

- BELIZE -

ENERGY STORAGE AS AN ENABLER FOR BELIZE ENERGY TRANSITION

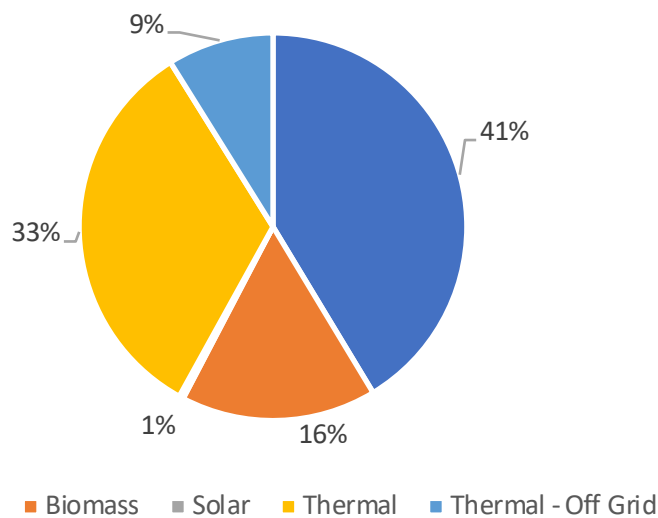
Energy Storage Partnership Stakeholder Forum

Pretoria - November 07, 2023



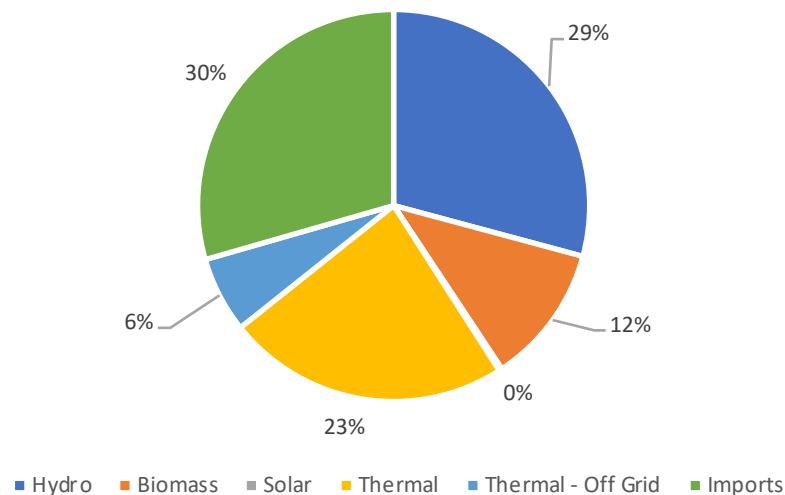
Electricity Sector Overview - *Installed Capacity*

Local Installed Electricity Capacity - 131.8 MW



- Renewables account for 77 MW or 58% of installed capacity.
- Hydro and biomass are both at risk from climate change.
- Hydro is formed of ageing infrastructure and does not provide flexibility to the system

Total Installed Electricity Capacity inc. Mexico - 187.8 MW



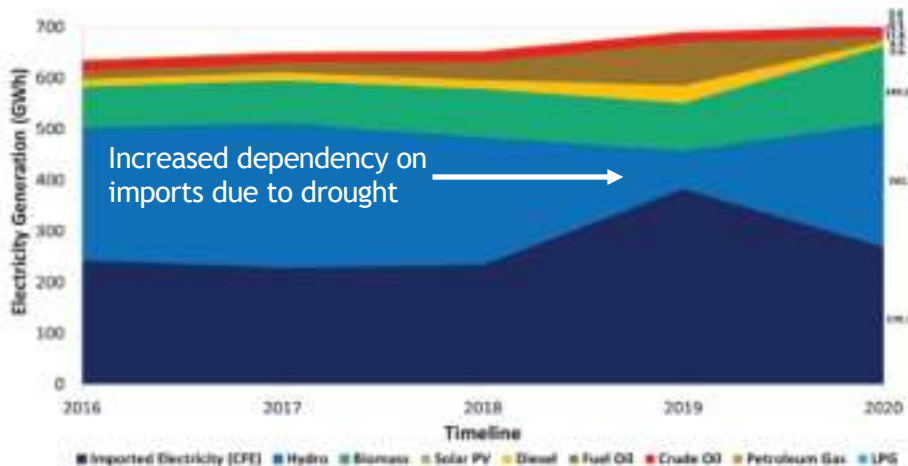
- Significant reliance on imports from Mexico to meet peak demand creates energy dependency
- Imports bought on day-ahead but settled at spot price cause significant price volatility.
- Electricity demand is forecast to grow at 3% per annum. New capacity is needed.

Decarbonization and Resilience of the Belize Energy Sector: a Government Priority

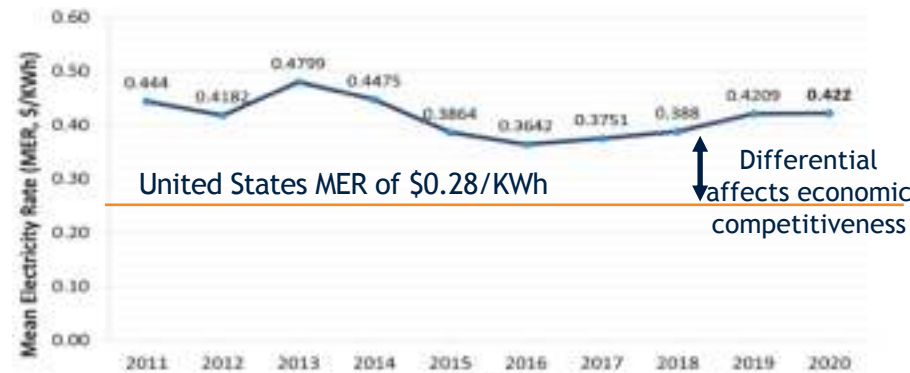
Belize electricity sector is currently dependent on the following sources (and **shocks**):

1. Imports from Mexico (~30-50%), closely correlated with the **price of fossil fuels** and purchased on the 2-day ahead market leading to electricity price volatility.
2. Hydropower (vulnerable to **drought based climate change**)
3. Co-generation of biomass (vulnerable to **hurricane and drought**)

- Electricity Generation in GWh by Source (2016-2020)



- Average cost of electricity in 2020 (BZ\$/kWh).



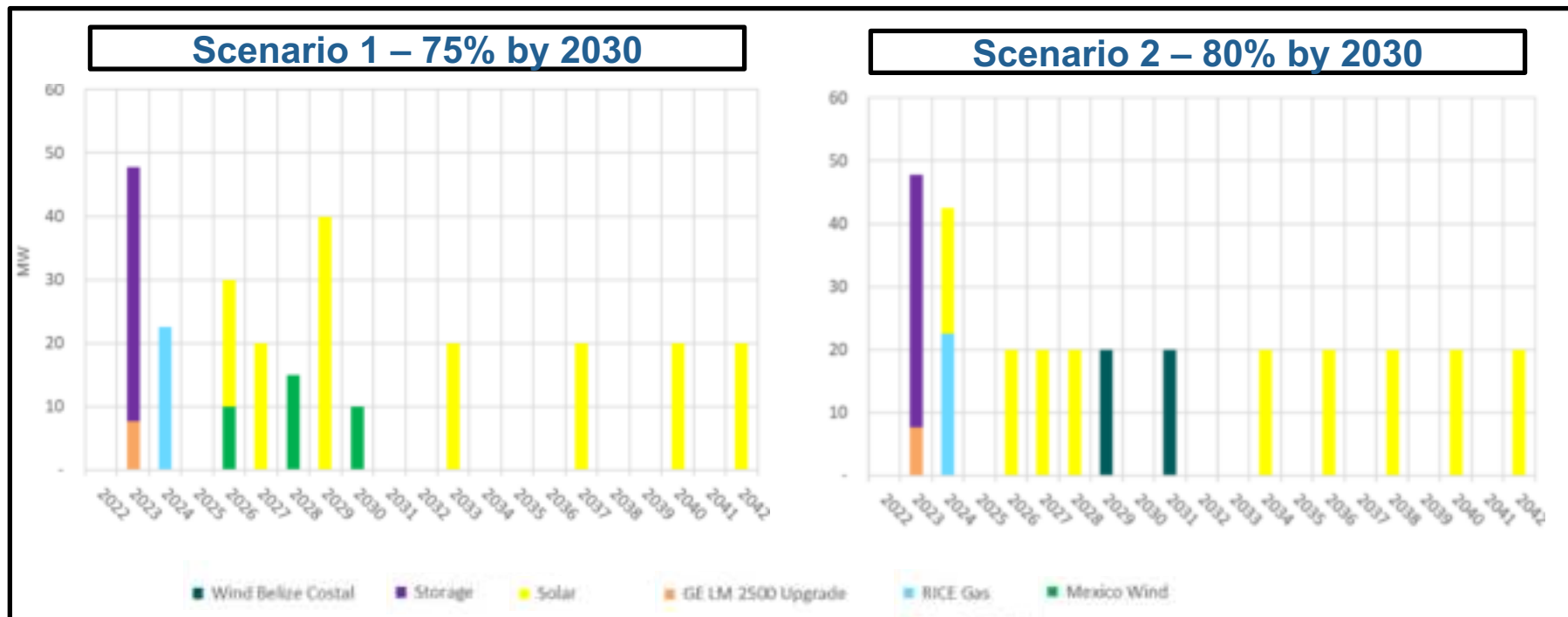
Power demand expected to triple by 2040, Belize committed to reach 75% Renewables in its Energy Mix by 2030 (50% today): “**imperative and urgent to scale up Renewable Energy and modernize grid infrastructure using battery storage.**”

RE Potential



- **Belize has substantial renewable energy potential** which could be utilized to increase renewable energy capacity, attract private sector investments, reduce dependency on fossil fuels and imports, improve the affordability of tariffs and contribute to creating local green jobs.
- **Masterplan indicates that Belize could add in excess of 100 MW of domestic generation capacity from renewable energy sources** such as solar, wind and hydropower. This would increase the share of green energy in the domestic supply mix to over 75% by 2030 in line with the NDC.

Battery Storage makes consensus in all scenarios of the Belize draft Masterplan



- ✓ **40 MW of battery storage is required in the immediate short-term**
- ✓ Battery storage first use: enable the integration of variable renewable energy (wind/solar)
- ✓ Battery storage second use: electricity service reliability improvement, by providing additional capacity to the system during peak demand
- ✓ Battery storage third use: improve the grid resilience to climate event (drought, storm, flooding)
- ✓ **Battery storage in Belize is simultaneously a Mitigation and Adaptation asset.**

Belize Government Requested WB Support for its First Energy Storage Investment Project

- **Project Development Objectives:** To enable integration of new renewable energy generation and enhance the electricity system resilience against extreme climates by strengthening the national transmission infrastructure.
- **Component 1 - Supply and Installation of Battery Energy Storage Systems:** 4 BESS in Ladyville, Orange Walk, Independence and San Pedro, for a total capacity of 40 MW / 4h.
- **Component 2 - Supply and Installation of Grid Resilient Infrastructure:** new or upgrade of grid assets, to improve the resilience to climate events.
- **Component 3 - Technical Assistance, Implementation support and Capacity building:** to support the training and regulatory framework on BESS, and the design of economic dispatch rules including energy storage, VRE and power imports.
- **Project to be approved by WB in early 2024, first BESS operational in 2025.**
- **IFC Advisory supporting the Government on the Solar Transaction.**

Location of Battery Sites



BESS in Belize: Many Challenges Ahead

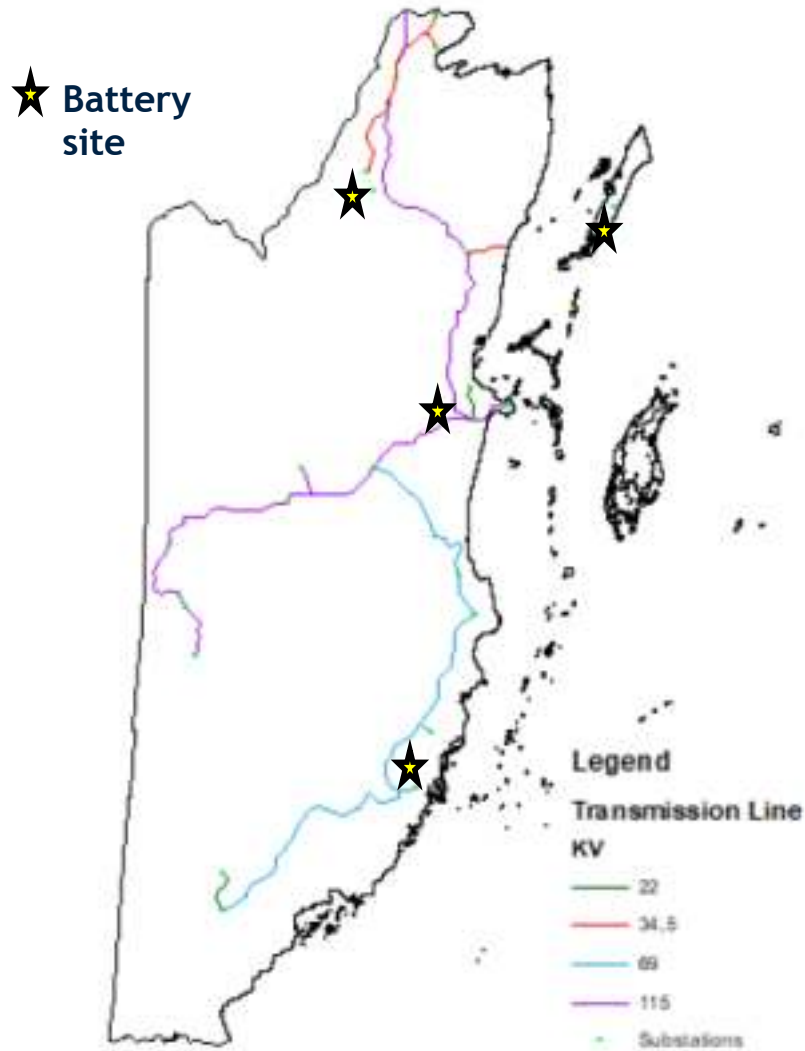
(And Need for ESP Technical Support)

- **BESS location, ownership and operational arrangement**
 - GOB will procure BESS supply & installation and operations & maintenance
 - O&M cost and loan repayment recovered through electricity rate and deposited into escrow by BEL for GOB liabilities
 - Independent System Operator (ISO) to dictate the operation of the BESS assets in accordance with dispatch rules for public interest, transparently

- **BESS Procurement Strategy and Regulatory Framework**
 - Close to very active US BESS market, need to attract competitive suppliers.
 - First BESS in Belize, need Grid Code adjustment, Environmental guidelines, etc..

- **BESS Scale Up**
 - Need to prepare the enabling environment for potential privately financed and operated BESS, in the medium term.

Thank You – Q & A



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