

Diversification into Renewable Energy Production in the Sugar Industry



▶ Regional Workshop – South South Exchange on Renewable Energy & Energy Efficiency– 6th October 2017

▶ Head Office Complex,
▶ Fiji Sugar Corporation Ltd,
▶ Drasa Ave, Balawa,
▶ Lautoka
▶ Fiji Islands

▶ Jakir Hussain

Present Renewable Energy Plants in operation

- ▶ Fiji Sugar Corporation Ltd has Co-generation power plants operating at all the Sugar Mills which operates on steam produced by using bagasse (bi-product of sugar cane).
- ▶ The Sugar Cane is crushed in between the mill rollers and juice is separated from the fiber. The fiber from the final mill is sent to the Boiler for steam production. The high pressure steam (3320Kpa) is used for Power Generation and the Exhaust steam (100Kpa) is used for Sugar processing.

Renewable Energy Plants in operation

- ▶ Lautoka Mill
- ▶ 1 x 5MW Turbine Generator set. This supplies the full power demand of Lautoka Mill during crushing season.
- ▶ For any additional power requirements, Power is imported from FEA Grid.

Renewable Energy Plants in operation

- ▶ Rarawai Mill
- ▶ 1 x 5MW Backpressure Turbine generator
- ▶ 1 x 4MW Backpressure Turbine generator
- ▶ This supplies the full power demand of Rarawai Mill during crushing season.
- ▶ Factory power demand is 4.5MW and excess of 4.5MW is available.
- ▶ The existing Boiler is very old and is unable to supply the steam demand to operate both Power Generators together.

Renewable Energy Plants in operation - Rarawai 5MW Siemens Backpressure Turbine Generator



**Rarawai New 5MW
Steam Turbine
Generator Set
commissioned in
2015**

Renewable Energy Plants in operation - Rarawai 4MW Shinnipon Backpressure Turbine Generator

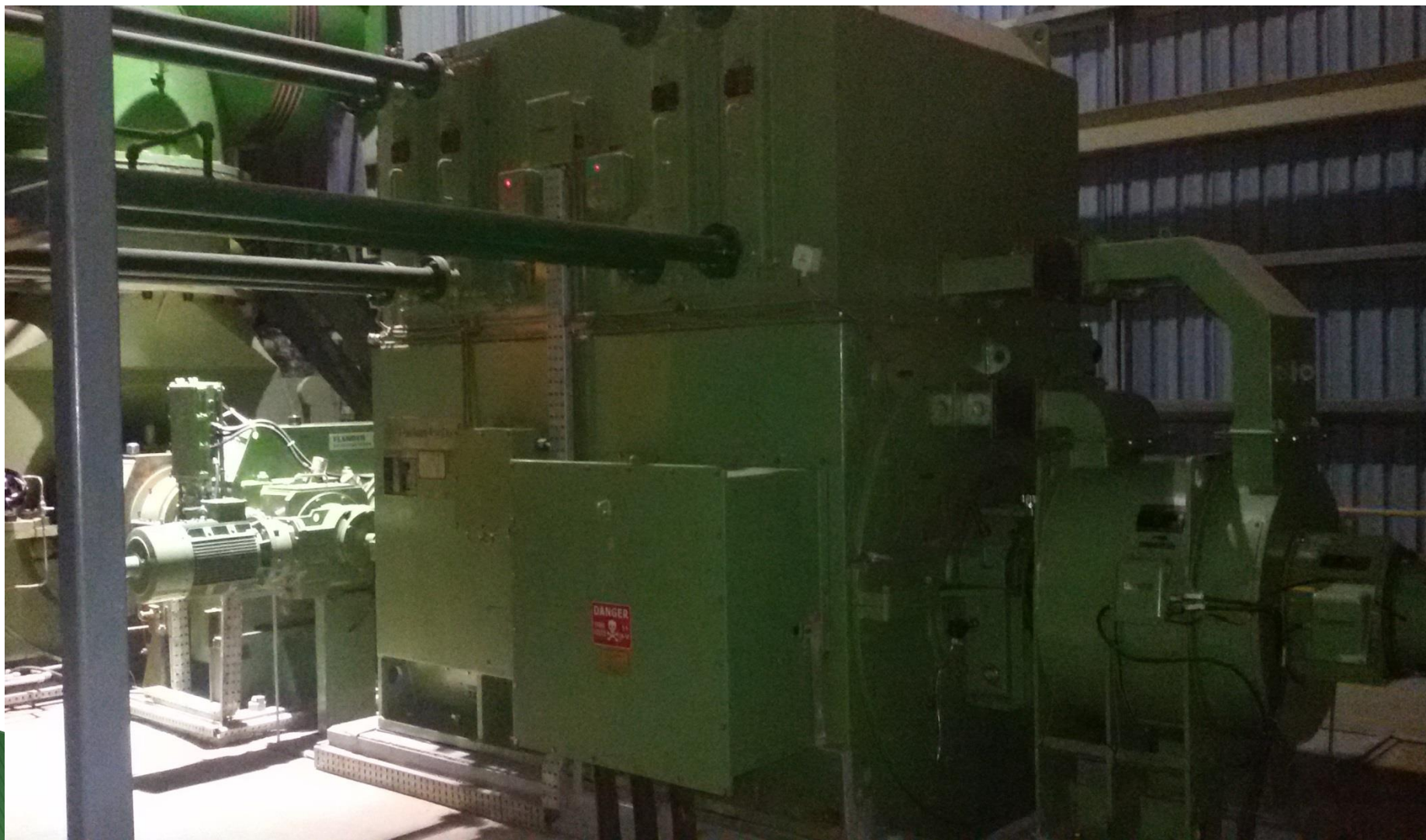


**Rarawai 4MW Steam
Turbine Generator Set**

Renewable Energy Plants in operation

- ▶ Labasa Mill
- ▶ 1 x10MW Extraction Condensing Turbine Generator
- ▶ 1 x10MW Backpressure Turbine Generator
- ▶ 1 x 4MW Backpressure Turbine Generator set
- ▶ Around 6MW is exported to FEA Grid which takes the full Grid load most of the times during crushing season and during this time all the FEA Diesel Generators are switched off.

Renewable Energy Plants in operation – Labasa new 10MW Extracting Condensing Turbine Generator set



Renewable Energy Plants in operation – Labasa Power Generation new PLC Control Systems



Renewable Energy Plants in operation – Labasa 10MW Extracting Condensing TG set – Condenser Unit



Renewable Energy Plants in operation - Labasa 10MW Peterbrotherhood Backpressure Turbine Generator



**Labasa 10MW
Steam Turbine
Generator Set**

Renewable Energy Plants in operation – Labasa 4MW Kessels Backpressure Turbine Generator



**Labasa 4MW Steam
Turbine Generator Set**

Future Renewable Energy Power Projects

- ▶ Lautoka Mill
- ▶ The existing 1 x12MW Backpressure Turbine Generator – Turbine has failed and the repair works have been started. This works is expected to be completed by mid of 2018.
- ▶ Power Export capacity to FEA will be up to 8MW during the crushing season.

Future Renewable Energy Power Projects – Lautoka 12MW Backpressure Peterbrotherhood Turbine – Turbine repair works in progress



**FSC Lautoka 12MW
Steam Turbine
Generator Set**

Future Renewable Energy Power Projects

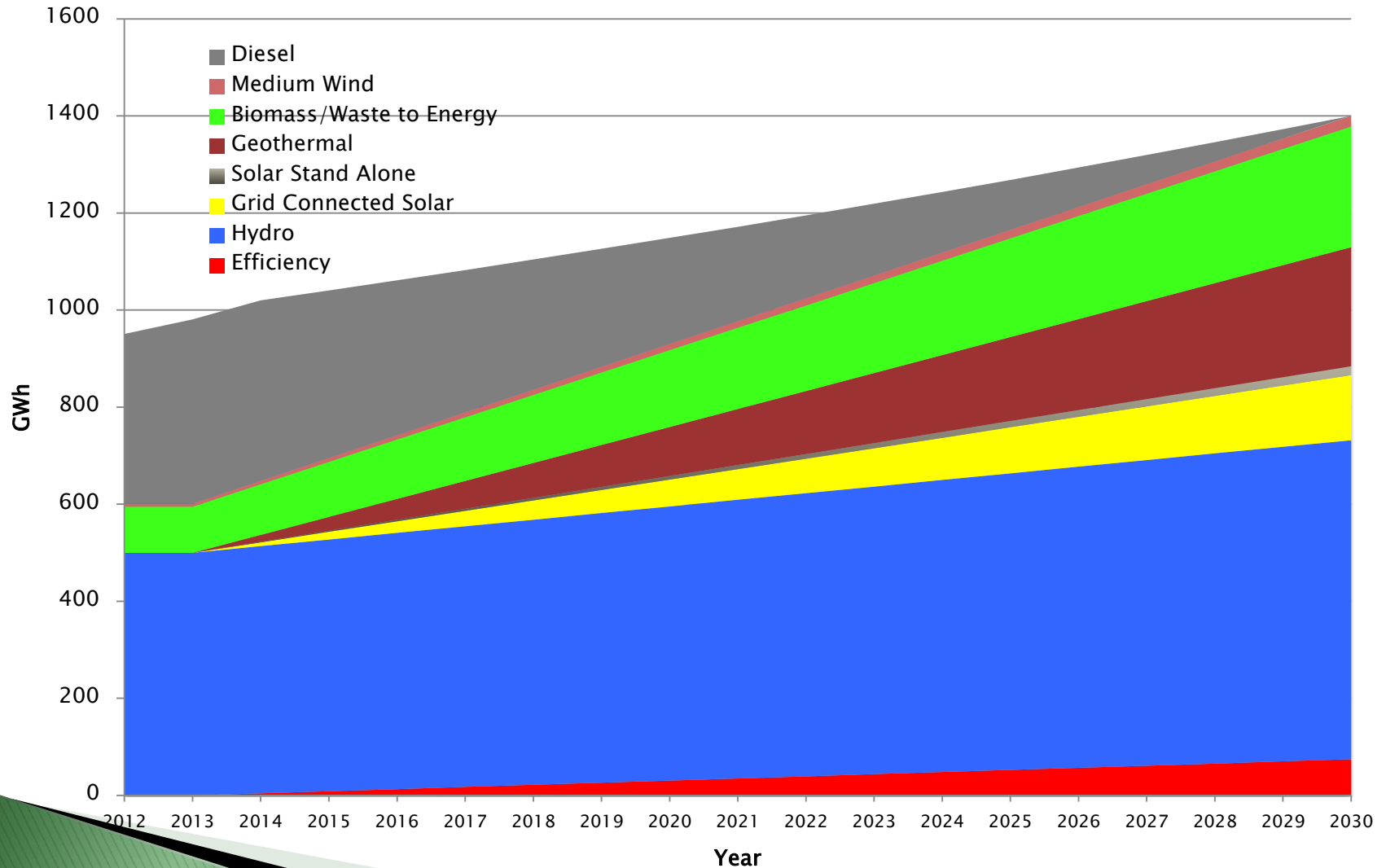
- ▶ Rarawai Mill
- ▶ FSC has plans to install another 200T Boiler which will be capable to supply the steam demand for the two power generators together.
- ▶ The surplus power can be exported to FEA Grid, 4.5MW

Future Renewable Energy Power Projects

- ▶ Labasa Mill
- ▶ Total of 24MW Power Generation capacity is available at Labasa.
- ▶ Total FEA Grid Peak demand is around 7MW.
- ▶ Plans are to increase the HV Power supply cable between FSC and FEA interconnector to cater for the FEA peak load demands.
- ▶ 50T Boiler upgrade works has been approved and is expected to complete by end of 2018.
- ▶ And offseason power generation will commence resulting in full year Renewable Energy Power Production for Labasa.

Key challenges and major policy initiatives to promote Renewable Energy

Projected Electricity Demand Supply Balance



Renewable Energy Targets

Indicator	Baseline	Targets		
		2015	2020	2030
Access to modern energy services				
Percentage of population with electricity access	89% (2007)	90%	100%	100%
Percentage of population with primary reliance on wood fuels for cooking	20% (2004)	18%	12%	< 1%
Improving energy efficiency				
Energy intensity (consumption of imported fuel per unit of GDP in MJ/FJD)	2.89 (2011)	2.89 (0%)	2.86 (-1%)	2.73 (-5.5%)
Energy intensity (power consumption per unit of GDP in kWh/FJD)	0.23 (2011)	0.219 (-4.7%)	0.215 (-6.15%)	0.209 (-9.1%)
Share of renewable energy				
Renewable energy share in electricity generation	60% (2011)	67%	81%	100%
Renewable energy share in total energy consumption	13% (2011)	15%	18%	25%

^[1] Preliminary data from 2007 Census, Fiji Islands Bureau of Statistics.

^[2] 2002-03 Household Income and Expenditure Survey, Fiji Islands Bureau of Statistics. Reliance on wood fuels as the main fuel for cooking.

^[3] Based on 15% fuel substitution to local fuels and a 3% annual efficiency improvement.

^[4] Fiji Islands Bureau of Statistics based on average 36 MJ per litre of fuel.

^[5] Annual Report 2011, FEA.

^[6] Based on total energy consumption of 16,500 TJ (Fiji Islands Bureau of Statistics) and 60% power generation from renewables (FEA).

^[7] Based on 99% renewable power and 25,000 KL of biofuel.

Future Renewable Energy Projects

- ▶ 40MW Rarawai Biomass Cogeneration Power Plant. Detailed Project Report (DPR), installation site Geotech survey and Environment Impact Assessment (EIA) has been completed. Is put on hold for time being.
- ▶ Ethanol Plant – 60,000 Liters per day(60KLD) for E10 blending – Transport fuel. DPR has been completed. Is put on hold for time being.

- ▶ Energy efficiency is combined with an increased diversification of energy sources and technological advancements.
- ▶ It can make a significant impact in acquiring an increased demand for the services energy and environmental protection.
- ▶ The efforts to improve energy efficiency will improve the efficiency of economies, enhance employment, and bring environmental benefits.

THANK YOU

