

Marshall Islands

Renewable Readiness Assessment

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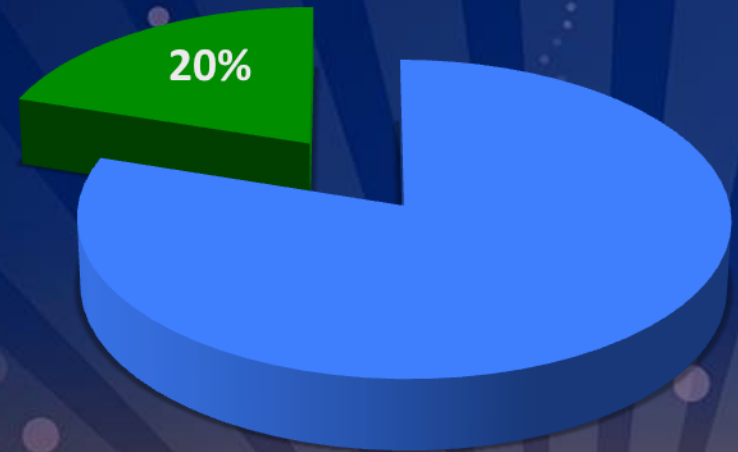
*International Renewable Energy Agency (IRENA)
Regional Consultative Workshop on Renewable Energy Developments in the Pacific
Tabua Room, Hotel Novotel Suva Lami Bay, Suva, Fiji
13th November, 2015*



RE overview of the Marshall Islands

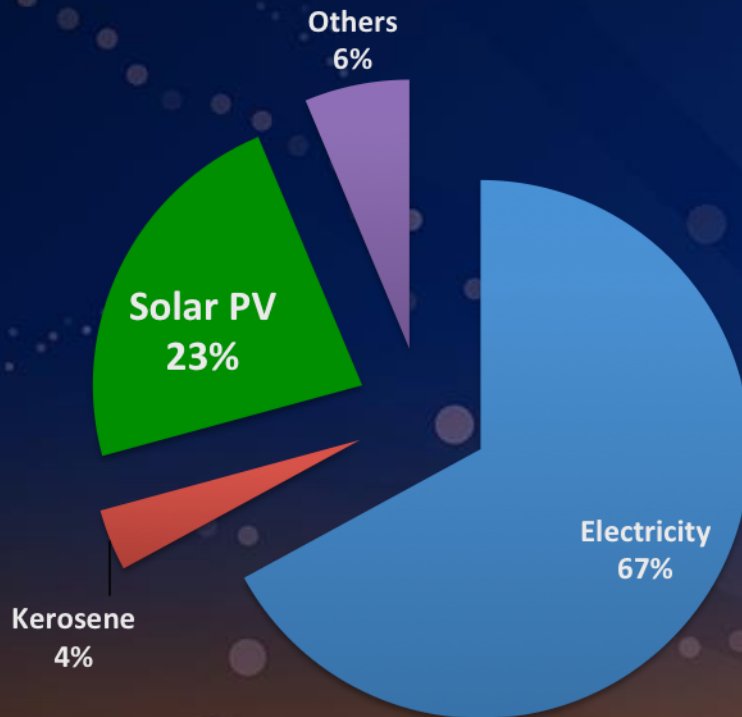
Policy Statement

“...so that local renewable energy will provide 20% of electrical energy generated in the Marshall Islands by the end of 2020.”

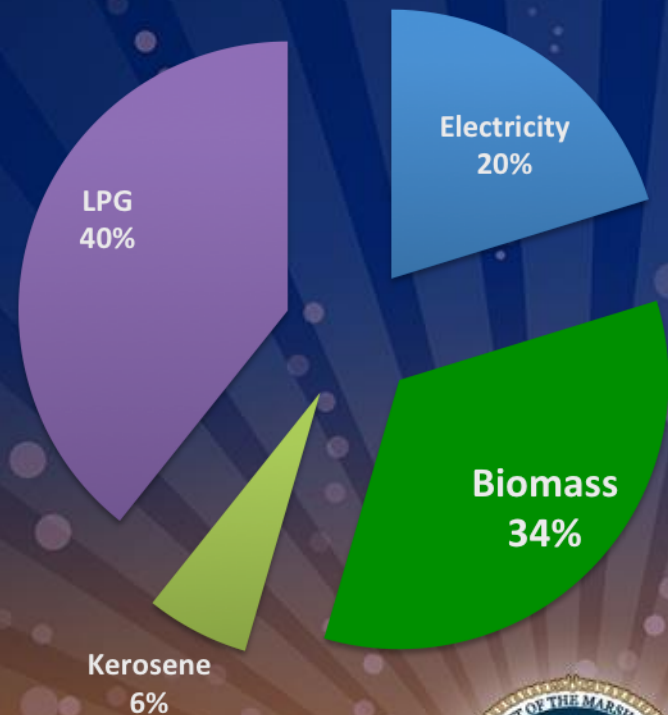


RE overview of the Marshall Islands

Residential lighting



Residential cooking



Source: Marshall Islands Census - 2011



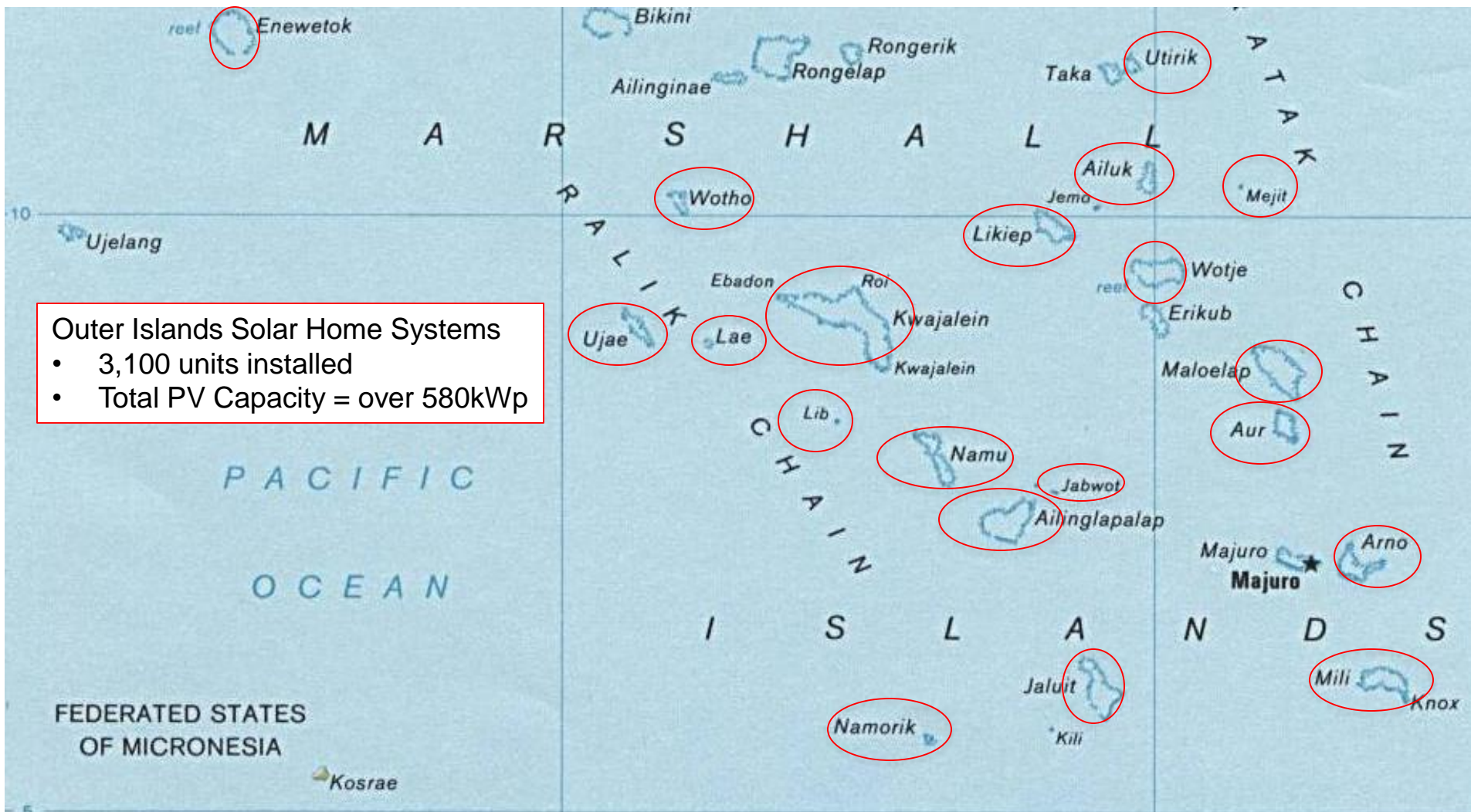
RE overview of the Marshall Islands

Outer Islands Solar Electrification Program

Policy statement

“...ensure that all outer island energy development will be through the use of energy sources where technically practical.”





RE overview of the Marshall Islands

Public Lighting

381 units installed on Majuro & Ebeye

100% off-grid

- PV size – 40Wp to 140WP
- Battery Size: 12V; 40Ah – 100Ah
- 44kWp total PV capacity

LED

- 15W – 30W

100 units to be installed

- PV size – 140Wp
- Battery Size: 12V; 100Ah
- 14kWp total PV capacity



RE overview of the Marshall Islands

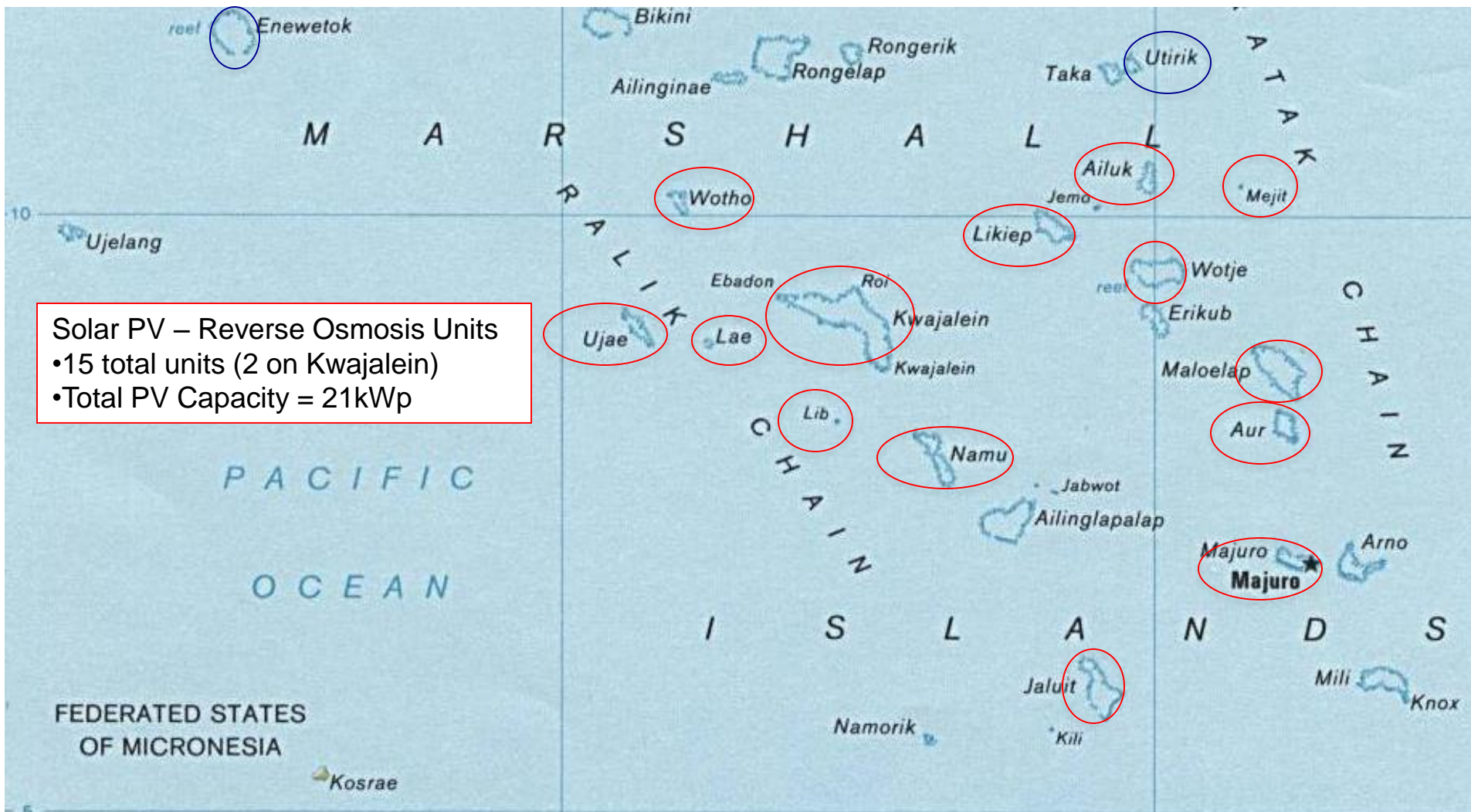
Potable Water Solutions for Outer Islands

Output: 150 – 300 gallons per day

100% off-grid

- 1.4kWp PV output (233Wp x 6 PV modules)
- Deep cycle batteries: 12VDC, 60Ah x 12
- DC – AC Inverter: Rated output 7.5kW
- Manufactured by Toray Industries





RE overview of the Marshall Islands

Outer Islands school PV systems (53kWp total PV)

| Location | Equipment | Installed Capacity |
|--------------------------------|-------------------------|---------------------|
| Toka Elementary School | PV Modules Batteries | 8.84kWp 3,100Ah |
| Ebon Elementary School | PV Modules Batteries | 10.7kWp 1,750Ah |
| Namdrik Elementary School | PV Modules Batteries | 13.26kWp 2,100Ah |
| Mejit Elementary School | PV Modules Batteries | 8.84kWp 3,100Ah |
| Ine, Arno Elementary School | PV Modules Batteries | 6.12kWp 2,100Ah |
| Majkin, Namu Elementary School | PV Modules Batteries | 6.12kWp 2,100Ah |



RE overview of the Marshall Islands

On-grid solar PV (300+kWp installed)

| Location | Capacity |
|-------------------------------------|---------------|
| Majuro Hospital | 209kWp |
| College of the Marshall Islands | 111kWp |
| USP – Majuro Campus | 12.54kWp |
| Majuro Fish Base | 9kWp |
| US Embassy | 7.5kWp |
| <i>Airport (in progress)</i> | 600kWp |



RE overview of the Marshall Islands

Legislation (Import Duties Act)

Section 206A (1)

“No import duty shall be levied on RE equipment (initially, warranted solar hot water heaters, PV panels, array frames, regulators, inverters, complete solar PV kits including batteries, or wind turbine kits)... for the purposes of power generation.”

March 10, 2011

Section 207

“(1) No import duty shall be levied on RE Vehicles.”

“(2) For the purposes of this Section, “RE Vehicle” means electric vehicle, completely or directly powered by RE including hybrid-electrical vehicles.”

March 9, 2015



RRA Consultation Process



Regional Consultative Workshop on Renewable Energy Developments in the Pacific



Accelerating RE (Challenges & Recommendations)

Institutional development & legislation

Challenges

RE development coordination needs to be improved

Recommendations

Legislative Review and institutional improvement

- Review existing acts
- Set-up working committee



Accelerating RE (Challenges & Recommendations)

Grid-connected renewables

Challenges

Energy company stressed with capacity shortage issues

Recommendations

Develop action plan

- **Grid-stability assessment**
- **Standardized technical design, installation & interconnection requirements**
- **Workable finance schemes**
- **Capacity building programs**



Accelerating RE (Challenges & Recommendations)

Off-grid renewables

Challenges

Operation & maintenance always an issue in the outer islands

Executing training program in the outer islands

Recommendations

Apply a customized approach to develop a solution

- Survey of factors causing failures in O&M sustainability
- Rural electrification institutional arrangement
- Training program suited and practical to the local environment



Accelerating RE (Challenges & Recommendations)

Diesel powered mini-grid conversion to solar PV systems

Challenges

High cost of operating diesel generators in the outer islands

Fuel leaks considered a major problem in the outer islands

Recommendations

Review and study conversions of diesel generation in other Pacific islands countries



Accelerating RE (Challenges & Recommendations)

Replacing diesel with coconut oil

Challenges

Concerning local economics of coconut oil

Copra degradation due to uncertain shipping schedule

Recommendations

Develop small-scale on-site coconut oil production capacity



Proposed Project Activities

Activity 1

Large-scale project to support private investment for on-grid solar, with and without energy storage

Activity 2

To provide a sustainable electricity supply to the outer islands' residents

Activity 3

Convert outer islands diesel grids to solar PV electricity generation

Activity 4

Coconut oil production shifted from Majuro to the outer islands, lowering costs and improving oil quality

Activity 5

Review the **Energy Policy** and enabling legislation



***Thank you
Vinaka vakalevu
Kommol tata***

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