TARRIFS AND DER

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Presentation Topic:
Tariff and Distributed Energy Resources
Tariff Challenges

• Electricity is an essential service
• Commercialisation of utilities creates an imperative for cost recovery
• Tariffs should also be designed to incentivise efficient behaviour and investment
• Conflicts between cost-recovery, efficiency and equity
Cost Recovery Challenge in PICTs

Ravita Prasad (2021) International Science Council Blog

PPA Benchmarking 2021

Figure 5.7.4: Utility Cost Breakdown 2020
Figure 3. Range of electricity tariffs by customer class (US$/kWh)

World Bank 2020

Figure notes: Bottom whisker cap = minimum; bottom box margin = 1st quartile; mid box bar = median; top box margin = 3rd quartile; top whisker cap = maximum.

Monthly Bill for a Residential Customer @ 200 kwh per month

PPA Benchmarking 2021

Pacific Island Utilities
Figure 7: Estimated $/kWh LCOE of Pacific PV projects and PV-battery projects compared to the marginal diesel fuel cost of generation
<table>
<thead>
<tr>
<th>Country</th>
<th>Fiscal Incentives</th>
<th>Feed-in Tariff</th>
<th>Net-metering/Billing</th>
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</thead>
</table>
| Fiji                 | • 10-year tax holiday for RE developers  
                       • No import duty on RE equipment  
                       • Financial grants and direct investment for RE development from Fiji Development Bank  
                       • Requirement for commercial banks to loan 2% of portfolio to RE projects  
                       • Subsidized borrowing and grant funding through Reserve Bank of Fiji                                                                          | Under development | Under development    |
| Kiribati             | • Government-funded RE projects are exempt from import duty  
                       • Development partners have provided direct grants for RE development                                                                         | No             | No                   |
| Marshall Islands     | • Equipment for RE generation is exempt from import duty  
                       • Development partners have provided direct grants for RE development                                                                         | No             | No                   |
| Micronesia, Federated States | • Interest-free loans have been provided to the utility  
                               • Financial grants have been offered for RE development                                                                 | Yes            | No                   |
| Nauru                | • Development partners have provided direct grants for RE development                                                                                                                                       | Yes            | No                   |
| Palau                | • Equipment for RE generation is exempt from import duty  
                       • Subsidized loans and grants have been provided for RE development                                                                                 | Yes            | Yes                  |
| Papua New Guinea     | • Development partners have provided direct grants for RE development  
                       • 10-year tax holiday in free-trade zones  
                       • Import duty exemption on RE equipment                                                                                                           | No             | Yes                  |
| Samoa                | • Equipment for RE generation is exempt from import duty  
                       • Development partners have provided direct grants for RE development                                                                         | Yes            | No                   |
| Solomon Islands      | • Equipment for RE generation subject to 10% import tax can apply for exemption  
                       • Development partners have provided direct grants for RE development                                                                          | No             | No                   |
| Tonga                | • Equipment for RE generation is exempt from import duty  
                       • Equipment for RE generation is exempt from consumption tax  
                       • Development partners have provided direct grants for RE development                                                                             | Yes            | Yes                  |
| Tuvalu               | • The utility receives a grant from the government  
                       • Development partners have provided direct grants for RE development                                                                               | No             | No                   |
| Vanuatu              | • Equipment for RE generation is subject to lower tiers of import duties  
                       • Development partners have provided direct grants for RE development                                                                             | Yes (20)       | Yes                  |
DER Opportunities Tariff Challenges

Opportunities
• Consumer investment in low-cost capacity
• Increase RE percentage
• Reduce network peak demand investment
• Voltage, reactive power support through inverters

Challenges
• Revenue loss
• Challenges and costs of integrating DER (V management, phase unbalance, minimum demand/reserves)
• Equity for non-solar customers
Australian Experience

- Initial focus on peak demand
- Utilities concern around PV-related revenue loss
- Balancing revenue certainty, incentives, equity challenging
- Consumer appetite for complex tariffs limited
- Large cross subsidies remain necessary for remote customers
Green Energy Markets for 2021 ISP

Figure 4-10 Assumed wholesale energy costs by time interval for NSW (and NEM from 2030) (excl GST)

Note: A large part of the change in prices between 2021 and 2030 of each time period is to do with the removal of smearing of costs in small consumer retail prices across time periods rather than underlying changes in wholesale energy costs during the hours covered by the Off-Peak, Solar and Peak periods.
Network Tariffs:
Solar Sponge Tariff
Modern FiTs Reflect the Value of PV

**What is the Value of PV?**
- To date, Australian FiTs have reflected energy value (avoided purchase of energy from the wholesale market by retailer) + avoided energy losses
- Network value/costs?
Flexible solar export trial set to soak up savings for South Australians

A new trial will allow solar customers in South Australia to export more power into the state’s grid. The ‘world-leading trial’ will introduce a new flexible solar export option for customers that’ll enable households to maximise their exports while reducing congestion on the electricity grid.

“Until now, the problem has been that in order to manage voltage and stability issues that occur only some of the time, networks around the country have had to impose exports limits that apply all the time.”

Through this trial, SAPN will begin offering small-scale solar customers either a reduced fixed export rate of 1.5 kilowatts (kW) or a flexible export option that allows up to 10kW of power to be sent back into the grid at least 98 per cent of the time.
Conclusions

• Tariff design is extremely challenging due to long-term investments in shared network assets with location and time-specific costs
• Efficiency often conflicts with simplicity, predictability and equity requirements ... tariffs as a social construct
• Opportunity to reduce costs and achieve goals with RE and DER
• Efficient tariff design can evolve with resource mix. Solar soak tariffs, solar export tariffs, ToU FiTs might better incentivise DER? Flexible exports allow networks control.
• Utilities and policymakers must bring consumers on the journey.
• New business models (aggregators, sharing models) may be needed to interface with customers.