



Te Aponga Uira

RAROTONGA'S RENEWABLE ENERGY JOURNEY

100% of islands in the Cook Islands to utilise renewable energy by 2020

LETS TALK ABOUT

- TAU
- RE Journey – Past
- RE Journey – Present
- RE Journey – Potential



ABOUT TAU

- Government owned
- Generation + Distribution + Retailing of electricity on Rarotonga
- Abt 50 Staff



RAROTONGA ELECTRICITY SUPPLY

- **Centralized Power Station**
 - Diesel Generation, 12MW





RAROTONGA ELECTRICITY SUPPLY

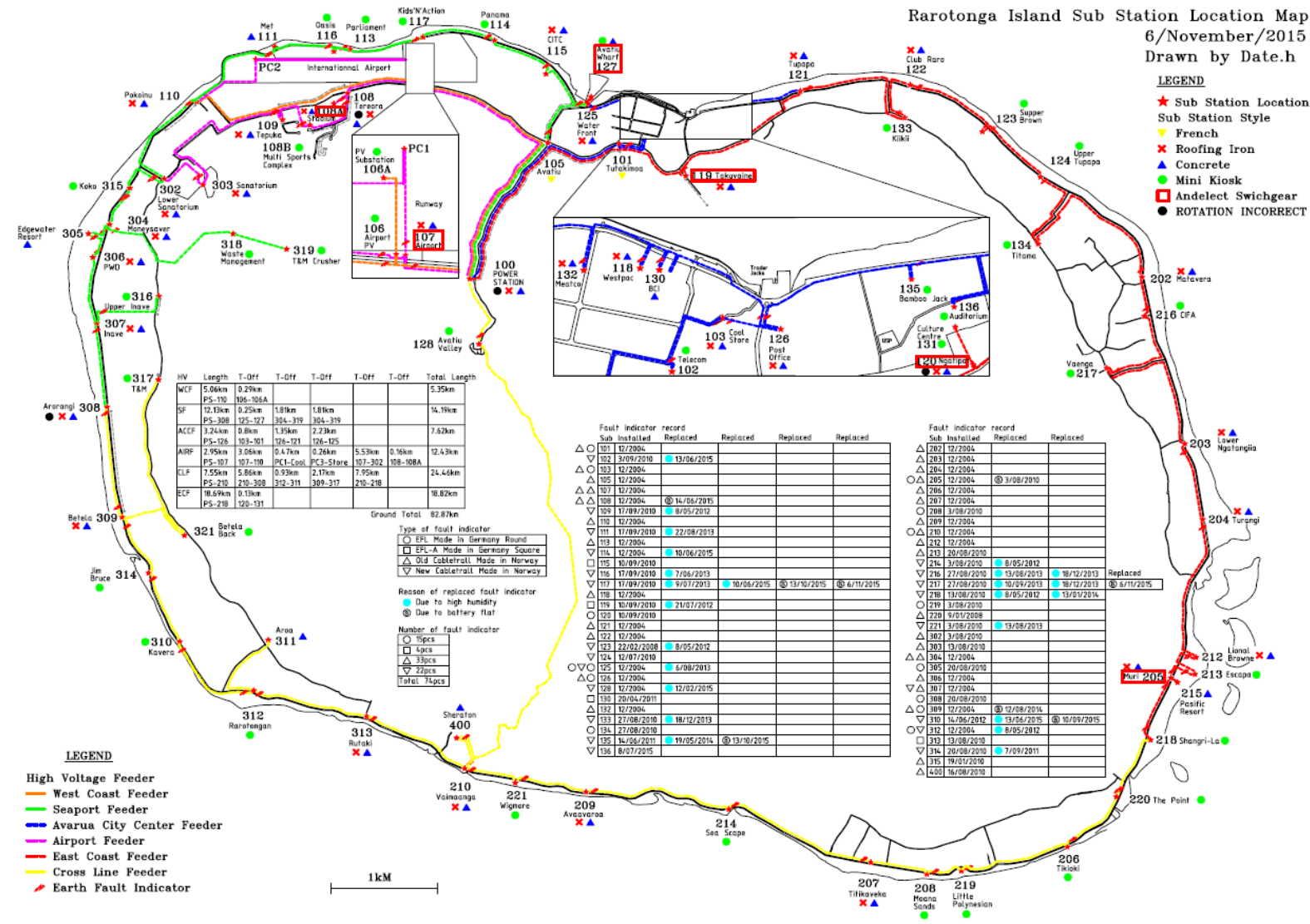
- **Distributed Generation**
 - Utility, 1MW
 - Net-meter, 1MW
 - Gross-meter & IPP, 2MW



RAROTONGA ELECTRICITY SUPPLY

• Distribution network

- HV - 11kV, 80km
- LV - 240/415V, 200km
- TX capacity - 14.32 MVA



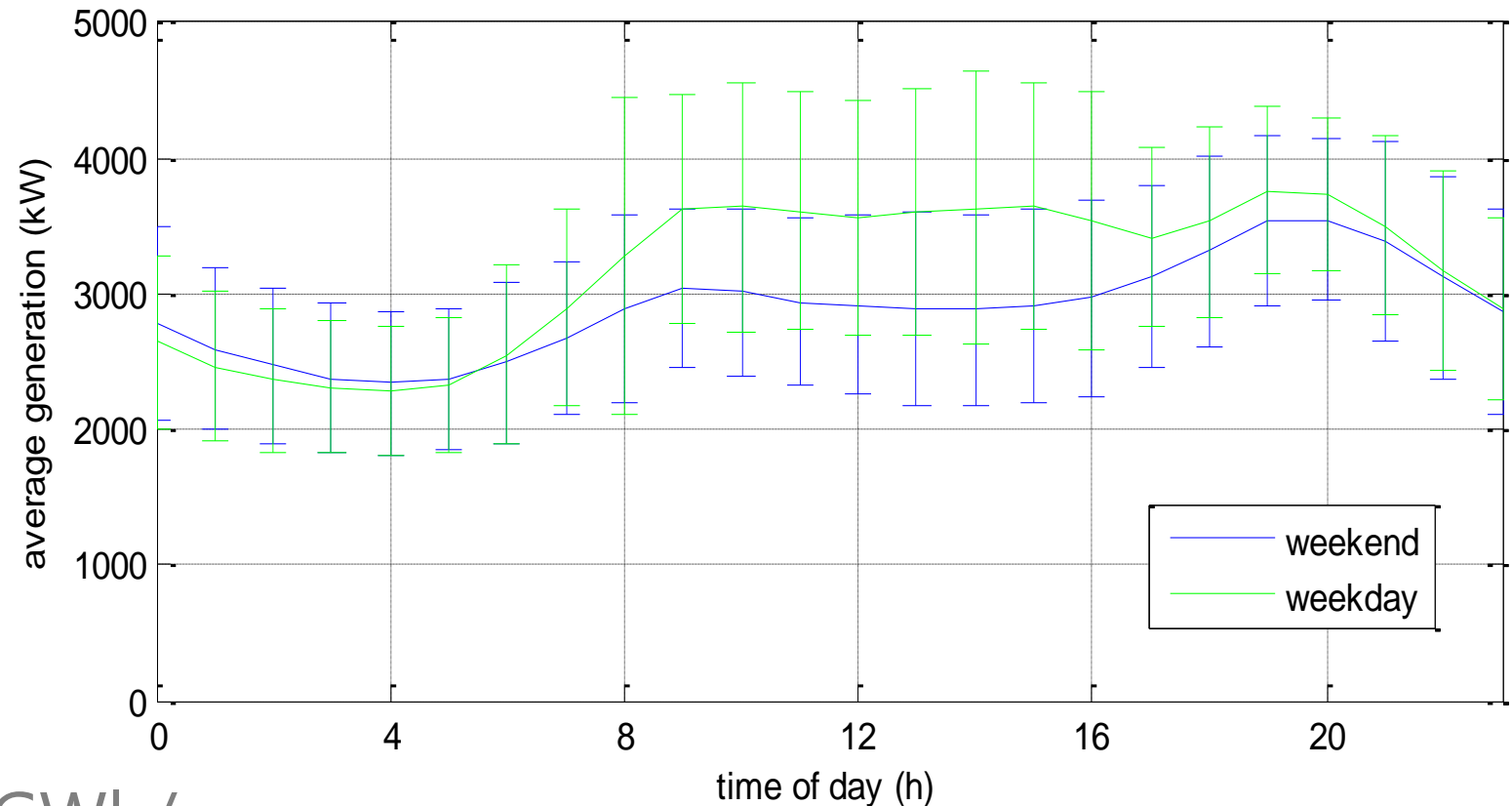
RAROTONGA ELECTRICITY SUPPLY

- **Distribution network**

- HV - 11kV, 80km
- LV - 240/415V, 200km
- TX capacity - 14.32 MVA

- **Load**

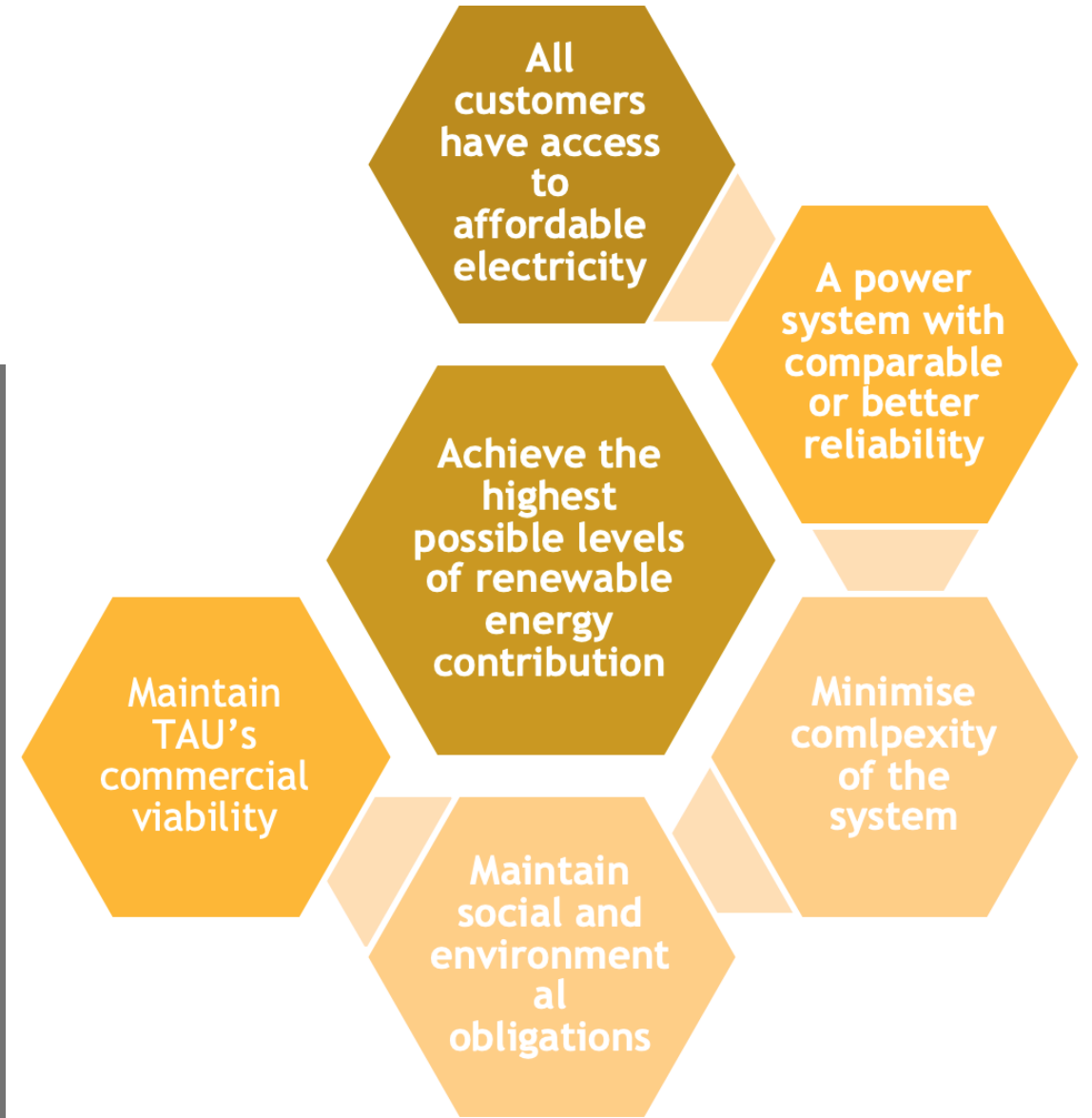
- 5000 customer
- Peak demand, 5MW
- Electricity demand, 30GWh/yr



PLANNING PRINCIPLES

National target: 100% of islands in the Cook Islands to utilise renewable energy by 2020

“A radical journey requiring change in thinking and behaviour of our society to turn our national vision into action”



PRIVATE SECTOR

INVESTMENT TIMELINE



0.01MW

2009

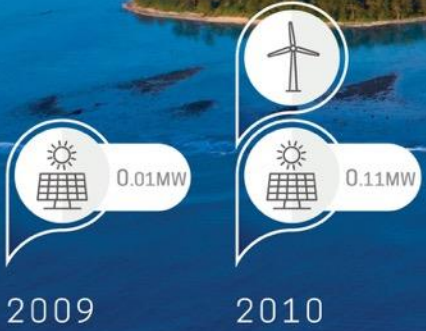
RENEWABLE ENERGY TARGET

▪ RE Policy DP03
Issue 1.0

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PRIVATE SECTOR

INVESTMENT TIMELINE



RENEWABLE ENERGY TARGET

- RE Policy DP03 Issue 1.0
- National RE Targets 50/15, 100/20

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INVESTMENT TIMELINE



RENEWABLE ENERGY TARGET

- RE Policy DP03 Issue 1.0
- National RE Targets 50/15, 100/20
- RE Study
- RE Policy DP03 Issue 2.0
- Cook Islands Renewable Energy Chart

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INVESTMENT TIMELINE



RENEWABLE ENERGY TARGET

- RE Policy DP03 Issue 1.0
- National RE Targets 50/15, 100/20
- RE Study
- RE Policy DP03 Issue 2.0
- Cook Islands Renewable Energy Chart
- Solar Resource Assessments
- Waste to Energy Study
- Storage Study
- RE Economic Viability Study



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INVESTMENT TIMELINE



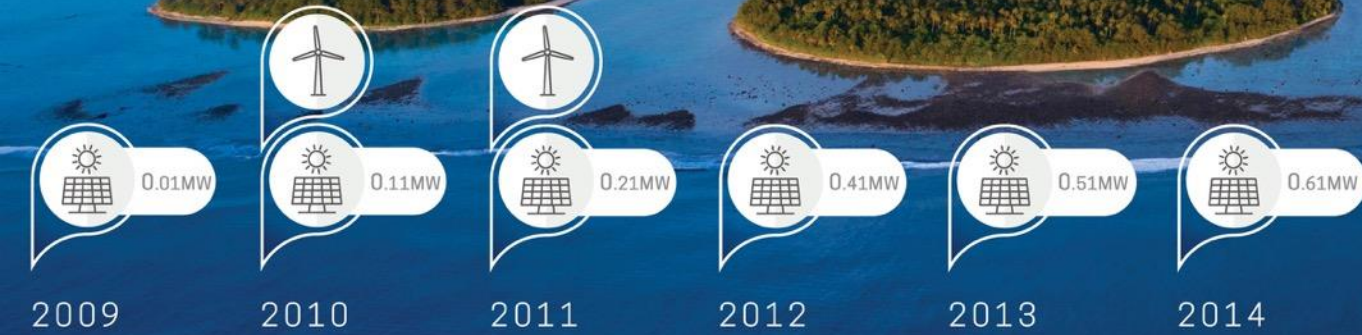
RENEWABLE ENERGY TARGET

- RE Policy DP03 Issue 1.0
 - National RE Targets 50/15, 100/20
 - RE Study
 - RE Policy DP03 Issue 2.0
 - Cook Islands Renewable Energy Chart
 - Solar Resource Assessments
 - Waste to Energy Study
 - Storage Study
 - RE Economic Viability Study
 - RE Policy DP03 Issue 3.0
 - Power Station Review-Diesel Generator set options to meet 2020 RE Target
 - RE Grid Impact Study
- 0.01MW
- 0.1MW

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INVESTMENT TIMELINE



RENEWABLE ENERGY TARGET

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 - RE Policy DP03 Issue 2.0
 - Cook Islands Renewable Energy Chart
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 - Waste to Energy Study
 - Storage Study
 - RE Economic Viability Study
 - RE Policy DP03 Issue 3.0
 - Power Station Review-Diesel Generator set options to meet 2020 RE Target
 - RE Grid Impact Study
 - Pump Hydro Pre Feasibility Study
- Below the list, two green speech bubbles with solar panel icons show additional capacity milestones: 0.01MW and 0.1MW.

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INVESTMENT TIMELINE



RENEWABLE ENERGY TARGET

- RE Policy DP03 Issue 1.0
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 - RE Study
 - RE Policy DP03 Issue 2.0
 - Cook Islands Renewable Energy Chart
 - Solar Resource Assessments
 - Waste to Energy Study
 - Storage Study
 - RE Economic Viability Study
 - RE Policy DP03 Issue 3.0
 - Power Station Review-Diesel Generator set options to meet 2020 RE Target
 - RE Grid Impact Study
 - Pump Hydro Pre Feasibility Study
 - Power Station Control Upgrade Project
- Additional capacity milestones shown in the timeline:
- 0.01MW (Solar icon)
 - 0.1MW (Solar icon)
 - 1.1MW (Solar icon)
 - 0.1MW (Solar icon)

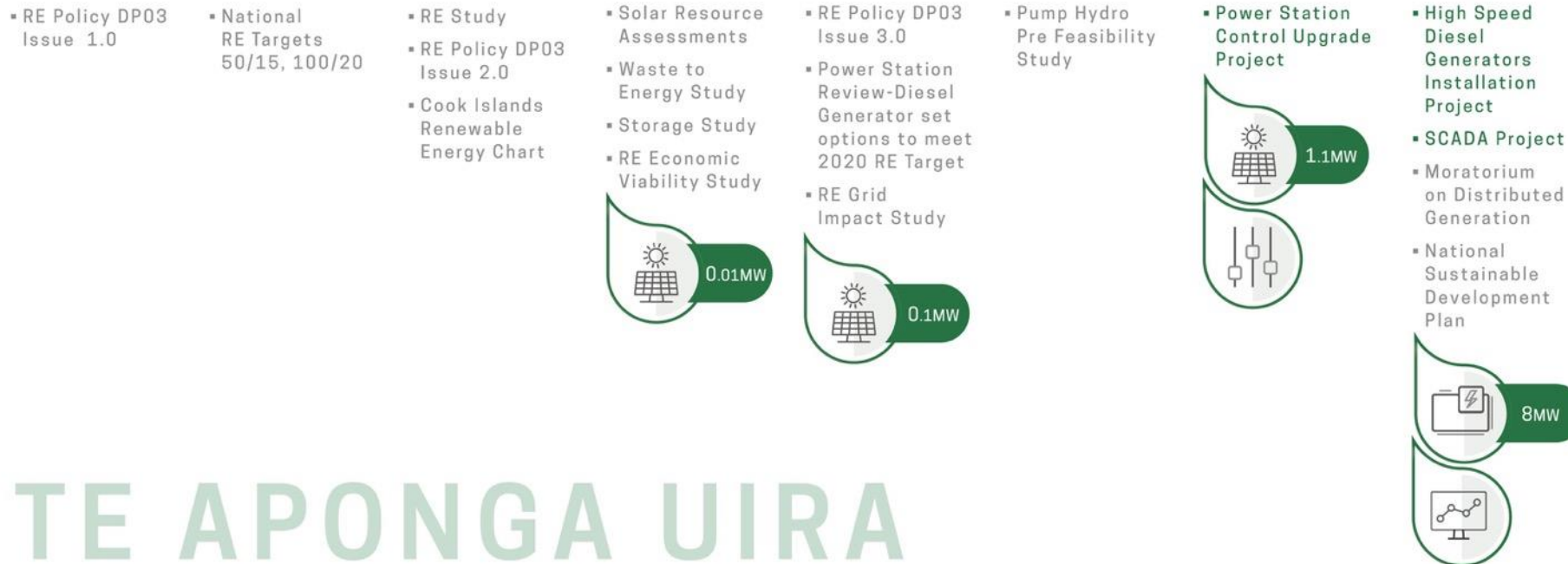
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INVESTMENT TIMELINE



RENEWABLE ENERGY TARGET



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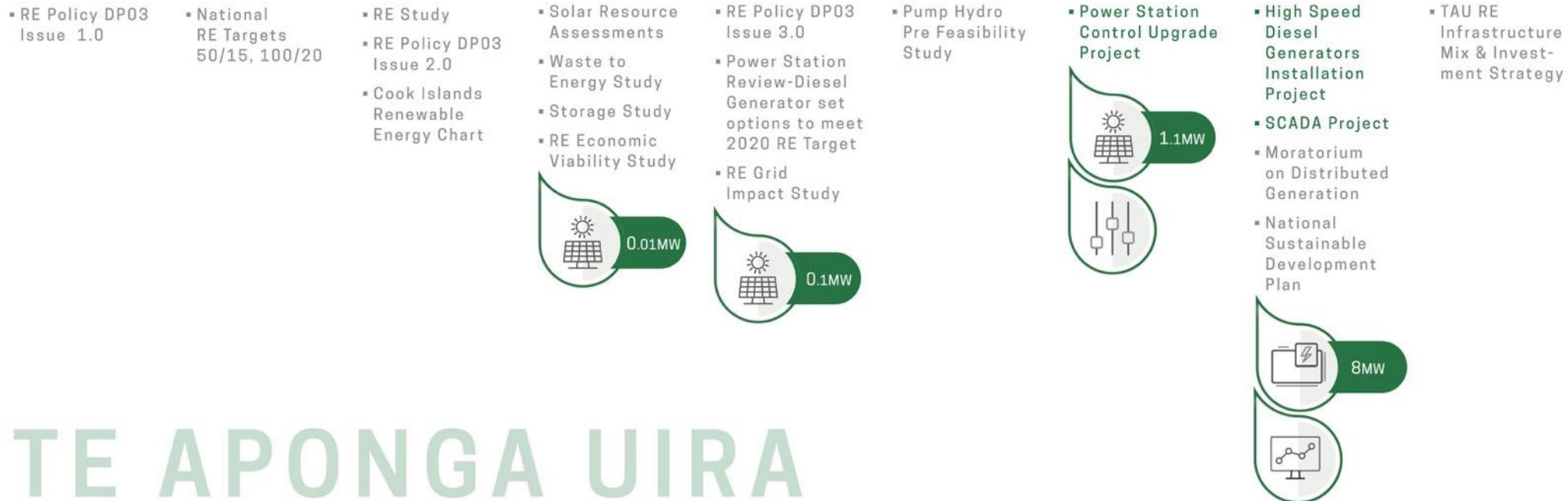
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INVESTMENT TIMELINE



RENEWABLE ENERGY TARGET

16%



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INVESTMENT TIMELINE



RENEWABLE ENERGY TARGET

16%

- RE Policy DP03 Issue 1.0
- National RE Targets 50/15, 100/20
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- Cook Islands Renewable Energy Chart
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- Waste to Energy Study
- Storage Study
- RE Economic Viability Study
- RE Policy DP03 Issue 3.0
- Power Station Review-Diesel Generator set options to meet 2020 RE Target
- RE Grid Impact Study
- Pump Hydro Pre Feasibility Study
- Power Station Control Upgrade Project 1.1MW
- High Speed Diesel Generators Installation Project
- SCADA Project
- Moratorium on Distributed Generation
- National Sustainable Development Plan
- TAU RE Infrastructure Mix & Investment Strategy
- EV Charger Project
- ICT Upgrade Project

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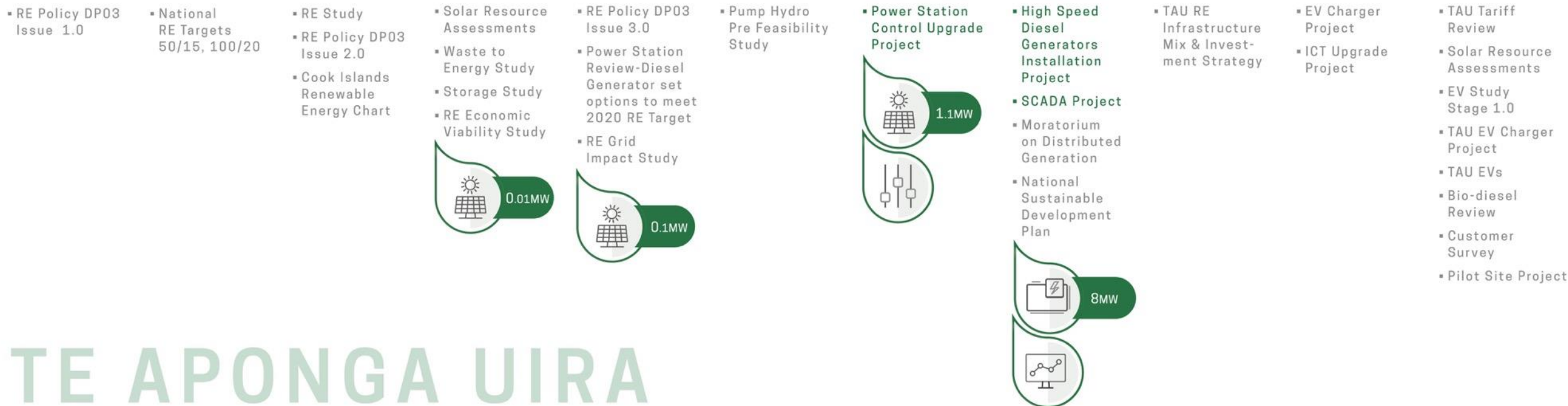
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INVESTMENT TIMELINE



RENEWABLE ENERGY TARGET

16%



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SO WHAT'S NEXT?



RAROTONGA RENEWABLE ENERGY PROGRAM SUMMARY

Te Aponga Uira o Tumu-te-Varovaro



2MW WIND



18MW PV



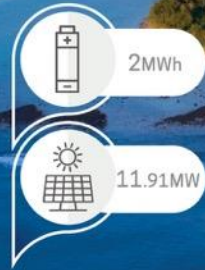
25MWH BATTERY
STORAGE SOLUTION

100%

PENETRATION BY
2020/21

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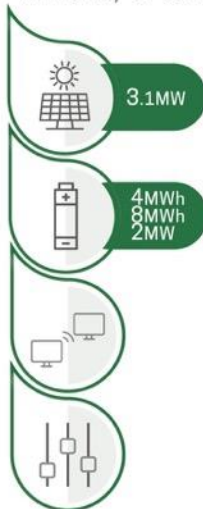
INVESTMENT TIMELINE



2020

RENEWABLE ENERGY TARGET

- TAU Control Project (Stage 1 & 2)
- Power Station Switchroom Upgrade Project
- EV Study Stage 2.0
- Pumped Hydro Feasibility Study
- RE Policy DP03 Issue 4.0



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PRIVATE SECTOR

INVESTMENT TIMELINE



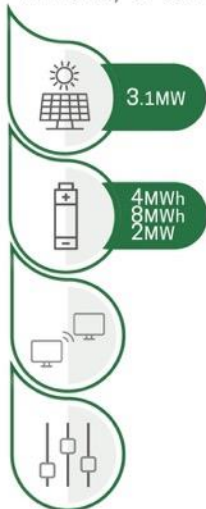
2020



2021

RENEWABLE ENERGY TARGET

- TAU Control Project (Stage 1 & 2)
- Power Station Switchroom Upgrade Project
- EV Study Stage 2.0
- Pumped Hydro Feasibility Study
- RE Policy DP03 Issue 4.0



ZERO DIESEL OPERATION

- Enablers Project
- EV Study Stage 3.0/Project
- Switchgear Automation Project



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INVESTMENT TIMELINE



2020



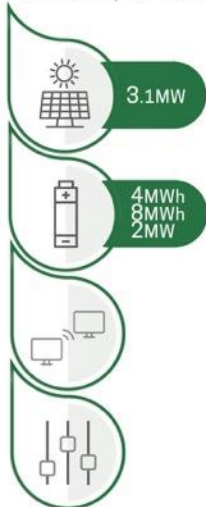
2021



POTENTIAL FUTURE OPPORTUNITIES

RENEWABLE ENERGY TARGET

- TAU Control Project (Stage 1 & 2)
- Power Station Switchroom Upgrade Project
- EV Study Stage 2.0
- Pumped Hydro Feasibility Study
- RE Policy DP03 Issue 4.0



ZERO DIESEL OPERATION

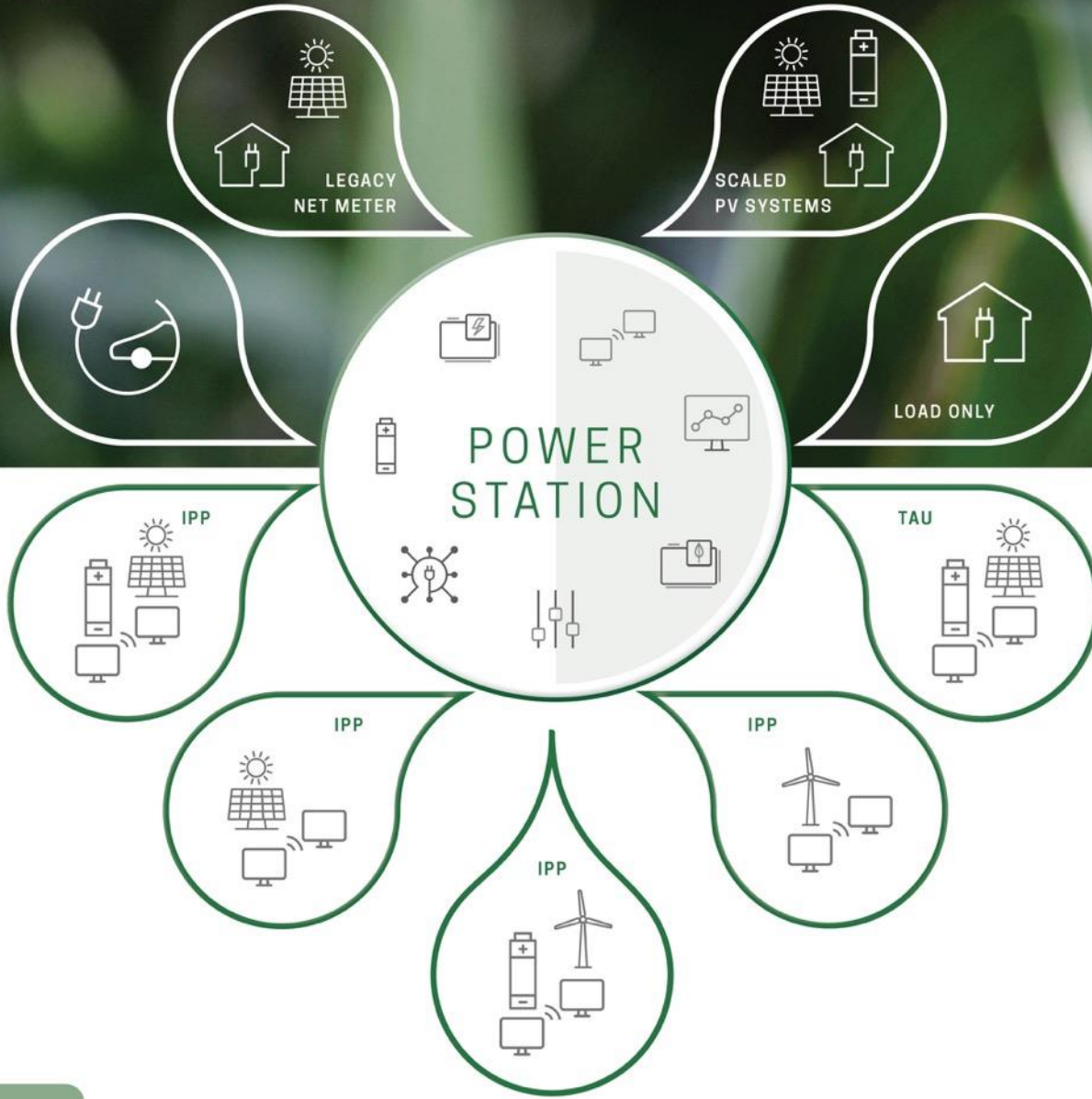
- Enablers Project
- EV Study Stage 3.0/Project
- Switchgear Automation Project



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CONSUMER

NETWORK DELIVERY



FUTURE SUPPLY NETWORK

SUPPLIER

NETWORK INPUTS

AND THEN?



A large group of approximately 25 people, including men, women, and children, are posing for a group photo in a lush, green tropical field. They are arranged in several rows, with some standing and others sitting or kneeling on the grass. Many are wearing casual summer clothing like t-shirts and tank tops. In the background, there are dense tropical trees, including palm trees, and rolling hills or mountains under a clear sky. A small wooden structure is visible on the left, and another building is partially visible on the right. The overall atmosphere is bright and sunny.

*“Enabling suppliers and consumers of energy to engage confidently
while embracing the benefits of new technologies
that support a greener way of life for Rarotonga and its residents”*

Investments and Impacts

- Total Cost Estimate for Renewable Program, \$88.2M
 - TAU \$34.9M (\$11.8M balance from Grant Funding)
 - Private, \$53.3M
- Change from high variable to high fixed costs
- Tariff Review
 - Drivers
 - Offgrid Competition
 - Providing a tariff level and structure reflective of the RE pathway
 - Ensure cost reflective tariffs while providing for TAU's financial requirements
 - Provide assurances to customers of the medium term tariff trajectory and manage expectations
 - Outcomes will look towards ensuring the investments taken are shared by all and minimise stranded assets



How our customer wants to engage with energy:

▼ Smart Meters for Information Management	★	52.55%
▼ Premium RE Charges		51.43%
▼ Smart Meter for Control of Equipment		48.89%
▼ Electrical appliances		48.89%
▼ Time of Use Pricing	★	48.57%
▼ Simple Customer Energy Audits	★	46.97%
▼ Rent to own Electrical Equipment		46.02%
▼ Comprehensive Energy Audits	★	43.31%
▼ Flat Monthly Bill Bundles		29.30%
▼ Pre-paid Metering	★	28.82%
▼ EV Charging Stations	★	23.09%
▼ None of the Above		5.41%
Total Respondents: 628		



New Product Opportunities we are Investigating

- Smart metering and energy management platforms
- Prepaid metering
- Time of use products
 - EV charging
 - Air condition loads
 - Pool pump loads



Kia Manuia