

# **ACTION PLAN FOR CO<sub>2</sub> EMISSION REDUCTION FROM INTERNATIONAL CIVIL AVIATION IN ANGOLA**



**April 2016**

*This document was produced with the financial assistance of the European Union.  
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## List of Abbreviations

<b>ANSP</b>	Air Navigation Service Provider
<b>APU</b>	Auxiliary Power Unit
<b>ATFM</b>	Air Traffic Flow Management
<b>ATM</b>	Air Traffic Management
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>ENANA</b>	Empresa Nacional de Exploração de Aeroportos e Navegação Aérea
<b>EU</b>	European Union
<b>GPU</b>	Ground Power Unit
<b>GSE</b>	Ground Service Equipment
<b>ICAO</b>	International Civil Aviation Organization
<b>INAVIC</b>	Instituto Nacional da Aviação Civil
<b>NAPT</b>	National Action Plan Team

# Acknowledgments

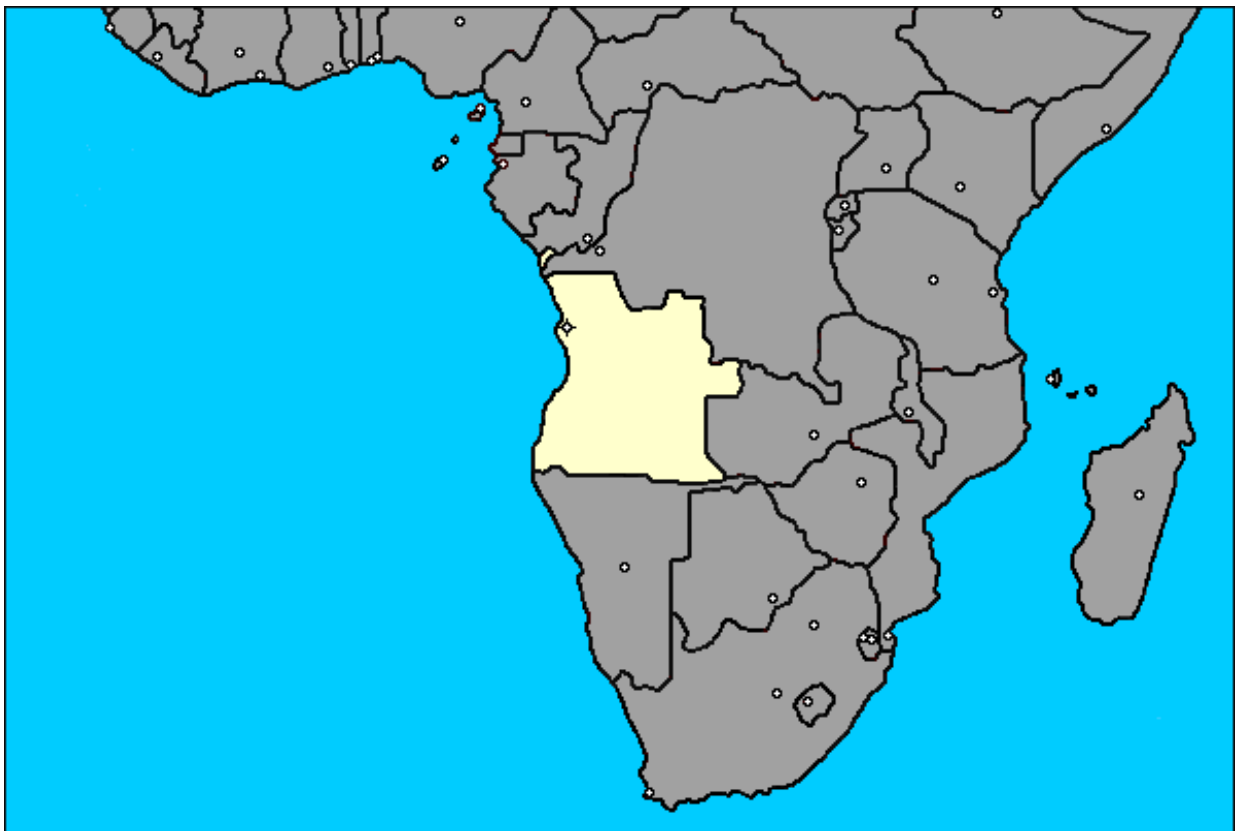
We acknowledge the financial, technical and strategic support of International Civil Aviation Organization (ICAO) - European Union (EU) Assistance project on Capacity Building for CO<sub>2</sub> Mitigation from International Aviation. This project has enabled ICAO to provide assistance to develop States' Action Plans, establish robust emissions monitoring systems and implement mitigation measures to reduce fuel consumption and emissions in 14 States from the African and Caribbean regions. The support of the ICAO-UE Project has been essential for the Government of Angola to develop and submit the State Action Plan on Emissions Reduction.

# 1. Introduction

## Angola - Territory and border

Angola is a member of Southern Africa region with surface extension of 1,246,700 km<sup>2</sup> and is located on the west coast of Africa, below the equator and east of the Greenwich meridian. Its border limits are:

- North - the Republic of Congo and the Democratic Republic of Congo;
- East - the Democratic Republic of Congo and the Republic of Zambia;
- South – the Republic of Namibia;
- West – the Atlantic Ocean.



**Figure 1** - Angola geographical location

Angola is currently composed of eighteen (18) provinces that form the current administrative division and are made up of seven indigenous cultural communities, including other subgroups (about a hundred) that are distinguished by their socio-cultural and linguistic particularities, namely, Bakongo, Ambumbu, Ovimbundu, Tchokwe, Ovinganguela, Ochiwambo and Khoisan.

Each region or province has got at least an aerodrome or an airfield. The main international airport in Angola, and the commercial airport which is the hub of the national carrier TAAG Angola Airlines, is Luanda International Airport (FNLU/LAD).

A new modern airport is currently under construction around 40 kilometers from Luanda, which is planned to handle 15 million passengers annually, and to accommodate the A380.

## **Legal basis of aviation in Angola**

The primary aviation legislation of Angola is the Civil Aviation Law (*Lei n° 1/08 de 16 de Janeiro*), approved by the National Assembly in 2008.

The Civil Aviation Law establishes general rules and principles applicable to civil aviation.

On the basis of the Civil Aviation Law, regulations are implemented in different domains such as infrastructure, airworthiness, air traffic regulations, operating rules, air transport and many more.

Recognizing the integrated character of international civil aviation, Angola adhered the Convention on International Civil Aviation on 11 March 1977.



## Environment

Recognizing the importance of climate change and global warming, the Government of Angola has been making effort to establish policies and regulation to protect the environment and mitigate greenhouse gas emissions.

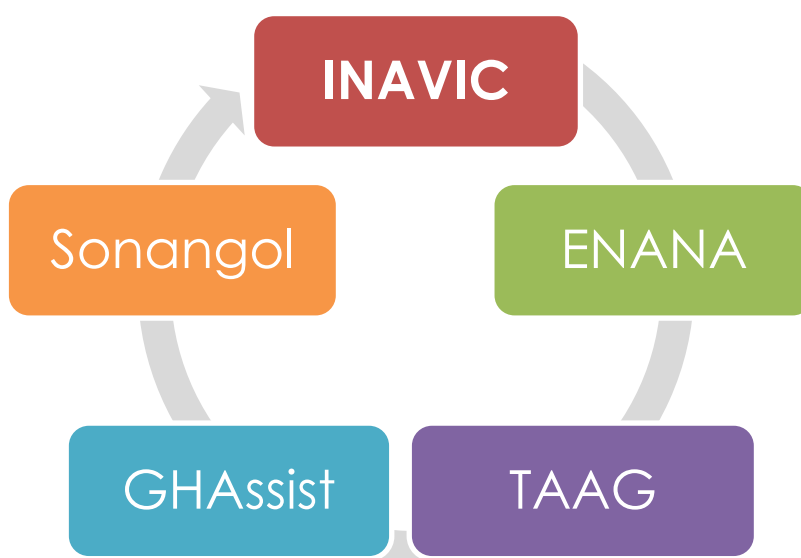
The Action Plan for CO<sub>2</sub> Emissions Reduction in International Aviation presents the initiatives of the civil aviation sector towards the fight against climate change. It has been elaborated through an inclusive process with the relevant stakeholders of the aviation sector in Angola, under the leadership of the Civil Aviation Authority INAVIC.

This Action Plan describes the civil aviation sector in Angola and its main actors, who compose the National Action Plan Team (NAPT) for CO<sub>2</sub> emissions reduction in aviation. The Action Plan then details the set of mitigation measures selected by the NAPT to address CO<sub>2</sub> emissions reduction in international aviation at the national level. The forecast of the trends of CO<sub>2</sub> emissions with and without the implementation of these measures is also described, reflecting the positive impacts of these initiatives on the carbon footprint of the national aviation sector in Angola.

These mitigation measures are mainly focused on improving the fuel management of the national airline, and on improving airport infrastructure and operations. These initiatives represent Angola's contribution towards the achievement of the global aspirational goals set by the International Civil Aviation Organization (ICAO) during its 37<sup>th</sup> Assembly in 2010: carbon-neutral growth from 2020 onward and a 2% annual increase in fuel efficiency up to 2050. It also answers ICAO's call to its Member States during its 38<sup>th</sup> Assembly (2013) to submit voluntary States' Action Plans to communicate on the progress toward the environmental goals set by ICAO and to request assistance if needed to implement these plans.

## 2. National Action Plan Team

The initiatives for CO<sub>2</sub> emissions reduction in international aviation in Angola will be implemented by a National Action Plan Team, composed of the main relevant stakeholders in the aviation sector and chaired by INAVIC. The institutions participating in the NAPT are described in more details in the following paragraphs.



**Figure 2 -** National Action Plan Team

The NAPT of Angola was officially created and held its first meeting in January 2016. It will meet regularly to follow the development and implementation of the Action Plan.

## 2.1. INAVIC

The National Institute of Civil Aviation (INAVIC) is a public institute of the economic sector, with legal personality, administrative, financial and patrimonial autonomy to support the aeronautical authority in carrying out its functions of coordination, guidance, control, surveillance, licensing and regulation of all activities related to the Civil Aviation Sector developed in Angola or in the airspace under its jurisdiction.

Within regulator and aeronautical authority, INAVIC has the following responsibilities:

1. Support the Ministry of Transports in defining policies and strategies for the development of civil aviation activity in the Republic of Angola;
2. Ensure compliance with applicable laws and regulations;
3. Study and propose the airport coverage policy and use of airspace, defining the principles to be respected in the development of general plans, master plans, service plans and environmental protection;
4. Promote and develop all activities related to civil aviation, including training and technical education, scientific and academic staff in the field of science and aviation medicine;
5. Study and propose laws, regulations and administrative measures to ensure the safety of air navigation, guide and coordinate the operations of civil aviation;
6. Make proposals on tariff bases to be adopted by entities exercising activities in the civil aviation sector;
7. Prepare performance indicators of activities and provide statistics on the operation of the branch;
8. Organize the participation and intervention of the aviation sector in international organizations, to ensure their rights and the commitments

made by the administration and coordinate the distribution of documents and information related to international affairs;

9. Establish standards for the systems and procedures of search and air rescue operations;
10. Coordinate with the competent authority procedures for aeronautical meteorology;
11. Participate in the negotiation of international treaties and agreements in the field of civil aviation;
12. Perform other duties established by law or determined superiorly.

## **2.2. ENANA**

On 11/05/1954, in response to the growth in air traffic, it was created in Angola the Civil Aeronautic Service which aimed to exercise the regulatory activity of civil aviation and at the same time managing and administrating major airports.

The Decree No. 14/80 of 13 February 1980 creates ENANA - National Enterprise for Airports Exploration and Air Navigation under the Ministry of Transports, separating it from the Civil Aviation Directorate which under another order was integrally linked the organic framework of the Ministry of Transports.

The Council of Ministers, through Decree No. 27/98, approving the organic statute of ENANA as Public Enterprise and, in November 1999, the first Enterprise Board of Directors, composed of five members was constituted.

ENANA-EP, under the Ministry of Transport, has under its control International Airport of 4 de Fevereiro in Luanda, Aerodromes of Huambo, Benguela, Cabinda, Lubango, Namibe, Uige, Luena, Malanje, Kuito, Saurimo, Soyo, Menongue, Ondjiva, Mbanza Congo, Sumbe, Porto Amboim, Nzeto, Waco Kungo, Andulo Bailundo, Dundo, Luzamba, Lucapa, Nzage and Cafunfo.

National and international operators are par excellence the main customers of ENANA, which in addition to other services, following them are provided:

- International and domestic air traffic control services in areas controlled inside the FIR of Luanda;
- Flight information services on national territory;
- Alert Service;
- Rescue and fire fighting services.

Among others, ENANA aims the attributes described below:

### **2.2.1. Mission**

Ensure the efficient operation of airports that are part of his responsibility and ensure high levels of safety to the air traffic control level in the airspace under the jurisdiction of the Republic of Angola, with a view to pursuing public interest and development of the national economy.

### **2.2.2. Vision**

Be a regional reference in the management of airports and air traffic control activity, oriented towards providing a high quality service and security to customers, basing its action on the objectives of efficiency and operational and financial sustainability, contributing to the promotion the image of Angola in the World.

### **2.2.3. Values**

- DEDICATION TO CUSTOMER: aiming to serve the airports customers in order to meet their needs, expectations and concerns based on a relationship of empathy, respect and availability;

- **SAFETY AND QUALITY:** guarantee the accuracy, professionalism and diligence in compliance with national and international civil aviation practice guidelines and operating procedures;
- **MANNING DEVELOPMENT:** enhancing the professional and personal growth of its employees, promoting those that contribute most to the achievement of the objectives of the company through a process of evaluation;
- **INTEGRITY AND HONESTY:** ensure transparency, fairness, integrity, honesty and trust in relations between all employees of the company and its customers, acting in full compliance with law and internal rules;
- **GUIDANCE FOR RESULTS:** demonstrate pro-activity, commitment and diligence in carrying out ambitious objectives based on an effective use of existing resources.

## 2.3. TAAG

*Linhas Aéreas de Angola (Angola Airlines)* is the state-owned flag carrier of Angola. Based in Luanda, the airline operates an all-Boeing fleet to domestic services within Angola, as well as medium-haul services in Africa and long-haul services to Brazil, Cuba, China, Portugal and the United Arab Emirates. The airline was originally set up by the government as *DTA – Divisão dos Transportes Aéreos* in 1938; rechristened *TAAG Angola Airlines* in 1973. The airline gained flag carrier status in 1975.

TAAG Angola Airlines is a member of both the International Air Transport Association and the African Airlines Association (AFRAA).

As of October 2014, TAAG Angola Airlines serves 31 destinations, including 13 domestic, 11 in Africa, 3 in Latin America, 2 in Schengen Europe, and 3 in the Middle East and the Asia-Pacific region.

## **2.4. GHASSIST**

Ghassist - S.A. was the first handling company licensed to provide ground services to the aircrafts in the Angolan airports, as of July, 1997. It is a private organization, composed by 3 shareholders, namely MACGRA, ENANA and TAAG. With a fleet of more than 100 pieces of equipment, including buses, forklifts, shuttles, and more, Ghassist provides the highest quality aircraft ground services to all of the regular flights, as well as charters, in Angolan airports.

Ghassist S.A.'s Board is committed to providing the best in personalized services, on a 24/7 basis. Therefore, has adopted and maintains a policy of integrated Quality Management compliance, enforcing and fostering the Integrated Management System, in the areas of Quality, Safety and Security as well as health and safety at work.

This dedication earned Ghassist, S.A. recognition as a pioneer in Angola, specially, through its work at Luanda Airport's ground service operations.

At the dawn of a new millennium, Ghassist positioned itself as an innovator through the utilization of QMS (Quality Management System) according to NP EN ISO 9001:2008 practices. Ghassist has strived to maintain the ISO 9001:2008 certification, by continuously evolving its operations to maintain a range of high-quality, competitive, professional, and efficient services. Through regular staff training and investment in the most innovative equipment, Ghassist has found success in meeting these goals.

With a commitment in offering the highest quality of personalized services to its clients, Ghassist worked at gaining the trust of their clients and recognition

as the best and most reliable company in ground handling operations. It operates the airports of Luanda, Cabinda, Lubango and Ondjiva.

As a leader in ground handling services in Angola, Ghassist focuses on providing Check-in, ramp, load control, cargo handling and mail services that are innovative and safe. However, the service of push back is provided on outsourcing basis by TAAG.

The cargo service consists in transporting cargo from/to the aircraft to the warehouse and build up pallets.

## **2.5. Sonangol Distribuidora – Serviços de Aviação**

The National Society of Angola Fuels (Sonangol) is the exclusive licensee for exploration of oil and gas in the basement and on the continental shelf of Angola. Created in 1976, its main activity is the prospecting, exploration, development, marketing, production, storage, transport and refining of hydrocarbons and their derivatives.

*Sonangol Distribuidora* comes in 1981 from the merger of the Directorate of Commercial Services and the Directorate of Operational Services, and being established as a subsidiary of Sonangol Group on 30 December 2005.

With the purpose of marketing and distribution of oil products such as fuels and lubricants throughout the country, the Aviation Business Unit was created (UNA), located at all airports nationwide.

The employees of *Sonangol Distribuidora* is responsible for implementing the actions necessary to customer satisfaction, their protection, the company's heritage, the environment and the community.



## 3. Baseline of CO<sub>2</sub> Emissions in International Aviation

### 3.1. Calculation method

The baseline for CO<sub>2</sub> emissions in international aviation represents the evolution of CO<sub>2</sub> emissions from international aviation in the next 20 years (up to 2035) in the absence of mitigation measures (*business as usual* scenario). In the case of Angola, it was calculated using one year of historical data (2014), provided by the national airline TAAG, the only airline registered in Angola that serves international flights. Only international flights according to ICAO definition were considered for the baseline calculation.

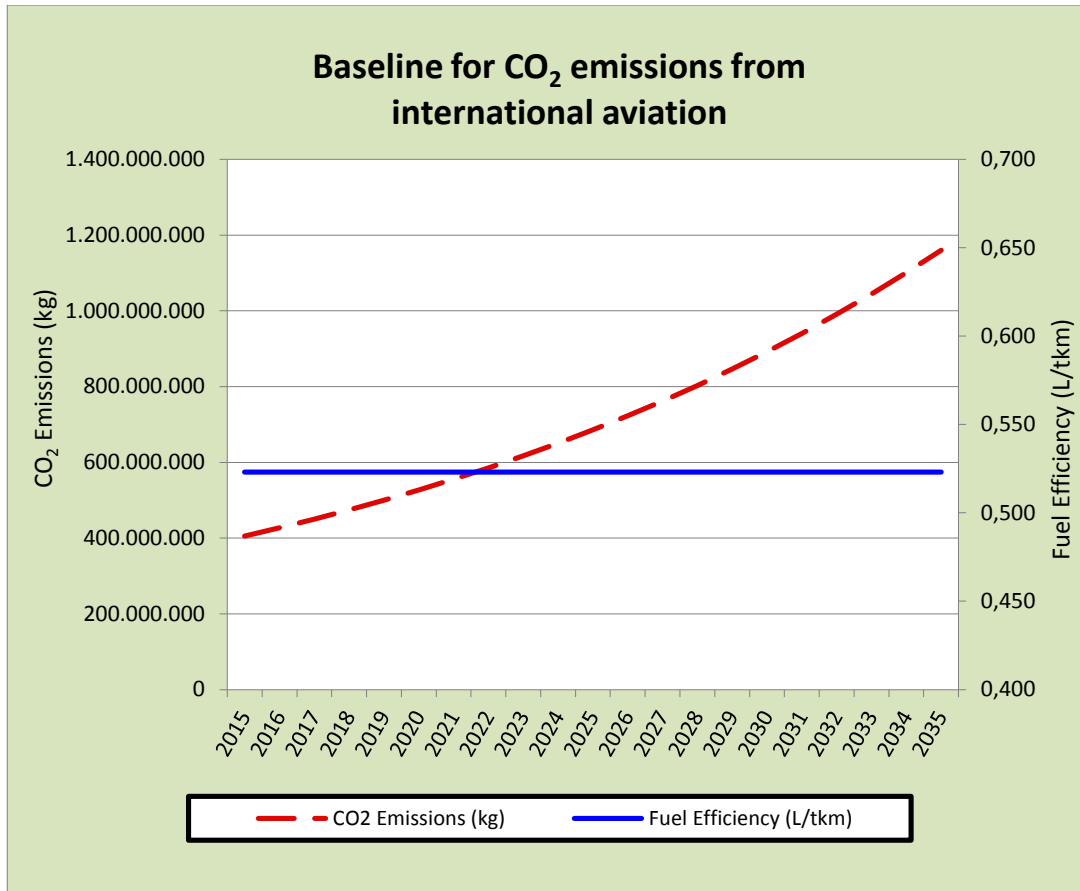
Following ICAO's methodology described in ICAO Doc 9988, the fuel efficiency calculated for 2014 (0.523 L/tkm) was assumed to remain constant until the baseline horizon (2035). On the other hand, the air traffic increase in the coming years was estimated using ICAO Circular 313, which forecasts a traffic (RTK) growth of 5.4% per year in the African region.

### 3.2. Results

The baseline obtained for CO<sub>2</sub> emissions up to 2035 is depicted in tabular and graphical formats on Table 1 and Figure 1 respectively. According to these results, in the absence of mitigation measures, CO<sub>2</sub> emissions from international aviation will grow from 405,249 tons of CO<sub>2</sub> (tCO<sub>2</sub>) in 2015 to 1,160,203 tCO<sub>2</sub> in 2035, which represents an increase of 186% in twenty years.

BASELINE				
Year	International RTK (tkm)	International Fuel burn (L)	International CO2 emissions (kg)	Fuel efficiency (L/tkm)
2014	290,777,587	152,091,250	384,486,680	0.523
2015	306,479,577	160,304,178	405,248,961	0.523
2016	323,029,474	168,960,603	427,132,405	0.523
2017	340,473,065	178,084,476	450,197,554	0.523
2018	358,858,611	187,701,037	474,508,222	0.523
2019	378,236,976	197,836,893	500,131,666	0.523
2020	398,661,773	208,520,086	527,138,776	0.523
2021	420,189,508	219,780,170	555,604,270	0.523
2022	442,879,742	231,648,299	585,606,901	0.523
2023	466,795,248	244,157,308	617,229,674	0.523
2024	492,002,191	257,341,802	650,560,076	0.523
2025	518,570,310	271,238,260	685,690,320	0.523
2026	546,573,106	285,885,126	722,717,597	0.523
2027	576,088,054	301,322,922	761,744,348	0.523
2028	607,196,809	317,594,360	802,878,542	0.523
2029	639,985,437	334,744,456	846,233,984	0.523
2030	674,544,650	352,820,656	891,930,619	0.523
2031	710,970,061	371,872,972	940,094,872	0.523
2032	749,362,445	391,954,112	990,859,995	0.523
2033	789,828,017	413,119,634	1,044,366,435	0.523
2034	832,478,730	435,428,094	1,100,762,222	0.523
2035	877,432,581	458,941,211	1,160,203,382	0.523

**Table 1** - Baseline



**Figure 3** - Baseline for CO<sub>2</sub> emission from international aviation

## 4. Basket of Measures for Angola

The mitigation measures selected to reduce CO<sub>2</sub> emissions from international aviation are focused on three categories from ICAO's basket of measures<sup>1</sup> :

1. Improved Air Traffic Management (ATM) and infrastructure use
2. More efficient operations
3. Airport improvements

The list of selected mitigation measures is described in more details in Annex 1.

### 4.1. Improved Air Traffic Management (ATM) and infrastructure use

The national airline TAAG has been undertaking for several years an active fuel management programme with the support of IATA to reduce fuel consumption and improve fuel efficiency. As part of the measures envisaged in 2016, TAAG will look for further improvements in the use of optimum flight levels and optimum routings, which will reduce en-route fuel burn.

### 4.2. More efficient operations

In addition, TAAG will implement measures to improve the efficiency of its operations, such as reducing the weight of its aircrafts (by reducing the quantity of fuel loaded or other weights such as magazines, potable water, etc.).

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<sup>1</sup> See Appendix A in ICAO Doc 9988 *Guidance on the Development of States' Action Plans on CO<sub>2</sub> Emissions Reduction Activities*.

Other operational measures applied during the flight aim at reducing/delaying the use of flaps for take-off and landing, and at minimising the use of reversers.

More efficient ground operations also play an important role in CO<sub>2</sub> emissions reduction from international aviation. TAAG will in this regard implement single-engine taxi and further train pilots to reduce fuel burn en-route and during taxi.

### **4.3. Airport improvements**

On this same line, TAAG aims at reducing the use of Auxiliary Power Units (APU) by aircraft on the ground, which will require ground handlers to supply ground power and pre-conditioned air to the aircraft at the airport.

The ground handler GHASSIST, on the other hand, is planning measures to enhance Ground Support Equipment (GSE) management, in particular by replacing fuel tractors by electrical tractors, and by minimising distances travelled by GSE, through the definition of parking areas close to the stands for aircraft parking. The Apron Management and Short Route functionality is expected to enable a more efficient use of aircraft stand parking, thus providing significant benefits linked to fuel consumption and delay reduction.

In addition, the airport operator ENANA has built a few years ago a rapid exit taxiway (runway 05-23), which allows the exit of the aircraft from the runway at high speed, thus reducing fuel consumption and environmental impact in descent/arrival phases.

## 5. Expected Results

The implementation of the mitigation measures selected by Angola will lead to the reduction of an average of 25,313 tCO<sub>2</sub> emissions from international aviation per year.

This quantification was performed using both a State methodology when available (measures selected by the national airline TAAG) and ICAO's rule of thumb<sup>2</sup> for the measure concerning the building of the new taxiway.

The measures on the improvement of Ground Support Equipment (GSE) will lead to the reduction of domestic CO<sub>2</sub> emissions only, and are hence considered as cobenefits. These reductions have not been quantified.

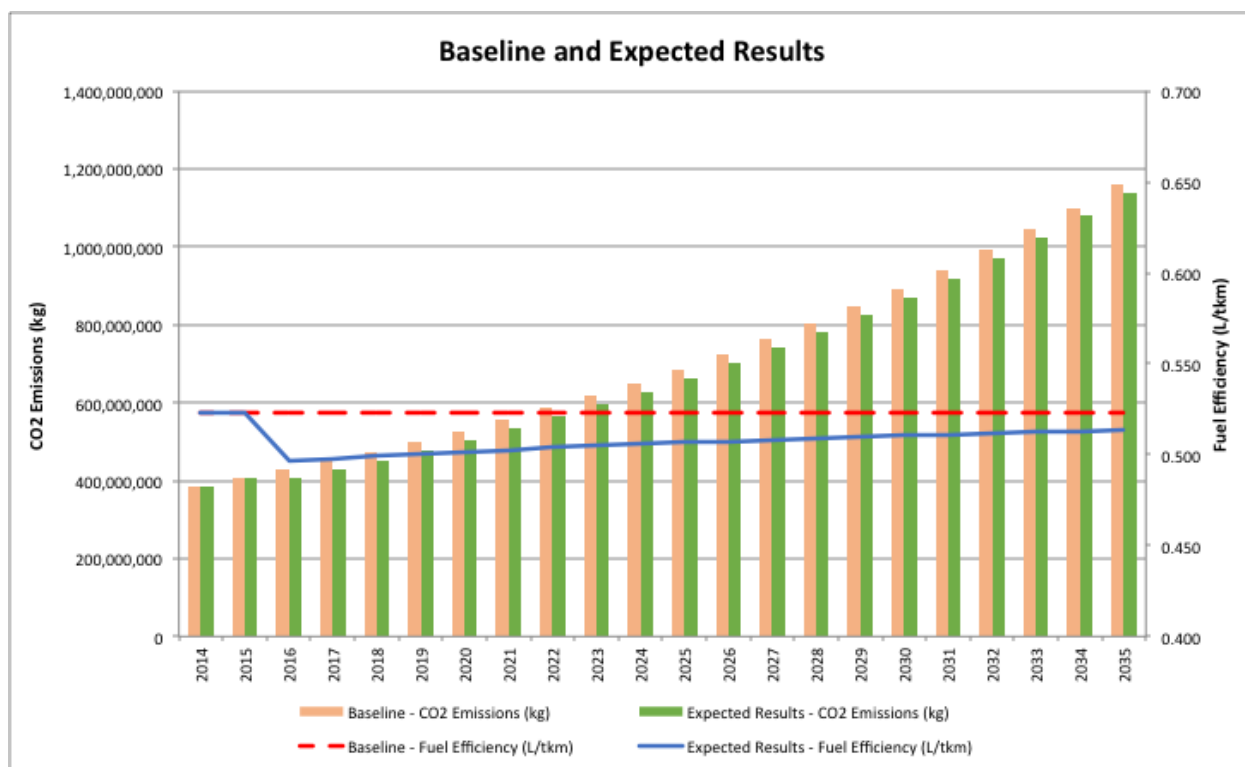
The expected results over the baseline horizon are depicted in on Table 2. Figure 2 provides a graphical representation of these results and confront them with the CO<sub>2</sub> emissions and fuel efficiency expected in the baseline scenario.

		EXPECTED RESULTS		
Year	RTK	International Fuel (litres)	International CO2 emissions (kg)	Fuel efficiency (L/tkm)
2014	290,777,587	152,091,250	384,486,680	0.523
2015	306,479,577	160,304,178	405,248,961	0.523
2016	323,029,474	160,389,216	405,463,937	0.497
2017	340,473,065	169,513,088	428,529,087	0.498
2018	358,858,611	179,129,650	452,839,755	0.499
2019	378,236,976	189,265,506	478,463,199	0.500
2020	398,661,773	199,948,698	505,470,309	0.502
2021	420,189,508	211,208,783	533,935,803	0.503
2022	442,879,742	223,076,912	563,938,433	0.504
2023	466,795,248	235,585,920	595,561,206	0.505
2024	492,002,191	248,770,415	628,891,608	0.506

<sup>2</sup> See Appendix C in ICAO Doc 9988 *Guidance on the Development of States' Action Plans on CO2 Emissions Reduction Activities*.

2025	518,570,310	262,666,872	664,021,852	0.507
2026	546,573,106	277,313,738	701,049,130	0.507
2027	576,088,054	292,751,535	740,075,880	0.508
2028	607,196,809	309,022,973	781,210,075	0.509
2029	639,985,437	326,173,068	824,565,516	0.510
2030	674,544,650	344,249,269	870,262,151	0.510
2031	710,970,061	363,301,584	918,426,405	0.511
2032	749,362,445	383,382,725	969,191,528	0.512
2033	789,828,017	404,548,247	1,022,697,967	0.512
2034	832,478,730	426,856,707	1,079,093,755	0.513
2035	877,432,581	450,369,824	1,138,534,915	0.513

**Table 2** - Expected results



**Figure 4** - Baseline and expected results

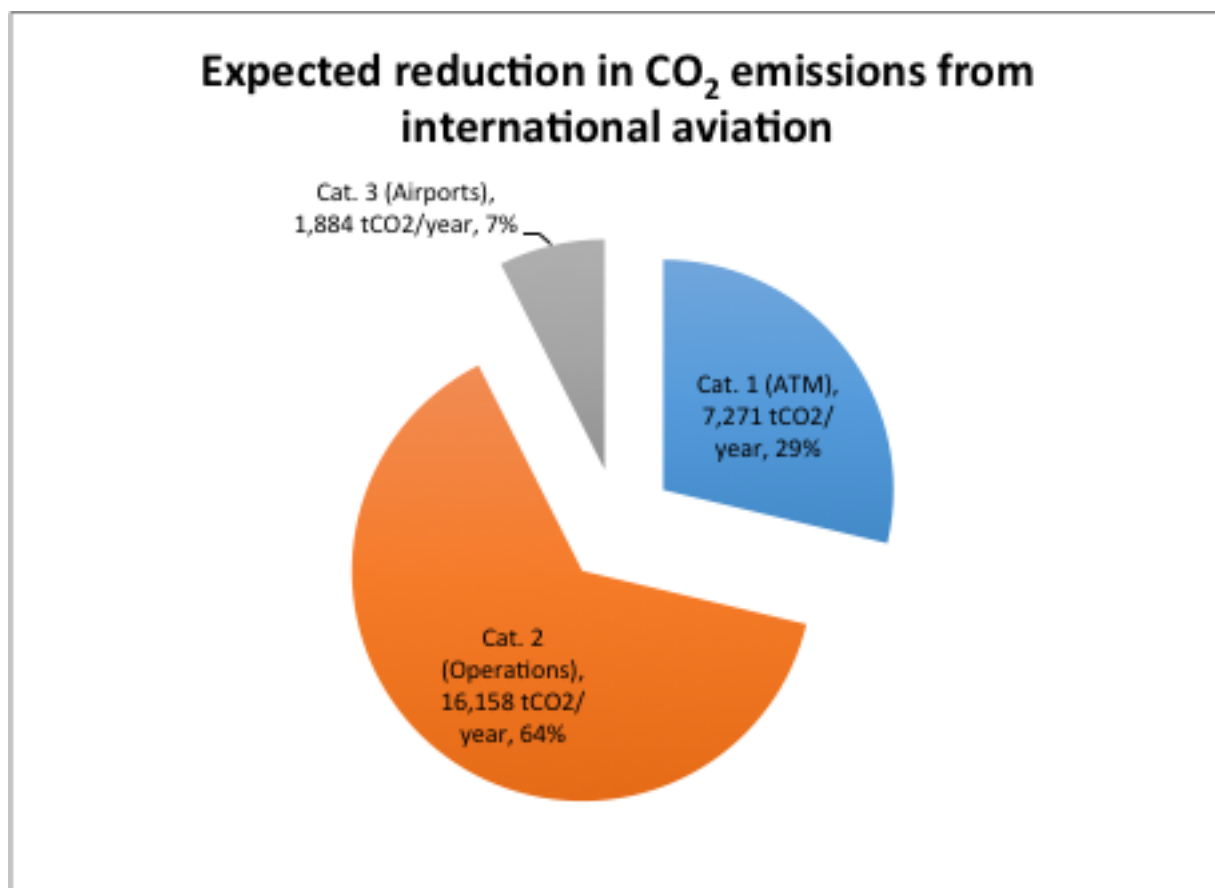
From the previous results and as illustrated on Table 3 and Figure 3, it appears that the highest reduction of CO<sub>2</sub> emissions from international aviation

will be obtained through the implementation of mitigation measures related to more efficient operations (64% of the annual tCO<sub>2</sub> reduced). On the other hand, improved ATM and airport improvements will contribute respectively to 29% and 7% of the emissions reduced.

	Nb of measures	Expected results (tCO <sub>2</sub> /year)	Expected results (%)
<b>Cat. 1 (ATM)</b>	2	7,271	29
<b>Cat. 2 (Operations)</b>	5	16,158	64
<b>Cat. 3 (Airports)</b>	4	1,884	7
<b>TOTAL</b>	<b>11</b>	<b>25,313</b>	<b>100</b>

**Table 3** - Baseline and expected results





**Figure 5** - Expected reduction in CO<sub>2</sub> emission from international aviation

## 6. Assistance Needs

The requested assistance mostly aims at achieving a better coordination between all relevant stakeholders. In particular, the national airline TAAG is expecting an improved cooperation with ground handlers and fuel providers to implement measures related to the reduction of the weight loaded in the aircraft. Similarly, improved cooperation with ENANA and INAVIC could facilitate the implementation of ATM-related measures such as the use of optimum routings.

## Annex 1: List of selected CO<sub>2</sub> mitigation measures

Measure	Description	Start date	Completion date	Expected results (tCO <sub>2</sub> reduced/year)	Stakeholders	Estimated cost (USD)	Assistance needs	Estimated cost savings (USD/year)
<b>1. Improved Air Traffic Management (ATM) and infrastructure use</b>								
1.1. Measures to improve the use of optimum flight levels	Apply Reduced Acceleration Altitude (Flaps Retraction level-off).	2016	2016	<b>969</b>	TAAG		N/A	445,055
1.2. Measures to improve the use of optimum routings	Apply : <ul style="list-style-type: none"> <li>Reduced Acceleration Altitude ;</li> <li>Optimized Cost Index ;</li> <li>Flight Planning Optimization (vertical and lateral) ;</li> <li>Alternate - Optimum Selection</li> </ul>	2016	2016	<b>6,302</b>	TAAG		Better Approach procedures provided by ENANA/ INAVIC.	2,561,288
<b>2. More efficient operations</b>								
2.1. Minimising weight	<ul style="list-style-type: none"> <li>Reduce Fuel Weight (ZFW Accuracy, Holding 15 Min, Flight Crew - Extra Fuel, Contingency Fuel, Fuel Bias (Flight Planning System), Center of Gravity Management, Excess Taxi Fuel, Dispatch Extra Fuel, Over Fueling)</li> <li>Reduce Other Weight (Magazines, Duty Free, Catering, Commercial Weight, Potable Water)</li> </ul>	2016	2016	<b>8,571</b>	TAAG		Cooperation with Ground Handling providers ; Cooperation of Fueling Services providers mainly	3,926,638

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The views expressed herein can in no way be taken to reflect the official opinion of the European Union.*



Measure	Description	Start date	Completion date	Expected results (tCO2 reduced/year)	Stakeholders	Estimated cost (USD)	Assistance needs	Estimated cost savings (USD/year)
							SONAN-GOL.	
2.2. Minimising / delaying flaps (take-off and landing)	Apply : • Low Drag Approaches ; • Reduced Flaps Takeoff ; • Reduced Flap Landings.	2016	2016	<b>2,268</b>	TAAG		N/A	1,085,504
2.3. Minimising reversers use	Apply Idle Reverse on Landing.	2016	2016	<b>352</b>	TAAG		N/A	174,573
2.4. Single engine taxi	Apply : • Engine Out – Taxi In ; • Engine Out – Taxi Out.	2016	2016	<b>1,331</b>	TAAG		N/A	678,550
2.5. Training pilots	Training on pilot techniques to reduce aircrafts fuel burn.	2016	2016	<b>3,636</b>	TAAG		N/A	1,699,903
<b>3. Airport improvements</b>								
3.1. Installation of fixed electrical ground power and pre-conditioned air to allow aircraft APU switch-off.	Reduced APU usage.	2016	2016	<b>355</b>	TAAG		Ground Handling assistance with Air Conditioning Carts and GPU.	169,939
3.2. Construction of taxiways	Building of a new taxiway to reduce taxi time (runway 05-23).	2010	2011	<b>1529</b>	ENANA	9.5M	N/A	

Measure	Description	Start date	Completion date	Expected results (tCO2 reduced/year)	Stakeholders	Estimated cost (USD)	Assistance needs	Estimated cost savings (USD/year)
3.3. Enhanced GSE (Ground Support Equipment) management	Replacement of Fuel tractors by electrical tractors.	2017	2017	<b>Cobenefits</b>	GHASSIST			
3.4. Enhanced GSE (Ground Support Equipment) management	Reduce distance travelled by GSE, by defining parking areas close to the stands for A/C parking.	2015	2016	<b>Cobenefits</b>	GHASSIST			