ARUP

Beyond the roadmap

Approaching environmental sustainability challenges in pacific island ports

Edward Rowe, Emily Gentilini, Ross Newcombe

6 September 2022

1

ARUP

Green ports project overview

Aim: to stocktake, benchmark, assess and develop a practical sustainability roadmap to optimise sustainability performance and preparedness of PIC Ports.

Drivers: need to mitigate climate change, address biodiversity loss, manage pollutants, leverage 'green growth' opportunities and build resilience to climate and supply chain shocks and stresses.

2

ARUP

Pacific island countries and their ports

Why is environmental sustainability important?

Some of the most *'at risk'* and *'least resilient'* communities globally.

Remoteness and *scale* means ports are critical to resilience and development.

Tiny carbon footprint. *Why invest* in sustainability?

1. *Lead by example:* PICs are demanding global action on decarbonisation and climate change.
2. *Vulnerabilities* to operations, infrastructure and supply chains will be introduced with inaction in environmental sustainability.

3

ARUP

Environmental sustainability framework

What did we do? SuPorts for PICs tool

- Greenhouse gas emissions
- Energy use and efficiency
- Climate change risk and adaptation
- Air pollutants
- Noise pollution
- Light pollution
- Liquid waste
- Solid waste
- Biodiversity
- Biosecurity

A tool to score ports based on assessment.

Updated from an existing tool for context and to reflect latest guidance and resources (e.g. UN SDGs, WPSP).

Aimed to minimise additional admin / documentation.

Energy Use and Efficiency	
	Define and improve energy efficiency and conservation measures.
Measurement	
Value	
3	The Port Entity produces its own energy using renewable sources i.e. wind, solar etc.
2	The Port Entity has set targets to improve energy use and efficiency and has implemented conservation measures.
1	The Port Entity quantitatively measures and monitors its energy use.
0	The Port Entity has identified its energy intensive activities.
Questions	
2-D1	What is the percentage of electricity produced from renewables in the country?
2-S1	What activities at the port consumes the highest volume of diesel fuel per annum?
2-S2	Does the port use grid electricity?
2-S3	What type of equipment uses fuel at the port?
2-S4	Are there any permanent diesel generators installed in the port zone for the purpose of generating electricity?
2-S5	What type of fuel(s) is(are) used at the port?
2-S6	What are the ship to shore handling methods? i.e. shipside cranes, shore side mobile harbour cranes, etc.
Suggested evidence	
Fuel logs or purchase orders. Diesel generator engine hours per month. Types of lighting – list/photographs. Electrical metering – types and data. Identification of energy saving initiatives in an operational plan/ manual/ strategy or similar.	
Notes	
This indicator acknowledges that some Port Entities may not be monitoring data but are investing in renewable energy. If this is the case the Port Entity will be awarded 2 points **Energy efficiency** the practice of reducing the amount of energy required to provide the equivalent product or service **Energy production** the generation of energy required to operate the port	

4

ARUP

Environmental sustainability assessment

Informing the assessment – data, data, data

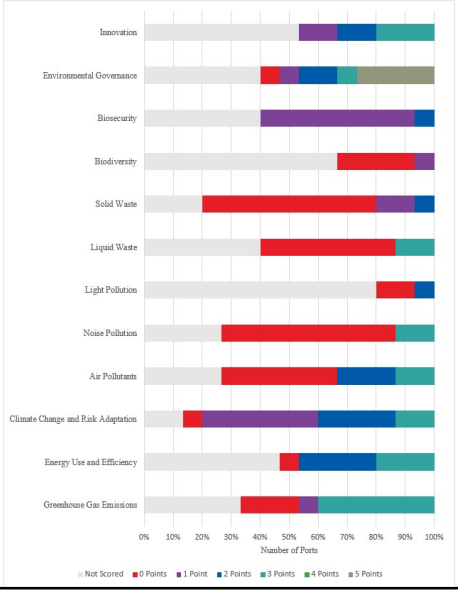
Pilot desktop assessment of three ports informed priority of data collection (essential, informative, nice to have).

Identified how data would be sourced.

Data collation included:

- Desktop review.
- Survey form / interview with port authority.
- Site visit.

All captured in the SuPorts for PICs tool and linked to each indicator / measurement value.



5

ARUP

Benchmarking with global peer ports and international best practice

To inform the roadmap actions to improve environmental sustainability the following were assessed against each indicator:

'best in class' practices (peer ports)

'global best practice' (leading global ports)

'future best practice' (foresight)

Peer ports were selected with consideration of their geography, size and access to funding.

Case study / example peer ports were selected to demonstrate best practices.

Global best practice was established through desktop assessment of four ports (Los Angeles, Rotterdam, Botany and Auckland). This determined a register of key sustainable practices and lessons for PICs.

4.3.2 Energy use and efficiency

Table 5: Energy use and efficiency performance for peer ports

Port of Los Cristianos	Port of Papeete	Port Autonome de la Guadeloupe
3	3	3
The port has an electric mobility plan in place, as noted above, and has implemented additional initiatives such as intelligent public lighting. The port is looking to implement 100% renewable energy supply.	The port has five solar power plants generating 227 kW and aims to produce 100% of the port's energy needs renewably. Extent of monitoring and evaluation activities is unclear.	On-site provision of renewable electricity is a current initiative. The port is targeting building/rooftop solar PV. Extent of monitoring and evaluation activities is unclear.

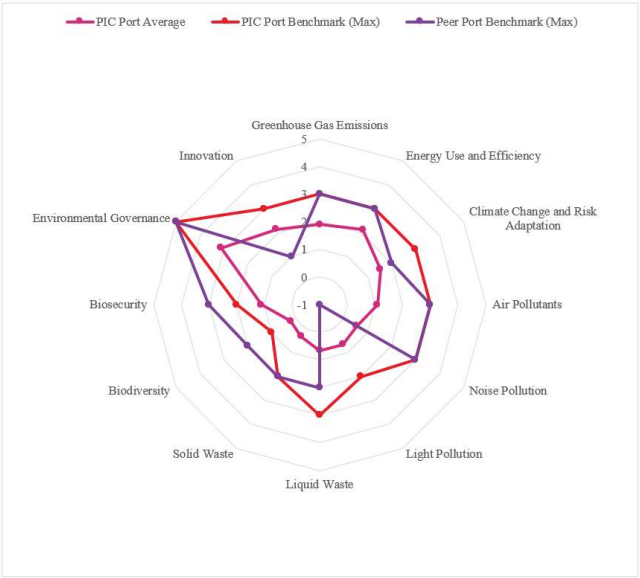
6

ARUP

Benchmarking with global peer ports

Best performing PIC ports were generally assessed at a similar level to global peer ports.

The PIC Port average scores demonstrate that there is significant improvement regionally to align environmental sustainability performance with best practices in global peer ports.



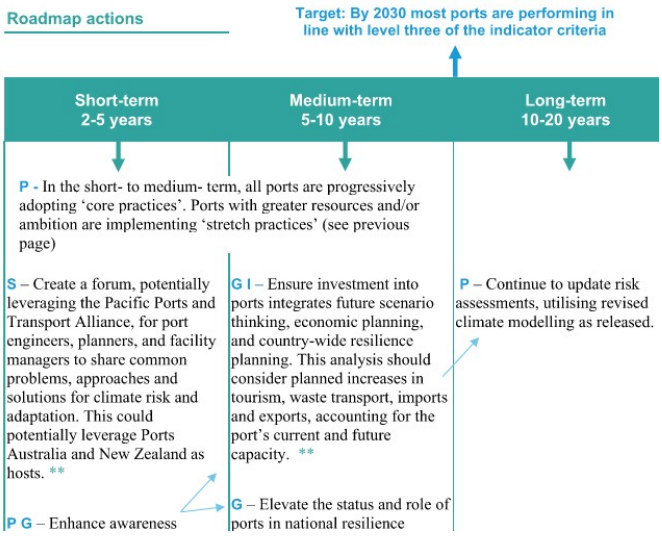
ARUP

Roadmap

Outputs

For each indicator:

- Summary of assessment.
- Key findings.
- Case study examples of best practice.
- Recommended practices – core practices and stretch practices.
- Roadmap actions across short-, medium- and long- term.
- Level of difficulty/complexity.
- Action owners identified (individual port, sector collaboration, investors/ donors, government, private sector.



ARUP

Priorities for action

Indicators

- Greenhouse gas emissions
- Energy use and efficiency
- Climate change risk and adaptation
- Air pollutants
- Noise pollution
- Light pollution
- Liquid waste
- Solid waste
- Biodiversity
- Biosecurity

Indicators most engaged with by ports. Motivated by **opex reduction**, **benefits of renewables**, experience with **damage recovery** from natural hazards.

Indicators that generally had no baseline monitoring being undertaken. Opportunity to establish future **monitoring and evaluation**.

Waste infrastructure was a priority area for investment, however, was considered **out of influence** for ports and requires wider government action. **Renewable energy** largely also considered out of influence.

9

ARUP

Key challenges

Capacity, resources and equipment, monitoring and evaluation

Limited capacity was identified as a common challenge faced by PIC ports across all of skills, roles and governance. This is linked to the scale of the ports and the PIC economies.

Availability of resources and equipment to undertake assessment, monitoring or act to improve performance.

Supporting legislation and/or the ability to comply with existing legislation.

Data collection and evidence against most indicators is limited. There are limited standardised collection and monitoring systems, limited transparency, and limited awareness.

10

ARUP

Collaborative solutions

Overcoming scale constraints

Partnerships and collaboration were identified as a top priority to overcome scale related constraints.

Establishing shared 'toolboxes' for regional resources such as templates for environmental monitoring and reporting, but also equipment for measurement and data collection.

Central coordination of vehicles, equipment and technology could allow:

- Coordinated planning, shared timelines, collective buying power.
- Centralised procurement and management of equipment, vehicles, spare parts and vessels for emergencies.
- Standardised training and support for PICs.
- Replicability/ lesson sharing across ports.

11

ARUP

Conclusion and future work

The Roadmap sets out several actions and opportunity areas for PIC ports, governments and other organisations, many of them collaborative.

There is significant work and resources required to execute these actions, however there are also some exemplary practices in the Pacific to learn from and leverage.

Monitoring is a key step in implementing sustainability. There is opportunity to utilise existing information and data being collected to establish baselines and monitoring processes as an initial step.

The SuPorts for PICs tool could be used as a framework for ongoing and detailed assessments of port sustainability.

12


ARUP