KIRIBATI ACTION PLAN ON CO_2 EMISSIONS REDUCTIONS FROM INTERNATIONAL AVIATION

Civil Aviation Authority of Kiribati

2023

Table of Contents

EXECUTIVE SUMMARY

The first action plan outlines Kiribati's key strategies to reduce CO2 emissions from international aviation. Kiribati is committed to managing the aviation industry's carbon footprint while enhancing safety and efficiency. The State Action Plan was developed in accordance with the ICAO Document 9988 and the IPCC methodology was used to establish the baseline scenario.

Acknowledging the impact of global warming, Kiribati has earnestly endeavoured to minimize the carbon footprint of aviation through measures including operational improvements, sustainable aviation fuel initiative, eco-airport programme and market-based measures like CORSIA.

Even though Kiribati's contribution to international carbon emissions is not substantial/negligible, the SAP sets a target to reduce aviation emissions, aligning with ICAO's global aspirational goals for the international aviation sector. These objectives encompass a 2% annual improvement in fuel efficiency improvement through 2050, achieving carbon-neutral growth from 2020 onwards, and a long-term global aspirational goal (LTAG) of net-zero carbon emissions by 2050.

Kiribati understands that this Action Plan is a living document subject to continuous review and updating as recommended in ICAO Assembly Resolution A41-21: Consolidated statement of continuing ICAO policies and practices related to environmental protection - Climate change. Kiribati, as one of the ICAO Member States, is committed to implementing ICAO's environmental protection programs toward greener aviation.

1. INTRODUCTION

1.1 Background and Objective

This Action Plan describes the circumstances of civil aviation activities in Kiribati and its key stakeholders that have initiated some efforts to reduce CO2 emissions in aviation. In addition, this Action Plan describes the mitigation measures selected by the National Action Plan Team to address CO2 at the national level. The projection of the trends of CO2 emissions with and without the implementation of these measures is also described, reflecting the positive impact of these initiatives on the carbon footprint of the national aviation sector in Kiribati. Because Kiribati does not have aircrafts conducting international flights, the mitigation measures focus mainly on domestic operations, reduction of energy consumption, implementation of green aviation and ICAO market-based measure.

Furthermore, these initiatives represent Kiribati's contribution towards the achievement of the global aspirational goals set by the ICAO. At its 41st Session in 2022, the ICAO Assembly reaffirmed the two global aspirational goals for the international aviation sector of 2 per cent annual fuel efficiency improvement through 2050 and carbon-neutral growth from 2020 onwards, as well as adopted a collective long-term global aspirational goal (LTAG) of net-zero carbon emissions by 2050. It also answers ICAO's call to its Member States during its 41st Assembly (2022) to submit voluntary States' Action Plans to communicate on the progress towards the environmental goals set by ICAO and, where appropriate, request assistance in implementing these plans.

1.2 Contact Information

Name of the Authority
Civil Aviation Authority of Kiribati

Point of Contact
Mrs Katikora Bwaare

Street Address
686 Tebue, Mackenzie Point

Country
Kiribati

Province
Tabaonga

Telephone Number
+686 73044824

E-mail address
katikora.baare@mict.gov.ki

2. OVERVIEW OF CIVIL AVIATION IN KIRIBATI

The Republic of Kiribati is a Pacific Small Island Developing State situated in the heart of the Pacific with a total land area of 811 square kilometres consisting of 32 islands dispersed across 3.5 million square kilometres of the Pacific Ocean. Kiribati became a party to the Convention on International Civil Aviation on 14 April 1981 and has since been working towards complying with international standards. The State has one airline that conducts domestic operations only and one airport operator, both of which are State-owned entities.

International flights are conducted by foreign airlines with a frequency of 24 flights per month and passenger capacity at 80% to 100% per flight. The State recognizes, through experience, the importance of mitigating and supporting off-setting activities and collaborations. Kiribati joined ICAO CORSIA since its inception where it is now in Pilot phase and will continue to explore ways in which it will be able to contribute to the reduction of international carbon emissions.

2.1 Current situation and future trend

With the scattered islands, the State has one airline serving domestic operations across the nation with 2 DHC 6-300 series, 1 DHC 6-300HG and 1 DHC 6-400 series. Kiribati has plans to initiate measures to increase passenger density and reduce energy demands in its operations and in turn contribute to the international long-term goals to reduce carbon emissions at the national level.

2.1.1 Air Operators

Air Operators	ICAO	IATA	Type of Operations
Air Kiribati Limited	AKL	IK	Scheduled/non-scheduled passenger and cargo domestic flights

2.1.2 Airport Operators

The table below is aimed at detailing the data of the airport operators in Kiribati in order to frame the aviation work under the perspective of the airport operators' side.

Airport Operators	Airport Names and Cities	Domestic/International
Airport Kiribati Authority	Bonriki Airport – Tarawa Cassidy Airport - CXI	Domestic and International Airport

2.1.3 Air Navigation Service Providers

Air navigation services provided in Kiribati include Air Traffic Services, providing information to aircrafts flying below 10,000ft, providing MET information for domestic flights and communicating with aircrafts conducting domestic air service.

Air Navigation Service Providers	Type of Service
Airport Kiribati Authority	Air Traffic Service

2.1.4 Passengers' Statistics

The table below shows the number of passengers (international) and air cargo (international) in 2022.

Year	Number of passenger (person)	Numbers of Air Cargo (kilograms)
	(**Int**)	(**Int**)
2022	32,856	71,840

3. BASELINE SCENARIO

3.1 Methodology and data

The baseline scenario describes the historical evolution of fuel consumption, CO_2 emissions, and traffic in the Kiribati as well as the expected future evolution in the absence of measures. Given the availability of data (annual RTK and annual international fuel consumption from international flights) is very limited, the Environmental Benefit Tool (EBT) version v2.8.2 is used to assist in the process of defining a baseline scenario, estimating the quantifiable benefits resulting from the selected mitigation measures, and generating the estimated expected results.

In addition, the IPCC methodology was used to estimate the fuel consumption and RTK data, as Kiribati's national airlines does not operate international flights. As explained in ICAO Doc. 9988, IPCC methodology means that each State reports the CO2 emissions of international flights departing from all aerodromes located in the State or its territories (State of Origin).

Based on the available data, Method A was selected for the use EBT. In addition, the following inputs are collected and used in the baseline:

- Baseline year: 2022
- International RTK: 6,602,973 tonnes-Kilometres
- International fuel burn: 1961 Tonnes
- Number of aircraft used for international flights: three (3) aircrafts.
- Annual RTK growth rate (average for APAC region): 5.8 %

3.2 Baseline

The following table and chart provide an estimated baseline of fuel consumption and CO2 emissions for international flights for the years 2022 to 2050.

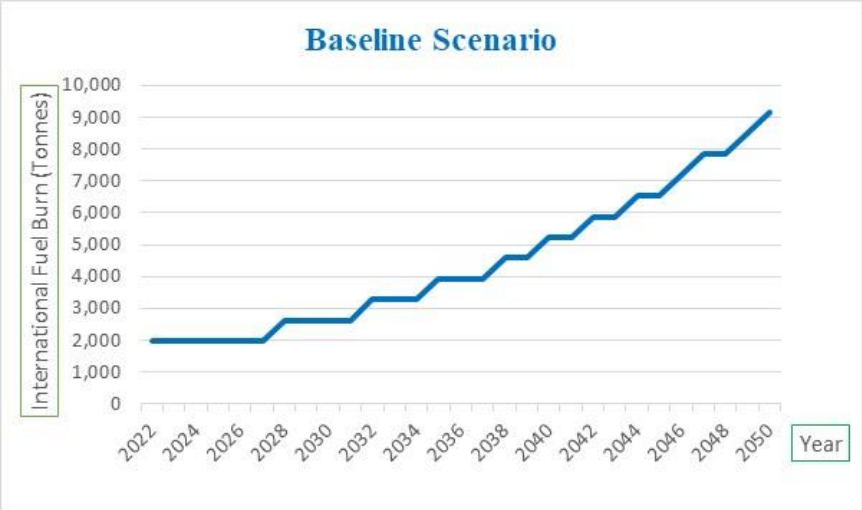
For the definition of "international flight" used in this document, reference is made to the IPCC methodology (all outbound international flights from Kiribati).

Table 1. Baseline Table

Year	International RTK ('000)	International Fuel Burn (Tonnes)	Efficiency (Fuel Burn/RTK)
2022	6,603	1,961	0.297
2023	6,603	1,961	0.297
2024	6,603	1,961	0.297
2025	6,603	1,961	0.297
2026	6,603	1,961	0.297
2027	6,603	1,961	0.297
2028	8,804	2,614.67	0.297
2029	8,804	2,614.67	0.297
2030	8,804	2,614.67	0.297
2031	8,804	2,614.67	0.297
2032	11,005	3,268.33	0.297
2033	11,005	3,268.33	0.297

2034	11,005	3,268.33	0.297
2035	13,206	3,922	0.297
2036	13,206	3,922	0.297
2037	13,206	3,922	0.297
2038	15,407	4,575.67	0.297
2039	15,407	4,575.67	0.297
2040	17,608	5,229.33	0.297
2041	17,608	5,229.33	0.297
2042	19,809	5,883	0.297
2043	19,809	5,883	0.297
2044	22,010	6,536.67	0.297
2045	22,010	6,536.67	0.297
2046	24,211	7,190.33	0.297
2047	26,412	7,844	0.297
2048	26,412	7,844	0.297
2049	28,613	8,497.67	0.297
2050	30,814	9,151.33	0.297

Figure 1. Baseline Graph.



As shown above, it was determined that fuel consumption will be around 2614.67 tonnes in 2030 and around 9151.33 tonnes in 2050, which represents an increase of 366.67 % compared to fuel consumption in 2022.

4. MITIGATION MEASURES

The ICAO basket of measures was taken into account when selecting Kiribati's mitigation measures to reduce CO2 emissions from aviation. These are the aircraft technology improvement, operational improvements, sustainable aviation fuels, and market-based measures, as follows:

4.1 Operational Improvement for Domestic flights

Minimizing weight for domestic flights

This is done by minimizing weight for all aircrafts conducting domestic flights in all the operational aircrafts. Kiribati will explore the possibility of purchasing aircrafts with installed lighter materials that would significantly reduce the weight of the aircraft. Considering Kiribati does not have aircraft manufacturers, this will be taken into account in purchasing new aircrafts.

4.2 Sustainable Aviation Fuel Integration Initiative

Use of Sustainable Aviation Fuel

Integration of the Sustainable Aviation Fuel (SAF) into the domestic operational fuel mixture would significantly reduce CO2 emissions from domestic operations but would also mean that a transition from the conventional fuels used in Kiribati to SAF would mean outbound international flights will reduce CO2 emissions as well from the use of SAF. This potential mitigation measure would first require a study on storage and handling of SAF as well as any financial challenges Kiribati may face in the implementation of use of SAF.

In Kiribati, there is only one supplier of jet fuel, Kiribati Oil Company Limited (KOIL), which can potentially be involved in the plans made for using SAF.

In addition, Kiribati has considered gaining more knowledge on sustainable aviation fuels (SAF) development process and requirements by joining the ICAO assistance, capacity-building, and assistance on SAF (ICAO ACT-SAF) programme.

4.3 Eco-Airport Program

a. Planting of trees
b. Installation of LED lights to replace classic lighting
c. Installation of solar panels in for power generation at the airport
d. Internal procedure improvement for minimizing energy consumption (human behaviour)

These measures will help reduce carbon emissions significantly through reduction of energy consumption and using environmentally-friendly materials. Improvement of internal procedure will prevent unnecessary consumption of energy.

4.4 Market-based Measures

Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

Kiribati has voluntarily participated in CORSIA since its pilot phase. Kiribati does not contribute to international carbon emission however participating in this market-based measure in support of ICAO global aspirational goal of carbon-neutral growth.

Kiribati understands that CORSIA is a global scheme for the global international aviation industry. The more States join the CORSIA, the more emissions are covered by the offsetting requirements of the Scheme and the higher its environmental effectiveness becomes. Each participating State brings ICAO closer to meeting its global aspirational goal of carbon neutral growth. For a State that does not have an operator attributed to it (and therefore no compliance cost is incurred), its participation in the Scheme will add those routes operated by foreign operators between the State and other participating States, thus increasing the overall emissions coverage of CORSIA. For States with particular interest in eco-tourism, participation in CORSIA provides the additional benefit of greening air transport connections to the rest of the world.

5. EXPECTED RESULTS

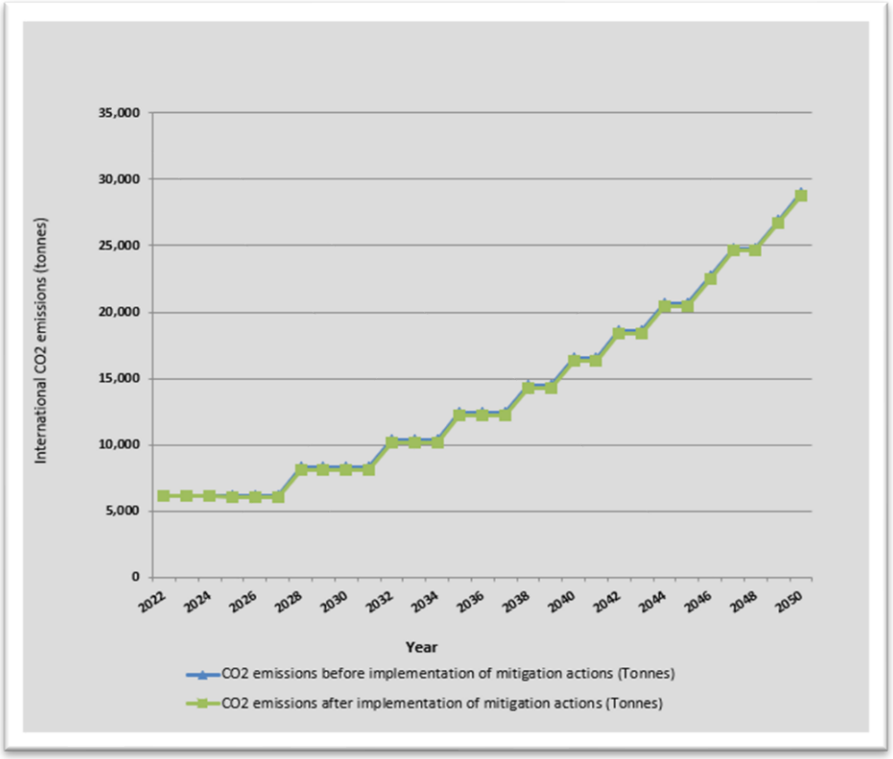
By implementing the mitigation measures outlined in Chapter 4 of this document, Operational Improvement Policy, Sustainable Aviation Fuel Integration Initiative, Airport & Airfield Infrastructure Improvement, and participation in CORSIA, it is estimated that the following fuel and CO2 savings to be achieved:

Table 2. Expected Results - CO2 Savings

EXPECTED RESULTS : CO_2 SAVINGS

Year	Annual CO_2 emissions before implementation of mitigation actions (Tonnes)	Annual CO2 emissions after implementation of mitigation actions (Tonnes)	Annual CO_2 savings (Tonnes)	Change CO_2 savings (%)
2022	6,196.76	6,196.76	0.00	0.00
2023	6,196.76	6,190.44	6.32	-0.10
2024	6,196.76	6,139.88	56.88	-0.92
2025	6,196.76	6,016.88	179.88	-2.90
2026	6,196.76	6,016.88	179.88	-2.90
2027	6,196.76	6,016.88	179.88	-2.90
2028	8,262.35	8,082.47	179.88	-2.18
2029	8,262.35	8,082.47	179.88	-2.18
2030	8,262.35	8,082.47	179.88	-2.18
2031	8,262.35	8,082.47	179.88	-2.18
2032	10,327.93	10,148.05	179.88	-1.74
2033	10,327.93	10,148.05	179.88	-1.74
2034	10,327.93	10,148.05	179.88	-1.74
2035	12,393.52	12,213.64	179.88	-1.45
2036	12,393.52	12,213.64	179.88	-1.45
2037	12,393.52	12,213.64	179.88	-1.45
2038	14,459.11	14,279.23	179.88	-1.24
2039	14,459.11	14,279.23	179.88	-1.24
2040	16,524.69	16,344.81	179.88	-1.09
2041	16,524.69	16,344.81	179.88	-1.09
2042	18,590.28	18,410.40	179.88	-0.97
2043	18,590.28	18,410.40	179.88	-0.97
2044	20,655.87	20,475.99	179.88	-0.87
2045	20,655.87	20,475.99	179.88	-0.87
2046	22,721.45	22,541.57	179.88	-0.79
2047	24,787.04	24,607.16	179.88	-0.73
2048	24,787.04	24,607.16	179.88	-0.73
2049	26,852.63	26,672.75	179.88	-0.67
2050	28,918.21	28,738.33	179.88	-0.62

Figure 2. Expected Results - CO2 Savings Graph.



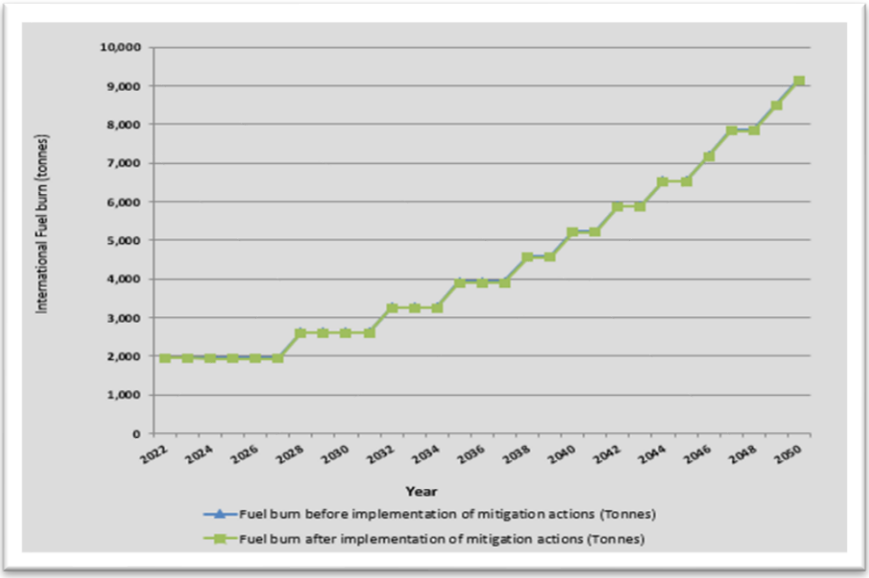
Description: The figure above provides a graphical representation of these results and confront them to CO_2 emissions before and after the measures are implemented. It was identified that the potential to reduce CO_2 emissions in 2050 will reach approximately 28,738.33 tonnes of CO2 emissions.

Table 3. Expected Results: Fuel Savings

EXPECTED RESULTS : FUEL SAVINGS

Year	Annual Fuel burn before implementation of mitigation actions (Tonnes)	Annual Fuel burn after implementation of mitigation actions (Tonnes)	Annual Fuel savings (Tonnes)	Change Fuel savings (%)
2022	1,961.00	1,961.00	0.00	0.00
2023	1,961.00	1,959.00	2.00	-0.10
2024	1,961.00	1,943.00	18.00	-0.92
2025	1,961.00	1,943.00	18.00	-0.92
2026	1,961.00	1,943.00	18.00	-0.92
2027	1,961.00	1,943.00	18.00	-0.92
2028	2,614.67	2,596.67	18.00	-0.69
2029	2,614.67	2,596.67	18.00	-0.69
2030	2,614.67	2,596.67	18.00	-0.69
2031	2,614.67	2,596.67	18.00	-0.69
2032	3,268.33	3,250.33	18.00	-0.55
2033	3,268.33	3,250.33	18.00	-0.55
2034	3,268.33	3,250.33	18.00	-0.55
2035	3,922.00	3,904.00	18.00	-0.46
2036	3,922.00	3,904.00	18.00	-0.46
2037	3,922.00	3,904.00	18.00	-0.46
2038	4,575.67	4,557.67	18.00	-0.39
2039	4,575.67	4,557.67	18.00	-0.39
2040	5,229.33	5,211.33	18.00	-0.34
2041	5,229.33	5,211.33	18.00	-0.34
2042	5,883.00	5,865.00	18.00	-0.31
2043	5,883.00	5,865.00	18.00	-0.31
2044	6,536.67	6,518.67	18.00	-0.28
2045	6,536.67	6,518.67	18.00	-0.28
2046	7,190.33	7,172.33	18.00	-0.25
2047	7,844.00	7,826.00	18.00	-0.23
2048	7,844.00	7,826.00	18.00	-0.23
2049	8,497.67	8,479.67	18.00	-0.21
2050	9,151.33	9,133.33	18.00	-0.20

Figure 3. Expected Results - CO2 Savings Graph.



Description: The figure above provides a graphical representation of these results and confront them to fuel efficiency improvement before and after the measures are implemented. It was identified that the potential to reduce the annual fuel burn in 2050 will reach approximately 9133.33 tonnes.

6. ASSISTANCE NEEDS

Even though its emission is quite insignificant still has a long way to go to maximize efforts to reduce CO2 emissions from the aviation sector. This will require support in the form of capacity building, knowledge sharing and joint projects in both policy and implementation. Some topics relevant to Kiribati's action plan include:

- Financial support for improvement of airports and airfields

  Airports and airfields in the islands could use a lot of improvement for the State to be able to conduct operations using larger aircrafts and taking up more passengers at a time therefore cutting down on the frequency of flights to and from the islands. In turn, this cuts on fuel consumption and CO2 emissions.
  At the same time, improvement of terminal buildings to use environment-friendly materials through installation of facilities using green energy and reducing usage of electrical power.

- Capacity development in eco-airport programme

  Eco-Airport programmes is easily one of the best programmes to be implemented in Kiribati because of its limited resources. This programme would allow the State to be able to enhance on what they already have around them in nature but considering the necessary requirements for internationally accepted airfields.

- Airport carpark development

  This requires the support in construction of a car park with green energy. This enables eco-friendly environment surrounding the airport with light installation powered by solar energy.

- Capacity building and development of technical officers

  This involves capacity building to acquire the necessary skills related to green energy and the reduction of carbon emission so that they are able to develop relevant projects in their respective aviation-related activity to support the mitigation measures.