Draft as at November 2008

GOVERNMENT OF NAURU

Nauru Energy Efficiency Action Plan

2008 – 2015

The Energy Efficiency Action Plan has been developed by EDF-9 funds managed and implemented by it-Power of UK through REP-5 and executed by the Pacific Islands Applied Geoscience Commission (SOPAC) and Live & Learn.

The action plan is developed and structured to the current challenging circumstances in Nauru with respect to electricity generation, distribution and transmission, and consumption. The ultimate objective is to contribute to the improvement of the energy sector and livelihoods in Nauru.

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MINISTER'S FOREWORD

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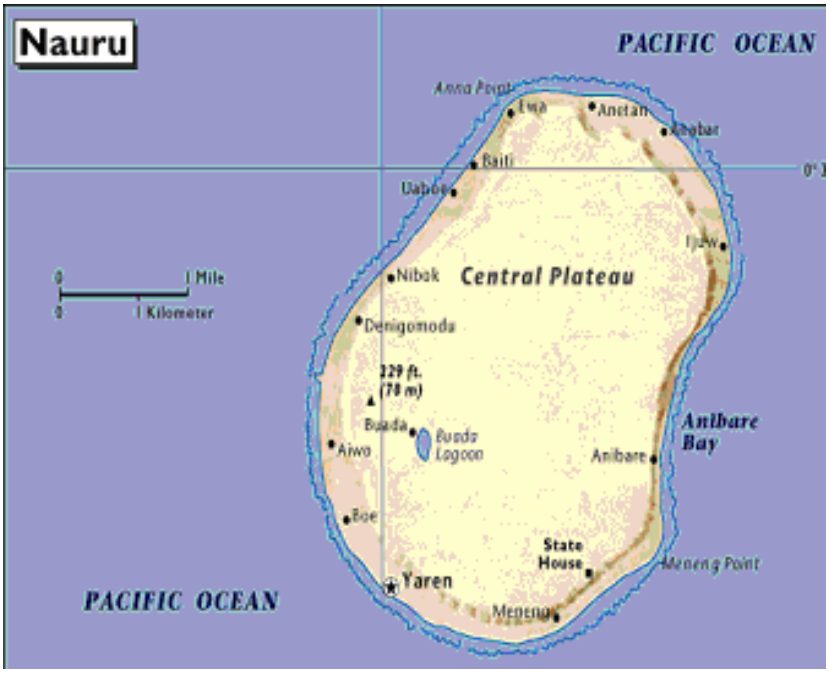
The Island of Nauru



Nauru is one of the smallest independent, democratic states in the world. It is a republic with a Westminster parliamentary system of government but with a slight variance as the President is both head of government and head of state. The island is small, isolated, coral capped with 21km^2 in area, 20km in circumference, located in the central Pacific Ocean 42km south of the equator and 1287km west of the International Date Line. Ocean Island (Banaba) is its nearest neighbour.

Nauru is faced with serious economic challenges. Its once thriving phosphate industry has ceased operation thus depriving Nauru of its major lifeline revenue source. The local infrastructure, including power generation, drinking water and health services, has been adversely affected in recent years by the decline in income from phosphate mining. However, further explorations of the residual phosphate deposits have raised hopes that there may be potential to keep the phosphate mining for yet sometime. With fewer prospects in the phosphate industry, Nauru has to look at other alternative revenue sources to support its economic development. Unfortunately, for a country of the size of Nauru (21 km^2) with its limited natural resources, the options are not many. Nauru now is highly dependent on donor support especially from Australia, Japan, New Zealand and Taiwan (ROC). It is important that Nauru develops and strengthens its partnership arrangements with the above countries to be able to meet the goals of its national development strategies which have identified key areas to be targeted in order to achieve some degree of economic stability.

The Government has prioritized reforms in the electricity and water sectors and in the management of fuel. With the recent adoption of its National Energy Policy additional legislation will be developed as required to provide a clear and practical path towards sustainable development.

Acronyms and Glossary

AUD	Australian Dollar
CFL	Compact Fluorescent Lamp
Demand	The rate at which a facility demands electricity from the grid
Demand Side Management	Managing the users' consumption of electricity (or energy).
EDF-9	9th European Development Fund
EEAP	Energy Efficiency Action Plan
EEO	Energy Efficiency Officer
Energy Audit	A process whereby all electrical appliances in a particular building are recorded with its power rating and usage time including information on user behaviour. A detail process will also include measuring of power consumption by appliances and a building.
Energy Conservation	Refers particularly to the user behaviour where energy usage is minimised through behavioural changes such as switching off lights when not in use, and minimising usage time of appliances.
Energy Efficiency	Technical means such as efficient appliances, efficient electricity generating technologies, efficient vehicles, replacing incandescent light bulbs with CFLs
GON	Government of Nauru
km	kilometre
REP-5	Support to the Energy Sector in Five ACP Pacific Island States Programme
SOPAC	Pacific Islands Applied Geoscience Commission
GJ	Standard abbreviation for Giga-Joule(s). A unit of energy. Equal to 1,000 MJ, equals 1,000,000 kJ.
kJ	Standard abbreviation for kilo-Joule(s). A unit of energy. Equal to 1,000 Joules.
kW	Standard abbreviation for kilo-Watt(s). A unit of power. Equal to energy use at the rate of one kJ per second.
kWh	Standard abbreviation for kilo-Watt hour. A unit of (normally electrical) energy. Equal to power of 1 kW for 1 hour.
kW	kilo-Watts
l/s	litres per second, a measure of air or liquid flow rate.
MD	Maximum Demand. The highest recorded demand (averaged over 15 minutes) during the billing period.
MJ	Standard abbreviation for Mega-Joule(s). A unit of energy equal to 1,000 kJ.
m/s	Metres per second, a measure of speed.
Power	The time rate of energy conversion

1.0 Background

The high electricity consumption situation in Nauru has been attributed to access to very cheap electricity during the years when the economy was doing well from phosphate mining – historically, it was access to free electricity when the Nauru Phosphate Company was operating. Now with the turn-around in the economy situation, Nauruans have been challenged to re-adjust their lifestyles particularly, in relation to the use of electricity. This has been further constraint with the limited electricity generation capacity coupled with other issues such as the limited cash-flow situation and no tariff structure, resulting to residential customers paying a flat rate of AUD5.00 per month despite the amount of electricity consumed.

The Nauru Energy Efficiency Training and Public Awareness Campaign is part of an overarching project with the primary objective of poverty alleviation by improving access to electricity to ameliorate living conditions. With the specific aim to improve the demand side efficiency of the energy sector in Nauru, the campaign has been structured to: commence an energy efficiency awareness raising and public education programme; and build capacity of local agencies including the training of the Energy Efficiency Officer to carry out energy efficiency programmes such as information dissemination and public awareness activities with energy audits and implementation.

More specifically, the campaign will also initiate the development of an outline for an Energy Efficiency Action Plan (EEAP); and conduct energy audits at Government buildings and selected residential houses. There are a number of foreseen challenges that could be of hindrance to the success of the proposed activities particularly, in the sustainability of energy efficiency and conservation programmes in Nauru due to the lack of incentives, policies and plans, to name a few. It is however envisioned that the Nauru Energy Efficiency Training and Public Awareness Campaign will reinforce the need for efficient and conservative use of energy; and mobilise additional resources to develop, adopt and implement relevant mechanisms for the betterment of Nauruans.

The EEAP has been developed through a consultative process involving stakeholders from the public sector, private sector and civil society groups. The EEAP provides a guideline for the development and implementation of energy efficiency strategies for the immediate future and mid-to-long term. It has been developed under an integrated planning approach, with the view that the EEAP is only one of the many policy instruments that will be put in place by the Government to ensure that the Nauru economy develops to its full capacity given the many current challenges. The EEAP adheres to the principle of partnerships. It is therefore essential that the involvement of the private sector and civil society groups in its implementation be encouraged.

The overarching vision of the EEAP is as in the Nauru National Energy Policy vision statement: “Secure and sustainable energy, enabling the social and economic development of Nauru”. The Ministry of Utilities is foreseen to provide the lead role in the implementation of this energy efficiency action plan.

2.0 Medium to Long-Term Plan [5 – 10 years, 2010-2020]

The medium to long term plan is structured over a five to ten years period that overlaps with the short term priorities. For continuity the strategies and activities outlined in the short term priorities are brought forward with an expanded scope.

2.1 Goal(s)

2.1.1 Poverty alleviation by improving access to electricity and thus the living conditions; and

2.1.2 Reduce the amount of fossil fuel imports through the provision of affordable and environmentally sound technologies, as well as the implementation of energy efficiency and conservation measures.

2.2 Strategies and Action Plan

2.2.1 Strategy: Establishment of a Demand Side Management Team

A Demand Side Management (DSM) Team will be established within the Power Utility to continue the implementation of this action plan. Associated costs will be the salary package(s) for the DSM Team. The DSM Team will be provided an annual realistic target in terms of kilowatts (kW) to be reduced through energy efficiency and conservation measures.

2.2.2 Strategy: Loss-Analysis of the Electricity Transmission and Distribution System

A detailed loss analysis of the transmission and distribution system is expected to be commissioned in 2010. The study will recommend an upgrading plan for the improvement of the transmission and distribution system of the Power Utility. Funding for this activity will be sourced from possible funding mechanisms from the regional and or international portals.

2.2.3 Strategy: Capacity Development for Local Personnel

A capacity development programme for local personnel, in the area of energy efficiency and conservation, will be formulated as activities progress through the short term priorities.

2.2.4 Strategy: Promote energy efficiency and conservation measures /practices through educational and awareness programmes

Will focus on the promotion of environmentally-friendly and sustainable use of energy. It will be an on-going activity from the short term priorities to ensure that messages get across to all levels in society including the commercial and industrial sectors of the economy. The detailed activities of this strategy will be an extension and or outlined in the Campaign Plan Activity 3.2.2.1.

2.2.5 Strategy: Conduct Energy Audits

Energy auditing would be a periodic exercise particularly for those consumers willing to progress energy efficiency and conservation measures through investing into energy efficient retrofits and appliances. It is with anticipation that at this stage there will be sufficient in-country capacity to conduct thorough energy audits – one of the major activities of the DSM Team.

2.2.6 Strategy: Demonstration of Energy Efficient and Conservation Measures and Practices

The demonstration strategy as of this stage will focus on investments in energy efficient appliances and retrofits that will provide a reasonable payback period. It is expected that the Strategies and Activities in the short term priorities will provide sufficient evidence, awareness and education for customer confidence to consider investing into such schemes. The primary target customers would be the top 5 electricity consumers. A comprehensive residential programme on energy efficiency and conservation will also be developed.

2.2.7 Strategy: Strengthened Legal and Regulatory Frameworks

The progress of the standards and appliance labelling project developed as part of the short term priorities. In addition, other appropriate regulatory mechanisms as referred to in the national energy policy framework will be developed and put forward for Government adoption and implementation.

2.2.8 Strategy: Promote the Use of Alternative /Energy Efficient Technologies

The successful demonstration of alternative /energy efficient technologies in the short term priorities will determine the buy-in from consumers. Appropriate incentives have to be regularised to enable the availability and affordability of such technologies.

3.0 Short-Term Priorities [2008-2010]

The short term priorities highlight immediate actions that will be undertaken to introduce and will form the basis for future energy efficiency and conservation activities in Nauru.

3.1 Goal

3.1.1 Promote the implementation of demand-side-management strategies for increased energy efficiency at all levels.

3.2 Strategies and Action Plan

3.2.1 Strategy: Capacity Development of Energy Efficiency Officer(s)

Activities	Description and Action Plan [specific outputs]	Timelines
3.2.1.1 Periodic training on energy efficiency and conservation	The EEO will be provided training on energy efficiency and conservation planning, promotional and policy mechanisms, energy auditing, monitoring and evaluation, reporting, and use of electricity measuring devices. It is anticipated that the EEO will attend /provided 1 training opportunity per year. [successful implementation of proposed activities]	2008 – 2010
3.2.1.2 Training needs analysis for the EEO(s)	Conduct a training needs analysis (TNA) to determine the additional capacity development requirements for the EEO to be implemented in the medium to long term plan. [training programme for the EEO(s)]	June 2009

3.2.2 Strategy: Promote energy efficiency and conservation measures /practices through educational and awareness programmes

Activities	Description and Action Plan [specific outputs]	Timelines
3.2.2.1 Develop an energy efficiency and conservation awareness campaign plan	The plan will cover a 24-month set of activities and will be developed through consultation processes. The campaign plan will also highlight the specific roles of the respective entities such as the Energy Office, the Aid Management Unit (AMU), and NIANGO. [campaign plan] As required, the campaign plan will be revised in 2010 to guide the medium to long term plan Strategy 2.2.4.	January 2009 July 2010

3.2.2 Strategy continues ……..

Activities	Description and Action Plan [specific outputs]	Timelines
3.2.2.2 Develop radio and TV programmes including posters, flyers and other appropriate promotional materials (have these in DVDs that can be distributed widely in the communities[1] including the development of a website where materials can be posted)	A staged approach to the information and activities will be considered with details to be covered in the campaign plan in Activity 3.2.2.1. Where applicable the local Media will be used to disseminate relevant information to the general public. The programmes and information will be translated and presented in the local context. [radio and TV programmes broadcasted /distributed through DVDs; posters, flyers and other materials published]	August /November 2008
3.2.2.3 Schools' programme	Materials such as T-shirts, poster and essay competitions and models, will be developed (in the local language as well) to promote energy efficiency and conservation practices amongst school children – dedicated days such as Earth Day (in April) and Environment Day (in June) can be used to demonstrated and remind students of the significance of energy efficiency and conservation. Additionally, there will be a teachers' programme that will involve the actual implementation of energy efficiency and conservation activities. [booklets, posters and flyers for schools; and number of competitions /projects performed by students]	August /November 2008

3.2.3 Strategy: Conduct Energy Audits

Activities	Description and Action Plan [specific outputs]	Timelines
3.2.3.1 Capacity development in energy auditing	A workshop to introduce the energy auditing process to a wide range of stakeholders. The workshop to provide hands-on practical sessions where participants will carryout an energy audit of a building. [proceedings of the workshop and "homework" by participants]	June 2008
3.2.3.2 Conduct energy audits of Government and public buildings and selected residential households	Following the workshop in Activity 3.2.3.1, the EEO will take a lead role to ensure that an energy audit of 5 premises is conducted including the reporting. [5 energy audit reports]	September – October 2008

[1] Note that the radio and TV coverage in Nauru is limited to the airport area only

3.2.4 Strategy: Demonstration of energy efficient and conservation measures and practices

Activities	Description and Action Plan [specific outputs]	Timelines
3.2.4.1 Replace fans at the Airport building	Following the energy audit of the Airport building in June, fans to be replaced will be identified. Replacement costs will be funded under the REP-5 project.	January 2009
3.2.4.2 Install photo-sensors on selected public building lights	As in Activities 3.2.3.2 and 3.2.4.1, where appropriate the use of photo-sensors to ensure that lights are turned off during daytime will be considered. Again, the associated costs will be funded by REP-5.	January 2009
3.2.4.3 A CFLs residential programme	This activity will be conducted in relation to Activity 3.2.4.4, below. The concept is to demonstrate the operation and use of CFLs to reduce electricity consumption. [CFLs distributed to households, impact monitored and documented]	June /November 2008
3.2.4.4 Select residential households to demonstrate basic energy efficient and conservation practices	14 residential households (one from each district) will be chosen to undergo an energy audit and implementation of basic energy conservation housekeeping practices. This will be monitored and reported upon by the EEO. [A summary report on the energy audit of 14 households]	August /September 2008
3.2.4.5 Develop a Standard and Appliance Labelling Project	The EEO will take a lead role in formulating the project with the intention of adopting a legislation that is consistent with the Australian-New Zealand Standards and experience from similar approaches in other PICs.	June 2010
3.2.4.6 Solar Refrigerators	Introduce the use of solar refrigerators with a demonstration to be installed at the Nauru Hospital.	May 2009
3.2.4.7 Gravity-feed water tanks	A site for the demonstration will be identified to showcase the possible savings from such an activity – this minismises the use of electrical pressure-pumps.	May 2009

3.2.5 Strategy: Strengthen partnerships between key stakeholders including the community on electricity data and relevant projects

Activities	Description and Action Plan [specific outputs]	Timelines
3.2.5.1 Monitor the electricity consumption of the top 5 consumers	The EEO will be required to monitor the electricity consumption of the top 5 electricity consumers and make recommendations on practical and simple means of reducing consumption. [a 3-monthly summary of electricity consumption by the 5 consumers]	November 2008 – December 2009
3.2.5.2 Community workshops /meetings	Device programmes that will continue to engage the communities particularly with the educational and awareness components for the better understanding of energy efficiency and conservation particularly with the introduction of prepayment meters [including renewable energy]. It is anticipated that the civil society groups will take the lead role in this component. Where possible additional training will be provided to the civil society groups.	January – December 2009

ANNEXES

Draft as of November 2008

GOVERNMENT OF NAURU

Implementation Schedule for the Short Term Priorities of the Nauru Energy Efficiency Action Plan

January – December 2009

Funding provided by the EDF-9 REP5
Second Programme Estimate

Introduction

This document provides a series of activities identified in the Nauru Energy Efficiency Action Plan (EEAP) that will be implemented within the period January – December 2009. The implementation of these activities has been made possible by the EDF-9 REP 5 funding through the second programme estimate. It is also noteworthy that these activities address some of the short term priorities as in the EEAP.

Objective

Promote the implementation of demand-side-management strategies for increased energy efficiency at all levels.

Summary Budget

Items	Totals [AUD]
Activities	185,000
Administration, reporting, monitoring & evaluation	5,000
Miscellaneous	10,000
TOTAL	$200,000

Activities

The following matrix provides an outline of proposed activities to commence the implementation of short term priorities of the Nauru Energy Efficiency Action Plan.

Sub-activities	Description	Means of Verification	Budget	Timeline
Gravity-feed water tank	Install a water tank to enable the demonstration of minimizing the use of pressure-pumps.	Tank installed and savings demonstrated	2,000	May 2009
Replace /install ceiling fans	Airport Terminal – faulty fans will be replaced Hospital – where required ceiling fans will be installed /replaced to ensure a comfortable environment for patients.	Fans replaced /installed and operating	20,000	March 2009

Activities	Description and Details	Means of Verification	Budget [AUD]	Timeline
Retrofitting of Air Conditioners at the Airport	Will consider retrofitting and or replacing old inefficient air conditioners.	Air conditioners replaced /retrofitted	50,000	March 2009
Install photo-sensors on selected public building lights	Photo-sensors will be installed at the Airport Terminal, Civic Centre and Government Buildings to ensure that all security lights are turned off during daytime.	Photo-sensors installed and operational	15,000	March 2009
A CFLs residential promotional programme	▪ Provide two (2) CFLs per household (4000 CFLs in total). ▪ A CFLs residential promotion programme will be developed with the concept of "buy one get one free". The programme will purchase 1000 CFLs which will be the "get one free" component.	Impact monitored and documented	28,000 10,000	February – October 2009
Schools' programme	▪ Educational /awareness materials – additional materials will be developed in English and Nauruan, printed and distributed to schools. ▪ Poster competition for primary schools – this will be considered at different age categories with 2 competitions scheduled for 2009. ▪ Essay competition for junior secondary schools – an appropriate theme will be determined with the competition to be considered for Nauru College students. ▪ Teachers' Programme – teachers from the various schools will be invited to propose projects on energy efficiency and conservation that can be implemented within their respective schools. The awards for the best two (2) project proposals will provide funds for the actual implementation of the proposals. ▪ Energy efficiency / energy conservation / renewable energy Models – Nauru Secondary School students will be invited to develop and submit display models that would portray a theme relevant to the mentioned areas.	Materials published and available Competitions completed and prices awarded Projects implemented, monitored and evaluated Models developed, displayed and prizes awarded	15,000 5,000 5,000 20,000 5,000	February – October 2009
Solar refrigerators	▪ Installation and commissioning of a solar refrigerator at the Hospital for vaccine storage – will demonstrate the use an energy efficient appliance.	Refrigerator installed and operational	10,000	May 2009