ICAO CAPACITY BUILDING SEMINAR ON LOW EMISSIONS AVIATION MEASURES

Renewable Energy for Aviation:

Practical Applications to Achieve Carbon Reductions and Cost Savings

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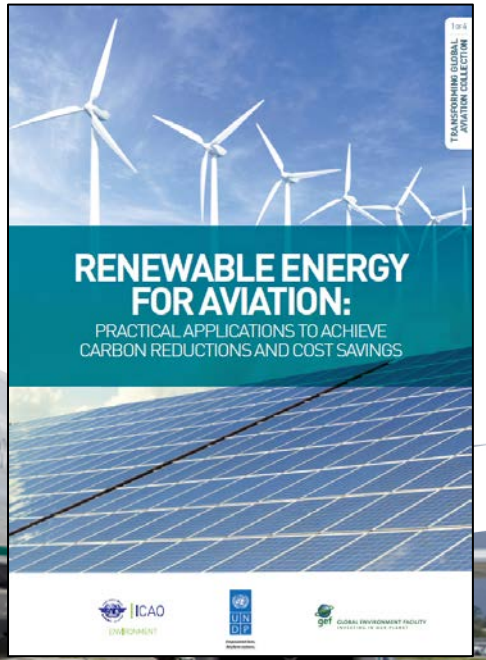
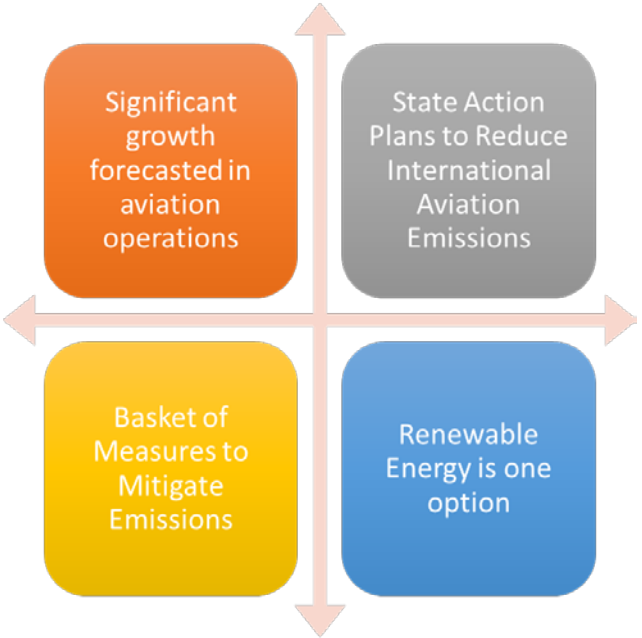
Presentation Topics

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



ICAO Role



Civil Aviation Authority

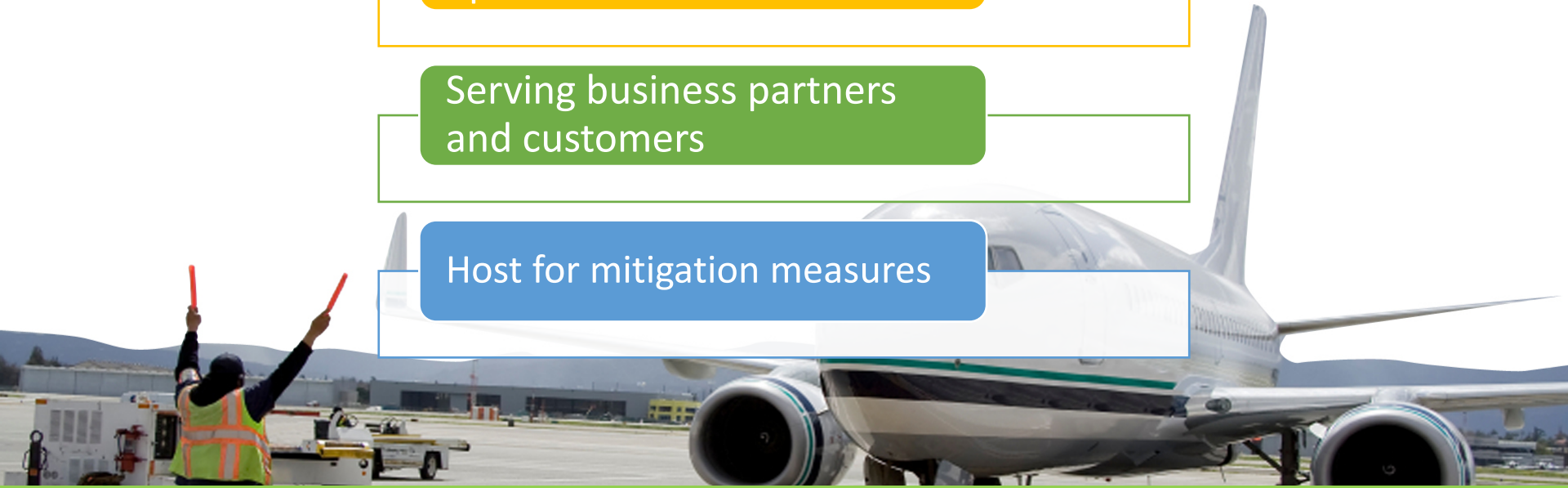
Responsible for National Aviation Policy

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



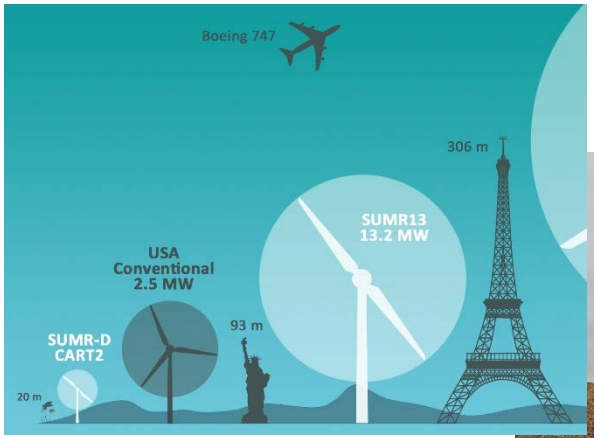
Compatibility

Airports

- Airspace
- Runways
- Terminal
- Ground Transport
- Supporting Infrastructure

Renewables

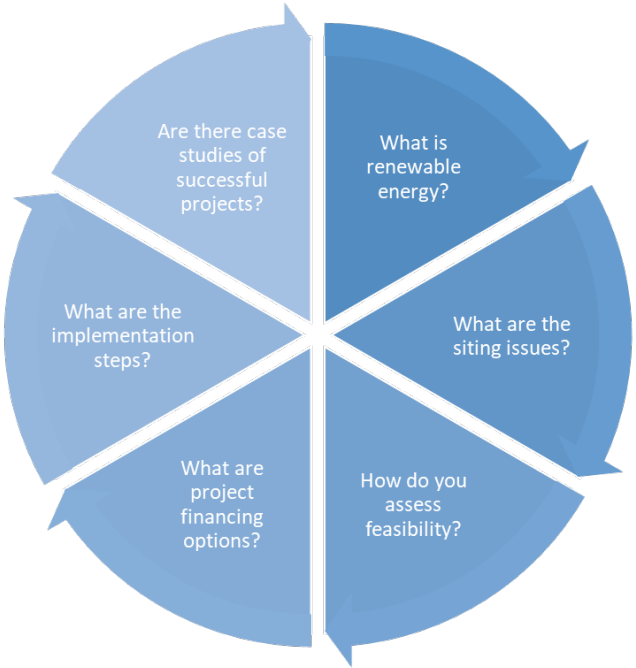
- Bioenergy – feedstock, processing
- Geothermal – unique geological features
- Hydropower – rivers
- Ocean – unique coastal features
- Solar – modular, ubiquitous
- Wind – requires tall structure



Economics

- Existing power costs
- Renewable energy costs
- Public policy incentives

Guidance



Feasibility

- Review Energy Usage
- Assess Renewable Options
- Compare generation and consumption
- Evaluate Project Sizing
- Identify Siting Options
- Calculate Project Costs and Payback
- Prepare Steps and Schedule

Project Ownership

Government owned

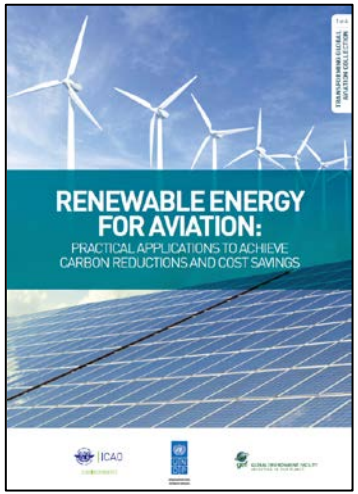
- Self Finance
- Contract with an Engineering, Procurement, Construction (EPC) company
- Self ownership, operations and maintenance

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



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 hactares 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, Micronesia

- 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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THANK YOU