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"The Role of Macroeconomic Policy and Energy Security in supporting Sustainable Development in the Pacific"

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Presentation

Cost-benefit Analysis of Investment in Renewable Energy and Energy Efficiency in the Pacific

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Structure of Presentation

1. Cost Benefit Analysis
2. Findings from selected Regional and National Level Energy Assessments
3. Conclusions
4. Recommendations
5. Acknowledgement
6. References

Cost Benefit Analysis

- **Definition**
  - Any quantitative analysis performed to establish whether the present value of benefits of a given project exceeds the present value of costs
- **Benefits**
  - Reduced risk of wasting money
  - Greater chance of selecting a better project
- **Challenges**
  - Ensuring objectivity
  - Ensuring transparency
  - Sometimes inadequate data
  - Sometimes difficulties in quantifying benefits
  - Frequent assumption: 'everything will go as planned'
  - Efficiency considerations always compete with other motives in project selection
  - Sometimes analysis prepared after a decision to proceed with a project already has been made

Findings from selected Regional and National Level Energy Assessments

- **PIREP Assessment, 2004/2005**

Country Estimates of GHG Emissions and Potential Savings after a Decade

	Potential Annual GHG Savings Adjusted to Projected Energy Demand	Relative Savings from Renewable Energy and Energy Efficiency			
		Renewable Energy		Energy Efficiency	
		Renewable Energy (Gg)	% of Total	Energy Efficiency (Gg)	% of Total
Cook Islands	13.1	11	84%	2.1	16%
Fiji	504	467	93%	37	7%
FSM	23.9	16.8	70%	7.1	30%
Kiribati	26.5	24.5	92%	2	8%
Marshall Islands	22.3	8	36%	14.3	64%
Nauru	16.6	2.8	17%	13.8	83%
Niue	1.08	0.64	59%	0.44	41%
Palau	49	12	24%	37	76%
PNG	1013	1010	>99%	3	<1%
Samoa	96.1	83.9	87%	12.2	13%
Solomon Islands	121	108.8	90%	12.2	10%
Tokelau	0.22	0.15	68%	0.07	32%
Tonga	31.6	28.3%	90%	3.3	10%
Tuvalu	2.2	0.8	36%	1.4	64%
Vanuatu	93.6	108	99%	1	1%

Source: SPREP, 2005, p. 42

Findings from selected Regional and National Level Energy Assessments

- **Fiji Department of Energy Study, 2004**
  - Study covered appliance labelling programme for refrigerators and freezers in Fiji
  - Findings
    - The costs of Minimum Energy Performance Standards (MEPS) and energy labelling would be between a quarter and a tenth of the value of the benefits
      - I.e. benefit/cost ratios between 4:1 to 10:1

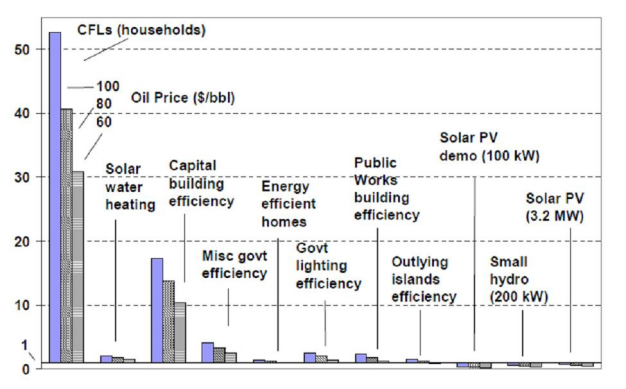
Findings from selected Regional and National Level Energy Assessments

- **SOPAC Economic Assessment of Renewable Energy Options for Rural Electrification in PICs, 2007**
  - Findings
    - Renewable energy technologies are the least-cost option for rural electrification
      - Renewable energy technologies provide a cost-effective source of electricity in rural areas where distances are large, populations are small, and demand for energy is low
    - There is not one renewable energy technology that is least-cost
      - It is very much dependent on local conditions and renewable resource availability

Findings from selected Regional and National Level Energy Assessments

- **Palau ADB Funded Assessment, 2008**

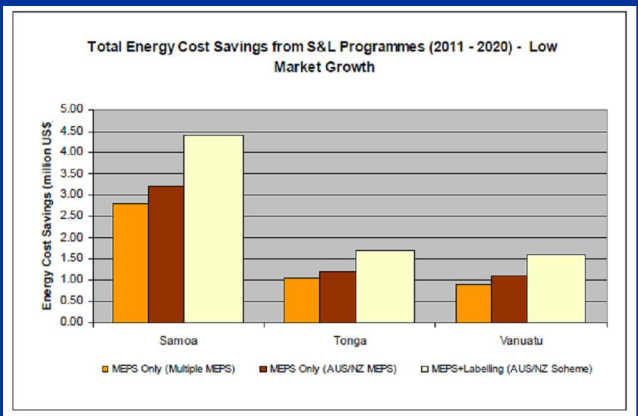
Benefit Cost Ratio for Palau Energy Investments



Source: Peter Johnston, 2008, p. 5

Findings from selected Regional and National Level Energy Assessments

- **SPC and REEEP S&L Sub-Regional Assessment, 2010**

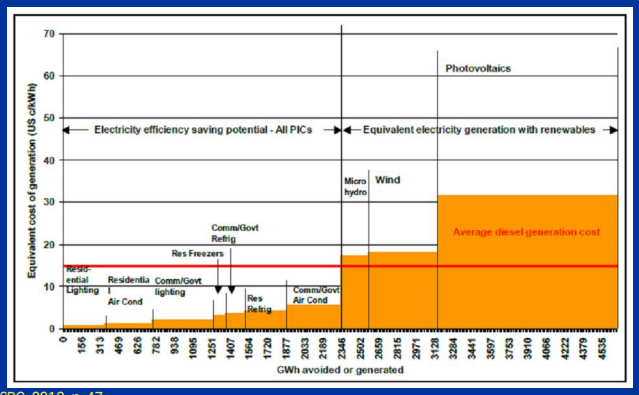


Source: SPC and REEEP, 2010, p. 3

Findings from selected Regional and National Level Energy Assessments

- **SPC Regional MEPS and Energy Labelling Assessment, 2012**

PIC Electricity Supply Cost Curve

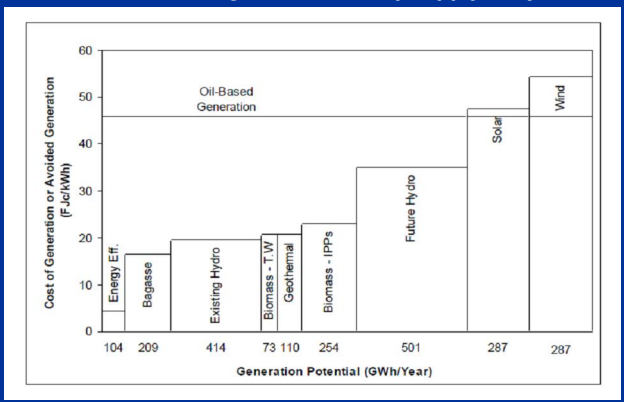


Source: SPC, 2012, p. 47

Findings from selected Regional and National Level Energy Assessments

- **Fiji Study by Australian National University, 2012**

Cost Curve of Technologies for Electricity Supply in Fiji



Source: Matthew Dornan and Frank Jotzo, p. 9, 2012

Conclusions

- In the PICs renewable energy systems (e.g. solar PV) are approaching parity with fossil fuels and in remote areas with very high fuel costs is often cheaper
- In the PICs at national level considering impacts (fuel savings, electricity reduction) in general energy efficiency investments seems to be significantly more attractive than renewable energy
- Economic/financial viability for the same renewable energy or energy efficiency technologies vary significantly depending on location – not just between PICs, but within the same country

Conclusions (#2)

- Choices made now for large scale electricity systems will lock PICs into a technology and fuel type for decades to come
  - Among others choices will be influenced by discount rate and assumption of future oil prices
- For any diverse group of actors, priorities and world views agreeing on the choice of any optimal investment decision is difficult to begin with
  - The presence of deep uncertainties like climate change further challenges the decision making framework

Recommendations

- Give energy efficiency higher priority
- Address renewable energy and energy efficiency together
- Include PICs vulnerability to climate change when evaluating and prioritising renewable & energy efficiency investments

Acknowledgement

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Thank you