



Destination Green

ICAO Symposium on Aviation and Climate Change, "Destination Green", 14 – 16 May 2013

Turkey Action Plan for Emissions Reduction

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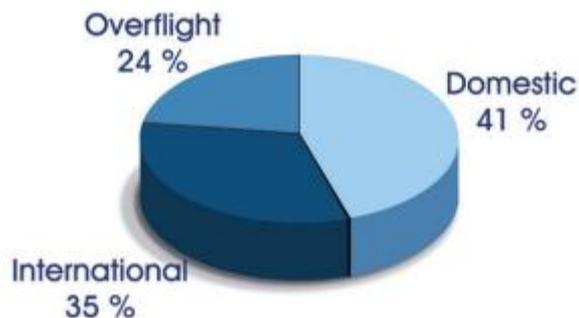
SCOPE



- **Overview of Turkey's Action Plan**
 - **Format**
 - **Contact/Introduction**
 - **Civil Aviation in Turkey**
 - **Baseline and Expected Results**
 - **Methodologies used**
 - **Mitigation actions**
 - **Reporting**
 - **Specific assistance**

- Fully committed to and involved in the fight against climate change
- Relevant memberships: Turkey is member of ICAO, UNFCCC(Annex I), ECAC, EUROCONTROL...
- High traffic growth (both domestic and international)

Breakdown of Flights in 2010
(IFR + VFR)



2009 - 2010 Outlooks

Traffic	2009	2010	Growth (% 10/ 09)
Domestic	419.422	497.862	19%
International	369.047	421.549	14%
Overflight	277.584	293.714	%6
Total	1.066.053	1.213.125	13.7 %



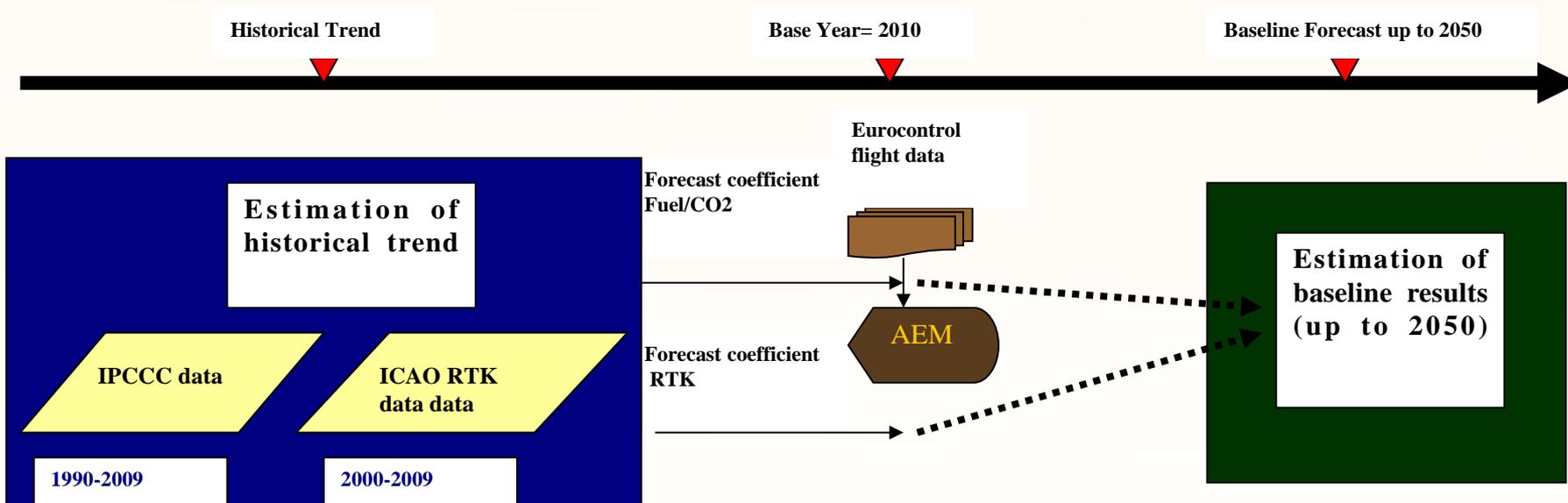
Contact/Introduction



- Responsibility is given to CAA to report Action Plan
- Airports
- Airlines
- Others

To Focal Point Turkey

- to describe the emissions that would result in the absence of action

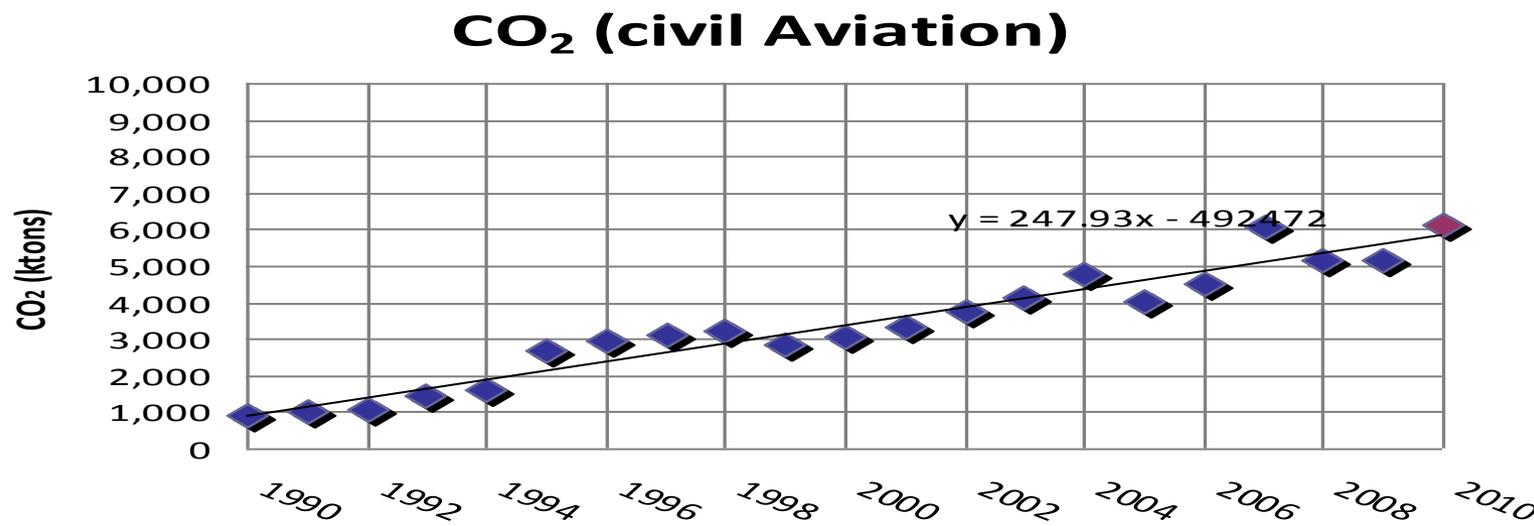


Historical Data

- Estimation of historical CO2 emissions from international aviation > UNFCCC data
- Estimation of RTK > ICAO

Year	Source	State	International_RTK	Total_RTK
2000	ICAO	TURKEY	2,369,741,000	2,683,511,000
2001	ICAO	TURKEY	2,755,092,000	3,077,646,000
2002	ICAO	TURKEY	3,528,901,000	3,836,532,000
2003	ICAO	TURKEY	3,423,331,000	3,738,893,000
2004	ICAO	TURKEY	3,540,877,000	4,040,532,000
2005	ICAO	TURKEY	3,731,019,694	4,302,032,694
2006	ICAO	TURKEY	4,194,657,000	5,023,617,000
2007	ICAO	TURKEY	4,639,372,000	5,607,739,000
2008	ICAO	TURKEY	5,256,206,000	6,406,060,000
2009	ICAO	TURKEY	6,286,403,000	7,489,263,000

- Trendline is calculated from historical data
- Base year is calculated with Eurocontrol data and AEM model
- Validation/cross check is made with small emitter tool



Baseline Results

Evolution of CO₂ (ktons)

$$y = 247.93x - 492472$$

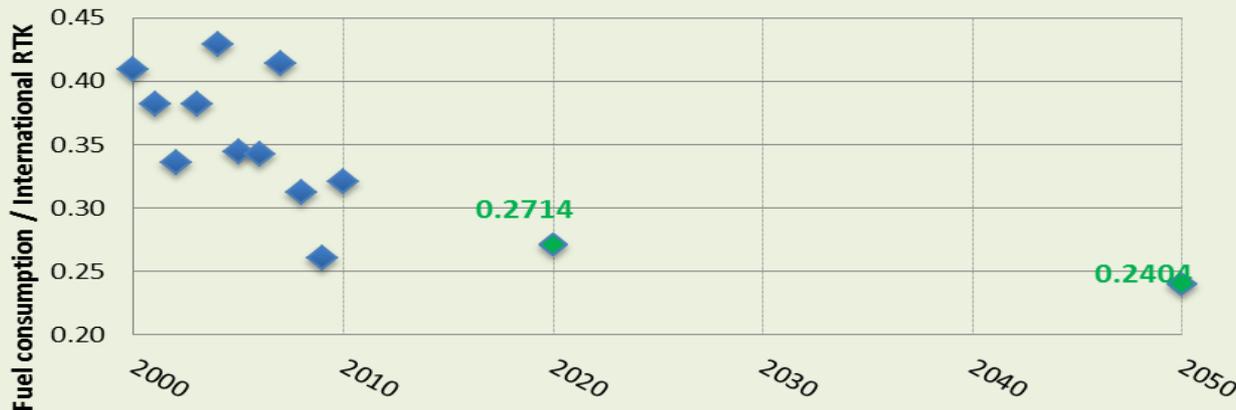


Evolution of International RTK (in millions)

$$y = 0.3686x - 734.83$$



Evolution of Fuel consumption / International RTK (x 1 millions)





Some considerations...



Availability of Eurocontrol data:

As the data was available to Turkey, Tier 3B can be used. Otherwise alternative solution is to use IPCC method (*for countries who doesn't have access to such data..*)

Forecasting:

Although short and medium term estimations can be reliable (up to 2020), others reflect high level of uncertainty..



Selecting mitigation measures



- Stakeholder consultation process initiated
- Some mitigation measures are selected to estimate expected results
 - SESAR
 - Biofuels
 - Increasing efficiency
- More will be investigated



Expected Results

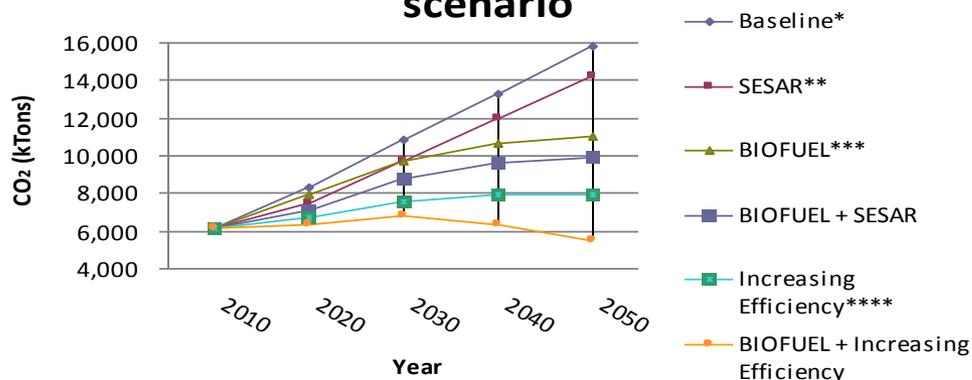


Expected Results reported as fuel consumption, RTK, and CO₂ emissions for the State's international aviation sector that are anticipated with all *interim proposed actions* having been applied.

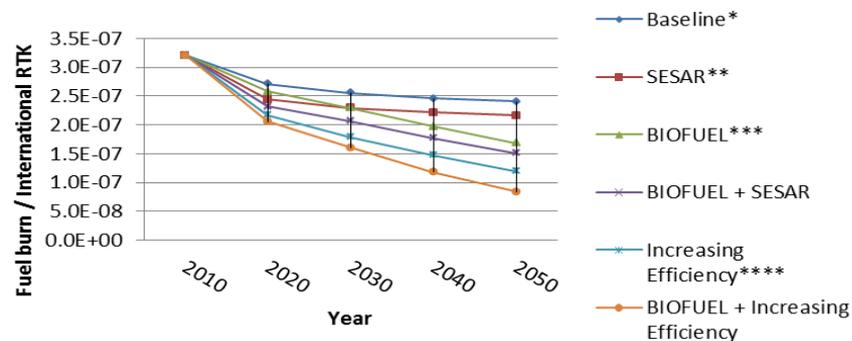
It is reported for future years in 10 years interval (as **2020** and **2050** are milestone years in A37-19).

Expected Results

Evolution of CO₂ depending on future scenario



Evolution of Fuel burn / International RTK depending on future scenario



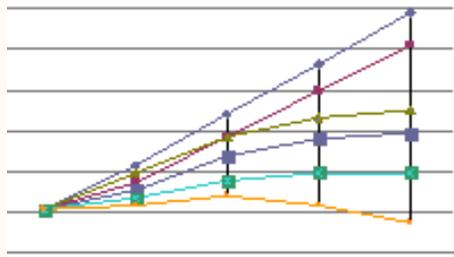
■ *(interim results)*

Year	Baseline*			SESAR**		
	CO ₂	Fuel Burn	Fuel burn / RTK	CO ₂	Fuel Burn	Fuel burn / RTK
2010	6 138	1 944	3.21E-07	6 138	1 944	3.21E-07
2020	8 347	2 644	2.71E-07	7 512	2 379	2.44E-07
2030	10 826	3 429	2.55E-07	9 743	3 086	2.30E-07
2040	13 305	4 215	2.46E-07	11 975	3 793	2.22E-07
2050	15 785	5 000	2.40E-07	14 206	4 500	2.16E-07

Year	BIOFUEL***			BIOFUEL + SESAR		
	CO ₂	Fuel Burn	Fuel burn / RTK	CO ₂	Fuel Burn	Fuel burn / RTK
2010	6 138	1 944	3.21E-07	6 138	1 944	3.21E-07
2020	7 929	2 512	2.58E-07	7 136	2 260	2.32E-07
2030	9 743	3 086	2.30E-07	8 769	2 778	2.07E-07
2040	10 644	3 372	1.97E-07	9 580	3 034	1.77E-07
2050	11 049	3 500	1.68E-07	9 944	3 150	1.51E-07

Year	Increasing Efficiency****			BIOFUEL + Increasing Efficiency		
	CO ₂	Fuel Burn	Fuel burn / RTK	CO ₂	Fuel Burn	Fuel burn / RTK
2010	6 138	1 944	3.21E-07	6 138	1 944	3.21E-07
2020	6 677	2 115	2.17E-07	6 343	2 009	2.06E-07
2030	7 578	2 400	1.79E-07	6 820	2 160	1.61E-07
2040	7 983	2 529	1.48E-07	6 386	2 023	1.18E-07
2050	7 892	2 500	1.20E-07	5 525	1 750	8.41E-08

Information on any assistance needs



To go from there

To there...

Specific assistance will be needed

SESAR : technology transfer and technical support

Biofuels : funding, education, technology transfer and technical support

Efficiency: education, technical support and commitment

Others (to be identified..)



Green Projects of Turkey





Green Airport



- **Project of Green Airport**

DGCA initiated necessary works to systematically decrease the existing or future damages of airport establishments on the environment and human health and to eliminate, if appropriate.

Firstly, in terminal luggage distinction areas of Atatürk, Adana, Adnan Menderes, Antalya, Dalaman, Esenboga, Milas Bodrum and Trabzon Airports where the traffic is dense; the relevant instructions were given to the ground handling services to utilize electric power-operated vehicles for moving the luggage instead of those operating on fuel oil, and to accomplish 50% of such conversion to the end of 2009 and the rest of it by the end of 2010.



Project of Green Airport



- Under the leadership of Directorate General of Civil Aviation, a project called "Green Airport" is contemplated; provided that the airline operators and service providers at the airports comply with the certain requirements, those airports will be called "Green Airport". DGCA shall provide the organizations and establishment that comply with the relevant requirements with a reduction in Service Tariff in order to grant them incentives and reward their sensibility.
- Besides, as a result of intensive studies for the last three years that are also followed up by our Directorate General, the works performed by Directorate General of State Airports Administration were put into practice with regard to ambient noise. Within this context, it has been stated that noise rating, noise mapping, action plans and relevant precautions will be performed by Directorate General of State Airports Administration.



Today; 23 Green Company

Destination Green 





Green Airlines



- Green Airlines Project, the amount of fuel consumed by the Turkish airline companies and reduce carbon dioxide emissions as a result of the consumption and aimed at creating environmental awareness.
- At the end of each year, the fuel consumption per passenger and, accordingly, to reduce carbon dioxide emissions over the previous year the three most rewarded by the company DGCA.
- Accordingly, a passenger or 100 kilograms, 100 km to the load and the amount of fuel consumed as a result of the consumption of carbon dioxide emissions from the very first Green Airlines reduce Logo "will be given.
- The second part of the project from the license extension 15 per cent from 10 per cent discount is scheduled for the third.

CONCLUSION



- **Thanks for your patience....**

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