



*Small Developing Island Renewable Energy
Knowledge and Technology Transfer Network*

5th Project DIREKT Meeting

Project DIREKT Seminar
Renewable Energy in Small Island States

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Renewable Energy Developments in the Pacific
– present status and future prospects

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RE in the PICs – Outline

- Energy Policy and Strategy in the region
- RE activities – regional
- RE activities – Fiji
 - National grid
 - Rural electrification
- Standards and certification
- The Future



The Pacific Island Countries and Territories (PICTs)





1. Energy Policy and strategy

- Energy challenges of the region
 - No indigenous sources of fossil fuel
 - Remoteness
 - Lack of human capacity and institutional mechanisms
 - Need policies at national level and strategies at regional level
- In 2004 the regional Pac Island Energy Policy (PIEP) – ineffectual (defunct)
- 2009/2010 replaced by the more imaginative Framework for Action on Energy Security in the Pacific (FAESP)



The FAESP

- FAESP is based on 11 guiding principles and 7 themes
 - Principles include primacy of national energy policies, whole-of-sector-approach to energy solution, many partners, one team philosophy
 - The 7 themes are
 1. Leadership, governance, coordination and partnership
 2. Capacity development, planning, policy and regulatory frameworks
 3. Energy production and supply
 - Petroleum and alternative liquid fuels
 - Renewable energy
 4. Energy conversion
 - Electric power



FAESP (7 themes cont)

5. End-use energy consumption

- Transport energy use
- Energy efficiency and conservation

6. Energy data and information

7. Financing, monitoring and evaluation



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IPESP

- FAESP lays down the policies and the philosophies – need a concrete plan to realise these ideas
- **Implementation Plan for Energy Security in the Pacific (IPESP 2011-2015)**
- Sets up indicators to monitor activities of the 7 themes at regional level.
- Each indicator comprises of components that are specific indicators at the national level.
- Additional indicators, called **macro indicators**, monitor the 4 key elements of FAESP- ***access to energy, affordability, efficiency and productivity, environmental quality.***



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IPESP cont.

- Thematic indicators use a scoring system that can be applied to the national level and aggregated across the region for comparative analysis of performance indicators across the Pacific Island Countries and Territories (PICTs)
- The year 2009 was chosen as the baseline year (as 2008 had an oil price spike in it)



IPESP cont.

- E.g. of a macro indicator

	Indicator	Unit	Purpose
Access to energy			
1.	Electrification rate	%	Share of households connected to the grid
2.	Access to small-scale power	%	Share of households with access to basic electrification (SHS + grid)
3.	Access to modern energy rural	%	Share of rural households with access to modern cooking and lighting energy
4.	Access to modern energy urban	%	Share of urban households with access to modern cooking and lighting energy



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IPESP cont.

Matrix of regional activities

This matrix shows all the regional activities and their indicators with their priorities and shows the timelines and required funding.

E.g. entry for Theme 2 – capacity development, energy planning, policy and regulatory frameworks.



Example of matrix entry – theme 2

Priorities	Regional Activities	Indicator /Measurement	Timeframe					Indicative Activity Costs (USD)
			2011	2012	2013	2014	2015	
Policies and implementation plans /roadmaps, and M&E frameworks	Support and improve capacity to collate, analyse and disseminate energy data including the assessment of the energy sector	20 PICTs energy country profiles						350,000
	Assist in the development and costing of their energy policies and implementation plans	6 PICTs costed IPs adopted	◆—————◆					180,000
Regulations, legislation and other administrative and legal tools	Assist in the formulation of administrative and legal tools	Assisted 6 PICTs						250,000
Human and institutional capacity development	Support for training in energy planning, policy and regulatory frameworks	6 training activities conducted	◆—————◆					200,000
	Conduct periodical training needs assessments	2 TNAs conducted		◆—————◆				100,000
	Develop and implement energy training programmes	2 regional training programmes implemented						250,000
	Promote the exchange of expertise between PICTs	3 exchange schemes realised						150,000
TOTALS							US\$1,480,000	



2. RE Activities - regional

- At regional and national levels
- Regional Activities
 - Secretariat of the Pacific Community (SPC) – North REP
 - International Union for the Conservation of Nature (IUCN) – various energy programmes
 - South Pacific Regional Environmental Program (SPREP)- Pacific Island Greenhouse Gas Abatement using Renewable Energy Programme (PIGGAREP)



Regional activities cont.

RE monitoring and resource assessment in the PICs - 2011

	Country	Site (exact location)	Type of monitoring/assessment	Date of installation/conduct	Agency
1	Samoa	Upolu	2 wind and solar monitoring stations	Jun-07	UNDP supported
		Savaii	1 wind station without tower	2010	UNDP supported
2	Cook Islands	Rarotonga	1 wind and solar monitoring station	May-07	UNDP supported
		Atiu Island	1 wind and solar monitoring station	May-10	UNDP supported
3	Tuvalu	First Funafuti, now Niulakita Is	1 wind and solar monitoring station	May-07	UNDP supported
4	Nauru		1 wind and solar monitoring station, excluding tower	Jul-09	UNDP supported
5	Fiji	Rotuma	1 wind and solar monitoring station	Jun-07	UNDP supported
6	Solomon Islands	Tender for Kirakira, Buala, Rennel, Taro	1 wind, solar, temp, pressure station		PIGGAREP (UNDP supported)
13	Vanuatu	Tendered, 1 for each of 6 provinces	1 wind, solar, temp, pressure station	Tender to be signed this week (25 Feb11)	Vanuatu govt/ PIGGAREP /IUCN



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3. Fiji Activities

- National grid development
- Rural electrification
 - Hydro
 - small home PV systems
 - Outer island biofuel projects for alternative diesel fuels

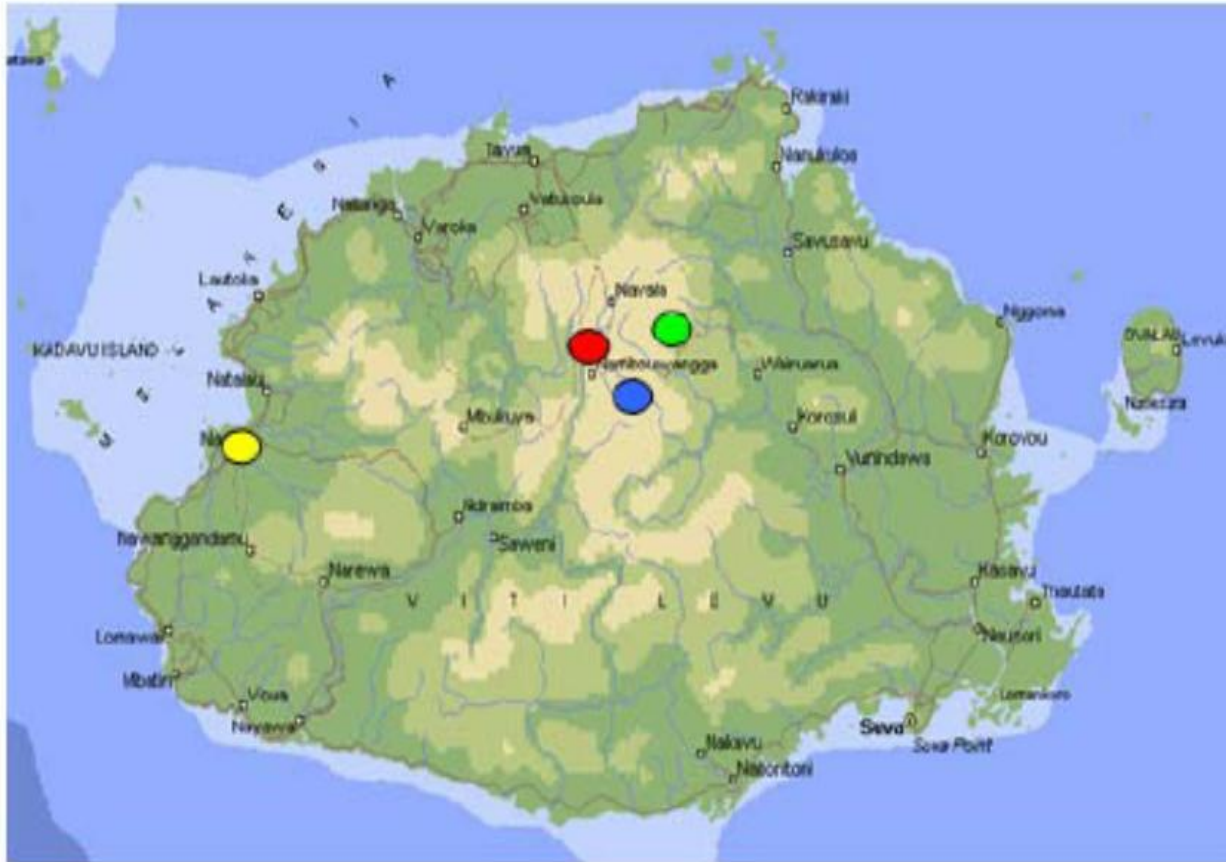


National grid – the Nadarivatu hydro project

- Grid power available in
 - Viti Levu (coastal region electrified)
 - Vanua Levu (Labasa and Savusavu)
 - Ovalau
- Main sources on Viti Levu are
 - Monasavu hydro (80 MW)
 - Other small hydro (~12 MW)
 - Diesel power stations at Kinoya (Suva), Vuda (Nadi) and others
 - Wind farm at Butoni (Sigatoka) (10 MW)
- Nadarivatu will add another 40 MW



Site of Nadarivatu project



- Key:
- Nadi International Airport
 - Nadarivatu Project
 - Wailoa Powerstation
 - Monasavu Dam



Nadarivatu hydro project cont.

- Located at the upper Sigatoka river and junction of the Qaliwana and Nukunuku rivers
- Power station at Ba river
- Design flow $Q = 15 \text{ m}^3/\text{s}$, gross head $H = 335.7 \text{ m}$
- Capacity 41.7 MW (check $P(\text{kW}) = 10 QH = 5035 \text{ kW} = 50.35 \text{ MW}$)
- Concrete weir, 2 km upper tunnel, 1.4 km penstock, 2x22 MW Pelton wheel turbines



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View from Qaliwana river





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Weir construction





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Penstock construction





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Switchyard construction





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Rural electrification

Small Hydro – Buca Village Vanua Levu

30 kW – funded by Turkish and Fiji governments





Buca hydro cont

Power house





Outer island biofuels programme

- Plan to provide electrification for outer island through use of coconut oil (CNO)/deisel blends
- Currently 20% CNO/80% deisel proposed, but later 100% CNO for diesel generators modified using duel fuel kits.
- Each mill with a capacity of 463,000 L per annum
- Koro, Rotuma and Cicia completed
- Feasibility study being carried out (Oct 2011) in the Lau group



Fiji's outer islands





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Biofuel for outer islands cont.





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4. Standards and certification

- Biofuel blends being produced by a number of private companies as well – need to define standards and certify new biofuels for consumption
- Biofuel standards approved by cabinet this year
- Negotiations with USP for establishment of an accredited biofuels testing laboratory



5. The future

- Fiji's powergen target – 90% renewable by 2015 – big boost with Nadarivatu coming online
- Rural electrification via small PV home systems ongoing
- Biofuel feedstock production in Vanua Levu (jatropha, pongamia, castor) by Biofuel International
- Other nations with similar ambitions – see Tonga's TERM, Samoa's biogasification scheme



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Thank you for your attention!