TERM & TERM plus

Our Journey thus far

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Presentation Overview

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Where we are NOW?

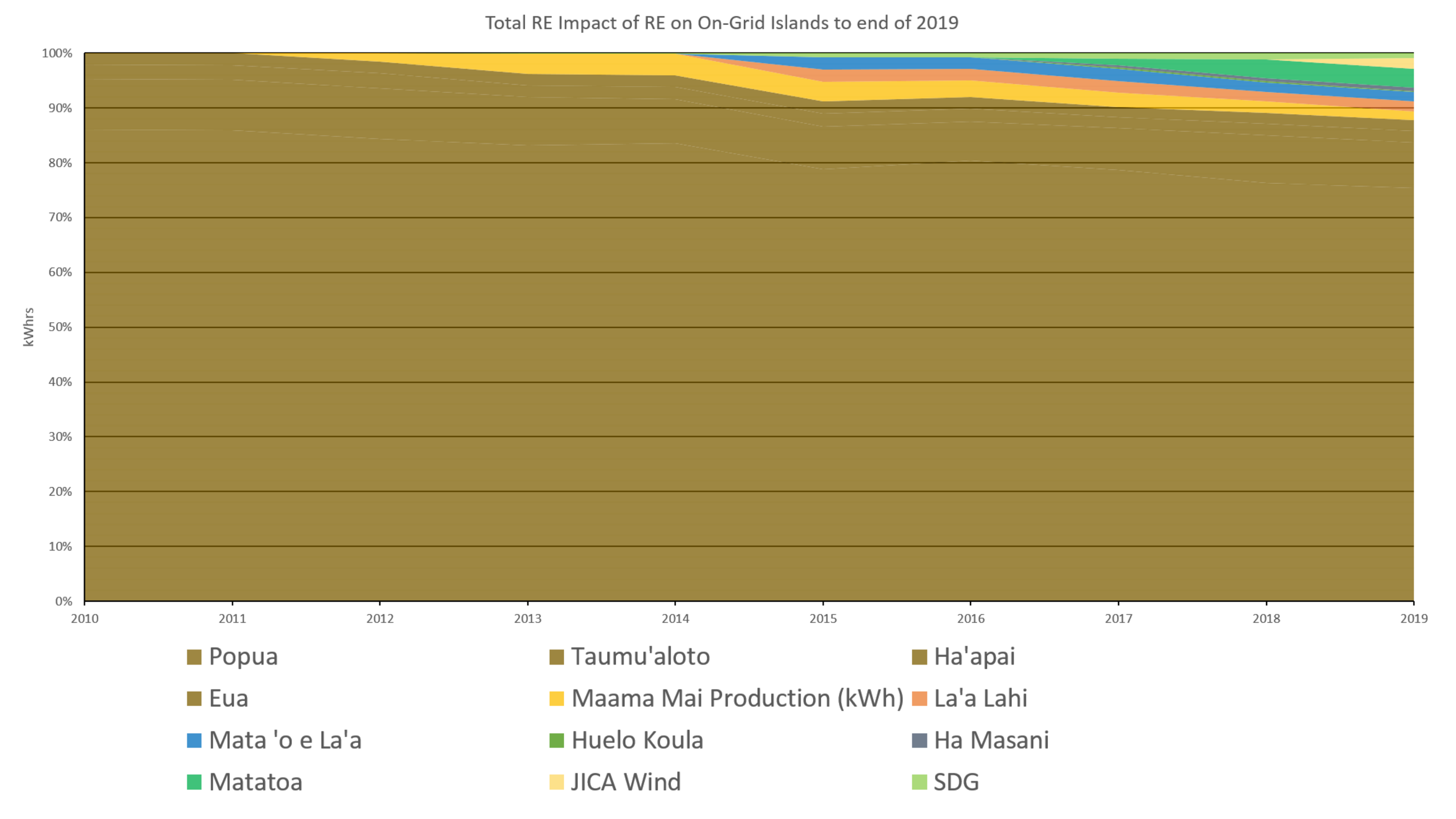
- The on-grid electricity situation
- Renewable Energy Efforts to date
- Renewable Energy efforts moving forward
- Enabling and related efforts

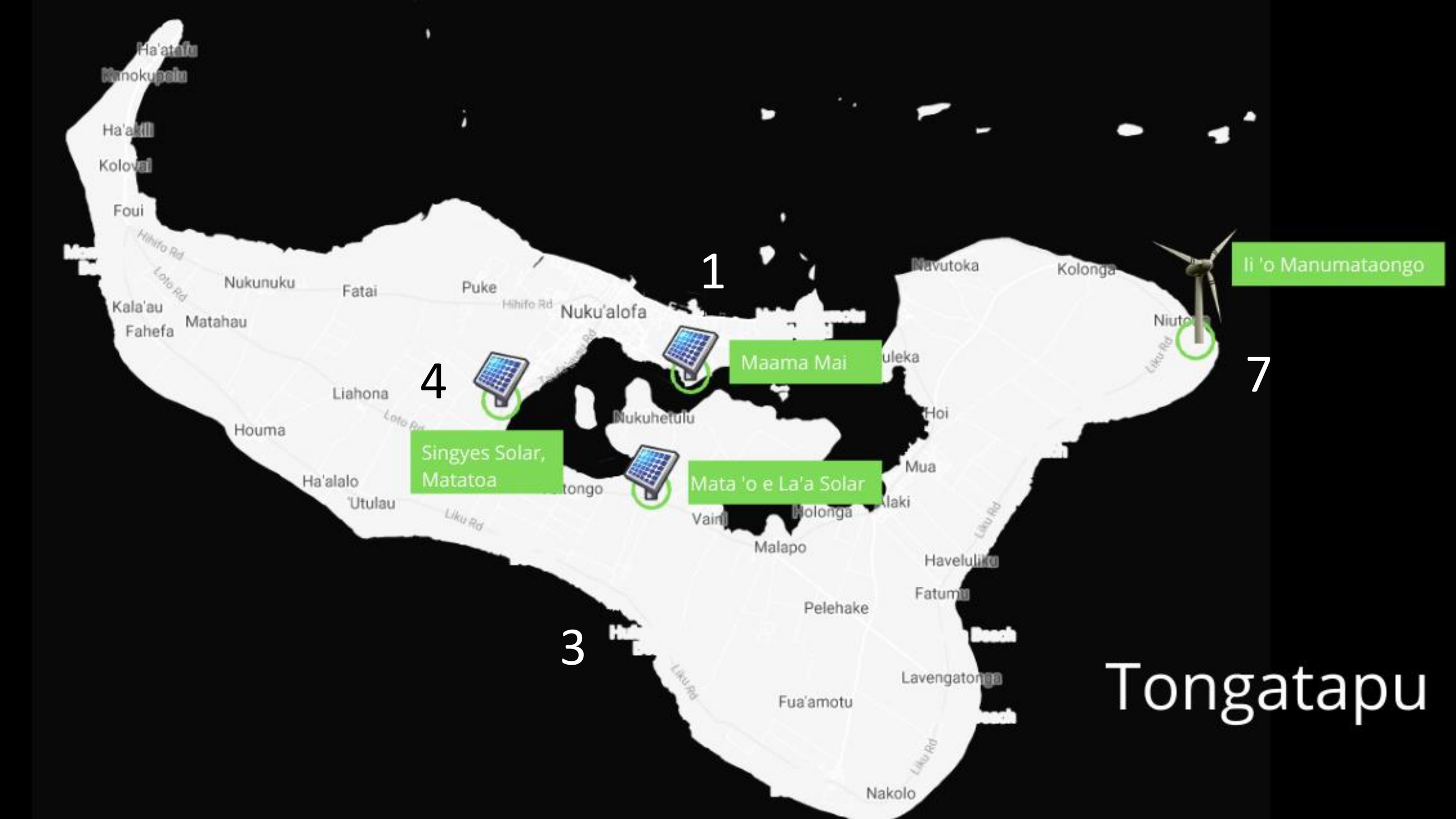
The on-grid electricity situation

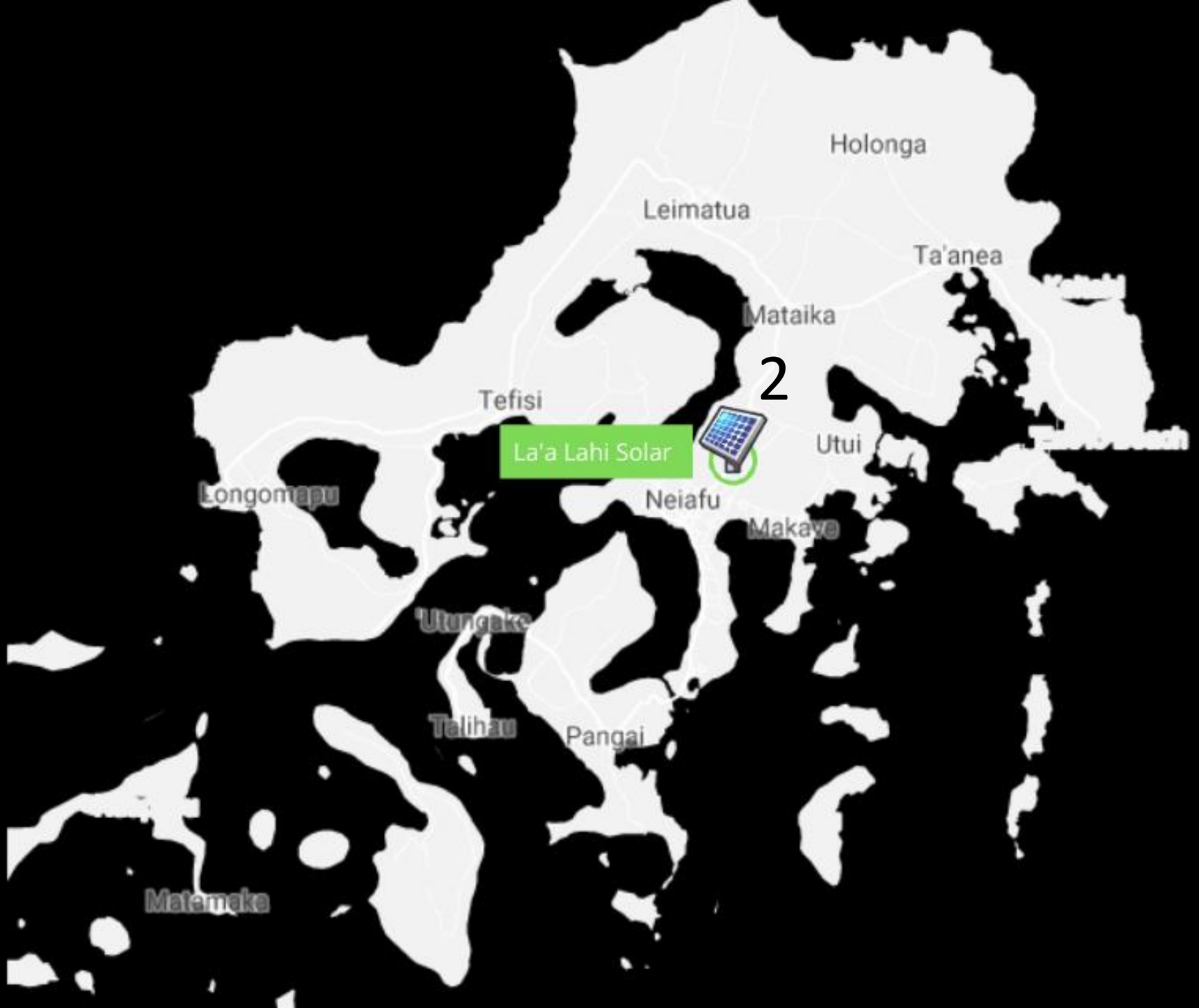
2010 vs 2019

2010		2020
52,582 *MWh produced in total*		***76,016*** *MWh produced in total*
13,086,288 *liters of diesel burn*		***16,014,805*** *liters of diesel burn*
0 *MWh of RE produced*		***8,999*** *MWh of RE produced*
0% RE		***12.27% RE***
17.5% *total system losses*		***9.95%*** *total system losses*
20,480 *Customers*		***24,043*** *Customers*
SAIDI- ***1,021 mins***		*SAIDI-* ***625.4 mins***

RENEWABLE ENERGY EFFORTS TO DATE


Total RE Impact of RE on On-Grid Islands to end of 2019
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
kWhrs
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Popua
Taumu'aloto
Ha'apai
Eua
Maama Mai Production (kWh)
La'a Lahi
Mata 'o e La'a
Huelo Koula
Ha Masani
Matatoa
JICA Wind
SDG


Ha'atafu
Kanokupolu
Ha'akili
Kolovai
Foui
Hihifo Rd
Loto Rd
Nukunuku
Fatai
Puke
Hihifo Rd
Kala'au
Matahau
Fahefa
Nuku'alofa
1
Maama Mai
Navutoka
Kolonga
Ii 'o Manumataongo
Niuto
Liku Rd
7
4
Liahona
Loto Rd
Houma
Nukuhetulu
Hoi
Singyes Solar,
Matatoa
Mua
Ha'alalo
'Utulau
Liku Rd
Mata 'o e La'a Solar
Holonga
Malapo
Liku Rd
Havelulilku
Fatumu
Pelehake
3
Lavengatonga
Liku Rd
Fua'amotu
Liku Rd
Nakolo
Tongatapu


Holonga
Leimatua
Ta'anea
Mataika
2
Tefisi
La'a Lahi Solar
Utui
Longomapu
Neiafu
Makave
'Utungake
Talihau
Pangai
Matamaka

Vava'u

5

Ha'apai

'Eua

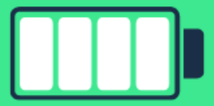

RENEWABLE EFFORTS
MOVING FOWARD


6MW IPP Solar
Maama Mai
Singyes Solar, Matatoa
Mata 'o e La'a Solar
GET 6MW
Ii 'o Manumataongo
3.8MW IPP
China Wind 2.25MW
Tongatapu
Foui
Nukunuku
Matahau
Puke
Nuku'alofa
Liahona
Houma
Ha'alalo
'Utulau
Nukuhetulu
Malapo
Pelehake
Lavengatonga
Nakolo
Navutoka
Kolonga
Hoi
Mua
Fatumu
Hihifo Rd
Loto Rd
Liku Rd

'Eua


Holonga
Leimatua
Ta'anea
Mataika
Tefisi
La'a Lahi Solar
Vava'u Solar
Neiafu
Makave
Longomapu
'Utungake
Talihau
Pangai
Matamaka

Vava'u

	Project No	RE Projects	Project Status	Target Completion Date (Pre-COVID 19)	Latest Completion Target	Accumulated RE%	
 SOLAR PROJECTS	8	Sunergise NZ IPP 6MW Solar - Tongatapu, Liukava, Fualu, Masilamea	CONSTRUCTION PHASE	2020	3 different plans (Sept, Oct 2021)	23.44%	
	9	Green Energy Technology (GET) IPP 6MW	AGREEMENT SIGNED	July 2020	March 2023	34.77%	
	10	'Eua & Vava'u Island Solar 650KW	DETAILED DESIGN PHASE	End of June 2021	March 2022	35.71%	
 WIND PROJECTS	11	Niutoua Wind IPP 4.5MW	AGREEMENT NEGOTIATION	Dec, 2020	Sept, 2023	50.64%	
	12	China Wind IPP 2.8MW	SITE MOBILIZATION	Dec, 2020	Sept, 2022	57.34%	
 BATTERY ENERGY STORAGE PROJECTS	13	Tongatapu Load Shifting Battery Energy Storage Project	CONSTRUCTION PHASE	Nov, 2020	Sept, 2021	All RE above current RE not possible without this storage component	
	14	Tongatapu Stabilizing Battery Energy Storage Project	CONSTRUCTION PHASE	Dec, 2020	Sept, 2021	All RE above current RE uneconomic without this storage component	

ENABLING AND RELATED EFFORTS

Adopting Technologies

- BESS
- Communications Platform
- Generation and Distribution Management System (SCADA Upgrade)
- Distribution Network Automation Equipment

ALL PROJECTS IN WHICH TPL IS INVOLVED

MAAMA MAI
Status: Completed

SINGYES SOLAR
Status: Completed

SUNERGISE 6MW IPP
Status: In-Progress

MATA 'O E LA'A
Status: Completed

HUELO 'O E LA'A
Status: Completed

'Eua BESS
Status: In-Progress

HA MASANI
Status: Completed

LA'A LAHI SOLAR
Status: Completed

300KW VAVA'U
Status: In-Progress

II 'O MANUMATAONGO 1.3MW
Status: Completed

3.8MW IPP
Status: In-Progress

CHINA WIND 2.25MW
Status: In-Progress

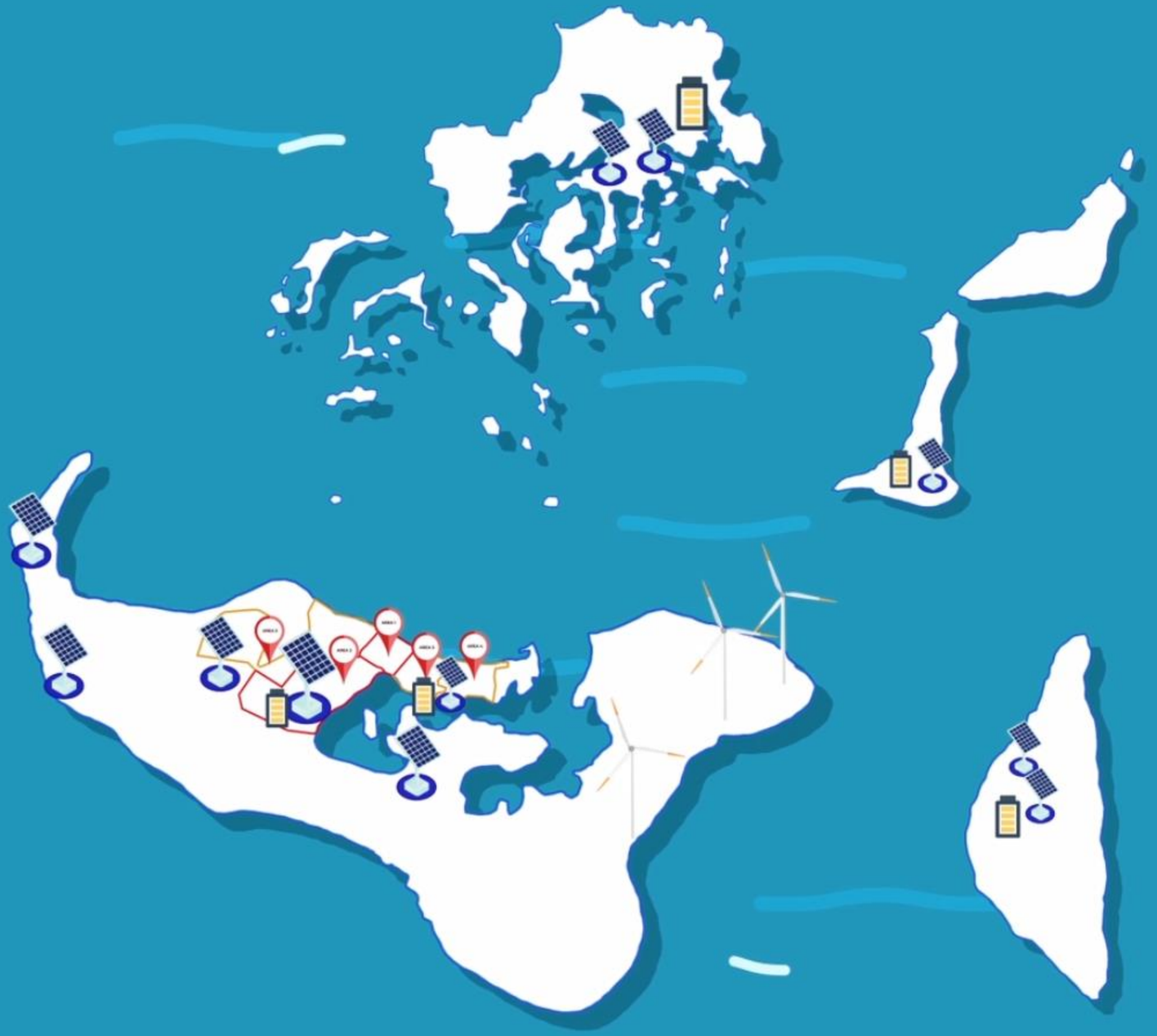
BESS #1
Status: In-Progress

BESS #2
Status: In-Progress

TONGATAPU VILLAGE NETWORK UPGRADE PROJECT
Status: Completed

OUTER ISLAND ENERGY EFFICIENCY PROJECT
Status: In Progress

NUKU'ALOFA NETWORK UPGRADE PROJECT
Status: In-Progress

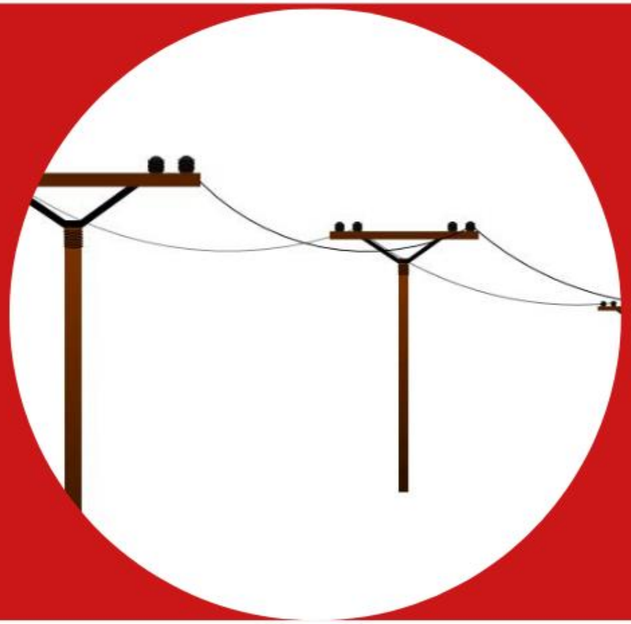


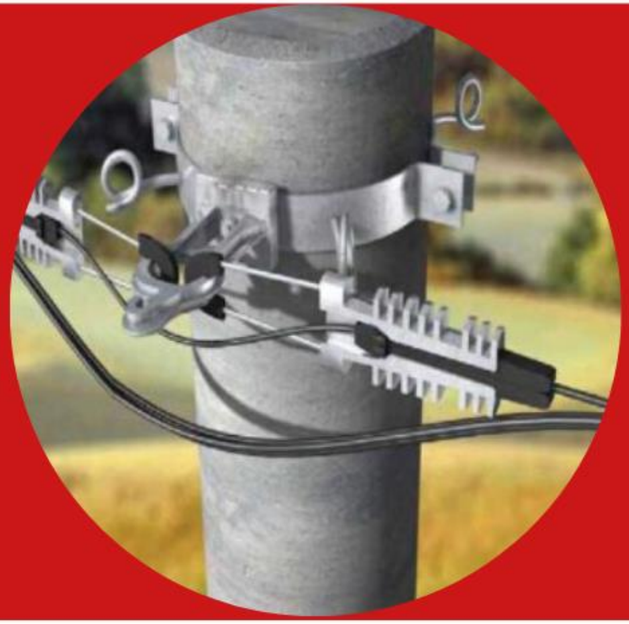
Replacing Ageing Assets

- Network Upgrade Projects
- Generator Replacement Program

5 AREAS OF NNUP

NETWORK UPGRADE





1. Replace all power poles and Cables for both Low and High Voltage Line

2. Cables for both Low and High voltage line will be ABC Bundle type.

3. All service line will be safely buried underground

Business processes and systems

- Renewable Energy Forecasting
- Diesel Generation Reserve Management tool
- Grid Code

Managing Funding and Finances

- New Multiple Tariff Structure
- Satellite Data based analytics program
- Island Clean Energy transition engagement
- Tonga Energy Efficiency Master Plan (TEEMP)
- Grid and Resource Assessment and associated capacity building

Managing Funding and Finances

- Remote Island Electrification
- Tonga Circular Economy System - Biomass
- Promoting private sector investment

Parting Messages – Institutional Priorities

- The priority goals of TERM to be reconfirmed– reduced reliance on fossil fuels = stable platform for economic growth / contribution to reducing climate change / affordability / electricity access.

- COVID-19 border restrictions has highlighted the heavy reliance on overseas experts – local capacity/workforce needs significant upskilling and knowledge enhancement. Both in terms of implementation and resource planning.

- The change being driven at policy/governance/corporate level needs better reflection at the operational/functional level.

- TPLs institutional and regulatory setup needs to start considering a business model that is based on the value of the service provided and NOT the size of the asset needed to deliver the service.