



YSPSC RE in Yap State : 2021 update summary on the main island & its outer islands

PPA Virtual Conference 26 August 2021

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Background before 2020

- <u>On Yap:</u> High speed diesel CAT generators were commissioned in 2017 :
 2 x 1.6MW + 1 x 0.83MW (ADB & WB funding) to produce in parallel with :
- 200kWp of ground mounted Solar installed by JICA / PEC in 2014
 300kWp of Roof top Solar installed on public buildings through YREDP / ADB in 2016
- 3 x 275kW Wind turbines installed in 2017 with YREDP / ADB
- Hybrid wizard control system installed by Vergnet YREDP / ADB
- New 5MVA transformer and Substation switchgears installed by YSPSC World Bank
- In the O.I. of Yap :
 - EDF9 2009 28kWp + 19kWp Ulithi Asor Fadrai
 - North REP 47.88kWp Mogmog / 62.7kWp Ulithi Falalop / 66.12kWp Fais / 41.04kWp Woleai / 61.56kWp Satawal
 - impacted by Cat 5 Typhoon Maysack in 2015
 - EFII 300kWp of stand-alone PV solar in 14 remote islands in 2014



Actions in 2020 - 2021

Efforts on increasing the RE share:

- 1. Working with ADB, FSM, Entura for determining new RE assets and procurement phase, up to bidding award
- 2. Maintaining, Servicing Wind assets according to Vergnet manufacturer standards. Maintaining, Troubleshooting Solar systems, Electronics
- Preparing the extension of the new substation 13.8kV/4.16kV to accommodate two RE feeders for the new projects
- 4. Consolidating O.I. operations with RE:

Changing Battery banks in Asor / Fadrai after 12 years of operation

Repairing Mogmog, Fais, Satawal assets from typhon damages, reconstruction of solar houses, repairing, replacing PV arrays, redesigning, replacing Electronics



2nd Phase 2022 - 2023

- Installing second 830kW high-speed genset for option to lower baseload genset dispatch during high RE penetration and low loads
 WB funding
- Construction of new solar facilities totalizing 2MWp of installed capacity, mainly ground mounted on a site close to the diesel power plant - ADB
- Construction of a BESS Li-ion system of 800kW / 800kWh capacity next to the existing substation – potentially a similar storage will be built in the North of Yap - ADB
- Upgrading the whole integration & control system optimizing the RE production with the above new assets and the existing wind farm and solar farms
- Rebuilding and upgrading Ulithi Falalop solar system with a capacity of 60kWp next the existing YSPSC complex
- Electrifying the O.I. of Ifalik and Lamotrek with 6 PV solar microgrids to complete the full electrification of the whole state of Yap



Share of Renewable – Progress against policies

2019 20%	2020 19%	Half 2021 18%	2024 37.9%
Wind 1,557,500kWh Solar 678,233kWh Diesel 8,758,773kWh	Wind 1,318,200kWh Solar 676,399kWh Diesel 8,689,599kWh	Wind 614,100kWh Solar 326,327kWh Diesel 4,223,223kWh	RE contribution projected Yap Feasibility Study by ENTURA 9 July 2019



Following slides show the diesel savings corresponding to Wind production along the years And the Solar production



Wind Savings

90,500.00



PEC PRODUCTION FY 2019-2020 (KWH)



Challenges – Maintenance - Renewal Accompanying RE - Building the right assets

- Typhoons on Outer-Islands facilities, especially in the Ulithi atoll
- Failures of Electronics of Solar facilities, especially inverters designed for mainland public markets (not utilities)
- Centralized continuous monitoring at power plant helps triggering troubleshooting quickly to maintain 100% operability
- Complete and sufficient stocks of spare parts, especially for wind turbines hydraulics & control and Solar electronics
- Consolidating conventional assets : substation additional feeders / protections & control with supervision in control room
- Renewing AC/DC auxiliary systems in power plant
- Etc
- Assets increase in number and diversity, maximum standardization and simplicity in overall designs are required where and when possible







Conclusion – Financing Impact on customers

- RE production gives stability to overall utility cost of energy.
- Diesel assets run at lower load, the direct benefice is less risk of failures due to wear and tear.
 Redundancy in the diesel plant is increased. This is extremely important nowadays with the pandemic slowing down any specialized technical missions.
- Tariffs remain unchanged and YSPSC can consolidate fragile operations in the Outer-Islands.
- Future projects in RE with BESS look promising to pursue a stable tariff strategy as YSPSC staff gains experience in maintaining these diverse assets.



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World Bank

• Asian Development Bank

• EU / SPC / USDA / IOM

