



ICAO

ENVIRONMENT

Action Plan
on Emissions
Reduction

Introduction to the ICAO Fuel Savings Estimation Tool



- Need by States to compute the fuel savings from operational improvements
- Previous ICAO guidance - Rules of Thumb (2006)

Avg. fuel burn per minute

Avg. fuel burn per nautical mile

Avg. fuel burn per change in flight level

Better suited for assessing changes in cruise (e.g. RVSM)



- Operational measures like PBN, CDO, CCO, etc. are among the measures from a basket of available measures that States are using today to reduce emissions.
- This was recognized in the ICAO assembly (A37-19) which requested ICAO to develop the necessary tools to assess the benefits associated with ATM improvements.
- States used sophisticated models or rules of thumb to estimate CO₂ emissions savings from operational measures.
- IFSET bridges this gap by allowing those States without sophisticated models to estimate the savings in a harmonized manner.



- Allows those States without modelling and/or measurement capabilities to estimate fuel savings from operational improvements
- Consistent with CAEP-approved GHG models
- Consistent with Global Plan
- Easy-to-use / minimal data requirements
- Better than the Rules of Thumb



- The tool can estimate:
 - Effects of shortening / eliminating level segments on departure and approach
 - Effects of shorter routes (either in time or distance)
 - Effects of cruising at different altitudes
 - Effects of reduced taxi times



- The tool **does not**:

Replace detailed modelling or measurement of fuel consumption

Estimate fuel consumption from airborne holding, currently but could be covered in future updates.





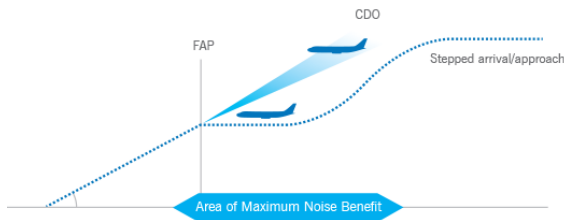
Operational Measure
Implementation
(planned or post)

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Need to quantify
change in fuel
consumption, but
don't have the tools?

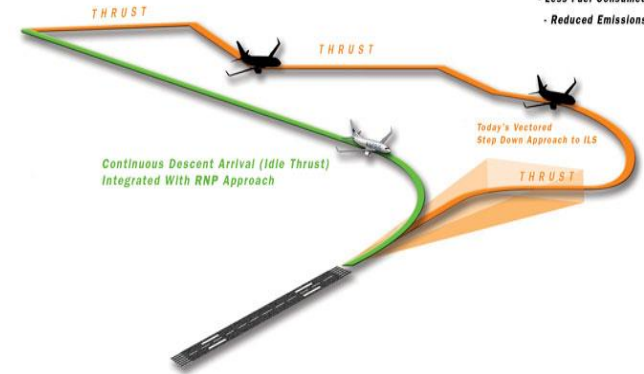
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**USE
IFSET**



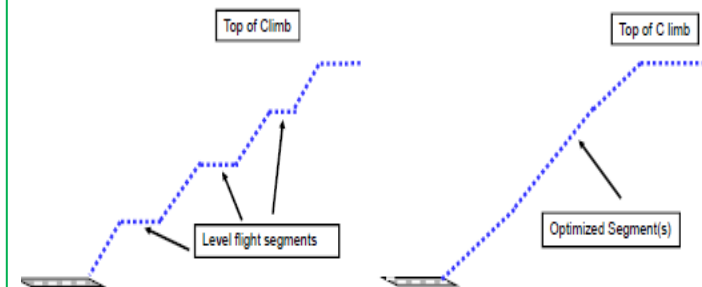
GREEN RNP APPROACH BENEFITS

- Lower Noise
- Reduced Track Mile Distance
- Less Fuel Consumed
- Reduced Emissions



Conventional Departure

Continuous Climb Operations



- **AEDT** (CAEP-approved GHG model) used to pre-compute
Level, (steady state) climb, and (steady state) descent fuel consumption
By aircraft category
In 1,000 foot intervals



- Fleet mix defined for baseline and post-implementation scenario

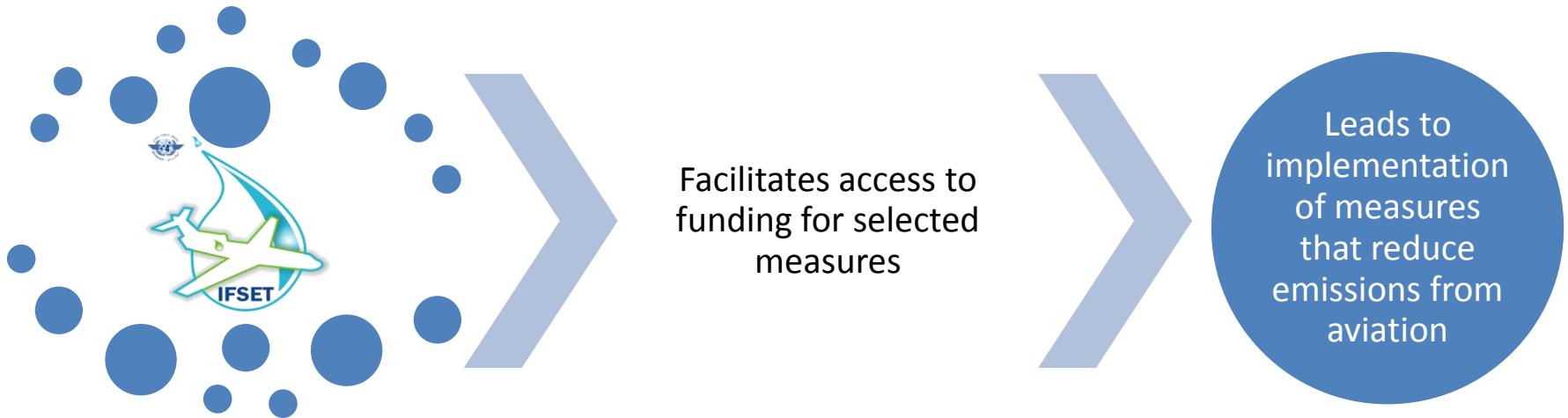
Aircraft category

Aircraft remaining trip distance (optional parameter that will increase accuracy for departures)

- User selects “elements” to define the baseline and “new” procedure
- Tool estimates the change in total fuel consumption between the 2 scenarios







- Quantify savings from planned or implemented measures
- Prioritize and select potential measures
- Support development of business cases



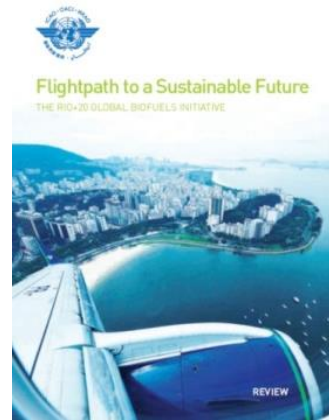
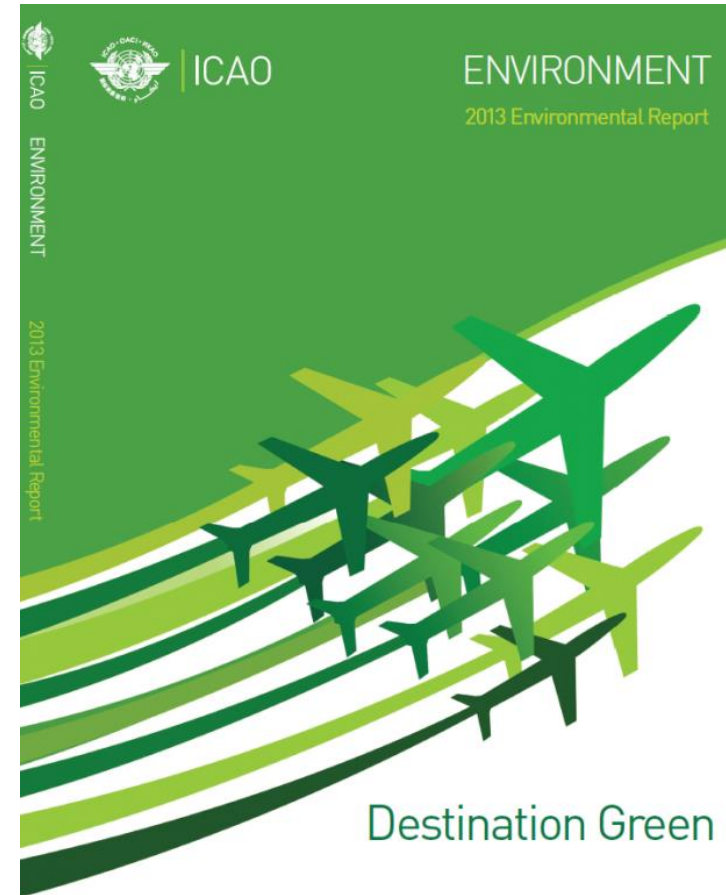
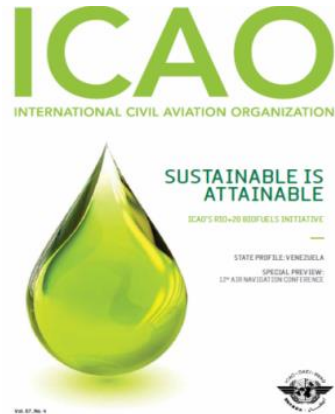
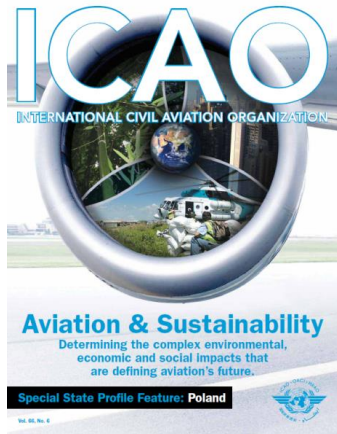
Table 6: Consolidated Estimated Benefits from the Major Initiatives

ANS improvements	Fuel Saving (per year in tonnes)	Carbon Emission Reduction (per year in tonnes)	Cost Savings (per year in Million \$)	Remarks
50 NM RHS	104,573	330,449	114.98	16 routes
RNAV 5	14,637	46,251	16.06	Q1 to Q13
NEW DOMESTIC ROUTES	9,889	31,248	10.95	8 routes
RNP 10	11,662	36,851	12.78	L875,756,516,899,518
THREE RWY OPS	13,140	41,480	1.30	Delhi
UPPER AIRSPACE HARMONIZATION	18,060	57,060	19.90	Chennai FIR
INSPIRE	218	688	0.20	Based on 1031 UPR flights
PBN	22,836	72,162	25.11	Based on 6 Airports
ENHANCED SURVEILLANCE	14,500	45,800	16.00	RHS on W20 and R460
CDO	1,164	3,678	1.30	Based at Ahmadabad ops
CONNECTOR Routes	4,095	12,941	3.65	V1 to V32
TOTAL	213,610	674,242	222	



- IFSET is not a static tool
- Current updates include:
 - Web-based interface
 - Eliminate need to have Access installed
 - “Batch mode”
 - Ability to import traffic data
 - Improved visualization
 - Easier to define procedures
 - Improved representation of ASBU modules





For more information on our activities, please visit www.icao.int/env

