



WORKING PAPER

ASSEMBLY — 38TH SESSION

EXECUTIVE COMMITTEE

Agenda Item 17: Environmental Protection

MARKET-BASED MEASURES AS THE FACTOR OF AN INCREASE OF GREENHOUSE GAS EMISSIONS IN THE SECTOR OF INTERNATIONAL CIVIL AVIATION

(Presented by the Russian Federation)

EXECUTIVE SUMMARY

For the last 12 years, the aviation community has discussed intensively issues related to the introduction of the Market-Based Measures (MBMs), which can help, as expected, to reduce the greenhouse gas emissions in the sector of international civil aviation.

ICAO has reached significant progress in a rapprochement of States with regard to all the elements of the “basket of measures”, which are promoting a decrease of CO₂ emissions, except for the provisions related to the MBMs introduction.

This paper presents analysis of MBMs’ negative impact on the capacity of the international civil aviation sector to reduce the volume of CO₂ emission, and in addition, it suggests alternative approaches for the REAL reduction of CO₂ emission in order to avoid catastrophic consequences of the climate change in the near future.

Action: Proposed actions by the Assembly are in paragraph 8.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective C – <i>Environmental Protection and Sustainable Development of Air Transport.</i>
<i>Financial implications:</i>	No additional resources required. Suggested actions can establish a framework for mobilization of additional resources for a long-term system planning and financing of the ICAO’s ecological programs on assistance to the developing States with due consideration of the SCRC principle.
<i>References:</i>	Doc 7300, <i>Convention on International Civil Aviation</i> Doc 9958, <i>Assembly Resolutions in Force (as of 8 October 2010)</i> C-WP/13894, <i>Market-Based Measures (MBMs) – Evaluation of Options for a Global MBM Scheme</i> HGCC/1-WP/8, <i>Three Options for a global MBM Scheme – Quantitative Assessment</i> HGCC/2-WP/10, <i>An Alternative Approach to Applying Market-based Measures to International Aviation</i> Cir 333, AT/190, <i>Global Air Transport Outlook to 2030 and Trends to 2040</i>

¹ Russian translation provided by the Russian Federation.

1. INTRODUCTION

1.1 In 2006, the publicist film “An Inconvenient Truth” appeared on screens. This documentary explains in plain language the scientific and political aspects of the global warming, and its possible serious consequences in the nearest future caused by the growth of anthropogenic emission of carbon dioxide into the atmosphere. The main conclusion of the film is that **the humankind should exert every effort for REAL reduction of CO₂ emissions in order to avoid catastrophic consequences of climate change in the near future.**

2. MARKET-BASED MEASURES AS A FACTOR OF AN INCREASING OF GREENHOUSE GAS EMISSIONS AND DECREASING OF THE FLIGHTS SAFETY

2.1 According to ICAO’s forecast, global annual average growth of passenger traffic volume will be 4.4 % – 4.5 % until 2040 (ICAO Cir 333, AT/190). Even, if to assume that the global aspirational goal of 2 % annual increasing of the fuel efficiency will be reached, by the estimates, based on results of ICAO’s independent experts groups studies, the real volume of the aviation’s CO₂ emissions will increase on the average by 4.8 % annually after 2020 (C-WP/13894, Appendix B):

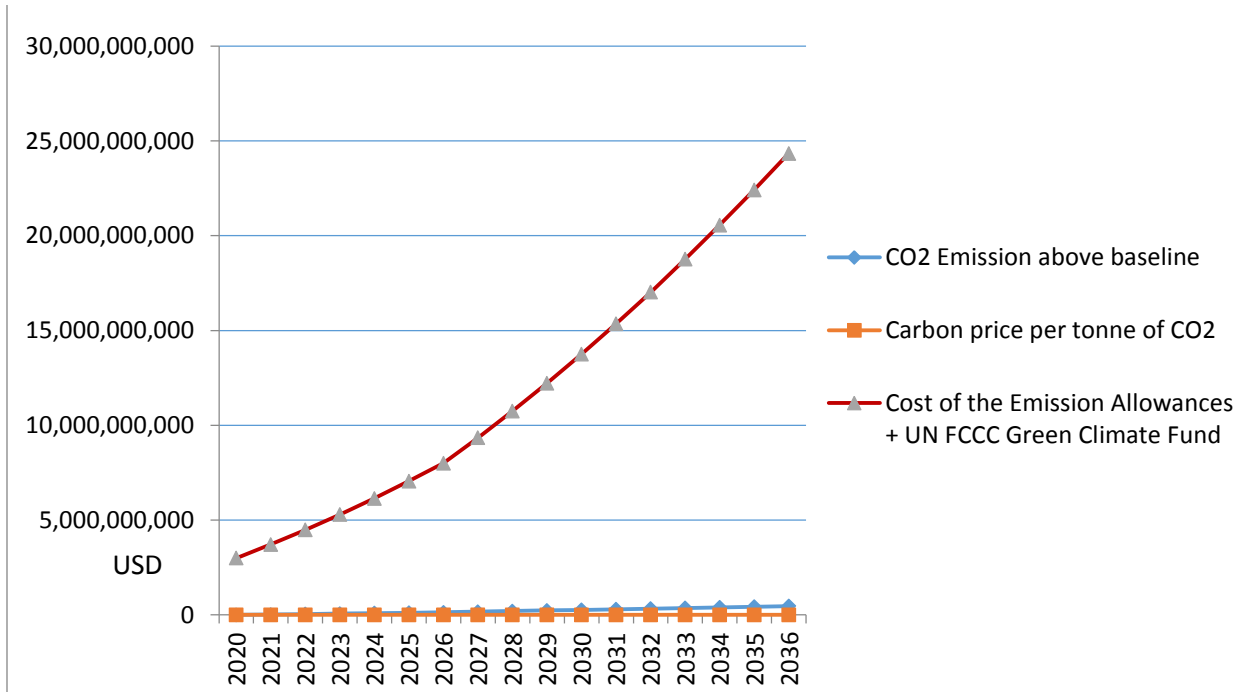
International civil aviation	2020	2026	2036
Volume of CO ₂ emissions (Megatons)	642 Mт	781 Mт	1107 Mт
Above a base line of Year 2020	0	139 Mт	464 Mт

2.2 As it is expected, it will be possible to fill a gap between the global aspirational goal of “a carbon neutral growth” (CNG) after year 2020 and a real ability of the international civil aviation sector on **real** reduction of CO₂ emission by means of market-based measures (MBMs). However, experts concurred that ability of sector for reduction of CO₂ emissions is limited and, irrespective of the scenario of MBMs introduction, 95 % of the “emission’s indulgences” (Emission Allowances – EA) will be bought in open carbon markets outside the international civil aviation sector. It will inevitably entail increase of air transportation cost and “...reduction in demand ranged from 0.35% to 2.52% compared to the RTK level in the absence of a global MBM” (paragraphs 2.3 and 2.4, HGCC/1-WP/8).

2.3 The predicted prices for one ton of the “emission indulgences” will be at the following level (paragraph 1.3, HGCC/1-WP/8):

Carbon markets	2020 год	2030 год	2035 год
The price for one ton of the (EA)	30\$	40\$	45\$

2.4 From data given above it follows that only **for the first 15 years** the sector of the international civil aviation will spend **151.3 billion US dollars** for an “emission’s indulgences” purchase. Thus, the aviation sector will “invest”, at least, 143.7 billion US dollars into "more successful" projects of other industrial sectors. If to add up to these expenses 3 billion US dollars, which are supposed to be an annual aviation contribution to the UNFCCC “Green Climate Fund”, **the cumulative losses of the international civil aviation sector will be equal to 199.3 billion US dollars for the first 15 years after 2020** (see the chart below).



2.5 A number of experts declares that purchasing of an “emission’s indulgences” is more “cost effective” in comparison with investments into industry-specific modernization programs. For example, at the moment it is cheaper to buy the “carbon credits”, rather than buy new aircraft or engines. However, owing to annual increase of a gap between the goal of “Carbon Neutral Growth” and actual increase of volumes of CO₂ emission, as well as a prices’ increase on the carbon markets, sooner or later, the overwhelming number of air transport operators (first of all, in the developing states) will be unable to finance their own modernization programs and, as a result, to do necessary investments into the flight safety programs.

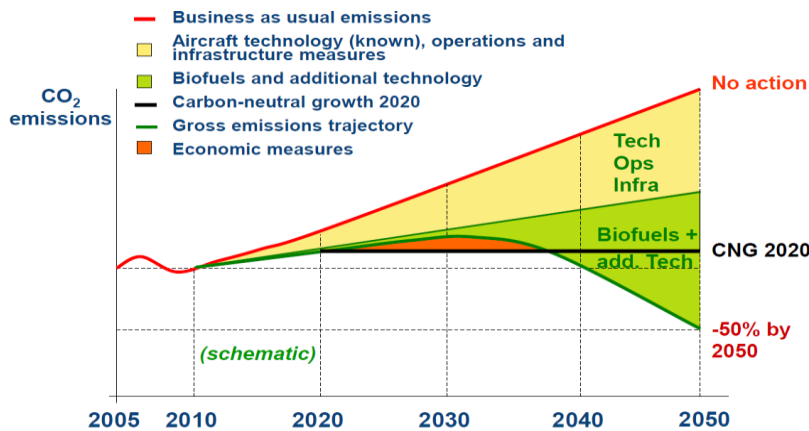
2.6 In view of low profitability of aviation business, it is possible to conclude that market-based measures will have a negative impact on the sector’s ability to make necessary investments into programs of renewal and modernization of aircraft’s fleet, into introductions of new technologies and procedures. **Thus, introduction of MBMs will lead to increasing of CO₂ emission volume in the international civil aviation sector and, as a result, will have a negative impact on the general level of flights safety and on a sustainable development of air transport** (owing to delay of in technical development).

3. ICAO GLOBAL ASPIRATIONAL GOALS AS PART OF A GLOBAL PROGRAMME TO PREVENT THE CATASTROPHIC EFFECTS OF CLIMATE CHANGE

3.1 For the last 12 years ICAO has reached a significant progress in concurrence of member States’ opinions with regard to all elements of the “basket of measures”, which are promoting decrease CO₂ emission, except provisions, related to introduction of MBMs. This, in turn, has caused **undue political tension** between several Member States and their regional associations. The ICAO has spent a considerable amount of time and resources to find mutually acceptable solutions on market-based measures for international civil aviation sector. Despite all efforts, the MBMs issue remains unsolved. Mostly, this is because a solution of this issue is related to the risk of violating the fragile balance of economic and political interests that has been established in the international aviation community over the past decades.

3.2 Even three years ago, most experts believed that market measures would be required for a very short period, after which a carbon-neutral scenario and even 50 % of reduction of emissions will be achieved largely through the use of biofuels.

Industry emissions reduction roadmap



3.3 Despite the significant progress in the field of research and development, as well as vast investments, there are still a number of obstacles which limit the large-scale use of biofuels in aviation in the medium term, namely:

- a) limited production capacity to meet the needs of international civil aviation;
- b) the higher price of biofuels (predetermines the greater economic and environmental efficiency of investments into the renewal of aircraft and engine fleets that provides 10-15 per cent increase in fuel efficiency while increasing the level of flights safety);
- c) low ecological “output factor” (in some cases the total volume of CO₂ emissions in a cycle of biofuels production and its incineration is four times higher of CO₂ volume, which can be absorbed during cultivation of industrial crops);
- d) food security issues against a backdrop of growing world population (according to the UNFPA-United Nations Population Fund in the period from 2011 to 2043 year world population will increase by 2 billion, reaching level of 9 billion);
- e) the need for additional use of scarce water resources for the cultivation of industrial crops and a possibility of an inappropriate land use, including the unjustified reduction of forestland areas;
- f) rising food prices;
- g) lower calorific output of certain types of biofuels compared to fossil fuels (which is also a factor of increasing CO₂ emissions);
- h) some technical problems in the use of biofuels for aircraft engines.

3.4 The abovementioned problems indeed are not the reason to stop researches on the production of the alternative fuels, which can have significant potential for disposal of biological waste, for a proper land use not suitable for growing food crops. At the same time, it would be premature to consider aviation biofuels as a silver bullet that can magically solve all the problems of aviation emissions in the medium term.

3.5 The arguments, mentioned above, lead to the thought that **the need for market-based measures is a consequence of the imbalance between ICAO aspirational goals and genuine ability of the sector to reduce CO₂ emissions.**

3.6 **If the main goal of a global reduction of CO₂ emissions is a prevention of catastrophic consequences of climate change,** it is obvious that the aspirational goals of any industrial sector must meet precisely this task. Thus, **the ICAO global aspirational goals should stimulate a real reduction of CO₂ emissions in the sector of international civil aviation,** precluding the need to use factitious tools to demonstrate imaginary achievements.

3.7 Taking the above into account, it seems appropriate to invite the ICAO Council to revise Global aspirational goals, so that they can contribute to achieving the main goals – actual reduction of CO₂ emissions in the sector of international civil aviation and improve flights safety, as well as “...creating and preserving friendship and understanding among the nations and peoples of the world”. (Preamble of the *Convention on International Civil Aviation* (Doc 7300)).

4. **"DE MINIMIS" PRINCIPLE AS A FACTOR OF STAGNATION FOR DEVELOPING COUNTRIES**

4.1 If putting aside considerations of market distortions related to the application of the “*de minimis*” principle, it seems, at first glance, that its application can create favourable competitive conditions for airlines of developing countries.

4.2 "Life cycle" of modern aircrafts are 20-40 years. It is clear that airlines of developed countries, possessing relatively greater financial resources, will strive (as part of their commitments on emissions reduction) to accelerate the renewal of the aircraft fleet, introduction of new technologies and procedures.

4.3 At the same time, older aircrafts will be offered to airlines in developing countries at relatively lower prices. It is easy to conclude that the “*de minimis*” principle will stimulate further widening of the gap between the levels of scientific-technological development of Countries with different economic potential. If we add to this the absence of a stimulatory environment for the adoption of innovative solutions for aviation sector infrastructure development at the level of Governments, it is evident that **the principle of “*de minimis*” will play the role of a stagnation factor to a large number of developing countries.**

4.4 Slowing the pace of technological development in developing Countries will also have a negative impact on the global result of greenhouse gases emissions reduction in the long term.

5. **STATES' VOLUNTARY ACTION PLANS TO REDUCE EMISSIONS IS A KEY ELEMENT TO ACCOUNT FOR THE PARTICULAR CIRCUMSTANCES AND RESPECTIVE CAPABILITIES OF DEVELOPING COUNTRIES (SCRC)**

5.1 The principle of “Common but Differentiated Responsibilities” (CBDR), which is being slowly replaced by the principle of taking into account the “Special Circumstances and Respective Capabilities” (SCRC), for the vast number of developing Countries is uncompromising starting point in discussions related to the MBMs introduction, while no one of Countries denies the fact **that meeting of global challenges, such as the possible catastrophic consequences of climate change, requires joint and coordinated efforts of all countries.**

5.2 At the same time, economic, scientific and technical potential of some States does not allow them to contribute adequately to the cooperative effort to combat the effects of global warming without targeted technical assistance from other States and international organizations.

5.3 No doubt, that **States' action plans for reduction of greenhouse gases emission should be voluntary**. However, such plans should be considered as a reflection of the political will and good intentions on CO₂ emission reduction of Governments submitting them. The States' action plans will clearly identify the range of issues, which are requiring an appropriate support from the international community. The absence of information with regard to the decisions taken in Countries on emission reduction programs blocks any possibility of providing such technical assistance, which in some cases can be interpreted as a violation of the sovereign rights of the Countries.

5.4 Taking into account stated above, it is appropriate to conclude that the States' voluntary action plans on CO₂ emission reduction is a key element for taking into account particular circumstances and respective capabilities of developing Countries in dealing with the emission issues of international civil aviation sector.

6. **“ECONOMIC INCENTIVES” MEASURES FOR GLOBAL REDUCTION OF CO₂ EMISSIONS AND POSSIBLE SOURCES OF FUNDING OF ICAO'S TECHNICAL ASSISTANCE PROGRAMS FOR DEVELOPING COUNTRIES**

6.1 During discussions, concerning introduction of MBMs, it has always been mentioned that MBMs' has a stimulating impact on the decision-making process, aimed at reduction of CO₂ emissions. However, as it was mentioned earlier, any scenario of MBMs' introduction will have negative impact on the real reduction in greenhouse gas emission.

6.2 While the vast majority of airlines is obviously motivated to reduce the fuel consumption, which takes from 30 to 40% of the operating costs, infrastructure solutions and issues of international trade in the majority of cases is entirely depending on political decisions by the Governments of the States of their Registry.

6.3 In this connection, it would be inappropriate to abandon the incentive role of economic measures that could facilitate the adoption of decisions aimed at real reductions in CO₂ emissions, both at the level of air transport operators and at the level of the Governments of the States of their registration. Such promotion meets the main goal – prevention of the catastrophic consequences of climate change, as well as meets the objectives of flights safety improvement and supports sustainable development of Air Transport. In other words, it is advisable to consider the possibility of replacing the concept of MBMs by concept of, so-called, “economic incentives” measures, which could lay a ground for stimulation of a fuel consumption reduction for air transportation.

6.4 In the previous chapter, the question of technical assistance to developing States in accordance with the principle of the SCRS has been touched. However, the question of the possible sources of funding for such assistance until now remains open. It is obvious that ICAO's regular program budget cannot be such a source, and voluntary contributions of States (in the context of the global economic crisis) do not allow to undertake a long-term system planning of ICAO's environmental technical assistance programs to developing States.

6.5 Thus, the issue of sustainable sources for financing the technical assistance programs is fundamental for the fruitful joint and coordinated efforts of all States in order to prevent the catastrophic consequences of climate change. In this regard, it is appropriate to propose to the ICAO Council to consider the introduction of a global fuel tax, which could be collected by all Countries in favor of the international ecological fund, operating under the control of the ICAO Council, with a view to implement environmental programs approved by the ICAO Assembly.

6.6 There is no doubt that the introduction of such a system of economic incentives would require thorough legal assessment and extensive consultations with ICAO member States. It should be noted, that if, for example, the tax rate will be set at 1 cent per ton of aviation fuel, the international ecological fund will receive approximately 200 million US dollars in the year 2020, which is equivalent to two ICAO annual budgets. Such an approach will not infringe existing balance of economic interests in the international aviation community, would not require additional costly bureaucratic superstructure, both in the States and at the level of the ICAO, and it will allow to introduce the SCRS principle in practice (not theoretically) for developing Countries.

7. THE UNFCCC "GREEN CLIMATE FUND"

7.1 During the discussion of the initiatives undertaken within the framework of the UNFCCC and the ICAO, the ICAO Council has repeatedly expressed concern about the intentions to use international civil aviation as a source of revenue for financing activities relating to climate change in disproportional quantities. As expected, the international civil aviation sector will be obliged to pay 3 billion US dollars annually to the "Green climate fund" of the UNFCCC, established by the decision of 16th meeting of the Conference of the parties to the UNFCCC in the year 2010.

7.2 During the teleconference, held at ICAO in 2012, representatives of the Preparatory Committee for the UNFCCC "Green Climate Fund" did not give clear answers to the questions asked by ICAO Council members with regard to the programs, which are intended to be financed by funds, received from international civil aviation sector.

7.3 At the same time, it should be noted that, according to information of the United Nations Economic Commission for Europe (UNECE), the World Wildlife Fund (WWF) and other organizations around the world forest fires are destroying annually about three million hectares of forestland. As a consequence, the regenerative function of forests is falling, millions of kilowatts of thermal energy together with around 700 million tons of CO₂ are emitting to the atmosphere. All this has a substantial impact on the processes of climate change. In addition, it creates a real threat to the life and health of people in different regions of the world.

7.4 In this connection, it is proposed to invite the ICAO Council to examine (as a reasonable alternative to the participation of international civil aviation in the financing of the UNFCCC "Green climate fund") the possibility to establish under the auspices of UN an aviation's firefighting mobile forces to combat mainly forest fires (by analogy with the creation of the UN peacekeeping forces), which may be considered as an undeniable and significant contribution of international civil aviation in prevention of the catastrophic consequences of climate change.

8. THE ACTIONS OF THE ASSEMBLY

8.1 The Assembly is invited to:

- a) *request* the ICAO Council to revise Global aspirational goals, so that they can contribute: to achieving the actual reduction of CO₂ emissions in the sector of international civil aviation, as the main goal, to further increasing flights safety, to sustainable development of international civil aviation, as well as to the strengthening of cooperation, in order "...to create and preserve friendship and understanding among the nations and peoples of the world";
- b) *request* the ICAO Council to study a possibility of replacing the concept of MBMs by the concept of "an economic incentives" measures in order to achieve a real reduction of CO₂ emissions in the sector of international civil aviation, as well as

meet the objectives of flight safety improvement and promotion of sustainable development of Air Transport;

- c) *request* the ICAO Council to examine the possibility of creation of ICAO's climate fund for a long-term system planning and funding of ICAO's environmental programs aimed at an assistance to the developing States and to the States which are implementing the transition to the market-based economies in line with the principle of the SCRC while taking in account the necessity of a global coordinated effort of all States in front of the catastrophic consequences of climate change;
- d) *request* the ICAO Council to examine the possibility of establishing under the auspices of UN of "an aviation's mobile firefighting forces" as an alternative to participation of international civil aviation sector in the financing of UNFCCC "Green Climate Fund";
- e) *encourage* Member States on a voluntarily basis to submit to ICAO their national action plans for reduction of greenhouse gases emission and to consider such plans as a key element for accounting the particular circumstances and respective capabilities of developing Countries (SCRS) while resolve issues related to a prevention of the possible catastrophic consequences of climate change;
- f) *urge* member States of ICAO to abandon the principle of "*de minimis*" as contributing factor to the further widening of the gap between the levels of scientific and technological development of States with different economic potentials.

APPENDIX

THE CUMULATIVE LOSSES OF THE INTERNATIONAL CIVIL AVIATION SECTOR IN CASE OF A GLOBAL MBMS INTRODUCTION DURING THE PERIOD FROM 2020 TO 2036

(Based on data presented in C-WP/13864)

Year	CO₂ Emission above baseline 2020 (ton)	Carbon price (USD per ton)	Annual cost of the Emission Allowances (EA) (USD)	UNFCCC Green Climate Fund (GCF) (USD)	EA+GCF (USD)
2020	0	\$30	\$0,00	\$3 000 000 000,00	\$3 000 000 000,00
2021	23 166 667	\$31	\$718 166 667,70	\$3 000 000 000,00	\$3 718 166 667,70
2022	46 333 333	\$32	\$1 482 666 668,80	\$3 000 000 000,00	\$4 482 666 668,80
2023	69 500 000	\$33	\$2 293 500 003,30	\$3 000 000 000,00	\$5 293 500 003,30
2024	92 666 667	\$34	\$3 150 666 671,20	\$3 000 000 000,00	\$6 150 666 671,20
2025	115 833 334	\$35	\$4 054 166 672,50	\$3 000 000 000,00	\$7 054 166 672,50
2026	139 000 000	\$36	\$5 004 000 007,20	\$3 000 000 000,00	\$8 004 000 007,20
2027	171 500 000	\$37	\$6 345 500 007,40	\$3 000 000 000,00	\$9 345 500 007,40
2028	204 000 000	\$38	\$7 752 000 007,60	\$3 000 000 000,00	\$10 752 000 007,60
2029	236 500 000	\$39	\$9 223 500 007,80	\$3 000 000 000,00	\$12 223 500 007,80
2030	269 000 000	\$40	\$10 760 000 008,00	\$3 000 000 000,00	\$13 760 000 008,00
2031	301 500 000	\$41	\$12 361 500 008,20	\$3 000 000 000,00	\$15 361 500 008,20
2032	334 000 000	\$42	\$14 028 000 008,40	\$3 000 000 000,00	\$17 028 000 008,40
2033	366 500 000	\$43	\$15 759 500 008,60	\$3 000 000 000,00	\$18 759 500 008,60
2034	399 000 000	\$44	\$17 556 000 008,80	\$3 000 000 000,00	\$20 556 000 008,80
2035	431 500 000	\$45	\$19 417 500 009,00	\$3 000 000 000,00	\$22 417 500 009,00
2036	464 000 000	\$46	\$21 344 000 009,20	\$3 000 000 000,00	\$24 344 000 009,20
The cumulative losses for the period 2020-2036:			\$151 250 666 773,70	\$48 000 000 000,00	\$199 250 666 773,70

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