

**Pacific High-level Policy Dialogue on  
“The Role of Macroeconomic Policy and Energy Security in supporting  
Sustainable Development in the Pacific”**

**8-9 October 2012, Nadi, Fiji**

**Jointly organized by  
UN ESCAP and Sustainable Development Working Group of the Council of Regional  
Organizations in the Pacific (CROP)**

**Session 2 – Enhancing Energy Security for Sustainable Development**

*Presentation*

**Pacific Subregional Perspectives on Challenges and Opportunities  
in Enhancing Energy Security and Promoting Sustainable Use of  
Energy in the Pacific**

by  
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## Pacific Subregional Perspectives on Challenges and Opportunities in Enhancing Energy Security and Promoting Sustainable Use of Energy in the Pacific

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Session 2: Enhancing Energy Security for Sustainable Development

Monday 8 October 2012 14:15

**Pacific High-level Policy Dialogue:  
The Role of Macroeconomic Policy and Energy Security  
in Supporting Sustainable Development in the Pacific**

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## What is Energy Security?

**IEA:** "uninterrupted physical availability at a price which is affordable, while respecting environment concerns."

- Implicitly concerned largely with petroleum

**FAESP:**\* "Energy security exists when all people at all times have access to sufficient sustainable sources of clean and affordable energy and services to enhance their social and economic well-being" and

"Energy security depends on the availability, accessibility, affordability, stability, and uses of energy."

**FAESP goal:** "Secured supply, efficient production and use of energy for sustainable development."

Concept is broadly clear (and a good start made by SPC on indicators)

\* FAESP = *Framework for Action on Energy Security for the Pacific* (SPC, 2011)

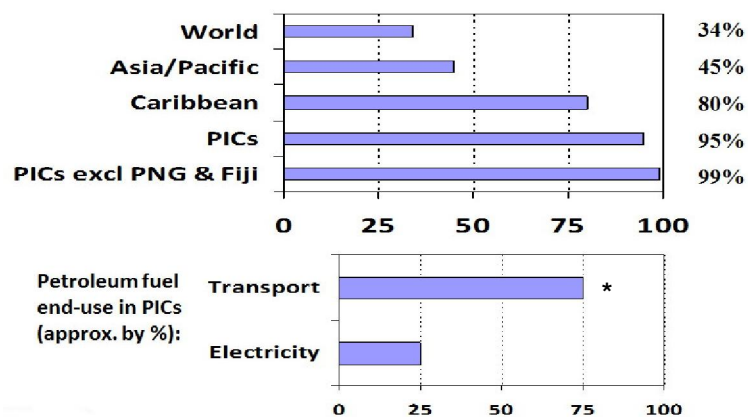
## Measuring Energy Security ?

Concept may be broadly clear ... but:

- No real common international understanding:
  - High-income country focus: **Technical solutions & diversification**
  - Lower-income country focus: **Increased energy use & access to oil**
  - Government focus: **Policies & standby measures (e.g. oil stocks)**
  - Public focus: **Reliable access at affordable price**
  - Urban focus: **Keep the lights on (reduce blackouts/brownouts)**
  - Poor focus: **Access for basic needs (education, health, transport)**
- Useful for PICs to consider short-term & long term separately ?
  - Short-term: **Reliable access to petroleum at affordable price**
  - Longer-term: **Increased resilience and adaptability to change**
- Difficult to quantify energy security and measure trends over time
- How to use energy security indicators to inform energy sector investment decisions ?

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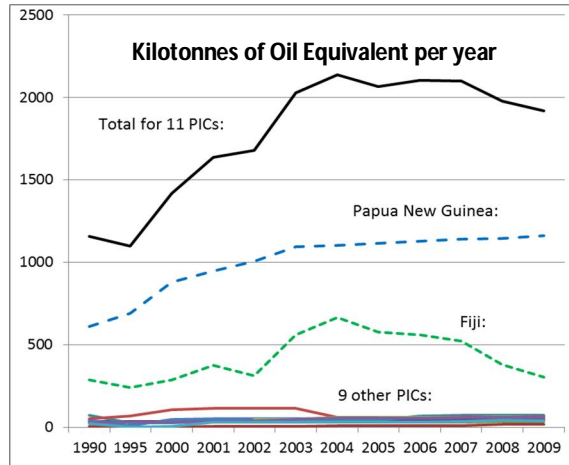
## Extreme PIC Petroleum Dependence



\* Probably too high but transport fuel use typically 60%

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## Ave. PIC Energy Use Doesn't Mean Much



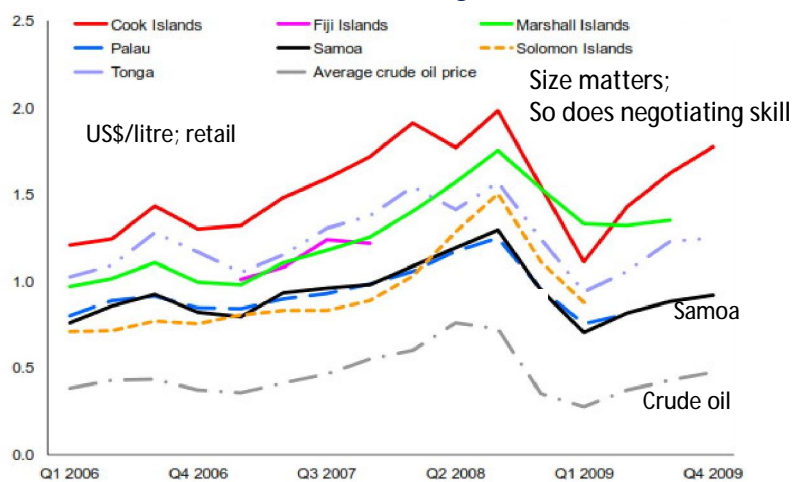
**PNG + Fiji ~ 80%**  
Skews PIC 'average'

**PNG typically > 60% of total**

**Every one else < 20%**

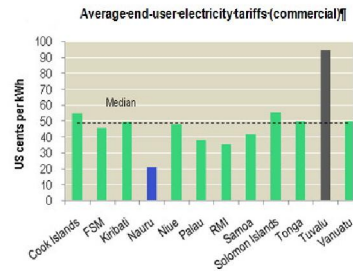
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## PIC Fuel Prices High & Vary Widely by Country



## PIC Electricity Prices are High

US¢/kWh in 2010



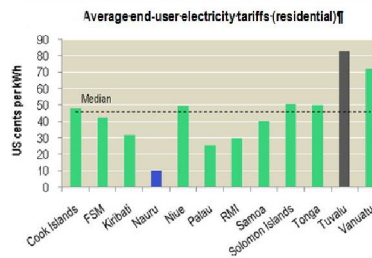
Household median 41¢; average 39¢  
(for 14 utilities, some not in the graph)

FEA (not shown) 23¢

PNG (not shown) 28¢

Caribbean average charge is 10% less

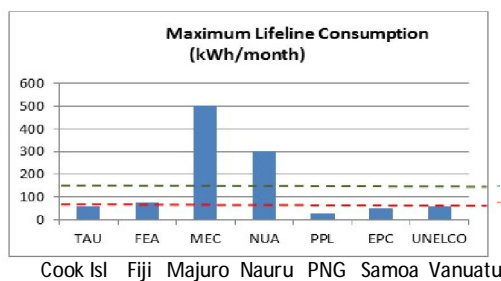
For many PIC utility costs > charges  
(Most Caribbean utilities charge full-cost so cost difference >10%)



PIC Commercial rates higher than household (cross subsidies)

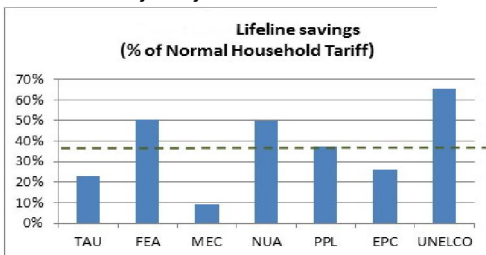
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## Can Lifeline tariffs improve energy security?



Lifeline tariffs differ substantially in benefit to low-income consumers and cost to the utility

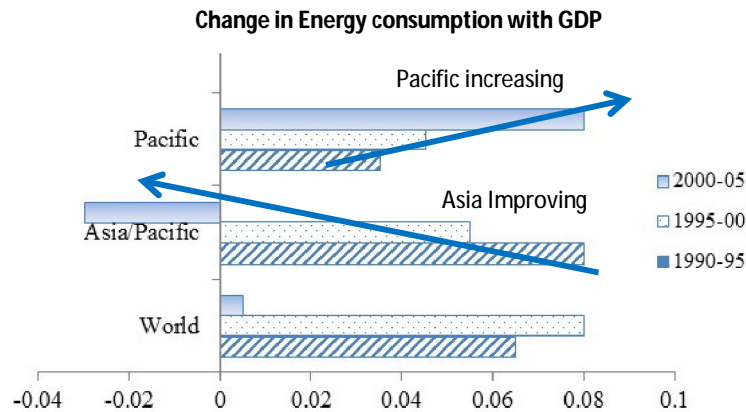
Average 154 kWh/m  
Median 60 kWh/m



Ave & median savings 37%  
(compared to standard tariff)

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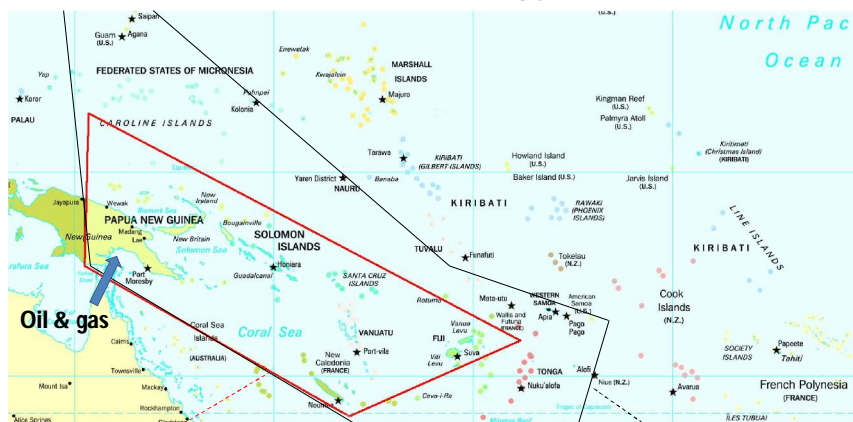
## Energy Intensity of PICs ?



PICs becoming more energy intensive? Or skewed by PNG? Does it matter?

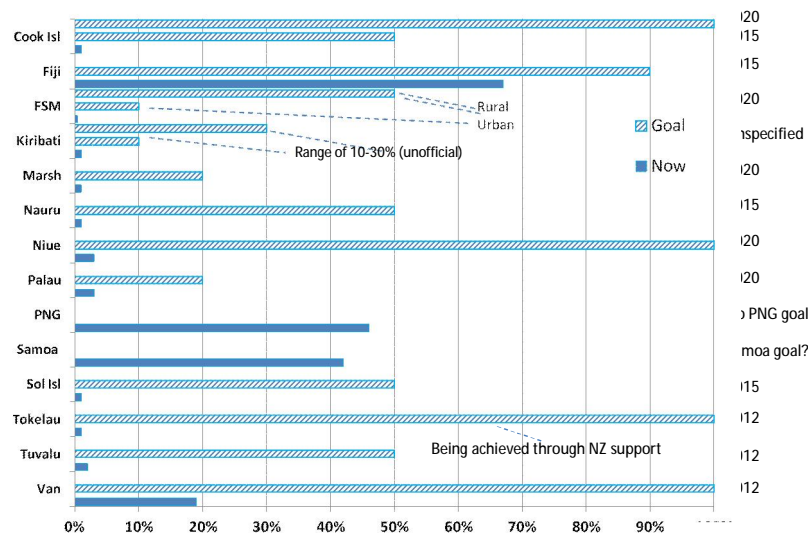
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## PIC Renewable Energy Resources



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## Electricity from RE: PIC Status & Ambitious Goals



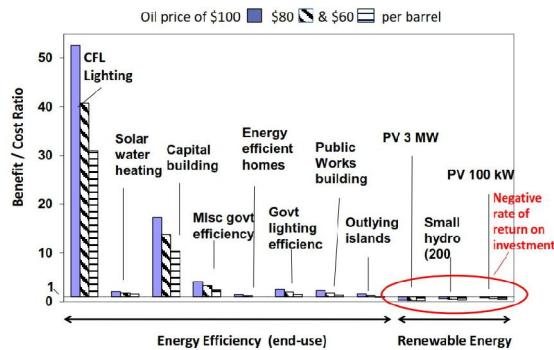
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## Electricity from RE: Reality of Goals

- Many are political goals but not practical
- Lots of policies; few real action plans  
Tonga TERM, Vanuatu NERM (underway), Kiribati (begun)
- Implementation/action plans tend to lack:
  - Clear sense of priorities, actions and time required
  - Evaluation of least-cost RE investments (and oil & EE)
  - Budget allocation & actual or potential funding source
  - Clear responsibilities for action
  - Real link between energy office & utility plans
  - Sufficient good energy & resource data for rational planning
  - Monitoring, evaluation and plan updating mechanisms

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## Don't Treat EE Improvements as Marginal (Benefits & Costs of RE & EE Opportunities in Palau 2008)



PICs development requires more commercial energy and expanded access but improved energy efficiency also has a role

PIC plans overwhelmingly emphasise new generation (incl RE) & seldom assess relative costs of new kWh versus saving a kWh

For expanded rural energy access (RE or diesel), considering supply and demand savings together can:

- reduce initial costs substantially, and thus
- serve more households, schools, health centres with same funds

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## Indicative Impacts of Climate Change on Energy

Probability, location, severity & timing of impacts can be highly uncertain

Technology	Air temp	Water temp	Water Availability	Wind speed	Sea level	Floods	Heat waves	Storms
Oil	1	2	1-3	-	-	3	1	-
Natural Gas	1	2	1-3	-	-	3	1	-
Hydropower	-	-	1-3	-	-	3	-	1
Wind	-	-	-	1-3	3*	-	-	1
Solar (PV)	-	-	-	-	-	-	1	1
Concentrating & tracking PV	-	-	-	2	-	1	1	2
Biomass/Biofuel	1	2	-	-	3*	3	1	-
Geothermal	-	-	-	-	-	1	-	-
Ocean / OTEC	-	1	-	-	1	N/A	-	3
T&D grids	3	-	-	1	3*	1-2	1	2-3
End Use	2	-	-	-	-	-	3	-

Notes: 3=Severe; 2=Medium; 1=Limited; - = No Significant Impact; N/A = Not Applicable  
 = 'change in'; \* = coastal or low-lying areas T&D = transmission & distribution  
 From *Climate Risk & Adaptation in the Electric Power Sector* (ADB, 2012)

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## Tools to Help Assess & Improve PIC Energy Security ?

- Cost/benefit analysis & ranking of investments (to be discussed by T Jensen, UNDP)  
Build climate resilience into investment decisions  
More broadly, use methodologies that consider a highly uncertain future.
- Quantitative Indicators of PIC energy security and trends ?  
Perhaps subset of SPC's 36 indicators? (to be discussed by M Sauturaga, SPC)  
Include short-term & long-term perspectives?  
Consider both Government & public perspectives?
- When considering investment, assess costs & benefits of new generation versus more effective use of existing power capacity (kW) energy (kWh)  
Utility energy audit services to major customers  
Incl minimum energy standards for appliances, building codes, vehicles
- Consider different financial risks\* of various energy investment options  
which may suggest more investment in RE & EE and less in diesel

\* Example in written report

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## Subregional Cooperation to Improve Energy Security ?

Suggestions in the written report include:

- Coordinated energy sector training at tertiary and technician levels for RE & EE
- Development of regional standards for RE & EE (design, installation, O&M, management mechanisms)
- Regional standards for Feed-In Tariffs and Net Metering
- Regional technical & contractual standards/templates for Independent Power Producers and Power Purchase Agreements
- Common standards for liquid fuels and their storage and distribution
- Standard regional project analysis mechanisms which considers resilience to climate change

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## Subregional Cooperation to Improve Energy Security ?

Continued:

- Development (if practical) of quantifiable PIC energy security indicators: both short-medium and long-term
- Development of standard, practical approaches for sustainable access to modern energy for low-income Pacific islanders (including effective approaches to life-line tariffs)
- Development of standard approaches to incorporate energy efficiency into PIC utility investment plans (and require least-cost approach?)
- Development of regional programme for consistent assessments of energy resources
- Development of regional action plan on sustainable energy for transport

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## Summary

- The Pacific faces serious development challenges, expected to be exacerbated by climate change
- Extreme dependence on imported petroleum: > 95%
- PIC energy use/GDP apparently  Asia-Pacific 
- High energy prices: Electricity >10% above Caribbean
- Yet 80% of PIC households have no access to electricity.

**By any reasonable definition, energy security in the Pacific is low and a substantial commitment is required for appreciable improvement.**

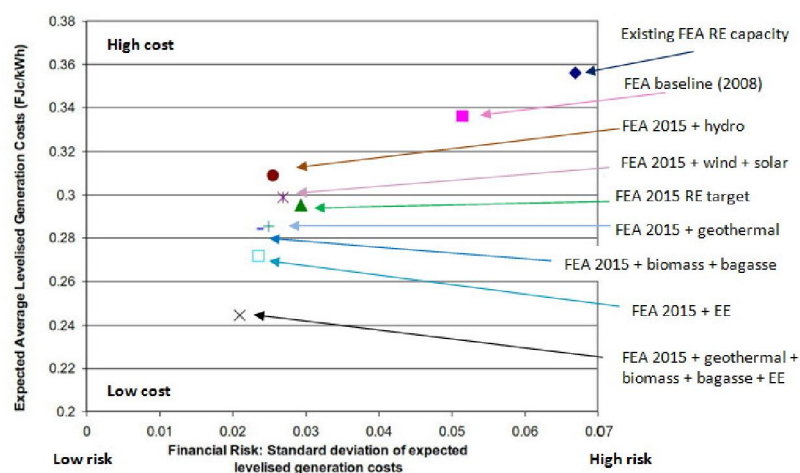
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“The citizens of most Pacific Island nations put up with low access to secure, reliable, and affordable energy.”  
(WB, AusAID, 2011)

Thank You

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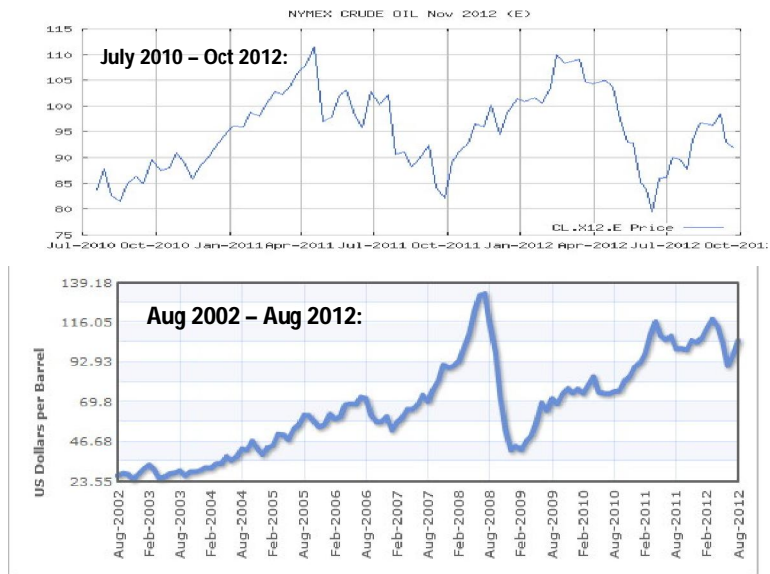
### Supplementary 1: ¢/kWh & Financial Risk (Fiji Study)



Source: *Small States, High Oil Prices: The Risk Mitigation Benefits of Renewable Technologies in the Pacific* (Matthew Dorman & Frank Jotzo, 2012) EE = improved appliances (A/C & refrigeration)

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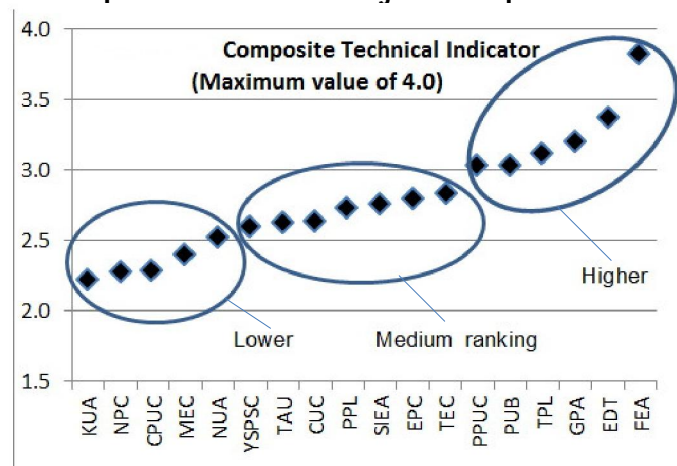
## Supplementary 2: Recent Crude Oil Price Variability



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## Supplementary 3: Energy Security Composite Indicator?

PPA member power utilities as an example,  
except both short-term & long-term composites



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