Assistance for Action

Aviation and Climate Change Seminar

23 - 24 October 2012

ICAO Headquarters, Montréal, Canada

Introduction to sustainable alternative fuels

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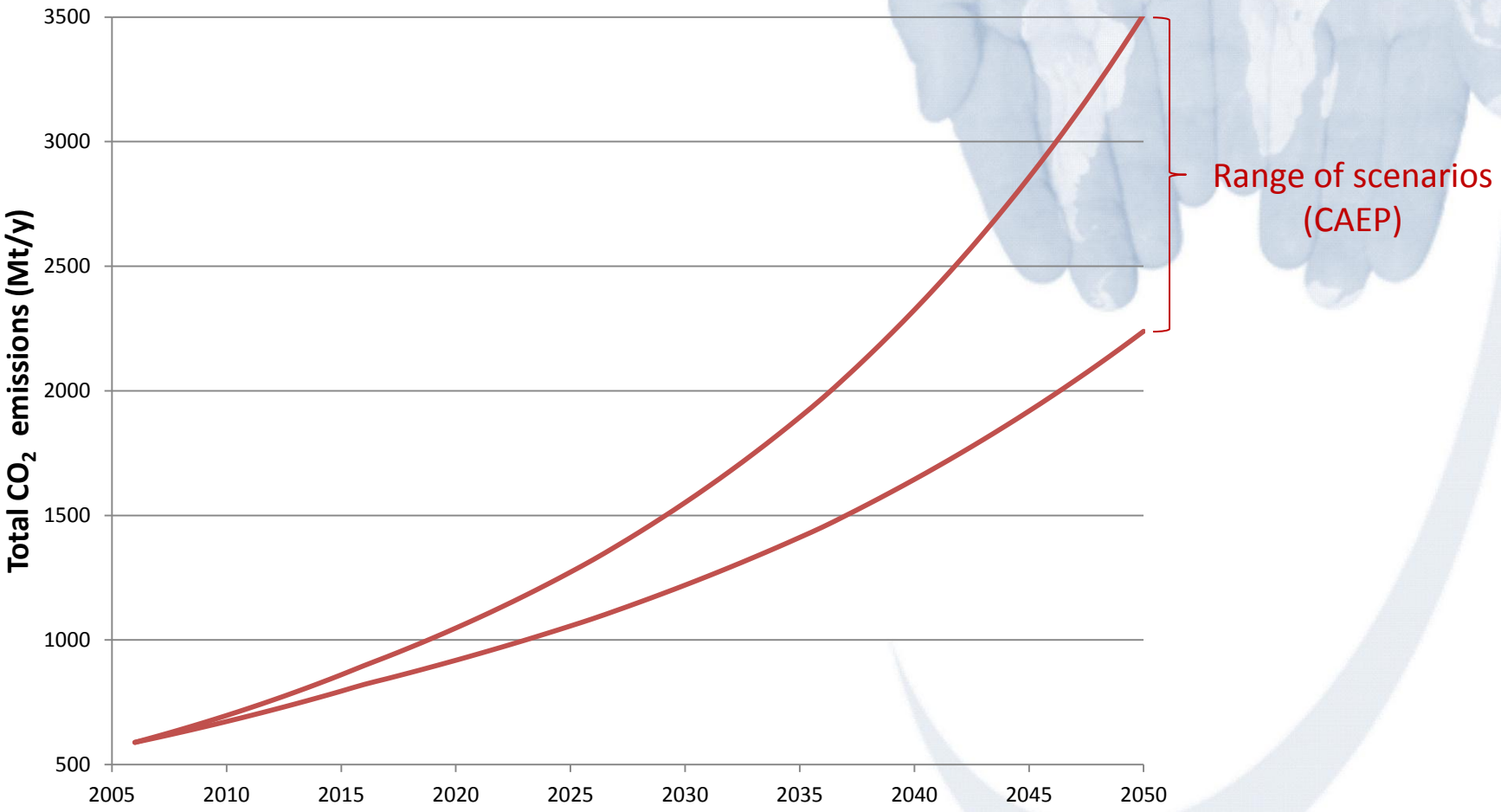
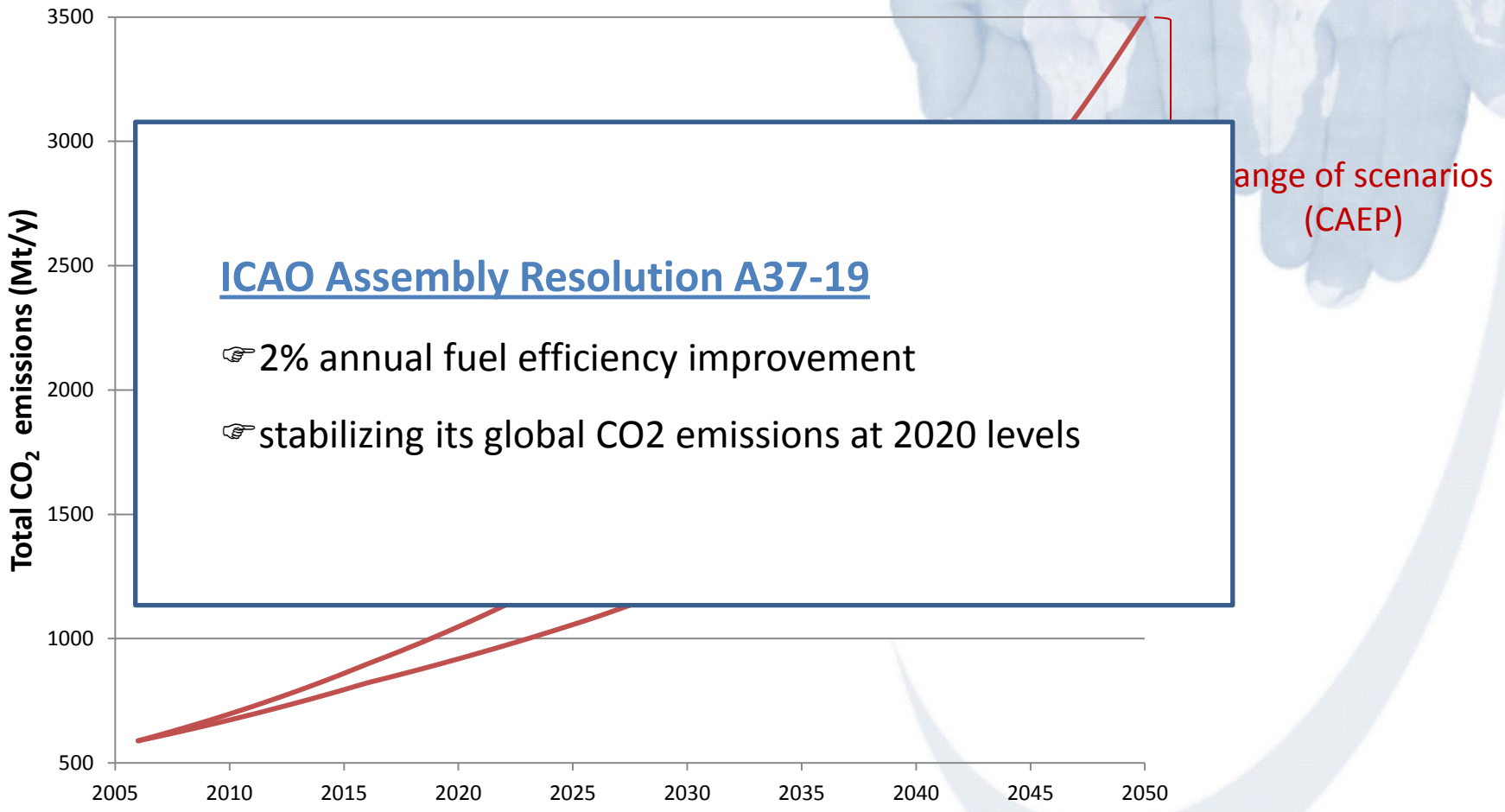
Content

- Sustainable alternative fuels
- The role of ICAO

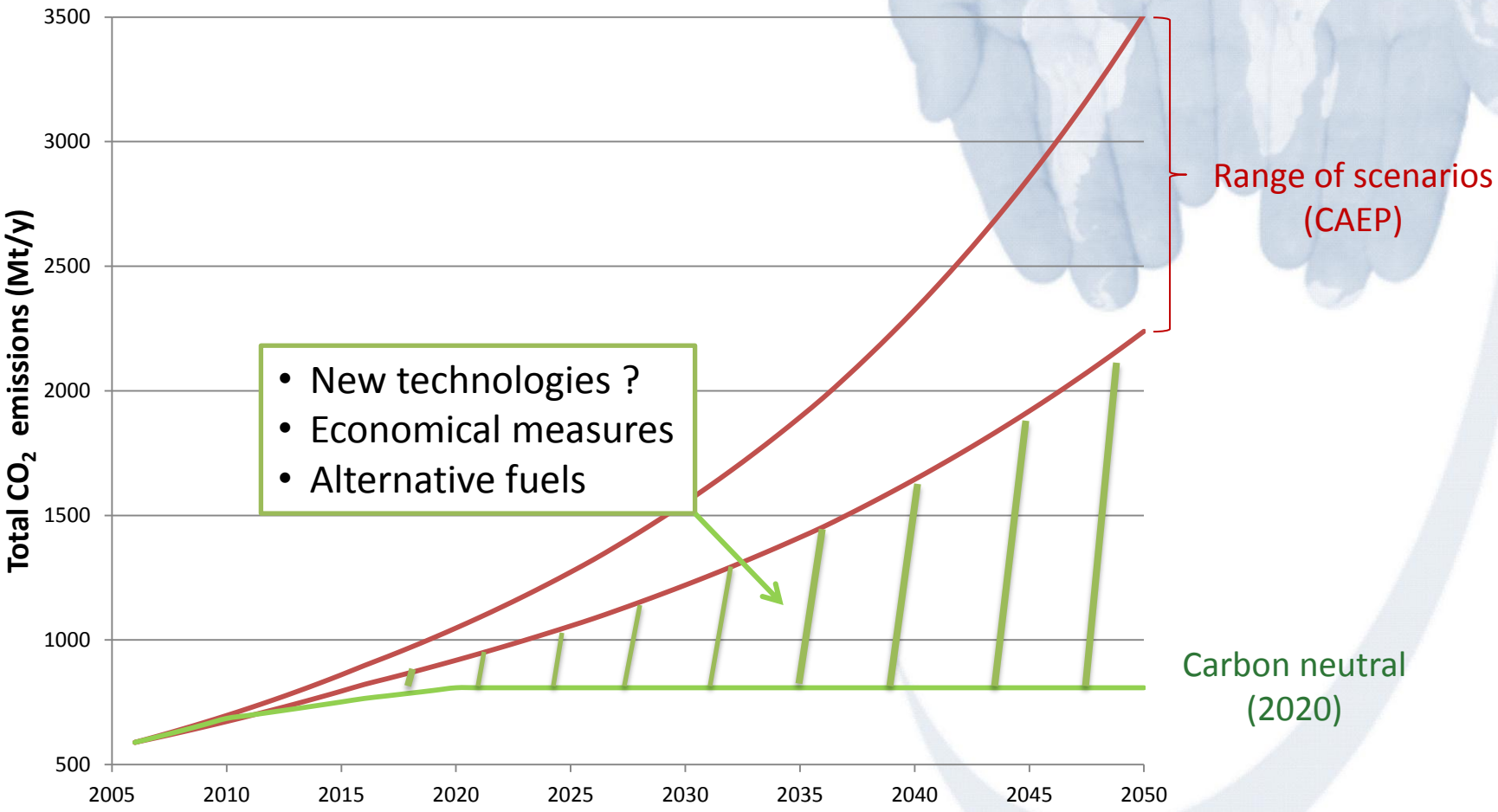
Aviation emission trends



Aviation emission trends



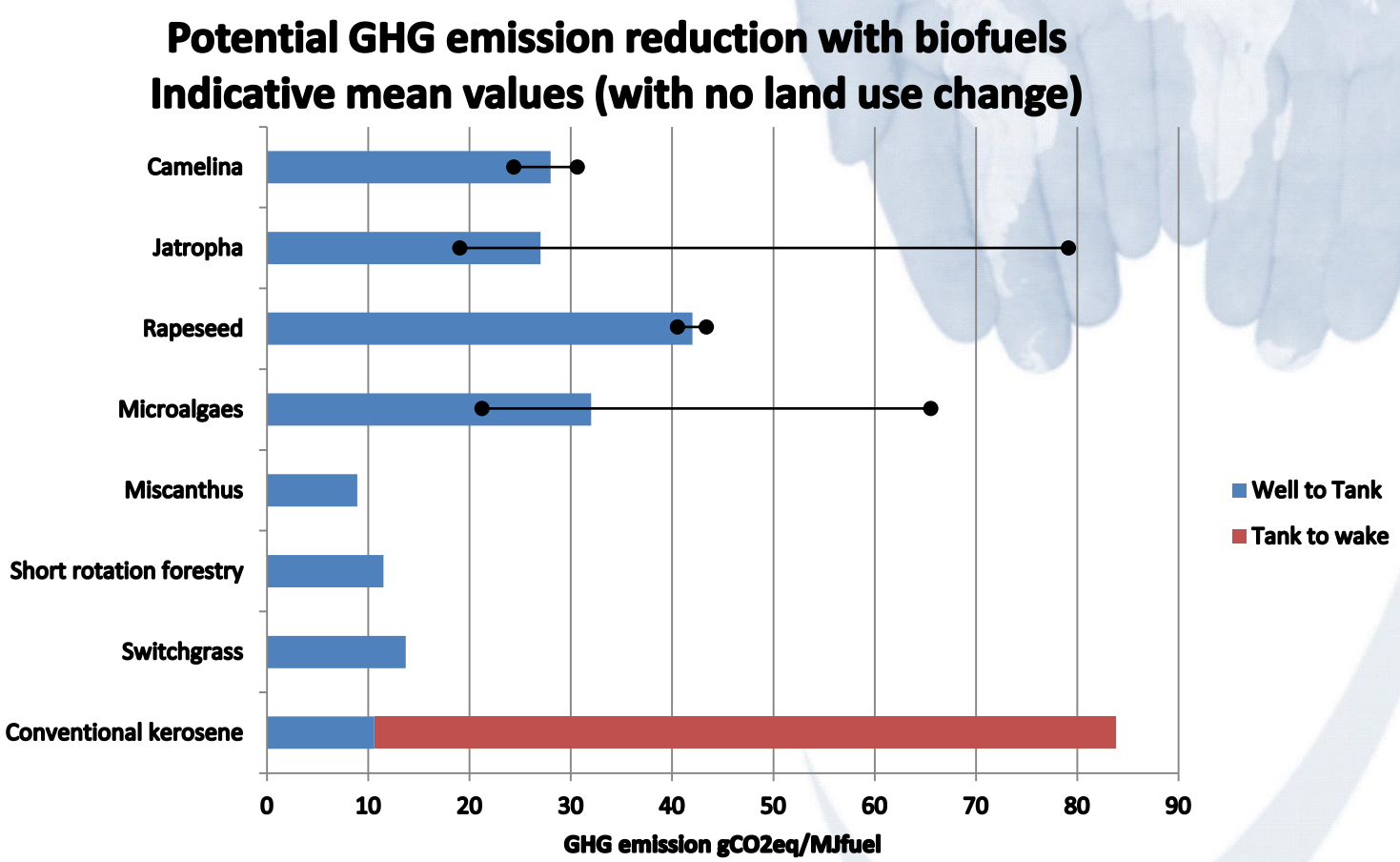
Aviation emission trends



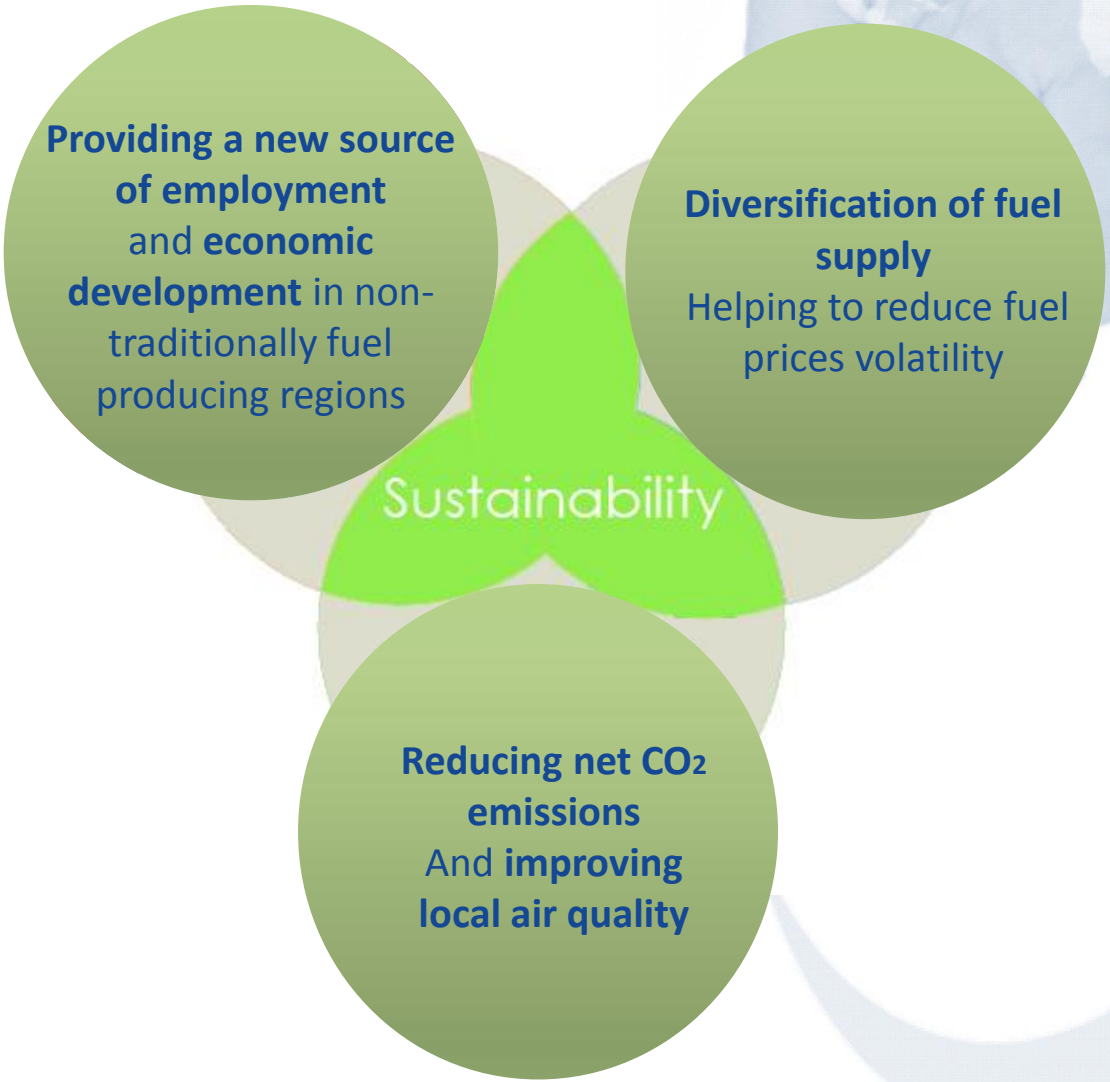
Changing the fuel to reduce climate impact

- Still Hydrocarbon fuels
- Sourced from renewable biomass and wastes
- I f properly produced, potential for significant emissions reduction

GHG emissions on a life cycle basis



A potential beyond GHG emissions



Corner-stones in alternative fuels development for aviation

- CAAFI (2006) & USAF works
- Approval of first “drop-in” fuels for aviation
  - ☞ ASTM 2009 (FT) and 2011 (HEFA)
  - ☞ Can be used safely with no adaptation nor limitation
- Demonstration flights (2008-2011)

  Virgin Atlantic (2008), Airbus (2008), Air New Zealand(2008), Continental (2009), JAL (2009), Qatar Airways (2009), KLM (2009)…

  ⇨ Demonstration of performance and safety
- Emergence of commercial flight (2011 ⇨ …)
  - ⇨ Proof of safe and harmless regular use
  - ⇨ Proof of airlines interest and engagement

Commercial flights (non exhaustive !)

DATE / ROUTE	CARRIER	AIRCRAFT	FEEDSTOCK	NOTES
29 June 2011 Amsterdam - Paris	KLM	B737	Used cooking oil	200 city pair flights from Sept 2011
15 July 2011 Hamburg - Frankfurt	Lufthansa	A321	Jatropha, camelina plants & animal fats	1,200 flights over six-month period
20 July 2011 Amsterdam - Helsinki	FINNAIR	A319	Jatropha	
21 July 2011 Mexico City – Tuxtla Gutierrez	interjet	A320	Jatropha	
1 August 2011 Mexico City – Madrid	aeromexico	B777	Jatropha	First biofuel transatlantic flight
3 October 2011 Madrid – Barcelona	IBERIA	A320	Camelina	
6 October 2011 Birmingham – Arrecife	Thomson Airways	B757	Used cooking oil	

Commercial flights (non exhaustive !)

DATE / ROUTE	CARRIER	AIRCRAFT	FEEDSTOCK	NOTES
13 October 2011 Toulouse – Paris	AIRFRANCE	A321	Used cooking oil	Flight used 50% biofuel blend
27 September 2011 Mexico City to San Jose, Costa Rica	aeromexico	Boeing 737-700	15% blend of camelina-derived biojet fuel	Weekly flights
7 November 2011 Houston to Chicago	UNITED	B 737-800	40% blend of biofuel made from algae	First USA biofuel commercial flight
9 November 2011 i) Seattle to Washington ii) Seattle to Portland	Alaska Airlines	B737-800 Q400	20% biofuel blend made from cooking oil	First of 75 flights
22 December 2011 Bangkok to Chiang Mai	THAI	Boeing 777-200	Used cooking oil	
12 January 2012 Frankfort to Washington DC	Lufthansa	Boeing-747	Biosynthetic fuel	
7 March 2012 Santiago to Concepcion		Airbus A320	Used vegetable oil	
13 April 2012 Sydney to Adelaide		Airbus A330	Used cooking oil	Australia's first commercial biofuel flight
17 April 2012 Toronto to Ottawa		Bombardier Q400	Camelina sativa and Brassica carinata	

Alternative fuel challenges

It works. Now the challenges are:

- To bring the production alive
- To make feedstock available
- To make it competitive
- To insure it is made in a sustainable way

The role of ICAO

- **Resolution A37-19 (Oct. 2010) requests council to:**

  "Encourage member States and invite industry to actively participate in further work on sustainable alternative fuels for aviation"

- **ICAO to act as a facilitator**
  - ✓ Support of international cooperation
  - ✓ Organization of information exchanges
  - ✓ Answer to expressed needs for global policies and measures
  - ✓ Global view

Achievements and on-going initiatives

- **ICAO's conference and workshops**
  - ✓ Rio November 2009: Conference Aviation and alternative fuels
  - ✓ Montreal Feb. 2009 and Oct. 2011: workshops on alternative fuels
- **Rio+20: the ICAO's "Flightpath" initiative**
  - ✓ Four connected flights using biofuels from Montréal to São Paulo
  - ✓ "Green flights": biofuels + flight optimization
- **ICAO's Global Framework on Aviation Alternative Fuels (GFAAF)**
  - A platform for sharing information on best practices and initiatives on the development and deployment
  - Rebuilding initiated for improved service

Achievements and on-going initiatives

- **SUSTAF experts group**
  - ✓ Initiated in July 2012
  - ✓ Currently 40 experts – memberships covering a variety of geographic areas and stakeholders
  - ✓ Mission: “to facilitate the development and deployment of alternative fuels for aviation”
  - ✓ Deliverable: “a set of recommendations to be approved by Council for presentation at the 38th Session of the ICAO Assembly with a view to supporting States and the industry in their activities to develop and deploy sustainable alternative fuels for aviation”
  - ✓ Schedule:
    - November 2012: preliminary document towards CAEP
    - March 2012: final document for Council

Achievements and on-going initiatives

- **SUSTAF experts group** (cont.)
  - ✓ Sustainable alternative fuels addressed from the multiple challenges points of view:
    - Sustainability and carbon accounting
    - Deployment issues
    - Market issues
    - Policies
  - ✓ Link with Action Plans and future emissions projection

Conclusion

- Sustainable alternative fuels are important contributors to aviation environmental goals
- We are at the beginning of the story with many challenges ahead
- ICAO is a important actor for facilitation and for a global approach at aviation level