Efforts towards Inclusive Transition in South Asia - Maldives case

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Energy Sector Office, Sectors Group, ADB

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## Country Overview

<table>
<thead>
<tr>
<th>1192 Tropical Islands</th>
<th>- 187 Inhabited + 1005 Uninhabited</th>
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<tbody>
<tr>
<td>168 Tourist Resorts</td>
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<tr>
<td>Population of 500,000</td>
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<tr>
<td>Area: 115,300 sq. km (including sea)</td>
<td>EEZ: 859,000 sq. km</td>
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<tr>
<td>Total land area: ~300 sq. km</td>
<td>Less than 1% of the EEZ</td>
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<tr>
<td>80% is less than 1 meter above sea level</td>
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EEZ – Exclusive Economic Zone
Energy Sector Overview

Entirely dependent on imported fuel

804,495 metric tons of fuel imported

Total primary energy consumption: 751 GWh/year
   Male’ region: 440 GWh/year

Oil import - 13.5% of GDP

ENERGY MIX

- Diesel: 81%
- Petrol: 12%
- Aviation: 4%
- LPG: 3%

60% is for Power Generation
Agenda

- ADB interventions (Energy Sector Efforts)
  - POISED Project and its additional financing
  - ASSURE Project (approved in Q3 2023)
- Does it support Energy Transition (ET)?
- Pathways for Just Transition (JT) from ET
- Transforming JT principles into real activities
- Lessons and opportunities

POISED – “Preparing Outer Islands for Sustainable Energy Development“
### Ongoing Project:

**POISED** & **Additional Financing**

**POISED - Investment**

<table>
<thead>
<tr>
<th>Grant Type</th>
<th>USD Amount</th>
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<tbody>
<tr>
<td>ADB Grant</td>
<td>48.5 m</td>
</tr>
<tr>
<td>CTF Grant</td>
<td>12 m</td>
</tr>
<tr>
<td>JFJCM Grant</td>
<td>5 m</td>
</tr>
<tr>
<td>EU Grant</td>
<td>5 m</td>
</tr>
<tr>
<td>EIB Loan</td>
<td>50 m</td>
</tr>
<tr>
<td>Govt Funding</td>
<td>14.5 m</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>135 m</strong></td>
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</table>

**POISED - Outputs**

- Solar PV installed: 28-30 MW
- Energy Storage: 10 MWh
- Diesel Generators: 20 MW
- Grid upgrades, EMS and SCADA

**Scattered over 160 Outer Islands**

**POISED - Outcomes**

- 30% Peak demand by PV
- Diesel savings: 0.1-0.3 Liters/Kwh
- Reduced Co2 emissions
- Tariff Reduction

**Impacts:**

- More Sustainable energy sector based on renewable resources
- All Islands initiate electricity sector decarbonization

**Capacity development**
### ASSURE Project

**$100.5 million**

<table>
<thead>
<tr>
<th>1</th>
<th>Private Sector Investments in Renewable Energy Enhanced</th>
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<tbody>
<tr>
<td></td>
<td>- Up to 50-55% RE (from ~ 10-12%)</td>
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<tr>
<td></td>
<td>- Covering at least 20 islands</td>
</tr>
<tr>
<td></td>
<td>- Including Floating Solar</td>
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<tr>
<td></td>
<td>- Sovereign Investments support BESS + EMS + Grid</td>
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<tr>
<td></td>
<td>- Private sector – Solar Panels in IPP</td>
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<tr>
<th>2</th>
<th>Solar Independent Power Producer projects de-risked</th>
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<tbody>
<tr>
<td></td>
<td>- Liquidity support (ESCROW)</td>
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<tr>
<td></td>
<td>- Performance incentive for bidders</td>
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<tr>
<td></td>
<td>- Attract Private Sector</td>
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<td></td>
<td>- Reduce Government borrowings</td>
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<tr>
<th>3</th>
<th>Renewable Energy Penetration using new Technologies and Net metering Increased</th>
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<tbody>
<tr>
<td></td>
<td>- Exploring wind and ocean energy</td>
</tr>
<tr>
<td></td>
<td>- Model for Rooftop solar deployment (utility driven)</td>
</tr>
<tr>
<td></td>
<td>- Identify and develop pilot for other technologies</td>
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<td></td>
<td>- Potential for scale up in future</td>
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<tr>
<th>4</th>
<th>Capacity building of MOECCT, FENAKA and URA Strengthened</th>
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<tbody>
<tr>
<td></td>
<td>- Necessary technical support for relevant stakeholders</td>
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<td></td>
<td>- Policy and regulatory support for URA, EPA and others</td>
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<tr>
<td></td>
<td>- New areas and cross sectoral areas energy sector has high potential</td>
</tr>
<tr>
<td></td>
<td>- Financial Management support for FENAKA</td>
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<tr>
<th>5</th>
<th>Disaster-resilient, innovative, and gender- and socially inclusive renewable energy-based farming technologies pilot tested and promoted</th>
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<tbody>
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<td>- Support Energy–Water–Food nexus</td>
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<tr>
<td></td>
<td>- Community driven / operated</td>
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<td></td>
<td>- Cross-sectoral approach supporting Agriculture using RE, efficient use of water, adopt new technologies, reduce chemical use.</td>
</tr>
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</table>
Does these ADB Interventions in Maldives support:

Energy Transition ??

Inclusive Transition ??
History of the Power Sector
Transition Towards Renewables
100% Energy Transition

- ADB’s entire energy sector portfolio in the Maldives supports “ENERGY TRANSITION”

- **POISED project**: Fundamental Shift towards sustainable RE system from Fossil fuel (diesel) based.

- **ASSURE project**: Accelerated RE penetration by facilitating private sector and innovative technologies

160 Outer Islands
~55 MW Solar PV, 60 MWh BESS
100% Energy Transition

- **POISED: Introduce Solar PV –Battery-EMS Hybrid systems** (Optimal design)

- **Cross sectoral Interventions (Decarbonization strategy to support other sectors)**
  - Solar PV-based ice making plants (Fisheries)
  - First Solar PV-battery Ferry (Marine Transport)
  - Energy - Water - Food Nexus (Agricultural)

- **Innovative and emerging technologies**
  - Ocean based technologies (wave, ocean current, tidal etc.)
  - Small wind technologies
  - Advanced storage (3C batteries, flow batteries)
Efforts towards **Just Transition**

1) **Public Outreach and Awareness Campaign**
   - Attract strong community support – reduce air & noise pollution, improve quality of life
   - Covering **115 outer islands (~ 12908 participants and more about 50% women)** – Still ongoing!
2) Career Guidance Sessions for Students

- Covering grades 8 to 10 and 12 (including teachers)
- Covering 115 outer islands (~6750 students – 3300 girls and 3400 boys)
3) RE training and Community Empowerment

- Over 50 WDC’s trained on RE and its benefits
- **Home Solar Program and Net metering campaign**
  - (more than 5MW capacity rooftop solar installed by households in outer islands)
Efforts towards **Just Transition**

4) **Energy Efficiency and Employment Opportunities**

- 120 Male and 30 Women employed by Utility
- Inclusive training (2,104 utility officers and community members, 296 female)
- Distributed 3,221,250 LED bulbs
Just Transition Interventions

First Solar Powered Community Ice Plant in Dhiffushi to support Fisheries

- The plant is operated by the island council and Women Development Community
Just Transition Interventions

Solar PV Based Ice making Plant
-Cross sectoral intervention supporting Fisheries

Community Inclusion

- Solar PV system – Owned by Utilities
- Ice Making Machine – Owned by Island Community (WDC)

Benefits for Community

- Residents use Ice to preserve fish – supporting the main economic activity
- Save fuel for Fishermen
- Generate Revenue for Island Council
- Create Ownership among Community
  
  • 365 Tons of Ice
  • ~ 320,000 MVR
Replication of Solar Powered Community Ice Plants to support Fisheries

- 4 Ice-making plants to be installed in 2024 in:
  - N. Landhoo
  - Th. Vilufishi
  - Th. Madifushi
  - Th. Buruni
Just Transition Interventions

Water-Energy-Food Nexus: Solar PV RO Plant

- Limited water resources for irrigation is a concern in Maldives
- First solar powered Reverse Osmosis (RO) water desalination plant for irrigation purposes in Thoddoo, where groundwater is already saline.
- Completely Community Driven Intervention

**RE:**
- Solar Plant
  - PV: 200 kWp
  - BESS: 500 kWh
- RO plant
  - 200 m³/day
- Challenges: Brine disposal

**Support Irrigation**
integrated with modern and efficient systems (sprinklers, drip system, rainwater harvesting)

**For agriculture activities**
(engaging modern methods – shade houses, green houses, pilot hydroponics etc.)
Lessons and Opportunities

- **Energy Transition / Just Transition**
  - Country, State, District or City context
  - Shall not wait for large scale transition (region/country)
  - Identify areas of immediate interventions

- **Transforming conceptual ideas into practical interventions**

- **Replicate Successful interventions**

"Genuine TRANSITION’ – Possible with consistent efforts and practical solutions"
Recognition - GTI AWARD

Winner for the category

RENEWABLE ENERGY

MALDIVES

Republic of Maldives

“Preparing Outer Islands for Sustainable Development (POISED) and its Additional Financing”
Thank you