

Challenges in Renewable Energy Integration to Pacific Island Grids

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Outline

- **Current Status of RE generation in PPA Member utilities**
- **PICs' National RE targets**
- **Challenges to accelerated RE integration**
- **Going Forward in Addressing the System Stability**

Present Status of Generation – PPA Members

Utility	Distillate ADO / IDO	Heavy fuel HFO / IFO	Hydro	Wind	Solar PV	Biomass & Biofuel	Total	% RE
ASPA (A Sam.)	159,113	-	-	-	-	-	159,113	0.0
CPUC (Chuuk)	-	9,798	-	-	-	-	9,798	0.0
CUC (Saipan)	208,446	-	-	-	-	-	208,446	0.0
EDT (Tahiti)	4,245	336,002	209,145	-	-	-	549,392	38.1
EPC (Samoa)	51,663	-	47,738	-	4	156	99,561	48.1
FEA (Fiji)	236,356	126,237	413,619	6,420	-	16,207	798,839	54.6
GPA (Guam)	26,122	1,835,881	-	-	-	-	1,862,003	0.0
KAJUR (RMI)	-	-	-	-	-	-	-	0.0
KUA (Kosrae)	6,504	-	-	-	56	-	6,560	0.9
MEC (Majuro)	62,912	-	-	-	-	-	62,912	0.0
NPC (Niue)	3,000	-	-	-	3	-	3,003	0.1
NUA (Nauru)	23,187	-	-	-	53	-	23,240	0.2
PPL (PNG)	31,734	16,333	283,454	-	-	-	331,521	85.5
PPUC (Palau)	83,075	-	-	-	n/a	-	83,075	0.0
PUB (Kiribati)	21,641	-	-	-	-	-	21,641	0.0
SIEA (Sol. Isl)	83,623	-	-	-	-	180	83,803	0.2
TAU (Cook Isl)	27,763	-	-	-	n/a	-	27,763	0.0
TEC (Tuvalu)	6,278	-	-	-	135	-	6,413	2.1
TPL (Tonga)	45,214	-	-	-	-	-	45,214	0.0
UNELCO (Van)	53,274	-	-	5,388	-	571	59,233	10.1
YSPSC (FSM)	13,000	-	-	-	-	-	13,000	0.0
Total	1,147,150	2,324,251	953,956	11,808	251	17,114	4,454,530	
% of total	25.8%	52.2%	21.4%	0.3%	0.01%	0.7%	100%	22.1

Current PICTs RE Targets

Country	National RE goal electricity
Papua New Guinea	n/a
Republic of Palau	20% RE by 2020 under GEM Initiative
Republic of Kiribati	Reach 70% of population with RE; date?
Solomon Islands	20% RE by 2018
Cook Islands	50% RE by 2015; 100% by 2020
Tuvalu	100% RE by 2020
Kingdom of Tonga	50% RE for main grid by 2012
Republic of Vanuatu	No RE goal
Yap State, Federated States of Micronesia	State goal of 28%, National 20% GEM
Kosrae State, Fed States of Micronesia	20% RE by 2020 under GEM Initiative
Chuuk State, Federated States of Micronesia	20% RE by 2020 under GEM Initiative
Pohnpei State, Fed States of Micronesia	20% RE by 2020 under GEM Initiative
Republic of Nauru	50% by 2015
Republic of Fiji	90% by 2015
Republic of Marshall Islands	20% by 2020 under GEM initiative
Samoa	20% by 2030

Current Barriers to development of grid-connected RE

- *Lack of legislations and cross-sector policy framework*
- *Aged and Inefficient Electricity Network*
- *Lack of budgetary support*
- *Lack of private sector engagement*
- *Lack of education and training programmes*

Lack of legislations and cross-sector policy

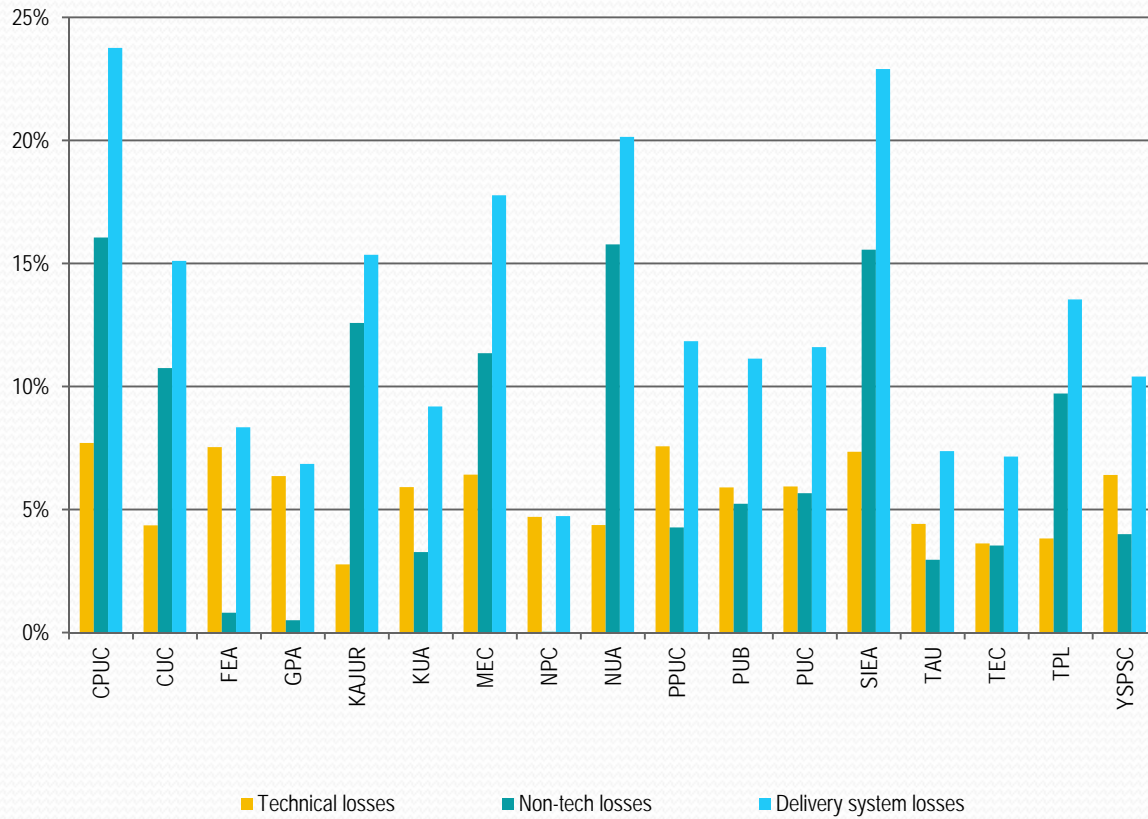
- No clear energy policies in a number of the countries
- Current policies are not properly enforced
- Lack of Policy framework to develop and reinforce the deployment of standardized PPAs leading to increased IPPs
- FITs are in early development stages – only 2 of 25 utilities have FIT
- Uniform tariff resulting in cross subsidy
- Tariffs have minimum charges and complicated fuel surcharge

Aged and Inefficient Electricity Infrastructure

- Majority of island networks are old
- High system losses
- Maximum demand 0.4Mw to 275 MW
- Stability problems being experienced (Niue and Cook Is)



Utility Systems Losses



System:
Average 12.8%
Median 11.6%

Technical:
Average 5.6%
Median 5.9%

Lack of budgetary support

- Low budgetary support for RE projects
- Almost all RE projects a development partner funded
- No economies of scale hence a challenge for development of RE technology deployment

Lack of private sector engagement

- Lack of local actors for investment, equipment supply as well as technical and commercial exploitations
- 75% of Member utilities are Government owned and private sector lacks adequate incentives to be involved in RE
- No economies of scale hence a challenge for development of RE technology deployment
- Capacity and skills inadequate so needs to be developed
- Existing RE businesses lack skills in marketing, management techniques and are underfunded

Lack of education and training programs

- Training program is fragmented
- Need to establish renewable energy education curricula
- Lack of trainers
- High turnover of trained personnel

Going Forward in Addressing the System Stability

- PPA is collaborating with IRENA to carry out dynamic stability studies for the island systems
- Intends to build on from previous work in loss studies
- Dynamic modeling of systems will be followed by data logging to verify modeling results
- Modeling would be able to determine if the project will be successful or not prior to investment.

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