From PREFACE1 - SPC in Noumea

Bonjour and Bula to all PEN readers.

It is again another issue of the PEN wherein we disseminate information about what is happening at the national, regional and international energy scenes. Information is knowledge and knowledge is power and we sincerely hope that the PEN is providing you with that power.

It is another opportunity to reflect on the major events of the last couple of months. Among the highlights is the joint SOPAC-SPC Regional Energy Meeting [REM 2000] in Tarawa, Kiribati. The event was a family reunion since the last REM in 1996. It provided an opportunity to rub arms with both the old and new colleagues. Some of you had the chance to meet with the Tokelauan man and I know for sure that no one will try to confront Matelino. Jean-Michel did his best on the guitar and singing and it is no wonder he has been given the "best unusual move" award. Toshi San’s singing will always be remembered by many as Pacific Islanders are not used to singing in four different tunes at a time.

REM 2000 also provided an opportunity to interact with some of the new regional guys like Tony Neil of PPA, Dr Robert Guild of the Pacific Islands Forum Secretariat, Anare of SOPAC and Jean-Michel of the SPC PREFACE. I hope the personal contacts made had provided the opportunity to exchange ideas and information.

The Pacific Islands way was once again echoed during the REM 2000. Delegates, in their usual cooperation and consideration unanimously endorsed the CSD 9 regional submission. For this we thank Paul Fairbairn and Robert Guild for their excellent efforts. Delegates actively participated in an effort to construct a regional logframe matrix for the regional energy programmes. This logframe highlights issues and priorities of the PICs and it is important that PICs are not only driving but also seen to be driving the setting of their priorities based on what they see as their pressing issues. The exchange of ideas and views during the REM was very constructive and we thank all the delegates for their visions and wisdom.

Vinaka Vakalewu and Koraba to Laisa, Anare and our hosts in Tarawa who all went out of their way to get things organised for the REM.

The SOPAC STAR Energy Working Group meeting proved to be another feature of the Tarawa get-together. I would like to congratulate Mrs Apisake Makasini Soakai of Tonga on her new role as the chair of this working group. It is encouraging to note that in this male dominated field, women are beginning to take the centre stage.

But so much has been said at Tarawa, now is the time for follow-up actions. We will try to do our part and we would appreciate if you could do yours as well.

Happy reading and we look forward to hear from you in the next issue of your PEN.

Solomone Fifita, SPC PREFACE, 20th October 2000

PREFACE - Pacific Renewable Energy (CSD9) 10

Energy Conservation & Efficiency
Day-Lighting in Architecture
Saving Diesel in Road Transport
The Energy Supply/Demand Database
Energy & Sustainable Development (CSD9)
Meetings and Conferences

Welcome to the last edition of “PEN” for 2000. It is the second issue of a joint effort of the SOPAC Regional Energy Program and PREFACE - SPC.

Please note that the next issue will be in January 2001 and we would love to hear from all readers and welcome articles and opinions/views on energy related issues in the region. Please send articles to the contacts below.

Until the next issue, we wish you all a Merry Xmas and an energetic New Year.

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CONTENTS

From PREFACE - SPC in Noumea 1
Regional News 2
National News 4
Technology - Fuel Cells & OTEC 6
Petroleum News 7
World News in Brief 8
Energy Conservation & Efficiency 8
Day-Lighting in Architecture 8
Saving Diesel in Road Transport 9
The Energy Supply/Demand Database 9
Energy & Sustainable Development (CSD9) 10
Meetings and Conferences 11
Regional Energy Meeting (REM 2000)

This meeting was convened as a joint SOPAC – SPC energy meeting. NEDO (Japan) supported the meeting in providing some funding and meeting the costs associated with Mr Ganke’s participation at the REM. Mr Ganke, from the Shikoku Research Institute in Japan, presented a paper on the development of a Solar Manual.

Country Participation
Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Papua New Guinea, Pitcairn, Samoa, Tokelau, Tonga, Tuvalu, Vanuatu.

CROP EWG Participation
Pacific Islands Forum Secretariat, South Pacific Applied Geoscience Commission (SOPAC), Secretariat of the Pacific Communities (SPC), South Pacific Regional Environmental Programme (SPREP), University of the South Pacific (USP), and the Pacific Power Association (PPA).

Other Participants
Mr Toshihiko Ganke, Energy Research Department, Shikoku Research Institute, Japan.

REM 2000 Issues and Presentations
CSD9 Regional Position Paper
A Pacific regional submission to the 9th Session of the Commission on Sustainable Development (CSD9). This submission represents a regional consensus position. A draft final version of the paper was endorsed and adopted by the REM 2000 (see page 10 for a sneak preview of the introduction and background to the paper).

Regional Energy Logical Framework Matrix
Sectors considered / reported:
Policy, Power Sector, Petroleum, Renewables, Environment, Transport, Training, Research and Development.

A draft regional Energy Logical Framework Matrix was adopted by the REM 2000. SPC will continue to coordinate the completion of the matrix in close collaboration with the EWG.

EWG – Regional Priorities and Activities
This paper provides an overview of priorities and activities in the energy sector in the Pacific region. The energy sector is of crucial importance to Pacific island countries, for both economic growth and quality of life. At the same time, energy use exerts a financial and environmental toll. Coordinating the activities of regional agencies to optimise investment, management, and operation in the sector is necessary if it is to have far reaching beneficial effects on development in the region.

The paper was noted and the work agreed to by the REM 2000 Delegates. The EWG will continue to develop the paper and to keep members informed of progress.

Forum Islands Petroleum Advisory Service
The Pacific Islands Forum Secretariat offer members a Petroleum Advisory Service.

Why are Pacific Islands concerned with Petroleum Issues?
Some insights on petroleum issues for the Pacific:
Price regulated versus contract markets. Understand both markets to negotiate better contracts
Spot vs. Posted pricing. Is it time to move away from posted price?
Independent fuel storage. Reduce fuel cost by owning your fuel storage.
Waste Oil Disposal. Insist on suppliers dealing with the waste oil.

SOPAC Energy Program
The SOPAC energy program is guided by its goal to strengthen the energy sector in member countries through the provision of technical assistance and services. The program focuses on the following areas:

Resource assessment; National energy policy and rural electrification policy development; Energy supply/ demand database; Energy information database; Energy conservation and efficiency; Demonstration projects - SEPP, Technical support and Training and Education.

PREFACE - SPC
PREFACE is aimed at utilising sustainable renewable energy technologies, in particular solar PV and wind energy in outer islands and communities.

The program focuses on the demonstration of sustainable renewable energy projects with management, maintenance and financial structures which are effective and appropriate to the local context.

CDM and Climate Change
SPREP presented an overview of SPREP activities highlighting issues on climate change and in particular opportunities for financial assistance in the region’s energy programs. SPREP further highlighted that under the Kyoto Protocol there were three flexible mechanisms (Article 6 - Joint Implementation; Article 12 - CDM, and Article 17 - Emission Trading), which could be potential sources of funding for energy projects in the region.

Pacific Power Association (PPA)
PPA presented a paper which
highlighted its role of providing a direct link between the private sector and member utilities to improve power sector services.

The need to strengthen other areas such as database management, fuel prices, human resource development and the overall improvement in the performance of power utilities in the region was also referred to by the paper.

**University of the South Pacific**

This presentation emphasised that USP being an educational institution will continue to focus its activities on capacity building. Apart from offering energy courses, USP perhaps would like to be more involved in research work especially in the areas of renewable energy resources.

**Shikoku Research Centre - Japan**

The paper presents the work being undertaken by the centre in PV generating systems and electricity charging. A Manual for PV Application in the Pacific is currently being developed by the centre.

The paper also differentiated projects funded by grant aid (charges includes investment charges and management and maintenance costs) and those by liable aid which includes management and maintenance costs only.

**Regulatory and Inspectorate Roles of the Cook Islands Department of Energy**

The paper presented the outcome of the reform in the electricity sector in the Cook Islands.

The Department of energy now is responsible for ensuring the compliance of prescribed safety and wiring standards, inspect, examine and approve new electrical installation, inspect and approve private generating facilities, carry out investigations of reported accidents, fire and complaints, registration and licensing of electrical workers.

**Next REM**

The REM 2000 recommended that future meetings be held on a regular basis (perhaps every 2 years). The timing being flexible and dependent on the need to address regional and international issues. As appropriate, subsequent REMs should have a specific theme.

The Cook Islands offered to host the next REM.
Cook Islands

Training Attachment
Tangi Tereapii, Energy Officer from the Cook Islands was on a training attachment with PREFACE during September. The attachment involved participating on an Energy Audit of SPC’s Noumea headquarter, participating in a photovoltaic feasibility study at Vanuatu and a socio-economic and technical assessment of photovoltaic projects in both Vanuatu and Kiribati. Mr Tereapii also had an opportunity to visit and held discussions with the Kiribati Solar Energy Company in Tarawa. “Seeing is believing”, said Mr Tereapii. “I have heard a lot about pre-payment meters and the success of the Kiribati Solar Energy Company and my visit has given me the opportunity to judge for myself the applicability of the ways they are doing things in Vanuatu and Kiribati to our situation in the Cook Islands”. It has also given me the opportunity to renew my personal contacts with old faces like Leo Moli, Moli J anjea and Terubentau Akara and all the old and new faces that showed up at the REM 2000 in Tarawa, Kiribati.

There are obviously opportunities to use what I have learnt in this training attachment to our activities on solar electrification, energy conservation and activities relating to our National Energy Policy.

Merci Beaucoup to Delene, Jean Michel, Solomone and PREFACE.

Fiji Islands

Bagasse Power
The Fiji Sugar Corporation [FSC] has teamed up with a French energy company, SICEL, for a $140 million [USD70 million] scheme for building a power station at Ba to be fuelled for about half the year by bagase, which is the crushed remnants of sugar cane, local wood waste and imported coal.

Built as an adjunct to the FSC’s Rarawai sugar mill, the 53MW power station would supply 8MW to the sugar mill and offer the 45MW balance, which is nearly 85% of output from the Monasavu hydro electric power station, for sale to the FEA. There’s no agreement yet on what FEA would pay for the power.

SICEL has built bagase plants in Mauritius, La Reunion in the Indian Ocean and at Guadeloupe in the Caribbean.

FSC Chairman Hafiz Khan says he believes the proposition is the cheapest way in Fiji of generating power and “permits us to diversify our business, save energy and foreign exchange, and reduces the length of the Rarawai crushing season. It would help towards making FSC more internationally competitive.”

Construction of the power station could begin next year. It would be owned by a public company with FSC as an “18-25%” shareholders, SICEL a “little bit more” and 49% on offer to other investors.

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The recently launched metering system is for the first time, allowing KAJUR to make nearly 100% collections.

To get customers to begin paying off bills, KAJUR is charging a percentage each time customers come in to pay for continued electricity use through the meter system, he said. While this lead to some complaints, Muller said that it is a necessary step to stabilize KAJUR. The power company has received tremendous support from leading Kwajalein Senator, Iroj Imata Kabua on its collections, Muller said.

“Imata was one of the first on Ebeye to request installation of the meters at his home, and he’s paid all of his bills,” Muller said. This has made KAJUR’s job much easier by having Kabua set an example for the rest of the community, he said.


Marshall Islands

Pre-pay meter magic
While Ebeye’s new “debit meter” system is a resounding success for KAJUR, Ebeye’s power company, the pre-pay metering is not producing adequate revenues for KAJUR to pay off its very substantial past debts.

KAJUR is saddled with about USD2.6 million in unpaid electric bills dating back to three years – coupled with close to a million dollars in debts it owes, according to the Private Sector Unit coordinator Bobby Muller. He noted that in 1997, KAJUR wrote off unpaid electric bills totalling USD2.8 million in an effort to “start fresh”, but the collection system did not improve.

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Toxic waste clean-up in the Pacific
Chemical stockpiles in more than 50 contaminated sites have been identified in 13 Pacific island countries, including the Marshall Islands, in a report released by SPREP.

The stockpiles include oil in old power transformers, which can contain toxic chemicals known as polychlorinated biphenyls, or PCBs, old pesticides and timber treatment wastes. Millions of dollars are required for the clean-up and disposal of hundreds of tonnes of obsolete chemicals. Many of the identified waste chemicals can only be safely disposed using high-tech treatment facilities, which are not available in these countries, so they will have to be packed into special containers and shipped outside the region.

Further details can be obtained from Dr Bruce Graham of SPREP [fax 685-20231 and Tel 685-21929]


Further Reading: Management of Persistent Organic Pollutants in Pacific Island Countries (SPREP).
Papua New Guinea

Landslide hits PNG oil

PNG’s oil production will be cut by 10,000 barrels a day for up to six weeks, while the operator of the Moran Oil Field assesses damage caused by a recent landslide. Two of its four wells in the Southern Highlands have been closed and will result in at least USD15 million dollars being lost in production.


International Group to Visit PNG Oil, Gas Fields

Port Moresby, PNG - A delegation of 10 international investors from major institutions and investment houses in the United States, Europe and Australia will be visiting major oil and gas project sites in PNG in mid-November.

Oil Search would host the delegation.

Mr Peter Botten, Oil Search Managing Director, says that Oil Search will continue to explore other areas in PNG in order to access the true potential of the country.

“An oil discovery, if made, can be developed quickly, with the oil sold on world markets as with Kutubu, if we find gas, you need to find a market, as we are trying to do for the gas to Queensland project,” Mr Botten said.

Source: Post-Courier/PINA Nius (1 November)

Samoa

Fruit Drying Project Designed to Boost Women in Business

At a recent demonstration of fruit drying the National Council of Women (NCW) was reopresented by presidents of village branches throughout Savai’i and Upolu.

The Nafanua Horticultural Centre played host to 20 women who attended the workshop, sponsored by the Salvation Army.

Peter Rutledge from the Ministry of Agriculture, Forests, Fisheries and Meteorological Services demonstrated on the use of the food dryer.

Tonga

Thesis Research

Mr Tevita Tukunga, Energy Officer with the Tonga Energy Planning Unit is now doing a Master of Engineering on Renewable Energy at the University of New South Wales (UNSW) in Sydney. Tevita is currently doing his Thesis research and has been financially and technically supported by PREFACE to carry out a socio-economic and technical evaluation of the EU-funded photovoltaic project in the Vava’u Group. There are a total of 340 systems in the Vava’u group which was installed in 1996.

Tevita’s research will not only fill the academic requirements for his studies but it will also contribute to the database on renewable energy knowledge in the region. Tevita is expected to rejoin the EPU and be seen around the regional energy scene later next year.

from page 3

PREFACE Feasibility Studies

funds for PREFACE to conduct a national solar electrification strategy workshop in Vava’u on 26 – 28 July. The workshop was aimed at bringing all the solar electrification stakeholders together to take stock of what has been done and to devise a strategy for the future. This was carried out as part of the PREFACE feasibility study, as PREFACE was interested in identifying management, technical and a financial structure which would guarantee that its planned solar electrification project on the Ha’apai group would be a success, according to PREFACE goals and strategies.

The fourteen islands which has been electrified with PV were all represented at the workshop. This was expected as one cannot afford to miss the beauty of the Vava’u group and the hospitality of its people. It was an opportunity for such a get-together to be held and it provided a chance for the island communities to voice their concerns directly to EPU. It also allowed the private sector, NGOs and related government departments to provide their experiences on related rural development projects and to point out potential opportunities for the solar electrification programme.

The two and a half days workshop removed some of the misunderstandings between the parties. Participants appreciated each others concerns and made compromises to arrive at common understandings. Among the highlights of these understandings is the pledge by the island communities to achieve a certain monthly fee collection rate by a fixed date. There was also a pledge to open an EPU office at Vava’u and to be manned by one of EPU’s experienced technicians.

PREFACE strongly believes and is supportive of facilitating and fostering mutual understandings and win-win partnerships between the “utilities” and consumers in renewable electrification schemes.

The feasibility study report is yet to be completed but out of the Vava’u workshop, the “service utility concept” appears to be the leading framework for the planned solar electrification project for the Ha’apai group.
Benefits of Fuel Cells

Energy Security
US energy dependence is higher today than it was during the “oil stock” of the 1970’s and oil imports are projected to increase. Passenger vehicles alone consume 6 million barrels of oil every single day, equivalent to 85% of oil imports.

- if just 20% of vehicles used fuel cells, we could cut oil imports by 1.5 million barrels everyday;
- if every new vehicle sold in the US next year was equipped with a 60kW fuel cell, we would double the amount of the country’s available electricity supply; and
- 10 000 fuel cell vehicles running on non-petroleum fuel would reduce oil consumption by 6.98 million gallons per year.

Clean and Efficient
Fuel cells could dramatically reduce urban air pollution, decrease oil imports, reduce the trade deficit and produce jobs.

The US Department of Energy projects that if a mere 10% of automobiles nationwide were powered by fuel cells, regulated air pollutants would be cut by one million ton per year and 60 million tons of greenhouse gas carbon dioxide would be eliminated. DOE projects that have the same number of fuel cell cars would cut oil imports by 800 000 barrels a day – about 13% of total imports.

Some of the Frequently Asked Questions

· Where did fuel cells come from?
The first fuel cell was built in 1839 by Sir William Grove, a Welsh judge and gentleman scientist. Serious interest in the fuel cell as a practical generator did not begin until the 1960’s, when the US space program chose fuel cells over riskier nuclear power and more expensive solar energy. Fuel cells furnish power for the Germini and Apollo spacecraft, and still provide electricity and water for the space shuttle.

· What sort of fuels can be used in a fuel cell?
Fuel cells can promote energy diversity and a transition to renewable energy sources. Hydrogen – the most abundant element on Earth – can be used directly. Fuel cells can also utilise fuel-containing hydrogen, including methanol, ethanol, natural gas and even gasoline. Fuels containing hydrogen generally require a “fuel reformer” that extracts the hydrogen. Energy also could be supplied by biomass, wind, solar power or other renewable sources. Fuel cells today are running on many different fuels, even gas from landfills and wastewater treatment plants.

Ocean Thermal Energy Conversion (OTEC)

What is OTEC?
OTEC is a system of converting heat energy into electricity by using small temperature difference between warm surface ocean water and cold deep ocean water - as long as there is 15 degree Celsius temperature difference at the minimum between the warm and cold water.

History
The idea of using thermal energy from the oceans is not new. It was a French scientist, J. D’Arsonval, who had first thought about the idea more than a century ago. It was only since early 1970 when research on this technology had started to take shape.

The Basic Process
Basically there are 3 types of OTEC processes: closed-cycle; open-cycle; & hybrid-cycle.

The closed-cycle system uses a working fluid such as ammonia, which boils at a temperature of 260°C (780°F) at atmospheric pressure to turn to vapour. The expanding vapour than drives the turbine.

The open-cycle system uses the warm surface water itself as the working fluid. The water vapourises in a near vacuum at surface water temperatures. The expanding vapour then drives a low-pressure turbine.

Hybrid systems use parts of both the open- and closed-cycle systems to optimise the production of electricity and fresh water.

Advantages
- uses clean, abundant, renewable and natural resources to produce electricity;
- research indicates that little or no adverse environmental effects from discharging the used OTEC water back to the ocean at prescribed depths;
- OTEC systems can produce electricity and fresh water as well;
- helps in reducing dependence on fossil fuels; and
- the cold seawater has many other uses: agriculture, cooling, etc

Disadvantages
- at present the cost per kWh is more than electricity generated from fossil fuels;
- construction of OTEC plants and laying of pipes in coastal waters may cause damage to the marine ecosystem; and
- there is a need to build a commercial size plant to further document economic feasibility.

Open-Cycle OTEC process

More to come in our next issue
Little Change in Oil Prices

New York, AFP - Oil prices trickled down on Friday 20 October, despite concern over dwindling reserves and continuing unrest in the Middle East.

After a brief stint at $US34.25 per barrel, light sweet crude for November delivery dropped slightly below the previous night’s rate of US$33.50, settling at US$32.91.

In London, Brent North Sea crude for December delivery fell to US$30.74 per barrel, after briefly reaching US$31.55, up from US$31.10 at the close of business on Thursday.

Analysts attributed the price hikes of Thursday and friday morning to the American Petroleum Institute’s announcement of contracted US oil reserves.

But according to an Analyst with GSC Energy in Atlanta, the American Petroleum Institute has said the drop in fuel reserves could stem from increased consumer demand.

“There will be no shortage, there’s plenty of production to meet demand,” the Analyst said.

Both the US Energy Department and the American Petroleum Institute have said that stocks are now more than 20 million barrels lower than at this time last year.

Analysts predicted that prices would remain well supported because of concern that the oil producing Arab countries could still use crude as a political instrument to support the Palestinians in their ongoing disputes with Israel.

Arab Leaders are to meet in Cairo for an emergency summit called to forge a strong Arab rank behind the Palestinians.

The situation is likely to remain tense “In the Middle East, and traders may want to be cautious in case there are further calls at the Arab summit in Cairo for the use of oil as an economic weapon,” London’s GNI brokerage said in a research note on Thursday.

But for the GSC Energy Analyst in Atlanta, “the Middle East is in the background”.

“There have been many signals from OPEC members that they are not ready to use the oil threat to make their point,” the Analyst said.

Meanwhile, US-based petroleum giant Unocal announced that it has made a new oil discovery in the Gulf of Thailand.


Changing Automobile Technologies

The automobile technology is heading towards being more fuel-efficient.

Significant work has been carried on alternative fuels such as LNG, LPG, battery operated and fuel cell vehicles. These technologies are designed to meet and exceed the most stringent of environmental standards proposed for the future and involve not just reduction in fuel consumption but complete replacement of conventional fuel requirements.

The President of Honda Motor Company has announced that they will have a new car powered by fuel cells on the road within three years.

Daimler Chrysler is investing US$49 billion world wide in research over the next three years exploring and testing improvements and alternatives to current conventional engine technology.

Biogas cars

Kogas, a Swiss company is making fuel based on Biogas which is more environment-friendly and cheaper than petrol.

The fuel is produced by collecting kitchen and garden trash and then put into a fermentation reactor. The fermentation process converts the rubbish into compost and biogas, which the Kogas company calls Kompogas. The gas made from a 100kg of waste can take a medium-sized car 100km.

Wind-Diesel Power for Fishermen

An isolated fishing village Puerto de la Cruz, on the Canary Island of Fuerteventura, Spain are using a wind-diesel system, which is powered by wind during windy conditions and by a diesel engine when there is no wind. This in turn supplies a desalination plant, which provides drinking water and a cold-storage depot where fish is deep-frozen.

Small Turbines for urban Environment

Lagerwey, in cooperation with Dutch utility NUON, has developed a 2.5kW wind turbine. The turbine is a complete system with gearbox and fully variable speed.

The turbine was designed for application in urban environments, with low noise levels.

Search for Environmental Projects

ScotishPower is looking for applications for funds from groups and organisations involved in developing renewable energy projects such as small-scale hydro and wind farms.

Although there are no maximum or minimum grant limits the ScotishPower group, Green Energy trust is likely to grant up to £15 000 for sustainable projects. Applicants will be asked to meet 50% of the project costs.

Day-lighting in Architecture

Before the invention of the light bulb, natural light played an important role in the lives of mankind. Buildings were designed and built to take advantage of the daylight. The use of natural lighting was then forgotten after the advent of the electric bulb.

Day-lighting in buildings only became popular in the early 90’s. Day-lighting is used in architecture for several reasons. The primary reason being to reduce the energy demand for lighting and cooling leading to energy savings and efficiency.

The day-lighting strategy fundamentals are:

- Classical day-lighting techniques
  Side-lighting (Figure A) is the most conventional day-lighting technique and it exists in offices, apartment buildings, multi-storey buildings and other high-rise commercial and residential buildings. Side-lighting include clerestories, which are windows that are placed above the normal window height.

- Innovative day-lighting techniques
  New techniques are constantly evolving and may involve the use of conventional day-lighting techniques combined with new materials or devices to manipulate, redirect and reflect the light or reduce excess light and heat, Figures E, F and G.

Source: Renewable Energy - Resources and Applications in Malaysia; Kamaruzzaman S, Mohd. Yusof O, Baharudin Y.
**Saving Diesel in Road Transport**

**Driver Techniques**

**Start up (warm up)**
Generally, start with no throttle and idle until full oil pressure is indicated. Increase speed (stay below 1000 rpm) until water temperature begins to rise – then ease out on to the road.

**Use correct gear positions**
Use the progressive shifting technique (i.e. using only enough revs in each gear to be able to get the vehicle moving and reach the next gear smoothly). Note that low rpm = low fuel consumption. When the driver revs between gears the engine is pushed to high fuel consumption region without doing useful work. Avoid jerky patterns of acceleration and deceleration. Too sudden acceleration leads to incomplete fuel combustion.

**Easy on the Brakes**
Avoid using the brakes where it is possible to look ahead and plan your moves. Heavy braking wears linings and tyres quickly, besides wasting useable energy.

**Switch off**
If it is necessary to stop for a minute or two switch off the vehicle.

Good driving techniques and sensible driving are key factors to fuel conservation in road transport.

Reference: Department of Primary Industries and Energy, Australian Government.

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**THE ENERGY SUPPLY/DEMAND DATABASE**

The energy supply/demand database template was initially designed as an activity carried out by the core Regional Energy Programme based at the Pacific Islands Forum Secretariat (formerly the South Pacific Forum Secretariat) in close cooperation with member country planning, statistics and energy offices. Training in the operation and management of the energy database were also part of the activities carried out during this initial stage.

Many countries encountered difficulties in the collection of energy data, particularly in the petroleum sectors down to the levels of desegregation that they initially envisaged as possible.

Since the physical transfer of the Energy Programme to SOPAC, now known as the SOPAC Energy Unit, the energy database template has been modified to meet member country requirements and assisting in making the database more user friendly and removing some of the difficulties initially encountered by the energy offices in the region.

Current and on-going in-country technical assistance provided by SOPAC has noted encouraging progress made with the collection of energy data in Fiji, Kiribati, PNG and Tonga.

Difficulties associated with the sourcing of petroleum data still exists, as petroleum companies seem reluctant to release the information due to market sensitivities.

The end-use sectors have been an area where detail information is required to accurately desegregate the energy consumed. This has been another one of the major hurdles which member countries are currently trying to overcome.

Other contributing factors to the slow progress in the energy data collection and input has been mainly due to the limited number of personnel, computers and funds allocated to the database work at the energy offices in the region.

In the long term, it is anticipated to have a regional energy supply/demand database, which will be housed at SOPAC and will be made available to member countries for planning and policy formulation. However, to reach this stage all member country inputs are required.
I. INTRODUCTION

1. The Pacific island countries continue to share a common aspiration for economic development and improved living standards while at the same time remain strongly committed to conserving the natural and cultural heritage upon which their future depends. This submission to the Ninth Session of the Commission on Sustainable Development aims to build on agreements already reached by Pacific island countries and the international community concerning the sustainable development of Small Island Developing States. It provides a measure of progress towards sustainable development in this region and identifies where special attention is required to further its implementation.

2. The context of generally small populations on often tiny islands spread over a huge area of ocean provides a setting that is unique on the global scene. This context has for generations directly impacted the lives and well being of all Pacific peoples and is deeply enshrined in traditional and cultural values and practices. Over the past one hundred years, with increased access to the “outside world” and the onset of globalisation, there has been a big change in the aspirations for a “better quality of life” for Pacific people.

3. Coastal communities dominate in the region. Population is increasing, and in some places as a result of “urban drift” the rate of increase is alarming. These changes are leading to stress on the island system with an increased demand for resources.

4. Further stress on the island system is occurring as countries develop. Their reliance on fossil fuels has increased, in particular for producing electricity. Another high energy-consuming sector is transport, including sea transport. It is therefore important to acknowledge that in providing access to energy sources, in particular electricity, there is significant opportunity to utilise renewable energy sources. Although renewable energy technologies such as solar, hydropower, biomass and to a lesser extent wind have already been utilised in a number of the Pacific island countries to improve, communication, health, education and some small cottage industry, there remain significant opportunities and potential to further develop these renewable energy resources. However, for the Pacific island countries there are still a number of constraints and barriers to the exploitation and integration of these renewable energy technologies into the urban and rural sectors.

5. The region acknowledges that the objectives envisaged for sustainable energy futures should reflect the need for adequate energy supplies and increasing energy consumption in developing countries. The increase in the level of energy services will have a beneficial impact on poverty alleviation and social and gender equity by increasing employment opportunities and improving transportation, health and education. While countries are individually making advances towards sustainable energy utilisation, and all parties can benefit from progress made in other countries, there remains a significant amount of ground to be covered.

6. The Pacific island countries remain heavily dependent on fossil fuel based systems of energy generation that are frequently environmentally and economically unsustainable and not equitably available to remote populations. This dependency makes them vulnerable to increased costs and uncertain supplies which slows the sustainable development of Pacific island countries, particularly in rural areas.

7. In the broader context of energy with in the region, it is important that future opportunities be enhanced not only through regional initiatives but also by aligning where applicable and appropriate with the wider global energy agendas. Not withstanding the insignificant emissions of greenhouse gases from the small Pacific island countries, the potential for actions leading to use of non-carbon energy sources will ensure a more sustainable energy path for the future. Most Pacific island countries have already embarked on projects and activities in the context of the commitments under the United Nation Framework Convention on Climate Change (UNFCCC), which have led to significant abatement in the levels of greenhouse gas emissions.

8. It is imperative that the Pacific Island countries are provided financial and technical resources to assist in their visions for the exploitation and use of new and alternative forms of energy. International and regional cooperation are important to ensure the promotion of energy conservation, improvement of energy efficiency, adoption of renewable energy technologies, and the development and dissemination of innovative energy-related technologies. The CSD9 is therefore requested to seek support from the international community to assist Pacific island countries in implementing the recommendations in this submission.

II. BACKGROUND

13. In recent years the need for and importance of energy in the region has increased significantly in particular in relation to the global agenda and associated issues such as changing climate and, sea level rise. The essential role of energy for economic and social development and the increasing need to reduce negative environmental impacts has been noted. Furthermore, the need for sustainable patterns of production, distribution and utilisation of energy are of critical importance to the above-mentioned objectives, and are among the issues facing the challenge of energy for sustainable development.

14. Energy consumption is often regarded as an important indicator of economic development of a nation. For households, access to
different types of energy sources is a key indicator of the standard of living: changes in these proportions would, consequently, provide evidence of the development path. The commercial/industrial sector is fueled by energy. The Pacific island countries energy use in these sectors is dominated by imported fossil fuels, mostly petroleum. Indeed, the region can be regarded as among the world’s most dependent on fossil fuels for their economic development.

15. In terms of energy imports, Pacific island country energy imports account for 15-25% of total imports and over 40% of the gross domestic commodity exports. A Pacific Regional Energy Assessment (PREA) (1992) report showed the tremendous impact of petroleum imports on the economy. The ratio of petroleum imports to total exports is very large for most Pacific island countries, between 40 - 80%, and alarmingly so for some countries where the figures are as high as 500%. This constitutes a dangerous dependency situation, for in case of a major disruption in the fuel supply due to global shortages, rising prices, conflicts or other causes, the consequences would be dramatic.

16. Most of the imported energy is used either for transportation or for the generation of electricity. This is compounded by the fact that the fuel prices in the region tend to be 20-30% higher than world market prices. The recent increase in oil prices have had a major effect on the Pacific island country economies.

17. Approximately 50% of the total energy used in the Pacific island countries is from indigenous, local sources. These consist mainly of biomass (fuelwood, bagasse, coconut husk and shell) hydro and small amounts of solar and wind energy.

18. On average individual Pacific islanders are responsible for producing approximately one quarter of the per capita CO₂ emissions attributable to the average person world wide. This means that the Pacific island countries account for some 0.03% of the global emissions of CO₂ from fuel combustion despite having around 0.12% of the world’s population. This can be compared to the 29 OECD countries, which account for just over 50% of the total global emissions from fuel combustion, with approximately 20% of the world’s population.

19. Transportation accounts for over half the petroleum use in most Pacific island countries. This is equivalent to about 680,000 tonnes of petroleum per annum. A nominal increase of 5% in vehicle efficiency would reduce GHG emissions by approximately 30,000 tonnes of carbon or over 108,000 tonnes of CO₂. This kind of analysis shows the potential for reducing carbon emissions from the transportation sector. Combined with other strategies, the resulting benefits on the environment and the economy are likely to be significant.

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**International Marine Renewables Conference**

**Marine Renewable Energy Conference**

A 2-day International conference 27-28 March 2001; Newcastle University: UK.

Organised by the Department of Marine Technology Newcastle University; the Institute of Marine Engineers; and sponsored by IEE, IMechE, IOE and Mathworks.

**1st. Call for papers:**

Papers to be submitted in the areas of Inshore and Offshore Wind; Offshore Wave Power; Coastal Wave Power; Tidal Power; Energy Control, Transmission & Storage; and Innovative Generation Technologies.

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**Fifth International Workshop**

**“Russian Technologies for Industrial Applications” “Renewable Energy”**

ST Petersburg 28-30 May, 2001

The Russian Foundation for Basic Research (RFBR) and the St Petersburg United Research Center hold a series of International Workshops “Results of Fundamental Research for Investments”, which are aimed at introducing the scientific fundamental results (Hi-Tech developments) to industry.

The following are the contacts should you need further information. Prof. S.G. Konnikov, Polytechnicheskaya 26, St Petersburg, 194021, Russia Tel: +7(812)247-9968 Fax:+1(812)247-5894 email:WRFRI@pop.ioffe.rssi.ru website: www.ioffe.rssi.ru/WRFRI

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**Samoa Fruit Drying Project**

**Designed to Boost Women in Business**

The centralised location of the food dryer may not be easily accessed by some women. It is for this reason that perhaps that the food dryers are built at the villages.

The solar powered dryer would be the ideal option. At the moment, experimental solar dryers are constructed by using corrugated iron, plastic or glass, black paint and silicon glue. Temperature attained by the experimental dryer is 48 degree Celsius however, the minimum temperature required for drying is 55 degree Celsius. Certainly there is a need to improve the efficiencies of these solar dryers.

The ultimate goal is to have an inexpensive solar powered drying box set up in the villages.

Source: Samoa Observer/PINA Nius (16/11/2000)