

## Global Warming Measures in the International Civil Aviation Sector<sup>1</sup>

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### 1. Introduction

At the 2016 General Assembly of the International Civil Aviation Organization (ICAO), the member states agreed on the implementation of global warming measures targeted at the international civil aviation sector. Detailed discussion followed the agreement, and, at the ICAO Council meeting held in Montreal in June 2018, specific standards and procedures were adopted.<sup>2</sup>

As the formal documents concerning the specifics adopted this time are yet to be disclosed, we are not in a position to closely examine the details; however, through a series of press releases following the ICAO Council meeting, it has come to light that the adopted standards and procedures were the result of fierce negotiations among member states.

The adopted standards and procedures are only for the limited implementation of measures (monitoring, reporting, and verifying emissions). Other issues, the standards for what is called credit trading, a mechanism allowed for offsetting emission increases, or the standards for biofuels allowed for inhibiting emissions, were left for future deliberations.

This article first focuses on the history of global warming measures taken in the civil aviation sector and briefly reviews those implemented within the ICAO framework. Then, we review the position of each member state reflected in the ongoing discussions through publicly available materials.

Lastly, based on the current situation, we consider the future development of the discussions. At present, two different positions are conflicting with one another: the European Union (EU) arguing that an internationally agreed-upon and strictly controlled credit trading mechanism be created and China requiring greater discretion of the member states. However, in consideration of the possible consequences on global warming negotiations at the UN, this conflict is expected to be resolved through a certain compromise by the EU.

### 2. History of Global Warming Measures

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<sup>1</sup> This article was written in August 2018, therefore, it doesn't reflect the results of COP24 of UNFCCC.

<sup>2</sup> The General Assembly (held once every three years) attended by all member states serves as the decision-making body of the ICAO. Following decisions made in the General Assembly, the ICAO Council (held three times a year) consisting of 36 countries elected from the member states deliberates on specific measures for adoption.

As the international civil aviation sector is not regulated by the United Nations Framework Convention on Climate Change (UNFCCC), the ICAO has been expected to implement its own emission reduction measures. However, it has been unable to implement any emission reduction measures because of the different views of the member countries. Under such circumstances, in 2008, the European Union decided to include the civil aviation sector in its own emissions trading scheme, called the European Union's Emission Trading System (EU ETS), which is administered in the EU. Consequently, aircraft operators, not only EU operators but also non-EU operators with flights leaving and landing in the EU are now subject to these rules and regulations, if they meet criteria.

This met with strong opposition from non-EU countries. In 2012, various news media reported that countries including the United States, China, India, and Russia strongly opposed the EU's decision. In particular, China urged the EU to reconsider the decision, implying that it might cancel aircraft orders that it had placed with Airbus Industries.<sup>3</sup> Following the agreement made in the 2012 ICAO Council meeting that the introduction of a market mechanism for CO<sub>2</sub> emission reduction should be considered, the EU announced in November 2012 that flights originating in non-EU countries would be temporarily exempted from the EU ETS regulations.

### 3. Global Warming Measures within the ICAO Framework

#### (1) Background of Introduction of the Market Mechanism

In light of the EU's unilateral decision that all aircraft operators from the ICAO countries be subject to the EU ETS, the ICAO itself began deliberations on global warming measures.

In 2012, the ICAO Council decided to approach this problem from two different angles: starting discussions on setting the CO<sub>2</sub> base emissions for aircraft and establishing voluntary goals for improving fuel efficiency by 2% every year.<sup>4</sup>

Furthermore, at the General Assembly held in 2013, the ICAO adopted a resolution demanding that yearly emissions from the international civil aviation sector after 2020 be no greater than the 2020 level. It also decided that a market mechanism would be introduced to achieve this goal, and that discussions on the specific procedures would be continued for final approval at the 2016 General Assembly.

Discussions continued following the 2013 decisions, and, in 2016, the ICAO General Assembly approved the introduction of the Carbon Offsetting and Reduction Scheme for International Aviation, or CORSIA, which is a global warming measure incorporating a market mechanism in the international civil aviation sector.

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<sup>3</sup> BBC "China 'blocks Airbus deals' in EU carbon levy spat," March 8, 2012.

<sup>4</sup> In March 2017, the ICAO Council agreed on the CO<sub>2</sub> base emissions for aircraft, which will be applied as of 2023. Production of any aircraft not conforming to this standard will be banned as of 2028. ICAO News release, March 6, 2017.

## (2) Outline of CORSIA

CORSIA mandates that airlines operating international flights maintain CO<sub>2</sub> emissions of the international civil aviation sector as of 2020 at the base year level (the average of 2019 and 2020 emissions). It also requires that if an operator cannot limit its emissions on the base year level, the operator must offset the increment by credits obtained from emission reduction projects implemented in other industrial sectors.

For the period from 2021 to 2026, the CORSIA regulations will start applying to operators from member states that have expressed their intention voluntarily to participate to the scheme. As of January 2018, as many as 73 countries have expressed their intention to do so. Among them are the United States and China, and it is expected that as much as 87% of the international civil aviation sector will be subject to the CORSIA regulations.

Table 1. Outline of CORSIA

Outline of the regulations	<ul style="list-style-type: none"> <li>The objective is to control emissions within the base year level (emissions averaged over 2019–2020) by allowing a market mechanism to achieve the objective as of 2021. Offsetting requirements will be set.</li> <li>In principle, the offsetting requirements will be determined from the relevant operators' yearly emission multiplied by the emission growth factor. How to determine the offsetting requirements and the growth factor will differ for different phases.</li> </ul>
Regulated operators	<ul style="list-style-type: none"> <li>The regulations are voluntary for 2021–2026. In principle, operators from all member states will be regulated as of 2027. Operators from Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developing Countries (LLDCs) will be exempted from the regulations unless they express their intention to participate voluntarily.</li> <li>Flights for which the origin or destination lies outside the regulatory boundaries are exempted from the regulations.</li> </ul>
Future schedule	
2021–2023	Pilot phase <ul style="list-style-type: none"> <li>Voluntary participation.</li> <li>Each country is given options for calculating its offsetting requirements.</li> </ul>
2024–2026	1st phase (voluntary participation) <ul style="list-style-type: none"> <li>Voluntary participation.</li> <li>Offsetting requirements and growth factors are calculated by a predetermined method.</li> </ul>
2027–2035 (2027–2029) (2030–2032) (2033–2035)	2nd phase (mandatory participation) <ul style="list-style-type: none"> <li>Mandatory participation with the exception of operators of countries for which the revenue ton kilometers (RTK) is greater than 0.5% of the 2018 total global RTK or countries that are ranked among the accumulative top 90% of the 2018 total global RTK.<sup>5</sup></li> <li>In the 2nd phase, the growth factors are reviewed every 3 years.</li> </ul>
Compliance period	3 years

<sup>5</sup> Revenue ton kilometer (RTK) refers to the weight (tons) of the commercial cargo transported multiplied by the distance flown (kilometers).

Compliance methods	<ul style="list-style-type: none"> <li>• Improvement of energy efficiency (introduction of energy-efficient aircraft; improvement of flight operations)</li> <li>• Introduction of biofuels</li> <li>• Utilization of offset credits</li> </ul>
Means for determining offsetting requirements and growth factors	<ul style="list-style-type: none"> <li>• Pilot phase Either of the following will be chosen as the offsetting requirements:                             <ol style="list-style-type: none"> <li>a. The operator's total yearly emissions multiplied by the total emissions growth rates of the applicable flights.</li> <li>b. The 2020 emissions multiplied by the total emissions growth rates of the applicable flights.</li> </ol> </li> </ul>
	<ul style="list-style-type: none"> <li>• 2nd phase and first three years of 3rd phase (2027–2029) Yearly emissions of the regulated operators multiplied by the total emissions growth rates of the applicable flights.</li> </ul>
	<ul style="list-style-type: none"> <li>• 3rd phase (2030–2032) Yearly emissions of the regulated operators multiplied by the composite factor of the total emissions growth rates of the applicable flights (80% weight) and the emissions growth rates of the applicable flights of individual operators (20% weight).</li> </ul>
	<ul style="list-style-type: none"> <li>• 3rd phase (2033–2035) Yearly emissions of the regulated operators multiplied by the composite factor of the total emissions growth rates of the applicable flights (70% weight) and the emissions growth rates of the applicable flights of individual operators (30% weight).</li> </ul>

(Source) Compiled by the Institute of Energy Economics, Japan.

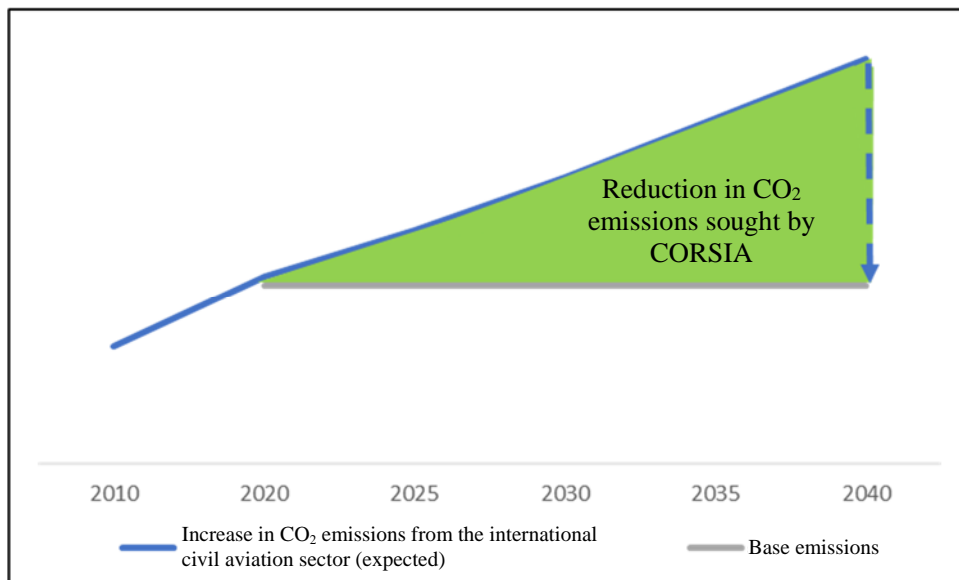


Figure 1. Reduction in CO<sub>2</sub> emissions expected within CORSIA framework (conceptual)

(Source) Drawn by the author based on ICAO material.

As to the reduction in CO<sub>2</sub> emissions from the aviation sector, since the effect of efficient flight operations to save fuel or the introduction of fuel-efficient aircraft is limited, the aircraft operator has

difficulty to control emissions below the 2020 level, without an engine which does not emit CO<sub>2</sub>, even reduce CO<sub>2</sub> emissions drastically.

However, since there are no such alternative energies that are currently commercially available, there is no choice but to offset emissions growth by utilizing an offset credit trading scheme for the time being. For this reason, it is expected that much of the compliance with the CORSIA regulations will be derived from credit trading.<sup>6</sup>

### (3) Consideration of Standards for the Implementation of CORSIA

CORSIA is a framework in which the government of each of the member states imposes regulations on the domestic aircraft operators under its control in accordance with the standards and procedures laid out by the ICAO. In the agreement made in October 2016, the standards and procedures needed for the implementation of CORSIA were to be decided at the ICAO Council meeting to be held in 2018.

The standards and procedures to be decided included: (1) credit trading systems to be utilized within the CORSIA scheme; (2) biofuel standards; (3) procedures for monitoring, reporting, and verifying emissions (MRV) that are needed to implement the regulations; and (4) specifics for establishing a registry for credits earned and transferred. These specific standards and procedures were to be adopted as the Standards and Recommended Practices (SARP) for the international civil aviation sector.<sup>7</sup> The member states of the ICAO are required to base their decisions regarding their aviation regulations on the standards adopted as the SARP. If a member state finds it difficult to conform to CORSIA, it may be exempted from the scheme by filing an appeal explaining “difference” with the domestic systems.

During the deliberations on SARP for the implementation of CORSIA, it was brought to attention that some member states might file an appeal for “difference” related to the standards for usable credits. Accordingly, it was is clear whether or not CORSIA could be implemented according to the globally agreed-upon standards and procedures.

## 4. Conflicting Opinions Surfacing among Member States

### (1) Standards Adopted in the ICAO Council

Following the 2016 agreement, the ICAO deliberated on the implementation rules for CORSIA. In June 2018, based on the results of the deliberation, the ICAO Council adopted, as the SARP, the implementation rules for CORSIA, which are the global warming measures of the international civil

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<sup>6</sup> According to the provisional calculation published by the ICAO in January 2016, the demand for offset credits is expected to be approximately 3.3–4.5 billion tons for 2021–2035. According to the documents for the Clean Development Mechanism (CDM) of the Kyoto Protocol published in October 2017, the demand is expected to be approximately 2.5–2.8 billion tons.

<sup>7</sup> Stipulated in Article 38 of the Chicago Convention, according to which the ICAO was established.

aviation sector.

However, the rules adopted as the SARP were limited to specific methods for monitoring, reporting, and verifying (MRV) emissions (CO<sub>2</sub> Estimation and Reporting Tool, CERT). Standards and recommendations regarding biofuels or credit trading, both of which would be allowed within CORSIA, were not adopted; these pending issues will be discussed in the future.

Since the results of the deliberations have not been disclosed, details of the standards and recommendations that were adopted this time are not known although some information has been reported by the media such as newspapers. According to one report, a certain system seems to have been approved, in which the CO<sub>2</sub> emissions from the fuel have been reduced during its oil refining process (through the use of renewable energies in the refining process, for example), and the emission offset credits generated in this refining process could be incorporated when calculating the CO<sub>2</sub> emissions from the combustion of said fuel. Although the details of this system are yet to be confirmed, the report stated that the system was proposed by Saudi Arabia with the support of the United States.

On the other hand, since this system leaves room for utilizing oil in the future, environmental NGOs or government officials who were involved in the deliberations are questioning whether or not CORSIA will be able to function properly as a global warming measure.<sup>8</sup>

## (2) China's Negotiation Tactics

Another major concern is uncertainty relating to China. More than one media outlet reported that China expressed its intention not to voluntarily participate in the CORSIA regulations scheduled from 2021 during the course of negotiation<sup>9</sup>. As mentioned earlier, China, together with the United States, originally expressed its intention to participate. However, this is now likely to be delayed until 2027 and beyond, when participation becomes mandatory. As an official statement has not been released yet, this development has not been confirmed. However, according to one report, China has already officially informed the ICAO that it will not voluntarily participate in the CORSIA regulations. If this is true and China does not participate, the target reduction by CORSIA will reach only 75% of its original goal.

Some media outlets report that China's attitude is just one of its negotiation tactics. They say that the Chinese government has stated its position since the beginning: offset credits that are recognized within CORSIA should be determined at its own discretion, not by any international standards, and that China simply wants its wishes reflected in the agreement.<sup>10</sup> It seems that the Chinese government is trying to make its own CCER<sup>11</sup> credit system based on an offset mechanism that

<sup>8</sup> Reuters, "UN aviation agency may include fossil fuels in emissions deal: sources," June 16, 2018.

<sup>9</sup> Reuter, "China no longer participating in start of aviation emissions deal," July 5, 2018, etc.

<sup>10</sup> See Footnote 7.

<sup>11</sup> China Certified Emissions Reduction. In 2012, the Chinese government established a voluntary emissions

China is operating on its own, recognizable within CORSIA. However, many countries are in favor of establishing international standards that are different and stricter than those of China, and China may just be checking those who are taking different positions by requesting the deletion from the list of countries voluntarily participating in the CORSIA regulations.<sup>12</sup>

### (3) Growing Dissatisfaction in EU

On the other hand, some who are in favor of stricter standards for credit trading express concerns about the future development.<sup>13</sup> In March of this year, the EU presented its view that the credit trading scheme should be applied as legally binding standards. Furthermore, the EU demands that the following conditions be laid out for credits recognizable within CORSIA<sup>14</sup>:

- Credits should originate from projects that started on and after January 1, 2017;
- Credits should be for real, additional, permanent, verified reduction of CO<sub>2</sub> emissions;

The mechanism contemplated by the EU is not clear. However, the EU recognizes that: (1) existing offset mechanisms such as the Clean Development Mechanism (CDM) established within the framework of the Kyoto Protocol involve many problems; and (2) credits should be limited to those that have been issued and verified in accordance with strict rules in order to achieve the goal set by CORSIA.<sup>15</sup>

In this context, sources in the European Parliament are expressing strong concern about China's negative stance toward the establishment of internationally agreed-upon and strict standards.<sup>16</sup> Furthermore, frustrated by the sluggish progress by the ICAO, some European Parliament members are proposing that the EU ETS needs to apply to non-EU airline operators as a stricter measure.

Contrary to the growing concerns and dissatisfaction toward the development led by the ICAO in the European Union, the European Commission, which conducts negotiations, welcomed the agreement reached by the ICAO this time. It seems that the European Committee will continue trying to talk China into voluntarily participating in the CORSIA regulations through negotiations.

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reduction project system, under which credits are issued for offset projects carried out in China. CCER refers to these credits.

<sup>12</sup> Immediately after the 2016 ICAO General Assembly, in which the implementation of CORSIA was adopted, the Chinese government officially expressed its intention to withhold itself from the paragraph in the ICAO resolution on CORSIA, which specified that the standards and procedures for offset credits recognizable within CORSIA be decided at the General Assembly. China's intention to decide the offset credits at its own discretion was apparent from the beginning.

<sup>13</sup> ENDS Europe, "UN agency reaches 'flawed' deal on aviation CO<sub>2</sub>," June 28, 2018.

<sup>14</sup> Letter dated March 1, 2018 from the EU to the Secretariat of ICAO (State Letter AN1/17.14-17/129: Agreement with Comments).

<sup>15</sup> In the Kyoto Protocol, developed countries are allowed to use credits that have been generated from emission reduction projects carried out in developing countries to achieve their emission reduction goals. This scheme is called the Clean Development Mechanism (CDM), within which as much as approximately 1.9 billion tons of credits have been issued so far. Other credit issuing systems have already been introduced, but the CDM has issued the largest amount of credits so far. However, there are some reports questioning whether or not the CDM is actually contributing to the reduction of CO<sub>2</sub> emissions. See the following document: Martin Cames et al. (2016). *How additional is the Clean Development Mechanism?* Institute for Applied Ecology.

<sup>16</sup> ENDS Europe, "UN agency reaches 'flawed' deal on aviation CO<sub>2</sub>," June 28, 2018.

## 5. Future Developments

### (1) Arduous Negotiations to Come

As discussed so far, different countries have different opinions about the details of implementing CORSIA, with no consensus reached on the principal measure to achieve its goals or the standards for credit trading and biofuels, which should be recognized within CORSIA.

There is a fundamental difference in thinking between China, which wants to award credits to be recognized under CORSIA at its own discretion, and the EU, which demands that internationally agreed-upon strict standards be established. Furthermore, the EU's position also differs widely from that of Brazil, which requires to use the current CDM under the Kyoto Protocol as the current system without no modification. These differences among countries on various issues make negotiations among member states further complicated.<sup>17</sup>

The United States, which withdrew from the Paris Agreement, has expressed its intention to remain within CORSIA. However, there are concerns that if China officially declares that it will not participate in voluntary adherence to the CORSIA regulations, the United States may change its current policy. Moreover, there is some speculation that India and Russia, too, will put off their voluntary participation in the CORSIA regulations, increasing the uncertainty over how many countries will support CORSIA beyond 2021.<sup>18</sup>

Another reason for this difficulty in reaching an agreement for CORSIA among member states is the growing conflict among countries under the UNFCCC. Presently, the parties to the UNFCCC are negotiating about the market mechanism under the Paris Agreement after 2020. However, due to differences in opinion, there is no prospect of reaching an agreement<sup>19</sup>.

In particular, although the CDM is considered the biggest supplier of credits to the demand of CORSIA, the respective opinions of the countries vary greatly. For example, Brazil argues that the current system should be maintained beyond 2020 while the EU is at odds with Brazil, saying that the system itself should be abolished. There are a number of voices questioning the capacity of the CDM to reduce GHG emissions within the EU, thereby affecting the deliberations on credit trading under CORSIA.

### (2) Possibility of Compromise by EU

On the other hand, some in the EU demand that the EU ETS be expanded to non-EU aircraft operators. In the event of such expansion, a serious conflict would likely occur between the EU and

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<sup>17</sup> Climate Home, "Operators eye massive carbon handout," June 28, 2018.

<sup>18</sup> "Mayday: Weak ambition, Chinese backtracking threaten future of CORSIA global aviation offset scheme," June 29, 2018.

<sup>19</sup> As results of negotiation in COP24, parties agreed to continue their negotiation to next year, COP 25.



the non-EU countries, and thus the EU is highly unlikely to take such drastic action.

Such action could trigger the disintegration of CORSIA; surely the EU does not want to bear the brunt of criticism for letting CORSIA fall apart by taking hasty, inconsiderate action. Moreover, given the difficulties with international negotiations on the implementation rules of the Paris Agreement, it is doubtful that the EU would make a decision that completely alienates itself from China. When Chinese operators were subject to the EU ETS in the past, the Chinese government suggested that it might cancel aircraft orders that it had placed with Airbus.

Furthermore, China could file for “differences” recognized in the Chicago Convention (Convention on International Civil Aviation) so that they would be able to apply different standards to Chinese operators compared to those of the SARP adopted by the ICAO. Therefore, even if internationally agreed-upon standards are established, if China does not agree, it can always resort to filing for “differences.” Accordingly, we conclude that although the EU could continue to persistently argue its position in future negotiations, it would ultimately be forced to make a compromise if reaching an agreement is its top priority.

## 6. Conclusion

Although the negotiations are proceeding with difficulties as described above, the possibility of a breakdown is small at present, but it is not clear when a consensus on the standards will be reached.

This prolonged uncertainty about the agreement may imply troubles in future, in particular, the implementation of CORSIA. This is because such difficulties could affect the development of projects that generate credits for achieving the goals of CORSIA, thereby defying the project development efforts. It is expected that such credits would potentially be generated in a sufficient volume. However, if it remains unclear which credits would be recognized under CORSIA, the project development could be delayed, resultantly suppressing the supply of credits.<sup>20</sup> This is true for biofuel production. If the situation continues for too long, where no one knows the standards for which biofuels are acknowledged and which are not, then the production of biofuels to be used for achieving the CORSIA goals could be delayed as well.

To achieve the objectives of CORSIA, limiting the increase of CO<sub>2</sub> emissions from international civil aviation sector, it is preferable to reach an agreement without delay regarding the standards for credit trading and biofuels. However, as mentioned previously, the interests of each country are

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<sup>20</sup> Provisional calculations of an expected volume of credits to be used to achieve the CORSIA objectives have been done. In these provisional calculations, the credits mainly come from CDM projects carried out under the Kyoto Protocol. According to the calculations, the supply of credits is expected to greatly surpass the expected demand. However, many of the calculations are based on optimistic assumptions such as those including credits that would come from new development projects to be started in and after 2020; it is unclear whether or not such ample supply of credits should be generated in the first place. See the following documents: Martin Cames (2015) *Availability of offsets for a global market-based mechanism for international aviation*. Institute for Applied Ecology; Rob Bails, Derik Broekhoff, and Carrie M. Lee (2016) *Supply and sustainability of carbon offsets and alternative fuels for international aviation*. Stockholm Environmental Institute.

complexly intertwined, making it hard to predict when, if at all, an agreement will ever be reached.

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