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ICAO CAPACITY BUILDING SEMINAR ON LOW EMISSIONS AVIATION MEASURES

Renewable Energy for Aviation: Practical Applications to Achieve Carbon Reductions and Cost Savings

Chrystelle Damar, Associate Environment Officer, ICAO





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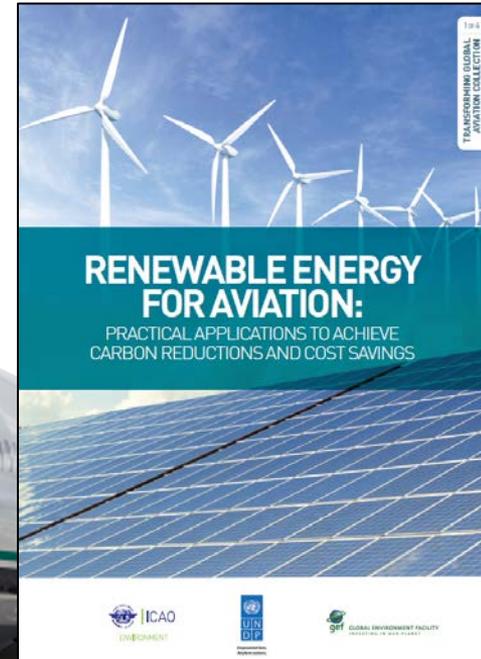
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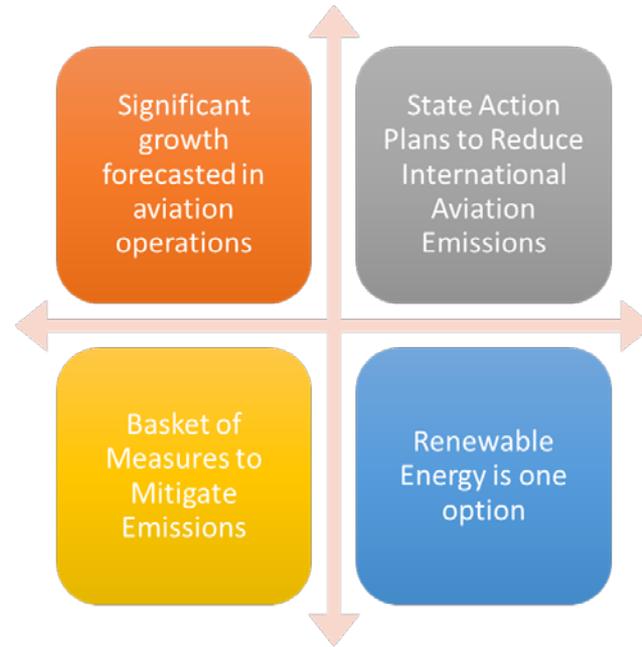
Presentation Topics

- Actors and Interests
- Renewable Energy
- ICAO Guidance
- Solar At-Gate Concept





ICAO Role





Civil Aviation Authority

Responsible
for National
Aviation Policy

Focal point
Action Plans

Over 100
Action Plans
submitted



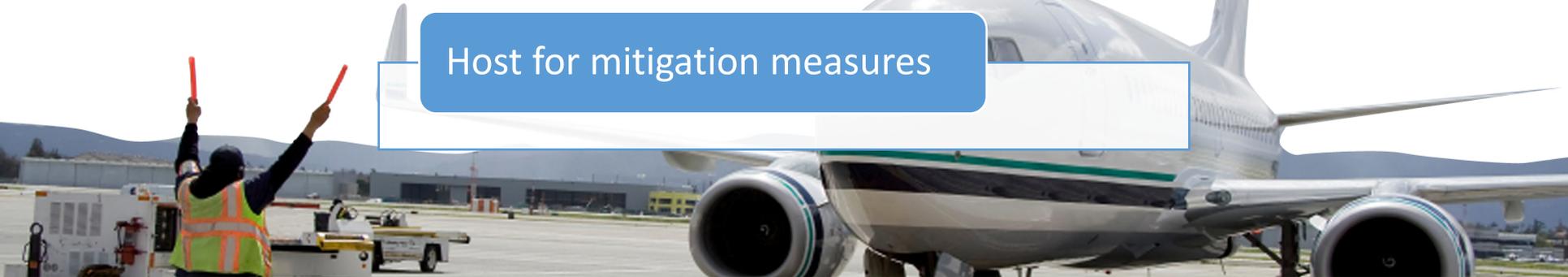


Airports

Center of aviation operations

Serving business partners and customers

Host for mitigation measures





Renewable Energy

Naturally replenishing; flow limited

- Bioenergy
- Geothermal
- Hydropower
- Ocean
- Solar
- Wind

Energy

- Electricity
- Thermal power

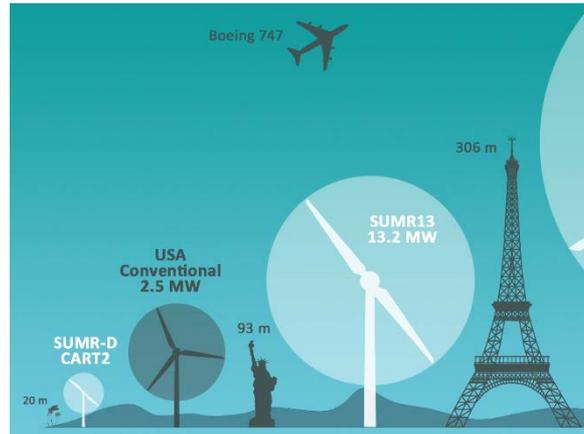




Airports

Airspace
Runways
Terminal
Ground Transport
Supporting Infrastructure

Compatibility



Renewables

Bioenergy – feedstock, processing
Geothermal – unique geological features
Hydropower – rivers
Ocean – unique coastal features
Solar – modular, ubiquitous
Wind – requires tall structure





Economics

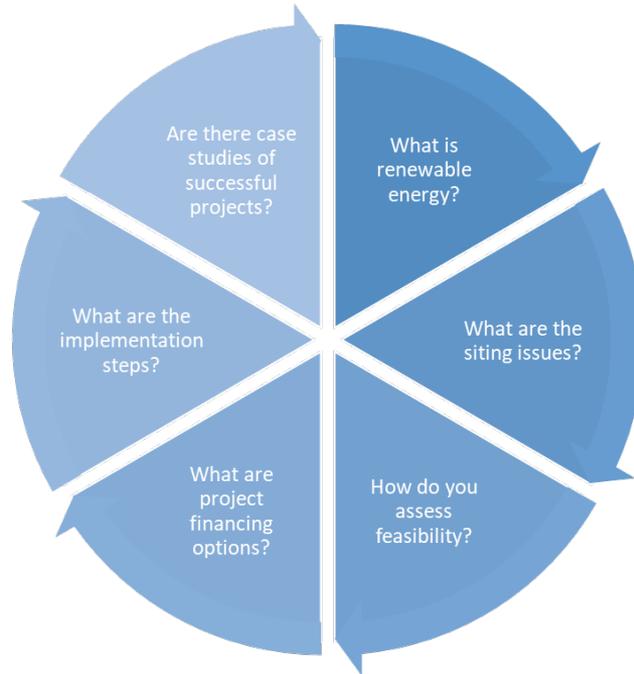
Existing
power costs

Renewable
energy costs

Public policy
incentives



Guidance





Project Ownership

Government owned

- Self Finance
- Contract with an Engineering, Procurement, Construction (EPC) company
- Self ownership, operations and maintenance

Privately owned

- Privately financed
- CAA/Airport serve as host
- CAA/Airport may receive lease payments or purchase the power generated



Benefits

- As fuel free energy, produces long-term savings
- Supports environmental goals and objectives
- Diversifies energy sources
- Investment in local businesses
- Facilitates sustainable growth
- Demonstrates leadership



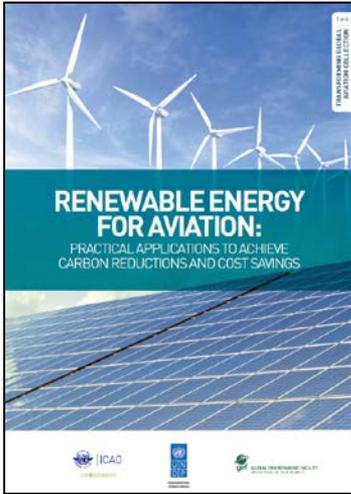
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Case Study Airports





Galapagos Ecological Airport



- three Wind Turbine Generators, rated at 750 kW each
- 35 per cent of its energy demand from solar PV panels installed on the terminal walkways
- 65 per cent from wind turbine generators (WTG)



George Airport, South Africa

The solar farm on 1.2 hectares of airport land.

The facility is comprised of 3,000 photovoltaic modules, with a nameplate capacity of 750 kW.

Project provides for 41% of airport's annual electricity





East Midlands Airport, United Kingdom

- Two Wind Turbine Generators
- 45 metres above ground
- Nameplate capacity of 250 kW each
- Approximately 6 per cent of the airport terminals needs
- Also has a biomass fired HVAC system with fuel grown on airport





Palau



- 226 kW solar facility
- Funded by the government of Japan's Official Development Assistance (ODA) office.
- 1,080 solar panels placed on canopies installed over the surface parking
- Provides both electricity and shading.
- Contributes approximately 15 per cent of the electricity needs of the airport
- offsets 80 tonnes of CO2 annually



San Diego USA



- 6 MW solar
- Terminal Roof and Carport Structures
- Component of proposed microgrid



Summary

- ICAO supporting State Action Plans
- Renewable energy one viable measure
- Guidance has been produced to support
- Co-benefits to domestic aviation activities

For more information on this project, please visit ICAO's website:

https://www.icao.int/environmental-protection/Pages/ICAO_UNDP.aspx



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