



# IMPLEMENTATION OF LOW EMISSIONS MEASURES: RENEWABLE ENERGY AT AIRPORTS



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**JAMAICA**



# ICAO-UNDP-GEF

The objective of this joint Assistance project *Transforming the Global Aviation Sector Emissions Reductions from International Aviation* is to **support capacity building in developing States and SIDS for implementing concrete measures for reducing CO<sub>2</sub> emissions from international aviation.**



Jamaica submitted its States  
Action Plan in **December 2012.**

Requested Assistance

**2014 – INTERNATIONAL YEAR OF THE SIDS**



# JAMAICA- Low Emissions Measures



## IMPORTANT DATES

- Official Government of Jamaica (GOJ) Letter of Commitment:
  - 23 June 2014
  - 17 August 2016
  - JAMAICA CIVIL AVIATION AUTHORITY Board 29 May 2014
- Regional Support – Caribbean Aviation Safety and Security Oversight Systems (CASSOS)
  - CASSOS Board – 29 April 2014



# Jamaica Solar At-Gate Pilot Project

Implemented in cooperation with the UNDP and funded by the Global Environment Facility (GEF)

ICAO/UNDP/GEF Private



Two Airports  
Two Funding Models





# Jamaica Solar At-Gate Pilot Project

## NORMAN MANLEY INTERNATIONAL AIRPORT



- **100 kW Solar Photovoltaic System**
- **PCA and GPU for Gate #1**



# Jamaica Solar At-Gate Pilot Project

## SANGSTER INTERNATIONAL AIRPORT



- PCA and GPU at Gate #9
- Planning support for attracting private partner for solar



# Jamaica Solar At-Gate Pilot Project

## DELIVERABLES



**FINANCE  
GUIDANCE**



**RENEWABLE  
ENERGY**



**REGULATORY &  
ORGANIZATIONAL  
MEASURES**





## Project Steps

- Concept development with local partners
- Secure funding
- Preparation of tender
- Bidders' conference
- Review of bids and selection of contractor
- Design and construction



# Jamaica Solar At-Gate Pilot Project

## Design Options

### Ground-mount



### Carport



### Roof-mount

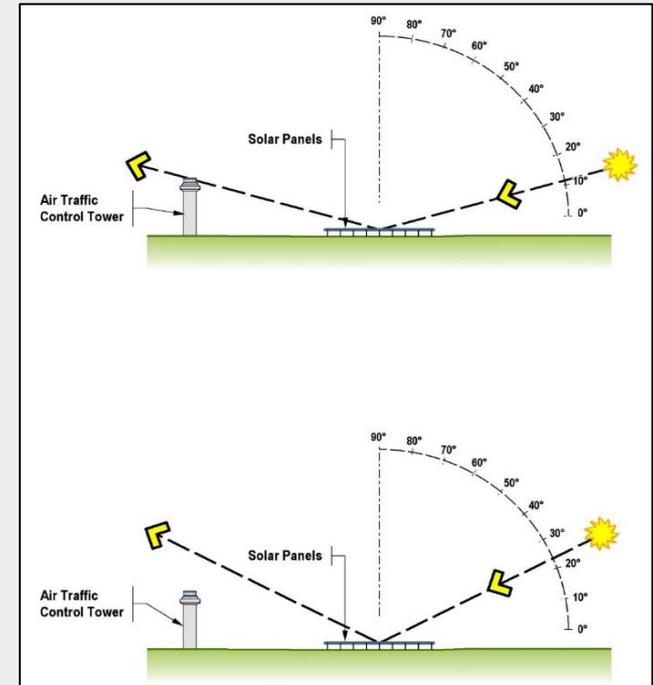




# Jamaica Solar At-Gate Pilot Project

## Glare Analysis

- Use modeling tool
- Assess Airport sensitive receptors
  - Control Tower
  - Aircraft on final approach
- Ensure no adverse impact





# Jamaica Solar At-Gate Pilot Project

## Main Components

### Electrification Gate 1

- Over 1,000 flights annually
- Large percentage of international flights

### Solar Carpark

- Close to terminal
- Connect to electrical
- High visibility





# Jamaica Solar at-Gate Pilot Project

## Solar Canopy



## PCA and 400 Hz GPU





# Jamaica Solar at-Gate Pilot Project

## Solar Capacity

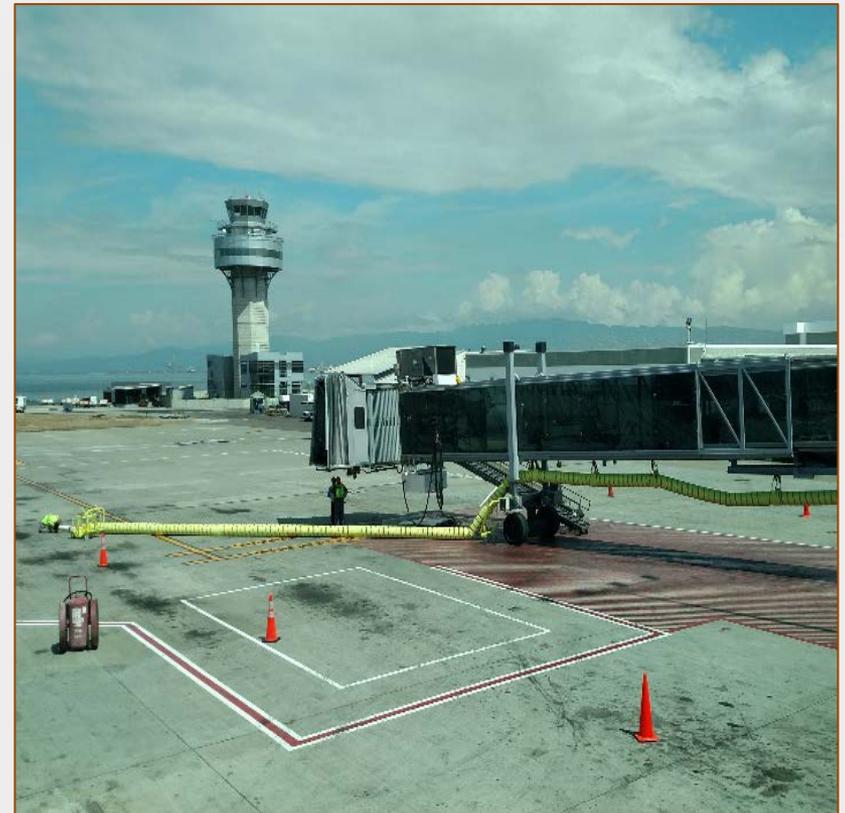
- Nameplate 106 kWdc / 100 kWac
- 324 solar panels
- 28 parking spaces covered
- Educational kiosk in terminal departure



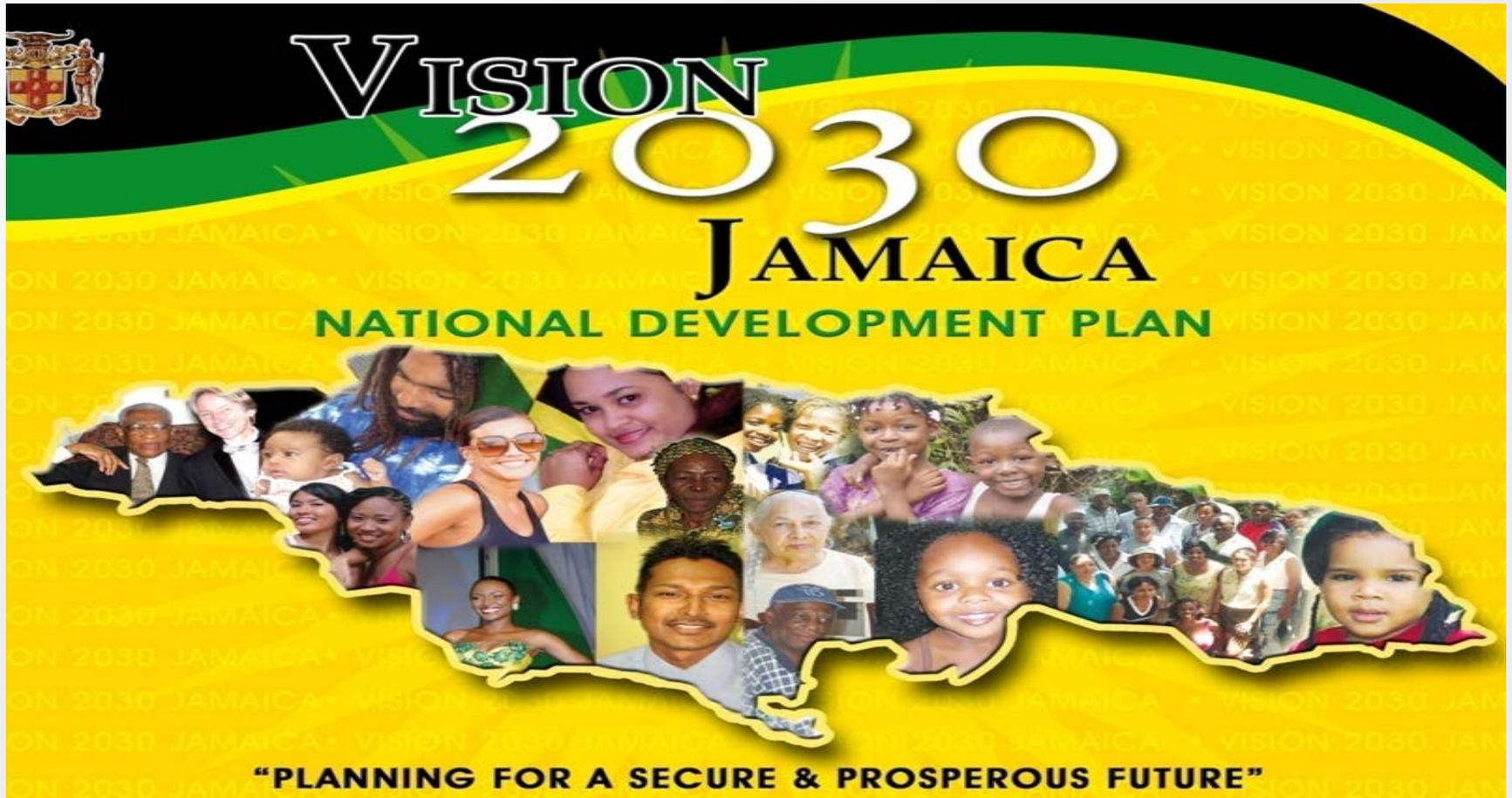
# Jamaica Solar at-Gate Pilot Project

## Gate Electrification

- Pre-conditioned Air Unit (PCA) and 400 Hz Ground Power Unit (GPU)
- PCA hose
- GPU cable
- Allows aircraft to plug-into Terminal



# NATIONAL DEVELOPMENT PLAN(NDP)



# JAMAICA'S VISION 2030

## NATIONAL OUTCOME #10 Energy Security

PROPOSED OUTCOME INDICATORS	BASELINE 2007 OR MOST CURRENT	PROPOSED	TARGETS	
		2012	2015	2030
Percentage of renewables in energy mix	4.8%	11%	12.5%	20%

## STRATEGY

- **CREATING INFORMED COMMITTED LEADERSHIP WHO ARE CHAMPIONS FOR ENVIRONMENTAL PROTECTION**
- **EFFECTIVE REGULATORY FRAMEWORK WHICH BINDS GOVERNMENT AND PEOPLE AND THE LEGISLATIVE REFORMS TO SUPPORT IT.**

# JAMAICA'S VISION 2030

COST  
BENEFITS

## STRATEGIES

- **DIVERSIFY ENERGY SUPPLY, INCREASE RENEWABLE ENERGY**
- **PROMOTE ENERGY EFFICIENCY AND CONSERVATION**
- **DEVELOP AND IMPLEMENT ENVIRONMENTAL STEWARDSHIP PROGRAMMES IN GOJ AGENCIES**

# JAMAICA'S VISION 2030

COST  
BENEFITS

## STRATEGY

- **SUSTAINABLE MANAGEMENT AND USE OF ENVIRONMENTAL AND NATURAL RESOURCES**
- **Promote Eco-Efficiency and the Green Economy**

# JAMAICA'S VISION 2030

CAPACITY  
BUILDING

## STRATEGY

- **BUILD CAPACITY (systems, processes, infrastructure and personnel) OF ENVIRONMENTAL INSTITUTIONS AND ENCOURAGE TRANSFORMATIONAL LEADERSHIP IN SUCH INSTITUTIONS**
- **SUPPORTS EFFECTIVE DELIVERY OF ENVIRONMENTAL EDUCATION AT ALL LEVELS OF THE JAMAICAN EDUCATION SYSTEM AND PROMOTE ENVIRONMENTAL AWARENESS**
- **DATA MANAGEMENT FOR ANALYSIS**

# ICAO-UNDP PROJECT SYNERGIES WITH GOJ POLICIES

## COST BENEFITS

- Understanding the costs and environmental benefits associated with implementation of the aviation low emissions measures through conducting an assessment of costs and environmental benefits associated with implementation of the aviation low emissions measures.

## POLICY

- Enhancing policy framework through a series of policy instruments, including guidance papers and studies on: regulatory and organizational measures to promote low emissions reduction activities; promotion of use of alternative jet fuels; and use of renewable energy at the airports.

## CAPACITY BUILDING

- Sharing knowledge and resources through an integrated environmental portal, as well as other awareness-raising initiatives.

# PARTNERSHIPS/COLLABORATION

## GOVERNMENT OF JAMAICA



**INTERNATIONAL CIVIL AVIATION ORGANIZATION**  
*A United Nations Specialized Agency*



**GLOBAL ENVIRONMENT FACILITY**  
INVESTING IN OUR PLANET



**MINISTRY OF TRANSPORT,  
WORKS AND HOUSING**

**SANGSTER INT'S AIRPORT**





**Vinaka vakalevu**  
**THANK YOU**

