

The 10th Anniversary of the ICAO State Action Plan on CO2 Emissions Reduction

25 January 2021



EGYPT - (APER)



State Action Plan on Emissions Reduction



Presented by: Eng. *AbdelGhafar Elsayed AbdelHalim*

SAP ,CORISIA Focal Point & CAEP Member – Egypt



ICAO MID





Historical Background

- The PLAN – **rather than just the obligation** – is considered an important tool in providing ICAO with Egypt’s action plan on its activities to reduce CO₂ emissions, as part of the national plans for capacity building and the assistance which called on States for the first time to reduce CO₂ emissions, where States were for the first time invited to voluntarily take action, starting from the 37th Session of ICAO Assembly in 2010 up to the 40th Session of ICAO Assembly (A40 Resolutions)
- The PLAN should be based on a **Capacity Building Roadmap, through the grouping of relevant stakeholders in accordance with a specific vision and a number of legislative requirements, in conformity with ICAO Annex 16 & ICAO Assembly Resolutions.**
- **Egypt** has benefited from **CAEP’s support of the action plans initiative, which provided experts from participating States an overview of ICAO’s activities and direct assistance in the preparation and development of their action plans, as published on the ICAO website.**
- *Note: Egypt participated in all events organized by the ICAO Secretariat in MID ICAO region starting from March 2015 in Dubai, the United Arab Emirates – including review of the **APER interactive secured website** and the updated document Doc 9988, Manual on Guidance on the Development of States’ Action Plans on CO₂ Emissions Reduction.*



Egypt's Action Plan on Emission Reduction (Egypt's 1st APER)

- ❖ Egypt prepared and submitted to International Civil Aviation Organization “ICAO” on **June 2016** its 1st ECAA Approved Action Plan on Emission Reduction “APER” ;which outlines the Egyptian Civil Aviation policies and actions for addressing Carbon dioxide “CO₂” emissions from international aviation.; using the secured Interactive website of “ICAO” ” <https://portal.icao.int>”. Furthermore Egypt may select another method approved by ICAO to submit its updated “APER”.

1. Introduction for Egypt's “APER”:

- **Egypt** since 13 March 1947 ratified Chicago Convention joining the “ICAO” as a **Contracting State**. Our primary civil aviation legislation approved by the Egyptian “*People's Assembly*” is the **Law No. 28 issued 1981** governing the civil aviation aspects and is amended by **Law No.136 issued 2010** as its supplement, which mention in its **chapter 4 article 30** that “*ECAA*” *in co-ordination with the relative sides shall determine the noise level and the engine emissions allowed for the airplanes which avail themselves of Egyptian airports* “.
- Since 2002 ,Egypt re-construct a new body responsible for the civil aviation known as the "Ministry of Civil Aviation“, This body composed of number of EGYPTIAN Stakeholders involved now in Egypt's Action Plan of CO₂Emission Reduction (APER).
- Amongst Egyptian Civil Aviation **Regulation “ECARs”** that “ECAA” issued to fully comply with the “ICAO” Standard & Recommended Practices “SARPs” **Annex 16** .



1) Development of SARP's on National Legislations is your CORE for any Action Plan

❖ Environmental Protection Legislation in Egypt :-

I-Chicago Convention

“specially Art.37&44”

II-Regulations

- Aircraft Noise
- Aircraft Engine Emissions
- Aeroplane CO₂ Emissions Certification Standard
- CORSIA “Carbon Offsetting and Reduction Scheme for International Aviation “
- Local Air Quality (LAQ)

Egyptian Aviation Law # ” 28/1981 amended by 136/2010”

“specially **Art.2 bis. & 30**”

Egyptian Regulations is available to the public on the website” www.civilaviation.gov.eg”

“Annex 16 Volume I” → ECAR Part **36**

“Annex 16 Volume II” → ECAR Part **34**

“Annex 16 Volume III” → ECAR Part **38**

“Annex 16 Volume IV” → ECAR Part 40

“Annex 14 Volume IV” → ECAR Part 139

“Guidance material on the environmental aspects of the development and operation of an **aerodrome** is included in the **EAC139-16** “ while the guidance on ICAO Document 9889 "Airport Air Quality Manual".

❖ Challenges & Solutions:

1-No independent Governing Body within ECAA is responsible for Environmental issues yet.

✓ Now All STAKEHOLDERS together with All Egyptian Operators are represented in the Ministerial Decree 513 dated 7-6-2020 including the SAP.

2- Most of the legislations above have great effects on sustainable developments in Egypt & Economical aspects for the Aviation STAKEHOLDERS. Including Sustainable Alternative Fuels(SAF).

✓ ALL EGYPTIAN Stakeholders are invited & involved in any Process for our National Legislations development.





2) Bringing ALL STAKEHOLDERS together is your magic key for Success

On June 2020 ,The MOCA Minister amended ministerial decree # 513 Re-establishing **“the MOCA High Committee for Emissions Inventory”** FOR CORSIA& SAP mainly including these TEAM PLAYERS:-

- ❑ Ministry of Civil Aviation (MOCA)
- ❑ Egyptian Civil Aviation Authority(ECAA)
- ❑ 14 Egyptian Airlines Operators *instead of 3.*
- ❑ National Air Navigation Services(NANSC)
- ❑ Egyptian Airport Company (EAC)
- ❑ Egyptian Meteorological Company (EMC)
- ❑ Egyptian Aviation Academy (EAA)
- ❑ Others.

جمهورية مصر العربية
وزارة الطيران المدني
القairo

تابع فـ
وزير الطيران
رقم ١٣٣ هـ لسنة
الصادر في ٧ / ٧

م	الاسم
١	سيد الاستاذ/ رواد عبد
٢	سيد شركة النصر
٣	سيد شركة اير
٤	سيد الشركة لمين كور
٥	سيد الشركة ملكه يحيى
٦	سيد الشركة ايه ا
٧	سيد الشركة سمير عثمان
٨	سيد الشركة حمام البحر
٩	سيد الشركة كان
١٠	سيد الشركة ممتاز
١١	سيد الشركة وائل خليفة

المادة الثالثة

١- وضع آلية للتنسيق بين وزارة الطيران المدني وسلطة الطيران
- شركة مصر للطيران لتخطيط الجوية - شركة مصر للطير
البيانات غارات الإختصاص الحرارى الحرارى بشكل دورى بجمهورية م
وإلتفاق باريس والمنظمات الدولية .

٢- المشاركة فى إعداد السياسات والأهداف لرصد الإنبعاثات و
البيئية على مستوى الشركات والهيئات والمطارات .

٣- التعاون والتنسيق بين جميع الجهات المعنية لإنشاء قائ
بقطاع الطيران المدني بأكمله مع إعداد مؤشرات أداء عم
بقطاع الطيران بشكل مستمر ووضع الآليات المناسبة للتعامل
٤- متابعة تفعيل نظام خطة التعويض عن الكربون وخفضه ف
من الجهات المعنية .

٥- متابعة متطلبات الانفاضية الإلزامية للتقارير المناخية من
برصند الإنبعاثات المحلية والمساهمات الوطنية ائف
NDCS - National determined contributions

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وزارة الطيران المدني
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وزير الطيران المدني
بعد الإطلاع
على قانون الطيران المدني رقم ٢٨ لسنة ١٩٨١ والمعدل بالقانون رقم ١٣٦ لسنة ٢٠١١ ،
وعلى قانون شركات قطاع الأصناف الصادر بالقانون رقم ٢٠٣ لسنة ١٩٩٦ ولائحته التنفيذية ،
وعلى قانون الهيئة رقم ٤ لسنة ١٩٩٤ والمعدل بقانون ٩ لسنة ٢٠٠١ ولائحته التنفيذية ،
وعلى القانون رقم ١٢ لسنة ٢٠٠٣ بإصدار قانون العمل والحريات والتوظيف المعدل رقم ٤٤ ،
وعلى القانون رقم ٨١ لسنة ٢٠١٦ بإصدار قانون العمل والحريات والتوظيف المعدل رقم ٤٤ ،
وعلى قرار رئيس الجمهورية رقم ٧٢ لسنة ٢٠١١ بشأن شركات في مجال الطيران المدني وتحويله ،
وعلى قرار رئيس الجمهورية رقم ٤٦ لسنة ٢٠٠٢ بتظهير وزارة الطيران المدني ،
وعلى قرار رئيس الجمهورية رقم ١٣٧ لسنة ٢٠١٢ بتدويل مؤسسة مصر للطيران إلى شركة قابضة ،
وعلى التنسيق الذى تم بين وزارة الطيران المدني وسلطة الطيران المدني والشركات والهيئات التابعة لها ،
وعلى عتاب السيدة الدكتورة / رئيس الإدارة المركزية للجودة رقم ٢٨٠ بتاريخ ٢٠/٠٢/٢٠٢٠ ومرفقه ،
قرر
(المادة الأولى)

تشكل اللجنة العليا لرصد الإنبعاثات بقطاع الطيران المدني من وزارة الطيران المدني والجهات التابعة لها برئاسة
السيدة الدكتورة / أميرة السيد أحمد - رئيس الإدارة المركزية للجودة وضخوة قدرين :-
عن وزارة الطيران المدني :-

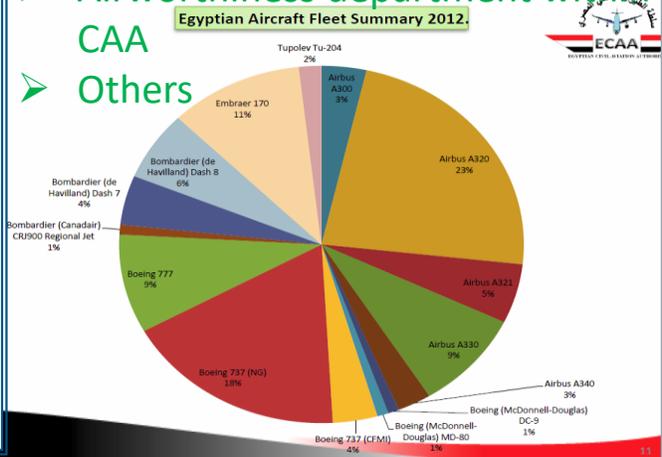
م	الاسم	الوظيفة
١	السيدة المهندس / عبد الغفار السيد عبد الغفار	مدير إسم الإدارة العامة للعمليات على المعدات الفنية التابعة لخدمة الطائرات بمنطقة الطيران المدني
٢	السيد الأستاذ / محمد فكري جسرانة	مقرر اللجنة - الإدارة المركزية للجودة
٣	السيد الأستاذ / عثمان طساوي سرحان	نحضر لى لى بالإدارة المركزية للجودة
٤	السيدة الأستاذة / مها فخايدة محمد عبدالطيف	المصانير لثلاث الإدارة المركزية للجودة

2) ALL STAKEHOLDERS together is your magic key for Success :Contd

- There are Internal and External STAKEHOLDERS. The focal point of contact of SAP should make a good strategy of communications throughout ALL STAKEHOLDERS (including EXTERNAL).
- External "out of your Organization" maybe either within your STATE or Outside it. Some of the External STAKEHOLDERS such as –but not limited to- are:-
 - ❑ ICAO HQ/ICAO MID , ACAO, AFCAC ,IATA ,CANSO ,ACI ,EUROCONTROL ,MIDRMA...etc



- ❖ "MSEA": Ministry of State for Environmental Affairs
- ❖ Egyptian Air Force
- Airworthiness department within CAA
- Others



ARAB REPUBLIC OF EGYPT
MINISTRY OF CIVIL AVIATION



Table of Content:

CH. Subject

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2. 1) Welcome to APER Website
2) Introduction for Egypt's "APER"
3) Egyptian Stakeholder in
 - 1) Egypt Fleet Summary & Action Plan
 - 2) All Egyptian Fleet Status
 - 3) Figures 2.3.8.4) Analysis using the ICAO 8 TABs fleet
3. 1) Baseline
2) Expected Results
4. 1) Mitigation Methods adopted
2) Assistance Required
5. 1) Egyptian Civil/Military Cooperation

APPENDIX

A Supporting Documents

Page designed: www.icao.int / www.canso.org

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EGYPT'S ACTION PLAN ON "CO₂" EMISSION REDUCTION FOR CIVIL AVIATION

Draft Version released to International Civil Aviation Organization "ICAO"

Author/Focal Point of Egypt's "APER":
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 Manager of Technical Researches & Environmental Development
 Airworthiness Engineering Directorate "AED"
 Airworthiness Central Administration "ACA"
 ECAA



(EGYPT'S "APER")⁽¹⁾





<This Plan Sets for the period (2010-2030)>

⁽¹⁾ This document required to be approved by the State (Egypt) before be published to public. Some Data maybe classified as "Secured" and may not be available except to "ICAO" only.

3) Prioritising & Selecting your best suited Mitigation Measures from the ICAO Basket of Measures (BOM)

The “MOCA High Committee for Emissions Inventory” (previously the National Committee on Environmental Issues in Aviation), had selected a number of elements from the basket of measures for the short term (2010-2020) “under evaluation of implementation now” and medium term (2020-2030), as follows:

- a) Modern technological improvements for aircraft (including fleet renewal);
- b) Improvement of Air Traffic Management (ATM);
- c) The more effective operational measures.

Note: it was expected that the new Egyptian plan for the long term (2030-2050) will include the sustainable aviation fuel



3) Prioritising & Selecting your best suited Mitigation Measures from the ICAO Basket of Measures (BOM) Contd.

a) Modern technological improvements (including fleet renewal):

- 1) **Modification Fuel Saving Impact (Review of SB's for Fuel saving potentials)**
- 2) **Engine Core Water Wash (Optimize the existing engine core water wash program)**
- 3) **Airframe Aerodynamic Deterioration (Reduce Airframe Drag Fuel Bias & Aerodynamic Deterioration due to Painting, Sealant, Dirty surfaces)**
- 4) **Maintenance Program Task Cards & "MEL/CDL" (Mark Task Cards & MEL/CDL with influence to fuel conservation)**
- 5) **Empty Weight A/C (remove FAK, Dirt and Dust as well as Dehumidify the A/C)**
- 6) **Reduction of APU usage of Maintenance**
- 7) **A/C Performance Monitoring System (Manage & reduce Airframe Drag & Aerodynamic Deterioration)**
- 8) **Fuel Conservation Training (Stir awareness & ensure Best Practice application throughout Airlines & Maint. Org.)**





3) Prioritising & Selecting your best suited Mitigation Measures from the ICAO Basket of Measures (BOM) Contd.

a) Modern technological improvements (including fleet renewal): contd

With the aid of newly secured “ICAO” interactive website known as “ICAO” Integrated Safety Trend Analysis and Reporting System ([iSTARs](#)), fleet summary information by state can be found easily for Egypt. ECAA will use the data in this friendly website in conjunction with ECAA database to summarize the current state of international Aviation.

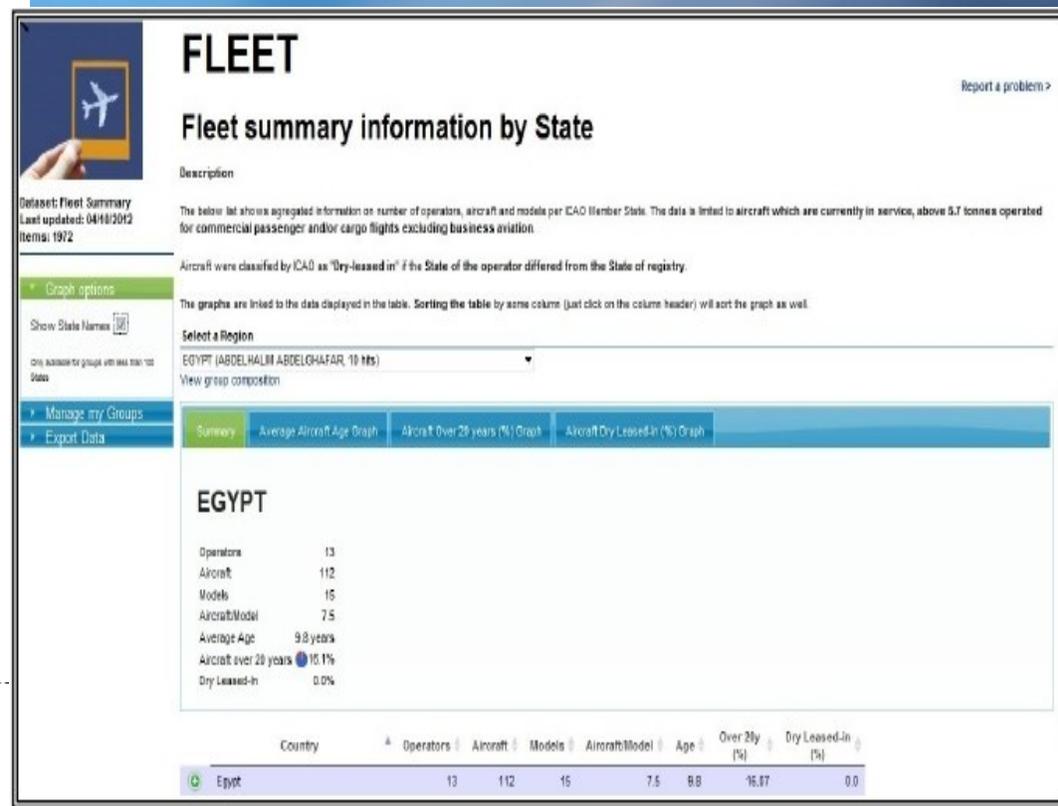
It’s already well known that the *Average Age* “year” of aircraft (A/C) is equal to the total age for all A/C divided by the number of A/C, but ([iSTARs](#)) added newly important information about the All Egyptian *fleet Average Age* with respect to the world fleet (Egypt=*9.8* years, World=*13.4*) which confirms that the Egyptian Operators buy new A/C even before amending our Egyptian Civil aviation Regulation “ECAR” Part 47(item 47.5) on July 2007 to mandate that any large A/C (>5700kg) must *not exceed than 15 years* to be registered in Egypt as well as *10 years* for *small A/C*. Of course this point has more benefits for **safety** and **environment**.

More & more benefits for **environment** regarding to the **operations & better use of air-space** mitigated since most of Egyptian operators perform too many *approved modification* to enhance their aircraft performance and also prefer to have an ECAA approval for Reduced Vertical Separation Minima (RVSM) operations (1).

Whilst ECAA also mandates all A/C to be approved for Basic Area Navigation (RNP-5) (2).

(1)Information related to the Performance Based Navigation (PBN) Operations will be found on the (Middle East Regional Monitoring Agency) website “www.midrma.com”

(2)Please see ECAR 91.707 Performance-Based Navigation within Egyptian airspace designated navigation specifications (RNP-5)



Note: the above information related to the 1st APER , ECAA / airworthiness department to update it

In ECAR Part 47 titled “The Requirements for Registering Aircraft in the Egyptian Aircraft Register , item 47.5 Registration required
 Each Aircraftshall be register in the Egyptian civil aviation register and issue certificate of registration as ...under these conditions :-
 (1)Aircraft max, take off weight **less than 5700 Kg** should **be not exceeding than 10 years from manufacture date.**
 (2)Passenger aircraft max. take off weight **over 5700 Kg** should **be not exceeding than 17 years** from manufacture date.
 (3)Cargo aircraft max. take off weight **over 5700 Kg** should **be not exceeding than 20 years** from manufacture date.



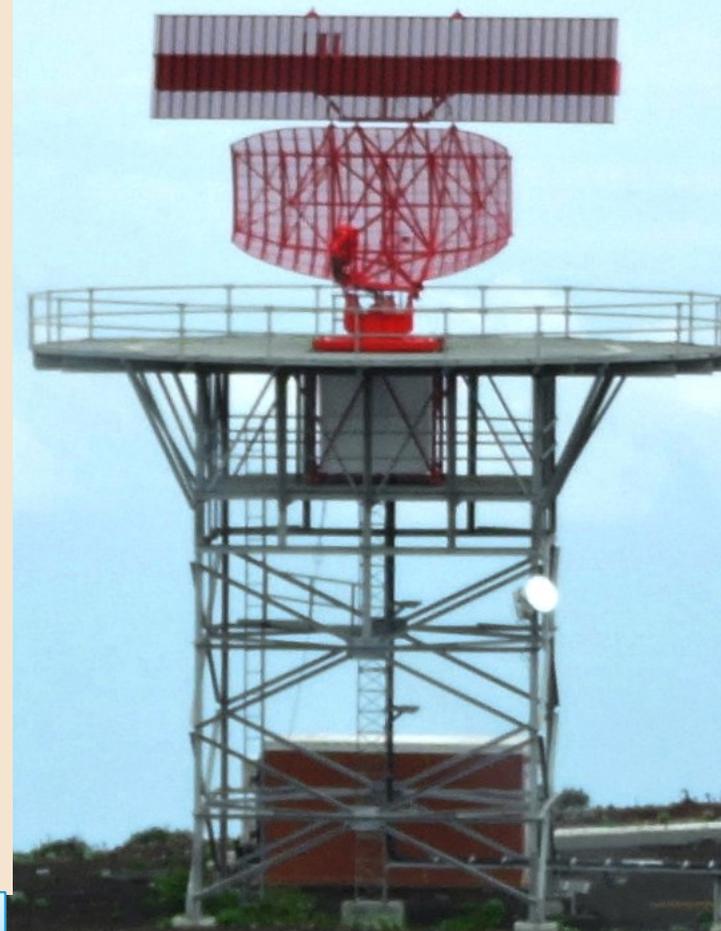
3) Prioritising & Selecting your best suited Mitigation Measures from the ICAO Basket of Measures (BOM) Contd.

b) Improvement of Air Traffic Management (ATM);

•Recognizing the importance of Civil/Military coordination, a Technical Committee has been established between the Ministry of Defense and the Ministry of Civil Aviation (Represented by NANSO and ECAA) for the purpose of reorganizing Cairo FIR to apply a flexible use of airspace (FUA) within a Civil/Military cooperation system in accordance with the Civil/Military operational requirements. Complying with PANS/OPS, PBN concept & Coordinate between Civil Military airspace users so as to provide a high quality service for our FIR users.

(RESTRICTED)

NOTE) Decide which data is Secured/Restricted and which is to published (National Level)



3) Prioritising & Selecting your best suited Mitigation Measures from the ICAO Basket of Measures (BOM) Contd.

- Approved a lot of direct routes inside national airspace to save fuel and time also reduce emissions to meet regional requirements (**Q680 SALUN-DBA Southbound**, **L315 CVO-HGD Southbound**, and **T55 NABAD-KATAB Southbound**)
- Solving a lot of conflict demands between civil and military side
- cancel a lot of prohibited areas inside national airspace to facilitate traffic flow as well as facilitate landing and taking-off operations for Cairo international airport.




L315 CVO - HGD southbound

- Existing just established very beneficial ATS route mainly for ARR HEGN with savings from Europe up to 20NM depending on departure airport.
- The availability in accordance with Egyptian orientation was confirmed for Over flying, DEP HECA, DEP Alexandria area and ARR HEGN.

	Total	Length (NM)	Time (min)	Fuel (kg)	CO2 (kg)	NOx (kg)
	31	566.04	75.65	1349.35	10817.7	88.04

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Technical Committee for Civil/Military Cooperation

Quick Wins

Q680 SALUN - DBA southbound

Eurocontrol reports that Existing very beneficial ATS route for ARR HECA published and for all over flying traffic.

Length (NM)	Time (min)	Fuel (kg)	CO2 (kg)	NOx (kg)	
28	201.63	62.58	1393.67	6179.39	21.3

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T55 NABED - KATAB southbound

- Newly planned also very beneficial ATS route for DEP HEGN with saving of more than 30NM inside Egypt. Initial idea of Egypt for availability is 00.00h - 07.00h UTC.

	Total	Length (NM)	Time (min)	Fuel (kg)	CO2 (kg)	NOx (kg)
	33	543.47	71.87	2648.26	11501.7	42.02

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3) Prioritising & Selecting your best suited Mitigation Measures from the ICAO Basket of Measures (BOM) Contd.

c) The more effective operational measures

➤ Ground Operations

- Reduction of the onboard weight & the assessment of other reduction potentials
- Reduce weight of onboard magazines
- Reduction of the onboard catering & the assessment of other reduction potentials
- Optimize the weight of Duty Free Material carried on-board
- Reduce the quantity of on-board water
- Reduction of Cargo Container Weight
- Introducing the paperless cockpit (Electronic Flight Bag)
- Stir awareness & ensure Best Practices application

➤ Flight Operations

- APU Operating Time Reduction (Reduce the use of the Auxiliary Power Unit)
- Pilot Technique & Flight Management (Introduce the principles of efficient pilot techniques)
- Low Noise Low Drag Approaches
- Reduce Flap Landing
- Idle Reverse on Landing (increase the use of Idle Thrust on LDG to all Flights)

➤ Airport Operations

- Reduction taxi fuel by assigning gates near to Take-Off/LDG runways
- Optimizing fuel uplift on final Zero Fuel Weight
- Fixed gate electrical & pre-conditioned air supply to reduce APU usage
- Introducing of RNAV SID/STARs at Cairo Airport





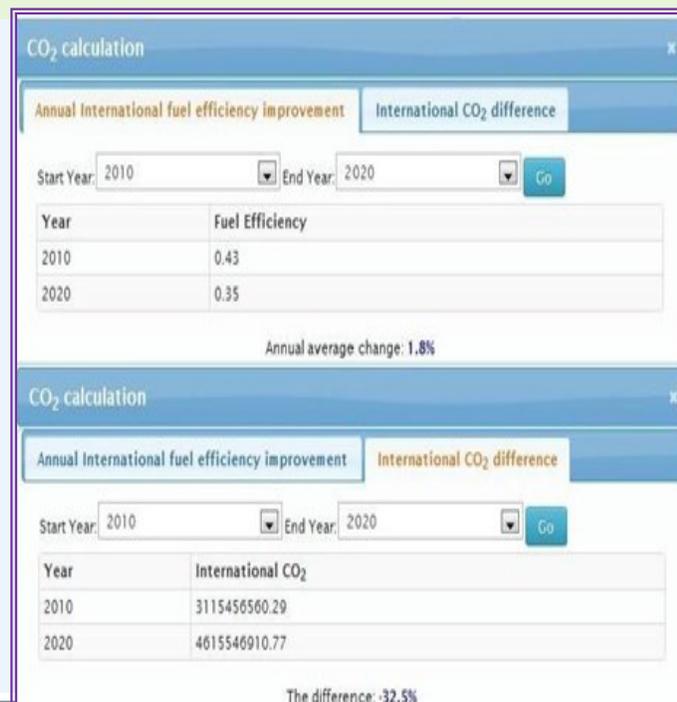
5) Data collected and analysis

- ❑ **Egypt's 1st APER: entering the estimated baseline of fuel consumption and CO₂ emissions for international aviation (using time series methodology for a period of 5 past consecutive years excluding their extremes)**
- ❑ **Then, enter the projected fuel consumption and CO₂ emissions (i.e. after implementation of mitigation actions) that Egypt envisages to reach.**
- ❑ **Noting that this year-by-year description of the projected Revenue Tonne Kilometres (RTK), fuel consumption, and CO₂ emissions can be done consecutively or periodically**

✓ **Short term: By using of APER tool, Analysis for the period (2010-2020) shows :**

• Average Annual international fuel efficiency improvement = **1.8%**

• International CO₂ difference = - **32.5%**



CO₂ calculation

Annual International fuel efficiency improvement | International CO₂ difference

Start Year: 2010 | End Year: 2020 | Go

Year	Fuel Efficiency
2010	0.43
2020	0.35

Annual average change: 1.8%

CO₂ calculation

Annual International fuel efficiency improvement | International CO₂ difference

Start Year: 2010 | End Year: 2020 | Go

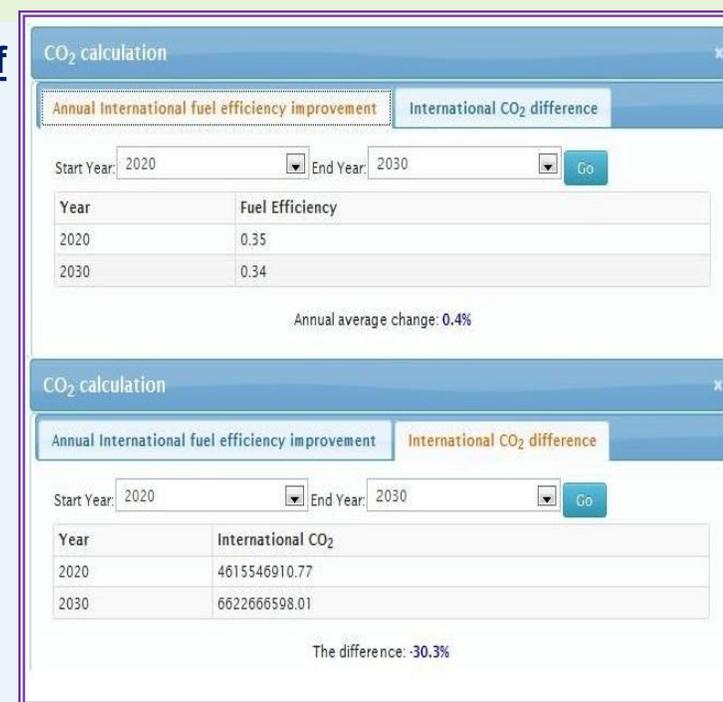
Year	International CO ₂
2010	3115456560.29
2020	4615546910.77

The difference: -32.5%

✓ **Medium term: By using of APER tool, Analysis for the period (2020-2030) shows:**

• Average Annual international fuel efficiency improvement = **0.4%**

• International CO₂ difference = - **30.3%**



CO₂ calculation

Annual International fuel efficiency improvement | International CO₂ difference

Start Year: 2020 | End Year: 2030 | Go

Year	Fuel Efficiency
2020	0.35
2030	0.34

Annual average change: 0.4%

CO₂ calculation

Annual International fuel efficiency improvement | International CO₂ difference

Start Year: 2020 | End Year: 2030 | Go

Year	International CO ₂
2020	4615546910.77
2030	6622666598.01

The difference: -30.3%

6) Next Steps towards updating our APER

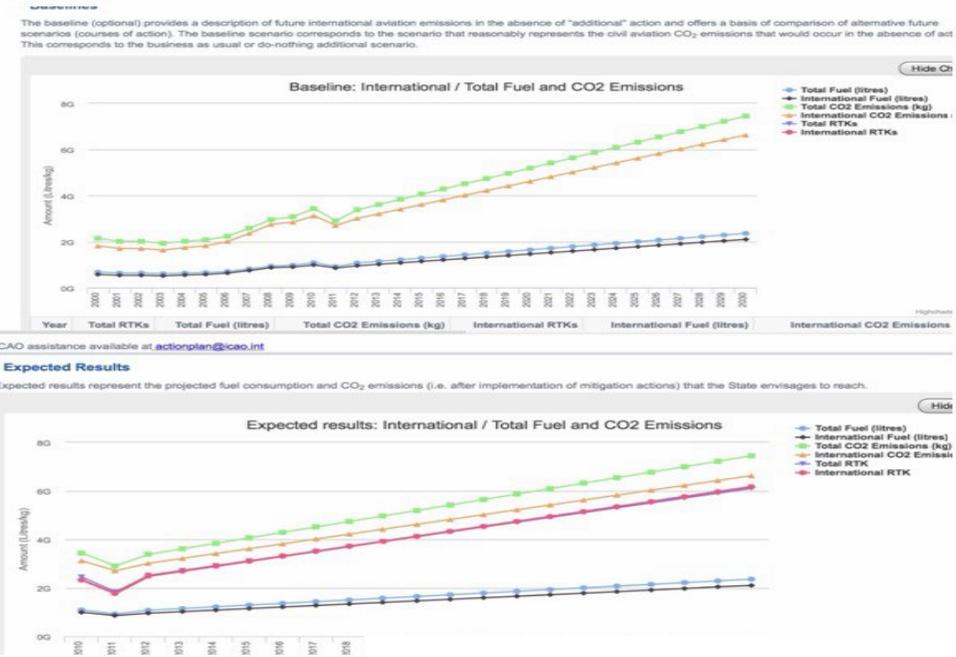
***Long term: (2030-2050):**

Our future Capacity Building will focus on Sustainable Alternative Fuel for Aviation - First seminar had been held by the Ministry of Civil Aviation since 2013 for alternative Fuel production opportunities.

Egypt as one of the developing countries faced many challenges in the field of development and in the sustainable building of their capacity. However Egypt intends to act on updating its 1st Action Plan, seeking guidance from the ICAO /ICAO MID as well as the updated Doc 9988 in addition to using the ICAO tool of Environmental Benefits Tool (EBT).

Our Updated APER intended to include:-

- * Adding ALL AO RTK to Egypt Air RTK
- Quantifying each Mitigation Measure OR include other mitigation measures
- May include a version available to the public



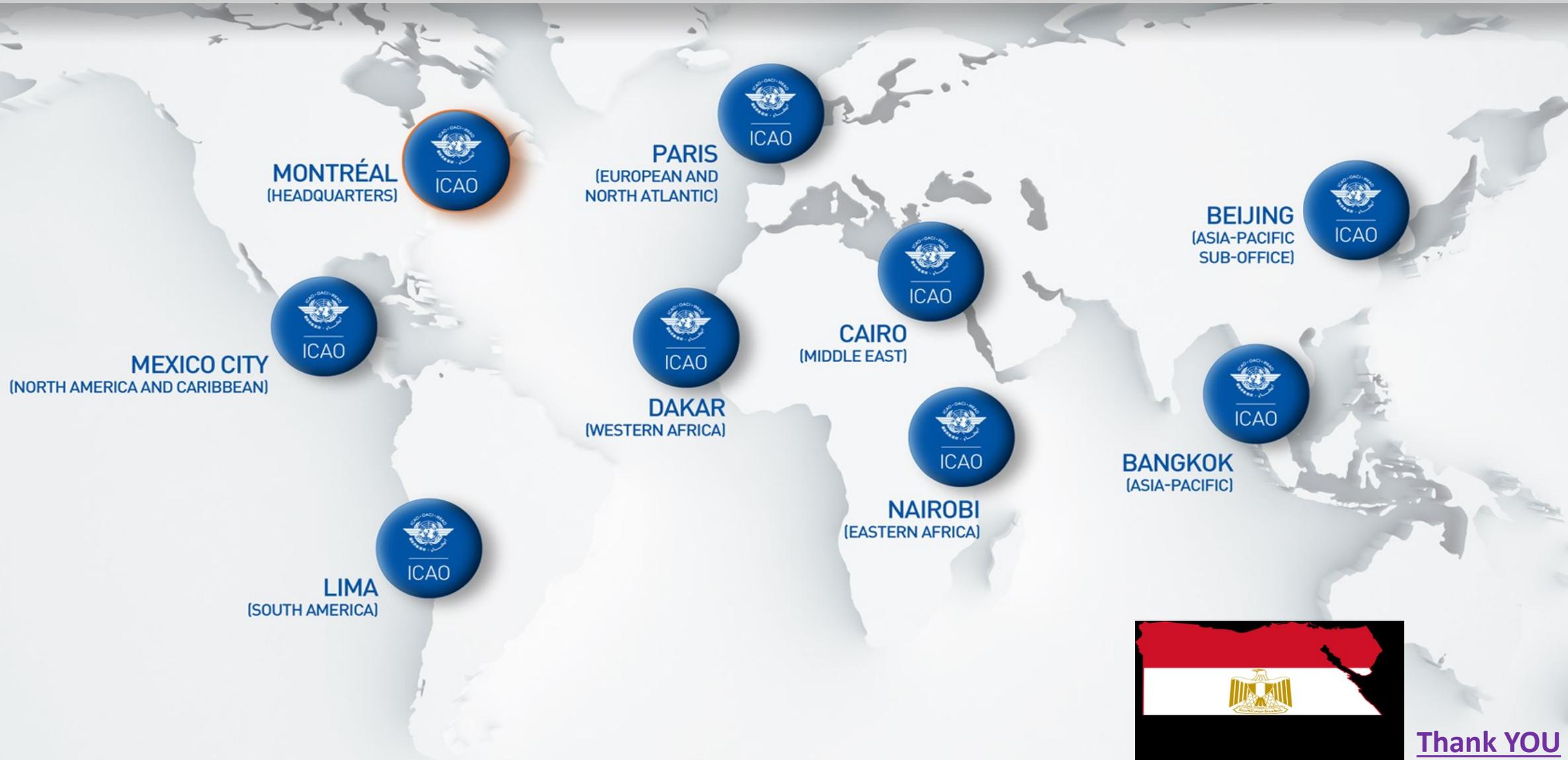
ECAA WOULD LIKE TO THANK VERY MUCH THE "ICAO" ACTION PLAN TEAM" FOR THEIR HIGHEST ASSISTANCE AND VALUABLE CO-OPERATION IN ORDER TO DEVELOP OUR 1ST APER DURING 2016 AS WELL AS DURING OUR WORK IN UPDATING IT FROM 2021.



ICAO MID



The 10th Anniversary of the ICAO State Action Plan on CO₂ Emissions Reduction



Thank YOU