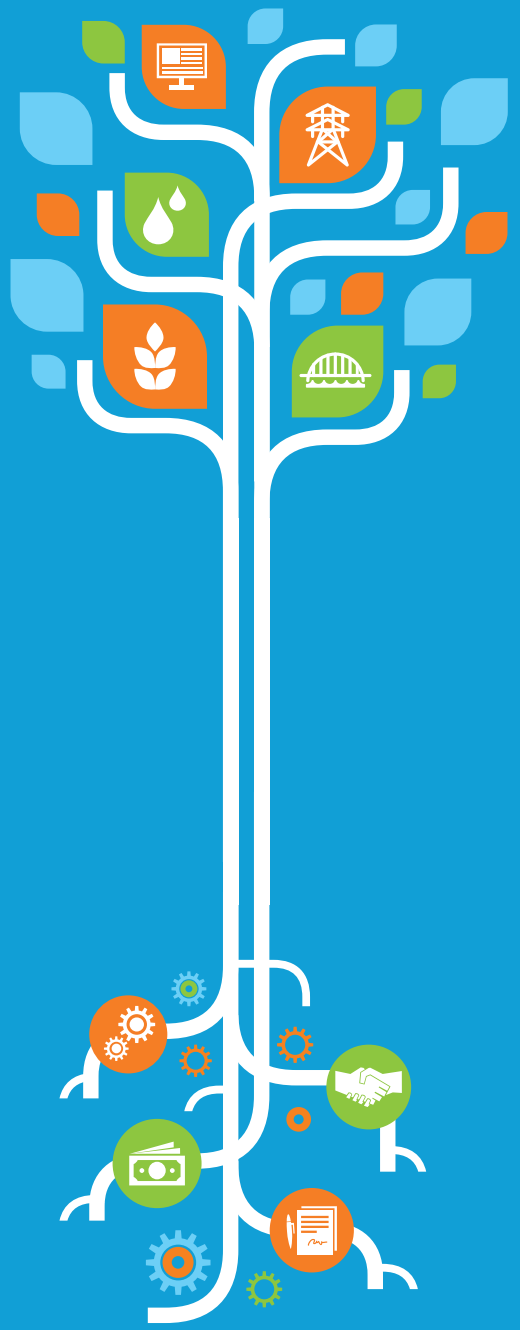


ADB

Approach on e-mobility in maritime sector

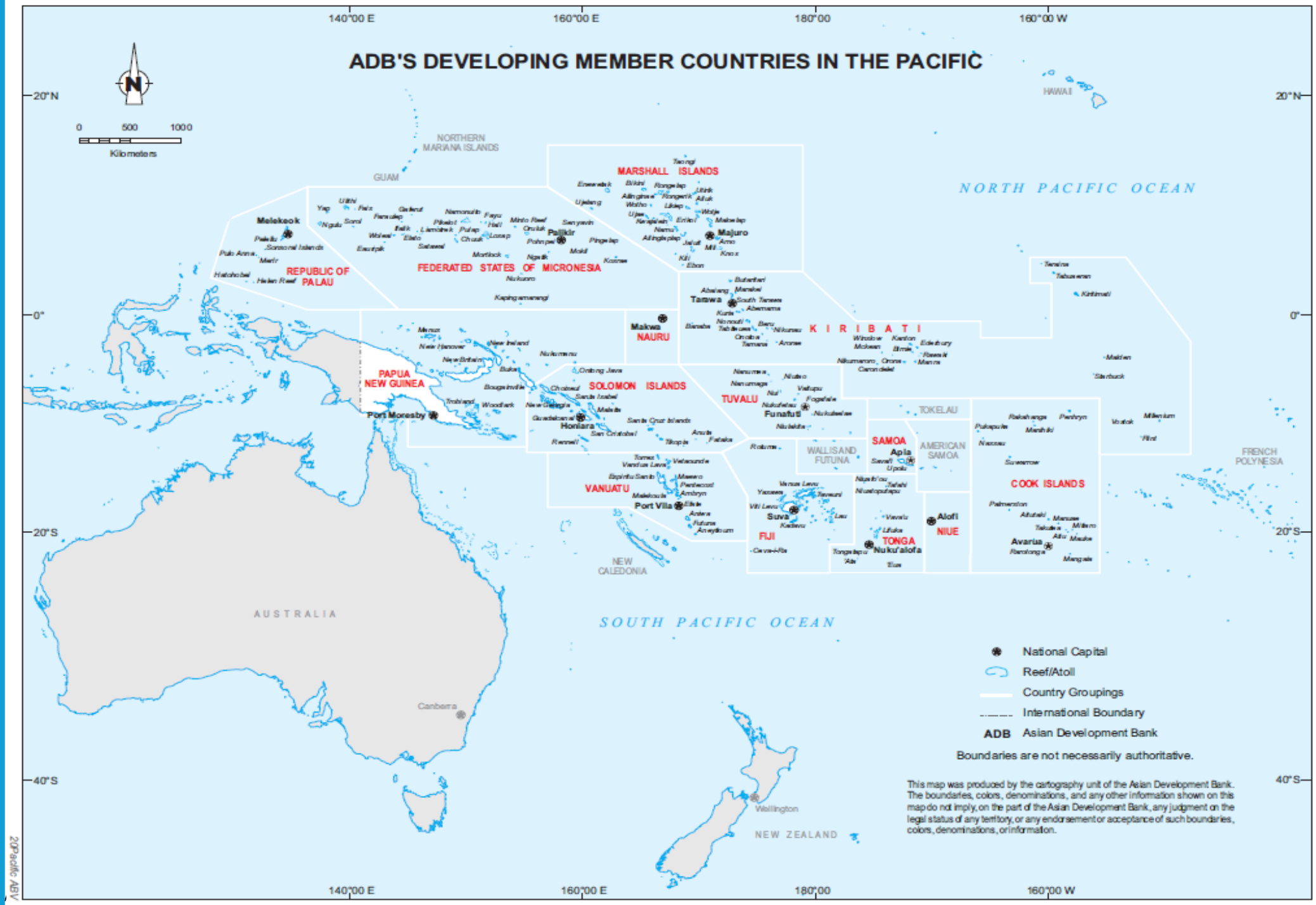
02 September 2022

Presented by
Hussain Haider, Principal Transport Specialist, Pacific Department
Len George, Principal Energy Specialist, Pacific Department

BUSINESS OPPORTUNITIES

ADB

BUSINESS OPPORTUNITIES



BUSINESS OPPORTUNITIES

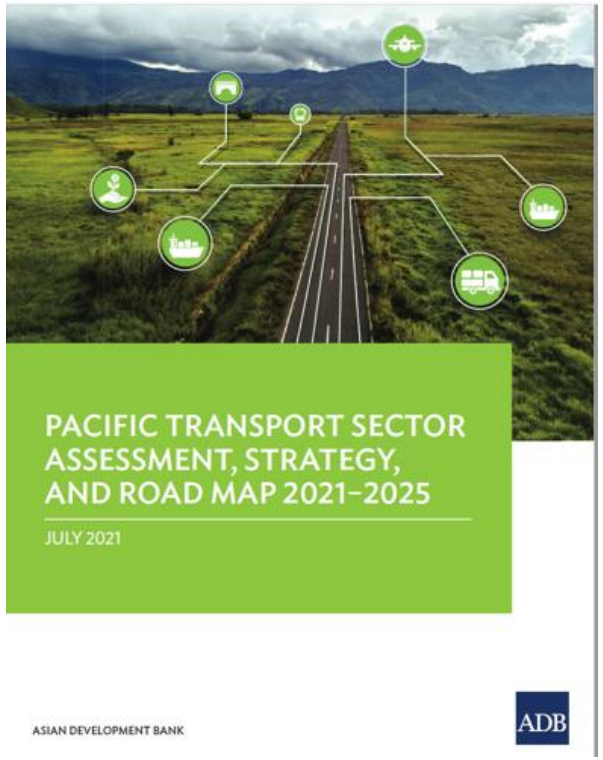


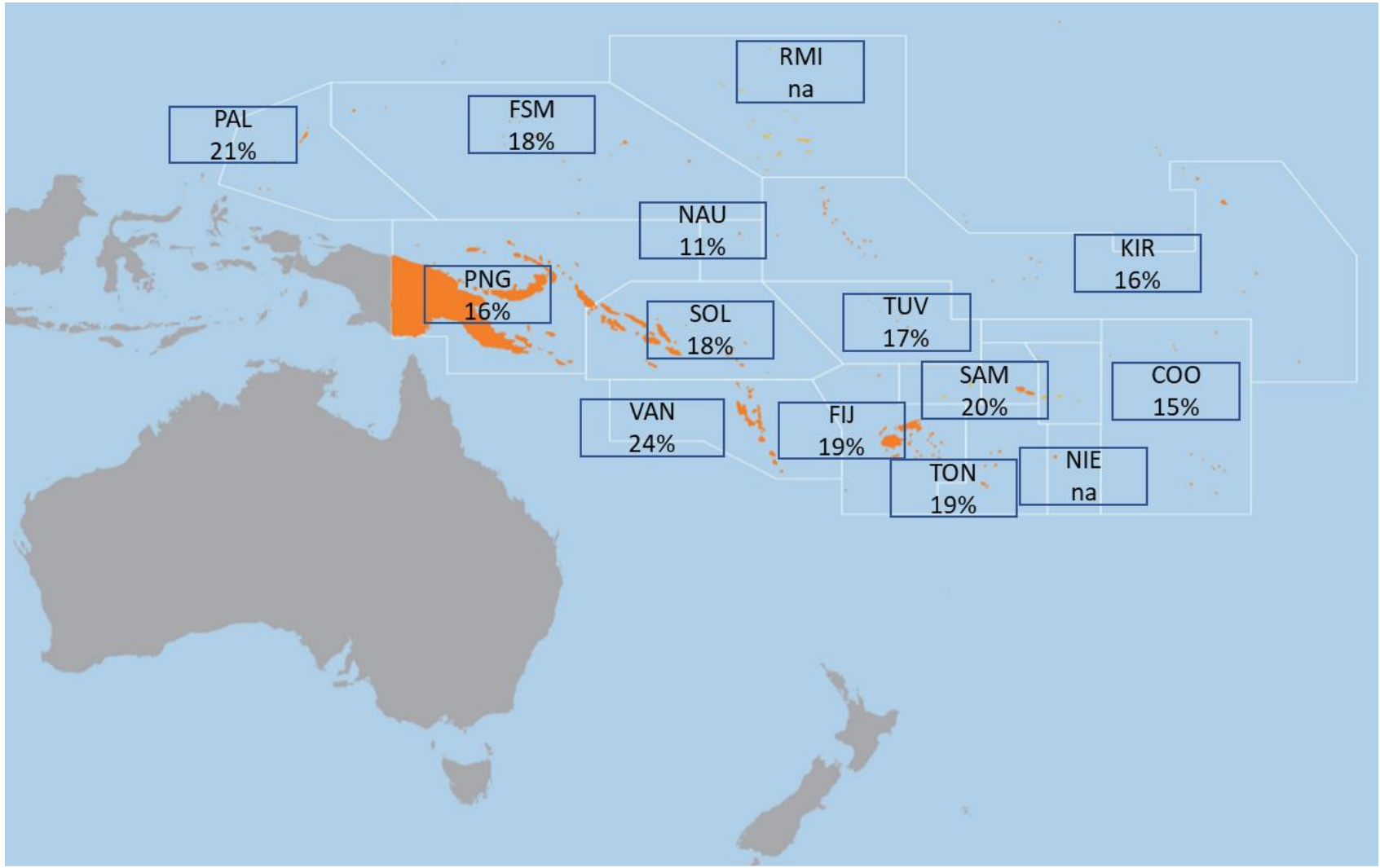
Figure: Strategic Linkages

ADB = Asian Development Bank, COO = Cook Islands, DMC = developing member country, FIJ = Fiji, FSM = Federated States of Micronesia, KIR = Kiribati, NAU = Nauru, NIU = Niue, PAL = Palau, PARD = ADB Pacific Department, PATC = Transport and Communications Division (Pacific Department), PNG = Papua New Guinea, RMI = Republic of the Marshall Islands, SAM = Samoa, SOL = Solomon Islands, TON = Tonga, TUV = Tuvalu, VAN = Vanuatu

[a] ADB. 2018. Strategy 2030: *Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. Manila.

Source: ADB.

Fossil fuel Imports for Pacific DMCs



Share of fuel imports to overall imports (2019). Primarily for transportation and electricity
Annual fuel imports ~2 billion USD in 2022

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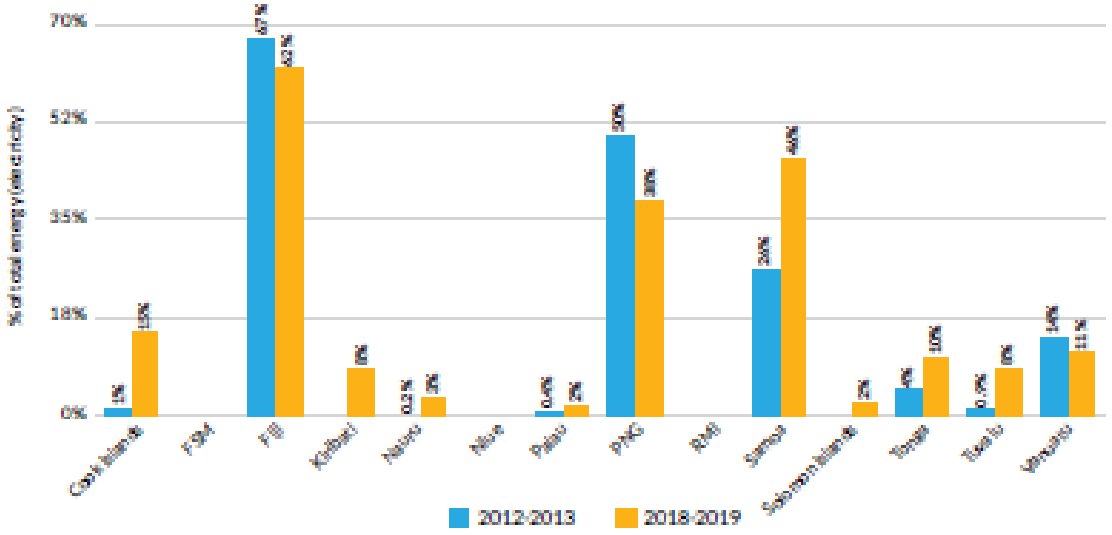
Ambitious Pacific decarbonization targets

"45% renewable energy by 2025"

"32% reductions in emissions by 2025 compared to 2010 baseline"

"Replace more than one-third of fossil fuels for electricity and transport by 2030"



Renewable energy share as a proportion of electricity generated

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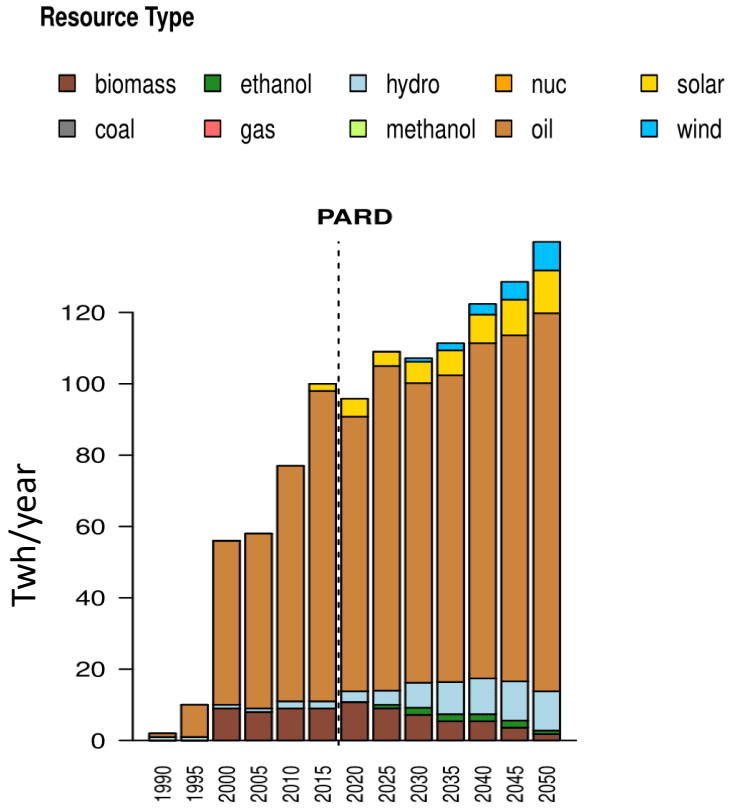
Key Challenges to Transition

- Planning
  - Limited inter-sector assessments
  - Evolving technology solutions
  - Long term lock-in decisions
- Design and Implementation
  - Intermittent energy – Challenges that larger countries don't face
  - Resiliency of electricity grids
  - Engineering and maintenance capacity
  - Transaction costs, limited shelf of projects, risk perception



Primary Energy Supply Trajectory
Pacific Region – Baseline

TA – 9690 – Interim Report modeling output

BUSINESS OPPORTUNITIES

Future Direction: Regional Technical Assistance work and Piloting

1) Confirm relevance for transport electrification and the need for a regional approach for planning, policies, pilots, scale up.

2) Assessment of specific niches / early wins for transport electrification
   - Relatively mature technology solutions
   - Alternate fuel viability
   - Supply chains for the Pacific – Local versus regional
   - Role of the public and private sector
   - Regional shipping studies and guidelines – SDCC

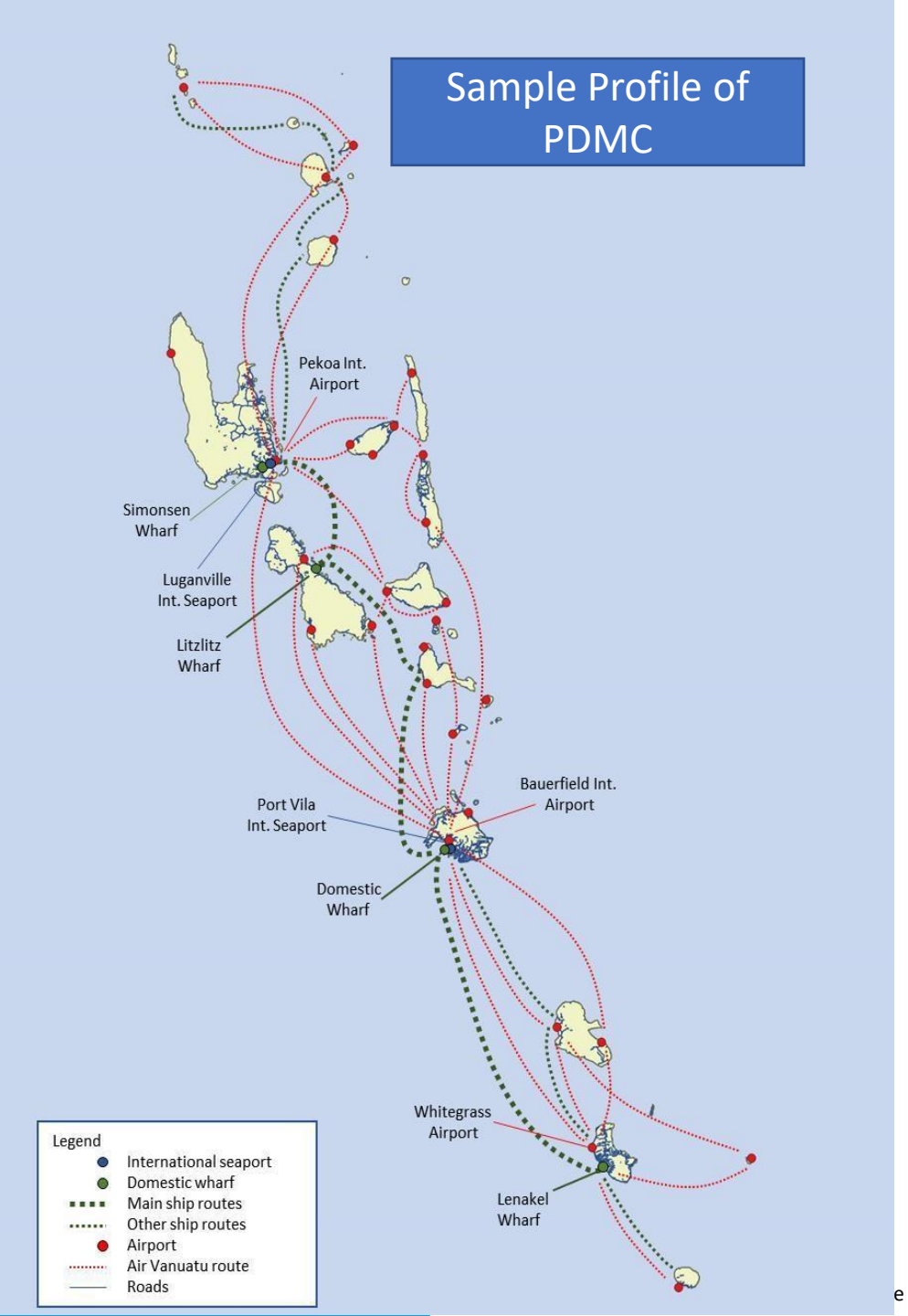
3) Energy Transition for the Pacific - Working with fuel, energy and transport utilities on addressing resistance to transition

4) Linking to studies and pilots for E-Mobility
   1) Green Boats
   2) Country assessments

BUSINESS OPPORTUNITIES

Green Boats Concept

BUSINESS OPPORTUNITIES



Rationale – PDMCs

Low level of urbanization and the large number of small villages remote inhabited islands

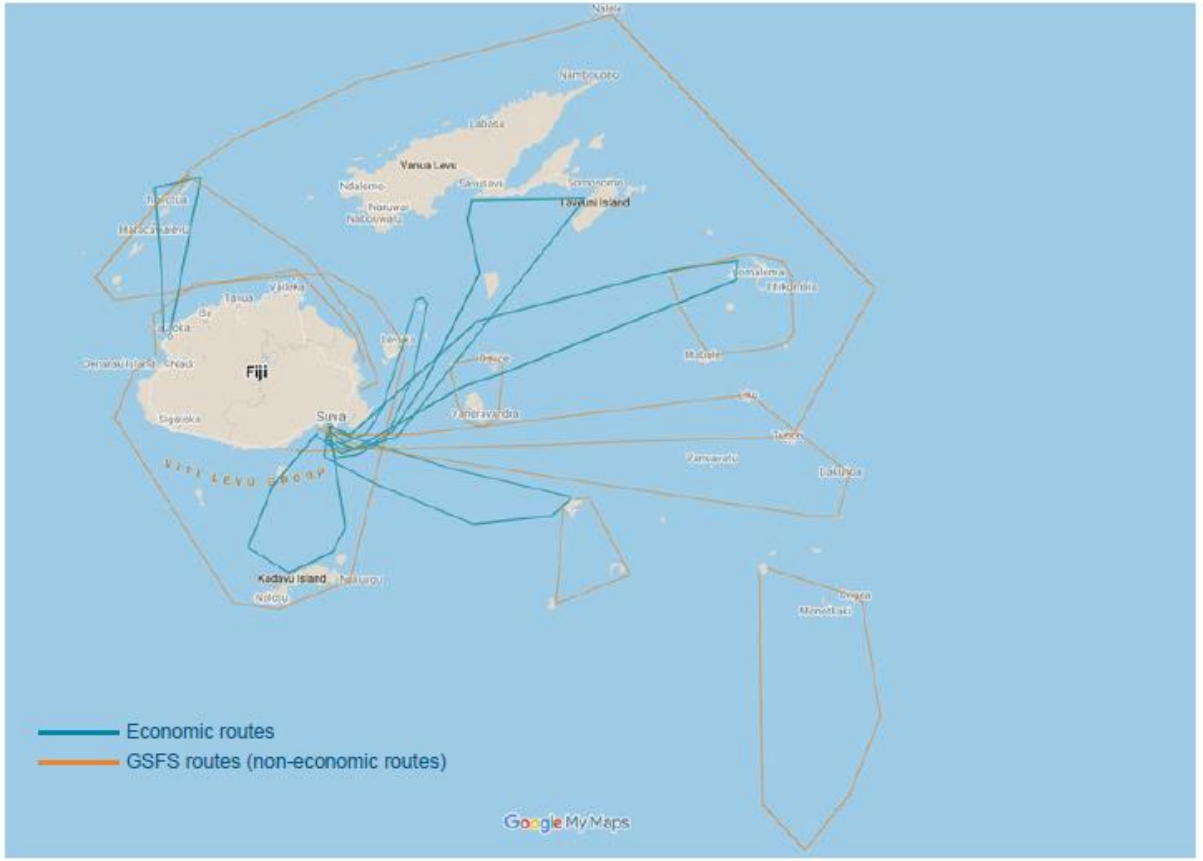
Maritime connectivity is critical to economy, which heavily depends upon imports of basic commodities and agricultural exports.

Due to inefficiencies in the country's logistics system the transportation costs of goods are relatively high

Marine connectivity is main means of transportation for domestic connectivity

Environment friendly

Fiji - Shipping Assessments



Review upstream technology options for decarbonization

Fleet assessments and potential niches for early decarbonization

Multi-criteria analysis and roadmaps including identification of potential economic benefits

Relevant business models

BUSINESS OPPORTUNITIES

Early wins –Concept& Consideration

Technology:

- Replace diesel and gasoline operated boats with batteries
- Batteries charging through land based solar or small hydro sources

Distance:

- Targeting short point to point distances
- Significant and predictable volume of traffic

Target Market: Domestic traveler and cargo/local produce

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Potential Models

Public sector aggregator role

- Bundled procurement
- Standardized operations (Service Level Agreements etc)

Private sector for specific routes

- Viability Gap Model
- Fiscal incentives

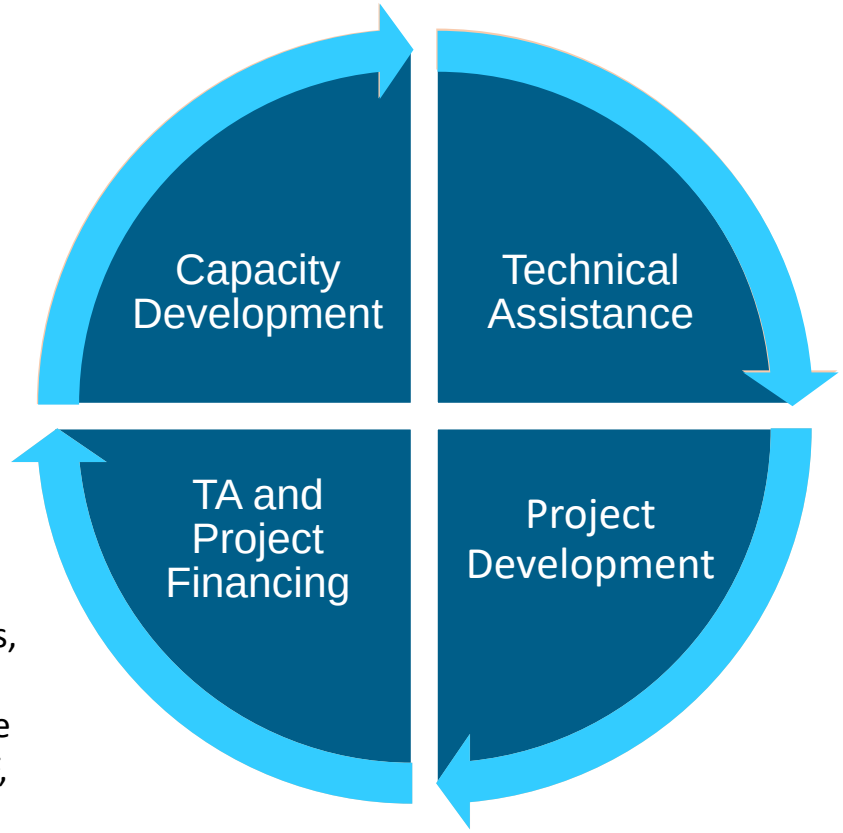
Financial Intermediary

- Local financial intermediary with smaller groups

BUSINESS OPPORTUNITIES

ADB's broader activities on promoting E-Mobility

- Training opportunities
- Regional workshops
- ADB Transport Forums



- ADB loan: Sovereign, Non-Sovereign
- Co-financing with other MDBs, GCF, bilateral support etc.
- Grants for technical assistance e.g. GEF, UCCRTF, EAKPF, HLTF, CCG etc.

(Sample studies)

- Initial assessment of EV opportunities across transport modes.
- Initial assessment on environmental, economic, financial and institutional impacts, business models
- INO: Charging infrastructure for 2 and 4 wheelers; E-Bus deployment in Jakarta.
- PRC: Study on Development of Green Ports and Shipping
- Development of net-zero carbon roadmap
- Development of green hydrogen opportunities in E-Mobility
- Developing Private Sector Sustainable Transportation Opportunities in Southeast Asia

(Sample projects)

- PRC: Shandong Trolleybus Demonstration Project
- PRC: Policy-Based Lending and Facility for Air Quality Management for Beijing-Tianjin-Hebei Province
- PHI: Davao Public Transport Improvement Project, Philippines
- PAK: Peshawar Sustainable Bus Rapid Transit Corridor Project
- KYG: Urban Transport Electrification Project
- IND: Nashik Metro Neo Project
- PAL: Disaster Resilient Clean Energy Financing project in Palau
- PAL: Pilot V2G EV deployment
- THA: E Smart Bangkok Mass Rapid Transit Electric Ferries Project

Factors to consider

Environmental Factor
- Grid Factor
- Existing Fuel Use
- Emission Regulation
- GHG Targets
- Pollution Management Regulation

Policy Factor: National and Local
- National EV Policy Direction
  - NDC, Industry Policy, Energy Security, Balance of Payment
- Local EV Policy Direction
  - Local Transport Plan/Policy

Economic Factor:
Comparative CPEX/OPEX
- Fuel Price (Fuel Subsidy)
- Electricity Price (Demand/Power)
- Incentives, e.g. Import/VAT/Vehicle Excise Tax

Financing
- Loan: MDB, Bi-lateral, International Inst.
- Government Budget
- New Mobility Service (e.g. car sharing)
- New Business Models

Other material considerations
- Consider how proposed EV fits into overall sustainable transport systems, climate mitigation, adaptation and resilience pathways to deliver sustainable long-term decarbonization pathways.
- Production of new electric vehicles (EVs), supply of batteries and charging infrastructure; vehicle manufacturing facilities, material extraction (e.g. mining)
- Additional electricity generation, distribution infrastructure and greener grids are required.
- Key infrastructure still required (i.e. roads designed with charging infra provisions, parking facilities with charging infrastructure).
- Transport & Energy nexus solution, taking into consideration environment and climate aspects.

BUSINESS OPPORTUNITIES

THANK YOU!

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