Setting Long-term Decarbonization Goals in the Airport Industry

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1. Introduction

One of the most important global issues requiring international response is climate change, and this includes decarbonization. Efforts are being made to address this challenge in all industries, and the aviation industry is no exception. The aviation sector is said to account for about 2% of the world's carbon dioxide emissions.[1] Although that percentage is by no means large at this time, due to an increase in traffic volume as well as decarbonization in other fields, the ratio of the aviation sector's emissions to the total amount of global emissions is expected to increase. Recently, under the leadership of the International Civil Aviation Organization (ICAO), efforts such as promoting the introduction of carbon offsets and actively using Sustainable Aviation Fuel (SAF) are underway.[2] The aviation sector includes airport activities, but it is said that carbon dioxide emissions at airports account for only about 2% of the emmisions for that sector. However, airports around the world are also making various efforts to achieve sustainable growth, and the International Airports Council (ACI), an international industry group representing airports around the world, has recently announced a long-term policy in the airport industry. They set a specific decarbonization target and published it together with a research report that analyzed its feasibility.This paper will look at how the airport industry is striving for decarbonization by reviewing the contents of that research report.

2. Long-term Decarbonization Goals of the Airport Industry

As a global approach to climate change in recent years, the Paris Agreement was reached at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21) in 2015. The goal was to "promise to keep the world average temperature rise to 2 degrees Celsius from the pre-industrial level, and pursue efforts to keep this temperature rise to 1.5 degrees Celsius."[3] In addition, the 2018 Intergovernmental Panel on Climate Change (IPCC) special report called for a significant reduction in global carbon dioxide emissions, which has boosted momentum in the airport industry.[4] Prior to ACI headquarters, the ACI EUROPE announced its commitment to net zero carbon.[5] In response, at the 60th General Assembly of ACI held in October 2019, it was agreed to conduct an investigation for airport goal setting and to determine long-term objectives.

In February 2020, ACI outsourced the investigation to ICF/Airbiz and conducted the following studies:

(1) Corresponding the "IPCC Special Report on Global Warming at 1.5 ° C" published in October 2018, to ACI

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[1] p44, 『Market Forecast for Commercial Aircraft 2020-2039』 (Japan Aircraft Development Corporation) (http://www.jadc.jp/files/topics/157_ext_01_0.pdf)

[2] ICA Website (https://www.icao.int/environmental-protection/Pages/default.aspx)

[3] Ministry of Foreign Affairs Website (https://www.mofa.go.jp/mofaj/ic/ch/page1w_000119.html)

[4] Ministry of the Environment Website (https://www.env.go.jp/press/106052.html)

[5] ACI Europe Website (https://www.aci-europe.org/netzero)

member airports' proposed long-term decarbonization goals and the feasibility of net zero carbon targets.

(2) Analyzing the feasibility of global decarbonization targets for ACI member airports by 2050.

(3) Taking into account regional differences due to size, geographic location, political situation, and the challenges faced by each airport, developing the right path and the resources and costs needed to achieve this goal.

(4) Identifying the challenges airports will face in different regions and make industry-level recommendations on how to overcome them.

After completing the studies, on June 8, 2021, ACI made the following announcement of the long-term decarbonization targets for member airports.[6]

"ACI member airports at a global level commit to reach Net Zero Carbon emissions by 2050 and urge governments to provide the necessary support in this endeavour."

This target is limited to carbon dioxide emissions that the airport operator is directly or indirectly responsible for, and does not include, for example, emissions from aircraft operations. In addition, this goal is not enforced by ACI, but is positioned as a goal voluntarily adopted by each airport. ACI, in consultation with regional and global member airports, reflects the latest policies, regulatory changes, technological advances, market conditions, scientific evidence, as well as the experiences and expectations of the general public and stakeholders. The target will be reviewed and updated every five years.

According to the aforementioned study, most airport operators generally attribute the largest cause of carbon dioxide emissions to purchased electricity generated off-site. In the report, emissions from sources owned or controlled by the airport operator (including combustion in boilers, power generation facilities at airports, emissions from

vehicles at airports) are referred to as "Scope 1". It is not possible for the airport operator to directly control the reduction of the carbon strength of the power grid, which is classified as "Scope 2" (purchased electricity generated off-site.) Other emissions sources included in Scope 1 will also require funding availability, supportive business models and advanced technical solutions, so airports recognize that in order to meet their goal of net zero carbon emissions by 2050, they will need the support and cooperation of governments and other stakeholders.

3. Decarbonization Target Proposal Study

The decarbonization target proposal study was carried

Figure 1: Four tasks for advancing decarbonization goals
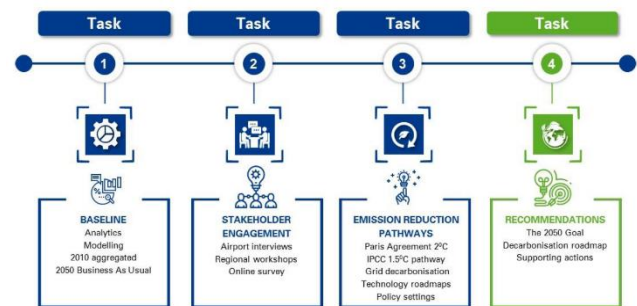
out according to the four tasks shown in Figure 1 below.

First, Task 1 investigated the sources and amounts of carbon dioxide emissions at airports, and evaluated the feasibility of cutting or reducing emissions in line with the goal of "zero carbon dioxide emissions". In Task 2, a wide range of data and views were collected from the CEOs of ACI member airports, and were examined in consideration of differences in regions and airport sizes. Task 3 set the path for emission reduction, and Task 4 provided a roadmap for achieving the long-term goals mentioned above including recommendations for actions to be implemented.

According to Task 1, in the baseline year of 2010, carbon dioxide emissions translated to 18.6 million tons, with 10.3% of emissions attributed to scope 1 emissions and 89.7% attributed to scope 2 emissions. From 2010 to 2019,

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[6] ACI World Press Release（https://aci.aero/news/2021/06/08/net-zero-by-2050-aci-sets-global-long-term-carbon-goal-for-airports/)

traffic volume increased significantly, but the absolute emissions of Scope 1 and Scope 2 decreased slightly to 18.4 million tons. In 2020, airport carbon dioxide emissions were significantly reduced due to the impact of reduced air transport demand and activity associated with the COVID-19 pandemic. These emission reductions, however, are temporary and in the future emissions are predicted to rise again to near 2019 levels as air traffic activity recovers over the next few years. If airports do not take any further action, Scope 1 and Scope 2 emissions are expected to reach 24.9 million tons by 2050 due to recovery from the pandemic and expected longer-term increases in airport traffic activity.

Based on the evaluation of emission sources and quantities in Task 1, and the data collected from ACI member airports in Task 2, the following three pathways for emission reduction were posed in Task 3.

● 2℃
● Temperature considerably lower than 2℃
● 1.5℃ (ideal) This is in line with the recommendations in the IPCC Special Report to prevent catastrophic and irreversible climate change.

This is in line with the Paris Agreement and the IPCC's scientific recommendation to "Keep the average value of global warming below 2 ° C and below 1.5 ° C." In addition, these warming restrictions will be translated into intermediate reduction targets for 2030 and 2040 and long-term carbon targets for 2050. In order to achieve those targets, it was stated that the following emission reductions would be necessary, relative to 2010:

● Reduction of 25% (2 ℃) to 45% (1.5 ℃) by 2030
● Reduction of 48% (2 ℃) to 73% (1.5 ℃) by 2040
● Reduction of 70% (2 ℃) to 100% (1.5 ℃) by 2050

In Task 4, recommended actions to be implemented by ACI and ACI member airports, governments and other stakeholders to acheive these decarbonization goals are presented, including emission reduction measures (Fig. 2), and scenarios of what measures should be taken and to what extent (Fig. 3).
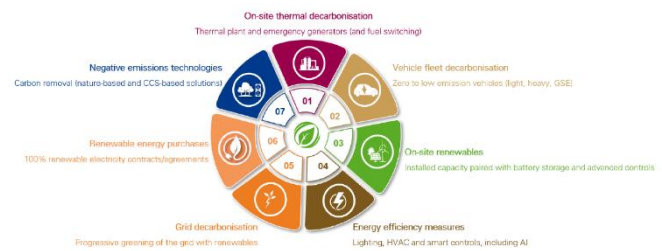

Figure 2: Emission reduction measures

(1) On-site thermal decarbonisation
(2) Vehicle fleet decarbonisation
(3) On-site renewables
(4) Energy efficiency measures
(5) Grid decarbonisation
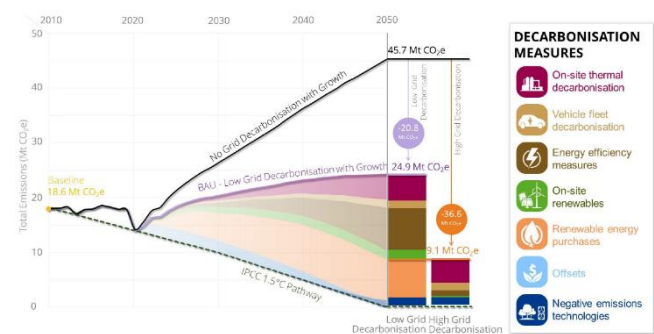(6) Renewable energy purchases
(7) Negative emissions technologies

Figure 3: Roadmap for decarbonization

Recommended actions to be taken toward decarbonization

ACI and ACI Member Airports

(1) Adopt common goals among ACI member airports and regularly review their feasibility.

Adopt the proposed goals and the recommendations that support them. This goal and the actions and recommendations that support it will be reassessed every five years, or at the very least in 2030 and 2040. It will be reevaluated for its feasibility and any necessary adaptations and additional support needed by member airports and countries will be identified.

(2) Establishing a voluntary mentorship program

Strengthen industry-wide knowledge sharing and

capacity building activities, and share good practices, especially regarding energy and carbon dioxide management. Airports that have reached a high maturity in carbon management will be invited by ACI to inform and support airports that are evolving their carbon management programs through webinars and other forums.

(3) Engagement strategy and toolkit development

Develop the following information packages and toolkits for ACI, each airport, and their CEOs:

a. Communicate and promote the airport's long-term decarbonization goals in all regions of ACI.

b. The airport will send a consistent message both inside and outside the industry, especially to the state and the general public, causing wide recognition of the industry's attention on and future aspirations for climate change measures and decarbonization.

c. Provide concrete steps to reinforce the benefits of decarbonization and promote an open, comprehensive low-carbon future that all airports can aim for.

d. ACI will work with multilateral development banks, infrastructure investment banks, governments, insurance companies, investors and industry to enhance the access to and flow of airport green finance and promote investment in technology that reduces and eliminates carbon emissions.

(4) Voluntary airport action plan formulation

Assist airport actions and collect relevant information and knowledge, including capacity building and identifying locations in need of assistance. This plan will help show the progress and outcomes of the airport industry towards long-term decarbonization goals, and be used to reassess the feasibility of the goals and any necessary adjustments.

(5) Hold a low-carbon airport symposium biannually

ACI, along with member airports and other key aviation and non-aviation stakeholders, will hold an event to promote constructive dialogue about climate change and carbon dioxide management issues, including each airport's outcomes and the drivers and challenges they face

in their long-term decarbonization goals.

(6) Support for cost-effective analysis research to promote innovative business solutions

Within the budget, ACI can partner with other organizations and businesses to analyze the net profits for airports to decarbonize in a cost-effective and sustainable manner. This kind of research supports evidence-based decision making and the introduction of renewable energy systems and low-carbon technologies.

(7) Establishment of a Global Sustainable Airport Roundtable

ACI has established a group of airport leaders in each region of ACI, including, but not limited to, representatives from national governments, industry, financial institutions, energy sectors, academia and other stakeholders, to provide supporting recommendations and involvement in both policy and program.

Government and Other Stakeholders

(8) Supporting decarbonization of the global power grid

Supporting ambitious grid decarbonization policies is essential to achieving the decarbonization of airports around the world.

(9) Support the transition to renewable energy and the development of viable business cases and partnerships for decarbonization measures

If necessary, the following actions will be promoted: decarbonization of local power grids, deployment of viable on-site renewable energy systems, implementation of energy efficiency measures and electric vehicle business cases, determination of the commercial feasibility of electrifying airport infrastructures, and investment in and access to the aforementioned technologies.

(10) Support the commercial development of complementary negative emission technology

In order to close the gap in achieving net-zero carbon emissions by 2050, commercially viable carbon capture and

removal technologies should be encouraged.

(11) Encourage and promote access to airport green finance

Depending on the situation, governments can play an important role in assisting and incentivizing airports to have the right tools to reach their international sustainability goals.

4. Conclusion

As mentioned above, the airport industry has set very ambitious goals. That being said, things such as the scale of each airport, the degree of advancement for environmental measures, the political situation of each country and region, and the geographical conditions are all different, and thus the method and degree of each airport's approach will vary depending on those conditions. Therefore this goal set in the industry will not be easy to achieve as a whole. However, the ultimate reality of reaching the overall goal is for each stakeholder to accurately grasp their role and steadily take effective measures. In that sense, the setting of this decarbonization target, which serves as a guidepost for each airport, will be of great significance. In Japan as well, Narita International Airport Corporation formulated the "Sustainable NRT2050" in March last year to contribute to the realization of a sustainable society (including decarbonization), and to become a world-class airport. [7] We believe that it is extremely important to formulate environmental targets ahead of the movements of the industry as a whole. Our hope is that Japanese airports will lead the world in this field, and we will continue to keep our eyes on domestic and international trends regarding this theme.

＜References＞

・International Airports Council, "Long-Term Carbon Goal Study for Airports Report"
https://aci.aero/about-aci/priorities/environment/long-term-carbon-goal-study/

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[7] Narita International Airport Corporation Press Release （https://www.naa.jp/jp/docs/20210325-sustainableNRT2050.pdf）