Supporting Energy Efficiency and Low Carbon Investments in Aviation through Climate-Based Finance

Holly Krambeck
The World Bank, Carbon Finance Unit
May 13, 2010
The Carbon Market(s)

• “The Carbon Market” is actually comprised of a patchwork of initiatives across the world, each with different standards, purposes, and rules.

• Compliance versus Voluntary Markets

• Allowance versus Offset Markets
Carbon Markets

• Compliance
  – Emissions from private companies are capped (limited) based on government regulation
  – Failure to meet cap may result in penalties
  – Prices for emissions tend to be higher than those on voluntary markets

• Voluntary
  – Companies, individuals, and local governments volunteer to reduce emissions to a target
  – Prices tend to be low
Allowance Markets

Coal Power Plant A (Small)

Allowances = 10,000 T / year*

Coal Power Plant B (Large)

Allowances = 15,000 T / year*

* simplified #s for learning purposes!
Allowance Markets

Coal Power Plant A (Small)

Emissions = 8,000 T

Coal Power Plant B (Large)

Emissions = 17,000 T
Allowance Markets

Emissions Market
Allowance Markets

• Allocation of Allowances
  – Auctioning
  – Grandfathering (a.k.a. Free Give-Aways!)

• Schemes (examples)
  – European Union Emissions Trading Scheme
  – Regional Greenhouse Gas Initiative (US)
  – Western Climate Initiative (US)
Offset Markets

Coal Power Plant A (Small)

Coal Power Plant B (Large)

Bus Fleet Engine Upgrade

Emissions = 8,000 T

Emissions = 17,000 T

Emissions = 5,000 T

* simplified #s for learning purposes!
Offset Markets

• What is an offset?
  – An offset is generated by the reduction, avoidance, or sequestration of GHG emissions from a specific project.
  – Offsets may be used to reduce the net carbon emissions of another entity.
  – Offsets can be traded on compliance or voluntary markets, where they “offset” one ton of CO$_{2}$e emissions.

• Offset Criteria

Source: Point Carbon, 2008
Clean Development Mechanism

- Designed to encourage participation of developing countries in global GHG mitigation efforts.
- Price of carbon is determined by market forces and reflects the cost to reduce emissions that would be incurred by an entity capped under the Kyoto Protocol.
- Only select project types are eligible, depending on whether an appropriate “methodology” has been approved by the UNFCCC.
- Funding is received after emissions reductions are realized.
Climate-Based Finance by Stage

- Program Design + Piloting
  - Grants
  - Global Environment Facility
- Construction
  - Climate Financing
  - Climate Investment Funds
- Operations and Maintenance
  - Carbon Finance
  - Clean Development Mechanism
- Cumulative Impact Programs
  - Performance-Based Financing
  - “Post 2012” Climate Finance
World Bank Carbon Finance Unit

- Kyoto Carbon Funds
- “Next-Generation” Funds and Mechanisms
- GHG Emissions Modeling and Monitoring Advisory
CDM Methodologies

• There are many tools for estimating greenhouse gas emissions from aviation activities (ICAO, IPCC, ACRP)
• But there are few internationally accepted, auditable methods for estimating emissions reductions from aviation investments
• Transport and facilities CDM methodologies could be adopted for this purpose
<table>
<thead>
<tr>
<th>CDM ID#</th>
<th>Methodology</th>
<th>Aviation Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMS III.T</td>
<td>BioDiesel</td>
<td>Alternative fuels</td>
</tr>
<tr>
<td>AMS III.C</td>
<td>Low emissions vehicles</td>
<td>Aircraft technology; airside vehicles</td>
</tr>
<tr>
<td>AMS III.S</td>
<td>Low emissions vehicles (fixed route)</td>
<td>Aircraft technology</td>
</tr>
<tr>
<td>AMS III.AA</td>
<td>Vehicle retrofits</td>
<td>Aircraft technology, airside vehicles</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMS II.C</td>
<td>Energy efficient equipment</td>
<td>Airport facilities and terminals</td>
</tr>
<tr>
<td>AMS II.E</td>
<td>Building efficiency and fuel switching</td>
<td>Airport facilities and terminals</td>
</tr>
<tr>
<td>AMS I.D</td>
<td>Renewable energy generation</td>
<td>Power generation</td>
</tr>
<tr>
<td>AMS II.B</td>
<td>Renewable energy generation (grid)</td>
<td>Power generation</td>
</tr>
</tbody>
</table>
CDM Limitations in Transport

• Short term versus long term, technology versus policy

• “Post-2012” alternatives under consideration for performance-based financing
  – Carbon Partnership Facility
  – Sectoral and Citywide Approaches
  – Nationally Appropriate Mitigation Actions
  – Performance-Based Lending
Additional Support

• Later presentations this afternoon will mention other types of support the World Bank offers for low carbon investments, such as:
  – Clean Technology Fund
  – Green Bonds
  – Global Environment Facility