

2016 Global Aviation Dialogues (GLADs) on Market-Based Measures to address Climate Change

4. The Role of Carbon Markets in the Global MBM Scheme



Environment, Air Transport Bureau
International Civil Aviation Organization (ICAO)



- Carbon market exists to address an environmental goal:
 - Reducing greenhouse gas emissions and tackling climate change in a cost-efficient manner
- Carbon market is a commodity market
 - Like any commodity market, it’s driven by the law of supply & demand
- There are compliance markets and voluntary markets
- Buying and selling of units results in a price of emissions



- Selling and buying carbon creates a commodity market
- Carbon is like gold, coffee, oil, orange juice, or corn
- Instead of involving a physical product, like an ounce of gold or a liter of juice, the “carbon market” involves tonnes of CO₂





- The CDM and JI under the Kyoto Protocol allow for emissions reductions (or emissions removals) as result of bilateral projects.
 - CDM involves projects in developing countries
 - JI involve projects in developed countries
- Emissions reductions/removals can be traded and sold, and used by developed countries to meet a part of their emission reduction targets under the Kyoto Protocol.
- Each project must show that the emissions reductions it produces are **additional** to what would have happened without the project.
 - This requirement ensures that emissions credits/units are not awarded for emission reductions that would have happened anyway.



- Private sector, e.g.
 - Companies with binding emission reduction obligations
 - Companies with voluntary commitments
 - Emission-reduction project developers
 - Banks
 - Investment firms
 - Brokerages
 - Law firms
 - Accounting firms
 - Technology developers
 - Consultants
- Public sector, e.g.
 - Multilateral development banks, such as the World Bank
 - Government agencies
 - United Nations agencies
 - Non-governmental organizations



- In a compliance market, a carbon market is developed by a government decision
 - Government creates and controls demand and supply of emissions units
- Government establishes and enforces rules for monitoring, reporting and verifying of emissions as well as emissions unit eligibility and issuances of emissions units
- About 40 national jurisdictions and over 20 cities, states, and regions are putting a price on carbon
 - Carbon pricing instruments cover about 7 gigatons of carbon dioxide equivalent or about 12 percent of global emissions

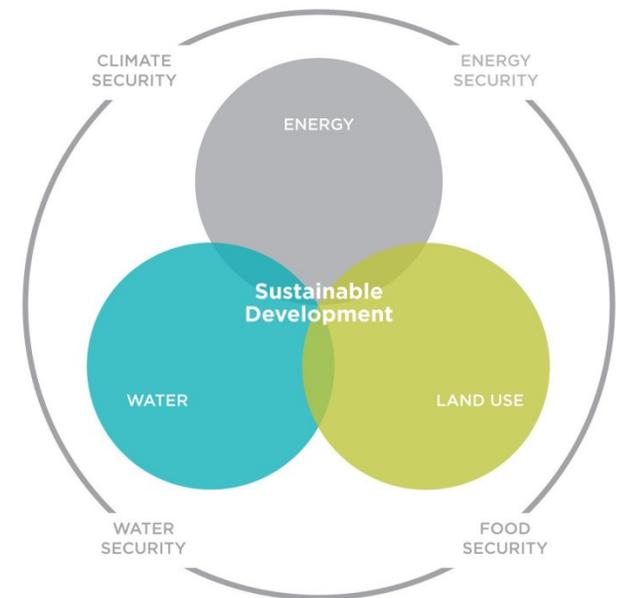


- Some carbon markets are run by non-governmental entities
 - Often known colloquially as “voluntary markets”
 - Emissions units are “voluntary emissions reductions (VERs)”
- An additional attribute of voluntary markets is that they can fill niches not met by government-run mechanisms:
 - Agriculture, forestry, and other land use projects → REDD+ is particularly well represented in the voluntary sector
 - Projects that provide third-party verification of social benefits in addition to environmental benefits
- Examples of voluntary markets include: Verified Carbon Standard, Gold Standard etc.

Gold Standard

- Projects in energy, afforestation/reforestation, agriculture, and water
- Based on the UNFCCC's Clean Development Mechanism
- Supplemented by additional requirements that relate to sustainable development
- To date: approximately 46 million offset credits

<http://www.goldstandard.org/>





- Governments agreed on the potential role of action in the forestry sector and of market approaches:
 - Article 5 of the Paris Agreement provides for Governments' action to conserve and enhance sinks and reservoirs of greenhouse gases, including forests
 - Article 6 of the Paris Agreement provides for cooperative approaches that involve the use of internationally transferred mitigation outcomes, and establishment of a new international market-mechanism (rules and modalities and procedures to be adopted)



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ENVIRONMENT

Video – Reducing Emissions with UN Climate Credits

Reducing Emissions with UN Climate Credits:

https://www.youtube.com/watch?v=B2zbaExs_B0



- Underlying commodity: emissions reductions
- Reduction of one tonne of CO₂ = one emissions unit
- Supply in the carbon market → emissions units coming from projects that reduce emissions

Two main types of emissions units:

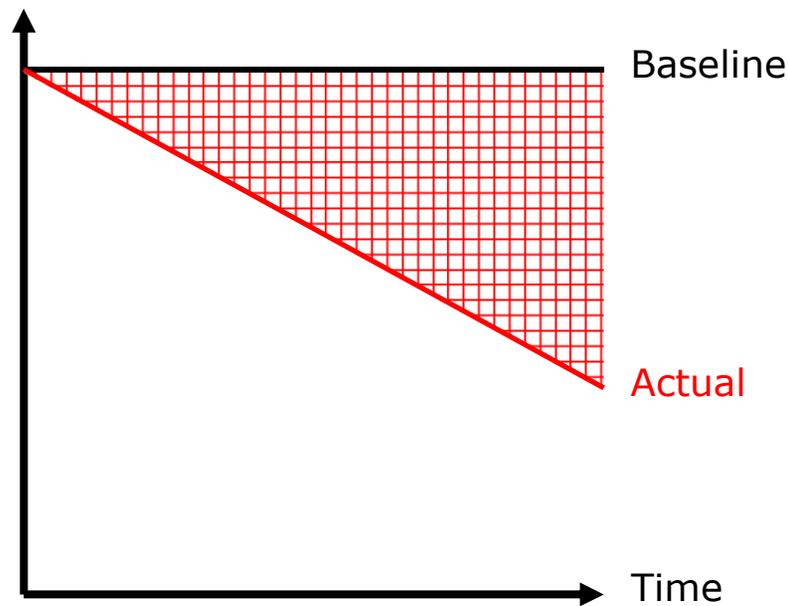
“Offset credits”
From crediting mechanisms
Examples: CERs, VERs

“Allowances”
From emissions trading schemes
Examples: EUAs, California units



- Issued by crediting mechanisms
- Basis for issuance: difference between baseline emissions (i.e. the project's predicted emissions in the absence of the project) and actual emissions (i.e. the project's actual emissions after the project is implemented)

Emissions



Offset credits
=
 Δ

Adapted from UNFCCC



- Administered by intergovernmental organizations:
 - UNFCCC CDM (Clean Development Mechanism): “certified emission reductions (CERs)”
 - Future market mechanism as agreed in the Paris agreement
- Administered by national governments:
 - China Certified Emission Reduction programme: “Chinese CERs”
 - Republic of Korea: “Korean Offset Credits (KOCs)”
 - Switzerland compensation scheme: domestic offset credits
- Administered by subnational governments:
 - California’s offset protocols (8): “ARB offset credits”
 - Quebec offset protocols (3): “Quebec offset credits”



CAEP Recommendations: Criteria for Offsetting Programmes

- Programmes that generate offset credits, for purchase by aircraft operators, should meet a range of elements covering the need for:
 - (i) clear, publicly disclosed, methodologies and protocols
 - (ii) considerations of the scope of activities
 - (iii) credit issuance and retirement procedures
 - (iv) identification and tracking of units
 - (v) the legal nature and transfer of units
 - (vi) validation and verification procedures
 - (vii) governance
 - (viii) transparency and public participation provisions
 - (ix) safeguarding systems to address environmental and social risks
 - (x) sustainable development criteria, and
 - (xi) the avoidance of double counting, issuance and claiming

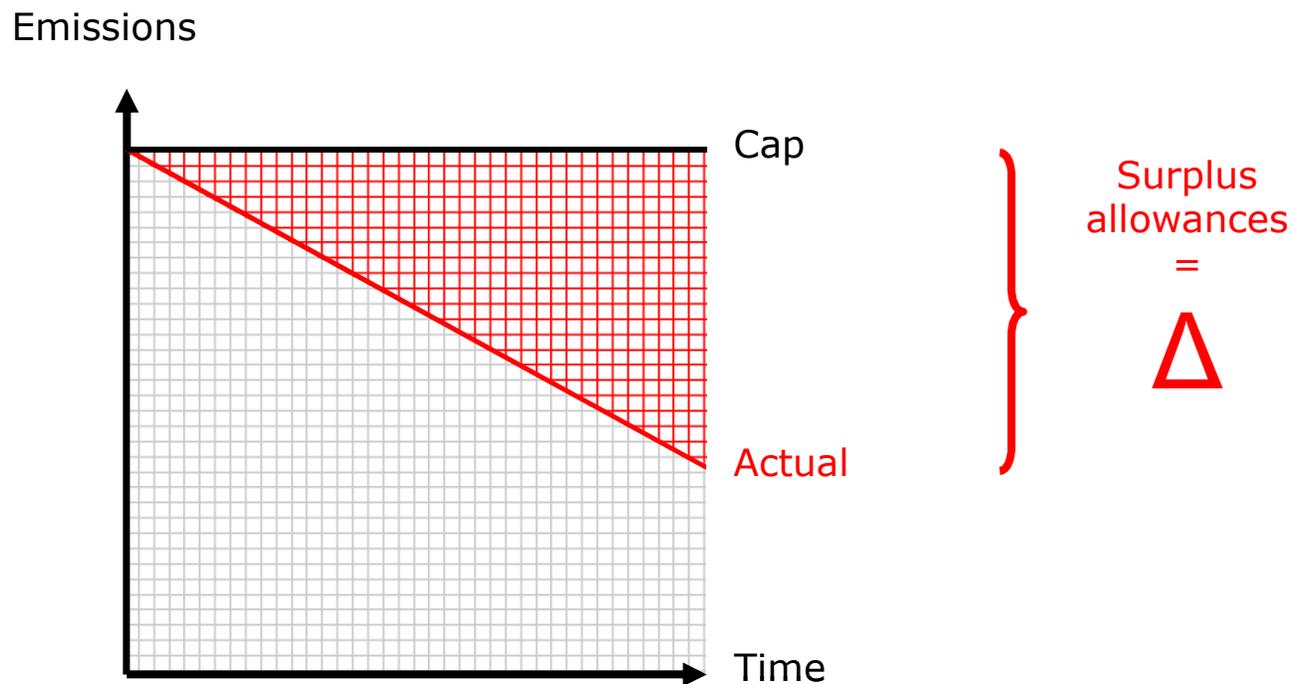


CAEP Recommendations: Criteria for Offset Credits

- Offsetting programmes should deliver such credits that:
 - (i) are additional
 - (ii) are based on a realistic and credible baseline
 - (iii) are quantified, monitored, reported, and verified
 - (iv) have a clear and transparent chain of custody
 - (v) represent permanent emissions reductions
 - (vi) safeguard against a potential increase in emissions elsewhere
 - (vii) are only counted once towards a mitigation obligation, and
 - (viii) do no net harm



- Issued by emissions trading schemes (ETS)
- Allowances are issued in a quantity equal to a cap on emissions
- An emitter must acquire enough allowances to cover its own emissions, but if it reduces emissions sufficiently, it will have surplus allowances





- Approximately 7 billion tonnes of CO₂ are covered by ETSs
- Administered by national governments:
 - European Union Emissions Trading Scheme (EU ETS)
 - Republic of Korea
 - Switzerland
- Administered by subnational governments:
 - China: seven subnational schemes
 - United States: two subnational schemes
 - Canada: Quebec
 - Japan: Tokyo

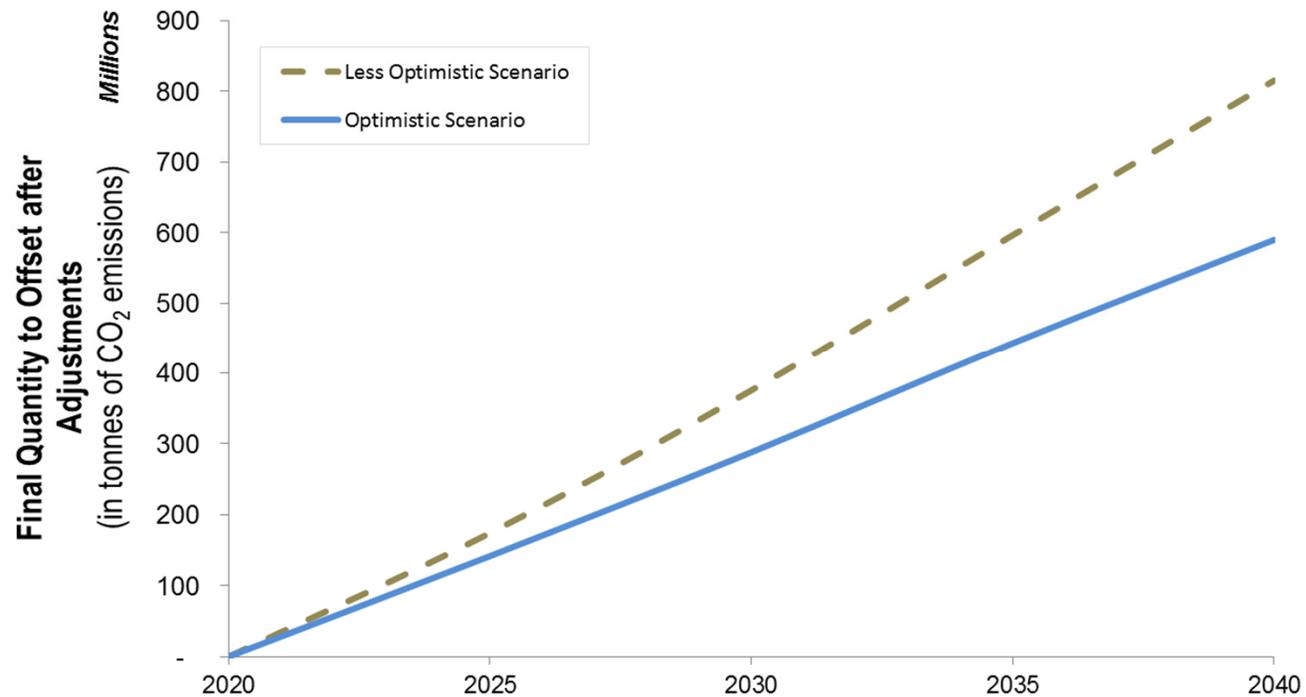


CAEP Recommendations: Criteria for Allowances

- Aircraft operators can also purchase allowances from emissions trading schemes, provided that the allowances comply with the following key elements:
 - (i) environmental integrity
 - (ii) voluntary participation of jurisdictions
 - (iii) market access
 - (iv) double claiming
 - (v) registry of allowance units, and
 - (vi) transparency



Demand: Emissions to be Offset



Final Quantity to Offset after adjustments (in Million tonnes of CO ₂ emissions)	2020	2025	2030	2035	2040
Less Optimistic Scenario	-	174	376	596	816
Optimistic Scenario	-	142	288	443	590

Source: CAEP analysis presented at EAG/15



- Supply is difficult to anticipate, as supply typically adjusts to demand
- Historically, supply markets have shown their ability to react and produce sufficient supply to meet demand
- World Bank estimates the following future supply pre-2020:
 - CDM: 150 million offset credits annually
 - Voluntary markets: 80-110 million offset credits annually
- An early decision on eligible emissions units under the global MBM would help the market to be ready to respond to international aviation demand



- Price formation is similar to any other commodity market: supply & demand
- Recent prices (approximate):
 - Offset credits (CDM): USD 0.50 – 0.56
 - Allowances: 85% of emissions are priced at less than USD 10.00
→ world's largest ETS (EU ETS) is currently trading at USD 5.50 – 6.00
- Prices can be higher in some voluntary markets:
 - Some buyers are attracted to projects with verified social benefits in addition to environmental benefits
 - Offset credit (Gold Standard): USD 4.00 – 4.50



Carbon Markets for International Aviation: How it Would Work for an Operator

1

An operator is aware of the quantity of emission it is required to offset (n tonnes of CO₂)

2

The operator acquires a number of emissions units equivalent to this obligation on the carbon market; Each emissions unit corresponds to one tonne of CO₂ that was reduced by another project or program

3

The operator surrenders these emissions units to the regulatory authority

4

The regulatory authority records that the operator surrendered these emissions units, thereby fulfilling its obligation



Delta

- In 2013, Delta used offset credits to achieve carbon neutral growth vs. 2012 levels
- Even though fuel efficiency increased, total emissions increased as well and in order to bridge this difference, the airline again decided to purchase offset credits for 2014
- A total of 1.7 million offset credits were purchased and retired in 2013 and 2014 to offset the corresponding increase compared to 2012 levels



TAP Portugal

- TAP Portugal's Carbon Offset Programme allows passengers to voluntarily offset CO₂ emissions from their flights
- Voluntary offsetting is included in the ticket booking process
- TAP has been participating in a UNFCCC CDM project (Brazil biomass project 'Irani')
- In 2014, over 68,000 passengers voluntarily participated in the programme; offsetting total of 16,076 tonnes of CO₂



Considerations when Buying Emissions Units

- How to purchase emissions units?
 - Buyer and seller find each other and contract directly between themselves
 - Also brokers exist to facilitate participation by buyers and sellers
 - With today's tools, all transactions can be done quickly online
- Emissions unit criteria
 - In February 2016, CAEP/10 meeting agreed on the first recommendations on emissions unit criteria, including:
 - Design elements for carbon offset programmes
 - Assessment criteria to ensure that the carbon offset units meet quality principles
 - Establishment of a technical advisory body evaluate ICAO-eligible emissions unit programs/project types



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