ordinary people. The small business operators are also trying to make ends meet as they are burdened with debts and high interest rates prompted by increasing fuel prices.'

Country	Vanuatu
Capital	Port Vila
Capital island	Efate
Population	234,023 (2009 census)
Land area	12,190 km^2
Max height above sea-level	1,877 m (Mt Tabwemasana)
Geography	Vanuatu is a scattered archipelago of about 80 islands of which 65 are inhabited. Vanuatu's terrain is mostly mountainous, of volcanic origin, with narrow coastal plains. Largest islands are Espiritu Santo, Malekula, Maewo, Pentecost, Ambrym, Epi, Efate, Erromanga, Malo, Tanna and Aneityum.
Location	Centred near latitude 16° S and longitude 167° E
EEZ	710,000 km^2

Climate	The tropical climate is moderated by southeast trade winds. There are two main seasons, hot and wet from November to April, and cooler and drier from May to October. During the hot, wet season, Vanuatu can experience occasional severe tropical storms and even hurricanes. Natural hazards affecting Vanuatu include tropical cyclones, volcanism (which causes earthquakes) and occasional tsunamis.
Rainfall	Between 2,300 and 3,800 mm per annum
Mean temperature	24°C
Economy	The leading producers of income in Vanuatu are agriculture, fisheries and tourism. Exports include copra, cocoa, beef, coffee, fish and timber.
GDP per capita	USD 2451
Currency	Vanuatu Vatu — VUV
Exchange rate	VUV/USD — $0.0091
Languages	Bislama, French and English are the official languages; plus about 105 indigenous languages spoken throughout the country.
Government	Republic and member of the Commonwealth
Country representative to SPC	Director-General Ministry of Foreign Affairs & External Trade Private Mail Bag 051 Port Vila, Vanuatu Tel: (678) 27045 / 27046 Fax: (678) 23142 Email: kkaloris@vanuatu.gov.vu

Energy context

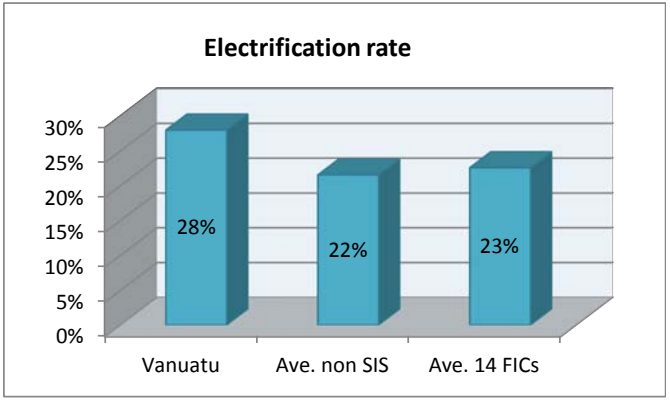
In 2009, Vanuatu's energy consumption scenario totalled 1732 TJ, with petroleum fuels accounting for 99.97% and renewable energy from hydro, wind and coconut oil biofuel accounting for 0.03% (contribution from biomass is excluded in this analysis). Petroleum fuel products (excluding liquefied petroleum gas — LPG) are supplied to Vanuatu by Pacific Petroleum, which mainly imports fuel to Vanuatu from Singapore via Solomon Islands. LPG products are imported by Origin Energy from Australia. In 2009, around 36.7 million litres of diesel, 8.2 million litres of petrol, and 0.29 million litres of kerosene were imported into the country. Fuel import for 2009 stood in the vicinity of USD 34.2 million. This accounts for 5.96% of the total gross domestic product (GDP) — USD 573.5 million in 2009.

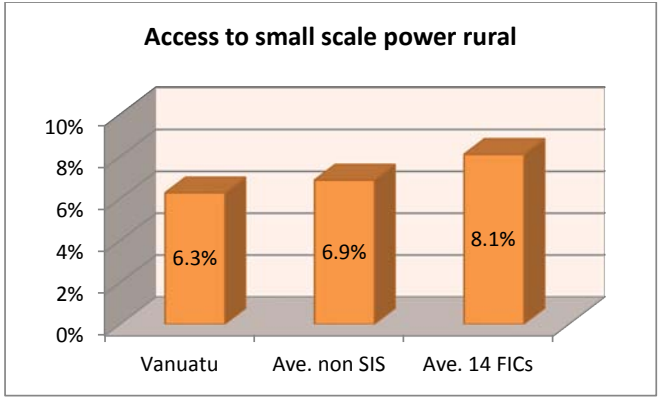
In the power sector, around 28% of households in Vanuatu are connected to the electricity grid network. Electricity is supplied by Union Electrique de Vanuatu Limited (UNELCO). In 2009, UNELCO generated 64.7 GWh of electricity. 62.6 GWH was supplied to the electricity grid, of which 56.9 GWh was sold to the customers. This recorded an estimated 9.1% in distribution loss. Of the electricity generated in 2009, around 8.9 GWh was contributed from renewable energy (RE) sources (hydro, wind and coconut oil biofuel). Port Vila on Efate and Luganville on Espiritu Santo account for over 95% of the total electricity produced in Vanuatu.

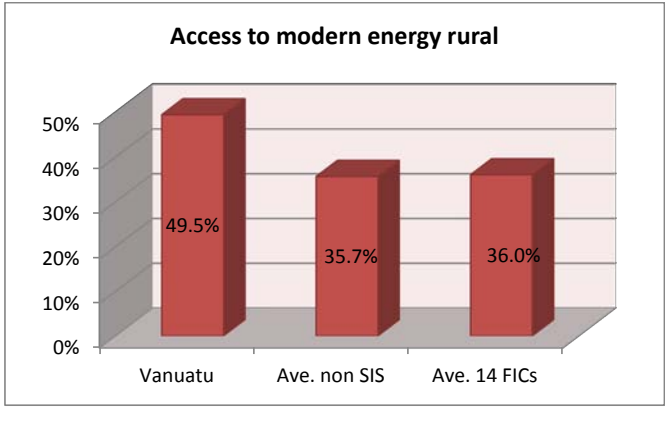
The 2009 baseline energy security indicators presented in this report are compiled and structured according to the four key outcomes to energy security and the seven action themes of FAESP. Graphical comparison included in the analysis provides a snapshot of Vanuatu's situation compared to other Forum non-SIS and Forum Island countries.

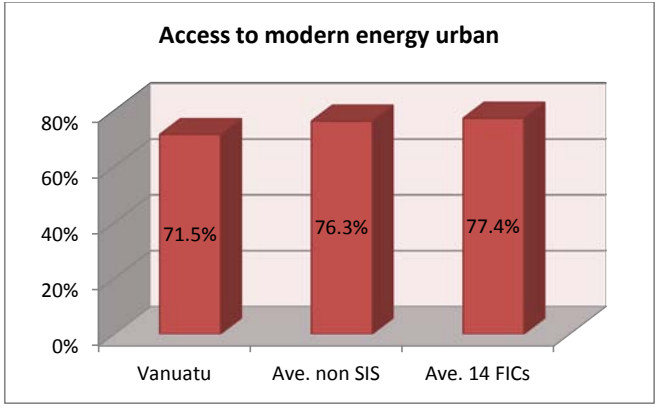
FAESP key energy security outcome 1 — access to energy

No.	FAESP indicators		Explanatory notes
1	Electrification rate (%)	28	*The indicator tracks the share of households actually connected to a utility grid.* Based on the 2009 census report, a total of 13,258 households in Vanuatu are connected to the utility grid, giving a national grid access of 27.99%. Grid electrification access of households in urban areas (Port Vila and Luganville) stands at 80% and in rural areas at 11%. Over 75% of households in Vanuatu are reported to be living in rural and remote areas.
2	Access to small scale power rural (%)	6	*The indicator tracks the share of rural households with access to basic electrification (solar, pico hydro, small wind, community grid).* Based on the 2009 census report, an estimated 5.03% of households in Vanuatu have access to small scale power. In the rural areas, overall access stands at 6.27% , and in the urban areas it stands at 2.33%.
3	Access to modern energy rural (%)	49	*The indicator tracks the share of rural households with access to modern cooking and lighting, which specifically covers all forms of energy other than traditional biomass.* Based on the 2009 census report, access to modern forms of cooking in rural areas stands at 3.9%. Estimated access to modern forms of lighting in rural areas stands at 95%. When averaged, estimated share of rural households that have access to modern forms of energy is 49.46%.
4	Access to modern energy urban (%)	72	The indicator tracks the share of urban households with access to modern cooking and lighting, which specifically covers all forms of energy other than traditional biomass. Based on the 2009 census report, access to modern forms of cooking in the urban areas stands at 43.6%. Estimated access to modern forms of lighting in rural areas stands at 99.5%. When averaged, the estimated share of urban households that have access to modern forms of energy is 71.54%.


Electrification rate
30%
25%
20%
15%
10%
5%
0%
28%
22%
23%
Vanuatu
Ave. non SIS
Ave. 14 FICs


Access to small scale power rural
10%
8%
6%
4%
2%
0%
6.3%
6.9%
8.1%
Vanuatu
Ave. non SIS
Ave. 14 FICs


Access to modern energy rural
50%
40%
30%
20%
10%
0%
49.5%
35.7%
36.0%
Vanuatu
Ave. non SIS
Ave. 14 FICs

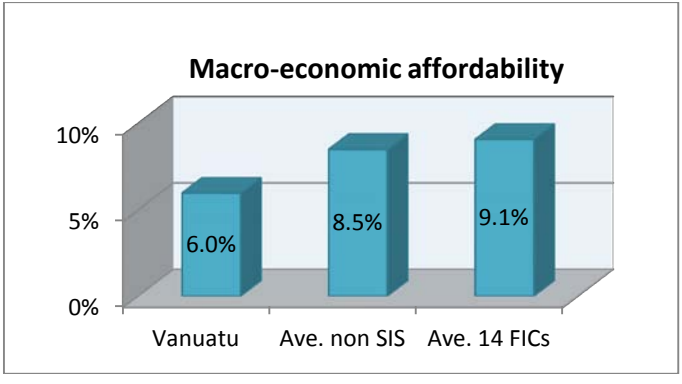

Access to modern energy urban
80%
60%
40%
20%
0%
71.5%
76.3%
77.4%
Vanuatu
Ave. non SIS
Ave. 14 FICs

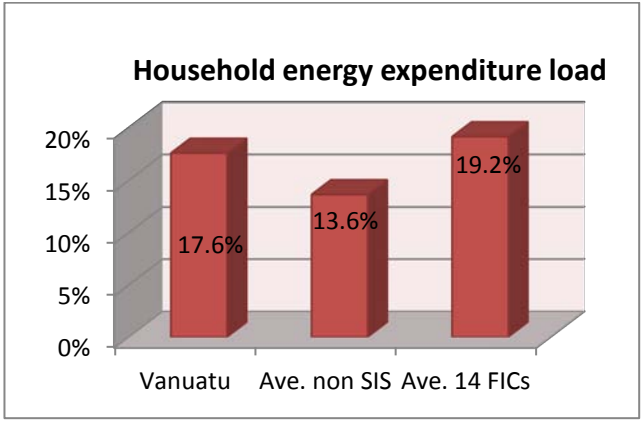
FAESP key energy security outcome 2 — affordability

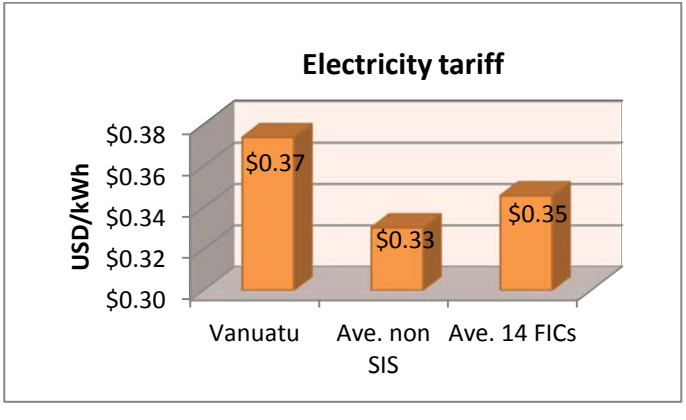
No.	FAESP indicators		Explanatory notes
5	Macro-economic affordability (percentage)	6.0	*The indicator tracks fuel imports as a percentage of GDP. The higher the figure, the more vulnerable an economy is towards world market price volatility.* The macro-economic affordability was calculated from the reference data provided by the Vanuatu Bureau of Statistics website for the total fuel imported over GDP based on referenced International Monetary Fund estimates for Vanuatu in 2009 (USD 34,170,500/USD 573,518,400).
6	Electricity tariff (USD/kWh)	0.37	*The indicator tracks average tariffs for the year (all tariff categories, i.e. residential, commercial and industrial). Requires averaging during the year as tariffs in most PICTs are adjusted several times a year.* Customer grouping used by Vanuatu is different from other Forum Island countries. Shown on the right is the reference calculation of the average tariff based on the Utilities Regulatory Authority of Vanuatu (URA) tariff review in October 2009.
7	Electricity lifeline (%)	85.8	*Relation between average tariff and lifeline tariff if a lifeline tariff exists.* Refer to the table on the right for reference calculation of the average tariff.
8	Household energy expenditure load (%)	17.6	*The indicator tracks average household expenditure for energy per year as a percentage of average household income.* The analysis was based on the 2006 HIES. Household energy expenditure was accounted from expenditure cost to annual household operation expenditure and annual transport expenditure.

Electricity tariff		USD 0.37
Business license holder	USD/kWh	USD 0.36
High voltage users	USD/kWh	USD 0.29
Other low voltage users	USD/kWh	USD 0.40
Small domestic consumers (average)	USD/kWh	USD 0.45
1–60 kWh	USD/kWh	USD 0.26
61–120 kWh	USD/kWh	USD 0.38
> 120 kWh (penalty)	USD/kWh	USD 0.70
Lifeline	%	85.79%

Referenced electricity tariff calculation based on UNELCO data via VRA.

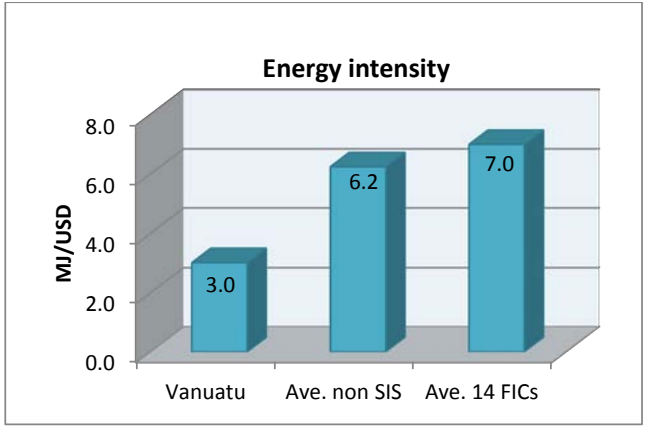

Macro-economic affordability
10%
5%
0%
6.0%
8.5%
9.1%
Vanuatu
Ave. non SIS
Ave. 14 FICs

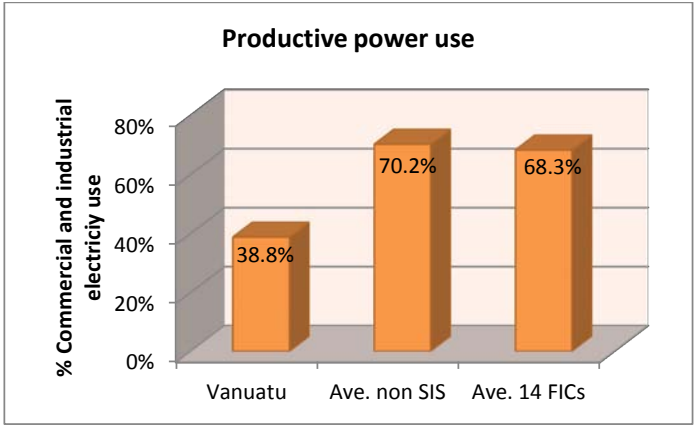

Household energy expenditure load
20%
15%
10%
5%
0%
17.6%
13.6%
19.2%
Vanuatu
Ave. non SIS
Ave. 14 FICs


Electricity tariff
USD/kWh
$0.38
$0.36
$0.34
$0.32
$0.30
$0.37
$0.33
$0.35
Vanuatu
Ave. non SIS
Ave. 14 FICs

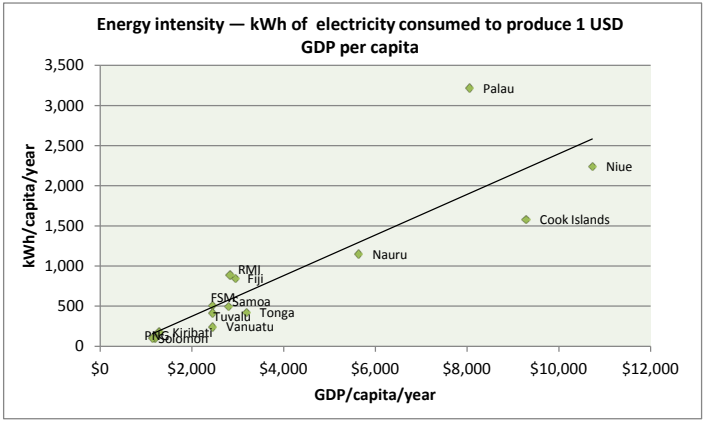
FAESP key energy security outcome 3 — efficiency and productivity

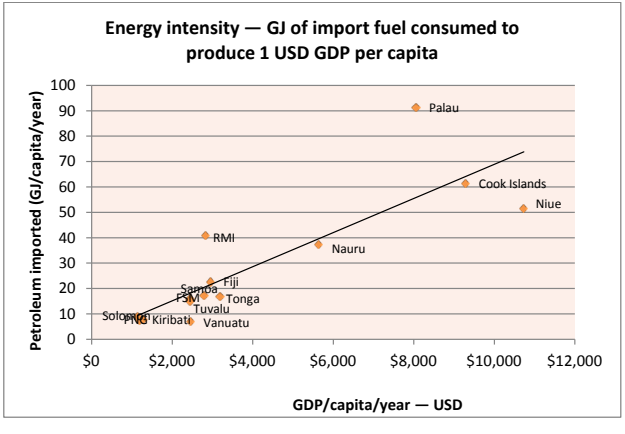
No.	FAESP indicators		Explanatory notes
9	Energy intensity (MJ/USD)	3.0	*The indicator tracks the amount of energy utilised to produce 1 USD of GDP.*
10	Productive power use (%)	38.8	*The indicator tracks the share of commercial and industrial use of electricity in total supply.* Referenced data sourced from the 2009 UNELCO report. The share of sales to 'high voltage' customers was only accounted for in this analysis for productive power use.





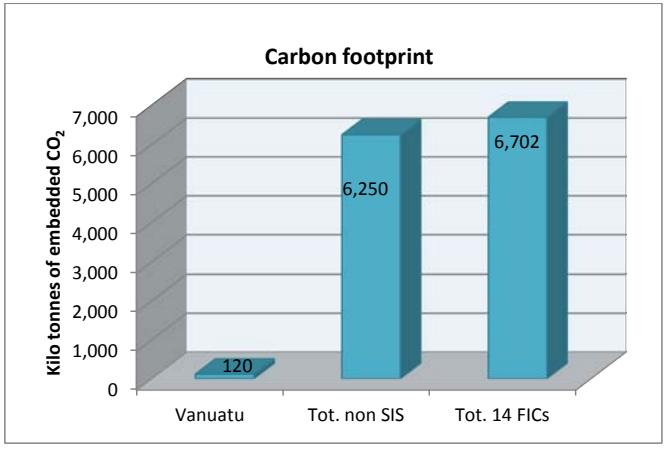
Provided below are energy intensity graphs that are presented in terms of electricity (kWh) and fuel (GJ) consumption against GDP when seen on a per capita comparison. Countries identified above the trend line are perceived to have higher than average energy consumption levels per person when compared against to their corresponding economic wealth (GDP per capita). That is, countries above the trend line are considered to be relatively energy inefficient as compared to countries below the trend line.

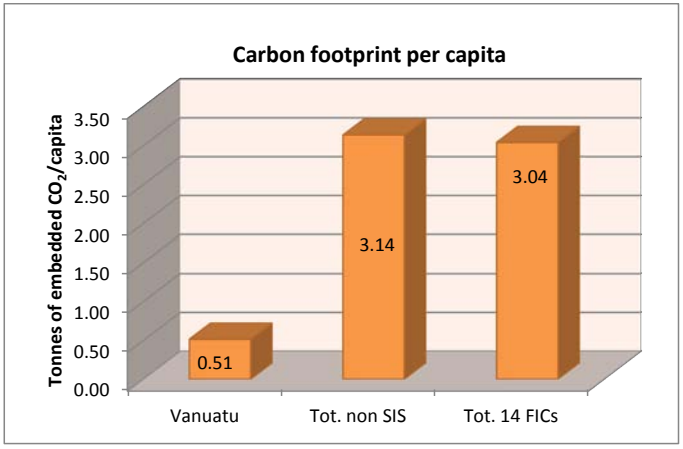




FAESP key energy security outcome 4 — environmental quality

No.	FAESP indicators		Explanatory notes
11	Carbon footprint (tonnes of CO_2)	120,490	*The indicator tracks total GHG emissions using embedded carbon as a measure (not UNFCCC method).* The GHG emission calculated is specifically accounted from the total fuel imported into Vanuatu.
12	Diesel fuel quality (ppm S)	5,000	*The indicator assesses the standard for sulphur (S) content of diesel fuel in parts per million (ppm) sulphur.* In 2009, Pacific Petroleum was mainly selling fuel having 5,000 ppm sulphur content.





FAESP action theme 1 — Leadership, governance, coordination and partnership

No.	FAESP indicators		Explanatory notes
13	Status of energy administration (score)	1	*The indicator assesses the status the energy administration has in the country. (Score system: Energy ministry = 3; Energy department = 2; Energy office = 1)* The Vanuatu Energy Unit is under the Ministry of Lands, Geology, Mines, Energy, Environment and Water Resources. It coordinates energy activities in Vanuatu, covering energy studies, legislation, policy formulation, project developments and rural electrification through small scale renewable energy technologies. Grid electricity was supplied by UNELCO, owned by Lyonnaise des Eaux of France. UNELCO in 2009 had the concessions to supply electricity in Efate, Santo, Malekula and Tanna islands. URA of Vanuatu was established in 2008 and is in charge of electricity regulation. Petroleum products are imported into the country mainly through Pacific Petroleum. LPG is imported by Origin Energy from Australia.
14	Energy legislation (score)	2	*The indicator assesses the status of the energy sector legislation in the country. (Score system: Updated energy act = 3; Adopted energy policy = 2; Subsector act or policy = 1)* In 2009, there was no energy act for Vanuatu. However, Vanuatu has a national energy policy document, which was endorsed in 2009. Vanuatu also has a subsector act — the Utilities Regularity Act No. 11 of 2007 — governing URA of Vanuatu for electricity regulation.
15	Co-ordination and consultation (score)	1	*The indicator aims to measure how decisions and directions given at regional or subregional events translate into practical action at national level. (Score system: Meetings lead to relevant national action = 1; No action = 0)* Vanuatu actively participates in regional activities and UNELCO is a utility member of the Pacific Power Association (PPA).

FAESP action theme 2 — Capacity development, planning, policy and regulatory frameworks

No.	FAESP indicators		Explanatory notes
16	Energy planning status (score)	1	*The indicator assesses the state/quality of energy planning. It distinguishes between integrated planning and subsector (i.e. power, petroleum) planning. (Score system: Whole of energy sector plan/roadmap operational with M&E framework = 3; Subsector plan operational with M&E framework = 2; Energy sector plans in preparation = 1)* Vanuatu endorsed its National Energy Policy in 2009; however, an energy sector action plan has not been developed.
17	Energy sector regulation (score)	1	*The indicator assesses energy sector regulation. It measures the progress towards a regulator independent of government or regulated entities. (Score system: Independent whole of energy sector regulator established = 3; Whole of energy sector regulator established = 2; Subsector regulator established = 1)* Only subsector regulation existed in 2009, such as the regulation of electricity by URA looking at prices, service standards and market conduct.
18	Enabling framework for private sector participation (score)	0	*The indicator assesses progress towards an enabling framework for private sector participation in selling electricity to the grid. (Score system: Standard power purchase and petroleum supply agreements operational = 3: Standard agreements for subsector operational = 2; Standard agreements in preparation = 1)* There was no specific legislation in place in 2009 supporting the participation of independent power producers (IPPs) to supply electricity to UNELCO.
19	Private sector contribution (%)	0	*The indicator tracks the share of electricity produced by IPPs under a power purchase agreement.*

FAESP action theme 3 — Energy production and supply

3.1 Petroleum and alternative fuels

No.	FAESP indicators		Explanatory notes
20	Fuel supply security (days)	137	*The indicator measures the number of days a country can keep operating in case of a petroleum product supply interruption. Calculation used if actual data are not available (size of total petroleum storage (m^3)/average petroleum product consumption per day).* Calculated, based on actual available data.
21	Fuel supply diversity (%)	0.37	*The indicator measures the share of locally produced fuel (biofuel or fossil fuel) as a percentage of total supply.* Indicative estimate in Vanuatu for 2009 is based on coconut oil blend used by UNELCO for power generation. Source: UNELCO 2009 Annual Report.
22	Fuel supply chain arrangements (score)	0	*The indicator assesses the control of countries over fuel supply chain. (Score system: Joint procurement scheme operational = 2; Participation in preparation of joint procurement arrangements = 1)* There is no joint fuel procurement arrangement or plan for Vanuatu. Pacific Petroleum is the only company importing fuel to Vanuatu. Pacific Petroleum is a multinational company serving ten countries in the Pacific. The fuel import route is from Singapore, through Solomon Islands to Vanuatu.

3.2 Renewable energy

No.	FAESP indicators		Explanatory notes
23	Renewable energy share (%)	0.03	*The indicator measures the share of renewable energy as a percentage of total supply for a given year.* Referenced calculation takes into account only the renewable energy contribution from UNELCO (coconut oil, hydro and wind) as presented in their 2009 annual report.
24	Renewable resource knowledge (score)	2	*The indicator assesses the quality of knowledge of national renewable energy potential. (Score system: Comprehensive assessment of all RE resources including cost for each source = 3; Comprehensive physical assessment of all RE resources = 2; Resource assessments fragmentary, under way = 1)* Extensive data sets and study reports are available on renewable energy resources: solar photovoltaic (PV) systems, hydro, wind, biomass, biogas and biofuel.
25	Least-cost RE development plan (score)	0	*The indicator assesses if data and information on RE have been translated into a least-cost development plan that gives priority to the most economical RE resource or application. (Score system: Least-cost development plan operational = 2; Least-cost development plan in preparation = 1)* No specific least-cost development plan was in place for Vanuatu in 2009.

FAESP action theme 4 — Energy conversion

4.1 Electric power

No.	FAESP indicators		Explanatory notes
26	Generation efficiency (kWh/l)	3.78	*The indicator measures the annual average fuel conversion efficiency for diesel generation in power utilities.* Source: UNELCO 2009 Annual Report
27	Distribution losses (%)	9.07	*The indicator compares the amount of kWh sold with the amount of kWh sent out from the power station.* Source: UNELCO 2009 Annual Report
28	Lost supply (SAIDI) — (hours)	382	*The indicator tracks electricity outage time (hours of lost supply per customer per year).* No indicative data were compiled in 2009. Referenced data sourced from the Performance Benchmarking for Pacific Power Utilities for 2010.
29	Clean electricity contribution (%)	13.80	*The indicator measures the share of renewable energies as a percentage of total electricity supply.* Source: UNELCO 2009 Annual Report

FAESP action theme 5 — End-use energy consumption

5.1 Transport energy use | 5.2 Energy efficiency and conservation

No.	FAESP indicators			Explanatory notes
30	Retail fuel prices			*The indicator tracks retail and wholesale fuel prices for petroleum products (diesel, petrol, MPK, LPG).*
		Retail price	Wholesale price	
	ADO (USD/l)	1.36	n.a	Source: Pacific Petroleum
	ULP (USD/l)	1.29	n.a	Source: Pacific Petroleum
	DPK (USD/l)	1.47	n.a	Source: Pacific Petroleum
	LPG (USD/kg)	n.a	n.a	Source: Pacific Petroleum
31	Legislative framework (score)	0		*The indicator assesses progress towards a comprehensive legislative framework for import of end-use devices. (Score system: Comprehensive framework covering transport, appliances, buildings = 3; Legislative framework for one subsector operational = 2; Preparation of frameworks under way = 1)* There was no legislative framework regulating the importation of end-use devices in compliance with energy efficiency initiatives in 2009.
32	Appliance labelling (score)	1		*The indicator assesses the state of appliance labelling. (Score system: Compulsory appliance labelling operational = 2; Appliance labelling in preparation = 1)* There was no compulsory appliance labelling programme available in 2009. In 2010, Vanuatu participated in sub-regional planning study on labelling. Vanuatu imports mostly from New Zealand and Australia. Selected products, mainly refrigerators and freezers, sold in retail outlets carry Australia and New Zealand energy labels.

No.	FAESP indicators		Explanatory notes
33	Availability of national energy balance (score)	1	*The indicator assesses the availability of national key energy data to SPC data management unit and other regional stakeholders. (Score system: Comprehensive data sets covering energy input conversion and end-use available 6 months after end of reporting year = 3; Partial data set available within 6 months = 2; Partial data set available within 12 months = 1)* No energy balance available. Energy datasets collected are fragmented.

FAESP action theme 7 — Financing, monitoring & evaluation

No.	FAESP indicators		Explanatory notes
34	Energy portfolio (USD)	1,036,000	*The indicator tracks the flow of funding into the country's energy sector. Grant aid commitments + loan commitments* Indicative estimate as of 2011.
35	Availability of financing information (score)	2	*The indicator assesses the availability of national energy financing information to SPC and other regional stakeholders. (Score system: Comprehensive set of information covering petroleum, utility and government financing = 3; Partial information set available within 6 months = 2; Partial information set available within 12 months = 1)* Financial data records of funded projects are available at the Energy Unit where indicative estimates of the latest spending can be easily provided. Detailed financial accounts could be compiled within 6 months.
36	Monitoring framework (score)	0	*The indicator assesses if there is a national energy sector M&E framework in place. (Score system: M&E framework in place = 1, No M&E framework = 0)* No specific monitoring and evaluation framework is in place for Vanuatu. Selected monitoring and evaluation activities are carried out on funded projects only.

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