



ICAO

ENVIRONMENT

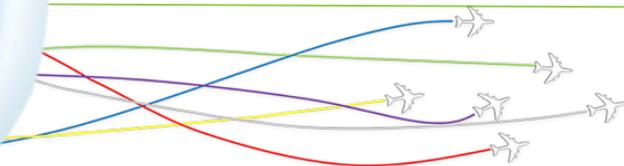
NO COUNTRY LEFT BEHIND



Successful examples of Regulatory measures from the ICAO-European Union Partnership

Eduardo Caldera-Petit

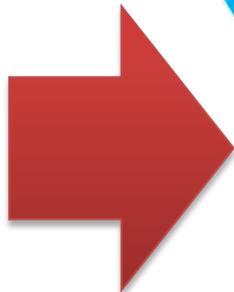
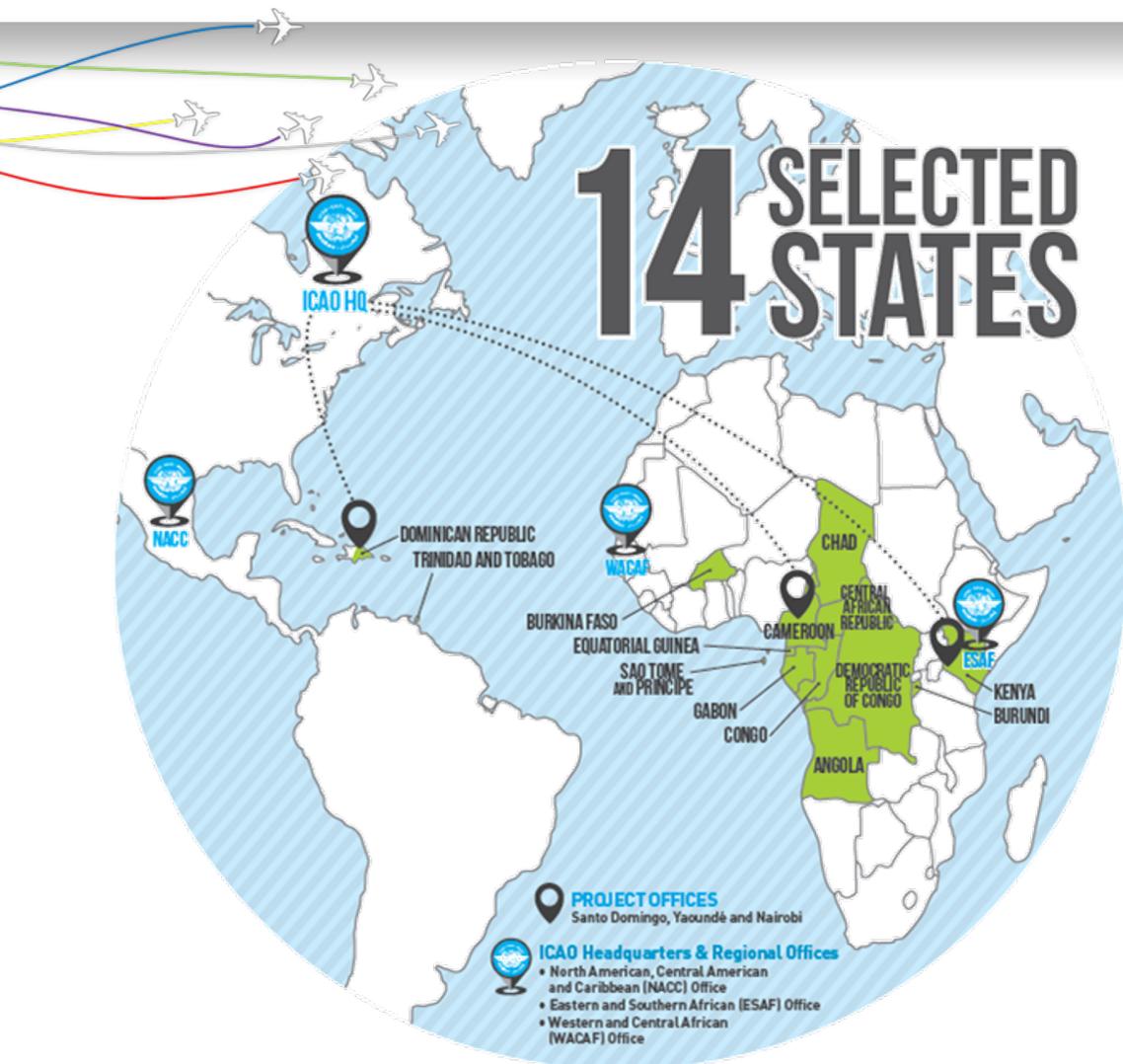
ICAO-EU Programme Coordinator



PROJECT FUNDED BY



European Union



OBJECTIVE 1

ACTION PLANS DEVELOPMENT:

Improved capacity of the National Civil Aviation authorities to develop an Action Plan on CO₂ emissions reduction from international aviation in accordance with ICAO recommendations

OBJECTIVE 2

AVIATION ENVIRONMENTAL SYSTEMS (AES):

Efficient CO₂ emissions monitoring system for international aviation developed in each selected Member State

OBJECTIVE 3

IMPLEMENTATION OF MITIGATION MEASURES:

Priority mitigation measures identified, evaluated and partly implemented

ENVIRONMENT



Progress-to-date | OBJECTIVE 1

Results on CAPACITY BUILDING

..... Six Project Seminars

14 States **Action Plans**

443,000 Tons of CO₂ emissions reduction per year from 2017

ONE Regional Action Plan



National Teams Consolidated

ALL the States with NAPT established

E-learning Tools





Aviation Environmental System | AES

Monitoring, Reporting and Verification tool developed in the scope of the ICAO-European Union Assistance Project | **AES – installed in the 14 selected States**



1. Provide a user-friendly tool to allow Civil Aviation Authorities (CAA) to monitor CO₂ emissions from international aviation at the State level
2. Automate the data reporting to ICAO

MONTHLY AVIATION CO₂ REPORT

Feb-18

Dominican Republic

State-level report - 5 reporting airline(s)
ICAO definition for international flights

KEY METRICS FOR INTERNATIONAL AVIATION

FLIGHTS	RTK (tkm)	FUEL BURN (L)	CO ₂ EMISSIONS (t)	FUEL EFFICIENCY (L/tkm)
523	433,949	551,512	1,393	2.813

TRENDS

MONTH-TO-MONTH	Feb-18	Jan-18	% CHANGE	6 MONTHS TREND
RTK (tkm)	433,949	2,121,882	-80%	
FUEL BURN (L)	551,512	1,527,272	-64%	
CO ₂ EMISSIONS (kg)	1,393	3,860	-64%	
FUEL EFFICIENCY (L/tkm)	2.813	2.309	+22%	

YEAR-TO-YEAR	Feb-18	Feb-17	% CHANGE	1 YEAR TREND
RTK (tkm)	433,949	2,204,416	-80%	
FUEL BURN (L)	551,512	2,238,844	-75%	
CO ₂ EMISSIONS (T)	1,393	5,659	-75%	
FUEL EFFICIENCY (L/tkm)	2.813	2.292	+23%	

Revenue Tonnes Kilometers (RTK)



Fuel Burn and Efficiency



Efficiency of Mostly Used Aircrafts

Aircrafts	Flights	Fuel Efficiency (L/tkm)
1 JS32	184	1.253
2 B190	90	2.402
3 SF34	63	2.599
4 JS31	52	1.303
5 C560	27	5.651

Fuel Burn Trends



Most Fuel Efficient Routes

Routes*	Flights	Fuel Efficiency (L/tkm)
1 MUHG-MUVR	4	0.389
2 MDLR-TBPB	2	0.677
4 MDSO-TAPA	6	0.731
5 WMKE-TAPA	2	0.78

Least Fuel Efficient Routes

Routes*	Flights	Fuel Efficiency (L/tkm)
1 SVMI-MDJB	3	14.424
2 TDPD-MDSD	2	9.089
3 TBPB-MDJB	2	8.349
4 KPBI-TAPA	2	7.224
5 MKJP-MDJB	2	6.091

* Only routes with at least 2 flights were considered.

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Routes with Highest Load Factors**

Routes*	Flights	Load Factor
1 MDSO-TDPD	2	0.974
2 MDJB-TNCM	2	0.967
3 MDSO-TNCM	14	0.955
4 MDSO-TAPA	6	0.877
5 MDSO-TQPF	9	0.865

* Only routes with at least 2 flights were considered.

** Only flights with at least 1 passenger were considered.

Routes with Lowest Load Factors**

Routes*	Flights	Load Factor
1 TDPD-MDSD	2	0.132
2 TBPB-MDJB	2	0.222
3 MKJP-MDJB	2	0.278
4 MDJB-WMKE	2	0.278
5 SVMI-MDJB	3	0.281

* Only routes with at least 2 flights were considered.

** Only flights with at least 1 passenger were considered.

ANNUAL AVIATION CO₂ REPORT

2017

Kenya

State-level report - 1 reporting airline(s)
ICAO definition for international flights

MONTHLY REPORTS SUBMITTED



KEY METRICS FOR INTERNATIONAL AVIATION

FLIGHTS	RTK (tkm)	FUEL BURN (L)	CO ₂ EMISSIONS (t)	FUEL EFFICIENCY (L/tkm)
31,694	1,005,964,260	344,557,408	871,041	0.796

TRENDS

YEAR-TO-YEAR	2016	2017	TREND	% CHANGE
RTK (tkm)	931,600,992	1,005,964,260	↑	8%
FUEL BURN (L)	355,584,946	344,557,408	↓	-3%
CO ₂ EMISSIONS (T)	898,919	871,041	↓	-3%
FUEL EFFICIENCY (L/tkm)	2.403	0.796	↓	-67%

Revenue Tonnes Kilometers (RTK)



Fuel Burn and Efficiency



Fuel Burn Trends



Most Fuel Efficient Aircraft

Aircraft	Number of flights*	Fuel efficiency (L/tkm)
1 788	4126	0.299
2 738	7163	0.691
3 E90	18848	0.85
4 73W	1256	1.33
5 73F	301	4.533

* Only aircraft with at least 2 flights were considered.

Least Fuel Efficient Aircraft

Aircraft	Number of flights*	Fuel efficiency (L/tkm)
1 73F	301	4.533
2 73W	1256	1.33
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* Only aircraft with at least 2 flights were considered.



PILOT MITIGATION MEASURES

TO BE IMPLEMENTED WITH PROJECT FUNDING

The pilot mitigation measures, which will be completed by 2018, will showcase concrete actions that may be replicated by other Member States to contribute to the achievement of ICAO's aspirational goals for CO₂ emissions reduction from international aviation.

SOLAR PANELS

Provides clean power to the airport grid

CAMEROON
DOUALA INTERNATIONAL AIRPORT

KENYA
MOMBASA INTERNATIONAL AIRPORT

CO₂ REDUCTION
2408
TONNES/YEAR

GATE ELECTRIFICATION SYSTEM

Provides ground power and pre-conditioned air to the aircraft at the gate

IMPLEMENTATION OF CCO/CDO

Continuous Climb Operations (CCO) / Continuous Descent Operations (CDO)

BURKINA FASO

GABON

CO₂ REDUCTION
1266
TONNES/YEAR



FEASIBILITY STUDIES

TO BE DEVELOPED WITH PROJECT FUNDING

The feasibility studies will provide the governments of the selected States decision-making tools that may unveil new opportunities to get to the edge of innovations for a sustainable aviation sector.

FEASIBILITY STUDY

on the use of renewable energy to power airport operations

TRINIDAD & TOBAGO

DOMINICAN REPUBLIC

TRINIDAD & TOBAGO

FEASIBILITY STUDY

on the development of sustainable alternative fuels

BURKINA FASO

KENYA





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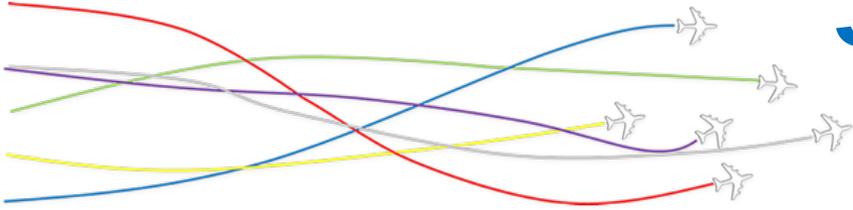
ENVIRONMENT

NO COUNTRY LEFT BEHIND



Regulatory Measures

Successful examples



- ✓ Establishment of National Action Plan Teams
- ✓ Regulation for CO₂ emissions reporting
- ✓ Environmental Unit at the CAA
- ✓ Enhancements to support the CO₂ mitigation

ENVIRONMENT



National Action Plan Teams

Official establishment of **National Action Plan Teams (NAPTs)** including all main relevant stakeholders in the aviation sector.

- Civil Aviation Authorities,
- Air Carriers and Airports
- Air Navigation Providers (ANPs)
- Fuel suppliers,
- Others

These teams were created as Committees or Working Groups through Aeronautical Information Circulars (AICs) by the DGCA of the selected States.



National Action Plan Team | **NAPT** Burkina Faso



AGENCE NATIONALE DE L'AVIATION CIVILE DU BURKINA FASO
NATIONAL CIVIL AVIATION AGENCY OF BURKINA FASO

14.425

DECISION N°/ANAC/DG portant création, attributions, composition et fonctionnement d'une Equipe du Plan d'Action (EPA) pour la réduction des émissions de CO₂ par l'aviation civile.

LE DIRECTEUR GENERAL DE L'AGENCE NATIONALE DE L'AVIATION CIVILE

- Vu la loi la Loi n° 013-2010/AN du 06 avril 2014, portant Code de l'Aviation Civile au Burkina Faso ;
- Vu le Décret n°2009-940/PRES/PM/MEF/MT du 31 décembre 2009, portant création de l'Agence nationale de l'aviation civile (ANAC) ;
- Vu le Décret n°2010-210/MT du 27 avril 2010, portant approbation des statuts de l'Agence nationale de l'aviation civile (ANAC) ;
- Vu le Décret n°2011-803/PRES/PM/MTPEN du 25 octobre 2011, portant nomination du Directeur Général de l'Agence nationale de l'aviation civile (ANAC) ;
- Vu la Délibération n°2A12-018/MTPEN/SG/ANAC/CA du 04 Mai 2012 du Conseil d'administration portant adoption de l'organigramme de l'Agence nationale de l'aviation civile (ANAC) ;
- Vu la résolution n° A37-19 de l'OACI invitant les Etats membres à élaborer un plan d'action relatif aux activités devant concourir à la réduction du CO₂ dans l'aviation civile internationale ;
- Vu le Décret n°2012-720/PRES/PM/MEF du 11 septembre 2012 portant réglementation des rétributions des prestations spécifiques des agents des administrations publiques au Burkina Faso,

DECIDE

CHAPITRE I : DE LA CREATION

Article 1 : Il est créé une Equipe du Plan d'Action (EPA) chargée d'élaborer le Plan d'Action (PA) de réduction du CO₂ pour le Burkina Faso.

Article 2 : L'EPA est placée sous l'autorité du Directeur Général de l'Agence nationale de l'aviation civile du Burkina Faso.

Article 3 : Les missions de l'EPA prennent fin le 30 juin 2015, après la soumission du PA à l'Organisation de l'Aviation Civile Internationale.

CHAPITRE II : DES ATTRIBUTIONS

Article 4 : L'Equipe du Plan d'Action a pour mission :

- de dresser un inventaire des émissions de CO₂ ;
- d'élaborer un plan triennal 2015-2017 de réduction des émissions de CO₂ conformément à la résolution A37-19 et aux normes et pratiques recommandées de l'OACI (SARPs, Annexe 16 à la Convention de Chicago du 7 décembre 1944) ;
- d'identifier des mesures d'atténuation des émissions et de faire des propositions de mise en œuvre de celles-ci dans l'objectif de la réduction de ces émissions et de la consommation de carburant ;
- d'identifier les sources de financement pour la mise en œuvre des mesures retenues ;
- de faire des propositions pour l'intégration aux marchés du carbone (MBM) ;
- de proposer des mécanismes de suivi-évaluation de l'efficacité des mesures retenues ;

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- de réaliser toute activité en rapport avec l'objectif de sa mission.

CHAPITRE III : DE LA COMPOSITION

Article 5 : L'Equipe du Plan d'Action est composée ainsi qu'il suit :

- 1 représentant du Ministère en charge de l'aviation civile
- 3 représentants de l'Agence Nationale de l'Aviation Civile (ANAC)
- 2 représentants de l'ASECNA
- 1 représentant de la Délégation aux Activités Aéronautiques Nationales (DAAN)
- 1 représentant de Air Burkina
- 1 représentant de la Régie Administrative Chargée de la Gestion de l'Assistance en Escale (RACGAE)
- 1 représentant de Total Burkina

Article 6 : Pour une session donnée, le Directeur Général de l'ANAC peut faire appel à toute autre personne compétente dont l'expertise est jugée utile pour l'élaboration du Plan d'Action.

CHAPITRE IV : DU FONCTIONNEMENT

Article 7 : La présidence de l'EPA est assurée par le Directeur Général de l'ANAC ou son représentant.

Le secrétariat est assuré par le point focal. Celui-ci est nommé parmi les représentants de l'ANAC.

Article 8 : L'Equipe du Plan d'Action se réunit une fois par mois, sur

3

convocation du Président et chaque fois que de besoin.

Article 9 : Toutes les réunions de l'EPA font l'objet d'un Procès-verbal ou d'un compte rendu.

Article 10 : Les membres de l'Equipe du Plan d'Action bénéficient des frais de sessions conformément aux textes en vigueur.

Les frais de fonctionnement sont à la charge du budget de l'ANAC et d'autres sources éventuelles de financement.

CHAPITRE V : DES DISPOSITIONS FINALES

Article 11 : Le Directeur de l'administration, des finances et de la comptabilité et le Contrôleur de gestion, sont chargés chacun en ce qui le concerne, de l'exécution de la présente décision qui entre en vigueur à la date de sa signature.

Article 12 : Cette décision sera publiée partout où besoin sera.

Ouagadougou le, 31 DEC 2014

Le Directeur Général

Abel SAWADOGO

Chevalier de l'Ordre national



National Action Plan Teams

BENEFITS:

- Creation of synergies (sometimes inexistent) and enhanced coordination between the aviation sector and the national structures for climate change.
- Participation of the CAA in the national delegation to the Conference of the Parties (COP) of UNFCCC
- Inclusion of CO₂ emissions from the aviation sector in the national inventories reported to the UNFCCC and other bodies
- Facilitated the preparation and progress monitoring of the National Action Plan



Regulation for CO₂ emissions reporting



National Regulation to require national airlines to **submit relevant flight data periodically** in the format compliant with the Aviation Environmental System (Form ENV1).



Form ENV1 includes all relevant data on traffic and fuel consumption necessary for the CAA to use the AES for **CO₂ emissions monitoring** from international aviation at the national level.

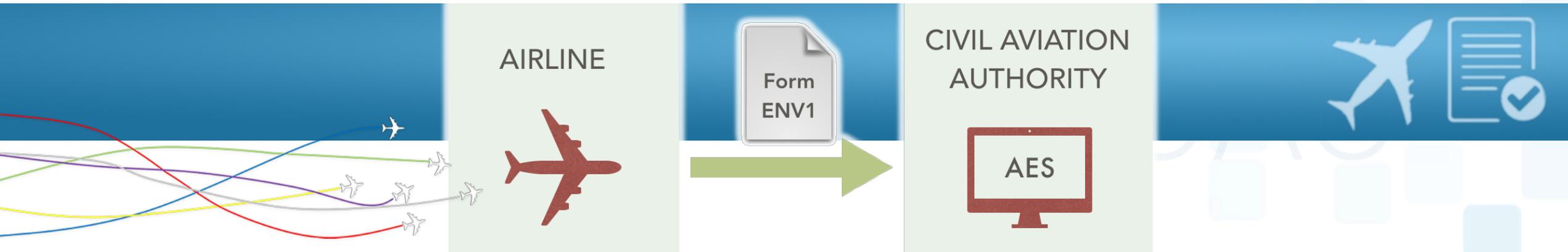




Regulation for CO₂ emissions reporting

➔ Additional benefits:

Most States included domestic flights in the reporting requirements, in order to assess CO₂ emissions from domestic aviation for **reporting to UNFCCC**, beyond the reporting of CO₂ emissions from international aviation to ICAO.





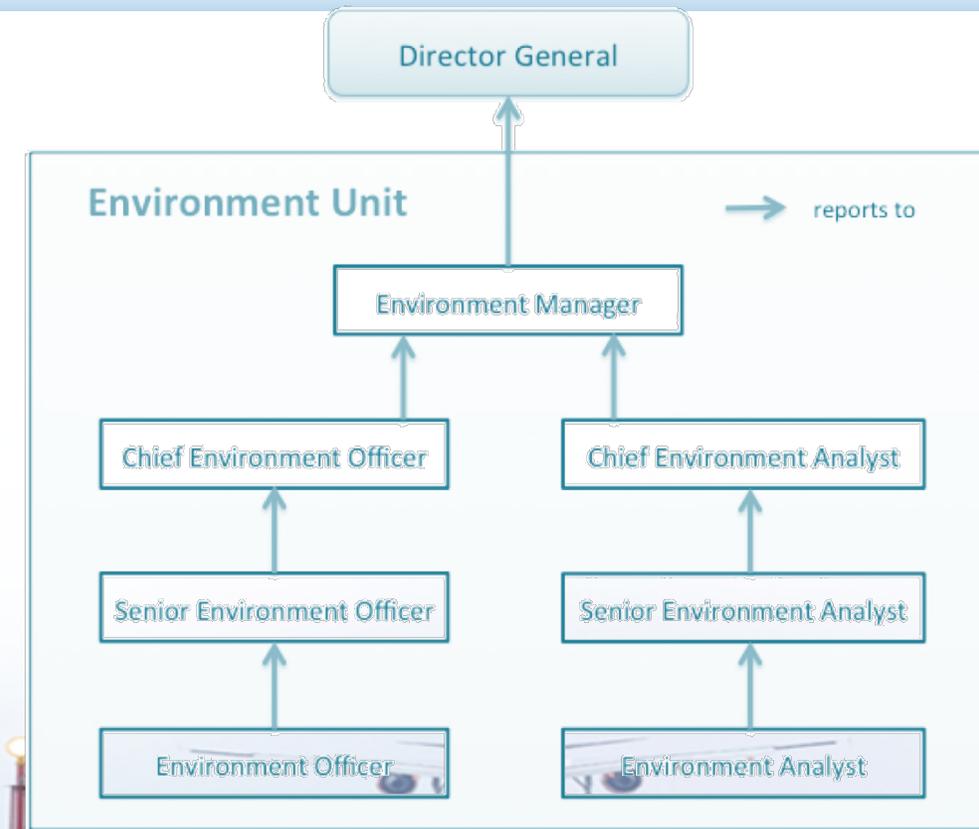
Environmental Unit in the CAA



Creation of an Environmental Unit within the Civil Aviation Authority with dedicated staff to environmental activities.



- Increased capacity to address environmental issues, monitor implementation of Action Plans and respond to emerging needs

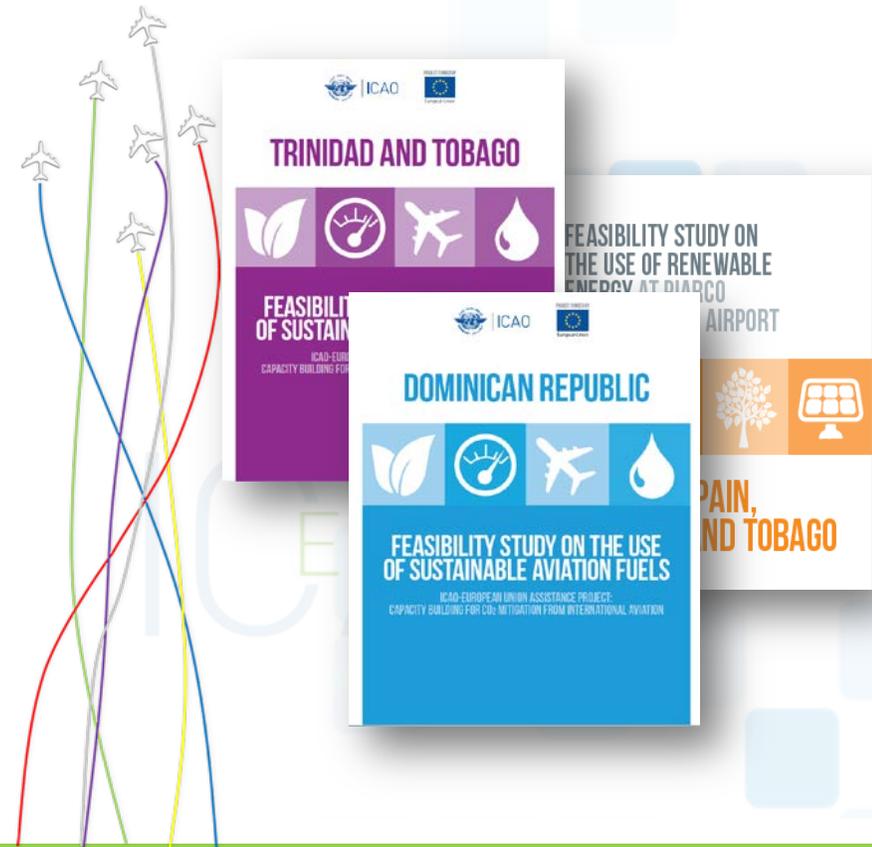




Other regulatory measures

Aeronautical regulations to request to the airlines and airports the submission of action plans on CO₂ emission reduction. This aims to facilitate the updating process of the national actions plans and improve the coordination between the government and stakeholders.

- **Development of Feasibilities studies as a trigger for reviewing and adjusting others policies, regulations and legislation not directly related to aviation,** to encourage the adoption of renewable energy (solar energy) and sustainable aviation fuels.





ICAO eLearning course

International Aviation CO₂ emissions: States' Action Plans

1. States' Action Plans on CO₂ Emissions Reduction
2. Baseline calculation
3. Mitigation measures
4. Selection, prioritization and implementation of mitigation measures
5. Tools and Expected Results

e-Books: in depth reference information

Certificate of completion upon successful approval of Assessment





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A WINDOW FOR A
GREENER FUTURE



ICAO



European Union