



Central American action plan for emission reduction from International Civil Aviation



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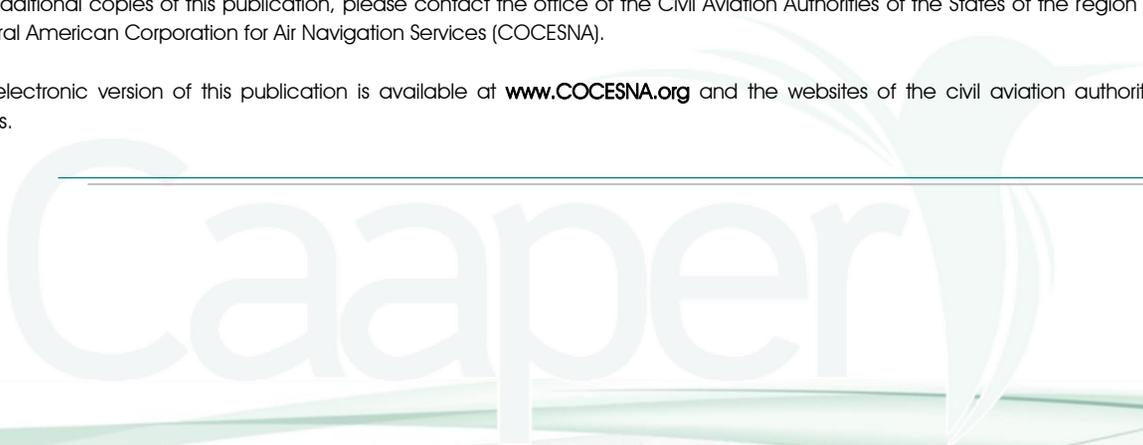
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Caaper





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reduction from International Civil Aviation

2013

Governments in the region recognize that the aviation industry represents a strong contribution to the economy, tourism and the progress in general of the states, and in the particular case of Central America, the bridge of the Americas, the development of aviation and related services also allows interconnect other regions of the world.

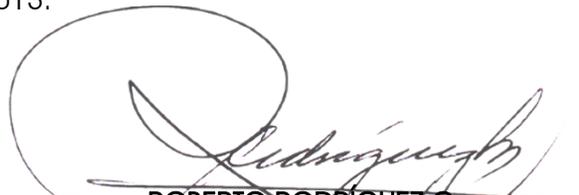
We also recognize that the Central American isthmus is one of the regions on the planet that fewer greenhouse gas emissions into the atmosphere adds, however, is highly vulnerable and sensitive to climate change created by global warming. For that reason is that it has developed this voluntary action plan on the activities of reducing CO₂ emissions which reflects the good faith and engagement with the Global Environment and seeks to contribute to the vision to promote a sustainable aviation under the capabilities of our own States.

This action plan aims at contributing to reducing CO₂ emissions through a variety of strategies. It contains no legal obligations or mandatory actions that may affect the capacity of airlines or business development opportunities in the States, therefore, we reiterate the voluntariness of the CAAPER and we reserve the right to implement or to undertake the proposed measures.

Dated at Panama City the 29th day of August of 2013.

A handwritten signature in black ink, appearing to be "Lindsay Garbutt".

LÍNDSEY GARBUTT
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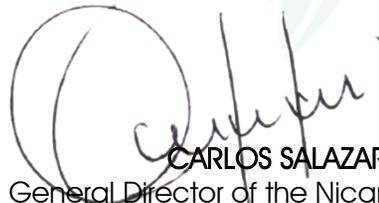
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Preamble

1.1. PRESENTATION

Since remote times, man has been interested in the ability to fly birds. The legends of people seeking being able to move in the air date back to ancient cultures. There are several stories of men on flying animals, gifted people, or divine powers with which they could fly, the legend of Icarus and Daedalus of the Greek culture is one such example, tells the winged flying escape of the Minotaur's labyrinth.

Through several studies, Leonardo Da Vinci determined that the humans by using his strength would not be able to fly unless it rests to external objects to him; this gave rise to important principles of aerodynamics. In the eighteenth century were generated worldwide advances in some designs and theories of aircraft lighter than air, however, was to early nineteenth century in 1903 when the Wright brothers made one of the first flights of the story through the concept of "wind tunnel" and the great contribution to flight through turn control which became an important base for flying objects heavier than air.

Some years later the aviation development was accelerated with industrial development and impulse the First and Second World War. From territorial flights jumped transatlantic flights with faster machines and capable of achieving higher altitudes, and the use of new technologies. After this period, there was a significant increase in aircraft pilots and aircraft which stimulated its use commercially. This generated the need to set rules to order the growing global air traffic and that's how according to the Paris Convention of 1919 and a number of subsequent conferences in 1944 at Chicago arises the International Civil Aviation Convention that gives origin to the Organization Civil Aviation Organization (ICAO).

The history of aviation has elapsed since the ancient civilizations to the present day with several periods of evolution which have transformed the idea that flying was impossible to reality. Today, aircraft are able to carry more than 800 passengers and fly nonstop routes in more than 15,000 kilometers. In less than a century based on the experience of the Wright brothers in 1903, aviation became an essential mode of transport for the global economy.

The growth dynamics of the economy and the new millennium brought the biggest challenge for aviation and humanity in general, the phenomenon of climate change. There is no denying the fact that humanity is at a critical moment in its history. The global climate change, *"understood as a change of climate which is attributed directly or indirectly to human activity, the composition of the global atmosphere and the amount of natural climate variability observed over comparable time periods"*¹, more than a scientific definition, climate change is a reality that is affecting our countries.

¹ Convention United Nations Framework on Climate Change (UNFCCC)

The Caribbean and Central America continue to be a clear and convincing evidence of the negative effects is climate variability. The frequency of hydrometeorological phenomena continues to grow progressively leaving behind consequences of loss of human life and social and productive infrastructure which hinders the governability in the States because they must increasingly invest more millions of dollars to mitigate the consequences of this phenomenon.

For that reason, we recognize and celebrate the efforts of ICAO, States and industry to assume this challenge and lead the world in reducing greenhouse gas emissions. This will lead to more productive economic sectors of society are added to this impulse to preserve and improve the global environment.

The Action Plans to Emissions Reduction (APER) are an important strategy because they allow take actions in the short and medium term with high long-term benefits in measures to mitigate climate change. Also allow States to to establish measures according to their capacities and territorial conditions, thus obtaining more proactive and decisive actions. We as Central Americans manifest the interest and willingness of our States to join in this effort through the preparation of the action plan for the reduction of CO₂ emissions. This Action Plan will strengthen regional integration and a set of strategies that will contribute to the work of fighting global warming.

We are grateful for the invaluable contribution of the working group formed by the focal points of each of the States in the region, the accompaniment of the Federal Aviation Administration of the United States (FAA), and the support of Environment Office of the ICAO and the North America, Central America and the Caribbean Regional Office (NACC) by being part of this momentum.

Finally, we reiterate our confidence in inventive capacity, initiative and creativity of the human being that has driven the growth aviation unimaginable limits in this new era that climate change has demarcated, this invention will be used for the development of a industry more sustainable and environmentally responsible in all areas.

A handwritten signature in black ink, appearing to read "G. Tobar Guzmán".

Giovanni Tobar Guzmán
Guatemala Focal Point

A handwritten signature in black ink, appearing to read "Carlos Mauricio García".

Carlos Mauricio García
Regional Focal Point

1.2. OBJECTIVES

- Contribute to the ICAO's aspirational goal of improved 2% annual average fuel efficiency in medium (2020) and long term (2050).
- Contribute to the global goal of maintaining the same level carbon emissions from international civil aviation from 2020.
- Cooperate in reducing CO₂ emissions and stimulate the development of activities that promote significant improvements in terms of noise, energy efficiency, airport infrastructure, optimization of materials, waste management and other elements that improve the environmental performance of the regional aviation from an integral vision.

1.3. KEY ELEMENTS

- *Voluntary*

This action plan expresses the initiative and commitment of the Central American States to contribute to reducing CO₂ emissions from international civil aviation activities. However, by the high sensitivity of the Region and aviation to global socioeconomic changes, the CAAPER under its voluntary character, promoted in States the adoption of a number of strategies and programs that do not contain legal obligations and reserves the right to implement them if it is identified that they can affect states or companies that operate or provide aeronautical services in Isthmus.

- *Special circumstances and respective capabilities*

It is important to reiterate that the Central American states are developing countries highly vulnerable and sensitive to climate change generated by global warming. Therefore, this action plan reflects and recognizes the vulnerability and sensitivity as part of the special circumstances of the States.

The progress in achieving the objectives and implementation of the strategies will depend on the respective capabilities and territorial and socio-economic conditions of states, as well as technology transfer, development of operational measures, improving infrastructure, cooperation, the technical support, assistance by ICAO and other resources that can be obtained from the contribution of third countries or organizations.



Background

2.1. CENTRAL AMERICA AND CLIMATE CHANGE

The world registers a big transformation in reference to the environment, extreme weather events such as hurricanes, floods, droughts and other events make every day a greater awareness is adopted in relation to global warming and climate variability. These phenomena that already will be more recurrent and more intense are entering a new era demarcated by climate change.

The Intergovernmental Panel on Climate Change (IPCC) has expressed a scientific consensus about the impact of human activity in this phenomenon, mainly through the burning fossil fuels, deforestation, changes in land use and others that lead to massive generation of carbon dioxide emissions (CO₂) into the atmosphere. The CO₂ emissions severely affect the ozone layer and accelerate global warming that causes the climate change.

Due to its location in a tropical zone, the region of the Intertropical Confluence Zone (ITCZ), the influx of the phenomena of the Atlantic and Pacific Ocean and affectations and influences of deforestation. Central America is a multi-hazard territory whose vulnerability has increased as a consequence of climate change, placing the region as one of the world's most vulnerable regions. The most recent World Summits on Climate Change have established to Central American countries as the most affected and vulnerable worldwide for this global phenomenon, however, Central America is one of the regions of the world that gives contributes less greenhouse emissions into the atmosphere.

Evidence statistics show us that are becoming increasingly frequent events such as hurricanes, floods, earthquakes, landslides, volcanic eruptions, forest fires, processes of desertification and drought in the area. This increase in the frequency and intensity of some of these extreme phenomena are caused by climate change and in turn they act how asymmetries multipliers further hindering prosperity of States.

2.2. THE AVIATION INDUSTRY IN THE REGION

For States in general air transport is an essential public service for its importance as a vital factor for economic and social development of nations. The air transport sector is a vital element in the global economy, employing around 60 million people globally by 2012, with direct and indirect jobs. Globally, the industry carried about 2.5 billion people per year, 40% of international tourism. It also produces around 3.5% of global GDP annually and mobilizes an estimated 44 million tons a year in goods that have value of 35% annual international trade.

It is estimated that the annual growth rate of passenger flow at the global level is 4.5%, however, in the last decade Latin America increased from transporting 95 million passengers to 170 million reflecting an increase of 80% and surpassing the global rate with an average growth of 6.2% annually. In 2012, the two airlines with the highest number of operations in Central America transported at the global level more than 43 million people and experienced a growth of 12.9% and 17.1% respectively compared with the previous year.

Consistent with the global trend of growing the operations in the Central American FIR have gone from 140,000 to 180,000 per year and it is estimated average passenger growth of 1.8% in the States. Much of this growth is due to the efficient management of the different processes of air transport through the coordination decision-making under the regional integration focus.

The States of Central America manage their upper airspace through the Central American Corporation for Air Navigation Services (COCESNA), whose member countries are: Guatemala, Belize, El Salvador, Honduras, Nicaragua and Costa Rica. This entity was created in February 26, 1960 as an international organization of Central American integration, nonprofit and financial autonomy. COCESNA was created with the clear objective and purpose to fulfill and jointly respond with the commitments in international civil aviation assumed by the States of the region as signatory countries of the Convention on International Civil Aviation of 1944 known as the Chicago Convention.

COCESNA has helped to strengthen American identity through leadership development strategies that are global model and which make this organization an important organism of regional integration. COCESNA has been conceptualized by some International Civil Aviation Organization (ICAO) as an institutional model to address the challenges that arise in the aviation industry.

Also related to the dynamics of growth in aviation activity, the Central American States promote the impulse and adoption of technology, the air traffic management, the creation of regulatory frameworks, and the expansion of airport infrastructure, among others.

In the Region there are 12 international airports that operate across 18 main airlines that allow inter connect the Central American states with each other and connect to the Central with 47 cities in 20 countries. Also, in the region operates hub of one of the largest airlines in Latin America and some of the airports have obtained significant recognition.

MAIN AIRLINES OPERATING IN THE REGION

Aeromexico
American Airlines
Avianca
Condor Flugdienst
Continental Airlines
Copa Airlines
Delta Airlines
Frontier Airlines
Iberia
Intejet
Jet Blue Airways
Parsa
Spirit
Tropic Air
United Airlines
US Airways

MAIN AIRPORTS OF CENTRAL AMERICA

La Aurora International Airport	Guatemala
Mundo Maya International Airport	Guatemala
Philip Goldson International Airport	Belize
El Salvador International Airport	El Salvador
Ilopango International Airport	El Salvador
Juan Manuel Gálvez International Airport	Honduras
Toncontin International Airport	Honduras
Augusto C. Sandino International Airport	Nicaragua
Juan Santamaría International Airport	Costa Rica
Daniel Oduber Quirós International Airport	Costa Rica
The Limon International Airport	Costa Rica
Tobías Bolaños Palma International Airport	Costa Rica

2.3. AVIATION AND CLIMATE CHANG

It is projected that the contribution of aviation currently represents about 2% of total global CO₂ emissions and increase as a result of continuous development of the sector. This in turn, generates several concerns about how to increase productivity and growths of the aviation sector and at the same time contribute to the sustainability of the industry in its three dimensions: Economic, Social and Environmental.

Like region, we recognize the efforts of ICAO to progress in reducing emissions of greenhouse gases from international air travel. The 37th session of the ICAO Assembly in 2010 represented an important development in addressing the issue. Complementary to this, there have been several initiatives in relation to contributing to global efforts to address climate change.

The Resolution A37-19 established an important precedent because it generated a scenario of global goals in the field of international civil aviation to stabilize levels of CO₂ emissions by 2020. It also encouraged the States submit action plans to reduce CO₂ emissions from international civil aviation.

Related to ICAO resolution on Climate Change, during the 96th Meeting of Directors of Civil Aviation of Central America and Panama (DGAC/CAP/96) held in Mexico City, Mexico from 22 to 25 May 2012, it was established that the Central American States develop an action plan together to address CO₂ emissions.

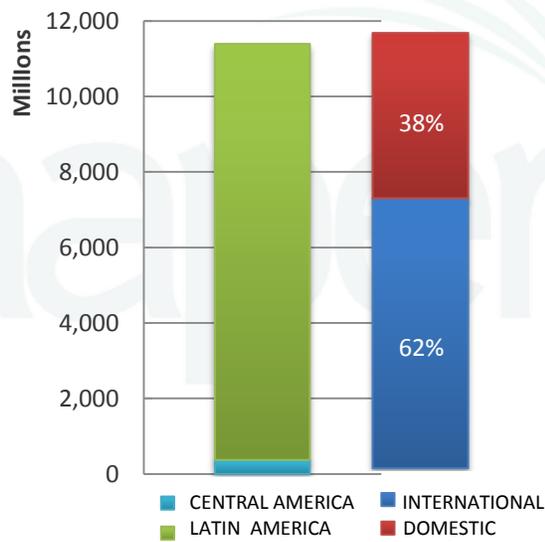
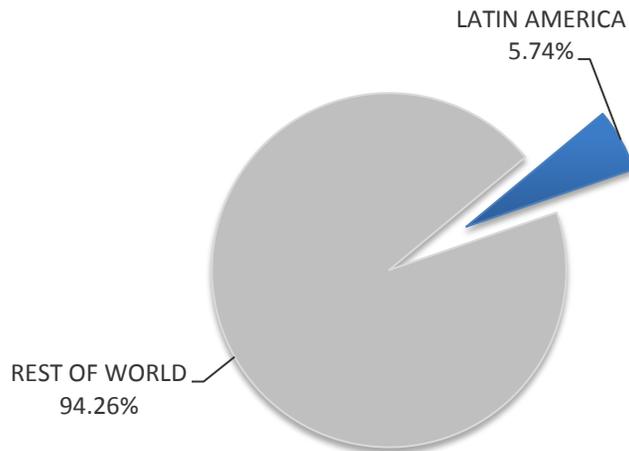
Consequently was defined methodology to unify information for establishing baseline regional of CO₂ emissions. Such statistical information that involves city data of origin, destination, route, airline, flight numbers, distance, passengers in route, CO₂ / passenger, frequency of flights, kg-CO₂ / flight, among others, allow establish the level of emissions and classify it by country, route and / u air operator. This with the aim to establish mitigation strategies appropriate and verifiable progress under some key criteria established.

With the integration of statistical information and fuel consumption information obtained with the support of the FAA, it was estimated that in 2010 the Latin America aviation used 11.4 Mton of fuel equivalent to 5.74% of total consumption at the global level. From this consumption in Latin America, 62% was used in international flights and the remaining 38% for domestic flights.

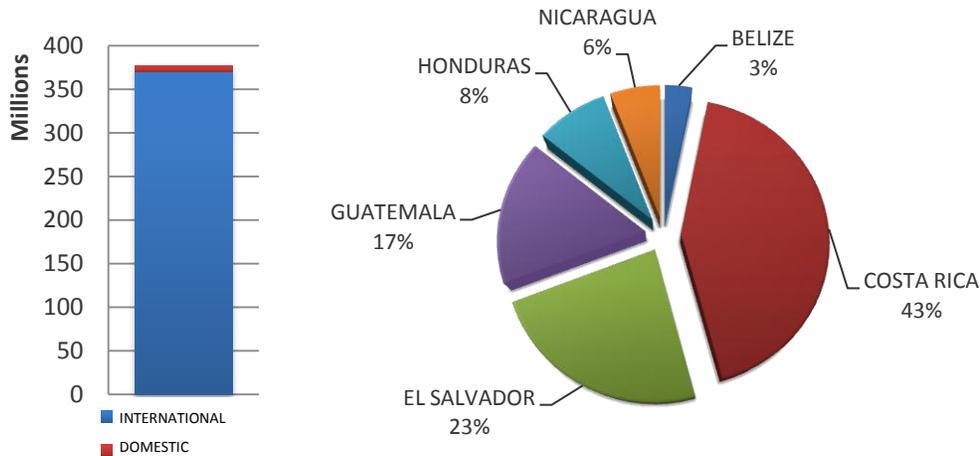
In 2010 in Central were registered around 69,000 international flights and 30,000 domestic flights, which consumed about 370,000 ton of fuel. This is equivalent to 0.19% of the fuel consumed worldwide and 3.26% of the fuel consumed in Latin America.

98% of the fuel consumed in the Central Region is used for international flights and is equivalent to the generation of 1.16 Mton of CO₂ into the atmosphere every year.

ESTIMATE OF FUEL CONSUMED IN LATIN AMERICA (kg)



ESTIMATE OF FUEL CONSUMED IN CENTRAL AMERICA (kg)



A comparison from 2005 to 2010 on international civil aviation operations in Central America allows observing that for five years international operations increased by 9.4%.

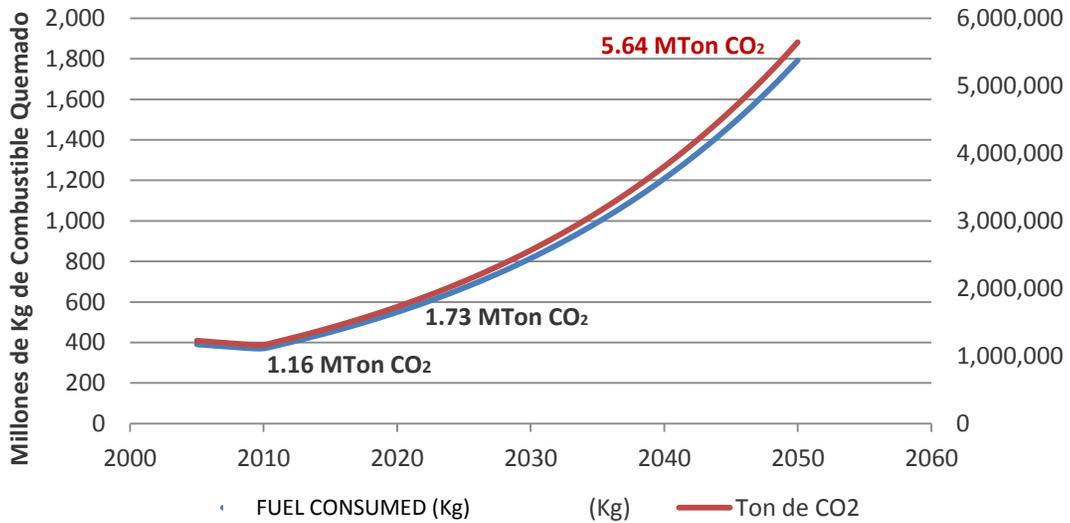
It is noteworthy that however, the increase of carrier activity, there was a reduction in fuel consumption of 9,000 Ton which represents an increase in fuel efficiency of about 0.5% per annum.

This is attributed to the modernization of fleets by airlines operating in the region and the adoption of more efficient operations by the States.

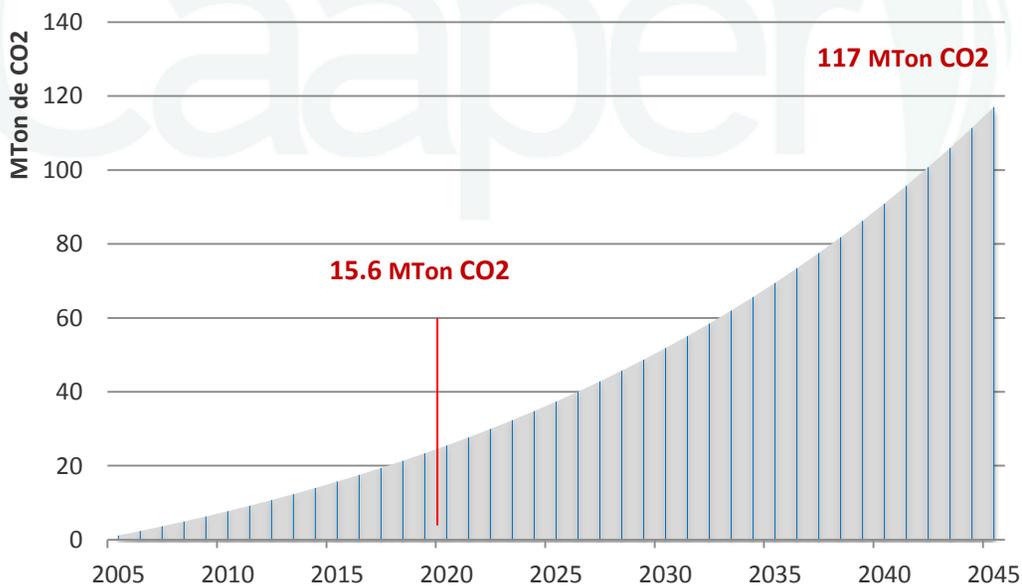
As mentioned previously, aviation will experience a 4.87% estimated growth in international operations which is expected to increase gradually over the next 20 years according to projections by the ICAO.

Consistent with this, the projected CO₂ emissions provided by the civil aviation operations in Central America could reach 5.64 Mton of CO₂ in the year 2050.

PROJECTION OF CO₂ EMISSIONS GENERATED BY YEAR WITHOUT THE IMPLEMENTATION OF MEASURES (MTon)



CUMULATIVE CO₂ EMISSIONS TREND SCENARIO IN THE ATMOSPHERE WITHOUT THE IMPLEMENTATION OF MEASURES (MTon)

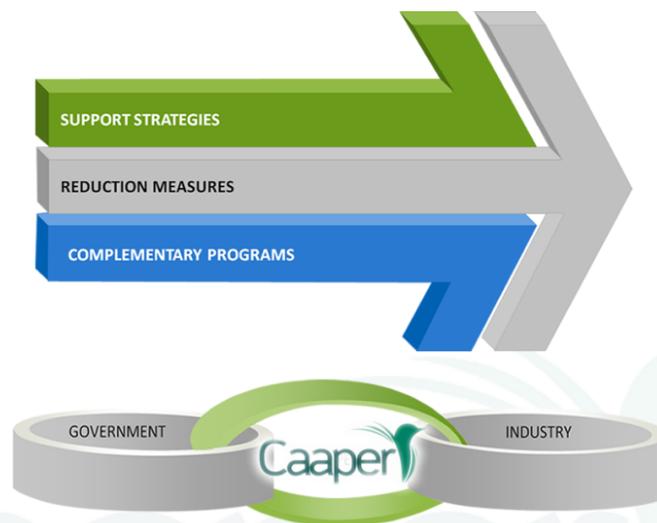




Strategies

The CAAPER includes a series of strategies aimed at to involve different actors and stakeholders related to the regional civil aviation within a set of activities designed to positively impact the reduction of CO₂ in the atmosphere and contribute to improving conservation the environment in different views.

The CAAPER recognizes the special circumstances and respective capabilities of each of the States and stakeholders, thus seeking to achieve greater compatibility in the development and growth of the aviation with the environment, were designed twelve strategies grouped into three key areas: supporting strategies, reduction measures and complementary programs. These strategies should be developed in an integrated manner to generate a greater impact in line with the international consensus to minimize the carbon footprint of human activities, including aviation.



The strategies are designed to have the greatest impact on reducing CO₂ emissions, however, some of them will also have a positive impact in reducing noise emissions, local air quality, the quality of the environment in proximity to airports and other general activities that contribute indirectly to improving the physical and mental health, human welfare, the biodiversity conservation and ecological balance surrounding.

3.1. SUPPORT STRATEGIES

With the proposal of these strategies, the CAAPER seeks to strengthen the capacities of the region in environmental and civil aviation, as well as the integration of the States in their different areas.

3.1.1. Regional Integration

The CAAPER is a strategic alliance that allows setting in the six States a common and shared environment purpose. It also will strengthen action initiatives and postulate new alternatives to negotiations and international positions that may impact on sustainable development in Central America and aviation sector in particular. This will at the same time align global strategies to local strategies according to the respective capabilities of each State.

Climate change requires coordinated action among States globally, therefore the integration of the States strategically will help international coordination and activate the proactive and responsible participation of stakeholders identified, seeking to align the efforts of the American States with the objectives and global environmental goals, including the implementation of methods and standards, navigation systems, technological measures, measures based on market criteria, among others.

This strategy represents a significant opportunity for to the Central American states action. The share of air navigation services can generate two important scenarios for reducing CO₂ emissions from international civil aviation:

- a) Establish coordinated actions to reduce CO₂ emissions from air transport operations generated in any of the Member States of COCESNA.
- b) The implementation of regional strategies such as restructuring of routes and others that contribute to reducing CO₂ emissions from all operators although not land in Central American airports, they do use the upper airspace as Bridge of the Americas.

These scenarios projected to be achievable through consolidation of regional institutions that will in future technical assistance and support to States in the implementation of the action plan, decision making in coordination, development monitoring programs and others.

3.1.2. Institutional Strengthening

The environment is not a new issue within ICAO. Traditionally, the sector of the international civil aviation has led a responsible management of environmental issues as reflected in Annex 16 to the Chicago Convention, the different resolutions, the development of methods and procedures as guidelines and other publications related to the subject.

However, the global warming and climate change have established an agenda at the global level of priority activities including aviation and which require active participation.

In most States worldwide, the issue of climate change and the environment in general are the responsibility of an institution and civil aviation from another. Therefore, this action plan in harmony with the objectives promotes the institutional strengthening through:

- a) Establish an organizational structure facilitation, coordination, integration and coordination that favor the creation of the conditions for the participation and cooperation of different actors in the public sector, private sector and other stakeholders.
- b) The interagency and intersectoral coordination in order to achieve timely implementation of strategies to promote sustainable development initiatives in the civil aviation of the Isthmus.
- c) Establishment of a regional program on environment for civil aviation through which be coordinate and establish the basis for the implementation of programs related to sustainable development of civil aviation.
- d) With the support of ICAO and other related agencies, develop programs to create and strengthen the human, technological, managerial and operational relating to the environment within the aviation industry, including the design of mechanisms and methodologies for measuring, monitoring and verification environmental programs.
- e) Design, adjust and implement a policy and regulatory framework governing comparable with international standards according to the capabilities of each individual state, this to promote the principles of prevention and environmental performance and optimize the operations related to air transport.
- f) Promote and implement international partnerships multilateral, bilateral and South-South that enable the implementation of the strategies.
- g) Working together to improve information systems and weather forecasting services to prevent accidents, optimizing the overall transaction times to achieve increased efficiency and fuel savings positive impact on reducing CO₂ emissions.

3.2. REDUCTION MEASURES

This set of strategies contains the core of the CAAPER and objectives. Each of these strategies involve a number of initiatives and specific programs, however, the degree of implementation and progress will depend greatly on the capabilities and territorial conditions of each state.

3.2.1. Technology

The evolution of fuel, airframe and engine, have made to aviation in a sector efficient, however, these changes involve a number of efforts by both the industry and the States. Assimilation and technology transfer is a mechanism of spreading knowledge capabilities and performance targeted to gestate more efficient and environmentally responsible in the aim of take advantage of innovative equipment and systems to support the development and growth of the different stakeholders identified.

The key objective of this strategy in accordance with the objectives of CAAPER, is create new spaces of investment and facilitate access to the gradual renewal of new technologies to increase fuel efficiency levels, optimizing the efficiency of navigation and management air traffic to reduces the carbon footprint of air transport activities in the Isthmus.

Latin America has one of the youngest fleets of aircraft. Particularly American aviation is no exception, with this action plan is expected contribute to maintaining this dynamic of modernization and growth that has allowed the continued increase in fuel efficiency and competitiveness for regional aviation.

Additionally, this strategy will promote the adoption of eco-efficient technologies for the generation and use of alternative and renewable energy, implementation of integrated management systems, quality control, safety, passenger service, performance, response measures and improving environmental adaptation, and related activities that increase the fuel efficiency and performance of international civil aviation.

3.2.2. Operational Measures

Operational measures in the context of aviation describe a wide range of activities including aircraft operations on the ground, the different phases of flight and other related operations.

Operational measures represent a mix of measures to optimize airport operations and air traffic which together impact directly and positively on increasing fuel efficiency, reducing CO₂ emissions, reducing operational costs, increasing profitability air transport and other environmental benefits.

- a) Continue work with the restructuring of space and air traffic management through the Performance Based Navigation (PBN).
- b) Plan and implement the restructuring and optimization of the upper and lower airspace, improving the use of flight levels and optimal speed, the ascent and descent procedures, and operational procedures land.
- c) Optimize operations and related services within the airport.
- d) Improving the efficiency of distribution systems for passengers and cargo, improving load factors and potentiating the ability of aircraft and airport operations processes.
- e) Develop and implement new communications, navigation, surveillance, or procedures of air traffic management to create more efficient routes and procedures.
- f) Define operational goals and constantly new procedures identifying potential opportunities to reduce environmental impacts and conditions generated by the maintenance and operation of equipment, aircraft and airports.
- g) Measures to improve decision-making in collaboration with States relating to the implementation of operational measures.

3.2.3. Infrastructure Optimization

The infrastructure is an important element associated with the provision and use of airports and air navigation services. Infrastructure is an inherent element of air transport because the airports serve as points of intersection of different operators and users. Therefore to infrastructure management focused on environmental protection, in addition to mechanisms for planning, administration and management, it should:

- a) Create and upgrade infrastructure to increase opportunities focusing operational capacity based on performance, and opportunities to reduce the environmental impacts generated by the value chain of air.
- b) Design and implement guidance tools to ensure environmental protection in the construction and modernization of airports.
- c) Develop inspection and adequacy of airport infrastructure considering operational procedures more efficient and environmentally friendly.
- d) Promote the efficient use of airport capacity through improvement measures taxiing and parking, onsite optimization support, the use of cleaner alternative energy in ground equipment and airport facilities, among others.

3.2.4. Cleaner Production (+CP)

Cleaner Production (+CP) is a concept introduced in 1989 by the United Nations Program for Environment (UNEP) and the United Nations Industrial Development Organization (UNIDO) in order to propose an answer to the question: how different productive economic sectors in the world could move towards a friendlier with their environment?

+CP was defined as "*an integrated preventive strategy applied to processes, products and services in order to increase efficiency and reduce risks to humans and the environment.*"² However, with the application over time, this proactive environmental management tool application has been developed as a factor of competitiveness and sustainability in industries.

The fundamental principle of +CP is analyze and optimize all processes within the value chain of a product or service, so that this strategy has a high positive impact on society, the environment and the economic sector that implements because it establishes a process of creating aggregate value continuously.

The promotion and implementation of +CP as CAAPER strategy will contribute to reducing CO₂ emissions and obtain other important environmental benefits through:

² UNEP / IE uses this definition of cleaner production, based on the assumption that the process generates some form of contamination, however the cleaner production approach is continuously reducing the generation of pollutants at each stage of the life cycle a product or service.

- a) Establish policies and actions to optimize energy and water resources to promote the rational use of these and other natural goods and services on airport premises, air transport operations and related.
- b) Develop a responsible management of waste inputs that allow managed efficiently the inputs and outputs of the value chain of services and aeronautical products, and promote the reuse, recycling and reduction of inputs.
- c) Develop financing programs, programs of cooperation and economic and administrative mechanisms that promote the implementation of cleaner production principles under the dimension of a value chain potentiate low emissions and more efficient.

3.2.5. Compensation Measures

Recognizing that technological measures in conjunction with operational measures and optimization of infrastructure represent a high potential for reducing emissions, however, by themselves are not enough to achieve the Global aspirational goal of promoting international aviation carbon neutral.

The CAAPER contemplates the compensation measures as part of a set of measures to reduce CO₂ emissions. The compensation measures are an important alternative strategy because they allow facilitate access to financial resources to work with and guide efforts toward strategic objectives.

As part of this strategy, the States of the Central American region recognize that there are still some key elements which should be worked on, and therefore, we actively add to the agenda of ICAO and other international organizations in the work to develop economic measures based on market criteria.

This strategy also seeks to promote the inclusion of voluntary compensation programs based on a low-carbon economic model that help to stimulate the participation of different stakeholders, including passengers. The above with the purpose to positively impact on reducing CO₂ emissions, conservation of biodiversity and environmental resources under a model of sustainable development in air transport in three dimensions: Economic, Social and Environmental.

Additionally, this strategy promotes establish a plan to exchange with other sectors in accordance with existing international instruments, considering the possibility of including the Clean Development Mechanism (CDM) as part of this compensation, and work to provide aircraft operators accredited compensation plans appropriate to their respective capabilities, among others.

3.3. COMPLEMENTARY PROGRAMS

The CAAPER promotes adding greater value added and competitiveness to air transport in the region through sustainable systems, and a series of complementary programs that will involve different stakeholders to contribute to the fulfillment of strategic objectives set.

These complementary programs may include:

- a) Research and development (R & D)
- b) Awareness and environmental education
- c) Incentives and recognition
- d) Management of vulnerability to climate change, promotion of carbon sinks and the conservation of ecosystems and biodiversity.
- e) Promotion of alternative fuels with a focus on sustainability and development.

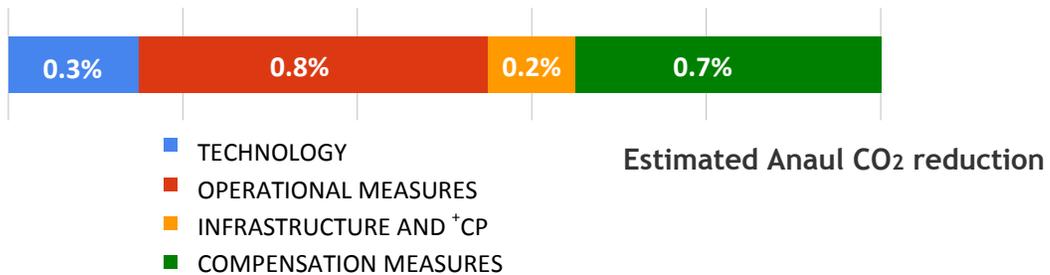
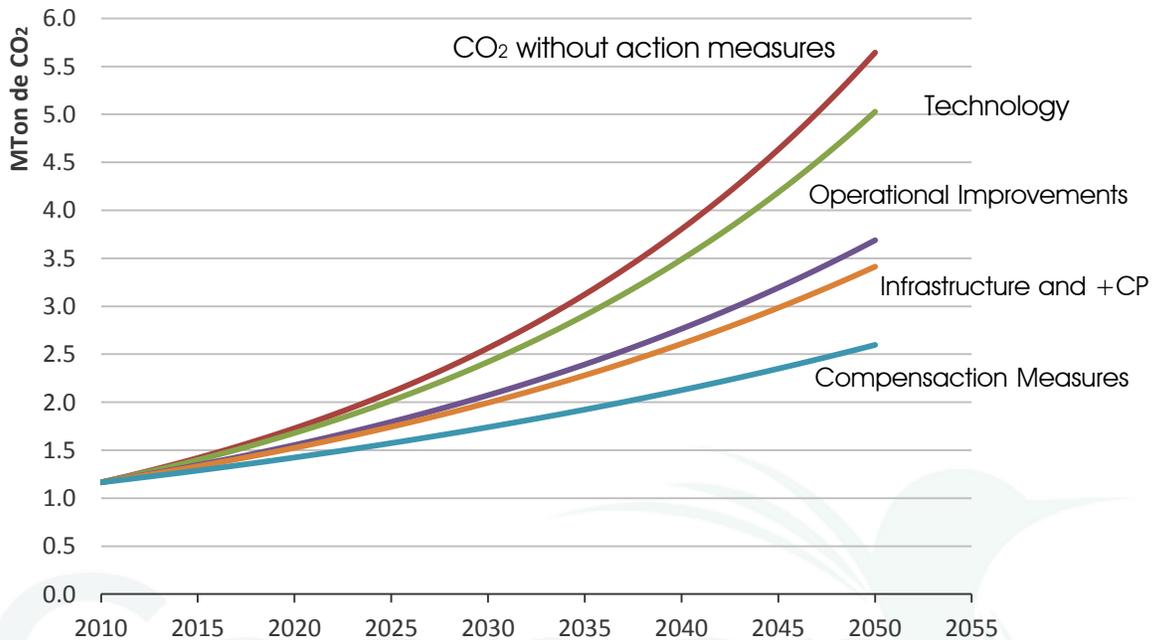
3.4. EXPECTED RESULTS

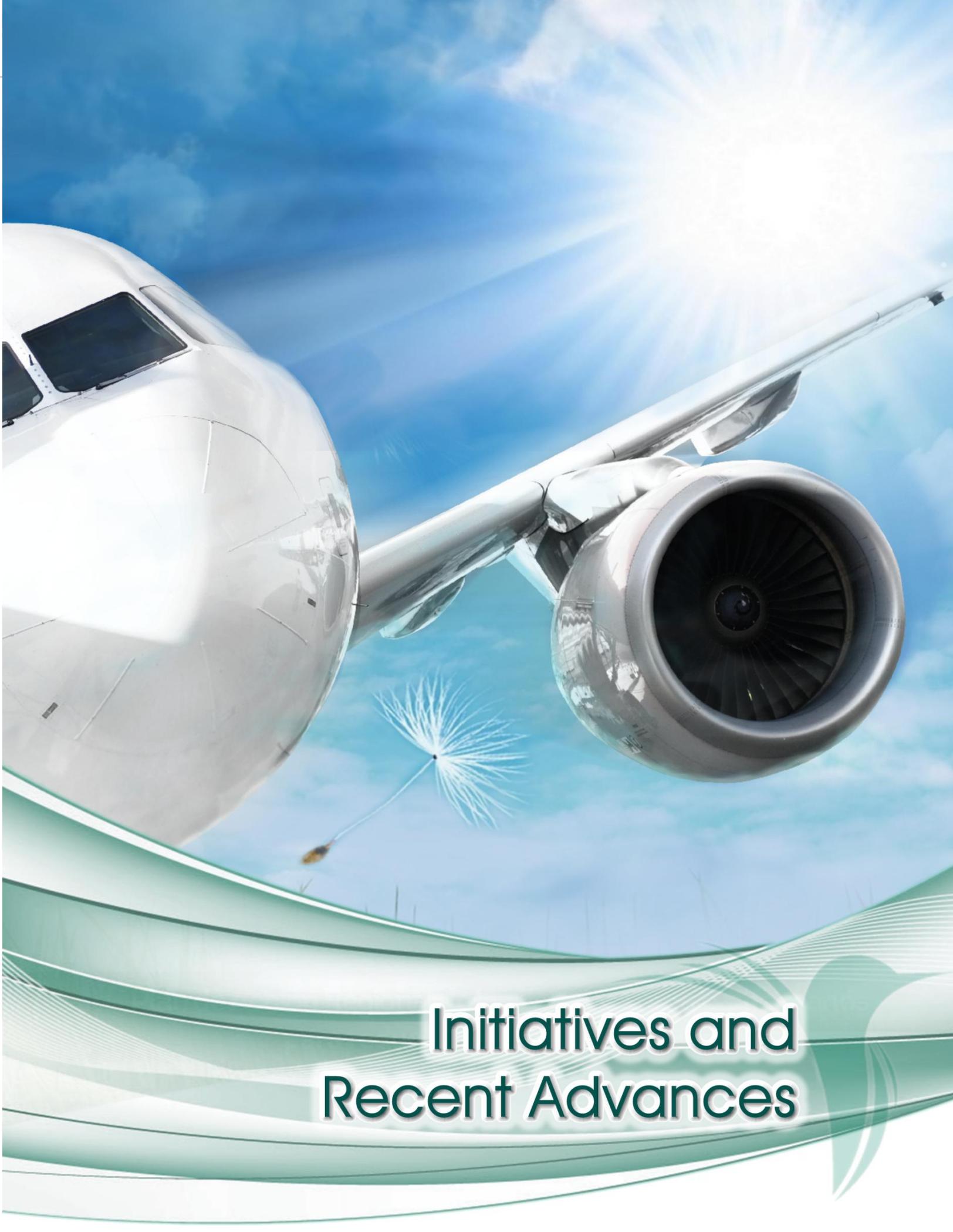
Based on fuel consumption data estimated for 2010 and projected average growth rate for aviation activity, as a trend scenario assuming that in the future will not be implemented any measure of improvement, it is possible to consider that the emissions provided by civil aviation in the region in 2020 will be 1.73 Mton of CO₂ and 5.64 Mton de CO₂ in 2050, generating a cumulative 15.7 and 117 Mton of CO₂ for 2020 and 2050 respectively.

Considering an optimistic scenario with the implementation of the proposed strategies, it is expected that through technological measures will help to increase efficiency in fuel consumption and contribute to the annual emissions reduction by 0.3%, 0.8% through operational measures, 0.2% through infrastructure optimization and implementation of Cleaner Production, and 0.7% with additional measures.

All registered operations at the regional level, including operations in the upper airspace of aircraft that interconnect to North America, South America and the Caribbean, in the last three years have increased from 150,000 to 175,000 representing an increase rate of 5.6% in operations registered per year from 2010 to date. Therefore, it is estimated that the projected positive impact of the strategies, may be even higher.

PROJECTED OPTIMISTIC SCENARIO FOR THE GENERATION OF CO₂ EMISSIONS BY YEAR TO THE IMPLEMENTATION OF STRATEGIES (MTon)





Initiatives and Recent Advances

4.1. REGIONAL INTEGRATION IN ENVIRONMENTAL ACTIONS

The actions are more effective as a region like the States individually, demonstrated experience in Central America through the COCESNA technical support, which has contributed to the development of the Isthmus aircraft through its technical agencies.

Environmental issues inspires a new reason to strengthen ties of cooperation between States in the search for strategies that activate the proactive and responsible participation of the actors identified aligning the efforts of the States to the objectives and global environmental goals of according to the respective capabilities of each individual State.

As mentioned above, the 96th Meeting of Directors of Civil Aviation of Central America and Panama (DGAC/CAP/96), in which was established that the States of the Region to develop an action plan together to address CO₂ emissions, and this adds another important advance for regional integration.

This progress has been reflected in the formation of a technical working group at regional level to the development of this Action Plan, and is projected to develop a regional technical entity to accompany States in their efforts to establish actions designed to assist in reducing CO₂ emissions from international civil aviation by improving the quality of the global environment.

4.2. OPERATIONAL IMPROVEMENTS

The Central Agency for Air Navigation of COCESNA (ACNA), is the regional technical entity for the implementation of operational improvements. ACNA in coordination with States, has planned and developed a series of activities in reference to the document RPBANIP and the Plan of PBN Implementation of the ICAO, both versions approved in 2011.

To date as part of the optimization of the structure of ATS routes, 18 RNAV routes have been implemented on the upper airspace of the Flight Information Region (FIR) of Central America, hoping to add an average of 12 routes by end of the year 2013. At the regional level has been achieved in the implementation of flexible use of airspace, ATS Central American states have agreements with the military authorities, and in some cases, committees have been established Civil-Military Coordination. In relation to this, there has been coordination with States of Belize (MZP1) and Honduras (MHR5) for consideration of the reduction or elimination of banned or restricted airspaces that affect some of the approaches..

RNAV ROUTES IMPLEMENTED IN THE CENTRAL AMERICAN FIR

ROUTE	ORIGIN/DESTINATION
UL423	BOGOTA - SAN JOSE / MEXICO
UL471	SAN SALVADOR – MIAMI
UL655	SAO PAULO – MIAMI
UZ403	SAN JOSE – MIAMI
UM419	PANAMA - MEXICO / LOS ANGELES
UM782	SAO PAULO – HOUSTON
UM787	CARACAS – MEXICO
UM796	CARACAS - SAN JOSE
UM659	GUAYAQUIL - SAN JOSE
UZ593	LIMA - SAN JOSE
UL200	PANAMA - MEXICO
UL401	SANTIAGO DE CHILE - MEXICO
UL318	QUITO - MEXICO
UL312	SANTIAGO DE CHILE - LOS ANGELES
UL308	LIMA - MEXICO
UL203	GUAYAQUIL - MEXICO
UL344	LIMA - MEXICO
UZ30	GUATEMALA / SAN SALVADOR - LIMA

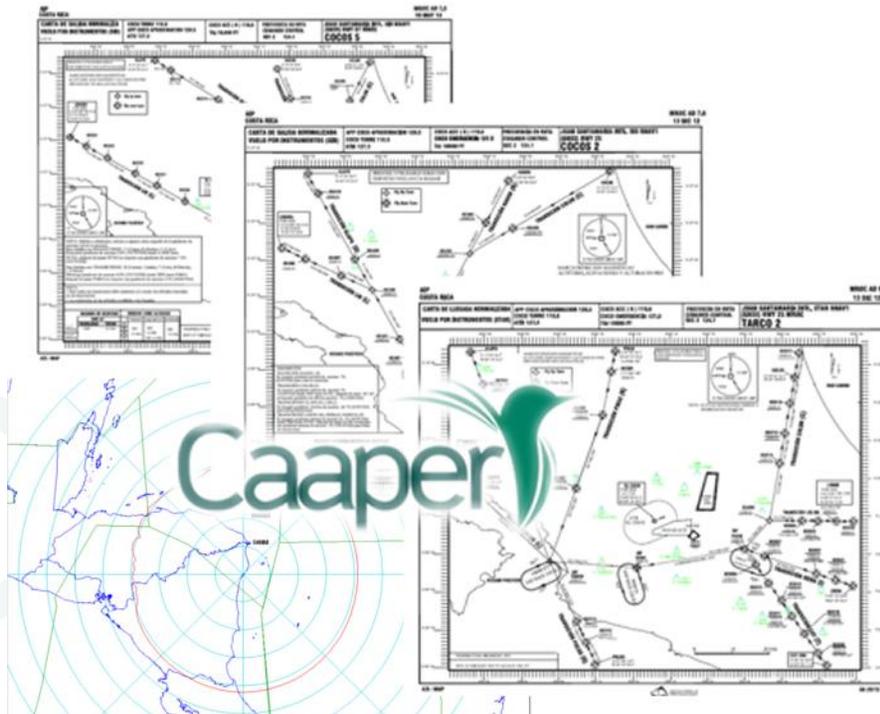
With the project "Implementation of the project of air traffic flow" (ATFM) State-driven through COCESNA coordination, progress has been made in improving the balance between demand and airspace capacity. It has been continually updated project work program in coordination with the CAR Region.

It has created a Center ATFM within COCESNA headquarters in Tegucigalpa, Honduras, and progress has been made in the publication and dissemination of the ATC declared capacity by sectors of the Area Control Center of Central American FIR (CENAMER ACC / FIC). Also have created a control sub ATFM in the States of Costa Rica and Guatemala and plans to implement one in the Central American Institute of Aeronautics Training (ICCAE) in El Salvador.

As part of the PBN Implementation Plan has been improved situational awareness of Air Traffic Management (ATM). Work is under way a plan to modernize ATM automated systems in the Central American states, there have been approaches with some Caribbean for comparison of radar data and plans to continue progress in the analysis of automatic dependent surveillance data and communications data link communications.

Progress in the implementation of PBN has contributed a series of progress reflected in complementary areas such as Unified Regional Monitoring Strategy, Implementation New Flight Plan Format ICAO model, improved Search and Rescue System (SAR), the optimization and upgrading of the communications infrastructure, improvements in the VHF and HF, Plans to improve the coverage AMS / HF in the Pacific ocean area of Central American FIR.

Currently, it is working on the restructuring of the terminal areas at airports in the region with departure and arrival procedures optimal and it is working on updating standardized departures and arrivals analyzing the temperature, the percentage of visibility and other external factors such way to generate more efficient procedures.





Follow-up

5.1 MEASUREMENT

In CAAPER development, it was possible to identify some opportunities to improve statistical systems in the States of the region, so as part of this action plan is expected in the short term institutionalize indicators to measure progress in efficiency fuel, reducing carbon emissions and other positive impacts on the environment.

From this, it is expected that statistical information collected can generate indicators to account for the level of CO₂ emissions and to classify it by country, route and / or aircraft operator, this with the purpose of establishing programs and appropriate mitigation measures with verifiable progress.

In the measurement process, It will be counted only the outgoing international flights, so will seek to exchange information with the countries with which it has connectivity, this with the aim of this to avoid duplication in accounting for fuel consumption and CO₂ emissions.

Additionally, it will be sought that each of the strategies, programs and measures implemented to establish an assessment method to measure the effectiveness respect to the objectives in its implementation.

5.2 INSTITUTIONAL MANAGEMENT

To develop the CAAPER is formed a working group formed by the focal points of each State (Guatemala, Belize, El Salvador, Honduras, Nicaragua and Costa Rica) and the information is centralized through a regional focal point.

It is expected that in the coming months will institutionalize a regional technical entity that together with the already established working group and representatives of the stakeholders, provide follow-up and monitor the implementation of the proposed strategies.

The team will meet at least one (1) time per year to establish annual business planning and measuring progress in achieving the objectives.

5.3 REPORTS OF PROGRESS

The working group as part of future work related to CAAPER will develop a reporting system and audits that involves the description of processes and supporting documentation that describes the progress of each of the strategies and measures promoted in the CAAPER.

As far as possible the reports shall describe in quantitative and qualitative progress in the achievement of the objectives in the implementation of the strategies and the results of state programs that in future arise as a result of the initiatives promoted in this action plan.

The information contained in the reports will be subject to the privacy policies of stakeholders involved and the laws applicable to the States in the region.

5.4 REVIEW AND UPDATE

The working group will make an annual review of CAAPER to analyze the level of progress in implementing the strategies, progress on the objectives and results of state programs that arise in the future as a result of the initiatives promoted in this plan action.





COCESNA