

# 3. MARKET-BASED MEASURES

## ICAO'S WORK ON THE DEVELOPMENT OF A GLOBAL MBM SCHEME FOR INTERNATIONAL AVIATION

BY ICAO SECRETARIAT

Market-based measures (MBMs) have been on ICAO's agenda for a number of years as one of the elements of the basket of measures to mitigate the climate change impacts of international aviation. In 2013, the 38th ICAO Assembly resolved that ICAO and its Member States with relevant organizations would work together to strive to achieve a collective medium term global aspirational goal of keeping the global net CO<sub>2</sub> emissions from international aviation from 2020 at the same level (so called Carbon Neutral Growth 2020). Aiming to ensure the fulfillment of this aspirational goal, the Assembly unanimously decided to develop a global MBM scheme for international aviation. Assembly also requested the ICAO Council to finalize all preparatory work, organize seminars and workshops, identify major issues and problems, and make a recommendation for a global MBM scheme that addresses them. Assembly requested the Council to report the results of the above work for decision at the 39th Assembly in 2016.

### Why MBMs for International Aviation?

According to the Intergovernmental Panel on Climate Change (IPCC 4th Assessment Report, 2007), aviation (both international and domestic operations) is estimated to be responsible for approximately 2% of global CO<sub>2</sub> emissions. International operations account for approximately 65% of total aviation emissions, thus representing 1.3% of the global CO<sub>2</sub> emissions. The assessment undertaken by ICAO's Committee on Aviation Environmental Protection (CAEP) concluded that annual CO<sub>2</sub> emissions from international operations were 448 Mt in 2010. Significant improvement in efficiency of air transport operations and technological progress has been made in the aviation sector, with aircraft produced today being much more fuel efficient per passenger kilometre than in the 1960s. Total aviation emissions, however, are forecasted to grow in the coming decades, and the aggregate environmental benefit achieved by these measures will be insufficient for the sector to reach its aspirational goal of carbon-neutral growth from 2020.

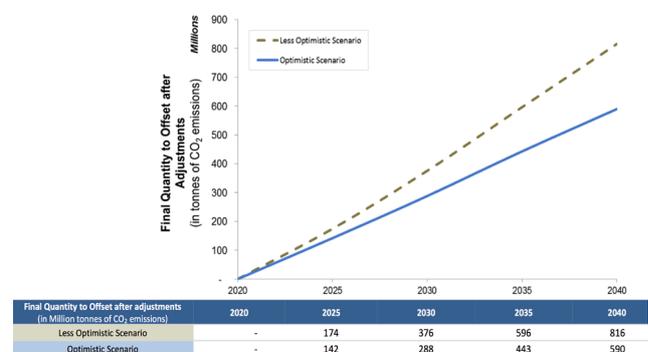
In addition to improving operational efficiency and achieving technological progress, aviation community is putting significant efforts in promoting the use of sustainable alternative fuels that have a reduced carbon foot print compared to conventional jet fuel (see article page 153). However, hurdles (mainly economic) still exist to prevent a large scale production.

A complementary global MBM scheme would act as a policy tool that would allow for an immediate response to the need for stabilising the emissions in a cost-effective manner for international aviation to meet its aspirational goal.

### Assessment of the Impacts of the Global MBM

As requested by the ICAO Council, CAEP and its Global MBM Technical Task Force (GMTF) provided the analyses on the

impacts of a global MBM. Firstly, CAEP analysed the total quantities of CO<sub>2</sub> emissions from international aviation, and estimated the total expected quantities to offset. Based on the analysis (see summary of the results in **Figure 1**), the estimated quantity to be offset by the whole international aviation sector would be of the order of 142 to 174 million tons of CO<sub>2</sub> in 2025; and 443 to 596 million tons of CO<sub>2</sub> in 2035.



**Figure 1.** Final Quantities to Offset. Source: CAEP analysis presented at EAG/15

CAEP also analysed possible costs of the proposed global MBM scheme by multiplying the estimated quantities of offsets with the assumed prices of an emissions unit (or carbon price). It should be noted that the carbon prices drive significant uncertainty in total cost impacts of offsetting CO<sub>2</sub> emissions from international aviation, and total cost estimates vary, depending on the assumptions.

In 2025, total offsetting costs vary from 1.5 to 6.2 billion US\$, and in 2035, total costs vary from 5.3 to 23.9 billion US\$ in 2035, depending on the assumed carbon prices (see summary of the results in **Figure 2**).

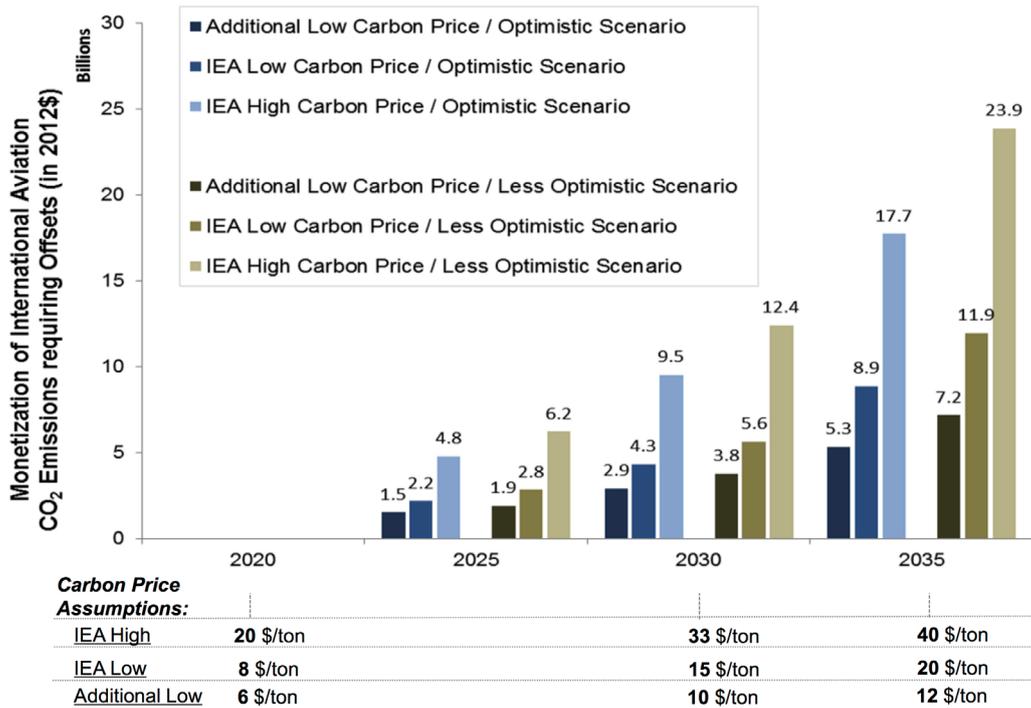


Figure 2. Cost of Offsetting with different Price Scenarios. Source: CAEP analysis presented at EAG/15

Putting in perspective with the reality of the business, the analysis also shows that the cost of carbon offsetting for operators would range from 0.2 to 0.6 % of total revenues from international aviation in 2025; and 0.5 to 1.4 % of total revenues from international aviation in 2035.

**The cost of carbon offsetting for operators would range from 0.2 to 0.6 % of total revenues from international aviation in 2025; and 0.5 to 1.4 % of total revenues from international aviation in 2035.**

According to a related cost analysis conducted by IATA, the offsetting costs related to the implementation of a global MBM scheme are expected to have a much lesser impact on international aviation than that caused by fuel price volatility. The estimated offsetting cost in 2030 is equivalent to that of a 2.6 US\$ rise in jet fuel price (per barrel); an extra 10 US\$ per barrel on the price of jet fuel would cost the industry about four times the estimated cost of offsets in 2030. To give a reference on magnitude, over the past decade the standard deviation of the jet fuel price annually has been almost 40 US\$ per barrel, meaning that airlines have managed to cope with oil price volatility (mostly upwards) of more than 15 times the size of the estimated offsetting cost in 2030.

Technical analysis also included estimating the cost impacts of various options for distribution of offsetting requirements to individual aircraft operators under the global MBM, e.g., using different combinations for individual operator’s growth rate and the international aviation sector’s growth rate, as well as the

route-based approach, accumulative approach, and comparison of these approaches<sup>2</sup>.

### Progress at ICAO

Since the 38th Assembly, ICAO Member States and relevant international organizations have actively been engaged to fulfill the request for the development of a global MBM scheme. In March 2014, the ICAO Council established the Environment Advisory Group (EAG), composed of 17 Council Representatives, to oversee all the work related to the development of a global MBM scheme and make recommendations to the Council. The EAG met a total of 15 times, and at its final meeting in January 2016, summarized deliberations and analyses conducted over the two years on options for a global MBM scheme.

Progress was pursued by the EAG, starting with a basic proposal for a global MBM scheme with a view to generating discussion and analyses on advantages and disadvantages of design elements, thus allowing for improvements. The EAG also discussed the work by CAEP to develop technical elements of a global MBM scheme, i.e., monitoring, reporting and verification (MRV), emissions unit criteria (EUC) and registries. The tenth meeting of the CAEP (1 to 12 February 2016) reviewed a vast amount of technical work related to the global MBM scheme and made recommendation to the ICAO Council. Pending to further decisions on a global MBM scheme by the Council and the 39th Assembly, GMTF’s work programme for years 2016 – 2019 aims to produce additional technical recommendations that are needed to implement the global MBM.

In addition, as a means to ensure the full engagement of all States and other stakeholders and widest possible range of inputs, and to respond to the Assembly’s request to organize seminars and

workshops on a global MBM, ICAO organized two rounds of Global Aviation Dialogues (GLADs). The first round of five GLADs was organized throughout April 2015 across the ICAO regions in Peru, Kenya, Egypt, Singapore and Spain, with 362 participants in total from 79 States and 22 international organizations<sup>3</sup>. The second round of GLADs was organized in March/April 2016 in Egypt, Senegal, Indonesia, the Netherlands and Mexico, with

390 participants in total from 60 States and 20 International Organizations<sup>4</sup>. The GLADs was a forum for information sharing and exchange of ideas, rather than a forum for decision-making. The main objective of the GLADs was to reach out to those States that are not directly engaged in the Council or CAEP. The GLADs allowed for well-informed deliberations on a global MBM scheme in the ICAO process toward the 39th session of the ICAO Assembly.

**362 participants in total from 79 States and 22 international organizations attended the first round of GLADs in 2015 and 390 participants in total from 60 States and 20 International Organization attended the second round of GLADs in 2016**



2016 GLAD in Cairo, Egypt



2016 GLAD in Dakar, Senegal



2015 GLAD in Madrid, Spain



2015 GLAD in Nairobi, Kenya



2016 GLAD in Bali, Indonesia



2016 GLAD in Mexico City, Mexico

In January 2016, the Council established a High-level Group on a Global Market-Based Measure Scheme to facilitate the convergence of views on a proposal for a global MBM scheme. The Group was comprised of high-level aviation and/or transport representatives of 18 States on the Council, taking into account equitable geographical representation. The group met in February and April 2016, and made progress on improving the proposal text.

Further in the process to develop a global MBM scheme for international aviation, a High-level Meeting on a global MBM scheme was held in May 2016 in Montreal with the purpose of facilitating a high-level discussion of a proposal on a global MBM<sup>5</sup>. The Meeting successfully clarified and improved a number of provisions in the proposal. The Meeting also recognized issues where further improvements were necessary, as well as possible alternative approaches and ideas to address the issues. The outcome of the Meeting was considered by the ICAO Council in June, after which the Council invited States to hold bilateral and multilateral consultations related to the draft Assembly Resolution text on a global MBM scheme. A “Friends of the President” informal group meeting was held in Montréal, Canada, from 22 to 23 August 2016, to evaluate the results of these consultations and develop compromise text for consideration by the Council, and its subsequent submission to the 39th Session of the ICAO Assembly. Timeline towards the 39th ICAO Assembly and beyond is presented in **Figure 3**.

**GLADs – Unique Format to Reach out ICAO Member States**

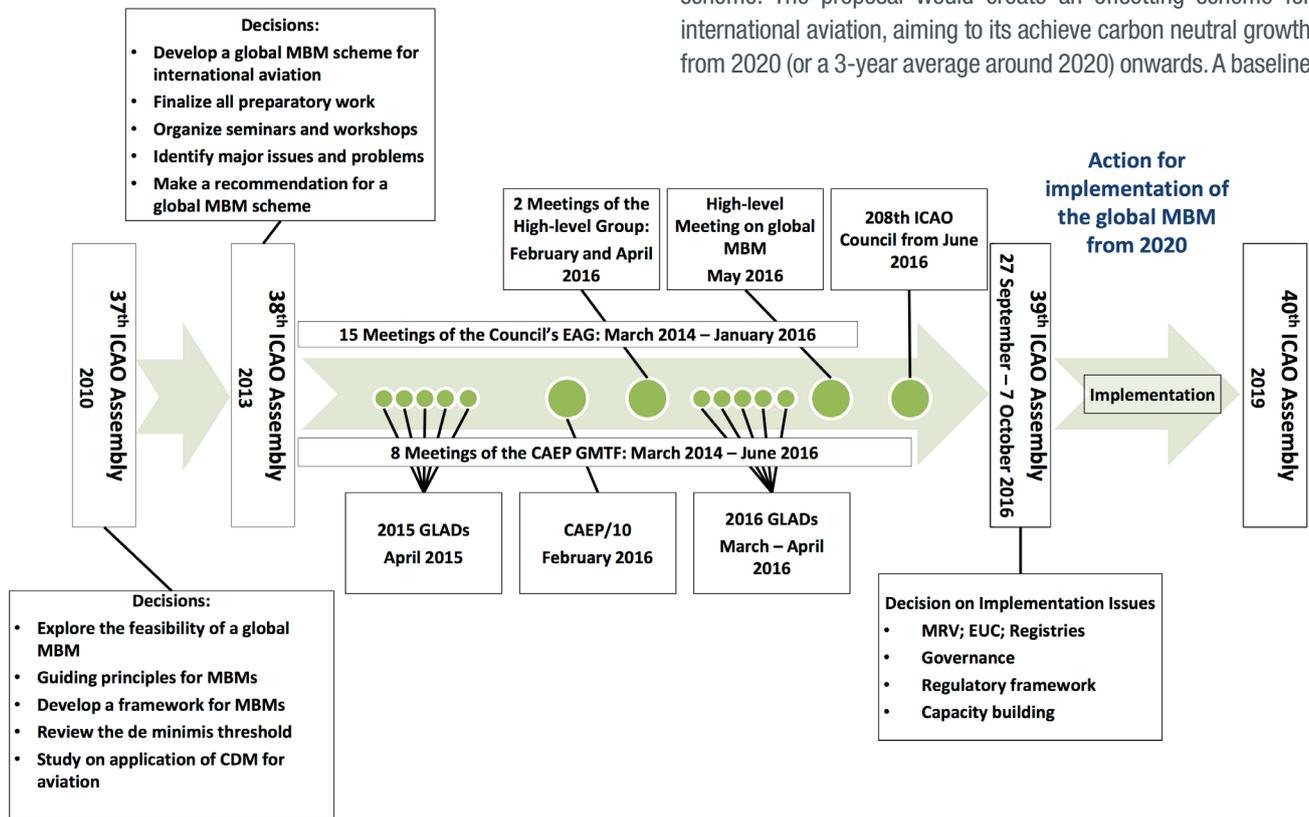
To facilitate the engagement of participants, the GLADs used a unique small-group format to organize thematic dialogue sessions on design elements and implementation aspects of a global MBM scheme. The GLADs also featured an interactive panel discussion with representatives from States, industry, environmental NGOs and financial institutions.

In terms of the outcomes of the GLADs, 2015 GLADs identified major considerations for the design of a global MBM scheme, such as: administrative simplicity, environmental integrity, cost effectiveness, differentiation/non-discrimination, and avoiding excessive cost or administrative burdens. 2016 GLADs highlighted the links between these major considerations identified by 2015 GLADs with the proposed global MBM scheme.

The structure and format of the GLADs successfully familiarized participants with the proposed global MBM scheme; provided opportunities to receive feedback from Member States and relevant organizations; and served as preparation towards the 39th Assembly.

**ICAO’s Proposal for a Global MBM Scheme for International Aviation**

In early 2016, the ICAO Council started to discuss a proposal (in a form of draft Assembly Resolution text) for the global MBM scheme. The proposal would create an offsetting scheme for international aviation, aiming to its achieve carbon neutral growth from 2020 (or a 3-year average around 2020) onwards. A baseline



**Figure 3.** Timeline towards the 39th ICAO Assembly and beyond

## Main Features of the Proposed Global MBM Scheme\*

### Phased implementation

- To accommodate special circumstances and respective capabilities of the States, the proposed global MBM scheme introduces a phased-in implementation, which classifies States in groups with different implementation timelines.
- To further acknowledge States' different capabilities, Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developing States (SIDS) and Landlocked Developing Countries (LLDCs) would be exempted from the scheme
- Nevertheless, States not included in the scheme are encouraged to voluntarily participate in the scheme.

### Route exemptions

- The global MBM would apply to all aircraft operators on the routes between States, both of which are included in the scheme. Provision ensures equal treatment of all operators on the same routes, thus avoiding market distortion between operators.

### Distribution of offsetting requirements

- CO<sub>2</sub> emissions required to be offset by an aircraft operator would be defined by combining operator's emissions growth with a sector-wide growth factor.

### Technical exemptions

- In order to simplify the global MBM scheme and avoid unnecessary administrative burdens, the proposal provides exemptions for small operators, new entrants and special operations, such as firefighting and search and rescue flights.

### Implementation of the proposed global MBM scheme

- The proposal requests ICAO Member States to implement a MRV system, which includes procedures on how to monitor the fuel use, collect data and calculate CO<sub>2</sub> emissions; report emissions data; and verify emissions data to ensure accuracy and avoid mistakes.
- EUC ensures that operators purchase appropriate emissions units from eligible mechanisms, programmes or projects. Reduction of one tonne of CO<sub>2</sub> equals one emissions unit. One example of emissions reduction programmes is the UNFCCC Clean Development Mechanism (see article page 146)
- Registries are a means to check that the operators are in compliance with the global MBM.
- To ensure uniform application of the scheme, the proposal calls for ICAO and Member States to take all necessary actions in providing the capacity building and assistance and to build partnerships to ensure successful implementation of the global MBM scheme.

for international aviation emissions in 2020 would represent the basis against which emissions in future years are compared. The difference between the emissions in any year after 2020 and the baseline would represent the sector's offsetting requirements for that year.

The proposal builds on the progress and feedback from the process since the 2013 ICAO Assembly and considers the need for a global MBM scheme to be simple, cost-effective, ensure environmental integrity, avoid excessive administrative burden as well as accommodate differentiation of States without discrimination.

Once agreed, implementation of the global MBM can begin. The proposal outlines an ambitious timeline for preparing the implementation towards year 2020, and requests ICAO Council to ensure that necessary capacity building and assistance will be in place. ICAO is already identifying partnerships amongst Member states and stakeholders to facilitate provision of technical and financial assistance for ensuring universal implementation of the MRV system and Registries, building upon existing assistance projects in this area.

## Conclusion

ICAO has made tremendous progress in developing a global MBM scheme for international aviation. Subject to the final decision on the design elements by the 2016 ICAO Assembly,

the CORSIA (Carbon Offsetting and Reduction Scheme) would be the first global MBM scheme for a whole sector, and a major step to complement the efforts made by States in the context of the Paris Agreement. Action for the implementation of the global MBM scheme for international aviation from 2020 will start right after the Assembly.

### Sustainable Development Goals



\*Reflects the main features of the proposal as of May 2016. Further updates were expected prior to the 39th Assembly. For final result from the Assembly, please refer to the Green pages in this report's post-Assembly edition.

## References

1. For reference see ICAO 2013 Assembly Working Paper A38-WP/26
2. For a summary of the technical analysis, please refer to ICAO High-level Meeting Webpage: [http://www.icao.int/Meetings/HLM-MBM/Pages/background\\_information.aspx](http://www.icao.int/Meetings/HLM-MBM/Pages/background_information.aspx)
3. For all material considered by the 2015 GLADs and full results, please visit the webpage: <http://www.icao.int/meetings/GLADs-2015/Pages/default.aspx>
4. For all material considered by the 2016 GLADs and full results, please visit the webpage <http://www.icao.int/meetings/GLADs-2016/Pages/default.aspx>
5. For all material considered by the High-level Meeting, please visit the webpage: <http://www.icao.int/Meetings/HLM-MBM/Pages/default.aspx>