Clean Development Mechanism (CDM) and Aviation

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INTRODUCTION TO CDM
Carbon markets

• Compliance markets and voluntary markets
• Emissions units are traded in carbon markets
• Cancel emissions units to offset emissions
• Supply and demand affect prices

ICAO Seminar on Carbon Markets in February 2018 for further information:
https://www.icao.int/Meetings/carbonmarkets/Pages/default.aspx
UNFCCC market mechanisms

• Carbon market mechanisms under the Kyoto Protocol:
  – Emissions trading
  – Joint implementation
  – Clean development mechanism
Clean development mechanism

- Emission reduction (or removal) projects in developing countries
- Certified emissions reductions (CERs)
  - 1 CER = 1 tonne of CO$_2$.
- CERs can be traded and used to meet a part of emission reduction targets under the Kyoto Protocol
Clean development mechanism

- Developed countries with emission reduction targets
  - Buy CERs
  - Investment
  - Emission reduction projects
  - Revenue from CERs
  - CDM
  - Carbon sink projects
  - Implementation
- Developing countries without emission reduction targets
  - Buy CERs
Key design features

- Sustainable development and emission reductions
- Flexibility in how targets are met
- Rigorous and public registration and issuance process
- Real, measurable and verifiable reductions
- Additionality
CDM projects

About 8,000 projects
• About 9 billion CERS (potential)
Actual:
• 3,125 projects issued CERs
• 1.9 billion CERs

15 sectoral scopes:
Energy production and demand;
Industrial processes;
Transport; Fugitive emissions;
Solvents use; Waste handling and disposal; Afforestation and reforestation; Agriculture
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Donor</th>
<th>Period</th>
<th>Est. reductions (t CO₂ eq/year)</th>
<th>Total actual CERs issued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaturu and Wainikasou Hydro Projects</td>
<td>United Kingdom</td>
<td>01 Jun 05 – 31 May 12</td>
<td>24,928</td>
<td>35,550 (Oct 07) 87,184 (pending)</td>
</tr>
<tr>
<td>Kinoya Sewerage Treatment Plant GHG Emission Reduction Project</td>
<td>Sweden and Spain</td>
<td>15 Apr 12 – 14 Apr 22</td>
<td>22,471</td>
<td>18,663 (Apr 17)</td>
</tr>
<tr>
<td>Fiji Nadarivatu Hydropower Project</td>
<td></td>
<td>01 Apr 13 – 31 Mar 20</td>
<td>47,361</td>
<td>100,367 (Mar 16)</td>
</tr>
</tbody>
</table>

Source: [http://cdm.unfccc.int/](http://cdm.unfccc.int/)
Future CDM?

• CDM is one of the mechanisms under the Kyoto Protocol
  – Ends in 2020

• Ongoing discussions under the Paris Agreement on a new mechanism
  – Modalities, rules and guidelines to be developed
A new energy paradigm for airports
Aviation CDM methodology

• ICAO developed a CDM methodology:
  – AMS-I.M.: Solar power for domestic aircraft at-gate operations

• Electricity from solar photovoltaic that supply electrical energy for aircraft at-gate operations in airports.
Applicability

• Important conditions under which the methodology is applicable:
  – New installation of a solar photovoltaic system at an airport facility where no onsite renewable energy power generation capacities existed prior to the implementation of the project
  – Electricity generated from the solar photovoltaic system is supplied to airports for domestic aircraft at-gate operations
  – Aircrafts that operate on international routes are not included in this methodology
Monitoring

- Emission factor of the baseline source (e.g. jet fuel, diesel, electric grid) used to provide energy
- Monitored:
  - Quantity of electricity consumed by aircraft electrical components for the domestic aircraft at-gate operation, which is supplied by the solar power
  - Quantity of electricity consumed by an aircraft to obtain pre-conditioned air for a domestic aircraft’s at-gate operation which is supplied by the solar power
SOLAR-AT-GATE PROJECT

TERMINAL

- Pre-conditioned air
- Power 400Hz
- Batteries
- Electric submeter
- Solar
- Primary airport meter
- Utility grid
Summary

- CDM has contributed to the establishment of an international carbon market and setting a price for carbon
- Moderately successful but not without problems
- Ongoing work relating to its potential successor under the Paris Agreement
- New CDM methodology for solar-at-gate
- Potential for developing CDM (or successor) projects to produce emissions units
NO COUNTRY LEFT BEHIND

THANK YOU