

Aviation and Environment

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Director Aviation Environment

IATA AGM Singapore

7 June, 2011



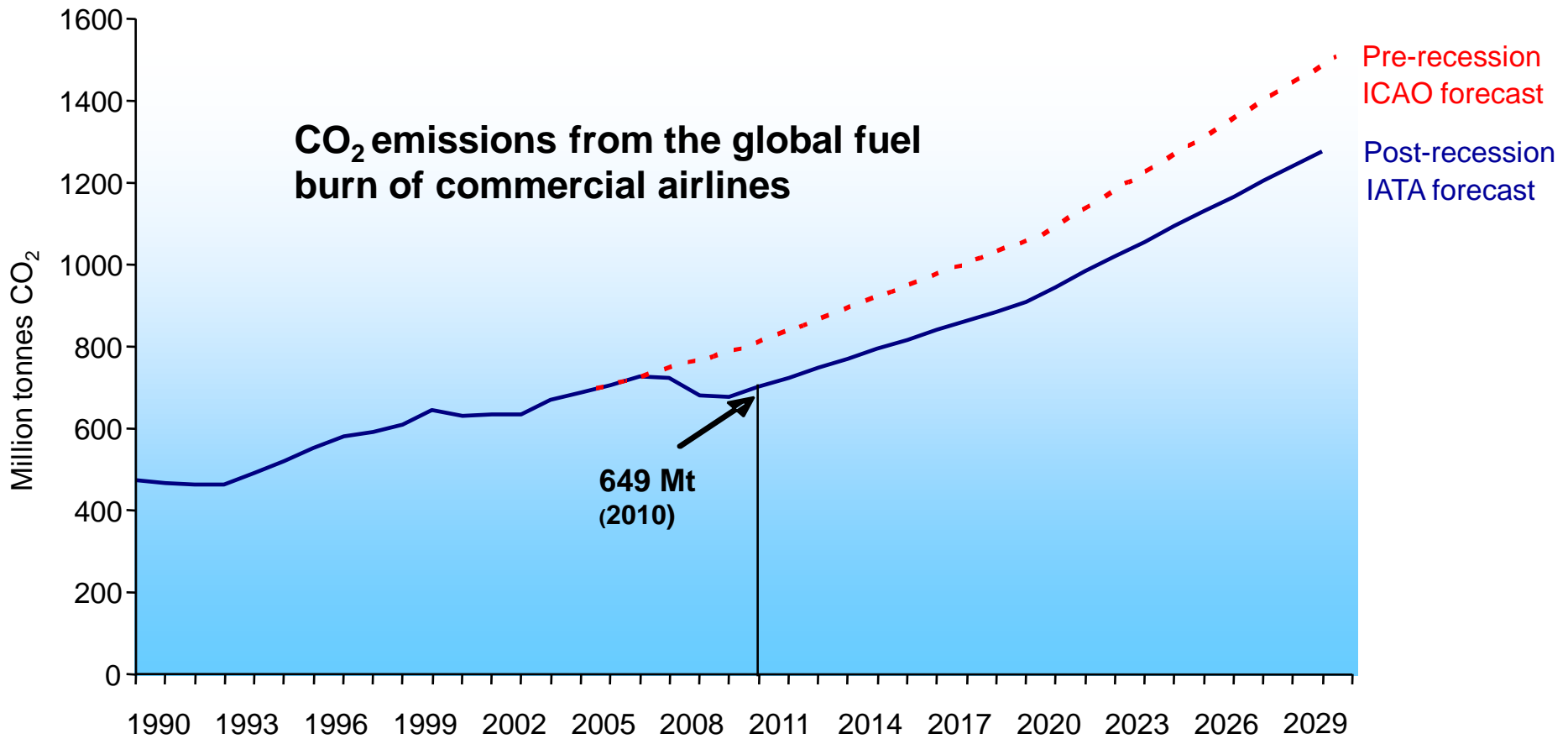
67th IATA ANNUAL
GENERAL MEETING

Agenda

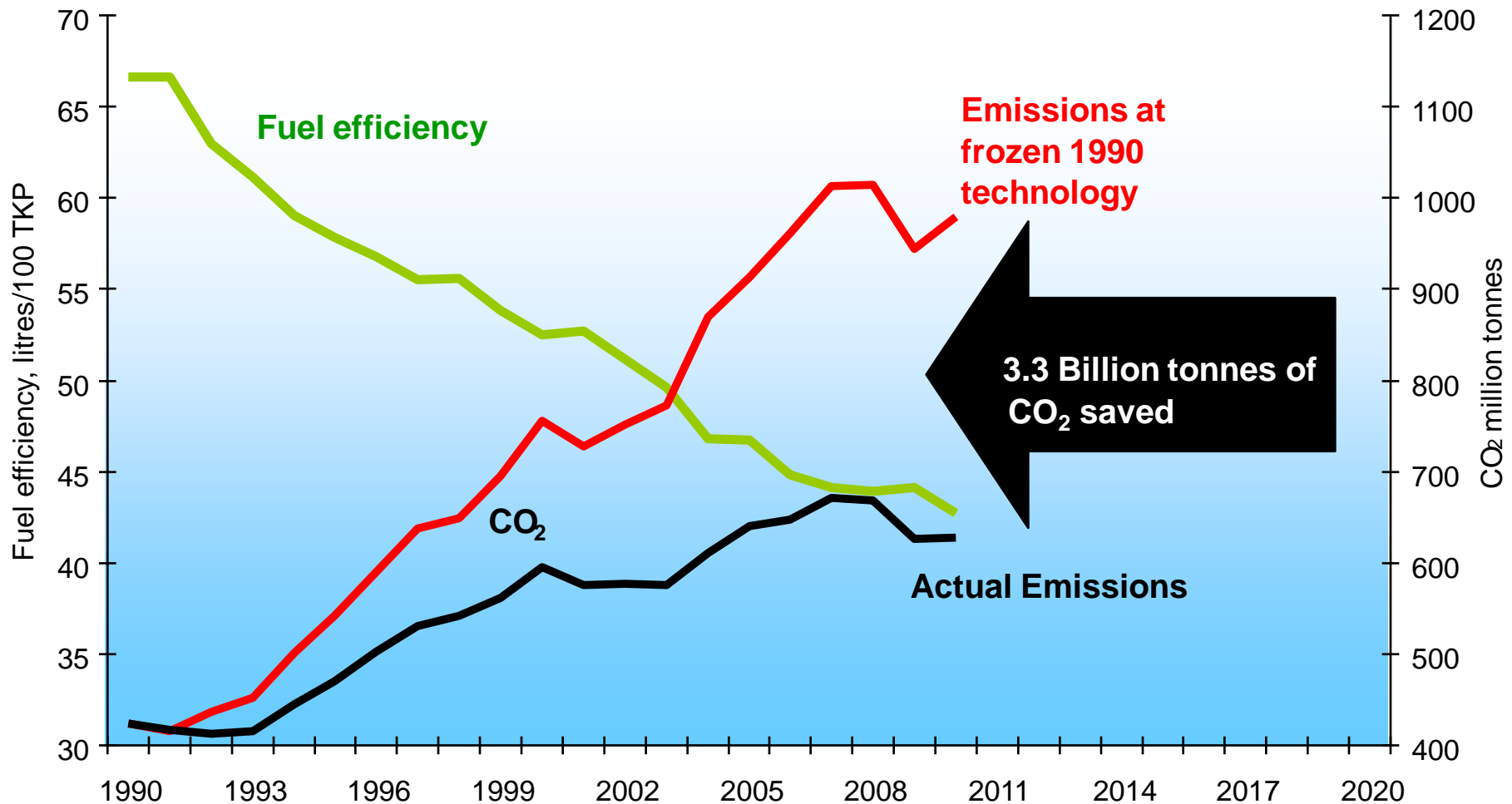
- **Aviation and climate change**
- **Global Policy Developments**
- **Progress on four-pillar strategy**
- **Three key next steps**



Aviation faces emissions challenge



But our track record is strong



Commitment on climate change



enviro.aero

Aviation Industry Commitment to Action on Climate Change

As leaders of the aviation industry, we recognise our environmental responsibilities and agree on the need to:

- build on the strong track record of technological progress and innovation that has made our industry the safest and most efficient transport mode; and
- accelerate action to mitigate our environmental impact, especially in respect to climate change while preserving our driving role in the sustainable development of our global society.

Therefore, we, the undersigned aviation industry companies and organisations declare neutral growth and aspire to a carbon-free future.

To this end, in line with the four-pillar strategy endorsed at the 2007 ICAO Assembly, we will:

1. push forward the development and implementation of new technologies, including cleaner fuels;
2. further optimise the fuel efficiency of our fleet and the way we fly aircraft and manage ground operations;
3. improve air routes, air traffic management and airport infrastructure; and
4. implement positive economic instruments to achieve greenhouse gas reductions wherever they are cost-effective.

We strongly encourage others to join us in this endeavour.

Our efforts and commitment to work in partnership with governments, other industries and representatives of civil society will provide meaningful benefits on tackling climate change and other environmental challenges.

We urge all governments to participate in these efforts by:

1. supporting and co-financing appropriate research and development in the pursuit of greener technological breakthroughs;
2. taking urgent measures to improve airspace design including civil/military allocation, air traffic management infrastructure and procedures for application of needed airport development; and
3. developing and implementing a global, equitable and stable emissions management framework for aviation through ICAO, in line with the United Nations roadmap agreed in Bali in December 2007.

3rd Aviation & Environment Summit, 22nd April 2008, Geneva, Switzerland

Signature Block:

- Airports Council International:** Robert J. Aaronson, Director General
- IATA:** Giovanni Bisignani, Director General & CEO
- Airbus:** Thomas Enders, President & CEO
- CFM:** Eric Bacheler, CEO
- Pratt & Whitney:** Stephen Finger, President
- Boeing:** Fernando Pinto, Chairman
- Boeing:** Scott Carson, President & CEO
- Boeing:** Mark King, President, Civil Aircraft
- Embraer:** Frederico Pleyry Quares, President & CEO
- Rolls-Royce:** Mark King, President, Civil Aircraft
- Canso:** Alexander Sir Kuis, Secretary General
- Canso:** Ashley Snout, Chairman
- Canso:** Marion C. Blaisy, Chair
- Canso:** Takashi Hosono, Vice-Chair
- Bombardier:** Steve Robill, President, Regional Aircraft
- GE:** Scott C. Donnelly, President & CEO, GE Aviation
- ATAGIS:** Philippe Rochal, Executive Director

Geneva, 2008

Global industry targets

2010

1.5% p/a fuel efficiency

Working towards CNG

2020

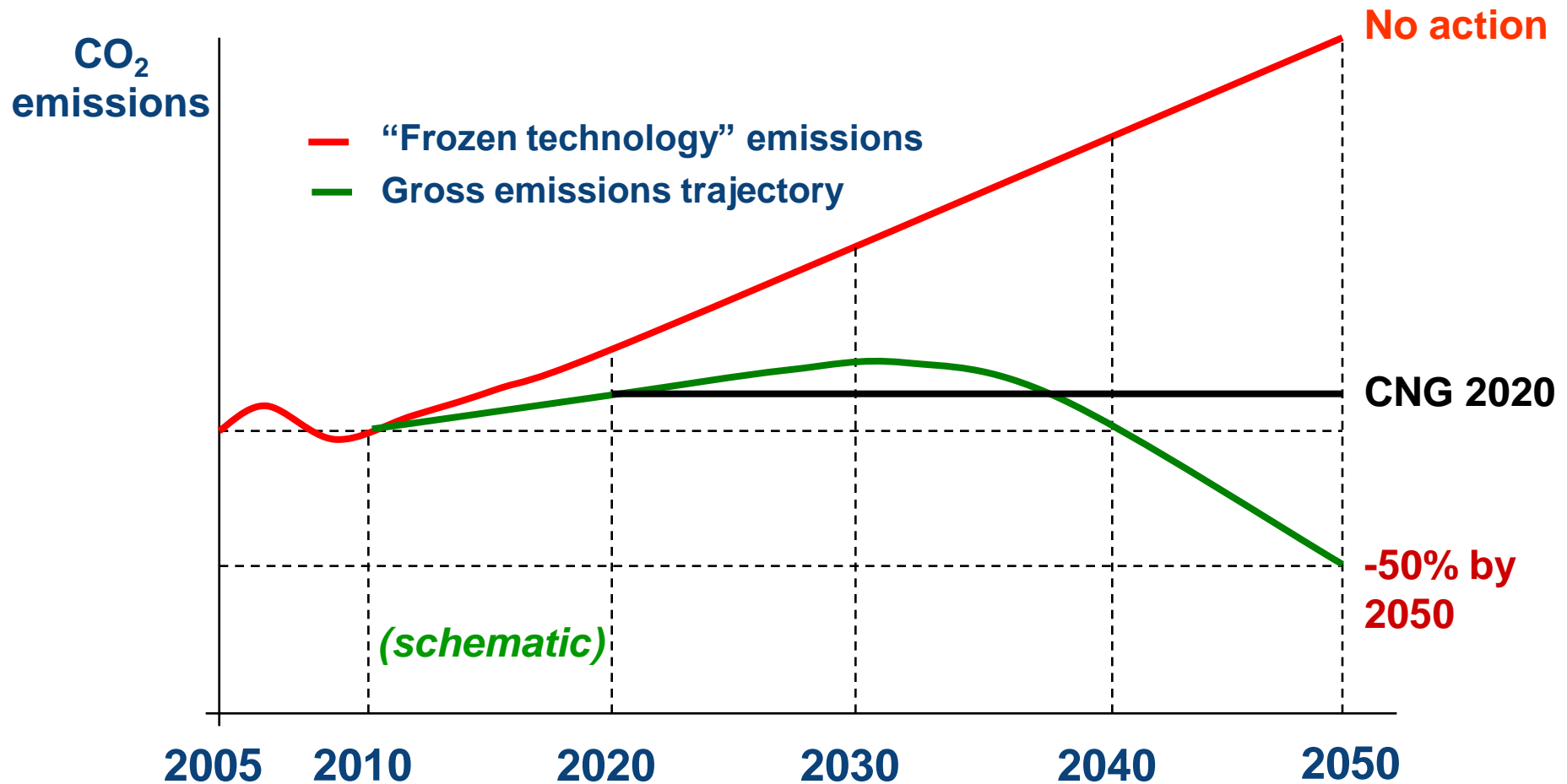
Carbon-neutral growth from 2020

Implementation of global sectoral approach

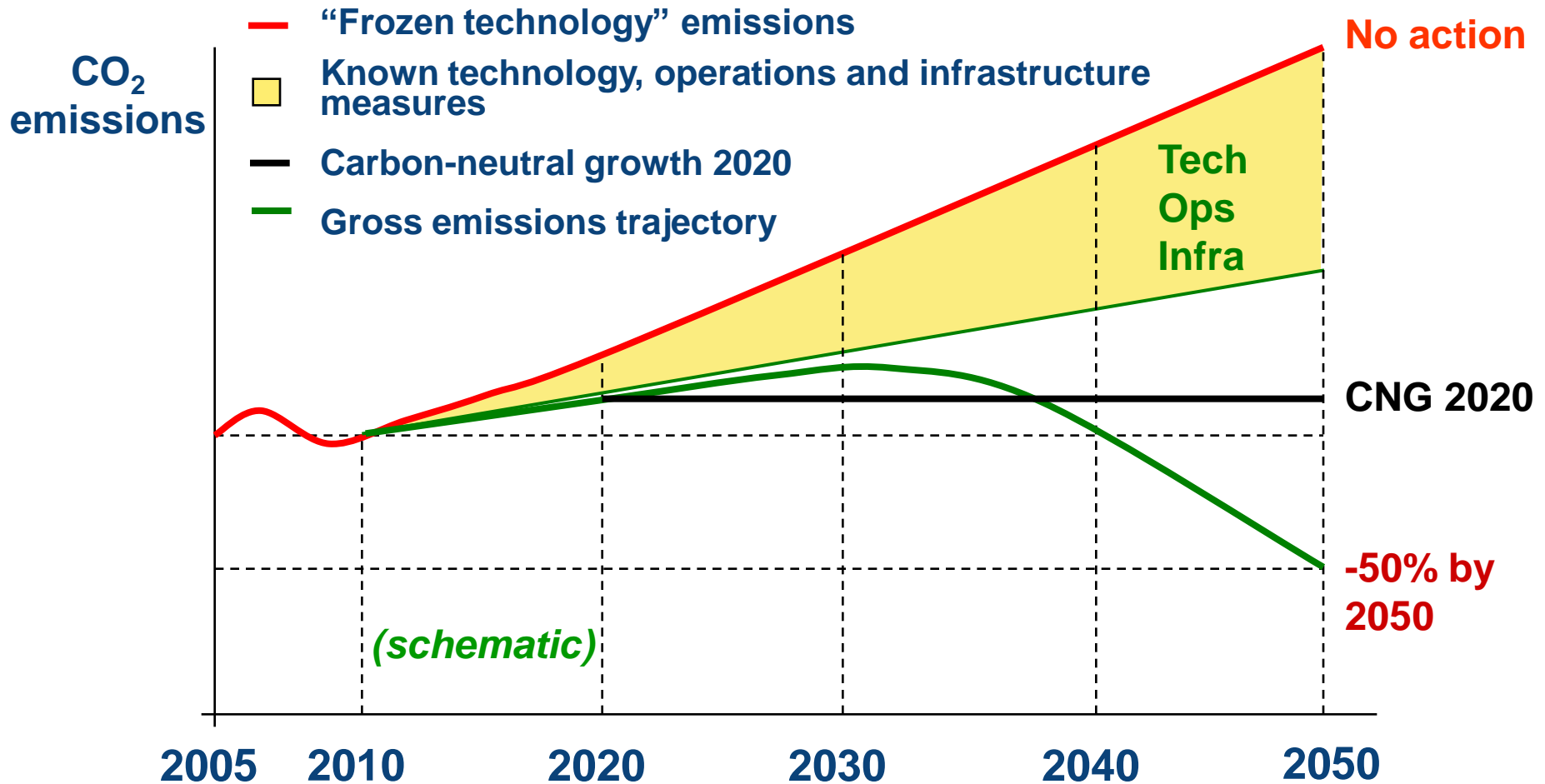
2050

50% reduction in net CO₂ emissions over 2005 levels

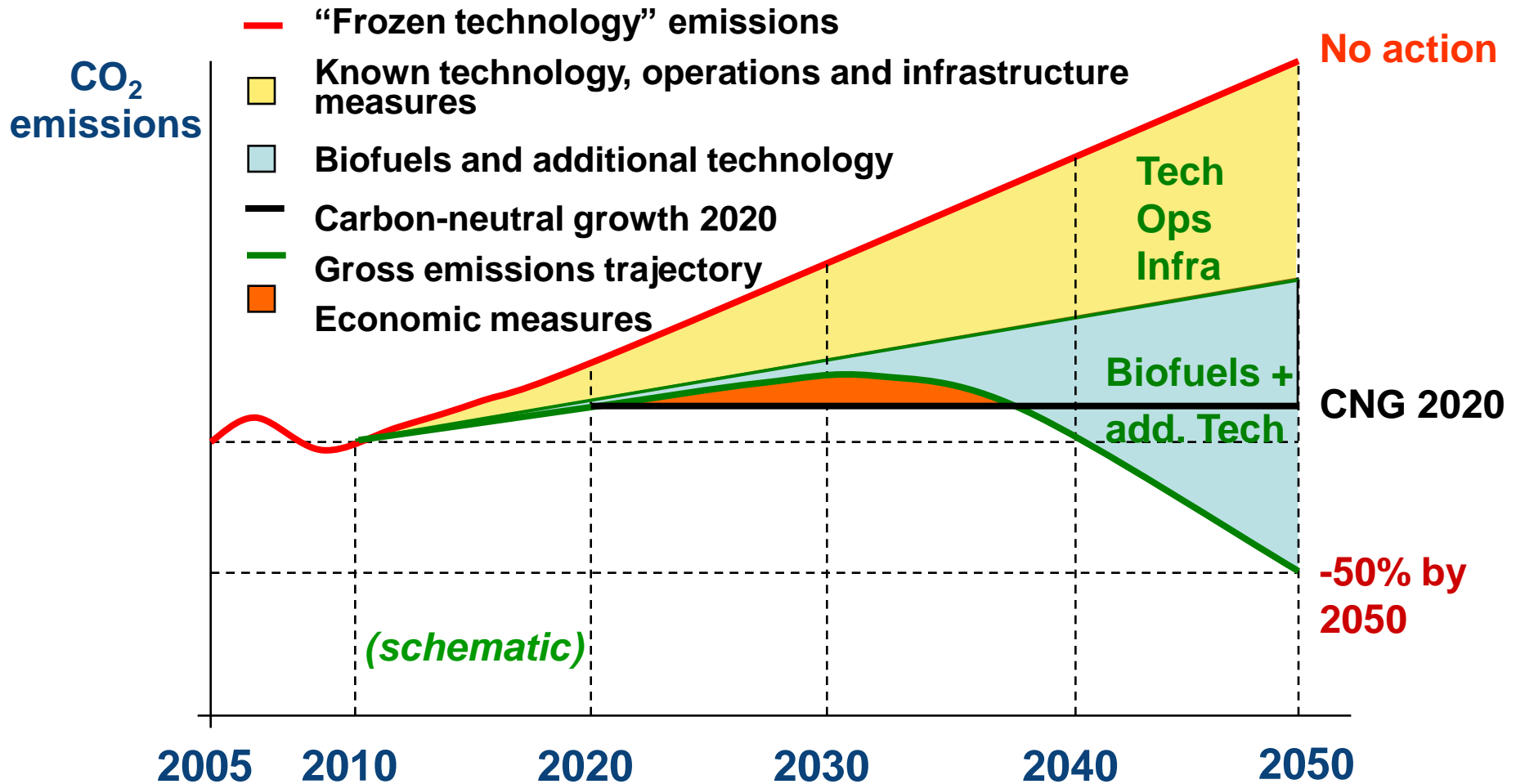
Emissions reduction roadmap



Emissions reduction roadmap



Emissions reduction roadmap



The four-pillar strategy

- 1) Invest in new **technology**
 - Including sustainable aviation **biofuels**
- 2) Fly using more efficient **operations**
- 3) Build and use efficient **infrastructure**
- 4) Use effective **economic measures**



Global policy developments

ICAO Assembly 2010

Positives:

- First ever global sectoral agreement on CO₂
- Reflects aspirational industry goal of carbon-neutral growth from 2020
- Lists 15 principles for Market-Based Measures, in line with industry priorities, e.g.
 - Transparency and simplicity
 - No duplication
 - Minimize leakage and distortion
 - Appropriate access to all carbon markets



Global policy developments

UNFCC Climate Talks Cancun 2010

- No progress on “Bunker Fuels” debate
- Strong recognition of progress in ICAO
- “Green Climate Fund” may target aviation/shipping



Global policy developments



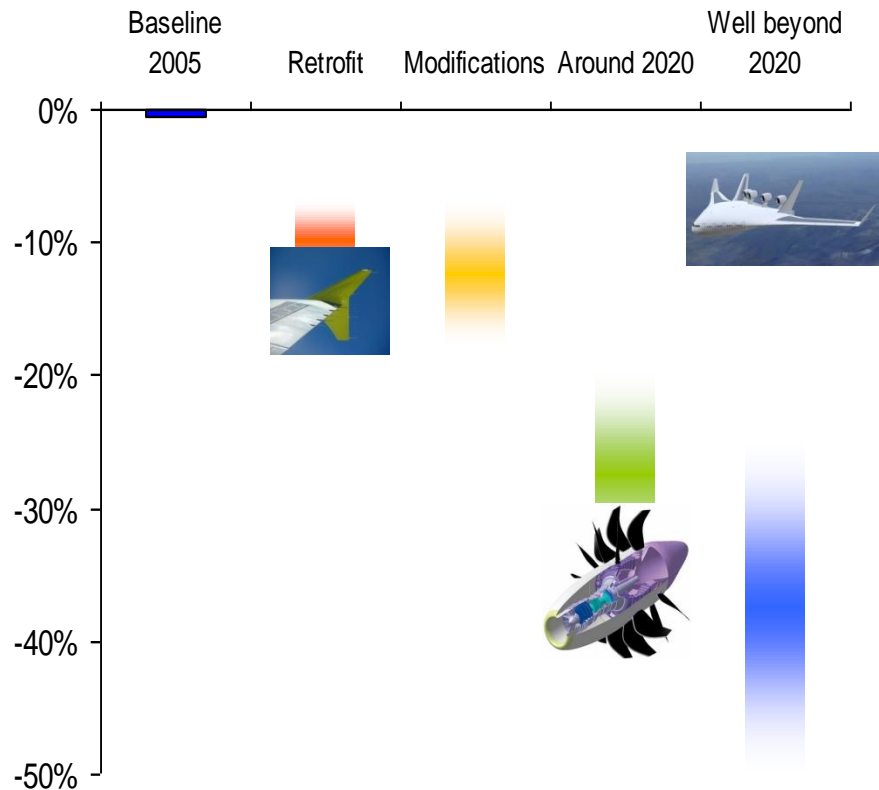
Technology – Fuel saving potential

Retrofits:

- Wingtips
- More efficient APU
- Engine retrofits
- Composite secondary structures

Serial modifications:

- Composite primary structures
- Engine upgrades
- Active load alleviation



New aircraft types (around 2020):

- New engine architecture
- (geared turbofan / counter-rotating fan / open rotor)
- Natural and hybrid laminar flow

New aircraft types (well beyond 2020):

- Variable cycle
- Hybrid wing body
- Truss-braced wing
- Fuel cell

Operations and Infrastructure

➤ Operations

- Improved maintenance techniques
- Flight and fuel planning accuracy
- Taxiing with one engine out
- Ground power instead of APU

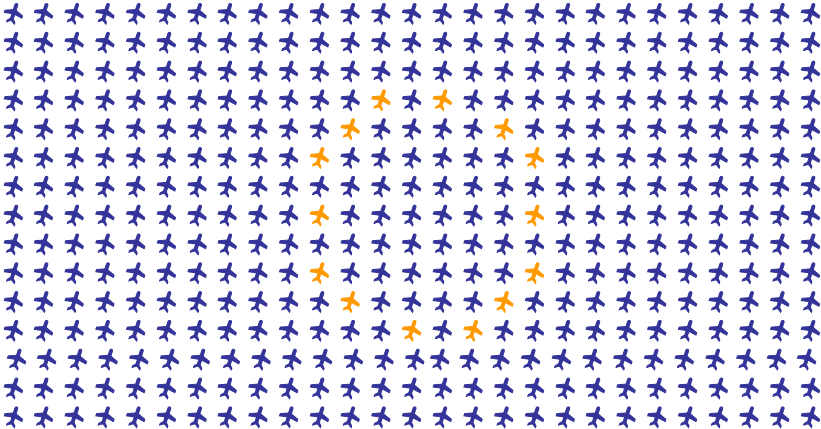
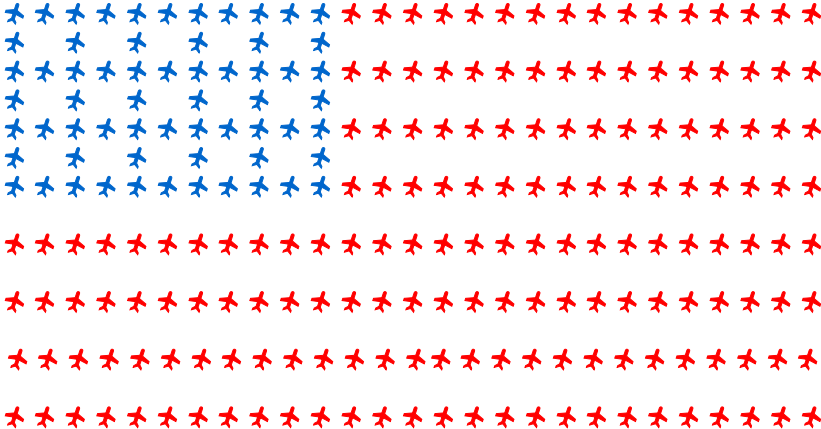


➤ Infrastructure

- Through RVSM, RNP, flex tracks, etc
- Limitations related to safety, capacity, noise, weather, etc
- Improvement potential in congested airspace

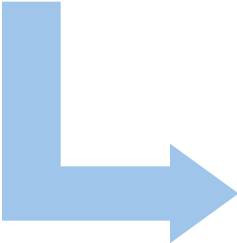


Governments need to step up



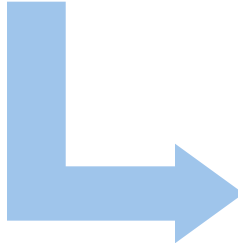
NextGen

SESAR



14 million

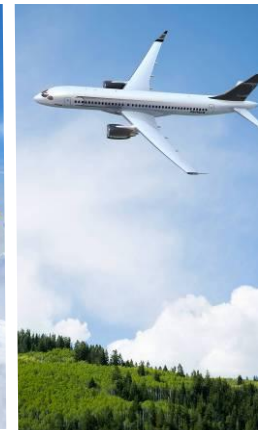
Tonnes of CO₂
saved by 2018



10%

Reduction in
CO₂ per flight
by 2020

Governments need to step up



Invest in
AEROSPACE
R&D



Governments need to step up



De-risk
REVOLUTIONARY
Technology



SOME POLICYMAKERS BELIEVE

TAXES

**ARE THE
ANSWER**



Uncoordinated patchwork

“Green” taxes



\$4.5bn



\$1.3bn



\$0.2bn



\$0.1bn



\$6bn?



\$?



\$?



\$?



Emissions trading



\$ 1.5 bn 2012



\$ 4 mn?



\$?



\$?



\$?



\$?



\$?

Where are we today?



1

Industry is united

Clear vision and strategy



2

Biofuels = global opportunity

Local solutions

3

Fragmented policy approach

DEMONSTRATE THAT WE CAN

**DELIVER ON
TARGETS**



IATA fuel data collection







- 144 members reported fuel/CO₂
- 86% of total Revenue Tonne Kilometers (RTK)
- Fuel efficiency per RTK + 5.0%
 - From 39.5 to 37.5 litres/100 RTK



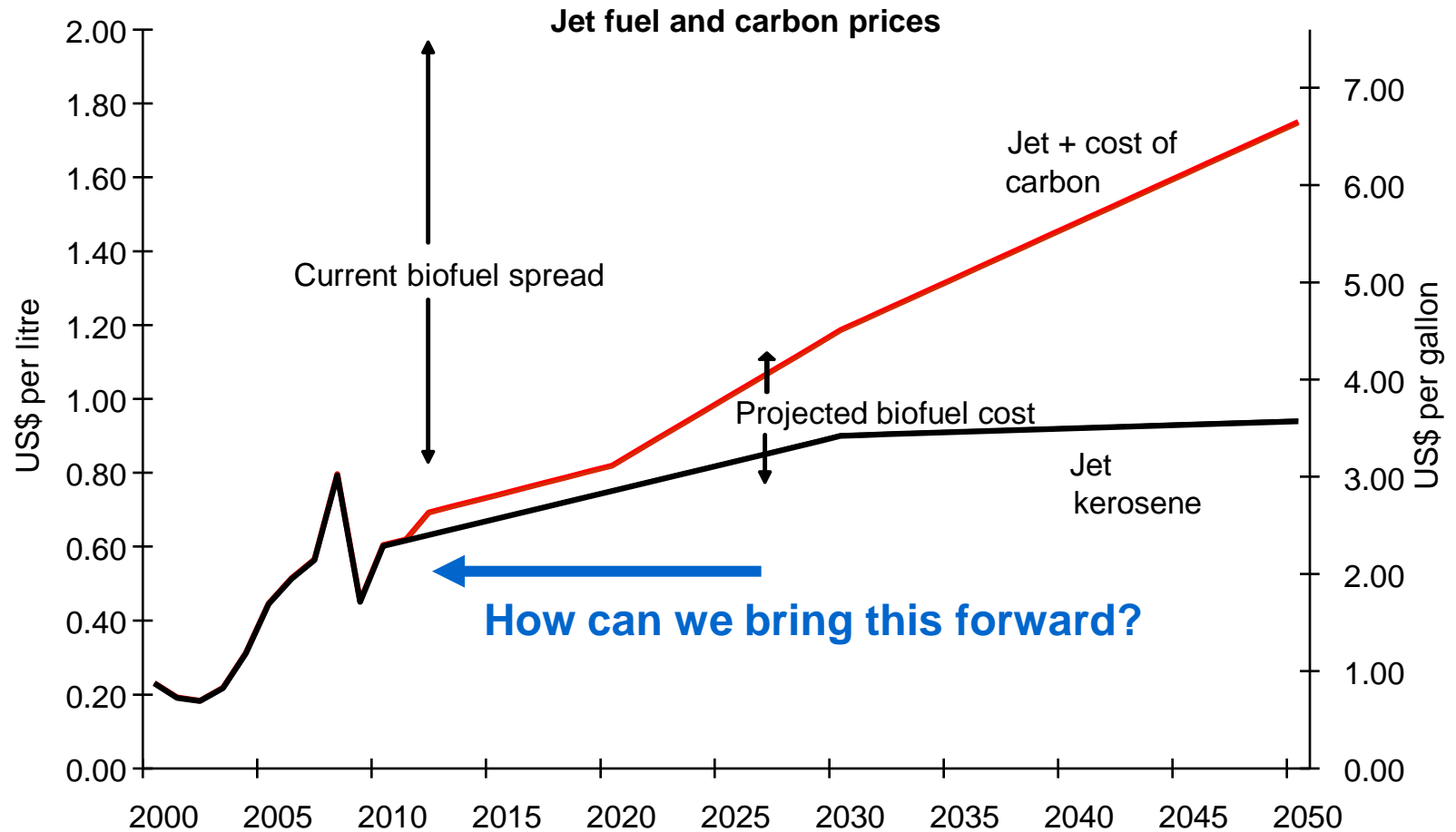
MAKE
BIOFUELS
A SUCCESS



Alternative fuels test flight programme

Carrier	Aircraft	Partners	Date	Alternative fuel	Blend
	B747-400	Boeing, GE Aviation	23 Feb 2008	Coconut & Babassu	20% one engine
AIR NEW ZEALAND	B747-400	Boeing, Rolls-Royce	30 Dec 2008	Jatropha	50% one engine
	B737-800	Boeing, GE Aviation, CFM, Honeywell UOP	7 Jan 2009	Algae and Jatropha	50% one engine
	B747-300	Boeing, Pratt & Whitney, Honeywell UOP	30 Jan 2009	Camelina, Jatropha, Algae blend	50% one engine
	A340-600	Airbus, Shell	12 Oct 2009	Gas to liquid (not biofuel)	50% four engines
	B747-400	GE, Honeywell UOP	23 Nov 2009	Camelina	50% one engine
	A319	Rentech	30 April 2010	Gas to liquid (not biofuel)	40% two engines
	A320	Airbus, CFM	23 Nov 2010	Jatropha	50% one engine
	A320	CFM, Safran, EADS, Airbus, Honeywell	1 Apr 2011	Jatropha	27%

Biofuels: costly today but within reach



Biofuels: 6 steps forward

1) RESEARCH

*2) DE-RISK
INVESTMENTS*

*3) PROVIDE
INCENTIVES*

*4) SUSTAINABILITY
CRITERIA*

*5) UNDERSTAND
LOCAL
OPPORTUNITIES*

*6) COLLABORATION
THROUGH THE
SUPPLY CHAIN*



**A GLOBAL
APPROACH IS THE
ONLY WAY FORWARD**



Global approach

ICAO Assembly 2010

ICAO next steps:

- Country Action Plans
- Goals feasibility – medium and long-term
- Framework for market-based-measures
- Proposals for single market-based-measure
- Alternative fuels for aviation
- CO₂ standard for new aircraft types



Our industry has great stories to tell

Airlines



change
is in the
air!

JAL participates in Team -6% with our Eco-Sky project.

Let's stop global warming together

Team -6%

Airports



HKIA Carbon Reduction



ANSPs

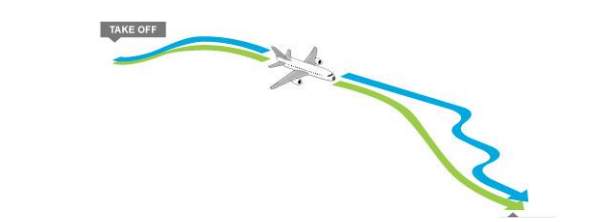
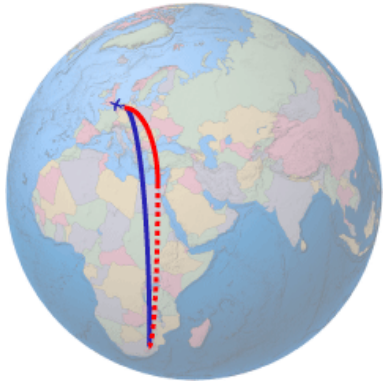


Manufacturers



SUSTAINABLE
AVIATION

Our industry has great stories to tell



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