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SECOND CONFERENCE
Mexico City, 11-13 October 2017

CONFERENCE ON AVIATION AND ALTERNATIVE FUELS

REPORT

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LETTER OF TRANSMITTAL

To: President of the Council

From: Chairperson, Conference on Aviation and Alternative Fuels

I have the honour to submit the Report on the work of the second ICAO Conference on Aviation and Alternative Fuels (CAAF/2) held in Mexico City, Mexico from 11 to 13 October 2017.

R. Kobeh González
Chairperson
Conference on Aviation and
Alternative Fuels

Mexico City, Mexico, 13 October 2017

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INTRODUCTION

Site and duration of the Conference

1. The second ICAO Conference on Aviation and Alternative Fuels (CAAF/2) was convened at the Presidente InterContinental Hotel in Mexico City, Mexico from 11 to 13 October 2017.

Attendance

2. The following 29 Member States of ICAO were represented at the Conference:

Argentina	India	Republic of Korea
Australia	Indonesia	Russian Federation
Brazil	Italy	Saudi Arabia
Canada	Japan	Singapore
China	Mexico	Spain
Dominican Republic	Netherlands	Sweden
Finland	Nicaragua	United Arab Emirates
France	Norway	United Republic of Tanzania
Germany	Pakistan	United States of America
Guatemala	Panama	

3. The following 11 Observer organizations attended the Conference:

Advanced Biofuels Association (ABFA)
Airports Council International (ACI)
Central American Corporation for Air Navigation Services (COCESNA)
Carbon War Room/Rocky Mountain Institute (CWR/RMI)
European Union (EU)
International Air Transport Association (IATA)
International Coordinating Council of Aerospace Industries Associations (ICCAIA)
International Coalition for Sustainable Aviaiton (ICSA)
International Federation of Airline Pilots Associations (IFALPA)
Sustainable Energy For All (SE4ALL)
SkyNRG

4. A list of participants to the Conference is provided in Appendix A to this report.

Mandate

5. ICAO's work on aviation alternative fuels responds to ICAO Assembly Resolution A39-1: *Consolidated statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality*, which recognized the importance of research and development in fuel efficiency and alternative fuels for aviation

that will enable international air transport operations with a lower environmental impact, both in terms of local air quality and the global climate, and Resolution A39-2: *Consolidated statement of continuing ICAO policies and practices related to environmental protection — Climate change*, which acknowledges the need for such fuels to be developed and deployed in an economically feasible, socially and environmentally acceptable manner and the progress achieved in the harmonization of the approaches to sustainability.

6. The 39th Session of the ICAO Assembly also welcomed the convening of the ICAO Conference on Aviation Alternative Fuels in October 2017 in Mexico, with a view to developing the ICAO Vision on International Aviation Alternative Fuels as a means to encourage States to take actions for that objective.

Opening of the Meeting

7. The high-level officials of ICAO and the Government of Mexico in attendance during the opening of the Conference were Dr. O.B. Aliu, President of the ICAO Council, Mrs. Y. Mascott Pérez, Undersecretary for Transport, Mexico, Mr. M. Peláez Lira, Director General, Civil Aviation Authority, Mexico, Mr. A. Sarabia de la Garza, Director General, Aeropuertos y Servicios Auxiliares (ASA), Mexico, Mr. R. Kobeh González, Director General, Servicios a la Navegacion del Espacio Aereo Mexicano (SENEAM), Mr. B. Djibo, Director, Air Transport Bureau, ICAO, Mr. J. Siu, Deputy Director, North America, Central America and Caribbean (NACC) Regional Office, ICAO, and Ms. J. Hupe, Deputy Director, Environment, ICAO.

8. Dr. O.B. Aliu, President of the ICAO Council, opened the Conference with the following opening address:

It's my great pleasure to open this Second ICAO Conference on Aviation and Alternative Fuels. I would like to thank the Mexican authorities and in particular Aeropuertos y Servicios Auxiliares, which so kindly offered to host this Conference here in beautiful Mexico City.

Even more so, we all appreciate the additional efforts from the Government of Mexico in preparing for this Conference particularly in light of the magnitude of the recent natural events. The solidarity of ICAO, its Member States and the aviation community is with the people of Mexico. ICAO stands firmly to support you through our Regional Office here in Mexico City. In fact, the Regional Office is also providing special support to other States in the region strongly impacted by the latest climate events.

That the resolve of Mexico to stand by its offer to host this meeting, even in adverse circumstances, provides us with inspiration and extra commitment to make this Conference a success.

Having served as Chairperson for the first ICAO Conference on Aviation and Alternative Fuels in 2009, it is personally gratifying to see how far we have come. Since then, the 39th Session of the ICAO Assembly has confirmed international aviation's global aspirational goals to achieve a two per cent fuel efficiency improvement per annum, and to keep net carbon emissions stable from 2020.

To achieve our sector's overall objectives, a comprehensive approach consisting of a basket of measures was agreed. These include technology innovations for aircraft, engines and avionics,

streamlined air navigation and air traffic management procedures to reduce fuel burn, promoting the development and deployment of sustainable aviation fuels (SAF), and market-based measures to reduce emissions.

ICAO has been working diligently to ensure progress on all of these fronts. But we must also be very clear that the available data illustrates for us that technological progress and operational efficiencies alone will not be sufficient. Even after these have been accounted for, we are still left with a significant mitigation requirement.

This points to the need for additional contributions if we are to succeed in reducing, in absolute terms, the greenhouse gas emissions from aircraft which will be needed to achieve our goal of carbon neutral growth.

Just last week I was at the Global Sustainable Aviation Summit, from ATAG – The Air Transport Action Group, that encompasses all industry stakeholders, and Alternative fuels were one of the main elements foreseen to support reaching industry's long term climate goals of reducing emissions by 50% in 2050. Good progress on future technologies were showcased, including on electric aircraft, but one message that came to me very clearly from the industry is that progress in one technical solution alone will not be enough, and that we should be looking at aircraft hybrid energy solutions to enable a sustainable aviation future.

Sustainable alternative fuels are critical to closing this mitigation gap, and in the nine years since the first Conference on this topic, in Rio de Janeiro, we have all learned a great deal about what is needed to realize a new and sustainable aviation fuel industry. We have had many successes along the way, and we have identified numerous challenges.

This Conference therefore comes at a very good time. On the one hand we find ourselves at a moment of great change in aviation and transportation generally, not to mention the significant transformations ongoing in our climate and our society.

Major airlines around the world are achieving record profits, many new airports have opened in the past nine years and many more are under construction. These modern and highly efficient air transport operators are moving more and more passengers and cargo every year.

We are also moving quickly with respect to unmanned and remotely-piloted aircraft, with expectations that these may be carrying cargo or even passengers within just the next decade. Similar rates of progress are being made in the areas of commercial space flight and outer space tourism.

Road transport developments are also impacting aviation. For example, innovations in taxi and ride sharing services are changing not only how passengers access the airport, with potentially significant impacts on parking revenues, but also the entire automotive industry.

Simply put, ladies and gentlemen, the point-to-point transportation network as a whole is constantly evolving and we are now living in one of the most dynamic periods of transition ever witnessed. This points to the need for us to remain open to alternative approaches and solutions and to regulate these developments without impeding the overall dynamic of innovation at the heart of them.

Importantly, these changes taking place throughout our societies and economies may aid us in our efforts to develop a new and viable Sustainable Aviation Fuel (SAF) sector.

Robotic agriculture, genetic modification, and automated production will all play a role in improving agricultural productivity. However, climate change impacts on aviation will present challenges, as may other challenges which have not yet been anticipated.

On this point, I'd like to reassure all of you on in that with great change comes great opportunity. And furthermore that sustainable aviation fuels would prove to be a very productive and beneficial opportunity for the aviation industry.

That being said, in this time of ever-changing world oil prices the aviation industry cannot afford to become complacent. ICAO's view is that if the air transport sector embraces the opportunities presented by sustainable aviation fuels, we will achieve more than we may now expect in terms of positive emissions mitigation benefits.

Looking back ourselves, we'd certainly see that there was no sustainable aviation fuels industry ten years ago. And since that time, many biological feedstocks have proven to be viable for producing the sustainable alternatives we know today, including:

- used cooking oil;
- non-edible plant oils;
- animal fat and tallow;
- municipal solid waste;
- forest residue;
- salt-tolerant grasses;
- agricultural wastes;
- and many other products.

Out of these feedstocks, five sustainable aviation fuel derivatives have been certified by an international standards body.

A group of private entrepreneurs, federal agencies, and multi-stakeholder organizations helped raise the funds to prove these production concepts, leading ultimately to the construction of the world's first continuously operating sustainable aviation fuel production facility.

Many airlines have worked with a variety of sustainable aviation fuel producers to secure purchase agreements for millions of gallons of these fuels annually over the next few years.

Several airports have begun not only offering sustainable aviation fuels to any airline interested in purchasing them, but have also introduced it into their hydrant fueling systems so that all aircraft fueling at the airport have at least a small amount of sustainable aviation fuels on board. This approach has led to more than 40,000 sustainable aviation fuels flights being conducted since they were first introduced.

Through these numerous actions, the aviation sector has now supplied the proof of concept for sustainable aviation fuels, confirming their operational viability and the feasibility of producing them in ways which lessen the impact of aviation on the climate.

I am sure that you will agree that these are all great accomplishments, and they have all been achieved in just the past decade.

This brings us to the difficult part, which is that each one of these elements must be scaled up by several orders of magnitude in order to achieve international aviation's commitment to carbon neutral growth.

We will all have to work together to accomplish this through supportive policies which help to clear the path for sustainable aviation fuel production. And we will have to share knowledge and lessons learned.

Most importantly we will need to devise strategies to fund the rapid and extensive growth of a new sustainable aviation fuels industry.

Last year, in 2016, we set forward-looking CO2 Standards for the certification of aircraft. We have the Global Air Navigation Plan (GANP) to ensure that future development of the air navigation field is sustainable, and for market-based measures we have CORSIA. Time has come for us to discuss the future path we want for sustainable aviation fuels to contribute in this basket of measures towards a sustainable aviation future.

The conclusions of this meeting will form the ICAO Vision on Aviation alternative fuels 2050 towards the realization of this objective.

It shall inspire States and stakeholders to take action to further develop and deploy SAF, and provide the inspiration that will be important to channel efforts in a unified way. As a living instrument, the ICAO Vision shall allow for progress to be regularly assessed and reviewed through a stocktaking process.

The results of this Conference will be presented to the ICAO Council as the basis of a draft policy to be endorsed by ICAO's 40th Assembly, which is just two years away.

With committed action on the part of ICAO and its Member States driving this effort forward, in collaboration with industry and other stakeholders, I am confident that international civil aviation can meet its responsibilities to significantly reduce aviation emissions.

With that, ladies and gentlemen, please let me wish you all a very productive and engaging conference.

Secretariat

9. The Conference was supported by Mr. B. Djibo, Director, Air Transport Bureau, ICAO, Ms. J. Hupe, Deputy Director, Environment, ICAO, Dr. N. Dickson, Chief, Environmental Standards, ICAO, Mr. M. Caballero Alarcon, Environment Officer, ICAO and Mr. S. Webb, Alternative Aviation Fuels, Technical Consultant, ICAO. ASA Liaison was carried out by Mrs. S. Neuman, Coordinadora de Planeación y Comunicación Corporativa, ASA. Document coordination was provided by Ms. V. Muraca, Environment Technical Associate, ICAO.

Election of the Chairman and Vice-Chairman of the Meeting

10. On the nomination by India, as seconded by the Dominican Republic, Mr. Roberto Kobeh González, Director General, Servicios a la Navegacion del Espacio Aereo Mexicano (SENEAM), was elected Chairperson of the Conference, and Mr. Kevin Shum, Director General, Civil Aviation Authority, Singapore, was elected Vice-Chairperson of the Conference.

Agenda

11. The Conference adopted the following agenda, which had been approved by the Council and presented in CAAF/2-WP/01:

Agenda Item 1: Developments in Research and Certification of Aviation Alternative Fuels;

Agenda Item 2: Financing and Assistance Programmes for Aviation Alternative Fuels;

Agenda Item 3: Challenges and Policy Making; and

Agenda Item 4: Defining the ICAO Vision on Aviation Alternative Fuels and Future Objectives.

Documentation

12. A list of the documentation associated with the work of the Conference is presented in Appendix B. All papers prepared for the CAAF/2 are available on the ICAO website (https://www.icao.int/Meetings/CAAF2/Pages/Documentation.aspx).

13. In addition to working and information papers, the Secretariat prepared three documents (CAAF/2-SD/1, CAAF/2-SD/2, and CAAF/2-SD/3) containing summaries of the conclusions and recommendations arrived at through discussions during the Conference. These summaries provide a record of the key issues identified under each Agenda Item. These papers were agreed to by Conference participants.

Structure and rules of procedure

14. The Conference also adopted the organizational arrangements for the Conference included in CAAF/2-WP/02. The rules of procedure were the *Standing Rules of Procedure for Meetings in the Air Transport Field* (Doc 8683).

15. In discussing the procedure for the consideration of documentation for each Agenda Item, the Conference noted that daily summaries of the discussions and decisions would be prepared by the Secretariat, for review by the Conference in plenary. The Conference also agreed that the outcome of the Conference would be a Declaration to be considered under Agenda Item 4 of the Conference, noting that the Declaration would consist of the key conclusions and recommendations of the Conference from each agenda item, as well as the ICAO vision on aviation alternative fuels.

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Agenda Item 1: Developments in Research and Certification of Aviation Alternative Fuels

1.1. **Documentation**

1.1.1 The Conference reviewed the following working papers and information papers from the Secretariat, and States:

Secretariat (CAAF/2-WP/01**)** presented the annotated agenda for the Conference.

Secretariat (CAAF/2-WP/02) presented the meeting arrangements and tentative time table for the Conference.

Secretariat (CAAF/2-WP/03) noted that a number of terms related to aviation alternative fuels are commonly used without a harmonized definition. This paper proposes definitions for the terms: Conventional Aviation Fuel (CAF), Aviation Alternative Fuel (AAF), Sustainable Aviation Fuel (SAF), Feedstock, Conversion Process, and Pathway.

Secretariat (CAAF/2-WP/04) reviewed the recommendations that were agreed during CAAF/1 to show the progress the industry has made since 2009.

Secretariat (CAAF/2-WP/05) presented an overview of the discussions that took place during the ICAO Seminar on Alternative Fuels, held in Montréal, Canada in February 2017, as a way to set the scene for CAAF/2.

Secretariat (CAAF/2-WP/07) described the existing specifications for aviation alternative fuels, the currently approved conversion processes for the production of aviation alternative fuels, and the conversion processes that are presently under evaluation. The challenges associated with the technical certification were also presented, as well as possible means to overcome them.

United States (CAAF/2-WP/17) noted that since CAAF1, the alternative fuel airworthiness certification approval process has evolved to a greater level of maturity. The United States Federal Aviation Administration (FAA) has introduced procedures, along with control and funding mechanisms, that have added structure to the overall process and facilitated the progress of new alternative fuel pathways towards ultimate approval. This has led to the approval of five alternative fuel pathways, with several more approaching approval. The FAA recently established the D4054 Clearinghouse to further improve the process with a single primary focal point to manage the evaluation and approval of new alternative fuel pathways. The current fuel approval process and the D4054 Clearinghouse concept being utilized by the aviation industry in the United States to qualify and certify new classes of aviation fuels were discussed. These concepts should be applicable to other CAAs and fuel specification-writing organizations.

Secretariat (CAAF/2-WP/08) described how aviation alternative fuel (AAF) prices remain above conventional aviation fuel (CAF) prices by a significant, but steadily declining premium. The paper noted that incentives and policy support will be required in the short-to-mid-term to ensure the development and scale-up of fuel production facilities. It went on to provide information on estimated prices of several types of AAF reported in published literature, and possible means of reducing costs associated with future sustainable aviation fuel (SAF) production.

Secretariat (CAAF/2-IP/01) provided details on the work being undertaken by the Alternative Fuels Task Force (AFTF) of the ICAO Committee on Aviation Environmental Protection (CAEP).

Estonia on behalf of the European Union (EU) and its Member States and the other States Members of the European Civil Aviation Conference (ECAC) (CAAF/2-WP/14) described how SAF have an important role to play in reducing net CO_2 emissions from air transport. The environmental benefits and the overall sustainability of such fuels are of primary importance. Equally, rules must be applied in such a way as to ensure fair competition. In addition to scaling-up research and deployment initiatives, stable policy frameworks are essential, not least for the financing of investments.

Japan (CAAF/2-IP/05) This paper introduced the present status of research and development, as well as the study on the establishment of a supply chain being conducted in Japan toward the realization of commercial flights using alternative jet fuels produced in Japan.

United Arab Emirates (UAE) (CAAF/2-IP/06) described the Sustainable Bioenergy Research Consortium (SBRC) currently conducting research on the development of a feedstock production system that can address volume demands in water-stressed regions, without competing with food crops for irrigation freshwater and arable land. An overview of the current research and development paradigm on the topic and the emerging solutions to overcome hurdles in the bench-to-market process are discussed.

Brazil (CAAF/2-IP/07) presented a broad overview of the Brazilian biofuels sector, including opportunities for the production of biomass feedstocks, a regulatory framework, research, development and investment, and biofuels production and promotion environments, focusing on SAF.

Brazil (CAAF/2-IP/08) described the Brazilian Biojetfuel and Renewables Platform, which has been promoting the concept "from research to fly" since its launch on Aviation Day during the RIO+20 Summit (2012) to promote highly integrated, logistically optimized regional value chains to support the global effort towards a low-carbon economy. The Sustainable Aviation Through Biofuel Refining (SABR) - Thermo-Catalytic Reforming (TCR) is a sustainable biorefinery concept to enable price competitive SAF production using waste, sludge, agricultural residues and/or biodiesel using used cooking oil and crude vegetable oils in remote sites and islands. The pilot proof of concept value chain is planned for deployment by the Plataforma Mineira de Bioquerosene e Renováveis in Juiz de Fora, MG in the 2018 to 2020 timeframe.

Brazil (CAAF/2-IP/09) presented a summary of the study "Techno-economic and Environmental Assessment of Biojet Fuel Production in Brazil". The study assumed the introduction of completely self-sufficient biorefineries, i.e. which only use different types of biomass (sugarcane stalks and straw, forest resources, and vegetable oils) as main inputs and do not rely on external electrical energy, natural gas, or other energy sources for the production of SAF and other biofuels. The analysis prioritized three SAF conversion routes already approved or currently under analysis by ASTM International. Twelve biorefinery scenarios were defined and assessed in terms of economic and environmental impacts.

Germany (CAAF/2-WP/15) noted that the 2015 Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) requires massive greenhouse gas (GHG) emission reductions in all sectors by mid-century to pave the way for a global GHG neutrality in the second half of this century. Renewable fuels are a major building block in achieving absolute emission reductions in aviation. The paper provided an introduction to the concept of producing sustainable jet fuel using renewable electricity, so-called Power-to-Liquids (PtL). Production pathways and jet fuel drop-in capability are explained. Compared to biofuels PtL has no demand for arable land and a significantly lower demand for water. Produced from renewable electricity PtL has the potential to become almost CO_2-neutral in the longer term. It can make a major contribution of the air transport sector to the global climate goals.

Mexico (CAAF/2-IP/10) noted that they have participated in several voluntary initiatives to reduce their emissions and to mitigate the effects of climate change, including initiatives in the aviation industry. The biojet fuel cluster of the Mexican Centre for Innovation in Bioenergy was created with the support of the Mexican Federal Government, to continue with the diagnostic and route mapping efforts that had been carried out in 2010 and 2011. The objective is to contribute to the development and implementation of the supply chain of aviation alternative fuels, given the potential that Mexico has, and therefore, supports the sector to accomplish the voluntary goals that have been established for 2020 and 2050.

1.2 **Discussion**

1.2.1 All States expressed their congratulations to Roberto Kobeh González, Director General, Servicios a la Navegacion del Espacio Aereo Mexicano (SENEAM), on his election as Chairperson, and to Mr. Kevin Shum, Director General, Civil Aviation Authority, Singapore, on his election as Vice-Chairperson. They also congratulated ICAO for convening a Conference on aviation alternative fuels and expressed their desire to collaborate with ICAO on this important topic, in light of the progress achieved since the first Conference on Aviation Alternative Fuels (CAAF/1) in 2009. All States thanked Mexico for hosting such a significant Conference.

1.2.2 There was extensive discussion about the definitions presented in CAAF/2-WP/03 for use by the Conference. Adjustments to several definitions were suggested and discussed. One suggestion was to use the definitions from the ICAO Committee on Aviation Environmental Protection (CAEP) Alternative Fuels Task Force (AFTF), which were accepted for use under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and that are presently being reviewed by the ICAO Council as part of the proposed amendment to Annex 16 – Environmental Protection, to include the first edition of Volume IV – CORSIA. The Conference agreed to this approach.

1.2.3 The progress made since CAAF/1 in 2009 to establish a commercial SAF industry was widely recognized. Establishing a technical certification for SAF was also acknowledged by the Conference as a significant milestone as was the on-going operation of a commercial scale, continuous production facility in the United States.

1.2.4 The Conference agreed to the significance of the technical certification of SAF and support efforts and policies to reduce the time and expense of certifying fuels.

1.2.5 The Conference recognized the importance of ICAO's efforts to foster SAF development, including through the work of the ICAO CAEP AFTF, the ICAO Seminar on Alternative Fuels, the ICAO State Action Plans for CO_2 Emissions Reductions from International Aviation initiative, and other dedicated workshops and seminars, and encouraged ICAO to continue such efforts.

1.2.6 The Conference agreed that SAF are important for reducing net CO_2 emissions from air transport. The environmental benefits and the overall sustainability of such fuels are important to the industry and are a major building block for achieving absolute emission reductions in aviation.

1.3 **Conclusions**

1.3.1 From the documentation and ensuing discussion on developments in research and certification of AAF under Agenda Item 1, the Conference concluded the following:

a) sustainable Alternative Fuels (SAF) have the potential to contribute significantly to ICAO's climate objectives and address environmental challenges facing aviation;

b) since CAAF/1 in 2009, significant progress developing an aviation alternative fuels (AAF) industry has occurred, including establishing an internationally recognized specification (5 conversion processes approved for AAF production), and reducing AAF production costs;

c) ICAO has been successfully fostering international cooperation by means of dedicated workshops and seminars, including the ICAO Seminar on Alternative Fuels which served as a basis for this Conference, and the Global Framework for Aviation Alternative Fuels website (GFAAF), and should continue to do so;

d) the emerging SAF industry has a challenge in competing with the well-established CAF industry, and there is a need for financial mechanisms and policies, to ensure the competitiveness of SAF and reduce the risk of SAF investments, particularly during a period of low oil prices. This includes reducing time and expenses required for technical certification of aviation alternative fuels. Global and interdisciplinary collaborations can contribute to that objective; and

e) numerous States have active SAF research, development, demonstration, and innovation programmes underway including policy support and financial mechanisms.

1.4 **Recommendations**

1.4.1 From the documentation and ensuing discussion on developments in research and certification of AAF under Agenda Item 1, the Conference adopted the following recommendations:

a) States should support ICAO efforts for fostering international cooperation on SAFs development and deployment, including through the work of the Council's Committee on Aviation Environmental Protection (CAEP), and the update of the ICAO GFAAF website, by sharing examples of policy implementation, results and lessons learned which could be useful to other States and CAEP work, as well as other ICAO outreach and capacity building initiatives;

b) encourage States to support the approval of new conversion processes under development, and explore means and policies for reducing time and expenses required for technical certification of aviation alternative fuels, such as the D4054 Clearinghouse concept;

c) encourage States to communicate the drop-in AAF certification concept to domestic aviation regulatory agencies and recommend that they issue appropriate communications to their domestic aviation community, such as described in FAA SAIB NE-11-56R2;

d) States should promote collaborative initiatives amongst States, and with industry, in supporting global efforts to pursue price parity between SAF and CAF, including utilizing existing facilities to produce SAF, and identifying and exploring feedstock resources and conversion processes;

e) defining terminologies is an important part of the work on aviation alternative fuels. The terminologies "sustainable aviation fuels", "aviation alternative fuels", "conventional aviation fuels", "conversion process", "feedstock", and "pathway" are under consideration by ICAO deliberative bodies as part of the work on CORSIA, and once adopted will be used for work on aviation alternative fuels; and

f) encourage States to foster the further development of innovative technological routes to produce SAF from sources such as renewable electricity, while additional efforts should be made to scale up the market of these fuels.

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Agenda Item 2: Financing and Assistance Programmes for Aviation Alternative Fuels

2.1 **Documentation**

2.1.1 The Conference reviewed the following working papers and information papers from the Secretariat, States and Observer organizations:

Secretariat (CAAF/2-WP/09) described opportunities for possible generation of carbon credits through alternative fuel projects as a possible means to mitigate projects' investment cost. It described offsetting programmes, notably the Clean Development Mechanism (CDM), and suggested ways the production of alternative fuels could obtain carbon credits from offsetting programmes.

Secretariat (CAAF/2-WP/10**)** identified current financial sources available for SAF projects, highlighting their importance to the development of the SAF industry.

United States (CAAF/2-WP/16) noted that despite years of efforts, continued breakthroughs will be necessary for SAF to achieve the numerous goals that have been established for them. To enable further successful deployment of SAF, it is important for ICAO to take a central role in reaching the key next steps in SAF development and deployment through information sharing, communicating among stakeholders in the international aviation community, and facilitating discussions between financial institutions and industry.

ACI (CAAF/2-WP/22) showcased current and planned initiatives by airport operators to support the supply of SAF, discussed the financing opportunities and limitations of such initiatives to be extended to other airports, and recognized that airports could be a facilitator for the deployment of SAF at a commercial scale when a clear business case is in place.

ICAO and UNFCCC Secretariats (CAAF/2-WP/24) identified opportunities for possible generation of carbon credits through alternative fuel production and utilization. The paper noted the opportunities for the possible generation of certified emission reductions through AAF projects, and identified the potential benefits of developing a dedicated CDM methodology for the production and utilization of AAF in domestic aviation.

Carbon War Room/Rocky Mountain Institute (CAAF/2-WP/27) detailed unique benefits associated with an airport-led approach to increase uptake of SAF, recognized existing applications of the unconventional approach, and highlighted the urgency of intervention in the SAF market.

Secretariat (CAAF/2-IP/02) provided information on the two ICAO assistance projects established with the EU, and the United Nations Development Programme (UNDP), with financing from the Global Environment Facility (GEF). These projects aim to support selected States to develop their State Action Plans and implement the mitigation measures contained therein, including those measures related to the development and deployment of SAF.

2.2 Discussion

2.2.1 The Conference discussed that there could be opportunities for possible generation of carbon credits through sustainable aviation fuel projects as a possible means to mitigate projects' investment cost, but recognized that there should be an assessment of the risk that this could result in double-counting and eliminate benefits for international aviation's contribution to global emissions reductions.

2.2.2 The Conference reflected on the fact that, under CORSIA, a sound methodology has been developed to claim the benefits of emissions reductions from the use of sustainable aviation fuels, and that this methodology was part of the proposed Standards and Recommended Practices (SARPs) and related guidance currently under review.

2.2.3 The Conference discussed the role of ICAO in the key next steps in the development and deployment of SAF, as a means to enable further successful deployment of SAF. There was widespread appreciation of the facilitating role that ICAO has played in this regard, with some views being expressed on the need to better reflect the role of ICAO beyond that of facilitation i.e. in policy-setting and in supporting actions by States, and with respect to defining the sustainability framework for AAF.

2.2.4 The Conference recognized the work undertaken by ICAO to define a set of sustainability criteria for AAF, and agreed on the need to provide financing to support approaches for the commercial deployment of SAF.

2.2.5 The accomplishments made by several airports in storing and delivering SAF to select airlines on an ad-hoc basis and the delivery of SAF into hydrant fuelling systems for all airlines were acknowledged by the Conference as important milestones in SAF acceptance.

2.3 Conclusions

2.3.1 From the documentation and ensuing discussion under Agenda Item 2: Financing and Assistance Programmes for Aviation Alternative Fuels, the Conference concluded the following:

a) as a new industry, the SAF industry must overcome a variety of initial market hurdles throughout its development cycle. Therefore, it is important to have a variety of funding sources throughout the development cycle of the SAF industry;

b) there could be opportunities for possible generation of carbon credits through sustainable aviation fuel projects as a possible means to mitigate projects' investment cost, but there should be an assessment of the risk that this could result in double-counting and eliminate benefits for international aviation's contribution to global emissions reductions;

c) ICAO assistance projects are successfully supporting States to develop their State Action Plans and implement the mitigation measures, including those measures related to the development and deployment of sustainable aviation fuels;

d) States and industry have the primary role in SAF deployment and that public-private partnerships have been, and will continue to be, instrumental to SAF deployment;

e) the availability of SAFs onsite at airports is an element that could facilitate the deployment of SAFs on a commercial scale;

f) several airports are already facilitating the use of SAF on a regular basis, while several airports receive SAF on an ad-hoc basis or are in the process of enabling supplies of SAF. These industry leaders should be recognized and best practices shared;

g) positive externalities of SAF production and use are valuable to airports. However, airports' initiatives on sustainable aviation fuels are highly dependent on airport ownership formats, a clear business case, stakeholder partnerships, and local subsidies, grants or other incentives available at particular airports, as well as appropriate engagement and collaboration with commercial and business operators; and

h) off-take agreements have been very beneficial to confirming the market for SAF and reducing market risk for SAF developers and investors, opening the initial markets that have been demonstrated to date.

2.4 **Recommendations**

2.4.1 From the documentation and ensuing discussion under Agenda Item 2, Financing and Assistance Programmes for Aviation Alternative Fuels, the Conference adopted the following recommendations:

a) ICAO to act primarily as a facilitator, sharing information and best practices, communicating the economic and environmental value of SAF to the international aviation community, facilitating discussions between financial institutions and industry;

b) ICAO to facilitate capacity building and assisting States to develop and deploy SAFs that are well suited to the circumstances and resources of individual States; and

c) States be encouraged to evaluate available funding sources, advertise the need for investing in SAF production and opportunities for investing in SAF production, and to the extent possible, facilitate accessibility to funding sources appropriate to development needs. This includes supporting airports that decide to implement the supply of SAFs and support new feasibility studies for the supply of SAFs at airports.

2.4.2 The Chairperson presented these conclusions and recommendations in CAAF/2-SD/1 and CAAF/2-SD/2, which were approved by the Conference.

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Agenda Item 3: Challenges and Policy Making

3.1 Documentation

3.1.1 The Conference reviewed the following working papers and information papers from the Secretariat, States and Observer organizations:

Secretariat (CAAF/2-WP/11) described the progress on the development of a "Guidance on Potential Policies and Coordinated Approaches for the Deployment of Sustainable Alternative Aviation Fuels" by the ICAO CAEP and invited States to evaluate the proposed qualitative methodology for the assessment of the effectiveness of alternative fuel policies.

Secretariat (CAAF/2-WP/12) described several challenges that exist for the development, production, and deployment of SAFs. The paper suggested possible means to overcome these challenges with the use of policy measures and presented benefits and opportunities in all pillars of sustainable development that might be created with the development of an SAF industry, which are consistent with the UN Sustainable Development Goals (SDGs).

Indonesia (CAAF/2-WP/19) expressed support for the work developed by ICAO to date on aviation and alternative fuels and described Indonesia's views on the promotion of policies for supporting the development of SAF.

Guatemala on behalf of the Latin American Civil Aviation Commission (LACAC) (CAAF/2-WP/29) described how the Latin American region has developed successful cases on alternative fuels for aviation, due largely to inter-institutional and intersectoral coordination. For this reason, the importance of forging partnerships of cooperation between States, international organizations, and other interested parties for the development of alternative fuels was highlighted. The need for a programme to disseminate funding sources and the importance of establishing strategic lines for the development of incentives and the promotion of technology transfer were also discussed.

IATA on behalf of Airports Council International (ACI), Civil Air Navigation Services Organisation (CANSO), International Air Transport Association (IATA), International Business Aviation Council (IBAC), International Coordinating Council for Aerospace Industries Associations (ICCAIA) (CAAF/2-WP/25) noted that the aviation industry has taken a proactive approach to address its contribution to the urgent global challenge of climate change. In 2009, the industry set three ambitious goals to reduce CO_2 emissions from international aviation and put in place a four pillar strategy to achieve those goals. The commercial deployment of SAF remains a fundamental element of that strategy. In this regard, the industry representatives requested that States put in place policy frameworks that strongly incentivize SAF development, production and use. The industry also supported a focus on identifying pathways for achieving a short-term aspirational goal in 2025, with the adoption of a longer-term goal as progress is assessed.

Secretariat (CAAF/2-IP/03) provided an overview of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which was adopted by the 39th

Session of the ICAO Assembly in 2016. It described the general design and implementation features of CORSIA, and accounting of emissions reductions from the use of SAF under CORSIA.

Secretariat (CAAF/2-IP/04) provided an overview of the current alternative fuel policies in place, not only in aviation but for ground transportation as well. It also described several policies and global initiatives developed to promote alternative fuels.

3.2 Discussion

3.2.1 The Conference discussed several policy options for encouraging and supporting the development, production, and deployment of SAF, noting that different options depend on national circumstances and resources.

3.2.2 The Conference recognized the importance of partnerships for cooperation between States, international organizations, and other interested parties for developing SAF.

3.2.3 There was general agreement that many States have significant policies supporting alternative fuel use in surface vehicles, but fewer policies that support alternative fuels for the aviation sector.

3.2.4 The Conference also recognized the importance for States to have stable policies to allow SAF development, financing, and production without disruption to planning and market forces.

3.3 Conclusions

3.3.1 From the documentation and ensuing discussion on Agenda Item 3: Challenges and Policy Making, the Conference concluded the following:

a) adequate policies are needed to reduce the production cost gap between SAF and CAF, reduce the risk of SAF investments, and integrate efforts among all stakeholders involved in the SAF supply chain;

b) few policies are in place for the deployment of SAF, in contrast with the several policies for ground transportation alternative fuels;

c) commercial aviation has currently no alternatives to liquid fuels as a source of energy, while in many cases ground transportation can rely on other sources such as electricity. For these reasons, States should be encouraged to promote the use of SAF for the aviation sector or promote policies that strive to establish a level playing field between aviation and other transportation sectors;

d) States may realize economic, social, and environmental advantages by building a new SAF industry, contributing to the ambitious and transformational vision set out in 13 of the United Nations SDGs;

e) there is a need for inter-institutional and inter-sectoral coordination for the development of policies, research, and financing for aviation alternative fuels, in order to avoid inconsistent actions; and

f) there are several potential policy options for incentivizing SAF production and

deployment, such as SAF blending mandates or targets, subsidies, production facility grants, loan guarantees, and tax credits.

3.4 **Recommendations**

3.4.1 From the documentation and ensuing discussion on Agenda Item 3: Challenges and Policy Making, the Conference adopted the following recommendations:

a) States are encouraged to provide examples of successful renewable energy and sustainable aviation fuels policy implementation case studies; results and possible lessons learned which could be useful to other Member States and current CAEP work, and could be used to promote the economic, social, and environmental advantages that may arise from the development of an SAF industry;

b) States are encouraged to evaluate the policy effectiveness by means of qualitative metrics such as flexibility, certainty, financial costs and benefits, price sensitivity to externalities, ease of implementation, contribution to SAF deployment and GHG reduction, unintended consequences, and robustness, while recognising the importance of quantitative metrics, where possible, to inform policy decisions;

c) States are encouraged to support the development and implementation of stable policy frameworks that facilitate the deployment of sustainable aviation fuels, including via policy incentives, collaborative research, and assistance, while avoiding distortions of fair competition; and

d) States are encouraged to develop policies that promote the use of SAF for the aviation sector or the promotion of policies that strive to establish a level playing field between aviation and other transportation sectors.

3.4.2 The Chairperson presented these conclusions and recommendations in CAAF/2-SD2, which was approved by the Conference.

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Agenda Item 4: Defining the ICAO Vision on Aviation Alternative Fuels and Future Objectives

4.1 Documentation

4.1.1 The Conference reviewed the following working papers and information papers from the Secretariat, States and Observer organizations:

Secretariat (CAAF/2-WP/06) presented the environmental trends endorsed at the 39th Session of the ICAO Assembly, including further details on the role of sustainable aviation fuels (SAFs), in order to support the discussion on the ICAO Vision on Aviation Alternative Fuels.

Secretariat (CAAF/2-WP/13) outlined the proposed ICAO Vision on Aviation Alternative Fuels, which aims to inspire States to transition to the extensive use of SAF in international aviation. To achieve this objective, ICAO Member States and stakeholders were encouraged to take significant steps in coordination with one another. This Vision will be a living instrument; the progress towards achieving it will be regularly assessed through a stocktaking process, in order to encourage States to take action at national and international levels to further develop and deploy SAF.

Mexico (CAAF/2-WP/23) summarized the current status for the development and deployment of SAF, and supported the need for an international Vision to encourage States to take policy actions on the national and international levels to further develop and deploy SAF.

Russian Federation (CAAF/2-WP/20) noted that according to members of the UN Intergovernmental Panel on Climate Change (IPCC) anthropogenic CO_2 emissions are the main driver of the global temperature increase. For this reason, the most efficient option to achieve CO_2 emissions reductions at the global level should be identified for international civil aviation. The paper presented technical data to enable CAAF/2 to consider the potential of aviation biofuels to achieve the global aspirational goal of carbon neutral growth from 2020 (CNG 2020) as well as other aspects of the early introduction of these types of fuel, in conformity with the UN SDGs, while taking into account the issues of flight safety, food, and water security.

Brazil and Indonesia (CAAF/2-WP/18) expressed support for the establishment of an ICAO Vision on Aviation and Alternative Fuels, including specific production aspirational goals. The paper also highlighted concerns regarding the means of sustaining the achievement of ICAO´s climate goals over the long term, which will require sufficient supply of SAF to compensate for aviation´s post-2020 growth in carbon emissions, and on the present lack of a mechanism to ensure a smooth and predictable transition path to the phase-out of ICAO´s CORSIA MBMs in 2035. To address these concerns, the paper proposed a way forward by means of a future revision to the formula for offsetting emissions in the CORSIA Standards and Recommended Practices (SARPs).

China (CAAF/2-WP/26) welcomed a practicable ICAO Vision for Aviation Alternative Fuels (AAF) to be developed through substantial consultation and discussion among States. This paper elaborated on China's efforts to facilitate the application of the aviation alternative fuels and serious concerns on some of ICAO's AAF initiatives, the assumption on the deployment objective and the standardization of "sustainability" in particular.

Singapore (CAAF/2-WP/28) noted that AAF) are part of the ICAO basket-of-measures to address international aviation emissions. While AAF is often seen as a longer term measure, there has been some advancement in its development with some airlines deploying AAF on a continuous basis. ICAO is also developing guidelines on the use of AAF. Singapore recently conducted a series of Green Package Flights involving the use of a suite of green measures including AAF to explore the environmental benefits of a combination of measures and to determine the procurement, logistics, and operational requirements of using AAF from the perspective of a State regulator. Several issues with the deployment of AAF have been identified for consideration by ICAO, to support the development of a relevant, practical and effective ICAO Vision on AAF.

Dominican Republic (CAAF/2-WP/30) described concrete steps in the Declaration of Punta Cana signed in December 2016 to contribute to the mitigation of GHG emissions and support a sustainable economic and environmental development in the international aviation sector through alternative fuels. It is clear that alternative fuels have significant potential even for developing countries, therefore, the Dominican Republic ratified its interest and commitment to move towards the development and use of SAF in accordance with the ICAO Vision. The Dominican Republic urged Member States and ICAO to continue working within a broader framework of cooperation and assistance, particularly in developing countries, to ensure a comprehensive approach and equal conditions for the use and development of alternative fuels.

International Coalition for Sustainable Aviation (ICSA) (CAAF/2-WP/21) described ICSA's views on the role of SAF in contributing toward mitigating the international aviation sector's climate impacts. ICSA provided its thoughts on developing an ICAO Vision on Aviation Alternative Fuels, SAF policies, and financing approaches. ICSA did not agree with the use of volumetric targets within the ICAO Vision and did not agree with the prioritization of aviation over other sectors. ICSA also suggested that AAF use should only be acknowledged by ICAO if the fuel complies with robust sustainability criteria and an associated framework, delivers significant GHG emissions reductions, after accounting for indirect land use change and other indirect effects, and avoids double-counting.

4.2 **Discussion**

4.2.1 The Conference discussed the need for a 2050 ICAO Vision for Sustainable Aviation Fuels as a means to inspire consistent, sustained, and significant development of SAF production.

4.2.2 The Conference noted that with the SAF industry just beginning to develop, it would be premature to establish quantitative SAF production goals. However, the Conference agreed that a significant proportion of conventional aviation fuels (CAF) be substituted with sustainable aviation fuels (SAF) by 2050, for international civil aviation to reduce carbon emissions significantly, and whilst pursuing all opportunities in the basket of mitigation measures to reduce emissions, as necessary.

4.2.3 The Conference agreed that quantitative goals for SAF replacement of CAF and carbon reductions as a result of SAF use could be defined in the near-term based on determining SAF use through a regular stocktaking process.

4.2.4 The Conference appreciated ICAO's efforts to organize CAAF/2 as a follow on to CAAF/1 and supported plans for CAAF/3 in the near-term. States suggested that the eight years between the first two Conferences had been too long to wait for CAA/3, but to provide flexibility, there was agreement that it should be planned for no later than 2025, and potentially as early as 2021.

4.2.5 The Conference agreed that ICAO should support States' efforts to develop and deploy SAF by communicating information on best practices and effective policies, developing guidance materials, and facilitating capacity building and assistance.

4.2.6 States welcomed and acknowledged the value of the Global Framework on Aviation Alternative Fuels (GFAAF) and the Conference encouraged ICAO to continue working with States, industries, and other stakeholders to maintain and update the framework.

4.2.7 The Conference encouraged ICAO to support a market launch strategy for alternative fuels produced from renewable electricity based on non-biogenic energy sources.

4.2.8 The Conference expressed its gratitude to the Government of Mexico for its efforts in preparing and organizing such a successful event, in particular in the aftermath of the recent earthquakes. The Conference reiterated its appreciation for the resolve of Mexico to stand by its offer to host this meeting, even in adverse circumstances, and reaffirmed the solidarity of ICAO, Member States and the aviation community with the people of Mexico.

4.3 **Conclusions**

4.3.1 From the documentation and ensuing discussion on Agenda Item 4, Defining the ICAO Vision on Aviation and Alternative Fuels and Future Objectives, the Conference approved the Declaration of the Second Conference on Aviation and Alternative Fuels (CAAF/2), which is presented as Appendix C in this report.

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APPENDIX A

LIST OF PARTIICPANTS

Participant Name	State/Organization
Alejandro Torres Lepori	Argentina
Martin Mainero	Argentina
Miranda Lello	Australia
Adriano Bonotto	Brazil
Ailton Ricaldoni Lobo	Brazil
Daniel Ramos Longo	Brazil
Guilherme Lima	Brazil
Mateus Caiado	Brazil
Pedro Rodrigo	Brazil
Mike Lu	Brazil
Rafaela Cortes	Brazil
Gilles Bourgeois	Canada
Martial Pagé	Canada
Sylvain Cofsky	Canada
Chunyu Ding	China
Kai Chen	China
Ming Li	China
Carlos Veras	Dominican Republic
Janne Mänttäri	Finland
Jyrki Laitila	Finland
Aline Pillan	France
Anne-Laure Gaumerais	France
Claire RAIS ASSA	France
Combet Sandra	France
Maxime Millefert	France
Nina Chini	France
Philippe Bertoux	France
Anne Bondiou-Clergerie	France
Jan Seven	Germany
Petra Bollich	Germany
Carlos Velasquez	Guatemala
Alok Shekhar	India
Cesar Velarde	Indonesia
Giovanni Barraco	Italy
Giuseppe Daniele Carrabba	Italy

Participant Name	State/Organization
Daisuke Umezawa	Japan
Junji Naito	Japan
Masato Takehisa	Japan
Mitsuhiko Ota	Japan
Shoji Kawamori	Japan
Takahiro Nakashima	Japan
Yoshiki Imawaka	Japan
Alberto Chaveste Noveron	Mexico
Alfredo Ramos	Mexico
Arroyo García Jesús G.	Mexico
David Rios Jara	Mexico
Dionisio Méndez Mayora	Mexico
Erika Casamadrid	Mexico
Gabriel Escamilla Carmona	Mexico
Gisela Yazmín Araujo Martínez	Mexico
Héctor Diaz Garcia	Mexico
Jose de Jesus Quezada Sanchez	Mexico
Mauricio Arellano Villavicencio	Mexico
Oscar Araiza	Mexico
Roman Ramirez	Mexico
Tania Buenrostro	Mexico
Victor Gonzalez	Mexico
Adrián Torija Miranda	Mexico
Alfonso Sarabia de la Garza	Mexico
Francisco Jaime Contreras Miranda	Mexico
Héctor Díaz García	Mexico
Jorge Nevárez Jacobo	Mexico
Luis Fernando Herrera Fallas	Mexico
Miguel Peláez Lira	Mexico
Pablo Carranza Plata	Mexico
Roberto Kobeh González	Mexico
Sylvia Neuman Samuel	Mexico
Rijk Klein Veldink	Netherlands
Carlos Real Sequeira	Nicaragua
Eveling Arauz	Nicaragua
Karl Koefoed	Norway
Olav Mosvold Larsen	Norway
Øyvind Ek	Norway
Asim Suleiman	Pakistan

Participant Name	State/Organization
Dorsa Sabet-Rasekh	Panama
Sohee Kim	Republic Of Korea
Sung-oun Oh	Republic Of Korea
Alexander Batalov	Russian Federation
Abdelrahman Mohammed A. Al Gwaiz	Saudi Arabia
Hamoud R. AlOtaibi	Saudi Arabia
Eileen Poh	Singapore
Erlina Ang	Singapore
Kevin Shum	Singapore
Meaveen Lee	Singapore
Tee Chiou Ng	Singapore
Raul Martin Fontana	Spain
Annika Lindell	Sweden
Carola Lindberg	Sweden
Gunnar Ljungberg	Sweden
Alejandro Rios G.	United Arab Emirates
Raphael Bokango	United Rep. Of Tanzania
Daniel Williams	United States Of America
James Hileman	United States Of America
Mark Rumizen	United States Of America
Robert Malina	United States Of America
Curtis Holsclaw	United States Of America
Nate Brown	United States Of America
Henrik Erametsa	ABFA
Mateo Radnic	ABFA
Erin Cooke	ACI
Abner González	COCESNA
Edwin Giovanni Tobar Guzman	COCESNA
Jorge Antonio Vargas	COCESNA
Craig Shiller	CWR/RMI
Peter Vis	EU
Alexander Menotti	IATA
Chun-Chieh Chuang	IATA
Daniel Chereau	IATA
Haldane Dodd	IATA
Hora Hayao	IATA
Jonathan Counsell	IATA
Michael Gill	IATA
Oracio Marquez	IATA

Participant Name	State/Organization
Robert John Boyd	IATA
Xing Ziheng	IATA
Yuan Biao	IATA
Frederic Eychenne	ICCAIA
Michael Lakeman	ICCAIA
Sean Newsum	ICCAIA
Carlos Calvo Ambel	ICSA
Christa Michelet	ICSA
Pedro Piris-Cabezas	ICSA
Robert Brons	IFALPA
Gerard Ostheimer	SE4ALL
Maarten van Dijk	SkyNRG

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APPENDIX B

LIST OF DOCUMENTATION

WORKING PAPERS

WP No.	Agenda Item	Title	Presented by
1	All	Annotated agenda	Secretariat
2	All	Meeting Arrangements and Tentative Timetable	Secretariat
3	1	Definitions	Secretariat
4	1	Follow-up on CAAF/1 recommendations	Secretariat
5	1	Outcomes of the ICAO Seminar on Alternative Fuels	Secretariat
6 (Revised)	4	Trends and Scenarios on Alternative Fuels	Secretariat
7	1	Status of Technical Certification of Aviation Alternative Fuels	Secretariat
8	1	Estimated Prices of Aviation Alternative Fuels	Secretariat
9	2	Generation of Carbon Credits from Projects Related to the Development and Deployment of Alternative Fuels, Including Aviation Alternative Fuels	Secretariat
10 (Revised)	2	Financial Sources for Sustainable Aviation Fuels Projects	Secretariat
11 (Revised)	3	Guidance on Potential Policies and Coordinated Approaches for the Deployment of Sustainable Aviation Fuels	Secretariat
12	3	Challenges and Opportunities in Policy Making for Sustainable Aviation Fuels	Secretariat
13	4	Proposed ICAO Vision on Aviation Alternative Fuels	Secretariat
14	All	European Views and Support for the Development and Use of Sustainable Aviation Fuels	Estonia on behalf of the EU
15	4	Power-to-Liquids (PtL): Sustainable Alternative Fuels Produced from Renewable Electricity	Germany
16	4	ICAO's Role in the Development and Deployment of Sustainable Aviation Fuels	United States
17	1	Alternative Fuels Certification Process Accomplishments and Challenges	United States
18	3,4	Proposals for an ICAO Vision on Aviation and Alternative Fuels and for Ensuring a Smooth Transition to the Phase-out of CORSIA MBMs	Brazil and Indonesia
19	3	Indonesia Views on Policies for Supporting the Development of Sustainable Aviation Fuels	Indonesia

20 (Revised)	4	Aviation Biofuels Efficiency in Terms of CO_2 Emissions Reduction	Russian Federation
21	2,3,4	Views of ICSA on the ICAO Vision for Aviation Alternative Fuels	ICSA
22	2	Contributions from Airports to the Supply of Sustainable Aviation Fuels (SAFs)	ACI
23	4	Development of Sustainable Aviation Fuels and the ICAO Vision	Mexico
24	2	Development of a New Dedicated CDM Methodology For the Production and Utilization of Aviation Alternative Fuels in Domestic Aviation	ICAO and UNFCCC Secretariats
25	4	Industry Positions on the Proposed ICAO Vision	ACI, CANSO, IATA, IBAC, ICCAIA
26	4	China's Position on the Development of ICAO Vision for AAF	China
27	2	Unique Airport Role to Advance Sustainable Aviation Fuel (SAF)	Carbon War Room/Rocky Mountain Institute
28	4	Use of Aviation Alternative Fuels for International Aviation	Singapore
29	4	Progress of the Latin American Region on the Development and Deployment of Alternative Fuels for Aviation	LACAC
30	4	Production and Use of Sustainable Alternative Fuels for Aviation in Developing Countries	Dominican Republic

INFORMATION PAPERS

IP No.	Agenda Item	Title	Presented by
1	1	Work of the Alternative Fuels Task Force	Secretariat
2	2	ICAO Assistance Programmes on Environment	Secretariat
3	3	Consideration of Sustainable Aviation Fuels in CORSIA	Secretariat
4	3	Current Policies and Global Initiatives on Alternative Fuels	Secretariat
5	1,2,3	Efforts of Japan Toward the Realization of Commercial Flights Using Alternative Jet Fuels	Japan
6	1	Integrated Production Systems for Sustainable Aviation Fuel (SAF) Feedstock Production in Water-Stressed Regions	UAE
7	3	Sustainable Aviation Fuels Environment in Brazil	Brazil
8	1,2	SABR-TCR: A Stand Alone Biorefinery Solution For ICAO´S "No Country Left Behind"	Brazil
9	1,2	Techno-economic and Environmental Assessment of Biojet Fuel Production in Brazil	Brazil
10	1,2	Mexican Center for Innovation in Bioenergy (MCIB) – Biojet Fuel Cluster	Mexico

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APPENDIX C

The Conference on Aviation and Alternative Fuels, convened by the International Civil Aviation Organization (ICAO) in Mexico City, Mexico from 11 to 13 October 2017 with the participation from States and industry approved the following declaration:

DECLARATION
OF THE SECOND CONFERENCE ON AVIATION AND ALTERNATIVE FUELS (CAAF/2)
Mexico City, Mexico, 11 to 13 October 2017

Whereas the ICAO 39th Assembly recognized the importance of research and development in fuel efficiency and alternative fuels for aviation that will enable international air transport operations with a lower environmental impact, both in terms of local air quality and the global climate;

Whereas the ICAO 39th Assembly requested the Council to continuously monitor the implementation of all elements of the basket of measures and consider the necessary policies and actions to ensure that progress is achieved in all of the elements in a balanced way with an increasing percentage of emissions reductions accruing from non-MBM measures over time;

Noting that the introduction of sustainable aviation fuels (SAF) is one of the measures that can contribute significantly to ICAO's climate objectives and to the goal set forth in ICAO Assembly Resolution A39-2, and address environmental challenges facing aviation, and may also realize economic, social, and environmental advantages that contribute to the ambitious and transformational vision set out in 13 out of 17 of the United Nations Sustainable Development Goals;

Whereas the ICAO 39th Assembly acknowledged the need for SAF to be developed and deployed in an economically feasible, socially and environmentally acceptable manner, and progress achieved in the harmonization of the approaches to sustainability;

Noting that, since CAAF/1 in 2009, significant progress developing a SAF industry has occurred, including establishing an internationally recognized specification, reducing SAF production costs, and starting commercial SAF deployment at locations around the world;

Acknowledging that ICAO has been successfully fostering international cooperation by means of dedicated workshops and seminars and should continue to do so, and also *welcoming* the ICAO initiative on State Action Plans, including those measures related to development and deployment of SAF;

Acknowledging the challenges faced by the emerging SAF industry in competing with the well-established CAF industry, and the need for financial mechanisms and policies to ensure the competitiveness of SAF and reduce the risk of SAF investments. This includes reducing time and expenses required for technical certification of SAF;

Recognizing that States and industry have the primary role in SAF deployment and that public-private partnerships have been, and will continue to be, instrumental to SAF deployment;

Acknowledging the availability of SAF onsite at airports is an element that could facilitate the deployment of SAF on a commercial scale;

Noting that the aviation industry is already facilitating the use of SAF on a regular basis, with several airlines using SAF and airports receiving SAF on an ad-hoc basis, or are in the process of enabling supplies of SAF;

Acknowledging that global and interdisciplinary collaborations are needed for technical certification of SAF, and that inter-institutional and inter-sectoral coordination is needed for developing policies, research, and financing for SAF to avoid inconsistent actions;

Acknowledging the importance of having a variety of funding sources throughout the development cycle of the SAF industry;

Recognizing that the environmental benefits of SAF production and use are valuable. However, airports' initiatives on SAF are highly dependent on airport ownership formats, a clear business case, stakeholder partnerships, and local subsidies, grants or other incentives available at particular airports, as well as appropriate engagement and collaboration with commercial and business aircraft operators;

Noting that commercial aviation has currently no alternatives to liquid fuels as a source of energy, while in many cases ground transportation can rely on other sources such as electricity. For these reasons, States should be encouraged to promote the use of SAF for the aviation sector or policies that strive to establish a level playing field between aviation and other transportation sectors;

Noting the several potential policy options for incentivizing SAF production and deployment, such as SAF blending mandates or targets, subsidies, production facility grants, loan guarantees, and tax credits.

***Declares** that:*

1. The Conference endorses the 2050 ICAO Vision for Sustainable Aviation Fuels as a living inspirational path and calls on States, industry and other stakeholders, for a significant proportion of conventional aviation fuels (CAF) to be substituted with sustainable aviation fuels (SAF) by 2050, for international civil aviation to reduce carbon emissions significantly, and whilst pursuing all opportunities in the basket of mitigation measures to reduce emissions as necessary;

2. The Conference recognizes that the sustainability of alternative aviation fuels is of essential importance to the efforts of international civil aviation to reduce its CO_2 emissions. This is ensured by application of sustainability criteria to SAF as is currently under consideration by ICAO;

3. The Conference notes that this path is based on the assumptions of a progressive increased use of SAF, and should be periodically reviewed through a stocktaking process to continuously assess progress on the SAF development and deployment, including the necessity to consider policies and actions, and the organization of regular workshops and seminars, leading up to the convening of CAAF/3 no later than 2025, with a view to updating the 2050 ICAO Vision to include a quantified proportion of CAF to be substituted with SAF by 2050, and carbon reductions achieved by SAF;

4. ICAO and its Member States, in cooperation with the aviation industry and other stakeholders, will work together to pursue any opportunities to implement necessary policies, technology and financing measures, with an increasing proportion of SAF into the fuel supply over time towards the 2050 ICAO Vision, without any attribution of specific obligations to individual States;

5. ICAO will act primarily as a facilitator to support States on their efforts to develop and deploy SAF, by sharing information and best practices, communicating the economic and environmental value of SAF, facilitating discussions between financial institutions and industry, and developing guidance material;

6. ICAO will facilitate capacity building and assistance for States to develop and deploy SAF that are well suited to their national circumstances and resources;

7. ICAO, States, and stakeholders should develop guidance materials describing the drop-in nature of SAFs to support SAF deployment by aircraft operators, including for the integration of SAF into the hydrant system; and on the different models available for funding, incentives, development, and transfer of technology for SAF;

8. States are encouraged to support ICAO efforts for international cooperation on SAF development and deployment by sharing examples of policy implementation, results, and lessons learned, which could be useful to other States and CAEP work, as well as other ICAO outreach and capacity building initiatives;

9. ICAO should continue to work with States, industry and other stakeholders to update the Global Framework on Aviation Alternative Fuels (GFAAF);

10. States are encouraged to support the approval of new conversion processes under development, and explore means and policies for reducing time and expenses required for technical certification of SAF, such as the D4054 Clearinghouse concept;

11. States are encouraged to support the development and implementation of stable policy frameworks that facilitate the deployment of SAF, including via policy incentives, collaborative research, and assistance, while avoiding distortions of fair competition;

12. States are encouraged to develop policies that promote the use of SAF, or promote policies that strive to establish a level playing field between aviation and other transportation sectors on the use of sustainable fuels;

13. States are encouraged to evaluate the policy effectiveness by means of qualitative metrics such as flexibility, certainty, financial costs and benefits, price sensitivity to externalities, ease of implementation, contribution to SAF deployment and CO_2 reduction, unintended consequences, and robustness, while recognising the importance of quantitative metrics to inform policy decisions;

14. States are encouraged to provide examples of successful renewable energy and SAF policy implementation case studies; results and possible lessons learned, which could be useful to other States and current CAEP work, and could be used to promote the economic, social, and environmental advantages that may arise from the development of a SAF industry;

15. States are encouraged to evaluate available funding sources, and to the extent possible, facilitate accessibility to funding sources appropriate to development needs. This includes supporting airlines and airports that decide to implement the supply of SAFs and support new feasibility studies for the supply of SAFs at airports;

16. States are encouraged to promote collaborative initiatives amongst States, and with industry, in supporting global efforts to pursue price parity between SAF and CAF, including utilizing of existing facilities to produce SAF, and identifying and exploring sustainable feedstock resources and conversion processes;

17. States are encouraged to foster the further development of innovative technological pathways to produce SAF from sources such as renewable electricity, while additional efforts should be made to scale up the market of these fuels;

18. The 2050 ICAO Vision does not set a precedent for or prejudge the work to be undertaken by the ICAO Council regarding the exploration of a long term global aspirational goal for international aviation under paragraph 9 of Assembly Resolution A39-2, or the periodic review of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) under paragraph 18 of Assembly Resolution A39-3.

— END —

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