Tokelau Case Study

Part 1 of a series on Energy Resilience in Pacific Island Countries and Territories

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Context
Solar Project

The world’s first truly renewable energy nation

‘It was a landmark project, which paves the way for a lot of other projects of this scale across the South Pacific.’

• 3 minigrids each around 300kW solar with between 1.1 and 1.6 MWh of battery storage
• Funded by MFAT, Govt of Tokelau
• Prior to TREP the atolls relied on diesel gensets.
• Subsequent addition of 30kW of PV on each island (2016) and the current Renewable Energy Expansion Project (TREP) - a further 210kW of PV and almost 2MWh of battery capacity.
Resilience challenges

• Remoteness
  • ‘Everything is two weeks away’, including maintenance and spare parts
  • Reliance on external technical expertise - ‘maintenance on failure’

• Load growth
  • The TREP introduced 24-hour electricity for communities, increasing reliability and demand
  • Despite an additional 30kW of PV installed on each island in 2016, there has been a reduction in renewable energy contribution

• Tokelau’s dependency on imported fuel presents huge financial and logistical challenges
  • ‘Diesel is an expensive and logistically demanding source of fuel’
  • One ship per month delivers diesel to each of the atolls. Sometimes the communities do not get diesel and must go without for long periods of time.
Resilience challenges

• Asset management
  • Harsh environment requires high quality products
  • Constraints of small nation budgets result in maintenance on failure

• Donor dependence
  • Donor dependence puts planning decisions and implementation timeframes outside of Tokelau control
    As the TREP was an ambitious project in such a remote location, the New Zealand Government was hesitant to provide funding, delaying the implementation several years
  • GoT has limited capacity e.g. for planning and tariff design
    Tariffs set too low to invest for load growth, but diesel is still required at times

• And now COVID
  • Tokelau Renewable Energy Expansion Project (TREEP) was set to be installed in 2020, but has been halted by COVID-19
  • COVID-19 has also hindered and system repairs
Planning for resilience

• Equipment quality
  • MFAT’s Renewable Energy Mini-grid **Common Design Principles**

• Capacity development
  • Training for utility staff during and after installation, manual operation of generators

• Building reliability and redundancy
  • in distribution network, in TREEP battery capacity

• Tokelau Climate Resilience and Ready Office (TCR2O)
  • Integration of climate change and disaster risk into government and villages’ development planning and decision making

• Fiscal discipline required