



Destination Green

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

Tools for Quantifying Historical Emissions

Ted Thrasher

ICAO Environmental Modelling Unit



Background



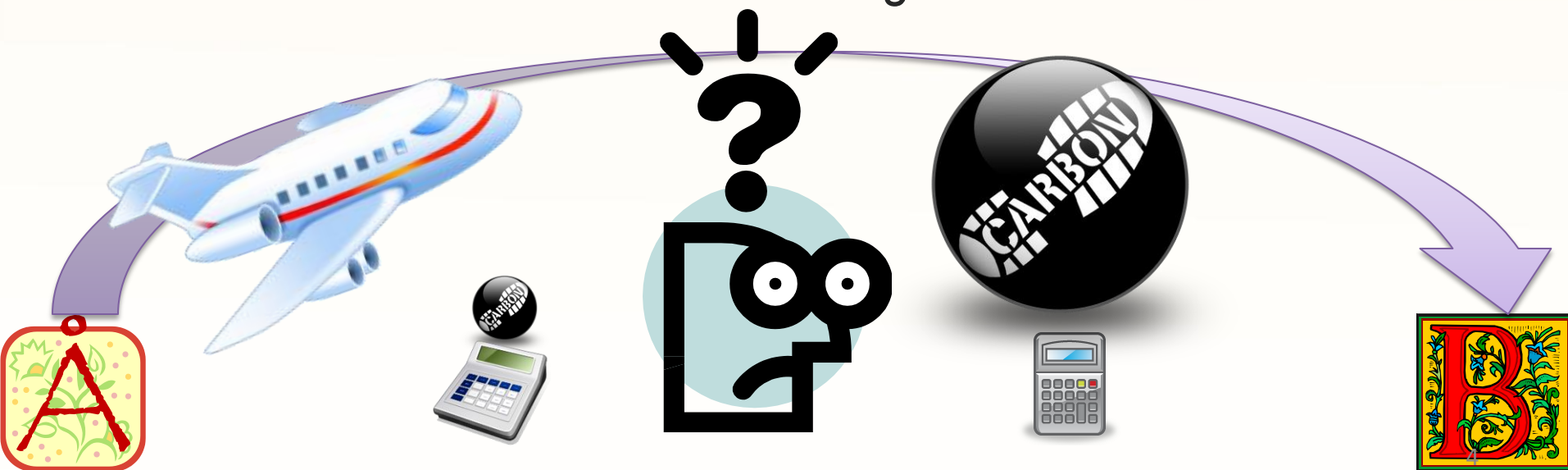
- Demand for reliable tools to account for emissions from air travel
 - Individual travellers
 - Businesses
 - UN System
 - ICAO member States (progress toward goals)



ICAO Carbon Emissions Calculator

Background

- Proliferation of tools for calculating “carbon footprint” from aviation
 - Results differ by factor of 4 or more!
 - Unknown data sources and methodologies (black box)
 - Inconsistent basis for offsetting





Methodology



- **Objectives**
 - User-friendly, unbiased, tool to compute carbon emissions from air travel
 - Suitable for use with offset programmes
 - Best publicly available data (**transparency**)
 - Fully documented



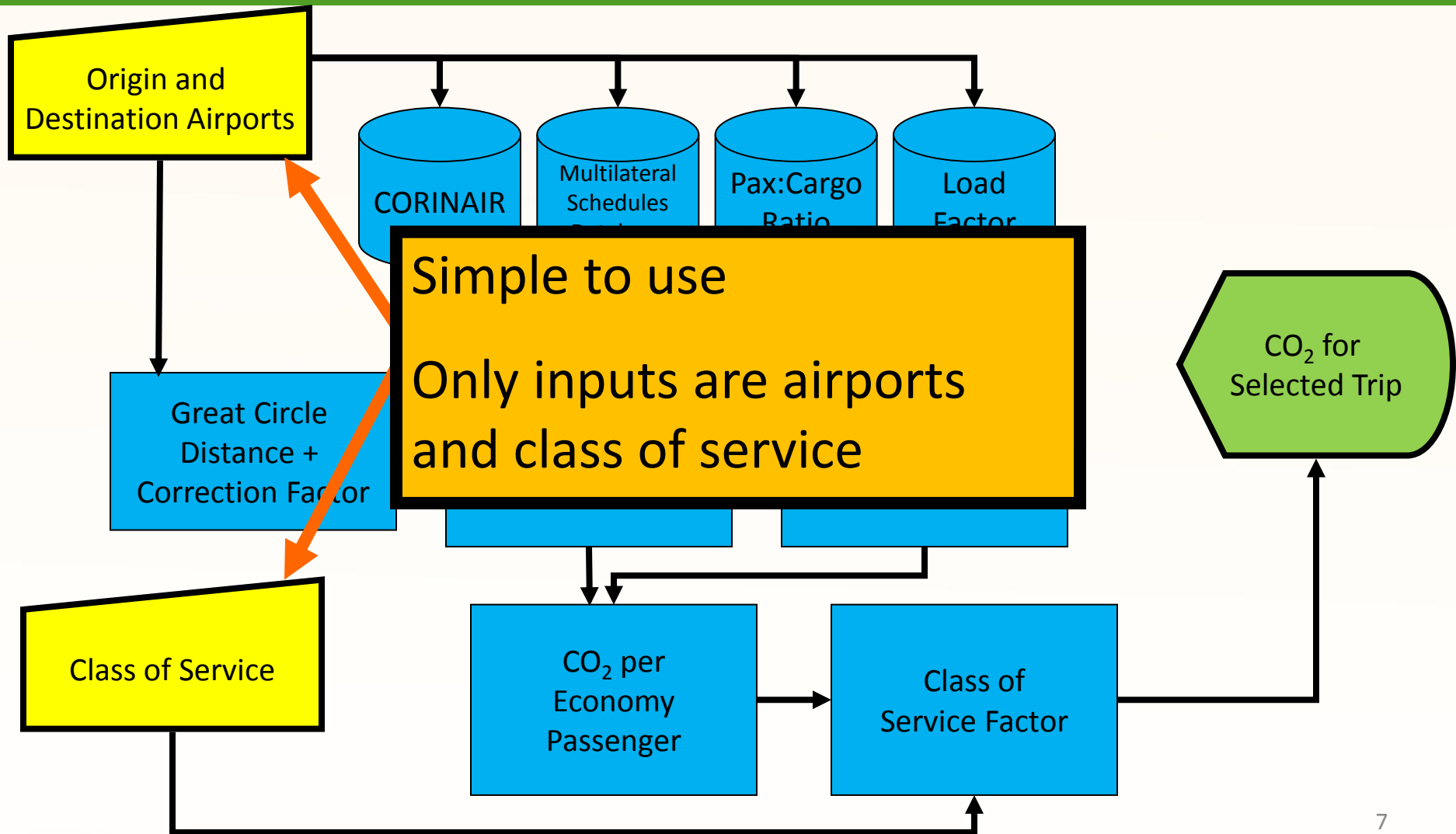
Methodology (cont.)

- **Methodology Developed through CAEP**

- **Expert input provided from**
 - ICAO Secretariat
 - ICAO Member States
 - Universities
 - NGOs
 - International Air Transport Association – IATA (Airlines)
 - International Coordinating Council of Aerospace Industries Associations – ICCAIA (Manufacturers)

- **Methodology is internationally recognized and accepted**

Methodology (concl.)





About “Multipliers”

- Multipliers are often used to account for the effects of “non-CO₂” emissions... **often incorrectly**
- Selection of metric depends on objective
 - Limit temperature increase to 2 degrees
 - Climate induced social damages
 - Limit concentrations in atmosphere
 - Conservative estimate to assure all effects accounted for (accuracy may not be the key issue – difference between “best estimate”)
- More important than the metric
 - Time horizon and/or discount rate assumed (applies to all above)
- **Above 2 points require a formal UN policy decision**
- Uncertainties still remain on some non-CO₂ effects from aviation
 - Additional clarity anticipated by 2013 in IPCC 5th Assessment Report
- **Until international agreement on above is reached, ICAO calculator computes only CO₂**



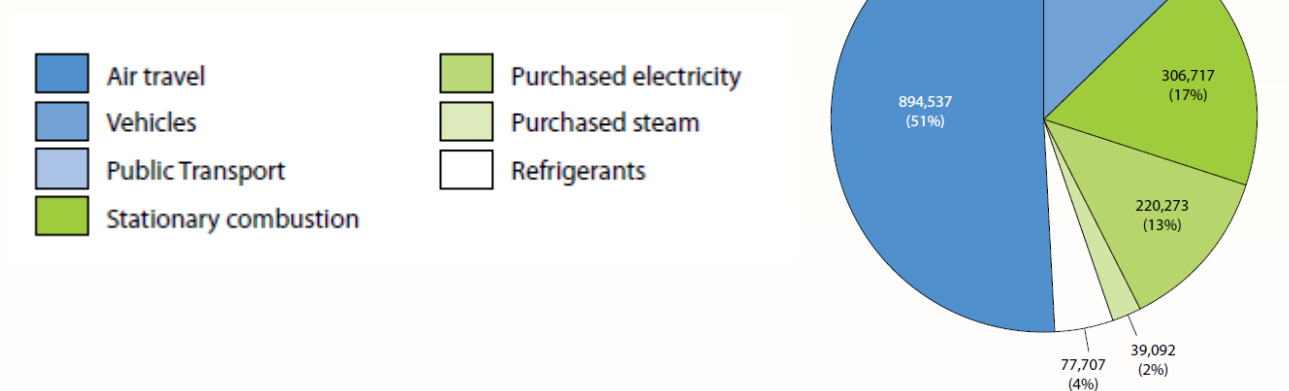
Many Interfaces



- Public
 - ICAO website
 - Mobile app (Apple and Android)
- Enterprise
 - Database of emissions
- United Nations (Climate Neutral UN)
 - Direct link to travel approval systems
 - Excel-based with user support
- States
 - Excel-based designed to facilitate Action Plan development



- *The UN Environment Management Group adopted the ICAO Carbon Emissions Calculator as the official tool for all UN bodies to quantify their air travel CO₂ footprint - April 2009*
- **All UN air travel GHG inventories are prepared using the ICAO Calculator**





Try it for yourself!



INTERNATIONAL CIVIL AVIATION ORGANIZATION
A United Nations Specialized Agency

Search this site...

Home | About ICAO | Strategic Objectives | Meetings & Events | Publications | Online Store | Employment

Destination Green

Fourth ICAO Symposium on Aviation & Climate Change
ICAO will hold its Fourth Symposium on Aviation and Climate Change, "Destination Green", in Montréal from 14 to 16 May 2013 - read more...

38th ICAO Assembly | Destination Green | Large-scale Environment Project | MRTD West Indies Seminar | Bursary Programme

NGAP and TRAINAIR PLUS

Aviation: Your Reliable Connection to the World
International Civil Aviation Day Theme

Constantly seeking to foster and support the sustainable growth of air transport, the International Civil Aviation Organization serves as the global forum for its 191 Member States. Amongst its many other functions supporting all aspects of international civil aviation, ICAO brings together States and key industry organizations to determine areas of strategic priority, develops policies and standards, coordinates global monitoring, analysis and reporting initiatives, and delivers targeted assistance and capacity building.

Latest News

- ICAO Welcomes Senior Federal, Provincial and Municipal Officials | 3/5/2013
- Qatar Offer to Serve as ICAO Permanent Seat | 24/4/2013

Recent Events

- Next Generation of Aviation Professionals (NGAP) and TRAINAIR PLUS Regional Symposia | Bali, Indonesia | 23/4/13 - 25/4/13
- Agadir Regional Runway Safety Seminar | Agadir, Morocco | 10/4/13 - 12/4/13
- ICAO Language Proficiency Requirements (LPRs) Technical Seminar | ICAO Headquarters, Montréal Canada | 25/3/13 - 27/3/13

Services & Resources

- Carbon Calculator
- ISTARS
- FITS
- ICAO Data+
- Treaty Collection
- Technical Co-operation
- Procurement
- Economic Facts & Figures

Highlights

Safety Audits

Air Transport Sustainability

Aviation and Tourism

ICAO and EU intensify collaboration

ICAO-TIACA Agreement

Regulation of Emerging Modes of Aerospace Transportation (REMAT)
24 - 25 May 2013
Centre Mont-Royal, Montréal

A joint McGill University/ICAO event examining the remarkable evolution of air and space transportation systems and the challenges these developments now pose to international legal boundaries and airspace/outer space legal regimes - read more...

or



Screenshots

Carrier WiFi 3:38 PM

Carbon Emissions Calculator

Itinerary

From:

To:

Class:

Trip:

Passengers:





ICAO CO₂ Reporting and Analysis System (ICORAS)



Assembly Resolution A37-19



- **Para 21:** *Requests* the Council to regularly report CO₂ emissions from international aviation to the UNFCCC, as part of its contribution to assessing progress made in the implementation actions in the sector based on information approved by its member States;

And...

- **Para 4:** global annual average fuel efficiency improvement of 2 per cent until 2050
- **Para 6:** keeping the global net carbon emissions from international aviation from 2020 at the same level
- **Para 7:** Review the medium-term goal in light of progress towards the goal, new studies and relevant information from States
- **Para 8:** Explore the feasibility of a long-term goal by studies on the assessment of attainability and cost impacts, including information from States on their experiences working towards the medium-term goal
- **Para 10:** Compile information from States' action plans in relation to the achievement of global aspirational goals
- **Para 11:** Facilitate the dissemination of economic and technical studies and best practices related to aspirational goals prior to June 2012



Assembly Resolution A37-19



In other words... a reliable means to measure international aviation fuel consumption and traffic is needed.



ICORAS Objectives

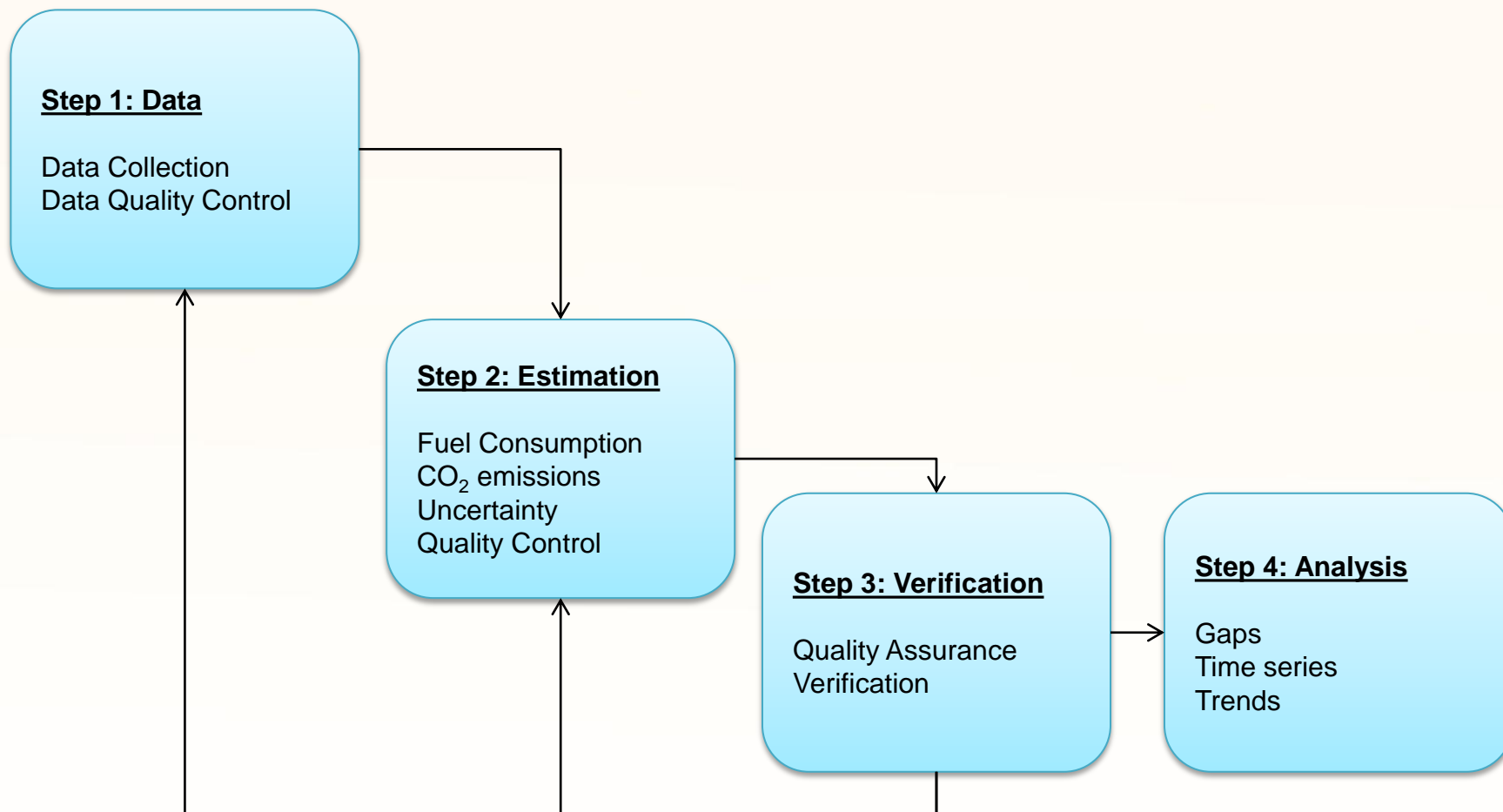


■ Objectives

- To generate an accurate accounting of global CO₂ emissions from international aviation
- To accurately measure progress toward ICAO's global environmental aspirational goals
- Support conducting studies on the feasibility of climate change goals for aviation

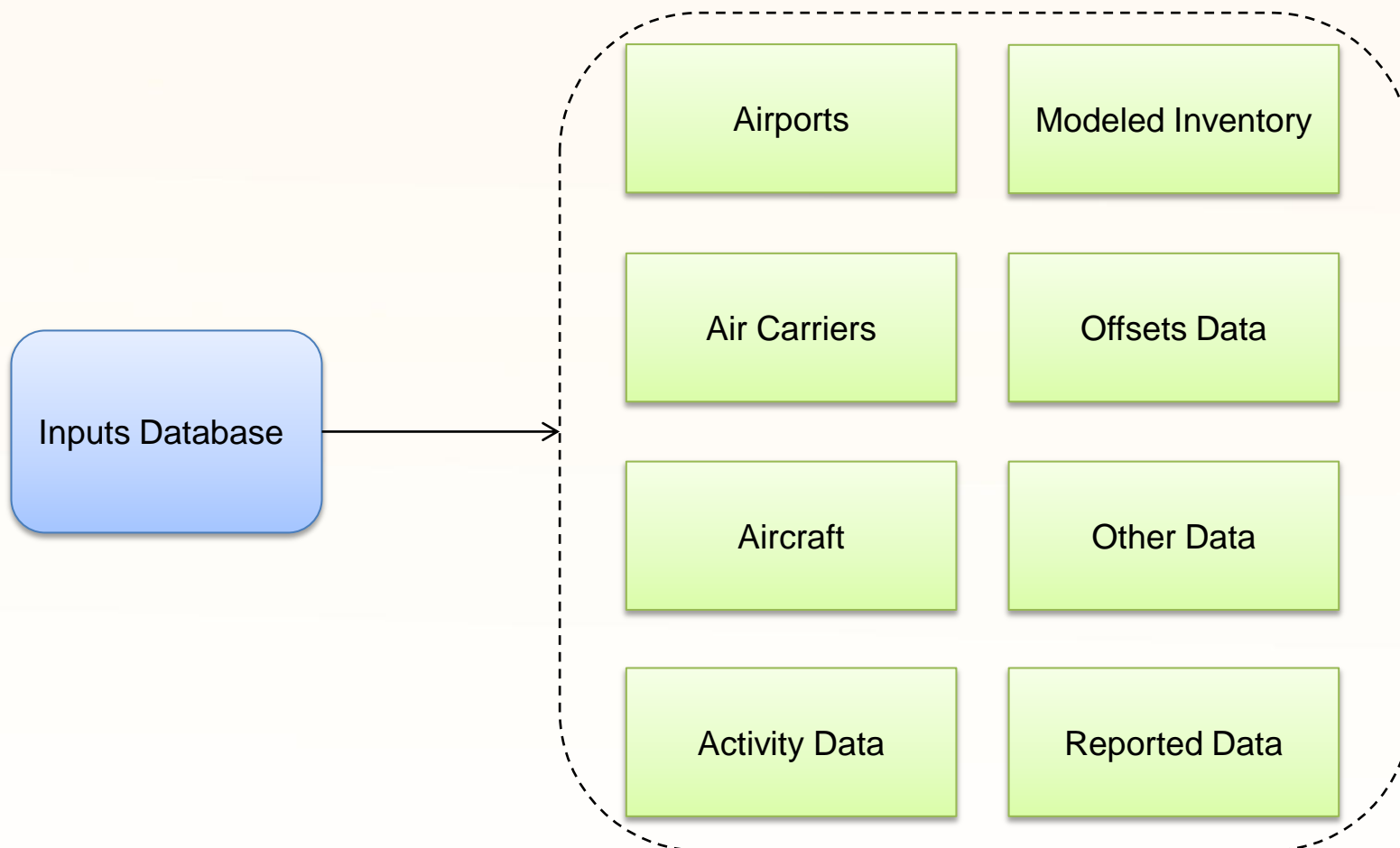


ICORAS Overview



Feedback from Step 3

Inputs Database





Data Sources



FORM M

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
AIR TRANSPORT REPORTING FORM
FUEL CONSUMPTION AND TRAFFIC - INTERNATIONAL AND TOTAL SERVICES, COMMERCIAL AIR CARRIERS**

Contact person: _____
 Organization: _____
 Tel: _____
 Fax: _____
 E-mail: _____

State: _____
 Air carrier: _____
 Year ended: _____

Doc 7910

FORM C

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
AIR TRANSPORT REPORTING FORM
TRAFFIC - COMMERCIAL AIR CARRIERS**

Contact person: _____ State: _____
 Organization: _____ Air carrier: _____
 Tel: _____ Month (s): _____
 Fax: _____ Year: _____
 E-mail: _____

ICAO code	Description	Unit	TOTAL ALL SERVICES (passenger, mail and freight including all-freight)		ALL-FR (include)	
			Classified by flight stage			Ch
			International	Domestic	Internat	
	a	b	c	d	e	
1010	SCHEDULED REVENUE FLIGHTS	000				
	1. Aircraft kilometres	number				
1020	2. Aircraft departures	number				
1030	3. Aircraft hours	number				
1040	4. Passengers carried	number				

FORM C

**LOCATION INDICATORS
INDICATEURS D'EMPLACEMENT
INDICADORES DE LUGAR
УКАЗАТЕЛИ (ИНДЕКСЫ) МЕСТОПОЛОЖЕНИЯ**

ICAO - OACI - ИКАО

FORM C

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
AIR TRANSPORT REPORTING FORM
TRAFFIC BY FLIGHT STAGE (TFS)
Scheduled Services (Revenue) - International Operations**

State: _____
 Airline: _____
 Year: _____

To	Type of aircraft	Number of flights	Capacity available		Revenue traffic		
			Passenger seats (number)	Total payload capacity (tonnes)	Passengers (number)	Freight (tonnes)	Mail (tonnes)
b	c	d	e	f	g	h	i



and other sources (currently being evaluated)



The Challenges with Reported Data

- Coverage is incomplete
- Quality is variable
- Different basis of reporting
 - Country of air carrier registration (ICAO)
 - Country of departure (UNFCCC)



ICORAS Key Functions



- Key Functions
 - Validation of reported data
 - Transformation between reporting bases
 - Fill-in data gaps
 - Improved accuracy of other tools (e.g. ICAO Carbon Emissions Calculator)



What ICORAS Enables



- ICORAS responds to A37-19, by:
 1. Allowing ICAO to report international CO₂ emissions to the UNFCCC in a robust/acceptable way
 2. Measuring progress toward the goals already set
 3. Supporting studies on the feasibility of climate change goals for aviation



Next Steps



- Group within CAEP has been established to review ICORAS methodology and initial results
- Continuous improvement of data collection process
- Initial presentation to UNFCCC



Thank You



A large banner for the "Destination Green" event. On the left is the ICAO logo. To its right, the text "Destination Green" is written in a large, bold, italicized font. Below this, it says "ICAO Headquarters, Montréal, Canada" and "14 - 16 May 2013". The background of the banner features several green airplane silhouettes flying upwards, with green and yellow wavy lines at the bottom.