



Country Energy Security Indicator Profile 2009









Niue Country Energy Security Indicator Profile 2009

Prepared by the Energy Programme, Economic Development Division Secretariat of the Pacific Community Suva, Fiji 2012 © Copyright Secretariat of the Pacific Community (SPC), 2012

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Original text: English

Secretariat of the Pacific Community Cataloguing-in-publication data

Niue Country Energy Security Indicator Profile 2009 / prepared by the Energy Programme, Economic Development Division, Secretariat of the Pacific Community

- 1. Energy policy Niue.
- 2. Power resources Niue.
- 3. Energy security Niue.

I. Title II. Secretariat of the Pacific Community

333.79099626

AACR2

ISBN: 978-982-00-0545-7

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Acknowledgement

The *Framework for Action on Energy Security in the Pacific* (FAESP) country energy security indicator report 2009 was prepared by the Energy Programme of the Economic Development Division (EDD) of the Secretariat of the Pacific Community (SPC).

Many special thanks to Niue Power Utilities, the Project Management Unit under the Premier's Office and Niue Statistics Office for the assistance in the collection of in-country data.

SPC would also like to thank the European Union Energy Initiative – Partnership Dialogue Facility (EUEI PDF) for providing funds to SPC to carry out in-country technical activities and collect data required for the energy security indicators.

The cooperation of the many contributors to this edition 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 DeputyDirector (Energy) Economic Development Division, SPC

In August 2010 at the 41st Pacific Islands Forum at Port Vila. Vanuatu. the 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 of 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. 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
BFC	Bulk Fuel Corporation
CO2	Carbon dioxide
DPK	Dual purpose kerosene
е.	Estimate
EEZ	Exclusive economic zone
FAESP	Framework for Action on Energy Security in the Pacific
14 FICs	Forum Island countries
HIES	House income and expenditure survey
GDP	Gross domestic product
GHG	Greenhouse gases
GJ	Giga joules
GWh	Giga watt hour
IPP	Independent power producer
IUCN	International Union for the Conservation of Nature
kWh	Kilo watt hour
kWp	kilo watt peak
km	Kilometre
LPG	Liquefied petroleum gas
MJ	Mega joules
n.a	(Data) not available

N/A	(Indicator) not applicable
NEP	Niue Energy Policy
NEAP	Niue Energy Action Plan
Non SIS	Non-Forum small island state members – Fiji, FSM, PNG, Samoa, Solomon Islands, Tonga & Vanuatu
NPC	Niue Power Corporation
NZD	New Zealand dollar
PICs	Pacific Island countries
PPA	Pacific Power Association
opm	Parts per million
PRISM	Pacific Regional Information System, Statistics for Development at the Secretariat of the Pacific Community
PMU	Project Management Unit
RE	Renewable energy
REP-5	'Support to the Energy Sector in Five ACP Pacific Island countries' programme funded by the European Union
SIS	(Forum) small islands states – Cook Islands, Kiribati, Nauru, Niue, Palau, RMI & Tuvalu
JLP	Unleaded petrol (another name for motor gasoline)
JNDP	United Nation Development Programme
JNFCCC	United Nations Framework Convention on Climate Change
JSD	United States dollar

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Country profile

Niue National Energy Policy Vision 2005

"...minimise Niue's dependence on petroleum products by actively encouraging fuel conservation and efficient end-use"

Country	Niue
Capital	Alofi
Capital island	Niue Island
Population	1514 (July 2009 PRISM Projection); 1625 (September 2006 Population census)
Land area	259 km ²
Max height above sea-level	69 m
Geography	Niue consists of one elevated atoll that has two terraces rising from the sea. It is one of the largest uplifted coral islands in the world. The lower terrace rises sharply, creating the 20-metre coastal cliffs that virtually surround the island. Inland, a second terrace rises abruptly from this coastal belt to a central plateau some 60 metres above the ocean. A fringing reef borders much of the island's 64 km coastline. There is no surface water on the island but artesian bore holes provide a subterranean reservoir of fresh water.
Location	20°S and 175°W
EEZ	390,000 km ²

Climate	The climate in Niue is tropical with moderate southeast trade winds. There are two distinct seasons in Niue, the hot, wet season from November to April, and the cool, dry season from May to October. The hot season is also the hurricane season. Most of the rainfall occurs during the hot season, often in torrential downpours.
Rainfall	Average of 2177 mm per annum
Mean temperature	25 °C
Economic	The leading producers of income in Niue include aid, remittances, tourism and agriculture; exports include vegetables, fruit, fish and handicrafts.
GDP per capita	USD 12,631
Currency	New Zealand dollar – NZD
Exchange rate	NZD/USD 0.6348 (OANDA 2009)
Language	English and Niuean
Government	Self-governing in free association with New Zealand
Country representative to SPC	Secretary to Government Premier's Department Office of the Secretary to Government PO Box 40 Alofi Tel: (683) 4 200 Fax: (683) 4 232/ 4 151 Email: secgov.Premier@mail.gov.nu

Energy context

Energy consumption in Niue is predominantly reliant on imported fossil fuels, which roughly account for over 99% of the country's consumption. Petroleum fuel is currently supplied to Niue by REEF Bulk Fuels (REEF), which ship fuel in tanktainers on cargo ships from New Zealand. The fuels supplied are regular unleaded petrol (91 octane), diesel and jet fuel. In 2009 around 532 thousand litres of petrol, 1.2 million litres of diesel and 25.8 tonnes of LPG were imported into the country. The indicative fuel import bill for 2009 was estimated in the vicinity of NZD 3.2 million with the current total GDP of Niue standing at NZD 16.2 million.

Diesel fuel for the electricity and transport sector accounts for the biggest portion of fuel imported into Niue, with over 60% of diesel used for electricity generation. Petrol imported into the country is mainly used for transportation.

In the power sector, around 99% of households in Niue are connected to electricity through the public grid network provided by the Niue Power Corporation (NPC). In 2009, NPC generated 3.9 GWh of electricity of which 3.4 GWh was sold, recording an estimated 13% distribution loss.

Prior to 2008, electricity for cooking and water heating accounted for most of the energy consumption at the household level. Through the REP-5 Programme (2006–2010), solar hot water systems and LPG cook stoves were installed in households around Niue benefiting 70% of the population.

In terms of renewable electricity generation in Niue, three grid-connected solar PV systems totalling 52.5 kWp were installed in 2009 by the REP-5 Programme. These have contributed around 0.3% of renewable energy to Niue's overall energy consumption. The grid-connected solar PV systems are also estimated to save 18,000 litres of diesel fuel a year and contribute some 2% in clean electricity production.

The 2009 baseline energy security indicators that are presented in this report for Niue 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 Niue's situation compared to that of other Forum small island states (SIS) and Forum Island countries.

FAESP key energy security outcome 1 – access to energy

No.	FAESP indicators		Explanatory notes
1	Electrification rate (%)	99%	<i>The indicator tracks the share of households actually connected to a utility grid.</i> Prior to 2004, there was 100% electrification rate in Niue where all residences and businesses have access to the grid line. However, since Hurricane Heta in 2004, a number of households have moved inland from the coast, removing them from access to electricity. Current estimates based on the 2011 Niue planning and policy workshop stand at around 99%.
2	Access to small scale power rural (%)	1%	The indicator tracks the share of rural households with access to basic electrification (solar, pico hydro, small wind, community grid). An indicative estimate of 1% of households in Niue is now located in areas out of the electricity grid network such as in the interior of the island. These households usually have small petrol generators for meeting their power needs.
3	Access to modern energy rural (%)	100%	The indicator tracks share of rural households with access to modern cooking and lighting, which specifically covers all forms of energy other than traditional biomass. Rural areas in this context include all the villages in Niue, (only Alofi is an urban area.) Niue is well supplied, with all rural households having access to modern forms of energy.
4	Access to modern energy urban (%)	100%	The indicator tracks share of urban households with access to modern cooking and lighting which specifically covers all forms of energy other than traditional biomass. Urban areas in this context refer to Alofi alone. Niue is well supplied, with all urban households having access to modern forms of energy.









FAESP key energy security outcome 2 – affordability

No.	FAESP indicators		Explanatory	notes		
5	Macro-economic affordability	19.9%	The indicator tracks fuel imports as a percentage of G an economy is to world market price volatility. The following figure was calculated based on referer Development and Statistics, Premier's Department GDP for 2009. (USD 3,225,768 / USD 16,243,480)	DP. The higher the f nce data provided by in Niue. Total valu	<i>figure, the mo</i> the Econom e Fuel impo	nre vulnerable nic, Planning, rts over total
6	Electricity tariff	USD 0.43	The indicator tracks average tariffs for the year (all	Electricity tariff		0.43
	(USD/kWh)		tariff categories, i.e. residential, commercial and industrial). Requires averaging throughout the year as tariffs in most PICs are adjusted several times a year. Refer to the table on the right for reference calculation of the average tariff.	Commercial block	USD/kWh	0.45
				Industrial block	USD/kWh	0.45
				Residential block	USD/kWh	0.38
				1-100 kWh	USD/kWh	0.32
				101-300	USD/kWh	0.38
				>301	USD/kWh	0.45
				Lifeline	%	82.50%
7	Electricity lifeline (%)	82.5%	Relation between average tariff and lifeline tariff if a lifeline tariff exists. Refer to the table on the right for the reference calculation of the average tariff.	Referenced electricity ta Co	triff calculation base orporation data	rd on Niue Power
8	Household energy expenditure load (%)	27.9%	The indicator tracks average household expenditure j household income. The latest 2006 Census does not provide detailed in Analysis was based on the 2002 HIES. Reporting operation expenditure and annual transport expendit is calculated from these two reference categories.	for energy per year of formation on energ gives a breakdown iture. Associated ene	as a percenta y household of the annu ergy expendit	expenditure. al household ture load cost







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FAESP key energy security outcome 3 – efficiency and productivity

No.	FAESP indicators		Explanatory notes
9	Energy intensity (MJ/USD)	4.8	<i>The indicator tracks the amount of energy utilised to produce 1 USD of GDP.</i>
10	Productive power use (%)	19%	The indicator tracks the share of commercial and industrial use of electricity in total supply.







FAESP key energy security outcome 4 – environmental quality

No.	FAESP indicators		Explanatory notes
11	Carbon footprint (tonnes of CO_2)	5514	<i>The indicator tracks total GHG emissions using embedded carbon as a measure (not UNFCCC method).</i> Referenced calculation based on quantity of petroleum products imported into the country. Fuel import data sourced from Niue statistics office and BFC.
12	Diesel fuel quality (ppm S)	10	<i>The indicator assesses the standard for sulphur content of diesel fuel in parts per million (ppm) sulphur.</i> Niue imports directly from New Zealand through Reef Shipping. Standards of fuel therefore follow NZ standards, which currently are set at 10 ppm. No other shipping route for fuel exists for Niue.



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

No.	FAESP indicators		Explanatory notes
13	Status of energy administration (score)	0	The indicator assesses the status the energy administration has in the country. (Score system: Energy ministry = 3; Energy department = 2; Energy office = 1) There is no energy department or energy office in Niue. Currently the energy office function is party executed by the General Manager of the power utility. Project funded activities are managed by the Project Management Unit under the Premier's Office which also manages the EDF 10 Project. Of note, each government department participating in the energy sector are usually independent with no overall coordination or regulation.
14	Energy legislation (score)	2	The indicator assesses the status the of energy sector legislation in the country. (Score system: Updated energy act = 3; Adopted energy policy = 2; Subsector act or policy = 1) There is no comprehensive energy sector legislation for Niue. Energy activities are mainly driven by project funding or guided by the National Energy Policy. The following are a number of existing acts that govern Niue's energy sector: the Electric Power Supply Act 1960, which governs the power utility; the Niue Transport Act 1965; the Price Control on Imported Goods for Resale in Niue Act 1975; Sales of Goods Act 1908; the Customs and Exercise Act 1966. Niue does not have a petroleum Act.
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) Niue actively participates in regional activities, and NPC is a utility member of PPA. Within Niue, there is no clear sense of coordination among the key energy sectors. The National Energy action plan has identified the important contribution of the key sectors towards plans to establish the Niue Energy Authority Board.

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. 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 under preparation = 1) Strategic Action Plan developed with National Energy Policy, no long-term development plan for power utility.
17	Energy sector regulation (score)	0	The indicator assesses state of energy sector regulation. Indicator measures the progress towards regulator independent from 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) Electricity tariff regulation through Cabinet, fuel prices not regulated, and government undertakes price tests for fuel supply.
18	Enabling framework for private sector participation (score)	0	The indicator assesses progress towards 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 under preparation = 1) Currently there is no enabling framework for private sector participation to sell electricity as an IPP to NPC. A view pertaining to lack of interest of expooring this is due to the Power sector being extremely small. Niue, however is participating in a GEF/UNEP project that aims at promoting privately-owned distributed generation (net metering).
19	Private sector contribution (%)	0%	The indicator tracks share of electricity produced by independent power producers under a power purchase agreement. In 2009, there were no established IPPs in Niue, so contribution from IPPS to the utility is zero. Similar trend shown in 2010, and 2011.

FAESP action theme 3 – Energy production and supply

3.1 Petroleum and alternative fuels

No.	FAESP indicators		Explanatory notes
20	Fuel supply security (days)	60	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 is not available (Size of total petroleum storage (m3)/Average petroleum product consumption per day). Figure provided is the stock holding days for BFC. Based on the current fuel storage capacity and estimated fuel consumption demand in 2009, it is estimated that Niue has the facilities to increase their fuel supply capacity to 89 days.
21	Fuel supply diversity (%)	0	The indicator measures the share of locally produced fuel (bio-fuel and fossil fuel) as percentage of total supply. No bio fuel projects were undertaken in Niue in 2009. No resource assessment on bio-fuel from coconut oil in Niue has been undertaken to explore its potential.
22	Fuel supply chain arrangements (score)	0	The indicator assesses control of countries over fuel supply chain. (Score system: Joint procurement scheme operational = 2; Participation in preparation of joint procurement arrangements = 1) REEF Bulk Fuels (RBF) in tanktainers on cargo ships currently supplies petroleum fuel to Niue from New Zealand. Niue used to have a small port facility in the main port of Alofi that was supplied by LCT from Fiji. The three tanks were destroyed by cyclone Heta in 2004. As part of the tanktainer supply arrangement, a small terminal (Amanau) was built (built by RBF but paid for and owned by the government) to allow the petroleum products to be transferred from the isotainers into the terminal tanks and the isotainers returned to New Zealand to minimise isotainer rental costs.

3.2 Renewable energy

No.	FAESP indicators		Explanatory notes
23	Renewable energy share (%)	0.3%	<i>The indicator measures share of renewable energy as percentage of total supply for a given year.</i> Referenced calculation used mainly refers to the solar PV systems installed at the hospital and the power utility in 2009 by the REP-5 project.
24	Renewable resource knowledge (score)	1	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) Reliable data on solar and wind regime available. Empirical data on economic performance of PV systems and solar water heaters from various installations. Other renewable energy resources – biomass and ocean energy potentials not explored.
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 under preparation = 1) No specific least cost development plan in place for Niue. Solar PV is preferred over wind due to land acquisition issues. NEAP has listed a number of activities to assess and monitor potential renewable energy resources in Niue.

FAESP action theme 4 – Energy conversion

4.1 Electric power

No.	FAESP indicators		Explanatory notes
26	Generation efficiency (kWh/l)	4.05	The indicator measures the annual average fuel conversion efficiency for diesel generation in power utilities. Referenced figure was calculated from the total electricity generated in 2009 divided by the total litres of ADO use by the power utility. Source REP-5 monitoring report.
27	Distribution losses (%)	13%	The indicator compares the amount of kWh sold with the amount of kWh sent out from the power station. Referenced estimate was calculated from the REP-5 monitoring report – 2009 power data
28	Lost supply (SAIDI) – (minutes)	414	<i>The indicator tracks electricity outage time (hours of lost supply per customer per year)</i> Data sourced from the PPA 2011 Bench Marking Report. Indicative data was taken for 2010.
29	Clean electricity contribution (%)	2%	<i>The indicator measures share of renewable energies as percentage of total electricity supply.</i> This percentage is calculated from the 52.5 kWp grid-connected solar PV systems installed at the hospital, Niue Secondary School and NPC by the REP-5 programme

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 price	Wholesale price	The indicator tracks retail and wholesale fuel prices for petroleum products (diesel, petrol, MPK, LPG)
	Retail fuel prices	USD/l - ADO	1.63	1.51	Sourced from Niue Bulk Fuel
		USD/l - ULP	1.37	1.22	Sourced from Niue Bulk Fuel
		USD/l - DPK	n.a	1.22	Sourced from Niue Bulk Fuel
		USD/kg - LPG	4.61	n.a	Sourced from Niue Bulk Fuel
31	Legislative framework (score)		0	The indicator asse for import of en covering transpor operational = 2; P No legislative fra of energy-efficien the Niue Energy and efficiency actions' to ensure disadvantageously a disincentive to t	sses progress towards a comprehensive legislative framework d-use devices. (Score system: Comprehensive framework t, appliances, buildings = 3; Legislative for one subsector breparation of frameworks under way = 1) unework or acts in place that promote the importation at end-use devices. However, priority activities listed in Policy and action plan promote energy conservation under the sub-heading 'Technology and appliances that energy-efficient appliances and equipment are not y priced under government taxes and duties so as to act as their use.'
32	Appliance labelling (score)		0	The indicator asse appliance labelling No compulsory ap from New Zealau in New Zealand. imported from fa	esses state of appliance labelling. (Score system: Compulsory g operational = 2; Appliance labelling under preparation = 1) ppliance labelling programme in place. Imports are mainly nd, most products sold have labels due to requirements A noted percentage of second-hand appliances is also milies in New Zealand.

FAESP action theme 6 – Energy data and information

No.	FAESP indicators		Explanatory notes
33	Availability of national energy balance (score)	2	The indicator assesses 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) Energy datasets available are fragmented – Electricity production and supply data are available including a number of assessment reports. Petroleum data easily accessed. Relative database compilation work to establish energy balance will be relatively easy to undertake within 6 months however identification of relevant office to undertake data compilation work in country will need to be identified first.

FAESP action theme 7 – Financing, monitoring and evaluation

No.	FAESP indicators		Explanatory notes
34	Energy portfolio (USD)	\$5,459,433	<i>The indicator tracks the flow of funding into the regions energy sector. Grant aid commitments</i> + <i>loan commitments</i> Snapshot of donor portfolio as of 2011 (not 2009 baseline). Listed donor and development organisations or projects involved in the energy sector in Niue include EU/EDF 10, IUCN and UNDP via PIGGAREP.
35	Availability of financing information (score)	2	The indicator assesses 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 six months = 2; Partial information set available within 12 months = 1) Comprehensive set of information on funding activities available with the Project Management Unit. Detailed financial documents and acquittals will be available within one to two months.
36	Monitoring framework (score)	0	The indicator assesses if there is a national energy sector M&E framework in place. (Scoresystem: M&E framework in place = 1, No M&E framework = 0)No specific monitoring and evaluation framework has been developed for Niue. Systematicmonitoring of EU/EDF 9 activities reports are available.

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