RIO+20 outcome on energy

Sustainable energy for all — Roll-out of Pacific initiatives

Second quarter 2012 oil market report (April–June)
Leadership, governance, coordination and partnership

RIO+20 outcome on energy
What does it mean for the Pacific? .......................................................... 4
Technical assistance for mitigation and adaptation activities in the energy sector .......................................................... 5
Challenges to increasing the share of renewable energy .................. 6
Sustainable energy for all — Roll-out of Pacific initiatives ........... 8

Capacity development, planning policy and regulatory frameworks
Enhancing understanding of petroleum pricing in the Pacific .......................................................... 13

Energy production and supply (renewable energy)
Planning a wind resource monitoring programme .......................... 14

Energy production and supply (petroleum)
Second quarter 2012 oil market report (April–June) ......................... 16

Energy conversion
Diversifying the power generation in Pacific Island countries and territories: can solar PV be deployed without grants? .......... 18

End-use energy consumption
Australia partners with SPC to advance implementation of energy standards and labelling in the Pacific ................................ 20

Opinion column
Energy or ecosystem? Have them both through careful planning .......................................................... 21

Other news
Old soldiers never die; they just fade away .................................. 22
Welcome to Pacific energy sector .......................................................... 23

Pacific energy events calendar (August–December 2012) .................... 24
This last quarter, as in earlier quarters, was not short of events to support the sustainable energy for all (SE4All) initiatives of the Pacific Island countries and territories (PICTs). In this issue of the Energiser, we will capture the events highlighted below.

The Work Plan Design and Implementation Regional Workshop for the Pacific Appliance Labelling and Standards Program was held in Suva from 11–13 April 2012. Following this workshop, a grand agreement was signed between the Commonwealth of Australia represented by the Department of Climate Change and Energy Efficiency and the Secretariat of the Pacific Community (SPC). This agreement has facilitated the transfer of the first tranche of funds for this project.

In line with 2012 being the International Year of Sustainable Energy for All (IY SE4All), a high-level conference of the small island developing states achieving SE4All was held at Barbados from 7–8 May 2012. As one of the preparatory meetings leading up to the RIO+20 conference, it was pleasing to note the voluntary commitments made by PICs in this conference with regards to their effort to pursue the SE4All initiative. This conference also acknowledged the International Renewable Energy Agency’s (IRENA) effort in supporting small island developing states (SIDS) in their efforts to accelerate renewable energy deployment. A SIDS Dock national coordinators meeting on 9 May resulted in the call for the SE4All initiative to recognise that SIDS DOCK is a critical vehicle through which technical and financial support, capacity building, and preparation of investment opportunities are delivered to our members in order to achieve the three objectives of the SE4All initiative and the core purposes of SIDS DOCK.

The members of the Pacific Energy Oversight Group (PEOG) are already engaged in various partnerships with both IRENA and the SIDS Dock. IRENA’s Renewable Energy Coordinator for the Pacific region is now based at SPC in Suva. Both IRENA and SIDS Dock participated in this year’s annual conference of the Pacific Power Association (PPA). A capacity building programme with PPA, SPC, the Secretariat of the Pacific Regional Environment Programme, the Sustainable Energy Industries Association of the Pacific Islands and the University of the South Pacific was developed.

Members of PEOG, and with the support of the International Union for the Conservation of Nature, the Reserve Bank of Fiji and other agencies in Fiji, successfully did the regional roll-out of the IY SE4All on 18 May 2012. The event was graced by His Excellency, Ratu Epeli Nailatikau, the President of Fiji. In his keynote address, the president emphasised that ‘the situation is no longer confined solely to an energy security situation, rather it poses as an imminent threat to the security of our economy, our livelihood and our sovereignty as a nation’.

The issue of accelerating renewable energy deployment in power generation and transportation was the subject of a joint workshop by IRENA and the government of Japan, at Okinawa, Japan on 26 May 2012. While case studies of projects working on the ground were presented, the issue of grid stability and lack of credible data are challenges that have been identified and renewed effort are currently underway to address these.

Petroleum products and their prices continue to be a major challenge to the socio-economic development of PICTs. With the support of the World Bank, GIZ (German Agency for International Development) and Platts (a division of the McGraw-Hill Companies and a lead publisher of petroleum pricing data in the Asia-Pacific region), a regional petroleum pricing workshop was conducted on 18–22 June.

The quarter concluded with the Rio+20 conference, which was held on 20–22 June at Rio de Janeiro.

As we embark on the third quarter, it is reporting time once again to the various meetings leading up to the Forum Leaders’ Summit and SPC’s governing council meeting (Committee of Representatives of Governments and Administrations). As part of the reporting obligations under the Framework for Action on Energy Security in the Pacific, PEOG is preparing the progress report on the implementation plan for the energy security framework. We hope to capture the key achievements in the next issue of our newsletter.

‘Ofa atu
Solomone Fifita
RIO+20 outcome on energy
What does it mean for the Pacific?

On the world stage, the Pacific Island countries and territories (PICTs) can be easily overwhelmed with the global statistics that one in five people still lack access to modern electricity, however, for the Pacific, it is seven out of every ten people that still lack access to modern electricity. Access by households to the electricity grids is lowest in the higher populated countries of Melanesia. Add to this the nearly 100% reliance on fossil fuel and the highest electricity tariffs, fuel costs and transport costs in the world then it is understandable why PICTs have been anticipating the outcome of the Rio+20 conference with a lot of hope.

The Rio+20 outcome of ‘The Future We Want’ recognised the critical role that energy plays in the development process, as access to sustainable modern energy services contributes to poverty eradication, saves lives, improves health and helps provide for basic human needs. It emphasised the need to address the challenge of access to sustainable modern energy services for all and the need to take further action to improve this situation, including mobilising adequate financial resources, so as to provide these services in a reliable, affordable, economically viable and socially and environmentally acceptable manner in developing countries.

Mobilising financial resources is not new to PICTs leaders’ agendas. In fact it is often said that the region is not short of generous financial resources from generous partners. It is however short of well coordinated and successful projects on the ground. Hence in 2011, leaders called on development partners to assist in the implementation of prioritised energy activities in the region, the implementation of national energy sector plans and targets and to strengthen coordination of their financing activities.

The RIO+20 conference reaffirmed support for the use of an appropriate energy mix to meet developmental needs through increased use of renewable energy sources and other low-emission technologies, the more efficient use of energy, greater reliance on advanced energy technologies, including cleaner fossil fuel technologies, and the sustainable use of traditional energy resources.

For PICTs, leaders in 2011 agreed on the value of energy audits and of developing credible whole of sector plans such as “energy road maps” and structures to improve energy security, reduce dependency on fossil fuel for electricity generation and improve access to electricity. It is pleasing to note that the developments and refining of energy roadmaps and charts are currently underway in Tonga, Cook Islands and Vanuatu and discussions are underway with the relevant authorities in Nauru and Kiribati. This is a priority area for the Secretariat of the Pacific Community’s (SPC) Energy Programme and the financial assistance through the GIZ-funded Coping with Climate Change in the Pacific Islands Region (CCCPIR) is gratefully acknowledged.

In line with the spirit of the Forum leaders' decisions in 2011, RIO+20 also urged governments to create enabling environments that facilitate public and private sector investment in relevant and needed cleaner energy technologies. Rio+20 recognised the need for energy efficiency measures in urban planning, buildings and transportation, and in the production of goods and services and the design of products. The importance of promoting incentives in favour of, and removing disincentives to, energy efficiency was also recognised by the conference.

For PICTs, the major obstacle to effective energy planning is the absence of vital energy data. Planning of any energy efficiency programme in urban buildings, transport, buildings, etc should be based on decent, credible data, which should at least correctly establish the current energy consumption and therefore act as the basis from which savings can be estimated. Regrettably this is not the major undertaking of most energy offices in PICTs and SPC’s back-up support is inadequately resourced to provide meaningful assistance. The European Union Policy Dialogue Facility and the Australian government’s assistance in this area is gratefully acknowledged.

The conference was determined to take the necessary steps toward making the UN initiative on Sustainable Energy for All a reality and, through this, help to eradicate poverty and lead to sustainable development and global prosperity. The Pacific had its regional roll-out of the International Year of Sustainable Energy for All on 18 May 2012. Already, PICTs have been at the forefront of making commitments to this initiative. Cook Islands, Fiji, Nauru, Palau, Republic of Marshall Islands, Samoa, Solomon Islands, Tonga and Tuvalu have all made their commitments. Cook Islands, as host of the 2012 Forum Leaders’ Meeting, is planning an energy side event as a follow-up to the Rio+20 conference.

Well before the Rio+20 PICTs have already embarked on ‘The Future We Want’. The future that PICTs want includes: Sustainable Energy for All. It is a future based on an universal access to modern energy services that are reliable, affordable, efficient, clean and safe. It is an energy future that is clearly laid out in a government-adopted roadmap, a roadmap that looks at an appropriate energy mix including cleaner fossil fuel technologies. It is hoped that Rio+20 would result in more generous and better coordinated support to PICTs — support that would also take care of the basic planning tools such as data collection and analysis, which are required for successful renewable energy and energy efficiency interventions.

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Technical assistance for mitigation and adaptation activities in the energy sector

The Pacific-German Regional Programme, ‘Coping with Climate Change in the Pacific Island Region’ (CCCPIR), aims at strengthening capacities of Pacific Island countries (PICs) and regional organisations to adapt to and mitigate the impacts of climate change.

The CCCPIR is funded by the German government and jointly implemented by the German Agency for International Development (GIZ) and the Secretariat of the Pacific Community (SPC), in close partnership with the Secretariat of the Pacific Regional Environment Programme (SPREP). The programme has six thematic components, namely:

1. strengthening the regional advisory and management capacity;
2. mainstreaming climate considerations and adaptation strategies;
3. implementing adaptation and mitigation measures;
4. sustainable tourism and climate change;
5. sustainable energy management; and
6. climate change education.

The CCCPIR programme started in January 2009 and will end on 31 December 2015. The programme is implementing activities in 12 PICs and has its main office in Suva with sub-offices in Vanuatu, Tonga, Solomon Islands, Samoa and the Federated States of Micronesia.

The energy (component 5) objective is as follows: ‘Public and private service providers in the energy sector strengthen and improve their climate-related services and their focus on sustainability, reliability and cost-effectiveness in the energy sector within the region’. To achieve this objective, CCCPIR plans to provide technical assistance to six countries (Fiji, Kiribati, Nauru, Tonga, Tuvalu and Vanuatu) in the areas of:

- policy and strategic planning;
- capacity building to support demand-driven measures in the field of energy efficiency and renewable energy;
- impact assessment of energy policies;
- development of sustainable energy project proposals; and
- dialogue and coordination.

Through the provision of technical assistance, CCCPIR project aims to assist the countries to meet the goals laid out in their energy policies, including reduced dependence on imported fossil fuels, improved efficiency of energy use and increased use of renewable energy. The current national energy policies in place and the renewable energy targets that have been adopted by the six target countries are presented in Table 1.
Table 1: PICs current national energy policies

<table>
<thead>
<tr>
<th>Country</th>
<th>% grid-connected renewable electricity (2009)*</th>
<th>% access to electricity (2009)*</th>
<th>Main implemented renewable energy technologies</th>
<th>Key energy policy documents</th>
<th>Year</th>
<th>Renewable energy targets</th>
<th>Finalised action plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>61.0</td>
<td>83</td>
<td>solar PV, wind biomass, biofuel, hydro</td>
<td>Fiji National Energy Policy &amp; Strategic Action Plan</td>
<td>2006</td>
<td>90% grid electricity and 55% off-grid electricity from RE by 2011</td>
<td>Yes</td>
</tr>
<tr>
<td>Kiribati</td>
<td>0.0</td>
<td>80</td>
<td>solar PV</td>
<td>Kiribati National Energy Policy</td>
<td>2009</td>
<td>–</td>
<td>No</td>
</tr>
<tr>
<td>Nauru</td>
<td>0.2</td>
<td>100</td>
<td>solar PV</td>
<td>Nauru Energy Policy Framework</td>
<td>2009</td>
<td>50% of electricity from RE by 2015</td>
<td>No</td>
</tr>
<tr>
<td>Tonga</td>
<td>0.0</td>
<td>94</td>
<td>solar PV</td>
<td>Tonga Energy Road Map (TERM)</td>
<td>2010</td>
<td>50% of electricity from RE by 2012</td>
<td>Yes</td>
</tr>
<tr>
<td>Tuvalu</td>
<td>2.1</td>
<td>98</td>
<td>solar PV</td>
<td>Tuvalu National Energy Policy</td>
<td>2009</td>
<td>100% of electricity from RE by 2020</td>
<td>No</td>
</tr>
</tbody>
</table>

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Challenges to increasing share of renewable energy

It would be fair to say that all the renewable energy efforts in the Pacific Island countries and territories (PICTs) are aimed at reducing the economic and environment burdens of the heavy reliance on fossil fuel. Various programmes and projects are therefore aimed at the removal of the barriers to the acceleration of the deployment of feasible renewable energy technologies in the region. These barriers can be broadly classified as technical, fiscal and financial, institutional, knowledge and awareness, legislative and regulatory as well as the market and they are aimed at the two key consumers of fossil fuel — power generation and transportation.

A joint workshop by the International Renewable Energy Agency (IRENA) and the government of Japan, in Okinawa, Japan on 26 May 2012, was an opportunity to discuss the specific technology solutions to address the barriers to accelerating renewable energy deployment in the Pacific region, focusing on the power generation and transport sector. The workshop took advantage of the opportunity of the 6th Pacific Island Leaders Meeting (PALM 6), where the leaders of the Pacific Island countries agreed on the importance of renewable energy and energy efficiency for achieving sustainable development, as well as the reduction of greenhouse gas emissions in the region. These initiatives were welcomed in the workshop, which was attended by representatives from the Cooks Islands, Fiji, Kiribati, Niue, Republic of Marshall Islands (RMI), Samoa, Solomon Islands, Tonga, Tuvalu, the Pacific Islands Forum Secretariat, the Pacific Power Association and the Secretariat of the Pacific Community (SPC).

Power generation

On the power generation issue, the workshop focussed on grid stability. Various technology solutions from different islands around the world were shared and discussed. For instance, Miyako Island of Okinawa is promoting a micro-grid project, integrating 4,200 kW of wind and 4,000 kW of solar photo voltaic (PV) with 4,100 kW of batteries. The batteries ensure grid stability, helping to limit frequency fluctuations and accommodate varying PV output. In Hawaii, to better integrate wind and PV and to improve grid reliability, their projects have extended to the concept of smart grids, which will incorporate advanced information and communication technologies to control the power system. The Rokkashomura-Futamura wind power station in Aomori, Japan is part of the Northern Tohoku electricity system and it continued to operate in the aftermath of the Great East Japan Earthquake in March 2011 because it has batteries. The King Island in Tasmania, Australia has reduced its diesel use by 45%, which represents a financial savings of over two million dollars a year and a result of a series of development steps using energy storage, a dynamic resistance frequency controller, a flywheel-based UPS (uninterruptible power supply) and further demand-side management tools to achieve zero diesel operation.
For the Pacific Islands, one of the key challenges is the understanding of the operation of existing diesel generators in the grids in order to identify the technical parameters and criteria for grid stability. This should ensure a reliable power supply and a better understanding of what role electricity storage can play.

Another challenge to grid stability in the Pacific Islands is that the majority of island networks are old (e.g. diesel generators are on average more than 20 years old), and the power supply is relatively inefficient with high system losses. It is reported that Niue and Cook Islands are already feeling the grid stability problems due to the increased integration of renewable energy to their respective grids.

IRENA has therefore initiated a grid stability assessment for the Pacific island grids to ascertain how much variable renewable energy these island grids can absorb without it affecting their power quality. A database has been developed for all diesel generators in the region, including their technical characteristics. An assessment of diesel generators on PICs showed that the engines can be operated at around 30% partial load. But in some cases, especially for the older generators, this may require a retro-fit of the controller. It is also necessary to assess the impact of variable renewable energy on the frequency and voltage of PICs grids. IRENA thus started to look into software packages that allow dynamic modeling of the power grids to simulate the variation. Various software packages are available but so far only with limited validation for small island grid operations.

Given the significance of the grid stability subject to renewable energy deployment in the Pacific, IRENA conducted a workshop on ‘assessment of grid stability for increased integration of renewables in Pacific islands grids’ on 15 July at the margins of the annual conference of the Pacific Power Association, which was held at Port Vila, Vanuatu.

Use of renewable energy in the transportation sector
The workshop looked at the options of wind and biofuel. A presentation on wind propulsion system for ships showed the uses of kites to propel and pull ships to reduce their energy consumption. Depending on the strength and direction of the wind, it can reduce the daily fuel consumption by one to three tonnes. The system is already installed on different types of vessels and is being used in daily operations. In addition, just by optimising the piloting scheme of cargo ships, supported by software, about 9% in fuel savings can be achieved.

On biofuel, in Lejima Island of Okinawa, an innovative approach has been taken to raise the sugar and fiber sugarcane yield through interspecific hybridisation of different sugarcane species. Okinawa has also started to introduce bioethanol blending to gasoline, targeting 3% ethanol in the gasoline pool by the fiscal year 2015.

In the Pacific, PIGGAREP (Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project) has funded biofuel feasibilities studies, including a study at Christmas Island in Kiribati. The Fiji government has adopted a biofuel standard and various tests of biofuel in vehicles have been conducted at RMI and Vanuatu. There is also a renewed effort by a consortium including the International Union for Conservation of Nature – Oceania Regional Office, the Fiji Islands Voyaging Society, the Sailing for Sustainability (S4S), the University of the South Pacific – School of Marine Studies, the Greenheart Project (GH) and the B9 Shipping Ltd (B9) to revive the navigation, boat building and sailing skills in the Pacific. This effort has fuel savings as one of its key outcomes.

The absence of reliable statistics on the transport sector of PICTs is a serious concern and an area that SPC is currently looking for funding to support surveys and data collection. For instance, how much of the transport fuel consumption goes to land transport, to aviation and to sea transport? Within land transport, how much goes to cars and trucks? The European Union Policy Dialogue Facility has supported SPC’s energy database works and there is hope they will fund this very important gap in the pursuit of energy security in PICTs.
Sustainable energy for all — Roll-out of Pacific initiatives

The United Nations General Assembly declared 2012 the International Year of Sustainable Energy for All (SE4All), recognising that access to modern, affordable energy services in developing countries is essential for sustainable development.

The Pacific has much work to do to achieve this goal. Seven million of the region’s ten million people still do not have electricity. While more than 90% of households in the small island states and more than 80% in Polynesia have access to electricity, it is still below 30% in some of the larger and more populated Melanesian countries.

Moreover, the region continues to rely heavily on fossil fuel, which supplies about 95% of its commercial energy needs. Not surprisingly, given the region’s geography, the cost of electricity is among the highest in the world. However, in addition, total energy losses in some power utilities are as high as 25% and renewable energy opportunities and potential efficiency gains in the transport sector remain generally under-utilised.

For these reasons, at the 2011 Forum Leaders Meeting, Pacific leaders reaffirmed their commitment to renewable energy and the promotion of energy efficiency. They agreed on the value of energy audits and of developing credible whole-of-sector plans such as ‘energy road maps’ and structures to improve energy security, reduce dependency on fossil fuel for electricity generation and improve access to electricity. Leaders also emphasised the importance of effective management of fuel supply risks and meeting energy efficiency targets.

Through SE4All, the UN is calling for the achievement of the following complementary objectives by 2030:

• ensure universal access to modern energy services;
• double the rate of improvement in energy efficiency;
• double the share of renewable energy in the global energy mix.

Pacific organisation showed their commitment to ensuring sustainable energy for all by holding an event to mark SE4All on 18 May in Suva, Fiji. Delivering the keynote address at the event, His Excellency Ratu Epeli Nailatikau, the President of the Republic of Fiji, stressed that the provision of a regular energy supply is critical for the region’s very existence and has become one of the defining issues of this century.

‘The situation is no longer confined solely to an energy security situation, rather it poses an imminent threat to the security of our economy, our livelihood and our sovereignty as a nation. The International Year of Sustainable Energy for All is, therefore, an opportunity for the region to take seriously the Forum Leaders’ vision for an energy-secure Pacific and join the world community in pursuing the three UN objectives to be achieved by 2030,’ he said.

The Pacific SE4All in Suva went beyond targeting policymakers to reach out to the future leaders of the Pacific. The Secretariat of the Pacific Community (SPC) organised regional poetry and essay competitions on the theme of sustainable energy all, and the submissions proved that there is no lack of talent and creativity among our youth. Young Jin Choi of St. Nicholas High School, Solomon Islands, won first prize in the essay competition and Jessica Parapolo of King George VI School, Solomon Islands, won first prize in the poetry competition.

Several other key events were announced during the day. A research scholarship was awarded to Riyad Mucadam, a
Marshall Islands national in the final year of a PhD programme in applied physics at Victoria University, Wellington, New Zealand. Riyad’s research will provide an evaluation of the performance of the 1 MW Popua solar farm in Tonga.

SPC, with the financial support of the European Union Energy Initiative Partnership Dialogue Facility, has been working on establishing baseline energy security indicators for its member countries and territories. The first in the series of 14 Pacific Island country energy profiles was completed for Niue, and this was launched during the Pacific SE4All event.

Also launched was the Certification and Accreditation Scheme for Technicians and Sustainable Energy Businesses developed by the Sustainable Energy Industries Association of the Pacific Islands and the University of the South Pacific (USP).

The scheme aims to increase the level of professionalism of people working in the Pacific energy sector.

The Pacific SE4All event was a collaborative effort by national, regional and international agencies in the Pacific. Key regional organisers of the event were SPC, USP, the International Union for Conservation of Nature, the Pacific Islands Forum Secretariat, the Pacific Power Association and the Secretariat of the Pacific Regional Environment Programme. These organisations are committed to improving energy security in the region to ensure sustainable energy for all.

The work of these agencies in the Pacific energy sector is further guided by the Framework for Action on Energy Security in the Pacific, which was endorsed by Pacific ministers in April 2011 at the inaugural regional meeting of ministers for energy, information and communication technology (ICT) and transport. The framework outlines a new approach to improving energy security in the Pacific region. It acknowledges that national energy policies and plans must be the principal means for achieving energy security and promotes a ‘whole of sector’ approach, based on the concept of ‘many partners – one team’. This approach recognises that numerous stakeholders contribute to energy security in the region and accepts them as equal partners.

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A post Rio+20 roll-out of the International Year of Sustainable Energy for All will take place on 28 August in Cook Islands during the Forum Leaders’ meeting.
Sustainable energy means

It’s not always going to be about you or about me,
You and I are just passersby,
And so too, those who are coming after us,
But what we must always remember is;
As long as we come and go in this world,
We will always rely on the sources of energy it offers to us.

Either it be in the first world,
Second world or the third world,
We all share a common need;
The need for sustainability

So many times, so many mistakes; taking for granted things we know
Will run out one day, yet continue on, as if there is nothing wrong.
Then BOOM! Reality sets in;
Diesel, petrol and oil are running out. What can we do?!

"Oh. No“, we Solomon Islanders grumble;
We can’t go on without electricity!
And we can’t go back to using lanterns; it’s so not the 21st century!
Well, who said you’ll be using lanterns instead of chandeliers

All that doesn’t matter anyway, what matters is;
Are we capable of using the resources that has been bestowed upon our care,
From the very beginning,
Accordingly and sustainably?

Think ahead and don’t be subsequent,
As an Island nation it’s safer to think
Solar energy, hydro energy,
Geothermal energy and wind power.

Think Green and pursue whatever
Renewable energy is available and affordable to Solomon Islands.
After all, sustainability is more than just conserving energy in the long run,
But a significant foundation, that underlies the making of a surviving future generation.

By: Jessica Parapolo
Sustainable energy for all

Solomon Islands is currently one of the forty nine least-developed countries in the world, with over seventy five percent of its labour force is engaged in subsistence farming and fishing. Therefore it is obvious that the country is very much dependent on foreign aid to keep it moving. With those facts, many may wonder on how, Solomon Islands is going to approach and implement the idea of sustainable energy to all its people.

Well to begin with, the energy sector in Solomon Islands continues to be dominated by fossil fuels, with more than four million liters imported on average per month. Approximately sixty percent of this import level is consumed in power generation by the national electricity authority, Solomon Islands Energy Authority or by institutional and private sector generation plants. The remaining forty percent of the import volume is consumed roughly, by the transportation sector (twenty two percent) and the community sector (eighteen percent) in the form of kerosene or petrol for power and cooking in villages. Essentially all transport fuels and the majority of power generation relies on imported petroleum products. Despite our abundant supply of sunshine, wind, rivers and massive plantation of coconut trees throughout the country and islands. We yet cannot rip the benefits from these natural resources, and continue to resort to fossil fuel for energy which in return cost the government millions of dollars of tax payers money each year, that should have been used for other worthwhile purposes.

With the continuous upsurge in oil prices, and in addition to that sea level rise which is slowly coming into effect particularly the Northern atolls of Ontong Java in Solomon Islands, where gardens have been inundated with saltwater. This has raised great concern for the government of the day to minimise the use of fossil fuel and to adopt other sustainable energy which are renewable and environmentally friendly. Thus such energy are most likely to be harnessed by means of solar, wind, hydro, and biofuel from copra to be specific. The government is also implementing Energy Conservation and Efficiency Project as well as two other programmes focusing on rural electrification through renewable energy. Their main targets are schools, clinics and hospitals located in rural and provincial centre focusing mainly to further improve service. And so far a number of micro-hydro power stations are in operation in three provinces, with plans for the installation of two more hydro power stations. Whereas for biofuel, there are two private producers of biofuel, selling to the Honiara market, but at very low volumes, which is still insufficient to fuel the country. But yet, it still has the potential to grow to reach that stage where it can satisfy the demand of the population, because of the massive plantings of coconut trees throughout the country.

As previously noted, the successful implementation of micro-hydro power stations in the provinces, will continue to be an ongoing project for the government with the inclusion of solar panels to distributed as well. But these projects are mostly done at remote areas, such as the islands, where the people are unable to get access to the main electricity generating plant, which is located in...
leadership, governance, coordination and partnerships

the capital Guadalcanal. As for the capital Honiara it has yet to undertake sustainable energy projects such as wind, solar and hydro, at an industrial level. To cater for the rapid urbanisation of people to the capital, of around seventeen point six percent of the overall populations are currently residing in Honiara and is still growing. So this indicates that the pressure towards the demand for power will continue to grow as well. Therefore the government can take advantage of this situation, by investing on large scale sustainable energy project, which in return can boost the countries revenue intake and at the same time reduces its huge expenditure on fossil fuel.

The idea of moving towards cleaner and renewable energy has its basic reason, and that is to be independent from imported fuel from foreign countries. Because as experienced in the past if there is a disruption somewhere along the distribution line, we will be very much affected for we greatly depend on fossil fuel for energy. Therefore making the switch to sustainable is a huge step for this country. Geographically Solomon Islands has the sites and resources that is suitable for these types of energy projects, but unfortunately there are still some obstacles ahead that can bring this plan to a complete standstill. Therefore it needs to be address swiftly and professionally. The first one is corruption, second is funding to get the project of the ground, and finally the most important one is the land issue. For about eighty seven percent of the land in Solomon Islands are under customary land tenure with rights and ownership outside of governmental and legal systems. So if not dealt with first, land issues can become a prominent in considerations of conflict, both at local and national level. Because of continued strong links between people and their lands, issues of land use, migration and resettlement remain potent decider of stability and conflict.

As the world is starting to realise the impact of using fossil fuel and that it is depleting and is going to finish one day. We as an island nation who is just a dot on the map, can prove to world that even though we are a least developed country we can still manage to be energy independent, if we set our minds towards it, impossible can be conquered. For Mahatma Gandhi once quoted, “Be the change that you wish to see in the world”. So from that we can set examples for the other countries to follow, to show them that man and nature can work together without causing harm to either one for generations to come. Because this is what sustainable energy is all about.

By: Young Jin Choi
Enhancing understanding of petroleum pricing in the Pacific

Petroleum products and their prices continue to be a major challenge to the socio-economic development of Pacific Island countries and territories (PICTs). Recognising the need to enhance understanding of the Pacific petroleum industry and the mechanics of the various factors that influence the prices of petroleum products, the Secretariat of the Pacific Community (SPC), in collaboration with Platts, the World Bank and the German Agency for International Development (GIZ) conducted a week-long (18–22 June) regional workshop in Suva on petroleum pricing.

More than 40 participants, including representatives from petroleum companies, power utilities, PICT governments (energy officials) and petroleum pricing authorities, attended the workshop.

In his opening speech, John Hogan, Director of SPC’s Economic Development Division, said, ‘The truth of the matter is that, while millions of dollars have been, are currently being, and will continue to be spent on renewable energy and energy efficiency, about 95% of the commercial energy needs of PICTs are met from petroleum, or fossil fuels.

‘While we continue to promote renewable energy and energy efficiency, villagers are queuing up daily to get their kerosene from village stores and every single minute a vehicle pulls up at a gas station somewhere in the Pacific Islands for a refill. In Fiji, for example, about two million Fijian dollars are spent daily on fuel imports.’

Since 2010, the Energy Programme of SPC has been assisting member countries to review their petroleum pricing templates and pricing practices. This exercise has resulted in savings of millions of dollars. More importantly, it has identified the need to immediately provide support to member countries to better appreciate the petroleum industry and all the drivers and mechanics that influence the prices of petroleum products.

‘We cannot put all our efforts into renewable energy and ignore the fact that we should address petroleum pricing issues as a matter of urgency,’ says Mr Hogan. ‘We need to appreciate that effective, enabling policies are necessary for the transformation of the energy sector and it is worth aiming to invest fossil fuel savings in reducing the risks in fossil fuel supply, and in renewable energy and energy efficiency.’

SPC’s work in petroleum involves working closely with Platts, a division of the McGraw-Hill Companies that is the lead publisher of petroleum pricing data in the Asia-Pacific region. PICTs rely on Platts for an independent source of petroleum market data, which is used in verification of price submissions from the oil companies.

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or
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Information Officer, EDD, SPC
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Planning a wind resource monitoring programme

For a wind energy development, the wind resource is obviously one of the most important factors. In a typical wind turbine power curve (see Figure 1), little energy is produced below about 5 m/s (18 km/h).

At the most common mean wind speeds at wind farm sites, the power curve is steep therefore the sensitivity of power production to changes in wind speed is high. Hence, it is critical to get an accurate wind resource estimate for project viability assessment.

The preferred wind measurement method is still to have anemometers and vanes mounted on tall towers (30m to 80m tall) to record wind data that is representative of what a wind turbine would experience.

For wind prospecting or wind map development, a high degree of accuracy is less critical so a shorter (cheaper) mast can be used. When siting a mast, choose a location that is exposed to the predominant winds. In practice this means selecting a coastal and/or hill-top site. Sometimes it will be possible to identify potential zones of wind speed acceleration due to local terrain features. Figure 2 shows an island in the Pacific where it is expected that the predominant easterly wind is accelerated around the coast and the high central land mass. This gives some guidance as to where the highest wind resource might be. The expected wind speed acceleration zones are circled.

If the site where the wind prospecting is done is also the most suitable site for a wind farm then time and money will be saved. For a wind farm, important issues include: land ownership, ease of access to the site, proximity to suitable transmission lines, site area and steepness, land use, aviation and distance from inhabited properties.

A full site assessment (done when the site of the proposed wind farm has been selected) ideally requires near hub-height measurements in a location representative of the proposed turbine locations to minimise the energy prediction uncertainty. If hub-height monitoring is too expensive or the footprint of a hub-height mast is too large for the available area, then the hub-height wind resource can be extrapolated from lower measurements using a wind shear analysis. A wind shear analysis will however increase the uncertainty in the resource prediction.

The installation of wind monitoring equipment and collection and management of the resulting data needs to be carefully implemented to ensure integrity of the data. If finance will be sought for the project, a ‘bankable’ wind resource assessment should be done by independent experts.

In cyclone prone areas, some extra precautions may be necessary to ensure safety of the wind monitoring equipment. In addition to other factors, the size of a wind farm in the Pacific Islands may depend on the grid integration. For this, the characteristics of the turbine such as controllability and power quality are important. Modern turbine technology and controls can increase the practical level of wind energy penetration on a grid.

How much money should be spent on a wind resource assessment? Is it worth spending a few percent of the eventual project cost to ensure viability? That is your decision.

William Thorp is the Energy Specialist (Palau) for the EU-funded North Pacific ACP Renewable Energy and Energy Efficiency Project (North-REP).

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Figure 2: Wind resource map showing potential wind acceleration zones

Predominant wind direction
In April, political pressure began to grow in the United States (US) for the release of strategic crude stocks as retail gasoline prices had moved close to USD 4/gallon. However, some of the pressure for action had eased with the fallback in crude prices towards the end of April along with statements made by Saudi Arabia that it was willing to keep its output at a very high level in order to meet any demand by buyers of Iranian crude seeking alternative supplies.

There has been a noticeable trend over the past three years where there is a sudden slump in crude oil prices around the beginning of May. The May monthly average crude price had dropped by just over USD 10/bbl, similar to the even bigger slumps in price of USD 15–20/bbl at around the same time in the previous two years.

The common factor behind the slump has been the realisation in oil markets that the underlying global supply/demand position was not as tight as previously thought. This year has been yet another example of this tendency, with oil markets also reacting in recent weeks to the latest data showing US crude stocks at the highest level since September 1990. Oil markets are also, currently, taking a much more relaxed view towards the long-running dispute over Iran's controversial nuclear enrichment programme and the potential impact of US/EU sanctions.

It looks almost certain that the planned tightening of US/EU financial sanctions and the EU oil import embargo against Iran will be fully implemented from the start of July. However, any impact from the further loss of Iranian crude oil, which could arise are being counterbalanced by the increasing evidence that the underlying stocks position has become much more comfortable in recent months, while Saudi Arabia has continued to make clear that it is willing to cover for any shortfall in Iranian export volumes.

Even if military conflict with Iran occurs, there is significant potential cover from strategic stocks. With the nuclear talks with Iran looking in deadlock, the possibility of military confrontation somewhere down the road cannot be completely discounted and we could see a re-emergence of concern over the possible closure of the Strait of Hormuz. However, even in the unlikely event of major military conflict, the combined total of government-held strategic stocks and industry-held compulsory security stocks in the 28 International Energy Agency (IEA) member countries amounts to some 2,200 million barrels, equivalent to about three year's supply of Iran's normal export level or some 4 months' cover for the loss of the total 17 million barrels per day Middle East export volumes through the Strait of Hormuz.
**Freight rates**

Freight rates showed signs of recovery from the falls in the first quarter of 2012 with rates climbing by close to 7% in April and then climbing further in May by close to 5% before falling by 5% in June. The average rate for the quarter stood at around 168 WS points an increase of close to 8% compared to the previous quarter.

![Graph 2: Monthly average 30kt clean tanker Singapore - Australia rates](image)

**Exchange rates**

The major currencies such as the Australian dollar and New Zealand dollar showed fluctuations against the US dollar throughout the second quarter with the Fiji dollar and PNG kina remaining relatively stable.

![Graph 3: Pacific currencies against US dollar](image)

**For more information:**

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Diversifying power generation in Pacific Island countries and territories: can solar PV be deployed without grants?

Contrary to the common understanding, grid-connected solar photovoltaic (PV) systems (without storage), can produce electricity cheaper than a diesel generator already today (see Bazilian et al., 2012).

What is then preventing those Pacific Island power utilities that currently rely exclusively on diesel generation from making any investment in solar PV, limiting their solar PV to a few donor-funded systems? And do we really need to use grant money for something already competitive under market conditions? Could we not focus grants on something socially desirable but not yet economically attractive, such as providing energy access to the people in the outer islands (see Gualberti and Taibi, 2011)?

The first step is to commission a grid stability study, to define the maximum penetration of solar PV in your grid without having to consider storage, which would rapidly escalate capital and maintenance cost. North-REP and the Pacific Power Association (PPA) are helping several utility companies with grid stability studies. The International Renewable Energy Agency (IRENA) and PPA just presented the results of their joint work on ‘assessment of grid stability for increased renewable energy integration in the Pacific’ in a side event of the PPA 2012 conference in Vanuatu.

Looking at the cash flow for a diesel generator compared to a solar PV system, it appears evident that the cost of installing solar PV systems can be quickly recovered from savings in diesel fuel (see Fig.1). Use the allocation for diesel fuel purchase and use retained earnings to install PV. One relevant question here would be: is the current tariff allowing for full cost recovery in your utility? If not, there will be no retained earnings to invest. Having a proper tariff in place is key not only for good operation of the utility, but also to differentiate your power generation mix using more capital intensive options. If your grid would allow more solar PV penetration, but your retained earnings are not sufficient to reach that share, you can consider access to development banks funding, to keep your weighted average cost of capital (WACC) as low as possible.

In case development bank lending would not be an option available to your company, commercial banks today are more familiar with solar PV technologies than just a few years ago. As commercial banks now know consider PV mature and ‘bankable’ (if you use bankable manufacturers for equipment) and reduced their risk premium, the resulting interest rate applied can prove attractive enough to consider a commercial loan for solar PV. Remember, you can pay the loan with the savings from diesel fuel purchases.

Minimising your WACC is key for the competitiveness of solar PV (see IEA RETD, 2012), as large part of the cost, unlike in the case of diesel generators, has to be covered upfront. Start implementing your solar PV using the cheapest capital you have at your disposal. For publicly owned utilities, the return on equity required by the government is usually very low, making retained earnings the cheapest source of funding, followed by development bank loans and then commercial loans. For a complete review of financial mechanisms for the deployment of renewable energy in the Pacific, see Wade, (2005).

Figure 1: Cash flow for power generation in a grid with 1 MW diesel generator and 700 kW solar PV system
To complete the portfolio of options, there is an increasing interest in the Pacific for having an independent power producer (IPP) to deploy solar PV under a power purchase agreement, as opposed to having the utility doing it directly. It all goes down to the WACC and the ability to do procurement of the IPP. It can result in being the most cost-effective way to reduce your power generation cost, or in a lost opportunity for savings, depending on how the power purchase agreement is defined.

In this moment of transition from power generation, mostly based on diesel, towards an important share of renewable energy in the mix, solar PV can provide an important contribution to the reduction of the energy bill for Pacific islanders and to the reduction of the expenses for importing diesel fuel. In such a critical moment, it is fundamental that Pacific Island countries carefully consider all the options available to them to fund this transition.

References

Gualberti, G. and Taibi, E. “The role of climate financing for reaching universal access to modern energy services”, proceedings of EADI/DSA General Conference 2011

IEA RETD – Renewable Energy for Remote Areas and Islands (2012)


Emanuele Taibi is the Energy Specialist (FSM) for the EU-funded North Pacific ACP Renewable Energy and Energy Efficiency Project (North-REP).
Australia partners with SPC to advance implementation of energy standards and labelling in the Pacific

Pacific Island countries participated in a regional energy workshop in April (11–13) expressed their commitment to improve energy efficiency by participating in the Pacific Appliance Labelling and Standards (PALS) programme.

Currently 13 Pacific Island countries are participating in the PALS programme, which is managed by SPC. In his opening remarks, Tim Farrell of Australia’s Department of Climate Change and Energy Efficiency said, ‘I commend your countries’ participation in this workshop because it acknowledges the importance your governments place on improving energy efficiency.’

‘The Australian government has now committed Fast Start Finance to the PALS programme until June 2013,’ he said. ‘Australia will partner with SPC and with Pacific Islands that plan to align with existing energy efficiency standards and labelling programmes, such as the successful programme that has been jointly delivered by Australia and New Zealand over the past 25 years.’

The PALS Programme is designed to assist Pacific countries implement labelling and standards for energy-using equipment such as refrigerators, freezers, air conditioners and lighting.

Over 50 countries around the world now have energy labelling or standards programmes in place. Those that have no standards risk being the dumping ground for inefficient equipment and appliances.

The need for introducing a PALS programme to PICTs was realised at the 42nd meeting of Pacific Islands Forum Leaders in September 2011, where the Leaders expressed support for the development of effective management of fuel supply risks, and for meeting energy efficiency targets — including expanding the existing electrical appliance energy efficiency standards and labelling programme — in order to help realise significant energy savings.

At that same meeting, Australia’s Prime Minister Julia Gillard announced her support for the introduction of energy labelling and standards for electrical appliances in the Pacific region. This led to the establishment of a PALS programme at SPC, supported by Australia.

‘Implementing appliance labelling and standards is an important strategy for mitigating climate change,’ Director of SPC’s Economic Development Division John Hogan told the delegates in his welcome remarks.

‘Studies have concluded that it is more cost-effective for the Pacific region to import more energy-efficient refrigerators, air conditioners and lighting than it is to import diesel fuel,’ he said.

At the PALS Implementation Workshop, the participating governments’ drafted implementation plans to enable the expansion of the PALS programme throughout the Pacific region.

Furthermore, with 2012 being declared the International Year of Sustainable Energy for All, the outcomes of this workshop are seen as a major step forward towards achieving the goal of sustainable energy for all in the Pacific.

For PALS Programme related enquiries, please contact Ms Makereta Sauturaga, Energy Efficiency Adviser, Energy Programme, EDD, SPC (MakeretaS@spc.int).

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Energy or ecosystem? Have them both through careful planning

In hindsight, some things are obvious. People occasionally like to help by pointing out mistakes after the fact, but I usually prefer to know them in advance and make better choices. Sometimes there's just too much information, plenty to do and never enough time, and in the energy sector this is true for everyone I've met.

Collating a few key points about energy and environment into a short factsheet was harder than it sounds. But, with inputs and encouragement from colleagues around the region, four renewable energy interventions have been addressed: small scale solar photovoltaic, wind power, hydro power and bioenergy. Each factsheet briefly suggests environmental and social impacts that project developers should consider. The cumulative impacts section is important for policy makers and communities alike, helping to bring a broader perspective of catchments and landscapes. As large projects often receive environmental impact assessment, the factsheets focus on the local impacts of small projects, which can be significant for their communities.

The factsheets were prepared under the International Union for Conservation of Nature (IUCN) Oceania's Managing the Ecosystem and Livelihoods Implications of Energy Policies in Pacific Island States programme, supported by the governments of Italy and Austria. Additional funding from the US Department of State's regional environmental grants program also supported the factsheets. This work is part of our pragmatic approach to solutions: we see great value in moving from oil dependency to renewables, but only if we get it right.

The factsheets aim to help energy colleagues to ask some good questions, and for environment colleagues to understand what energy projects look like. Ultimately, we recognise there is no substitute for local knowledge of the environment, with these providing a starting place. The factsheets are available on the internet, and are being distributed at events such as the Barbados meeting Achieving Sustainable Energy for All in SIDS — Challenges, Opportunities, Commitments in May.

The factsheets aim to bring perspective so projects are planned in harmony with the environment. One example is diadromous fishes, those that move between freshwater and the sea for breeding, and then return. Such fish are common in the Pacific — milkfish, gobies and S. pentecostii — and can be important for protein and income. Yet the primary cause of extinction is considered to be habitat alteration, degradation and outright destruction by non-fishery activities, such as poor design of hydro power facilities which threaten their migration. Careful planning can ensure communities protect their fish while still receiving power. Another example is photovoltaic power, where proper disposal of batteries is essential to avoid lead contamination in rural and remote areas.

IUCN recognises that while ecosystems are able to supply us energy resources, we must be careful this does not come at the price of other resources we need. Further information is usually available from environment departments and others in countries, and it is hoped the factsheets prompt further dialogue in this area.

Factsheets link:
http://www.iucn.org/about/union/secretariat/offices/oceania/oceania_resources_and_publications/

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Old soldiers never die; they just fade away

It was some twenty three odd years ago in 1989 when I first set foot on Rarotonga, the Cook Islands. Mission — to participate in a wave power workshop funded by the Norwegian government through SOPAC (that time known as the Pacific Islands Applied Geoscience Commission but now a division of the Secretariat of the Pacific Community — Applied Geoscience and Technology Division). The most exciting event at that time was visiting the Banana Court Nightclub. But my most memorable time was when I ran into a middle-aged man named Mata Nooroa — an Electrical Inspector at the time. It was that Kia Orana, a handshake and the smile that made Mata the one and only one.

Mata later took over the helm of the Cook Islands Energy Office and it was not long before the charm of his personality got translated into a phrase 'The-Mana of Mata'. In 1996, some 12 photo voltaic (PV) technicians from around the region were on their way to French Polynesia but got stuck in Rarotonga for a week without their per diems. It was The-Mana of Mata that came for their rescue. The Regional Energy Meeting of 2002 was at Rarotonga and just before everyone else had their turn to host the premier regional energy meeting, Rarotonga struck again and hosted the meeting of 2007. The only explanation for the Rarotonga double was The-Mana of Mata. When the longest serving regional energy expert decided to tie the knot and exchanged vows in Rarotonga rather than in Fiji or New Zealand, The-Mana of Mata came to the surface.

The-Mana of Mata is a model for younger energy planners to carry on. Deeply rooted and proud of his culture, Mata would not hesitate to do a chant (Pacific War Chant) before his prayers and speeches. He will always challenge people in meetings and workshops to remember the most vulnerable members of their communities in whatever they do.

On 1 July 2012, Mata retired from being the Director of Energy in the Cook Islands. As one of the international energy experts in the region wrote ... 'I am both sad and happy that you stop as the Director of the Energy Division. I am sad because I will really miss working with you on energy issues in the Cooks. We have had some great times and achieve several significant results over the last 10 years that I have had the great pleasure of working with you'. For me the highlight was our trip last year to Rakahanga and Manihiki that led to the USD 1 million from the PEC Fund to the Rakahanga PV project. I will never forget the trip — professionally, socially, nature and otherwise (including taking picture of course!). It was an absolute fantastic experience and you played a large role in making it so memorable.

But The-Mana of Mata is not lost yet. He will be working full time in promoting eco-tourism in the Cook Is and managing his own Vaikoi Bungalows. The Vaikoi will always be the place where Mata can be found in Rarotonga http://www.vaikoi.com/index.php?pageLoad=101.

And before I close, let us be reminded that besides a great man is an even greater woman. It would therefore be a remiss on my part not to acknowledge Kathy’s support to The-Mana of Mata.

Let us be reminded that the sweetness of today is the result of the sweat and blood of yesterday. And as the Cook Islands embark on its journey according to its Renewable Energy Chart, we bid farewell to an old soldier who have put his all to raise the profile of energy in his beloved country — the Cook Islands.

Enjoy your retirement Mata. Kia Manaia from all your friends in the region and abroad.

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Welcome to Pacific energy sector

IRENA's new Renewable Energy Coordinator for the Pacific region

Congratulations to Ms Apisake Soakai who has taken up the role of the International Renewable Energy Agency’s (IRENA) Renewable Energy Coordinator for the Pacific region, beginning in July 2012. Apisake is no stranger to the region. She has almost 20 years of working experience, 13 of which have been in the energy sector. She holds a BA and a MBA. Raised and moulded through the Energy Planning Office in Tonga, her planning and administrative skills in the energy sector took her to other positions such as being the Principal Assistant Secretary for Lands, Survey and Natural Resources, the Deputy Secretary at the Ministry of Fisheries and then to the Secretary / CEO of the Public Service Commission. For the last four years, she was the Chief Executive Officer of the Nauru Utilities Corporation (NUC) and led the reforms at the NUC. One of these is the outsourcing of the management of Nauru's fuel storage facilities.

In her new assignment with IRENA, Apisake will carry out the implementation of the IRENA work programme activities for the Pacific region. She is stationed at the Secretariat of the Pacific Community's (SPC) Energy Programme in Suva, Fiji and will work closely with both IRENA and SPC.

The IRENA work programme activities for the Pacific region involve all the three IRENA sub-programmes, namely policy advisory services and capacity building, knowledge management and technology cooperation, and IRENA innovation and technology in which the weight of the work dedicated to each sub-programme is roughly equal.

Nauru Utilities Corporation welcomes Mr Tomasi Tafia

Congratulations to Mr Tomasi Tafia who has taken over as the new Chief Executive Officer of the Nauru Utilities Corporation. Known for his honest and straight talking behaviour, Tomasi is always vocal, speaks his mind and always constructive in his approach. Tomasi was formerly the General Manager of the Tuvalu Electricity Corporation before taking up similar responsibility at Tokelau. Tokelau is going 90% renewable energy by the end of 2012 and Tomasi played a key role in this world's first.

EU funded REP-5 programme three grid-connected solar PV systems totalling 52.5 kWp in Niue
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<th>Event</th>
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<th>Responsible agencies</th>
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<td>tba</td>
<td>PPA</td>
<td>Andrew Daka (<a href="mailto:andrewd@ppa.org.fj">andrewd@ppa.org.fj</a>)</td>
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<td>SPC-GIZ CCCPIR Energy inception mission</td>
<td>Tuvalu</td>
<td>SPCC-GIZ</td>
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<td>6–10 August</td>
<td>Monitoring and Evaluation of PIGGAREP activities in Nauru</td>
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<td>SPREP</td>
<td>Nixon Kua (<a href="mailto:nixonk@sprep.org">nixonk@sprep.org</a>)</td>
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<td>8–9 August</td>
<td>Renewable Energy and Energy Efficiency Trade and Investment Forum</td>
<td>Nadi, Fiji</td>
<td>SPC, BizClim</td>
<td>Solomone Fifita (<a href="mailto:SolomoneF@spc.int">SolomoneF@spc.int</a>), Michel Lepropre (<a href="mailto:michel.lepropre@gmail.com">michel.lepropre@gmail.com</a>)</td>
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<td>20–24 August</td>
<td>PIGGAREP Multiparty Review Meeting</td>
<td>Savai, Samoa</td>
<td>SPREP</td>
<td>Sili’a Kilepoa Ualesi (<a href="mailto:siliau@sprep.org">siliau@sprep.org</a>)</td>
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<td>20 August</td>
<td>1st Project Steering Committee Meeting of the Pacific Appliance Labelling and Standards project</td>
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<td>SPC</td>
<td>Makereta Sauturaga (<a href="mailto:makeretas@spc.int">makeretas@spc.int</a>)</td>
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<td>20 August</td>
<td>Meeting of the Mitigation Working Group of the Pacific Climate Change Roundtable</td>
<td>Savai, Samoa</td>
<td>SPREP</td>
<td>Espen Ronneberg (<a href="mailto:espern@sprep.org">espern@sprep.org</a>)</td>
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<td>27–31 August</td>
<td>Monitoring and Evaluation of PIGGAREP activities in Cook Islands</td>
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<td>27–31 August</td>
<td>Forum Leaders Meeting</td>
<td>Cook Islands</td>
<td>Cook Islands PM’s Office</td>
<td>Elizabeth Koteka (<a href="mailto:cos@pmoffice.gov.ck">cos@pmoffice.gov.ck</a>)</td>
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<td>27–31 August</td>
<td>Clean and Green Industry Pacific Showcase</td>
<td>Rarotonga, Cook Islands</td>
<td>Cook Islands Chamber of Commerce</td>
<td>Steve Anderson (<a href="mailto:steve@anderson.co.ck">steve@anderson.co.ck</a>)</td>
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<td>28 August</td>
<td>Post Rio+20 Roll-out of International Year of Sustainable Energy for All (SE4All)</td>
<td>Rarotonga, Cook Islands</td>
<td>SPC</td>
<td>Solomone Fifita (<a href="mailto:SolomoneF@spc.int">SolomoneF@spc.int</a>), Elizabeth Koteka (<a href="mailto:cos@pmoffice.gov.ck">cos@pmoffice.gov.ck</a>)</td>
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<td>3–7 September</td>
<td>23rd SPREP Meeting</td>
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<td>6–7 September</td>
<td>Renewables and Islands Global Summit</td>
<td>Malta</td>
<td>IRENA</td>
<td>‘Apisake Soakai (<a href="mailto:ASoakai@irena.org">ASoakai@irena.org</a>)</td>
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<td>6–16 September</td>
<td>IUCN World Congress</td>
<td>Jeju, Korea</td>
<td>IUCN</td>
<td>Larissa Brisbane (<a href="mailto:Larissa.brisbane@iucn.org">Larissa.brisbane@iucn.org</a>)</td>
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<td>17–21 September</td>
<td>Monitoring and Evaluation of PIGGAREP activities in Niue</td>
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<td>24–28 September</td>
<td>Final Project meeting for DIREKT</td>
<td>Hamburg, Germany</td>
<td>DIREKT (Germany, Fiji, Trinidad and Tobago, Mauritius and Barbados)</td>
<td>Anirudh Singh (<a href="mailto:singh_ag@usp.ac.fj">singh_ag@usp.ac.fj</a>)</td>
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<td>1–5 October</td>
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<td>October (tbc)</td>
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<td>5–9 November</td>
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<td>12–16 November</td>
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