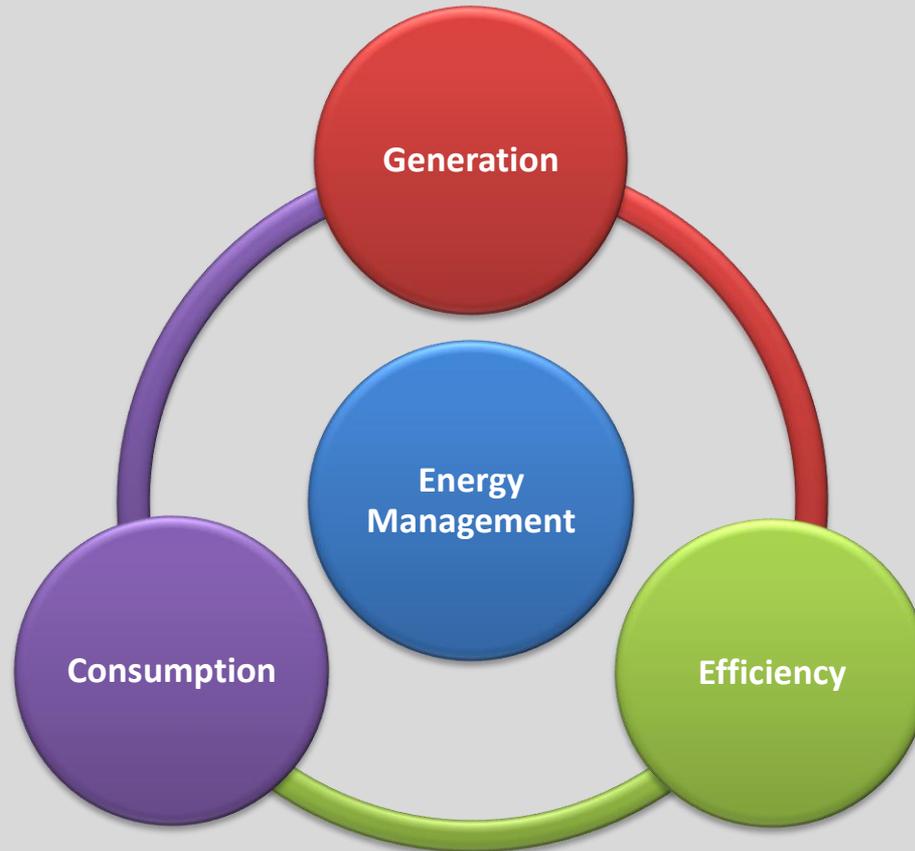




# Energy Management Strategy

Sangster International Airport

# Energy Management Strategy



# Energy Management Strategy and Initiatives



**Generation**

**Solar PV**

**Consumption**

- Sub-Metering of Tenants Ongoing (F&B, Retail, Lounges, etc.)
- Building Management System
- Behavior and Usage Patterns

**Efficiency**

- LED Lighting (All new and replacement lighting to be LED)
- Re-Insulation of Chilled Water Pipes
- Building Management System

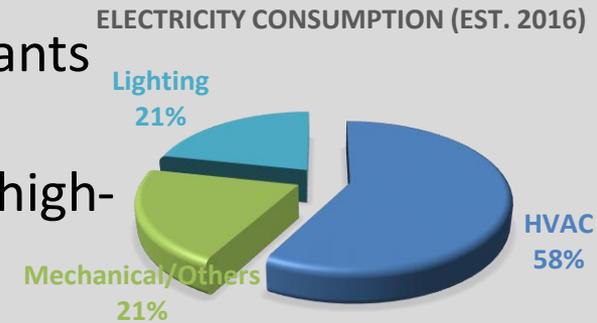
# Energy Management Initiatives - Consumption

## Sub-metering of Tenants (Including Retail and F&B locations)

- Ongoing program to sub-meter tenants to improve monitoring and recovery

## Behavior and Usage Patterns

- All new designs and renovation projects for Tenants to meet Airport established energy-efficiency guidelines including the use of LED lighting and high-efficiency air-conditioning units.
- For new projects Tenants will be required to utilize their own air-conditioning system.
- BMS to be used to analyze usage patterns of airport systems.



# Energy Management Initiatives – Efficiency

## LED Lighting

- All new and replacement lighting to be LED. This will be applicable to MBJ managed areas and all leased spaces.
- Ongoing LED retrofit program.
- Commercial LED Lighting has additional benefits including better space illumination and color rendition, reduced maintenance costs due to extended lifespan, and greater lumen/wattage ratio.

## Re-Insulation of Chilled Water Pipes

- Ongoing project to replace insulation of chilled water pipes throughout the terminal

## Building Management System

- Deployment of advanced Building Automation System to allow monitoring, scheduling and control of various energy related systems.

# Gate Electrification



- ICAO/UNDP-GEF Pilot Project : "Transforming the Global Aviation Sector: Emissions Reduction from International Aviation"
- Installation of an electric 400Hz GPU and PC Air on passenger jet bridge
- This falls into overall strategy to reduce our carbon footprint/greenhouse gas emissions impact in a sustainable manner and future solar PV project.

# Energy Management Initiatives – Generation

## Why Solar PV?

- Renewable energy, and specifically solar photovoltaics (PV), have become a key tool in reducing greenhouse gas emissions and operating costs at residential, commercial and industrial facilities globally, with an exponential increase in the rate of adoption in recent years.
- MBI Airports (MBJ), the operator of Sangster International Airport in Montego Bay, Jamaica aims to procure solar PV installations under an EPC model. The preferred location for these installations are on the roof of the airport terminal.

# Solar PV – Project Objective

- MBJ's goal is to reduce its reliance on power purchased from the national energy grid reducing its operating costs and its carbon footprint in a sustainable manner.
- The initial solar PV installation will have a target capacity of 1 MWAC and capable of supporting future expansions as the airport continues to grow.

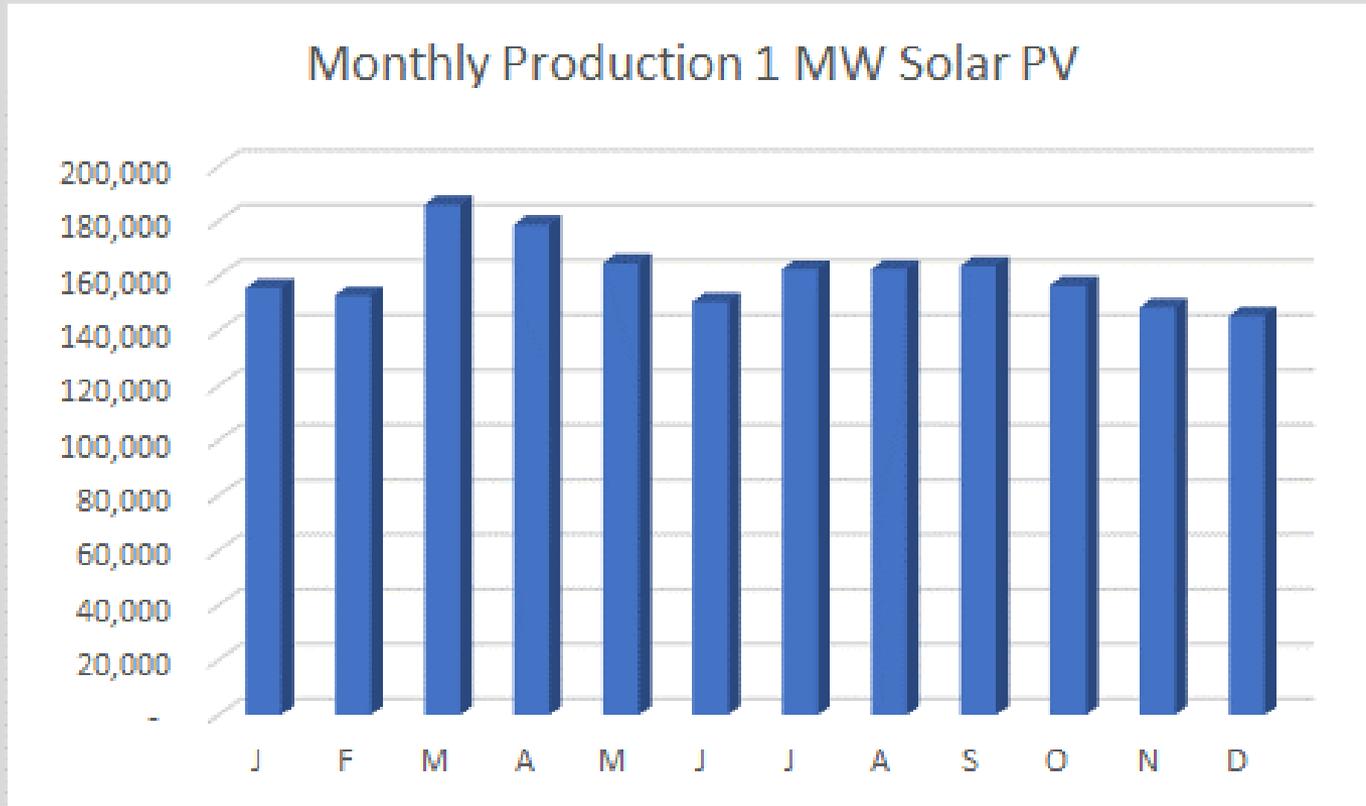
# Generation – Use of Electricity at MBJ

- Monthly consumption averages approximately 1,481,000 kWh
- The maximum rate of electricity use in a month has averages approximately 4 MVA with monthly levels ranging from 3.6 to 4.4 MVA
- Due to the impacts of air conditioning load and passenger traffic patterns, the peak period for electricity use at the airport is typically late morning to early afternoon
- The actual monthly cost of electricity purchases averages US\$342,000.
- Actual average cost per kWh is approximately US\$0.20 (US\$ 0.23 including GCT)

# Generation - Solar PV Opportunities

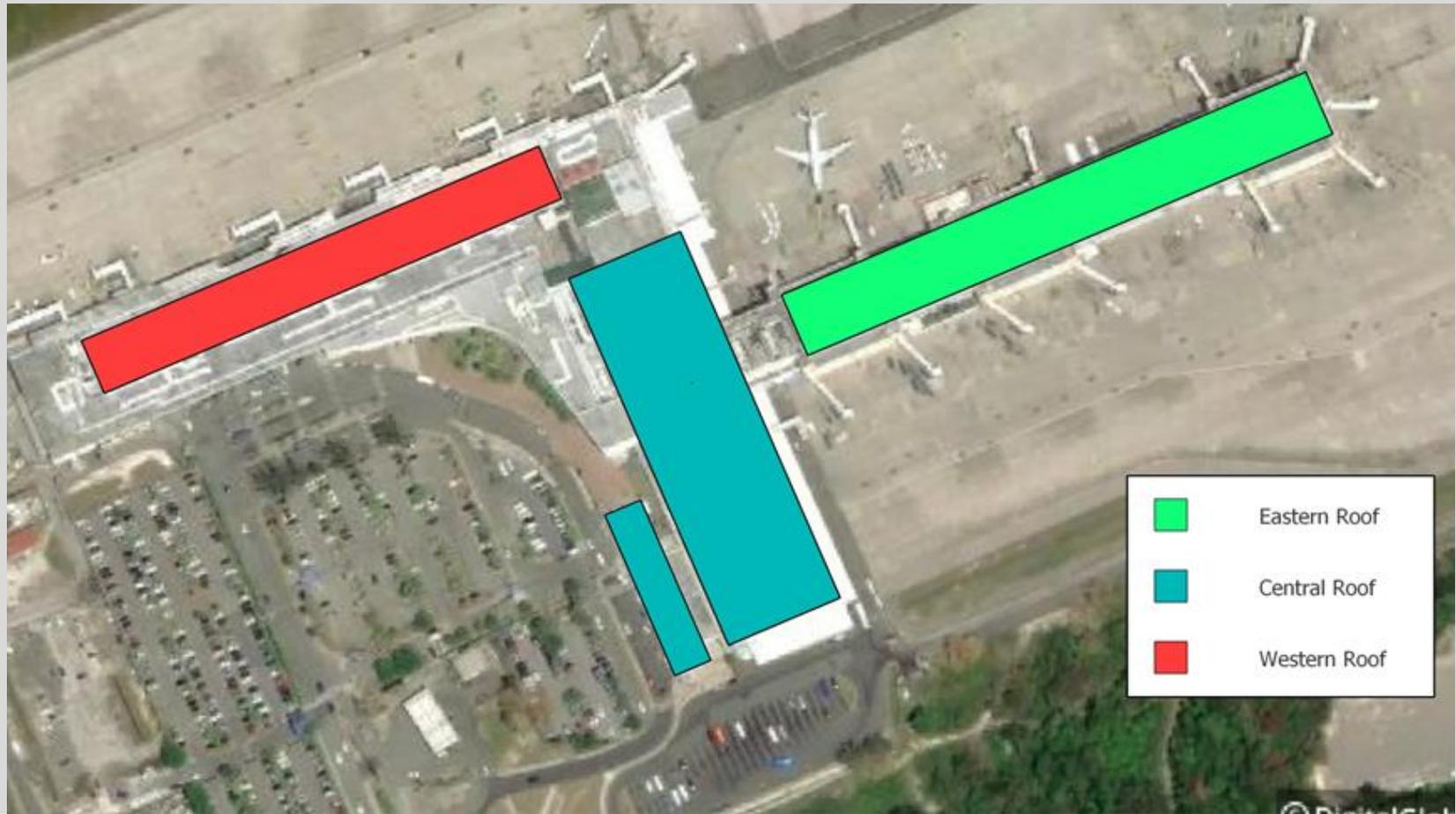
- Identified preferred locations (eastern and central roofs) with carport and expanded terminal building as an option for future expansion based on the Master Plan
- Target minimum initial installation in the 1 MW range
- Given airport's peak electricity demand coinciding with solar peak output, 100% of production would be used by the airport
- Industry standard model (PVsyst) used to estimate the potential electricity production by roof top solar PV panels at MBJ.
- The analysis indicated an average annual capacity factor of 22% based on the location of the airport. This corresponds to annual production of:
  - 1 MW plant – 1,927,000 kWh per year, about 11% of current annual purchases
  - 3 MW plant – 5,782,000 kWh per year, about 33% of current annual purchases

# Generation - Solar PV Opportunities



- Production would vary slightly by month.
- Highest production of the systems from 9 AM to 3 PM with production starting at approximately 6 AM and ending at approximately 6 PM.

# Proposed Location of PV Installation



# Energy Management – Key Objectives

