



Tonga Policy Framework Overview and Status

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August 5, 2024

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Background

- Tonga Energy Efficiency Master Plan, 2020
- Tonga Energy Road Map 2021-2035
- Regional Electric Mobility Policy for Pacific Island Countries and Territories
- Tonga Land Transportation Stakeholder Workshop, June 2023
- Access to 200 researchers at NREL's Center for Integrated Mobility Sciences



Tonga Land Transportation Stakeholder Workshop
Source: Prateek Joshi

Policy Framework to Improve Mobility Efficiency and Electrify Transportation in Tonga



- Includes both policies and projects
- Mode diversification and electrification improves overall system energy efficiency
- Improved system efficiency reduces costs and emissions
- Mode diversification reduces vehicle kilometers travelled and therefore traffic congestion
- EVs allow greater mode diversification
- Policy framework at www.nrel.gov/docs/fy24osti/87827.pdf

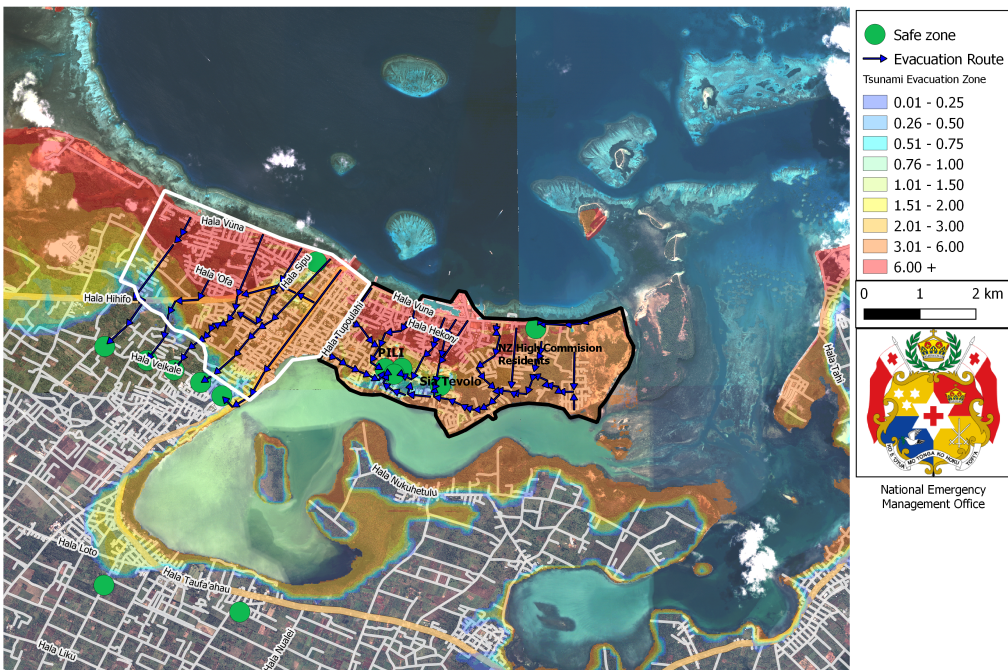
Synergies between mode diversification and electrification



- Electric drivetrains are more versatile than combustion
 - Scooters to buses
- Electrification can extend the range and reduce the time of bicycle trips
- EVs help solve the 1st-last mile conundrum
 - EV rickshaws
 - Electric bicycles parked at bus station
 - Carry electric scooters on bus

Policy Framework Improves Resilience to Cyclones and Tsunamis

TSUNAMI EVACUATION MAP - Nuku'alofa



- Mode diversification reduces congestion during evacuation
 - Carpooling
 - Buses
 - Bikes
- EVs can improve resilience
 - Reduce demand for gasoline
 - Some are sealed and waterproof
 - EVs promote mode diversification

Parking strategy can help steer transportation market

- Paid parking can be a substantial revenue stream
 - Replaces the implicit subsidy of free parking
- Paid parking helps those that value it most
 - Short errands and deliveries
 - People with walking difficulty (handicapped, children, those with heavy loads)
 - Carpoolers
- Smart parking kiosks can incentivize certain behaviors
 - EVs
 - Parking in off-hours
 - Smaller vehicles (motorcycles)
 - Carpooling
- Parking policy can be popular if tied to a project benefitting the local population
 - Bicycle and pedestrian infrastructure
 - Park and ride
 - On-demand shuttle



Smart solar parking kiosk on a beach

Source: FlowBird

Thank You

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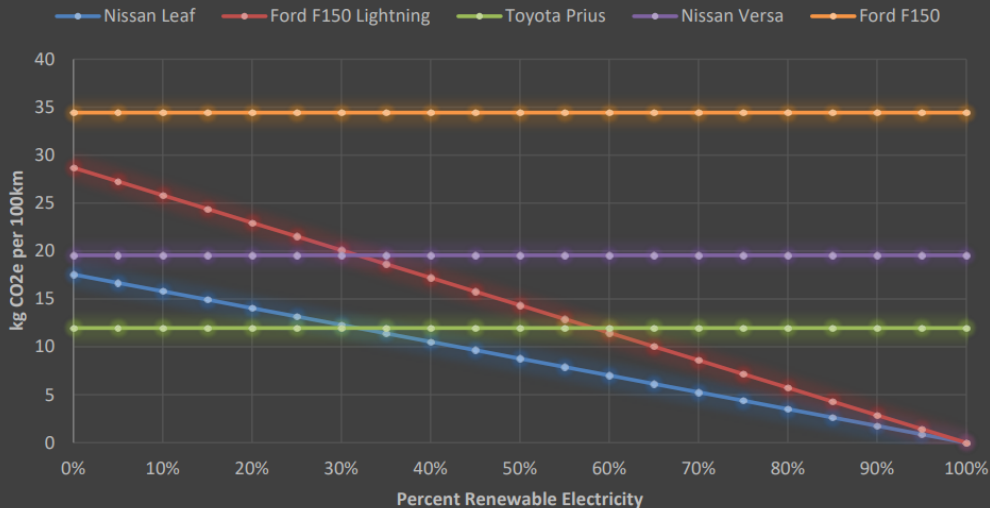
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EVs are a GHG Benefit Even Before Renewables

GHG Benefits of EVs in Tonga



GHG benefits of EVs in Tonga at various levels of renewable generation.

Source: NREL's EV Emissions on Islands Model.

- EVs are ~4.4X more efficient than combustion engines
- EV versions of specific vehicles are always lower-emission
- Don't overlook the benefits of downsizing or HEVs