Tonga Development Dialogue 2010

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Energy, Policy and Capacity Building for Tonga

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Overview

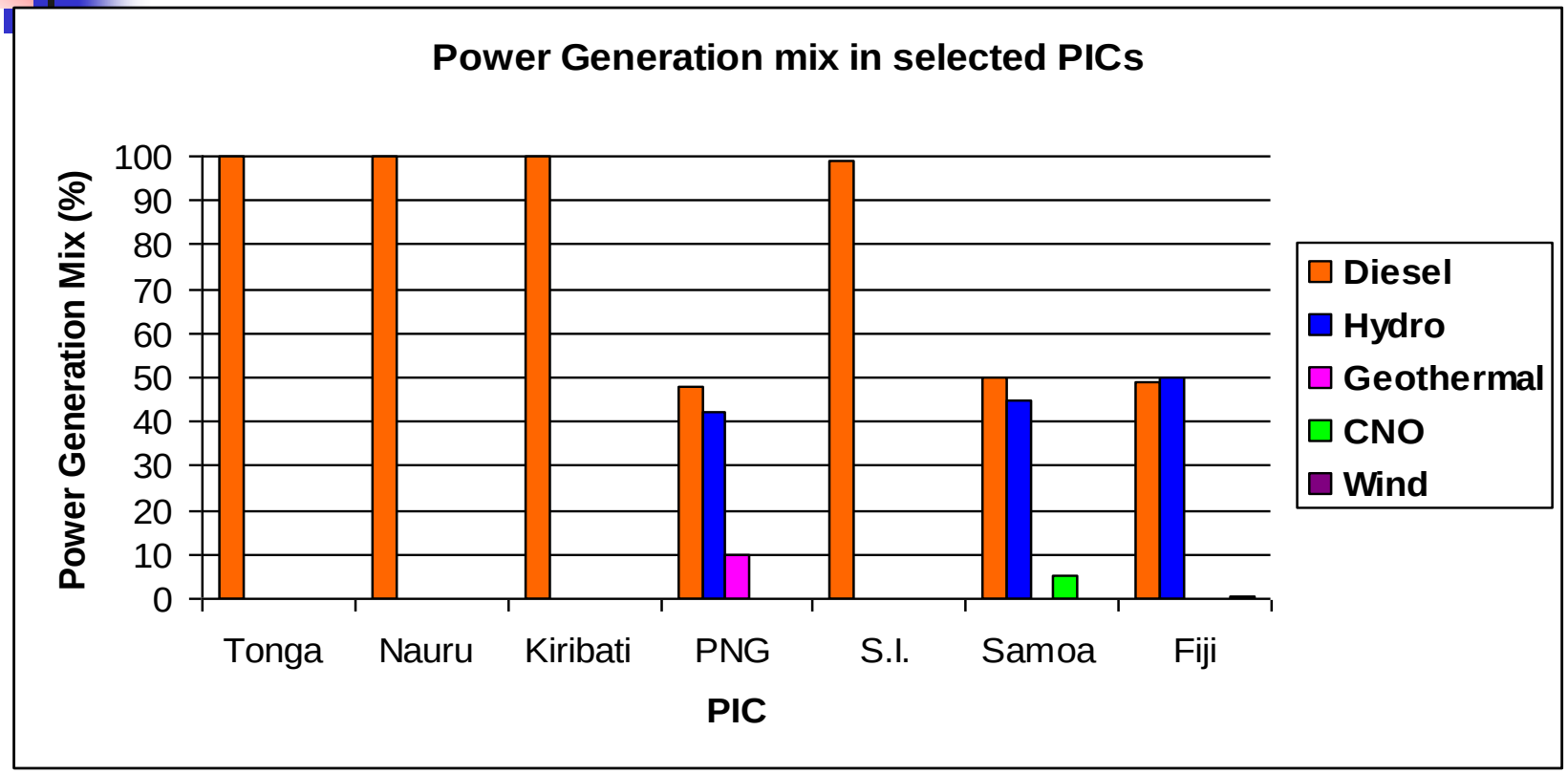
- **Energy Challenges faced by PICs**
- **Macroeconomic impacts of oil price rises**
- **Energy policies – regional and national**
- **Solutions to regional energy challenges**
- **Energy and the Economy of Tonga**
- **The Tonga Energy Road Map (TERM) 2010-2020**
- **Problems identified by TERM study**
- **USP's potential role**
- **Need for an Institute of Energy**

1. Energy challenges for the PICs

A multitude of challenges to energy supply:

- remoteness and lack of indigenous fossil fuel sources – heavy dependence on imported fuel and supply chain issues
- assessment and development of RE resources hindered by lack of institutional mechanisms, inadequate policy, general lack of human capacity

Fraction of imported fossil fuel for power generation in Tonga and selected PICs



Source: JICA report (2009); TERM (2010); FEA annual report (2008)

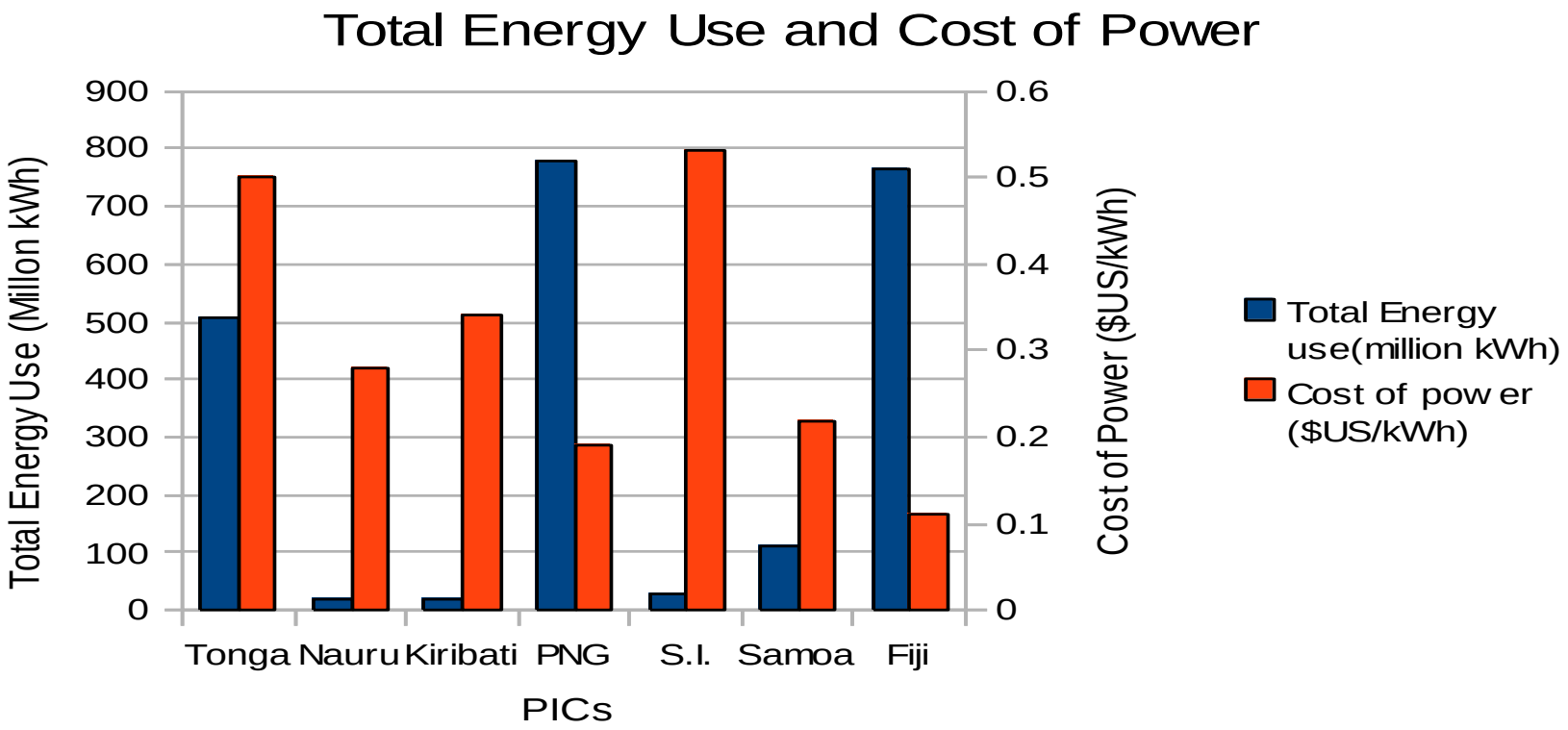
2. Macroeconomic impacts of oil imports

- Oil makes up a greater share of commercially traded energy supply in the PICs than in the Asia/Pacific region or globally.
- In 2006, 95% of the commercially traded energy supply in the PICs was oil, compared to 45% for the Asia-Pacific region, and 34% globally (ADB Paper 1 – FenMM meeting)

Macroeconomic impacts of oil price (cont.)

- *High oil prices (eg late 2008) leads to high inflation rates (10% for PICs), leading to deterioration of trade and current account balances, and lowering of international reserves*

Total grid power consumption and unit cost amongst PICs



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3. Energy policies-regional and national

- We need energy strategies and policies to reduce fossil fuel dependency and use more indigenous energy sources
- Challenges are both regional in nature as well as specific to individual nations.
- We need both regional and national energy policies.

Policies (cont.)

- In 2004, the Pacific Island Energy Policy (PIEP) was established to consider problems common to the region.
- Pacific Forum leaders called for its review in 2007.
- In 2009, new policy framework to ensure regional energy security was proposed.
- Now known as the Framework for Action on Energy Security in the Pacific (FAESP).

4. Solutions to regional energy challenges

- The traditional wisdom: explore renewable energy (RE) alternatives,

But

- Are there sufficient RE resources in the country?
- Is the technology developed? (Are they commercially proven?)
- Does the country have the institutional framework, and the human capacity to develop its RE resources?

Renewable energy resources of selected PICs

Country	Geog	Solar (kWh/ m^2/day)	Wind	Hydro	Biomass/fuel	Geothermal	Ocean	
Nauru	21 km^2	Yes (5.8)	?	No	No	No	No	
Kiribati	32 atolls	Yes (5.7)	No – atolls	No	CNO (5500Mton	No	No	
PNG	mountaneous	Yes (6)	Yes – 19 sites	**Yes** (1400MW)	Timber, palm oil	Yes (1 station)	No	
S.I.	6 volc.Is	Yes	No data	Yes (JICA 330MW)	CNO	Maybe	No	
Samoa	2 volc is	Yes (6)	~ 3m/s	Yes (issues)	5%CNO blend	No	No	
Fiji	2 volc	Yes	Yes - Butoni	yes	Timber, CNO	?	?	

Solutions to regional energy challenges (cont.)

Fossil fuels will continue to be indispensable for the foreseeable future (biofuels cannot completely replace fossil fuels for transportation)

5. Energy and the economy of Tonga

- All (100%) grid electricity in Tonga is generated from imported diesel fuel
- Oil (diesel) price volatility places the entire economy of the nation under serious stress
- Dramatic and continuous rise in oil prices in the 2004-2008 period forced rise in electricity tariff from TOP 0.40 to TOP 1.00 (=US$0.50)

6. The Tonga Energy Road Map (TERM) 2010-2020

- "A ten year road map to reduce Tonga's vulnerability to oil price shocks and to achieve an increase in quality access to modern energy services in an environmentally sustainable manner"
- To reduce Tonga's fossil fuel dependence for power generation by 50% asap

TERM (cont1)

Four methods to achieve this aim:

- improve petroleum supply chain
- increase efficiency and reduce losses at the Tonga Power Ltd (TPL) Power Station (supply side intervention)
- increase efficiency of conversion of electricity to consumer services (i.e. demand side intervention)
- increase the fraction of renewable energy in the energy mix

TERM – a whole of sector approach

TERM will use **a whole-of-the-sector** approach

- comprehensive, all-inclusive method
- involves all line ministries associated with energy at once
- pragmatic approach to use of RE – only mature technology will be considered

TERM Phases

TERM will occur in three phases

- Phase 0: policy, institutional, legal, regulatory, capacity-building and data gathering
- - Phase 1: First set of proof-of-concept RE projects (on-grid PV supply, landfill gas project if viable, end-use efficiency activities, review of financial risk management
- - Phase 2: Further efficiency and RE investments after all lessons learnt.

7. Problems identified by TERM study

- gaps and overlap in the existing policy, legislation and regulation
- insufficient data on RE resources, especially landfill gas and wind, also on coconut price and reliability of supply
- further measurements on solar energy resources needed
- need for a central data storage facility for RE resources
- general need for capacity building

8. USP's potential role

USP

Can provide courses/training in

- policy and regulatory frameworks (FBE)
- institutional frameworks

Can do renewable energy resource assessment

- current KOICA-funded project includes monitoring wind and solar energy resources

USP's role (cont.) – capacity building

Human capacity building

- Basic RE awareness course for decision-makers and
- hands-on course for technicians and operators planned by PACE-SD

USP's role (cont.)

Requirements:

- RE training centre
- - Mother-child training centre concept was originally proposed.
- - basic training equipment at Laucala

9. Need for an Institute of Energy

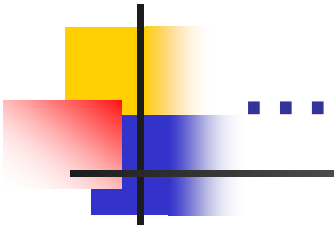
- Above training requirements can be provided within separate Faculties/Divisions of USP
- Database maintained separately
- But this is a piecemeal and fragmented approach to learning
- We really need a central body to bring together and develop the separate requirements coherently and meaningfully.

Need for an Institute of Energy (cont.)

- We need a place to combine information and understandings to develop sound policies.

We need a policy incubator, that inputs information and understandings and outputs sound and considered policies for the leaders of the region to adopt.

We need an Institute of Energy



Thank you
for your attention!