

Innovative Solutions for Small-Island States



Mafalu Lotolua
Pacific Energy Summit
Auckland, 7th June 2016

RE&EE Development in Tuvalu

- Guided by the RE&EE Master Plan and is directly linked to the
 - Tuvalu National Sustainable Development Plan (Te Kakeega III),
 - the Climate Change Policy (Te Kaniva) and
 - the Tuvalu National Energy Policy.
- Master Plan has identified the most possible proven technologies for Tuvalu to meet its 100% target.



RE&EE Master Plan

- RE TARGET – 100% by 2025
- GOAL
 - To generate electricity with 100% renewable energy by 2025, and
 - To increase energy efficiency on Funafuti by 30%

Implementation Strategies

- 60 – 95% - Solar
- 0 – 40% - Wind
- 5% - Biodiesel
- 30% - Energy Efficiency



- Cannot achieve 100% renewable energy with **ONE** Renewable Energy source and need to include other potential **PROVEN** and **MATURED** technology, and
- Energy Efficiency is also important to avoid additional renewable energy generation.

Renewable Energy Portfolio

No	Island	Technology	Capacity (kW)	% RE	Development Partners
1	Funafuti	Solar PV	750	17	NZ Govt, UAE and Japan
2	Vaitupu, Niutao, Nanumaga and Nanumea	Solar PV	1,032	90	NZ Govt
3	Nukulaelae, Nukufetau and Nui	Solar PV	188	50	EU
4	Amatuku, TMTI	Solar PV	8	2	Finland
5	Niulakita and Funafala	Solar PV SHS		100	Italian Govt.


Partners involved in RE & EE Space in Tuvalu

No	Partners	RE Technology/EE	Capacity (kW)	Site	Status
1	NZ Govt. (MFAT)	Solar PV mini-grid	3,032 + 170 =3,202	Outer-islands/Funafuti	Operational
2	EU	Solar PV mini-grid	182	Outer islands	Operational
3	United Arabs Emirates	Solar PV	500	Funafuti	Operational
4	Japan	Solar PV desalination Plant	66	Funafuti	Operational
5	World Bank	Solar/Wind/ Battery	925/200/1MW hr storage	Funafuti	Working on Equipment Technical Specifications
6	Finland Government	Solar	8kw with storage	Amatuku, TMTI	Contract signed with contractor and ready to start
7	Italy Government	Standalone Home System		Niulakita/Funafala	Yet to start
8	SIDS Dock (UNDP)	Demonstration Fale		TEC Compound	Near completion

Overall Share of Renewable Energy

IMPLEMENTATION STRATEGIES

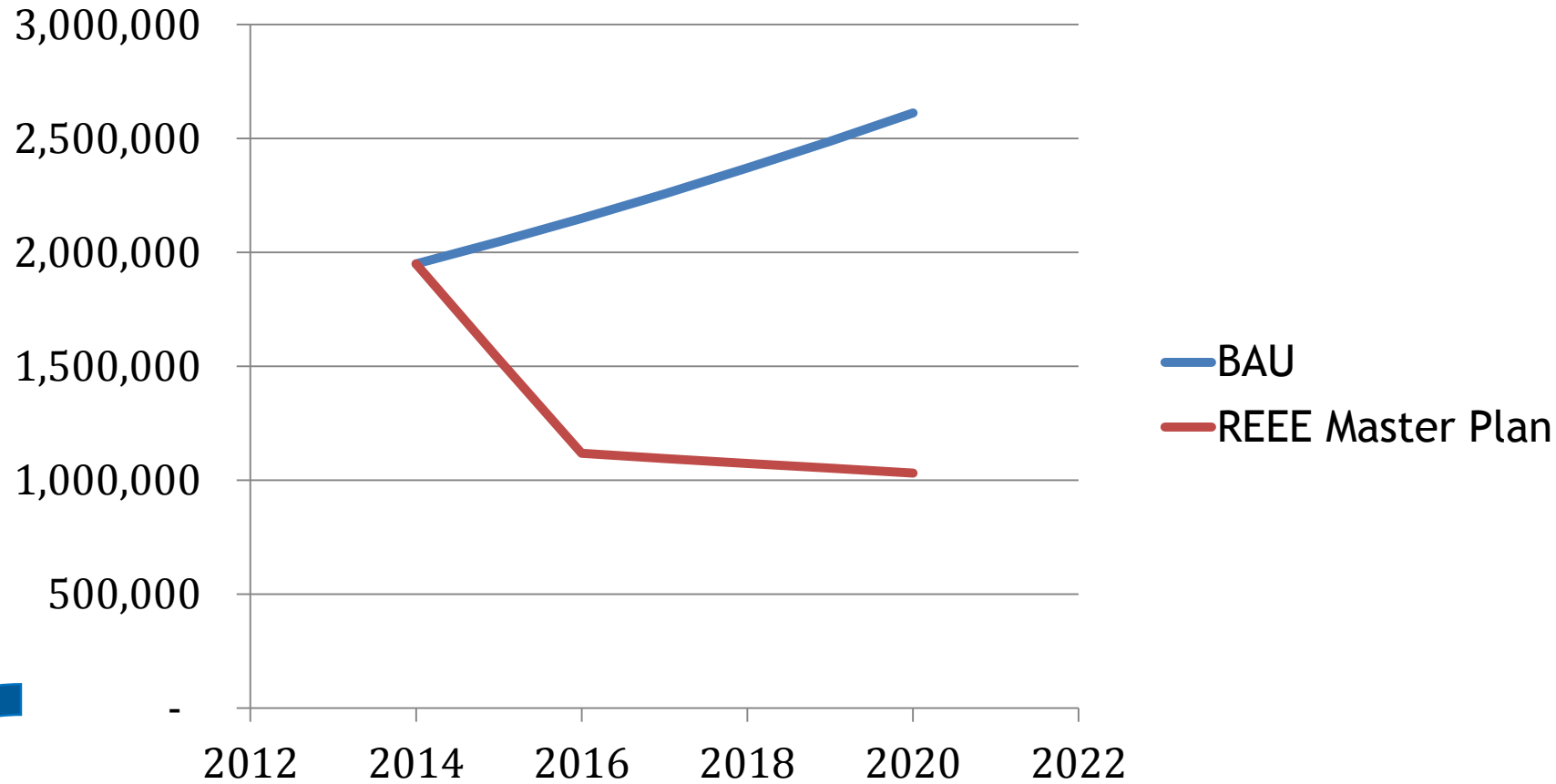
MASTER PLAN	END 2014	END 2015/2016	END 2017/2018
Solar PV : 60 – 95%	4%	29%	43%
Wind : 0-40%	0	0	2%
Biodiesel : 5%	0	0	0
Energy Efficiency : 30%	0	On going	On going

- 
- TOTAL SOLAR PV CAPACITIES BY END OF 2015 -2,010kWp
 - Outer islands – 1,212kWp
 - Funafuti – 756kWp (Controlled – 436kWp and Uncontrolled – 320kWp)

Energy Efficiency Portfolio?

No	Activity	Development Partners	Progress
1	Energy Efficiency Act	Australian Govt. through SPC	Endorsed by Parliament in April'16
2	Energy Efficiency Loan Scheme	Italian Govt	Started 2016
3	RE&EE Demonstration Fale	SIDS Dock through UNDP	Near Completion
4	Prepayment Meters	World Bank	Finalizing Specifications
5	Window Tinting for Govt. Main Office building	World Bank	Yet to start
6	Replacing of container freezers with Cool Rooms	World Bank	Yet to start

BAU Vs RE&EE



- BAU is steadily increasing and with the installation of RE, the diesel consumption tend to decrease.
- Diesel Saved during 1st quarter of 2016 – Outer-Islands 80% and Funafuti only 3%, as compared to the same period in 2015.

Challenges with moving to High Level of PV/Wind

- Raises the potential interconnection and challenges associated with system safety, reliability and imbalances and demand
- Limited land space
- Limited RE resources, predominately solar.



120kWp Solar PV on the Government main office building rooftop



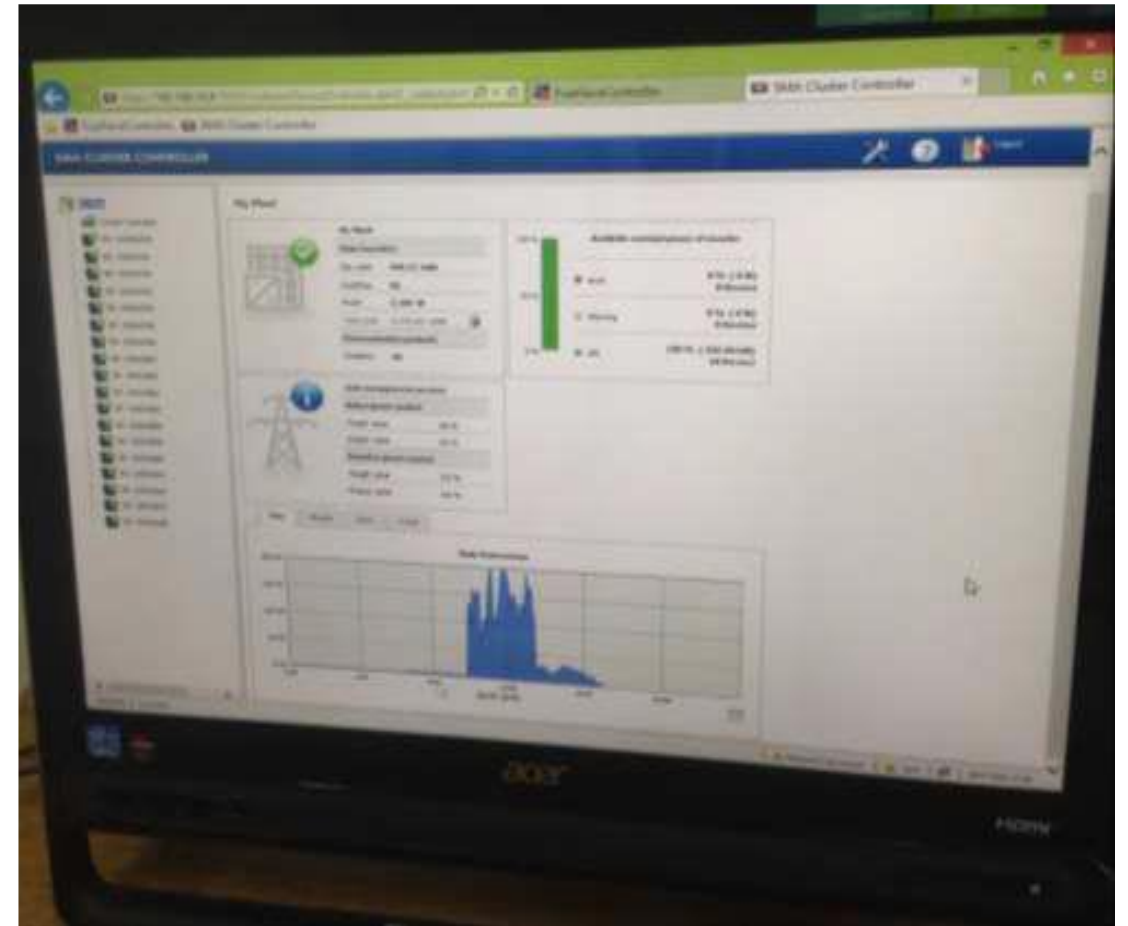
Outer Islands - Panel Structures build in the lagoon

Is it possible for Tuvalu to achieve 100% RE?

- According to KEMA, a Consultancy Firm in the United States (US) energy-sector investment roadmap for Tuvalu, **POSSIBLE**, but
 - a. required huge investment, and
 - b. also required a more detailed studies before specific large-scale renewable energy generation projects are begun.
- Engaged KEMA again, to do a more detail Renewable Resources Impact Study and also the Economics of investment.
- It is a huge challenge to the Government and we still need your financial support and assistance of the International Community and our Development Partners, so the vision of 100% renewable energy by 2025 can be truly fulfilled.

Asset Management

- Sufficient funding
- Qualified staff to look after the system
- Daily remote monitoring of the system
- Need the on-going support of the contractor



Proposed Projects for investment

- Utilizing existing Government, Commercial and Residential rooftop for more PV installation
- Additional 4MW of solar PV and storage for Funafuti
- Biofuels
- Expansion of Outer Islands mini-grid from 50% and 90% and Tuvalu Maritime Training institute to 100%, and
- Capacity development



Thank You

???