



JAPAN'S ACTION PLAN

To Reduce Greenhouse Gas Emissions From Aviation



国土交通省
Ministry of Land, Infrastructure and Transport

Japan's Action Plan to Reduce Greenhouse Gas Emissions from Aviation (2024 version)

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1 . Overview

With carbon neutrality by 2050 becoming a world trend in global warming countermeasures, Japan has also declared its commitment to achieve carbon neutrality by 2050 and submitted new greenhouse gas (GHG) reduction targets.

ICAO has also decided on a global reduction target of not increasing total emissions after 2020, and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was launched in 2021 among voluntary member states as a framework to reduce CO₂ emissions from international aviation. Japan has participated from the beginning and is currently working on measures.

In addition, Japan chaired a Task Group (LTAG-TG) working to develop ICAO's long-term aspirational goal (LTAG) for international aviation, which was adopted at the 41st ICAO Assembly as the long-term aspirational goal (LTAG) aiming for carbon neutrality by 2050.

Moreover, the ICAO CAAF/3 agreed on CO₂ reduction targets using SAF etc., and the G7 Transport Ministers' Meeting in Ise-Shima, Mie agreed on quantitative targets for the quality of SAF.

Japan will continue to steadily work toward this goal, while at the same time striving to foster public understanding and promote international cooperation.

Under these circumstances, Japan has launched study groups on CO₂ emission reduction in the "Aircraft Operation Sector" and "Airport Sector", and has been holding discussions to accelerate decarbonization in the aviation sector.

The study group on aircraft operations has been examining the direction of medium- to long-term efforts to reduce CO₂ emissions through three approaches: (1) introducing new technologies into aircraft and equipment, (2) improving flight operations through further sophisticated air traffic control, and (3) promoting the introduction of sustainable aviation fuel (SAF).

In the airport sector study group, discussions have focused on initiatives to reduce CO₂ emissions from airport facilities and vehicles. These initiatives include promoting the introduction of energy-saving systems such as converting airport facilities to LED lighting, encouraging the use of clean

energy vehicles such as EVs and FCVs, and facilitating the installation of ground power units (GPUs) to supply electricity and air conditioning to aircraft from the airport. Additionally, the group has considered promoting the introduction of renewable energy sources, such as solar power, to transform airports into renewable energy hubs.

Based on the discussions at each study group, roadmaps were compiled for both the operation and airport sectors.

Subsequently, in the aircraft operation sector, the roadmap for promoting aviation decarbonization was revised in March 2024, and in the airport sector, planning guidelines for promoting airport decarbonization were formulated in March 2022.

Currently, the certification of decarbonization plans is being carried out in both the aircraft operations and airport sectors, and we will continue to promote the formulation of plans by each airline and airport while also monitoring their progress.



2 . Background of Efforts to Reduce CO2 Emissions in the Aviation Sector

Considering the current situation, which could be described as a climate crisis, with natural disasters becoming more severe and frequent due to climate change, measures to combat global warming are an urgent task in every country in every field.

As carbon neutrality by 2050 becomes a world trend, Japan has also declared that it will achieve carbon neutrality by 2050. Japan has also set a new greenhouse gas reduction target of a 46% reduction for fiscal year 2030 while striving for an even higher goal of 50%.

To achieve this goal, the government as a whole revised the "Plan for Global Warming Countermeasures," "Basic Energy Plan" and "Long-term Strategy as a Growth Strategy under the Paris Agreement" (hereinafter referred to as the "Paris Agreement Long-term Strategy") in October 2021, and submitted targets for reducing greenhouse gas emissions as Japan's "Nationally Determined Contribution (NDC)" under the Paris Agreement.

In February 2025, Japan's new NDC was submitted to the United Nations Framework Convention on Climate Change (UNFCCC) secretariat for the 30th Conference of the Parties (COP30).

With regard to the aviation sector as well, it is necessary to steadily implement specific measures based on Japan's policy.

Japan's delay in efforts in the aviation sector could lead to a decline in the international competitiveness of the aviation-related industry. Also, accelerating efforts is urgently needed to maintain a healthy aviation network, and it is important for Japan to be a leader in the practical application of environmentally friendly technologies.

Furthermore, to ensure that Japan's position as an island nation dependent on international aviation is properly reflected, it is necessary for Japan to lead discussions on reducing CO2 emissions in the international aviation sector and contribute to climate change measures in the aviation sector.



3 . Reduction Targets for the Aviation Sector

3.1 Short to Medium-term Reduction Targets

3.1.1 International Aviation

The ICAO Assembly has decided on global reduction targets for CO₂ emissions and is considering specific measures.

ICAO's global reduction targets are: 1) to improve combustion efficiency by 2% each year, and 2) not to increase total emissions after 2020.

In addition, the document presents a basket of measures for achieving this goal, including: 1) the introduction of new technologies (new aircraft, etc.), 2) improved flight operations, 3) the use of sustainable aviation fuel (SAF), and 4) market mechanisms (CORSIA-Carbon Offsetting and Reduction Scheme for International Aviation).

As part of efforts toward 2035, the CORSIA-Carbon Offsetting and Reduction Scheme for International Aviation makes carbon offsetting mandatory for routes between countries that voluntarily participated in 2021, from 2024 to 2026, only for pairs of countries participating voluntarily, and from 2027 to 2035, for pairs of countries exceeding a certain size.

Japan has been subject to CORSIA since 2021 as a voluntary participant and is continuing its efforts to reduce emissions toward 2035 based on CORSIA rules.

Regarding the use of SAF, at the ICAO Third Conference on Aviation Alternative Fuel (CAAF/3) held in November 2023, it was agreed that the global goal would be to reduce CO₂ emissions by 5% by 2030 using SAF etc. compared to using 100% existing jet fuel. Japan has set a goal of using 10% SAF of its aviation fuel consumption by 2030, and in the future, we will proceed with our deliberations, keeping mind the goal of CAAF/3.

3.1.2 Domestic Aviation

With regard to domestic aviation, the Global Warming Prevention Plan (Cabinet decision: May 13, 2016; final revision: February 18, 2025) includes the following specific measures and policies: "For decarbonization

of the aviation sector, the following measures will be taken: (1) promotion of the introduction of sustainable aviation fuel (SAF), (2) improvement of flight operation methods by upgrading air traffic control procedures, (3) introduction of new technologies in aircraft and aviation equipment, (4) promotion of energy-saving of airport facilities and ground support vehicles, and (5) promotion to convert airports to renewable energy hubs, and promote public-private partnerships.”

The numerical goal is to improve the emission intensity by 16% by FY2030 compared to FY2013. Specifically, the emission intensity for FY2030 is set at 1.1693 kg-CO₂/ton km, compared to 1.3977 kg-CO₂/ton km in FY2013.

In terms of domestic efforts in Japan, a roadmap was established in 2021 to promote decarbonization of the aviation sector toward 2050 (the roadmap is provided in *Appendix*).

Additionally, an institutional framework has been introduced to enable each airline and airport to promote their efforts and properly fulfill their accountability, by positioning the promotion of decarbonization in the purpose provisions of both the Civil Aeronautics Act and the Airport Act.

This applies to any Japanese airline or airport operator, whether international or domestic.

Under this framework, we are promoting decarbonization.

3.1.3 Targets in Japan’s Action Plan (2021 version)

Japan’s action plan (2021 edition) submitted to ICAO in 2022 did not set reduction targets for Japan’s aviation sector, citing the need to consider it in light of ICAO’s long-term goals.

Long-term goals were adopted at the 41st ICAO Assembly, and in the field of international aviation, it is necessary to add: 1) to achieve carbon neutrality by 2050, and 2) to promote compliance with CORSIA.

3.2 Long-term Reduction Targets

In the field of international aviation, ICAO established a task group to consider long-term goals including those toward 2050, with Japan serving as



chair and leading the discussions.

At the 41st ICAO Assembly in 2022, a Long-Term Aspirational Goal (LTAG) was adopted, aiming to achieve carbon neutrality by 2050.

Regarding LTAG, we recognize that there are special circumstances and respective capabilities, and we will continue to be proactive so that Japan can lead the discussions.

Regarding Japan's long-term reduction targets for the aviation sector, taking into account ICAO's LTAG, etc., we aim to achieve carbon neutrality by 2050.



4 . Trends in CO2 Emissions, etc. in Japan's Aviation Sector

The following table shows the results of Japan's international and domestic aviation transport volume and CO2 emissions.

Results:

- Transport volume (revenue ton-kilometer)
 - ◇ 2005: 23,032 million ton-kilometers
 - ◇ 2023:24,154 million ton-kilometers (4.8% increase compared to 2005)
- CO2 emissions
 - ◇ 2005: 27.97 million t-CO2
 - ◇ 2023:23.48 million t-CO2(16% decrease compared to 2005)
- Fuel efficiency intensity:20% (annual rate of 1.2%) improved (compared to 2005)

Japan's status of achievement of action plan targets

- Japan's Action Plan (2021 version) did not set reduction targets for Japan's aviation sector, citing the need to consider it in light of ICAO's long-term goals.

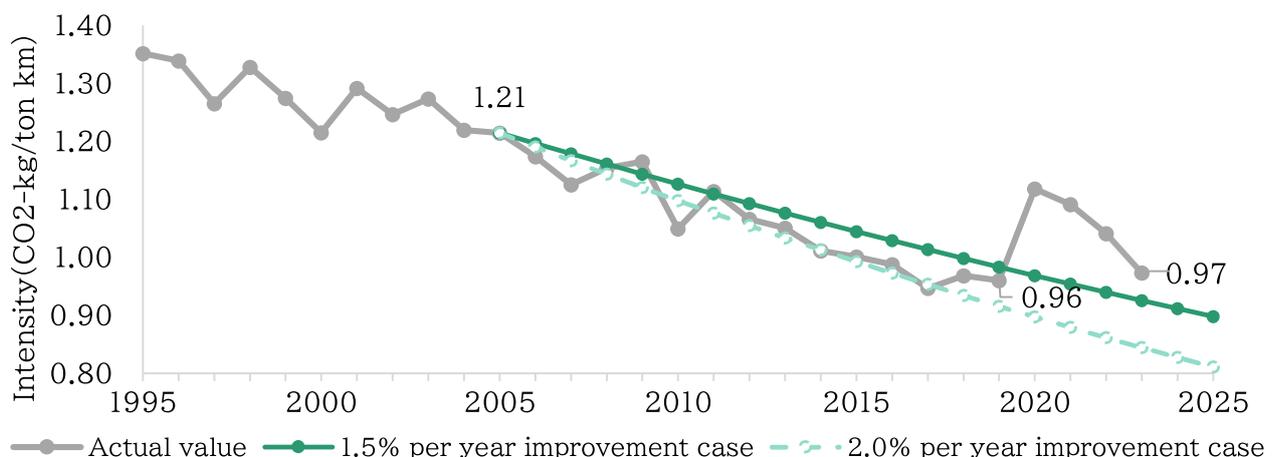


Figure 1: Trends in CO2 emission intensity of air transport

Note: Case achieving 1.5% improvement per year in the State Action Plan (2005 baseline)
 Case achieving 2.0% improvement per year in the State Action Plan (2005 baseline)
 Source: Air Transport Statistics

The estimated baseline CO2 emissions by 2030 and the estimated emissions based on the emission targets by 2030 in the action plan are as follows. For the calculation of transport volume and CO2 emissions, we refer to various data^{1,2} on domestic and international aviation.

- Baseline: 33.16 million t-CO2
- CO2 emissions based on the target: 321,400 t-CO2 (25% reduction in fuel efficiency compared to 2005, emission intensity of approximately 0.91 kg-CO2/ton kilometer)

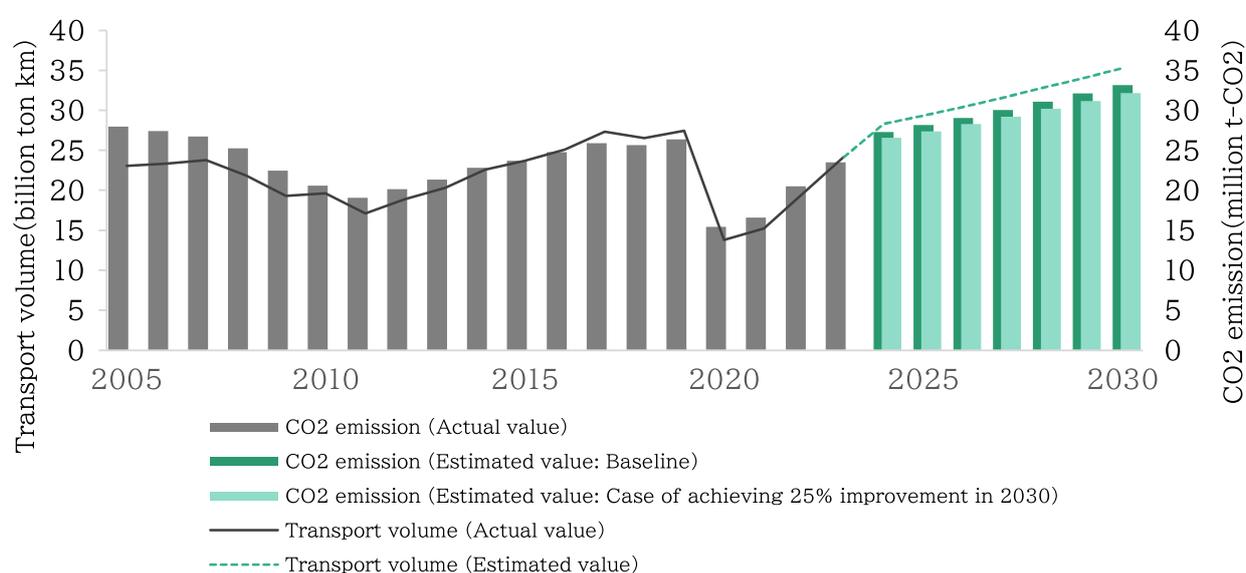


Figure 2: Actual and baseline forecasts of CO2 emissions and transport volume in the aviation sector

Source: Compiled from Air Transport Statistics², etc.

¹ Civil Aviation Bureau, Ministry of Land, Infrastructure, Transport and Tourism, <https://www.mlit.go.jp/common/001037759.pdf>, held in April 2014

² Statistical Survey on Air Transport, https://www.e-stat.go.jp/stat-search/files?page=1&layout=datalist&toukei=00600360&kikan=00600&tstat=000001018894&cycle=7&result_page=1&second2=1&tclasslval=0



CO2 emissions from international transportation are subject to carbon offsetting under CORSIA, and the results through 2023 are as follows.

As of 2023, there is no offset obligation, but it is highly likely that offset obligation will arise from 2024 onward, due to further lowering of the baseline for offset obligation.

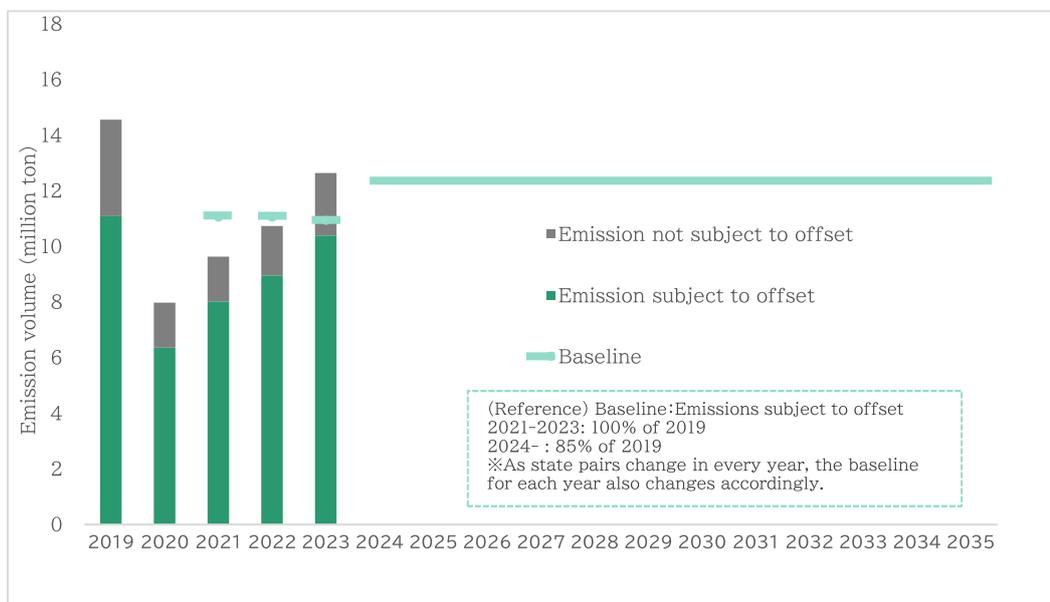


Figure 3: Actual and baseline of CO2 emissions volume in the international aviation sector

Source: Compiled from 2023 Emissions Reports, etc.



5 . Japan's Efforts [Aircraft Operation Sector]

5.1 Study Group on CO2 Reduction in the Aircraft Operation Sector

In the efforts to reduce CO2 emissions in the aircraft operation sector, a study group on CO2 reduction in the aircraft operation sector has been established with an awareness of the need to comprehensively and multilaterally examine the direction of Japan's efforts in the aircraft operation sector from the perspective of green recovery, with a view to the future introduction of various technologies and energy sources. The study group has been studying the direction of medium to long-term efforts to reduce CO2 emissions through the following three approaches: (1) introduction of new technologies in aircraft and equipment, (2) improvement of flight operation methods by upgrading air traffic control procedures, and (3) promotion of the introduction of sustainable aviation fuel (SAF).

5.1.1 Introduction of New Technologies into Equipment and Facilities

○ Efforts to date

• Technology development for new technologies

To date, aircraft fuel efficiency has improved thanks to constant technological innovation by aircraft product manufacturers and upgrades by airlines to more energy-efficient aircraft.

In addition, the government has also been working to develop new technologies through national research and development agencies such as the New Energy and Industrial Technology Development Organization (NEDO) and the Japan Aerospace Exploration Agency (JAXA). The government as a whole adopted a Cabinet decision on the "Basic Policy for the Realization of Green Transformation (GX)" in February 2023, and under this policy, in December 2023, the GX Implementation Council compiled "Sector-Specific Investment Strategies" that include the

direction of GX in the aircraft sector and investment promotion measures.

In addition, in April 2024, the government formulated the "Aircraft Industry Strategy," which outlines the direction that Japan's aircraft industry should take.

To promote the improvement of aircraft fuel efficiency, NEDO has been working to support the development of new technologies such as high-rate lightweight structures and ultra-high efficiency (airframe, propulsion, and equipment), hybrid electrification (propulsion and equipment), and hydrogen combustion propulsion systems, with a view to applying these technologies to next-generation aircraft.

JAXA has been conducting research and development of low resistance and lightweight technologies for airframe, high-efficiency technologies for engines, and electric hybrid propulsion technologies, with the aim of implementing these technologies in commercial passenger aircraft after 2030. JAXA has also been engaged in research and development of hydrogen technology and other technologies to further reduce CO2 emissions.

- **Development of standards related to new technologies**

Aircraft technology requires an extremely high level of safety, and to achieve early commercialization of new technologies for which standards are still being developed, it is necessary for industry, academia and government to work together to study safety standards in parallel with technology development.

From this perspective, in June 2022, a Public-Private Committee on New Technologies toward Decarbonization of Aircraft was established to discuss issues related to international standardization of new technologies and contribute to decarbonization of the aviation sector.

The committee is composed of manufacturers, industry associations, airlines, airports, research institutes, academics, and relevant government ministries and agencies.

In March 2023, based on the discussions at the Committee, the Study Group on CO2 Reduction in Aircraft Operations adopted a New



Technology Roadmap for Aircraft Decarbonization, which summarizes the establishment of a domestic collaboration system and the development of a system for the public and private sectors to strategically work on international standardization, etc.

○ Future efforts

• Technology development for new technologies

In the future, technological development of low-carbon airframe structures, engines, and equipment is expected worldwide. With a view to strengthening the international competitiveness of Japanese manufacturers, it is necessary to promote the spread of new technologies for aircraft and equipment, such as electrification of aircraft, hydrogen aircraft, lightweight aircraft, and more efficient engines, toward decarbonization. The Japanese government as a whole will continue to promote the development of new technologies and international standardization for aircraft and equipment toward carbon neutrality, based on the "Basic Policy for the Realization of GX," "Sector-Specific Investment Strategies," "Aircraft Industry Strategy," etc.

NEDO will continue to support the development of new technologies through each project.

JAXA will continue to work on research and development of technologies for reducing resistance and weight of aircraft, technologies for improving engine efficiency, electric hybrid propulsion technology and hydrogen technology, and other technologies.

• Development of standards related to new technologies

Based on the New Technology Roadmap for Aircraft Decarbonization formulated in March 2023, we will advance efforts including the establishment of a domestic consultative organization as a forum for industry-academia-government collaboration by the end of FY2025, and work on formulating standards and international standardization, etc.

5.1.2 Improvement of Flight Operation Methods by Upgrading Air Traffic Control Procedures

○ Efforts to date

In response to the increase in air traffic, Japan has been working to reduce fuel consumption and CO2 emissions while ensuring safety through the introduction of new technologies and new methods to upgrade air traffic control procedures. Some typical measures are shown below.

• Drastic reorganization of airspace

Increasing the overall airspace throughput will lead to more efficient aircraft operations.

For this reason, a drastic review of airspace is planned for the period from 2020 to 2025, and efforts are underway to improve processing efficiency by separating the airway airspace into high-altitude airspace that is mainly used for the cruise phase, and low-altitude airspace that is mainly used for the ascent and descent phase.

The airspace vertical separation of western Japan was completed in February 2022. The airspace vertical separation in eastern Japan has been underway since April 2023 and is scheduled to be completed in March 2025.

• Introduction of CDP (Climb and Decent Procedure)

In the offshore airspace, a reduced separation utilizing ADS-C CDP (Automatic Dependent Surveillance - Contract Climb and Descent Procedure) was introduced in September 2021. If certain conditions are satisfied, the distance between an aircraft and other aircraft during climb or descent can be shortened, allowing aircraft to fly at more economical and efficient altitudes.

• Promotion of the introduction of PBN (Performance Based



Navigation)

As a high standard RNAV deployment, the RNP-AR (Required Navigation Performance-Authorization Required) approach method has been introduced at 40 airports nationwide by FY2023. The RNP-AR approach method, thanks to its flexible routing, has been effective in shortening flight paths and improving the minimum weather conditions for landing, which leads to CO2 emission reductions and it is planned to be gradually introduced into airports nationwide.

• Introduction of airport CDM

In Japan, airport CDM (Collaborative Decision Making) has been introduced at New-Chitose Airport, Haneda Airport and Narita Airport, etc. By sharing information through a dedicated website and making the best use of resources, we are striving to improve the benefits to air travelers by promoting on-time operations, reducing fuel consumption, and reducing CO2 emissions.

○ Future efforts

While considering the future development of the air traffic system and trends in technological development, we will promote measures to improve each operational phase in terms of en-route, departures and arrivals, and airport surface, along with optimizing the entire air traffic system.

• Realization of time management

In addition to improving the efficiency of individual operations, such as shortening flight paths, it is necessary to achieve a smooth traffic flow by properly managing the entire air traffic. By specifying the time of passage, the traffic flow of aircraft can be strategically managed to maximize airport capacity and airspace capacity for safer and more efficient operations.



- **Free routing at high altitude**

With the completion of vertical separation of airspace in western Japan, direct flight planning routes have been realized in the high altitude airspace of Western Japan, making it possible to plan flights without relying on existing air routes.

In the future, after the vertical separation of eastern Japan airspace is completed, we will also implement nationwide direct flight plan routes to shorten flight distances.

The next step is to consider the introduction of a User Preferred Route (UPR) operating method that uses routes preferred by operators in domestic airspace.

- **Realization of fuel-efficient climb and descent procedures**

During the climb or descent phase, we will achieve operations that allow continuous climb or descent procedures without any temporary level flight, considering the surrounding traffic conditions. This can reduce fluctuations in engine output, leading to a reduction in fuel consumption and emissions, while also expecting noise reduction effects.

- **Reduction of ground standby time**

At the airport level, we will monitor the entire operation status from departure to arrival, optimize the taxiing for each aircraft with different aircraft performance, as well as departure and arrival scheduling to effectively manage the traffic flow and realize smooth running of aircraft before takeoff and after landing (reduction of fuel consumption).

5.1.3 Sustainable Aviation Fuel (SAF)

- **Efforts to date**

SAF stands for Sustainable Aviation Fuel, which includes bio-jet fuel. Compared to conventional fossil-derived jet fuel, SAF has a significant CO₂ reduction effect, and its use is essential to achieve the ICAO's

global reduction target (no increase in total CO2 emissions from the international aviation sector after 2020).

- **The Public-Private Council for Promoting the Introduction of SAF**

The Public-Private Council for Promoting the Introduction of SAF, established in April 2022, is working with private sector such as airlines and oil companies, to discuss ways to promote the introduction of SAF.

- **Air Transportation Business Decarbonization Promotion Plan**

In order to decarbonize aviation, it is important to support airlines' proactive and planned decarbonization efforts, and we are working to certify "Air Transportation Business Decarbonization Promotion Plan" based on the Civil Aeronautics Act and other laws.

In January 2024, the two plans of the ANA Group and the JAL Group were first certified, followed by the plan of AIRDO that was certified in November 2024. The certification process for other airlines is being gradually advanced.

- **Support for obtaining international certification for domestic SAF**

To achieve the goal of replacing 10% of fuel used by domestic airlines with SAF by 2030, we have supported the establishment of a SAF supply chain through a demonstration project using imported neat SAF at Chubu Centrair Airport.

We also provided support for the registration and certification of CORSIA-eligible fuel feedstock, and in 2024, based on a proposal from Japan, non-standard coconut was officially incorporated in ICAO documentation as a new feedstock.

In addition, the General Incorporated Foundation Nippon Kaiji Kyokai (ClassNK) has been approved by ICAO as the third body in the world and the first in Japan to certify sustainability for CORSIA-eligible fuels.

Besides, we worked on developing guidelines to visualize CO2 emission reductions through the use of SAF for aviation users such as



passengers and shippers, and on promoting understanding of efforts to decarbonize aviation among aviation users and others by holding symposiums.

- **Consideration of support and regulations to expand the supply of domestic SAF**

In the "Sector-Specific Investment Strategies" developed in December 2023, an investment strategy for Sustainable Aviation Fuel (SAF) was also outlined. The strategy identifies two key directions:

1. Establish a system capable of ensuring sufficient SAF production capacity and a reliable supply chain for feedstocks (including develop-and-import), enabling the stable supply of SAF at internationally competitive prices.

2. Develop technologies that enable SAF supply, avoiding limitations on feedstocks and technologies, and maximizing the use of domestic and international resources in consideration of feedstock constraints and other factors.

In order to increase the use and supply of SAF, efforts have been made to develop "support measures" through capital investment subsidies using Japan Climate Transition Bonds and tax credits for SAF manufacturers, and "regulations and systems" for the supply side, such as setting supply target volumes in the Act on the Sophisticated Methods of Energy Supply Structures.

○ Future efforts

- **Plan to Promote Decarbonization in Air Transport**

In line with the Basic Policy for the Promotion of Airline Decarbonization formulated in December 2022, we will support the preparation of plans by airlines to promote the decarbonization of the air transport industry, follow up on the progress of the plans, and steadily promote initiatives to promote the introduction of SAF.

- **Support for obtaining international sustainability certification for domestic SAF**

In order to achieve the goal of replacing 10% of fuel consumption by Japanese airlines with SAF by 2030, we will continue to build a system for a stable supply of domestically produced SAF at internationally competitive prices, support the registration and certification of feedstocks for CORSIA-eligible fuels, help airline users such as passengers and shippers to visualize CO2 emission reductions through the use of SAF, and promote understanding of aviation decarbonization initiatives among airline users by holding symposia.

- **Implementation of support and regulations to expand the supply of domestic SAF**

To increase the use and supply of SAF, we will continue to implement “support measures” through capital investment subsidies using Japan Climate Transition Bonds and tax credits for SAF producers, and “regulations and systems” for the supply side, such as setting supply target volumes in the Act on the Sophisticated Methods of Energy Supply Structures.

5.1.4 Market Measures

○ Efforts to date

For the international aviation sector, CORSIA allows airlines to use carbon credits generated from the ICAO-accredited CORSIA Eligible Emission Unit Program to comply with their offset obligations, which are being implemented as follows:

- Understand the rules for credit usage, market trends, and CORSIA certification schemes with a view toward making domestic credits eligible under CORSIA.
- Gather information on foreign countries advancing the introduction and implementation of market based climate change measures, such as emissions trading systems that include the aviation sector and climate change taxes on aviation fuel.

Efforts are also being made to use market mechanisms for domestic aviation sector.

- Participation of major airlines in the GX League, which operates Japan's unique voluntary emissions trading scheme.

○ Future efforts

For the international aviation sector, J-Credit Scheme is scheduled to be reapplied for CORSIA-eligible credits so that airlines can use it to comply with CORSIA offset obligations. In addition, when Japanese airlines secure CORSIA-eligible credits, support related to corresponding adjustments will be provided as necessary.

For domestic aviation sector, the following considerations will be made, taking into account the domestic targets set out in the Plan for Global Warming Countermeasures and the progress of the government's discussions on the implementation of an emissions trading scheme and the introduction of a carbon levy.

- Impact of the introduction of the emissions trading scheme and the levy on the aviation industry
- Utilization of credits to achieve voluntary goals of airlines
- Setting indicators for the emissions trading scheme

5.1.5 Compilation of a Roadmap and the Future Discussion Procedures at the Study Group

For the three approaches mentioned above, the study group has compiled a roadmap for promoting decarbonization of aviation, and updated it at the 7th study group meeting in March 2024 (the roadmap is provided in *Appendix*).

In order to continue to steadily progress in accordance with the compiled roadmap, we will continue to work closely with relevant parties in the public-private councils established for each of the three approaches.



5.2 International Cooperation and Other Issues

○ Efforts to date

• **Consideration of Long-Term Aspirational Goal at ICAO**

A task group was established at ICAO to consider the Long-Term Aspirational Goal (LTAG) including those for 2050, with Japan serving as the chair and leading the discussions.

At the 41st ICAO Assembly in 2022, the LTAG was adopted, aiming to achieve carbon neutrality by 2050.

• **ACT-SAF, ACT-CORSIA**

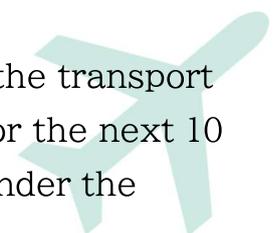
This is an ICAO capacity-building program designed to provide developing countries with support according to the stage of their SAF development and introduction, promote cooperation on various ICAO initiatives related to SAF, and set up a forum for sharing knowledge and promoting understanding of SAF. Among these the SAF-related program is called ACT-SAF (Assistance, Capacity-building and Training for Sustainable Aviation Fuels), and the CORSIA-related program is called ACT-CORSIA (Assistance, Capacity-building and Training for Carbon Offsetting and Reduction Scheme for International Aviation).

Regarding ACT-SAF, presentations were made on Japan's policies and initiatives for the introduction of SAF in March 2023 and June 2024.

Regarding ACT-CORSIA, Japan plans to provide support to Afghanistan, Bangladesh, Bhutan, Cambodia, Malaysia, and Myanmar, and is coordinating to support the implementation of CORSIA in each country, including explanations regarding CO₂ emissions magnitude check.

• **Japan-ASEAN Transport Cooperation**

In order to promote cooperation and collaboration in the transport sector between Japan and ASEAN, a new action plan for the next 10 years (2024-2033), "The Luang Prabang Action Plan under the



ASEAN-Japan Transport Partnership (AJTP)”, was adopted at the 21st Japan-ASEAN Transport Ministers’ Meeting held in Luang Prabang, Laos in 2023, which includes cooperation between Japan and ASEAN to promote the use of SAF.

In the ASEAN region, the demand for SAF is expected to grow significantly in the future, and abundant biomass resources that can be used as feedstocks for SAF are available. Based on these, we are considering supporting the expansion of SAF supply through feedstock diversification by developing the ”ASEAN-Japan CORSIA Eligible Fuel Certification Guidebook,” which explains how to register new feedstocks and production processes with ICAO and obtain CEF certification, as well as organizing seminars related to the guidebook.

• COP/SBSTA

At the COP3 of the UNFCCC held in Kyoto in 1997, it was stated that ”The Parties included in Annex I shall seek to limit or reduce greenhouse gas emissions not controlled by the Montreal Protocol, from aviation and marine fuels, working through the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO).” As a result, the international aviation sector has been tasked with is GHG emission reductions through ICAO.

Under the UNFCCC, ICAO and IMO continuously provide reports and information through SBSTA (Subsidiary Body for Scientific and Technological Advice).

• Aviation Green Lane

In December 2022, a policy dialogue was held between the aviation authorities of Japan and Singapore on key areas of aviation, and a Memorandum of Cooperation was signed on key areas of aviation, including consideration of an ”Aviation Green Lane” between Japan and Singapore to promote the use of SAF.

The Aviation Green Lane is a decarbonization concept that includes promoting the use of SAF, and its objectives are to promote decarbonization of the aviation sector toward achieving the LTAG,

promote mutual understanding of a common framework for decarbonization on a bilateral or multilateral basis, and promote the use of SAF.

The above concept was submitted as a working document jointly drafted by Japan, the United States, and Singapore at the ICAO Third Conference on Aviation and Alternative Fuels (CAAF/3) in November 2023.

Aviation authorities from Japan, the United States, and Singapore are currently in discussions to determine the content of this framework.

○ Future efforts

Based on the view that CORSIA is the only decarbonization scheme in international aviation, Japan will continue to take measures in accordance with the ICAO framework, including CORSIA.

In addition, we will work to ensure international collaboration and promote international cooperation, as well as to demonstrate Japan's presence in the world.



6 . Japan's Efforts [Airport Sector]

With regard to the efforts to reduce CO₂ emissions in the airport sector, the “Study Group on CO₂ Reduction in the Airport Sector” has been set up to proceed with the promotion of the introduction of energy-saving systems such as the use of LEDs in airport facilities, the promotion of the introduction of clean energy vehicles such as EVs and FCVs in ground support vehicles, the reduction of CO₂ emissions from airport facilities and vehicles by promoting the introduction of power and air conditioning supply facilities (GPUs) from airports to aircraft, and the conversion of airports into renewable energy hubs by promoting the introduction of solar power generation, etc.

○ Efforts to date

Based on the discussions at the study group, the Civil Aeronautics Act and other laws were amended in June 2022 introducing an institutional framework to enable airlines, airport administrators, etc. to proactively and systematically address initiatives.

Based on the “Basic Policy for Promoting Aviation Decarbonization” established under the same Act, in December 2022, we have published the “Guidelines for Developing Airport Decarbonization Promotion Plans (Second Edition)” and other documents with the aim of assisting in the development of airport decarbonization promotion plans, which are plans to promote decarbonization at each airport.

As for promotion plans, plans for four airports, Narita International Airport, Chubu Centrair International Airport, Kansai International Airport, and Osaka International Airport, were approved in December 2023, and a plan for the prefectural Nagoya Airport was approved in March 2024, the first case of an airport managed by a local government. In April of the same year, the creation of plans for all 27 airports managed by the national government was officially announced. As of the end of March 2025, promotion plans have been formulated for a total of 48 airports.

Additionally, to ensure that the initiatives of each promotion plan are steadily implemented, we have been supporting the introduction of equipment to promote the conversion of airports into renewable energy hubs through solar power generation, the conversion of airport vehicles to electric and fuel cell vehicles, the improvement of the efficiency of lighting and air conditioning in airport buildings, and the visualization of energy consumption. Furthermore, a "Public-Private Partnership Platform toward Airport Decarbonization" was established under the study group, and steady efforts were made in collaboration with relevant stakeholders.

○ Challenges and future efforts

To reduce CO2 emissions from airport facilities, LED lighting and lights, high-efficiency air conditioning, and energy-saving measures during reconstruction will be implemented. In this process, we will not only increase the efficiency of individual facilities and equipment, but also consider efficient methods to reduce CO2 emissions through energy visualization systems and BEMS, etc.

To reduce CO2 emissions from ground support vehicles, the conversion to EVs and FCVs, as well as the development of charging and hydrogen stations, will be promoted in conjunction with vehicle upgrades, while taking into account the status of vehicle technology development. We will also consider using biofuels to reduce CO2 emissions until conventional vehicles are converted to EVs and FCVs.

To reduce CO2 emissions from aircraft on the ground, we aim to introduce GPUs and consider reducing the use of APUs by expanding the use of GPUs. In addition, we will consider the development of taxiways for high-speed take-offs and intersection departures.

Regarding the introduction of renewable energy at airports, the introduction of solar power generation and other forms of energy will be promoted on the rooftops of airport buildings, parking lots, flat land, and in the vicinity of airports. In addition to promoting airport decarbonization, we will also consider measures to convert airports into renewable energy hubs, such as cooperation with surrounding

communities through the supply of renewable energy, strengthening the resilience of airports and their regions, and utilizing renewable energy for the creation of carbon credits.

Furthermore, considering the situation of each airport and the characteristics of the region, CO2 sink measures such as afforestation and blue carbon, utilization of hydrogen, emission reductions related to airport access, and energy management for the entire airport will also contribute to the decarbonization of airports.

In order to effectively and efficiently promote the above initiatives, it is desirable to develop an airport decarbonization promotion plan for each airport in collaboration with airport stakeholders (airport administrators, airport buildings, airlines, and other airport businesses) and other parties with decarbonization know-how at each airport, and to implement initiatives based on this plan.

The government will continue to support these initiatives.



7 . Review of ICAO Assembly Resolutions and Action Plan

7.1 ICAO Assembly Resolutions

In Resolution A41-21, paragraph 11, adopted at 2022 ICAO Assembly, member states are encouraged to develop or update and submit their Action Plans, and subsequently update and submit them every three years.

7.2 Review of Japan's State Action Plans

Japan will also consider updating the Action Plan every three years moving forward.



Revision Record

No.	Date	Remarks
1	October 2012	
2	July 2015	
3	June 2018	
4	March 2022	
5	March 2025	

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Roadmap for Promoting Decarbonization in Aviation

(Committee on CO2 Reduction in Aircraft Operation)

Civil Aviation Bureau
Ministry of Land, Infrastructure, Transport and Tourism
March 2024

Roadmap (①Promotion of SAF introduction)

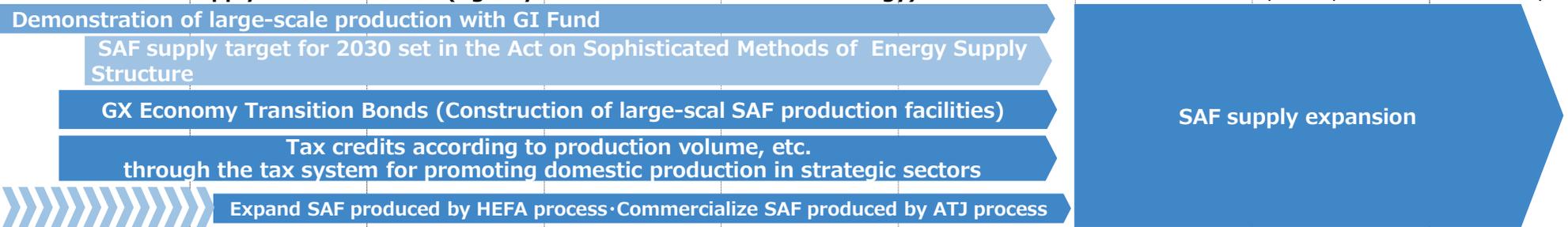
● Legend



2024 2025 2026 2027 2028 2029 2030 ~ 2040 ~ 2050

Production and supply of domestic SAF (Agency for Natural Resources and Energy)

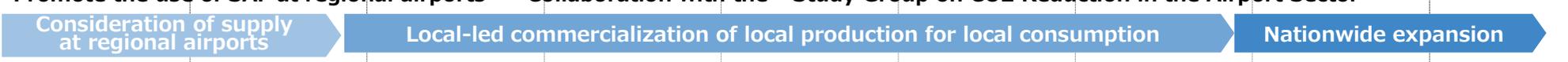
* The year represents the calendar year



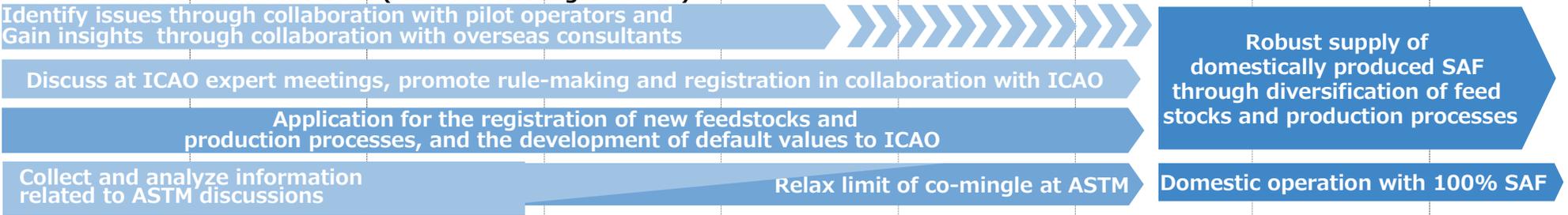
Support for the introduction of necessary facilities to accept SAF at airports



Promote the use of SAF at regional airports * Collaboration with the " Study Group on CO2 Reduction in the Airport Sector"



Obtain international certification (CEF: CORSIA Eligible Fuels)



Strengthen the support system for international certification



Visualization and evaluation of CO2 emission reductions through SAF use



Domestic SAF production/supply

Supply chain building

Local production for local consumption

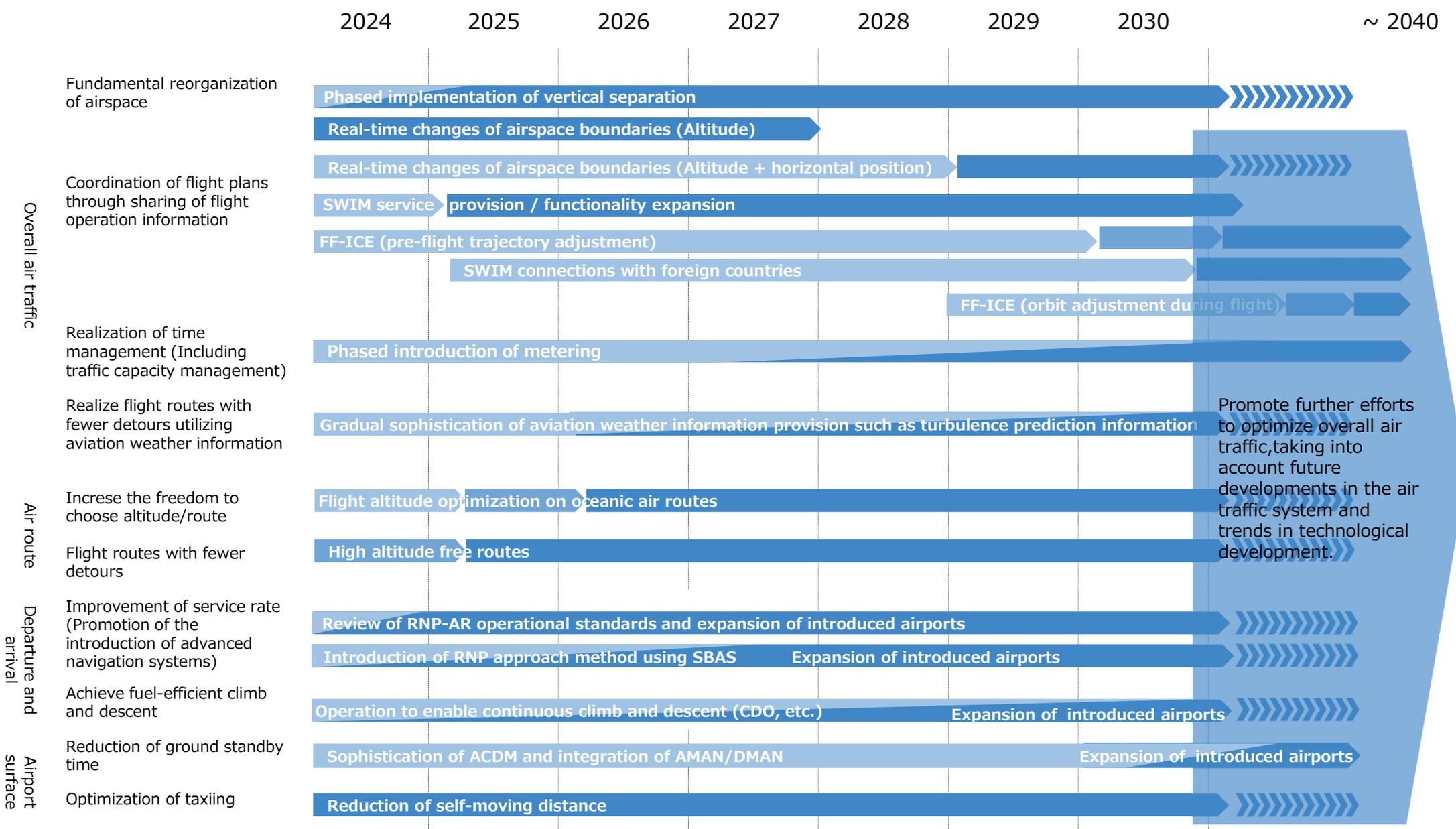
International certification of fuels

Promotion of Understanding

Roadmap (2) Improvement of flight operation methods by upgrading air traffic control, etc.)



* Year represents the calendar year



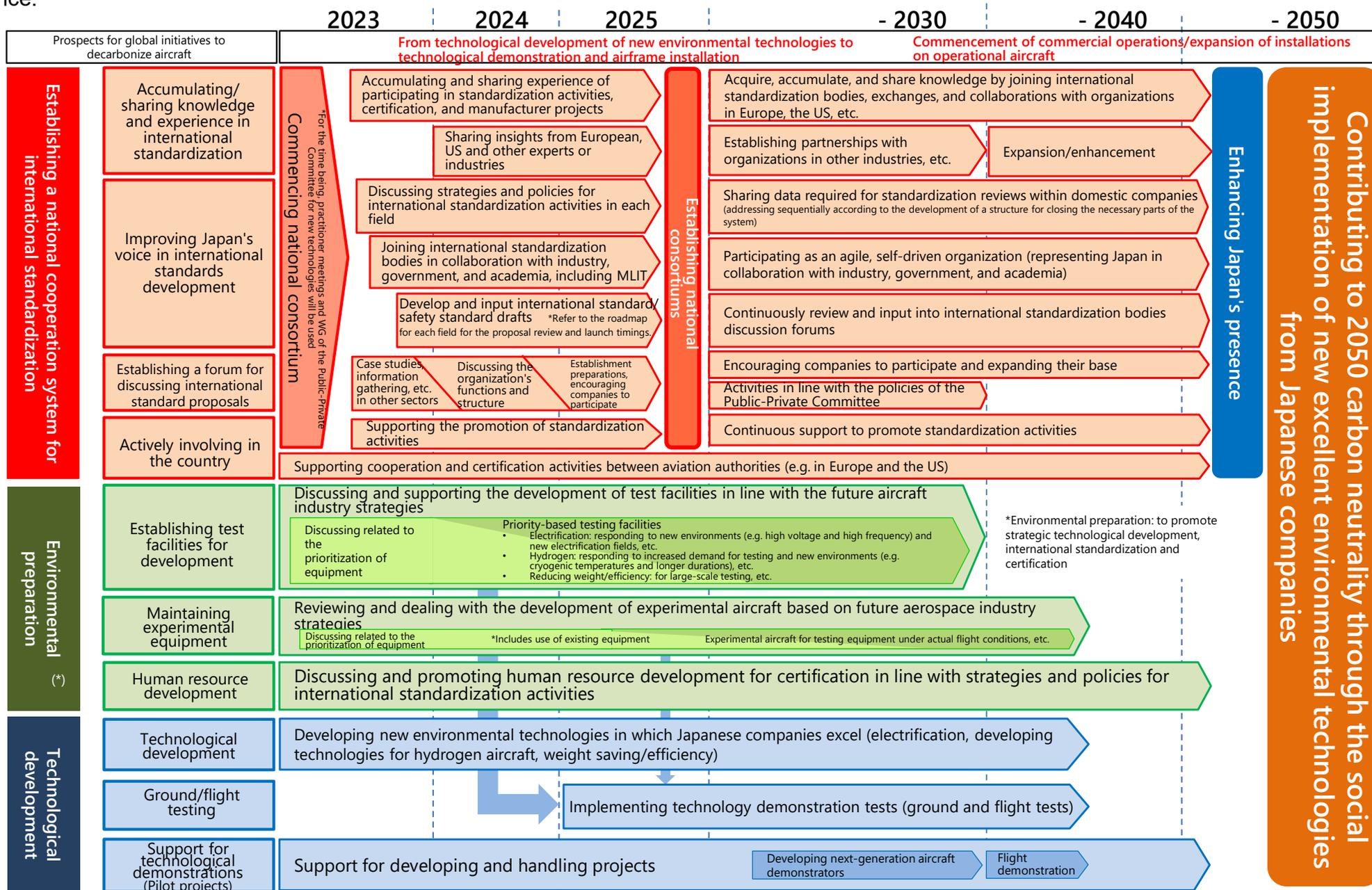
Promote further efforts to optimize overall air traffic, taking into account future developments in the air traffic system and trends in technological development.

* The descriptions in the table are examples of the initiatives.

New Technology Roadmap for Aircraft Decarbonization

15 March 2023: New Technology Public-Private Council for Aircraft Decarbonization

Based on the technological development trend of excellent new environmental technologies (Electrification of aircraft, hydrogen aircraft, weight reduction, etc.) owned by Japanese companies, this roadmap summarizes the establishment of a national cooperation system and institutional development for the public and private sectors to strategically work on international standardization, etc. for implementing these technologies in society and enhancing Japan's presence.



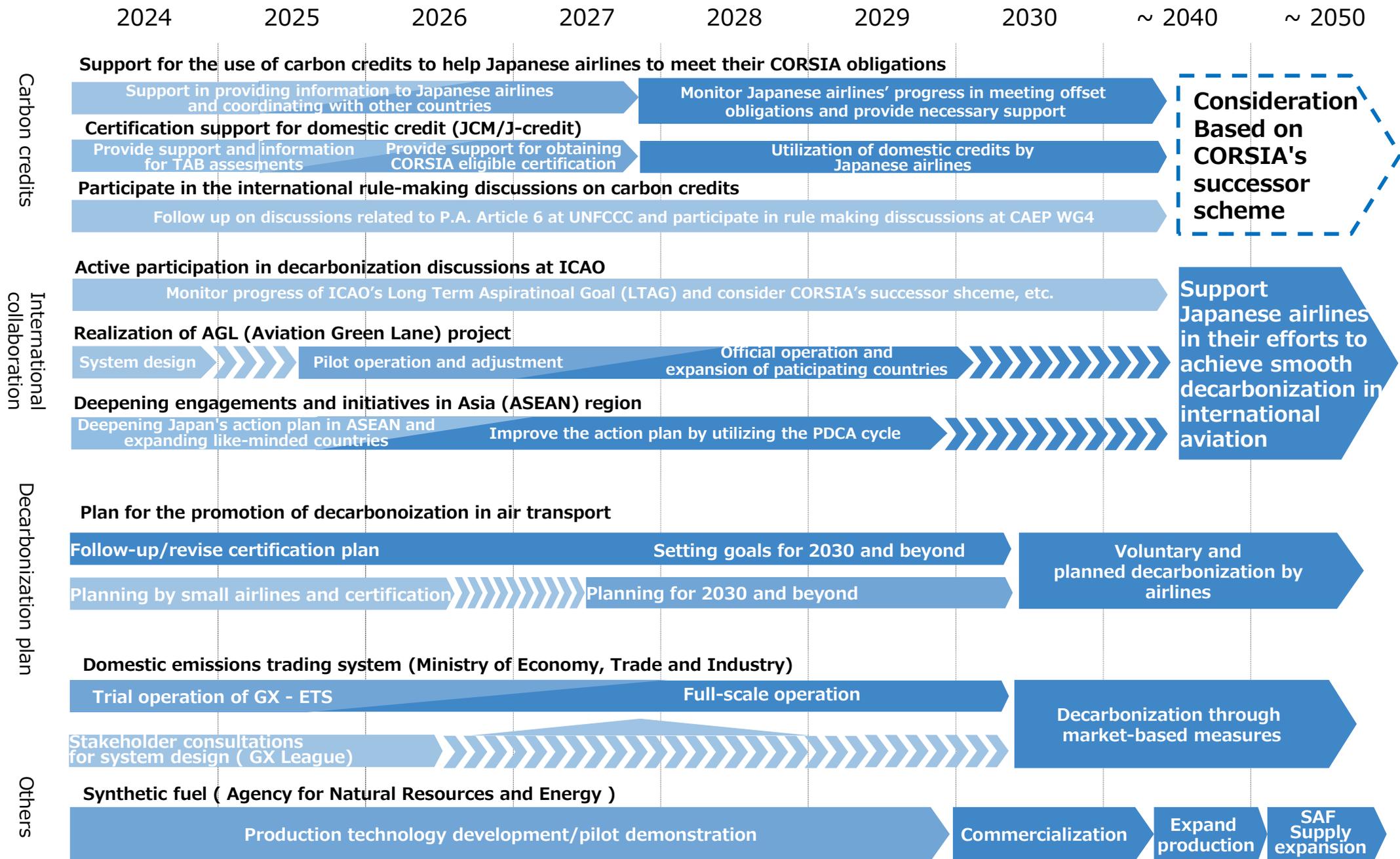
4. Roadmap (Carbon credits, International collaboration, Decarbonization plan, etc.)

● Legend

1. Investigation /examination phase

2. Demonstration phase

3. Full-scale operation / Introduction expansion phase



Consideration Based on CORSIA's successor scheme

Support Japanese airlines in their efforts to achieve smooth decarbonization in international aviation

Voluntary and planned decarbonization by airlines

Decarbonization through market-based measures

Expand production SAF Supply expansion