

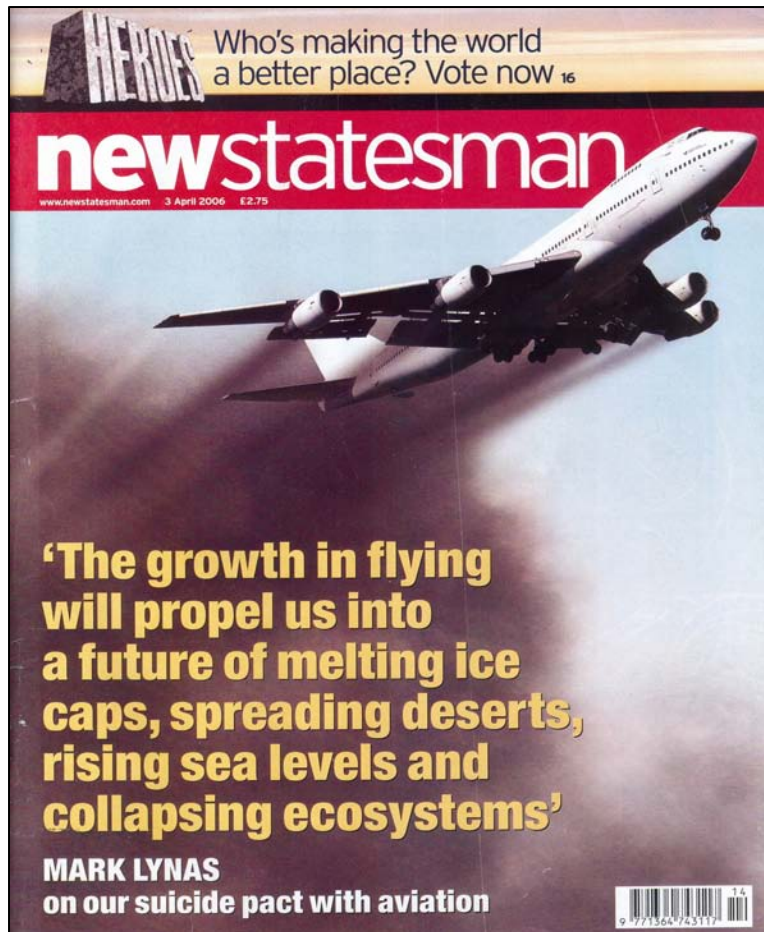


# Why We Need Alternative Fuels



**Paul Steele**

**Director Aviation Environment, IATA  
Executive Director, ATAG**



## Industry Under Threat

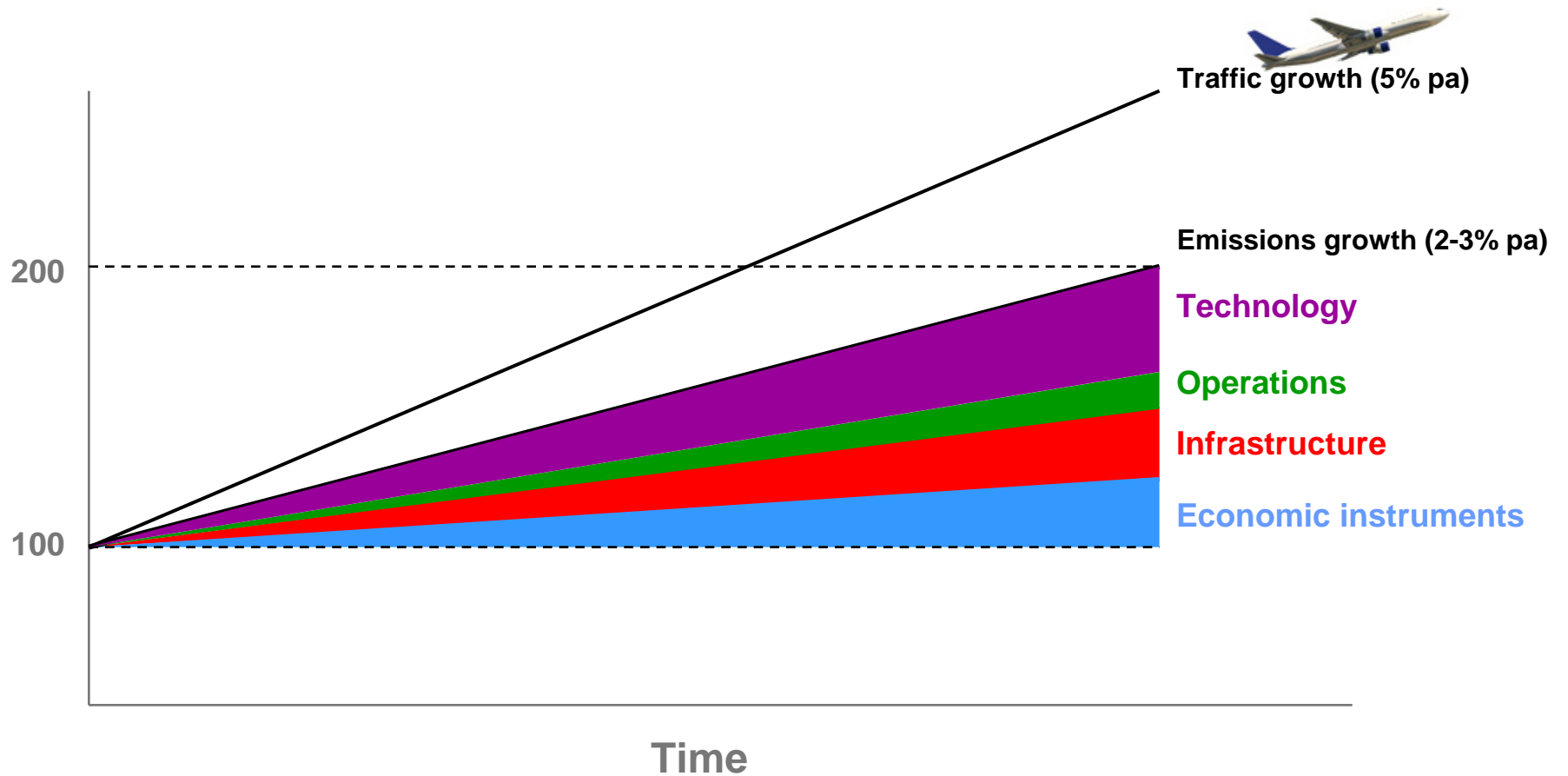
- **Despite a strong track record:**
  - Best performance on fuel efficiency
  - Best performance on noise
  - Removal of Soot and Sulphur
  
- **Perceptions of Aviation are:**
  - Heavy polluter
  - Emissions growing fast
  - Only one energy source: kerosene
  - Industry has nowhere to go
  
- **Intuitive Policy Response**
  - Limit demand / growth
  - Apply taxation
  - Use revenues to fund emissions reductions in other sectors

## Our Vision

- Is for carbon neutral growth
- Leading to a zero carbon emissions future



# Carbon Neutral Growth

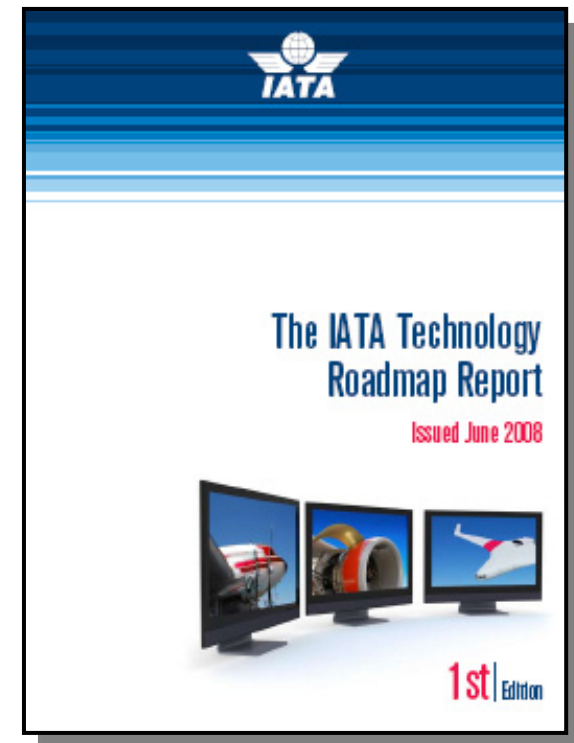


# IATA Four Pillar Strategy

- 
- A black and white photograph of classical architectural columns, likely from a government building or institution, positioned on the left side of the slide.
- **Technology**
    - Invest in New Technology
  - **Operations**
    - Fly More Efficiently
  - **Infrastructure**
    - Build & Use Efficient Infrastructure
  - **Economic instruments**
    - Use Effective Economic Measures

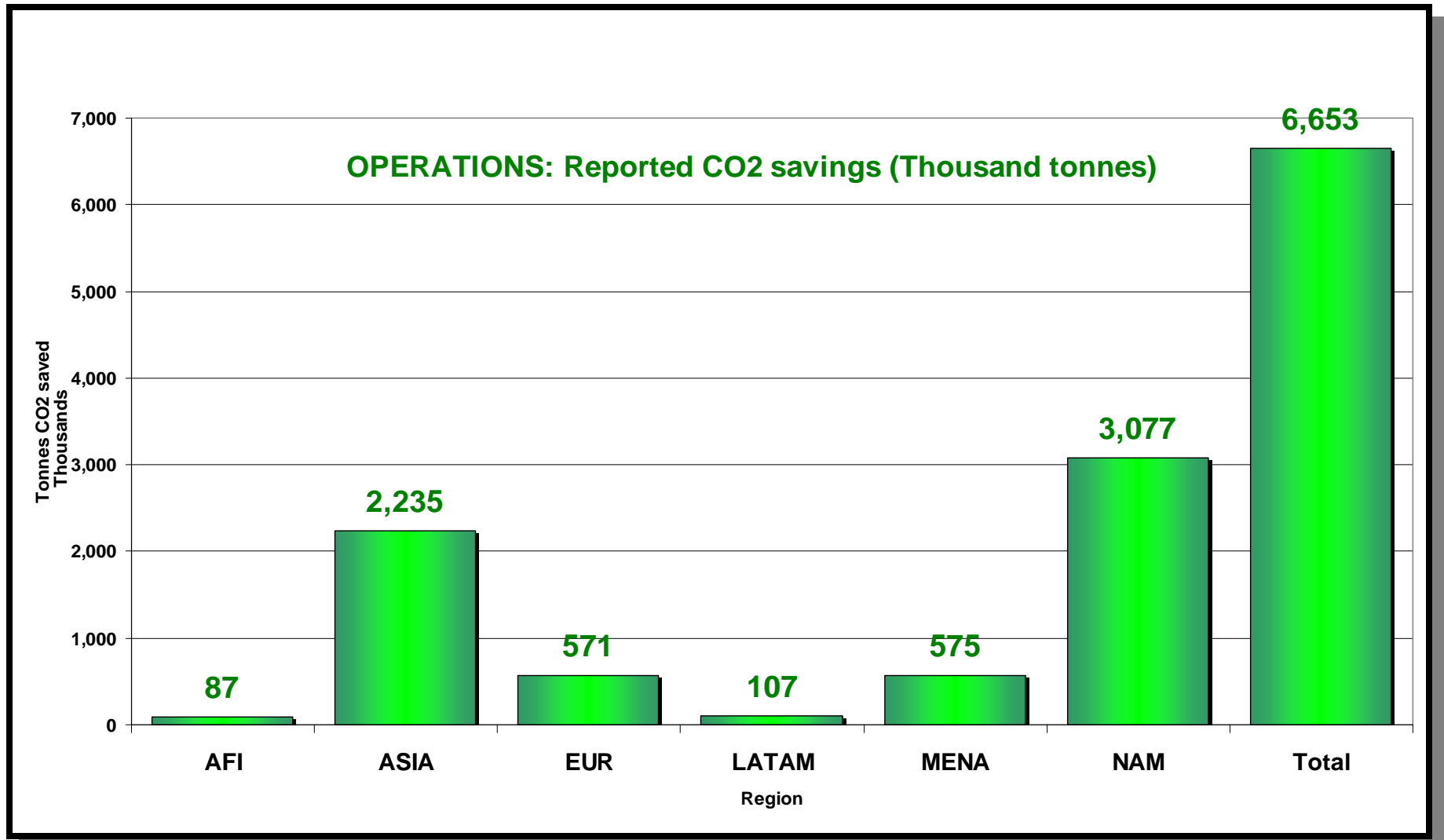
# Pillar 1: Technology

- **Engines (Geared Turbofan, Open Rotor)**
- **Structure and materials (Composites, alloys)**
- **Aerodynamic design  
(Laminar flow, winglets, active load alleviation)**
- **Systems (APU, Avionics)**
- **ATM technology (e.g. Continuous descent arrival)**



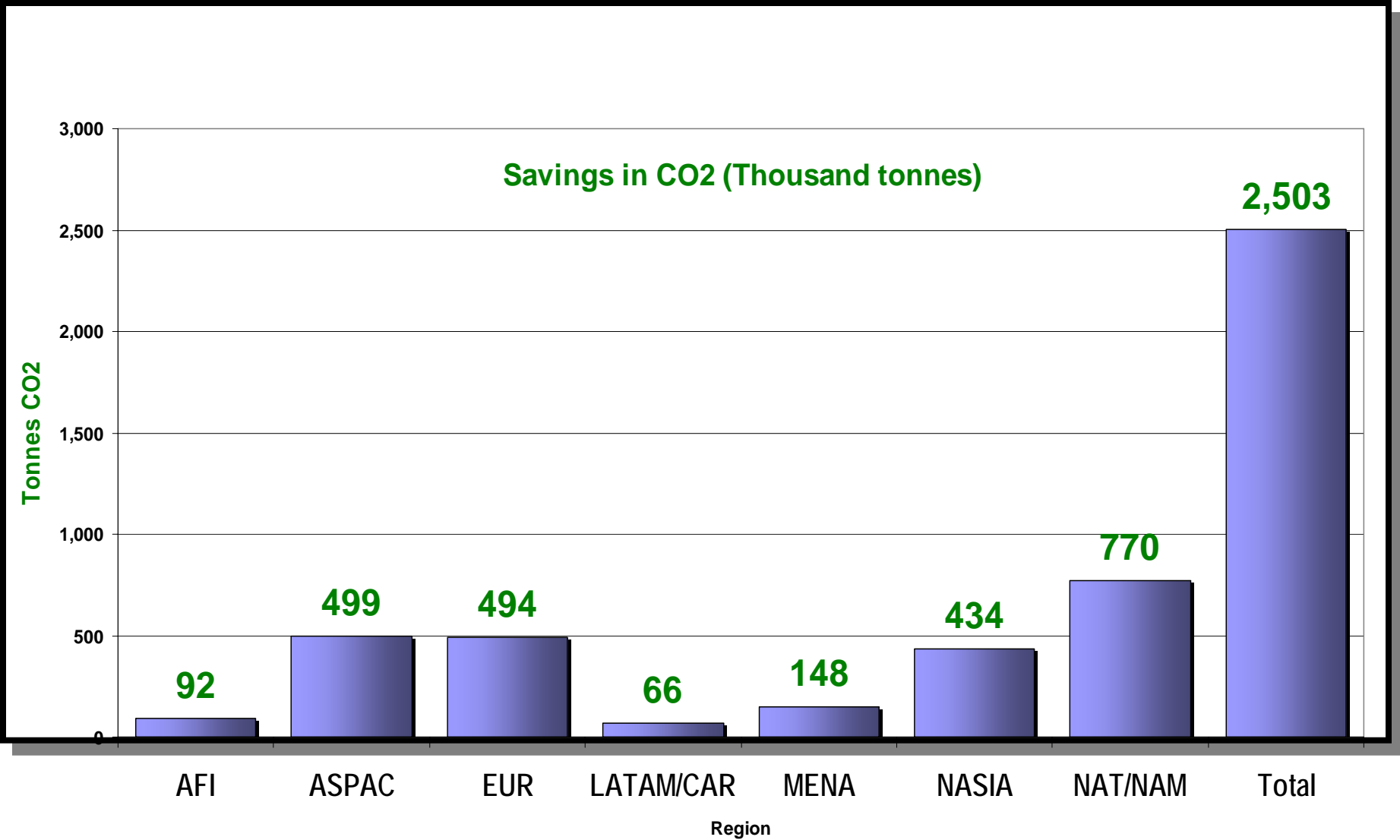
# Pillar 2: Operations Achievements

(65 Airlines supported in 2008)



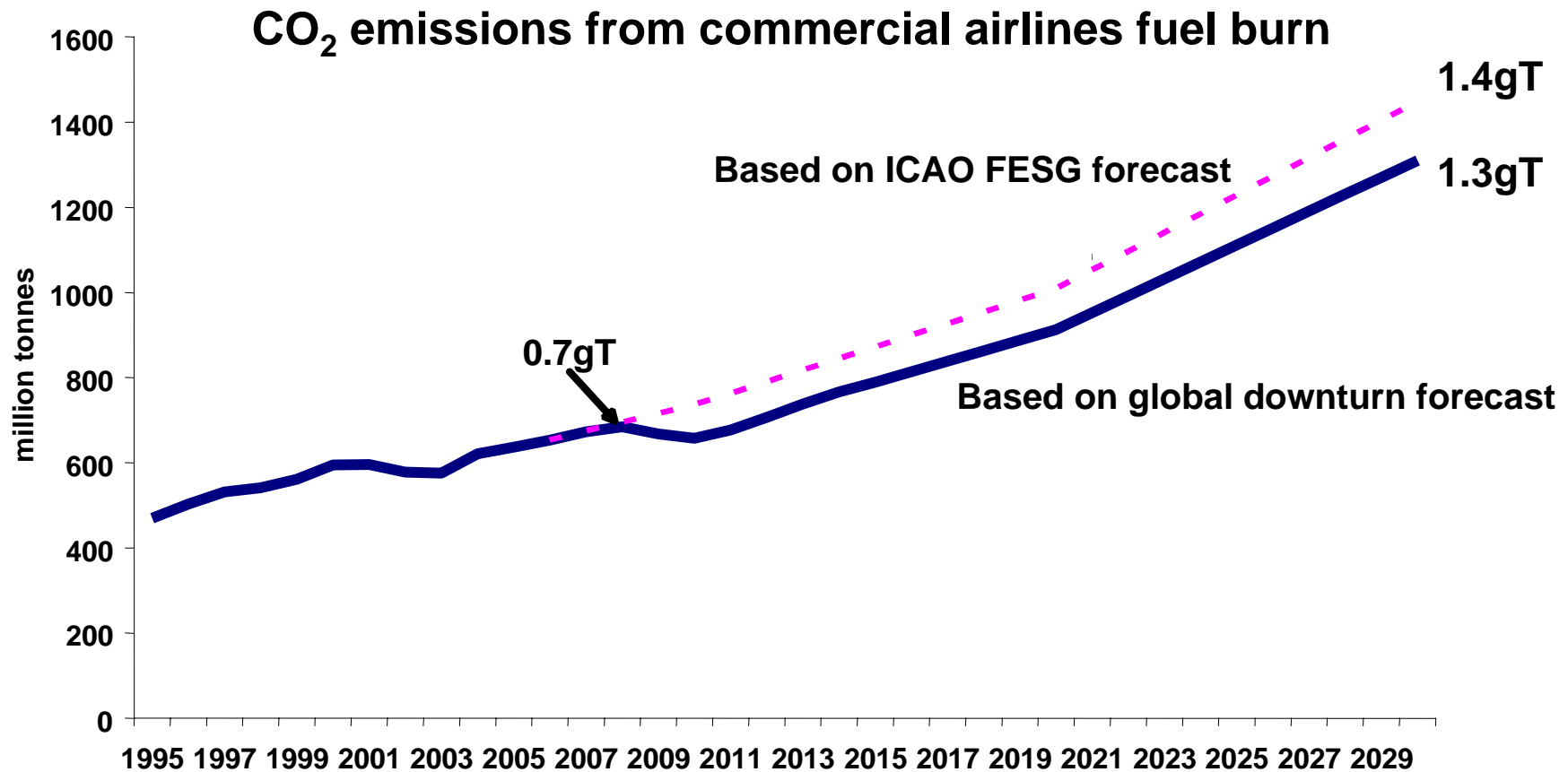
# Pillar 3: Infrastructure Achievements

(210 Routes and 80 Airport (arrival/dept) improvements)





# CO<sub>2</sub> Emissions Forecast To Grow



# 3 Key Drivers of Emissions Reductions

➤ Ongoing Fleet Renewal



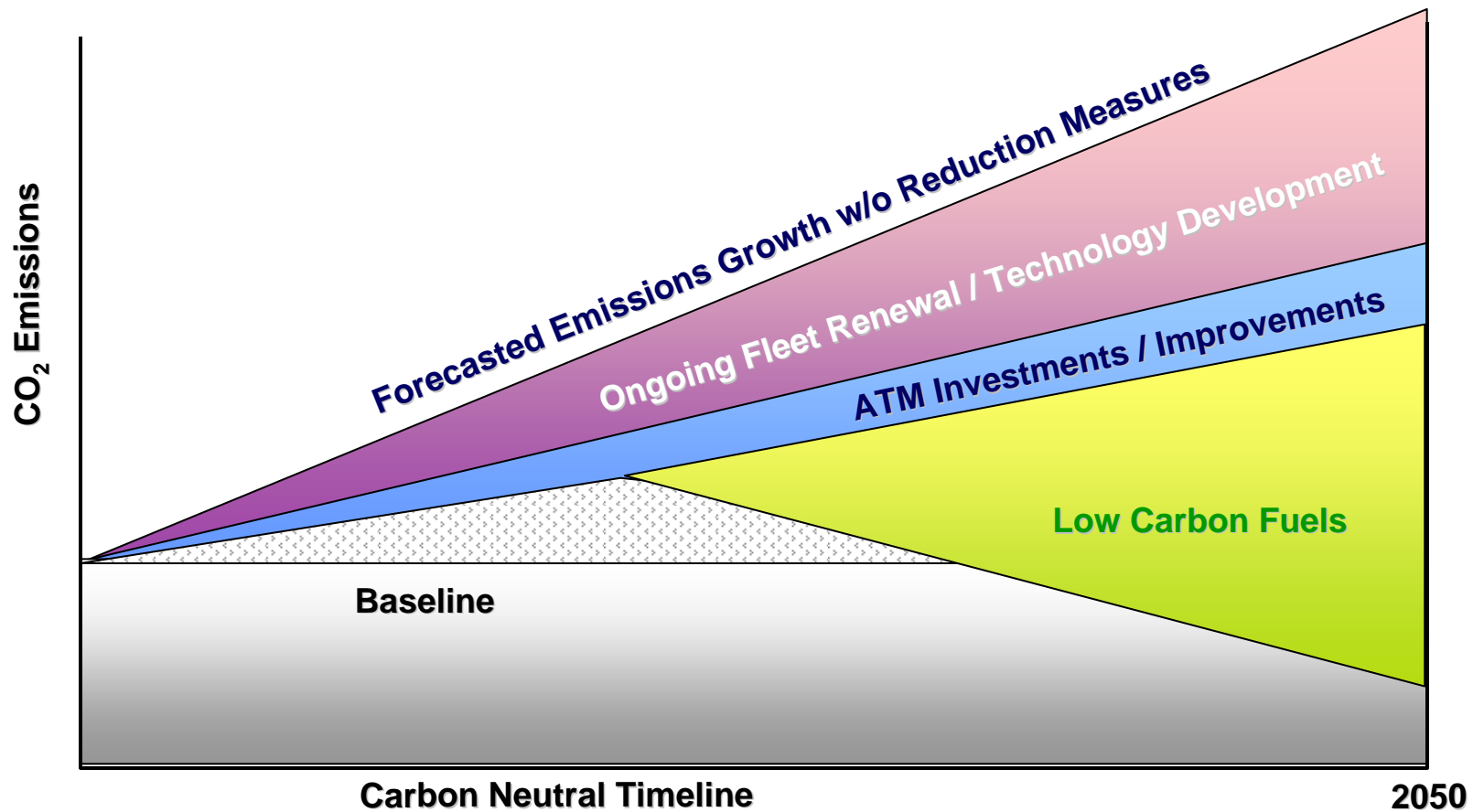
➤ Investments & Improvements in ATM



➤ Low Carbon Fuels for Aviation



# 3 Key Drivers of Emissions Reductions



# Types of Alternative Fuels

Alternative Fuels can be divided into 3 categories:

**1. Traditional Jet Fuel (i.e. kerosene)**

- Crude Oil
- Tar sands or oil shale
- Natural gas condensates

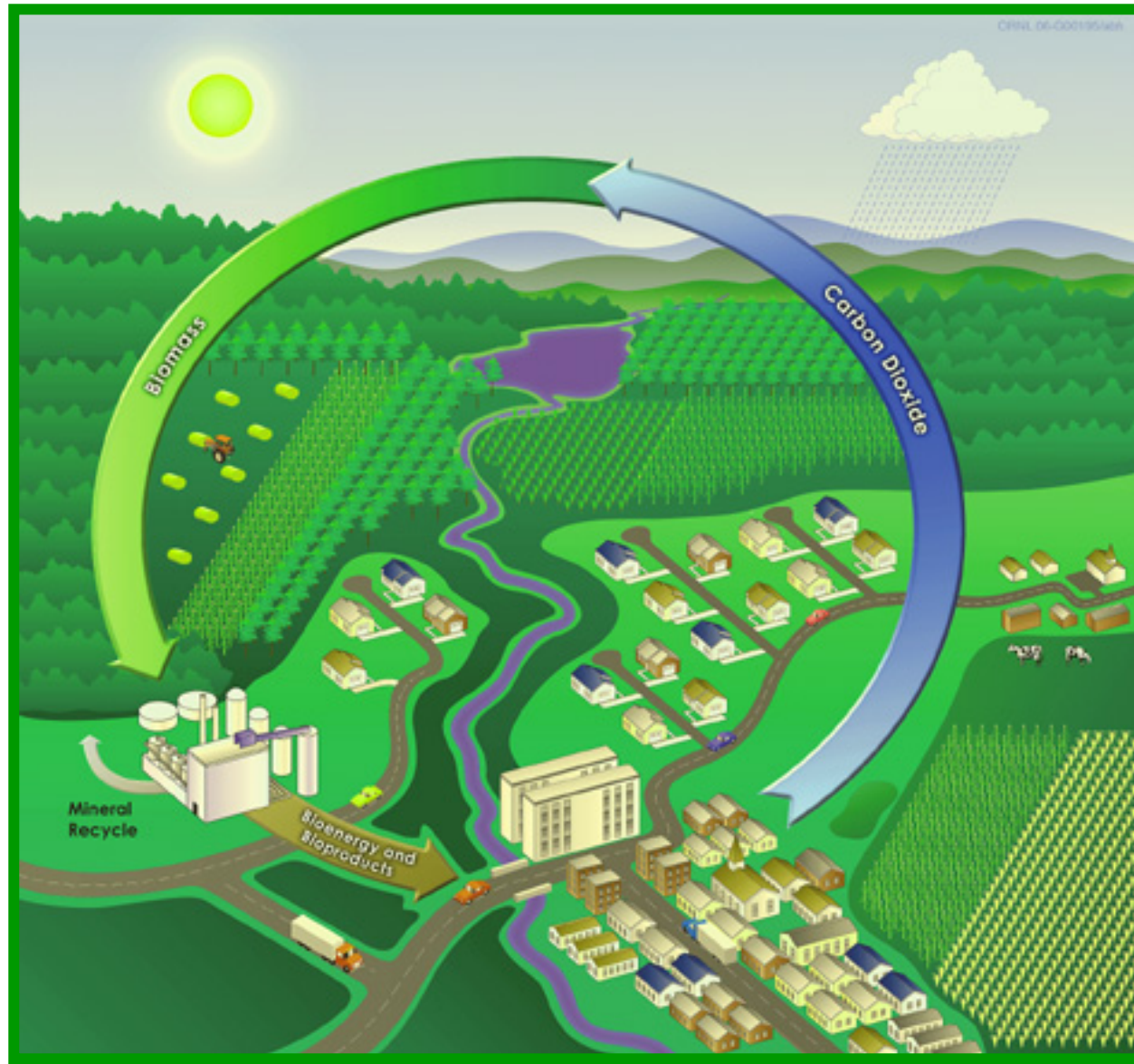
**2. Fischer Tropsch synthetic fuel**

- Coal to Liquid (CTL)
- Gas to Liquid (GTL)
- Biomass to Liquid (BTL)

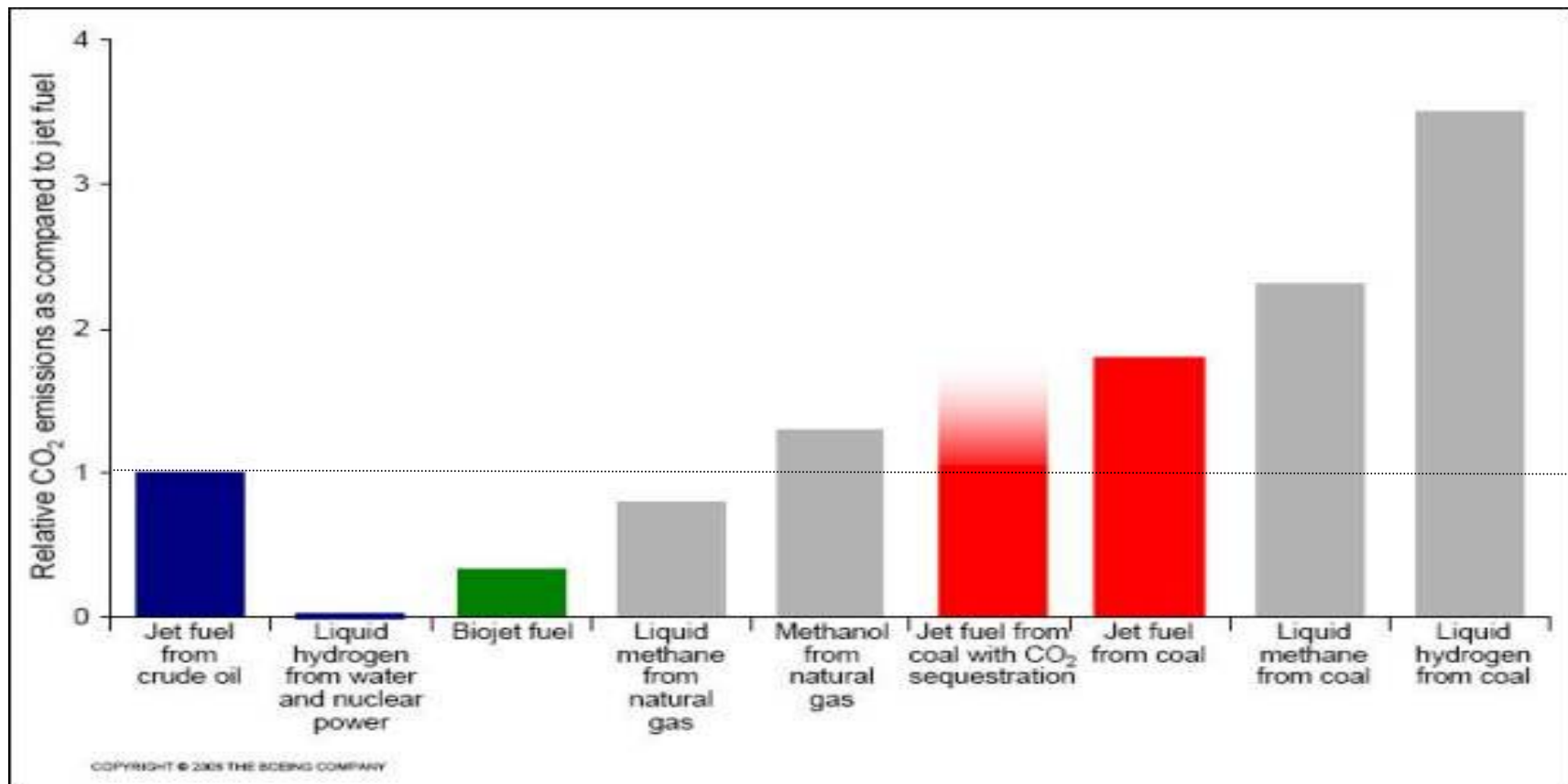
**3. Biofuels derived from biomass**

- Food crops (1<sup>st</sup> generation)
- Nature by-products /waste (2<sup>nd</sup> generation)
- Additional grown biomass (e.g. algae, jatropha, camelina)

# Carbon Lifecycle Analysis

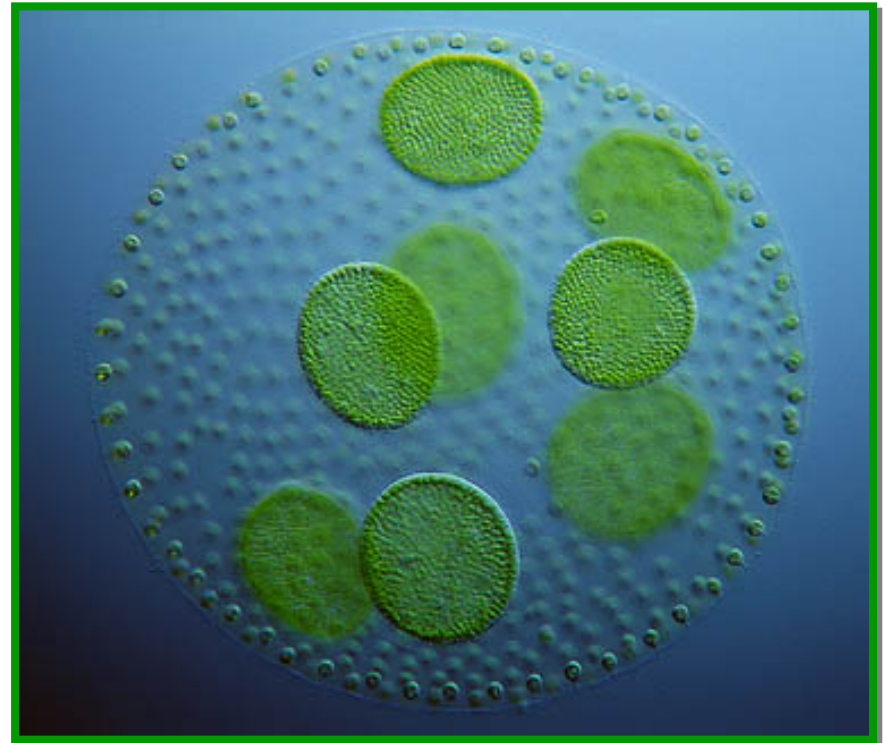


# Which Fuels Are Low Carbon?



# The promise of biofuels

- Can be grown with polluted or waste water
- Can be grown in poor soils
- High energy yield
- New livelihood opportunity for developing countries
- Reduce dependency on imported oil








# Biofuels Sustainability Parameters

**IATA parameters for sustainable aviation biofuels:**

- **Offer net carbon reductions over their lifecycle**
- **Do not compete with freshwater needs**
- **Do not compete with food production**
- **Do not cause deforestation or biodiversity loss**



# Biofuels Experience So Far

Carrier	Aircraft	Partners	Date	Biofuel	Blend
 virgin atlantic	B747-400	Boeing, GE Aviation	23 Feb 08	Coconut & Babassu	20% one engine
 AIR NEW ZEALAND	B747-400	Boeing, Rolls-Royce	30 Dec 08	Jatropha	50% one engine
 Continental Airlines	B737-800	Boeing, GE Aviation, CFM, Honeywell UOP	7 Jan 09	Algae with Jatropha	50% one engine
 JAL	B747-300	Boeing, Pratt & Whitney, Honeywell UOP	30 Jan 09	Camelina, Jatropha and Algae blend	50% one engine
 jetBlue	TBA	Airbus, IAE, Honeywell UOP	TBA	TBA	TBA

# The Way Forward

## Short-term priorities and current actions:

- |                                      |   |
|--------------------------------------|---|
| ↗ <b>Testing</b>                     | <b>First aircraft tests completed</b>   |
| ↗ <b>Specification</b>               | <b>Agreement with ASTM (Dec 09)</b>     |
| ↗ <b>Certification</b>               | <b>FAA: 2013, earliest 2010/2011</b>    |
| ↗ <b>Production</b>                  | <b>Process known and tested</b>         |
| ↗ <b>Blending with Jet A</b>         | <b>In evaluation</b>                    |
| ↗ <b>Logistic &amp; Distribution</b> | <b>Depending on blending capability</b> |

# The Way Forward - Challenges

## ➤ Certification

- How quickly can we get biofuels certified?

## ➤ Scalability

- How quickly can we get to commercial viability?<sup>1</sup>
- Optimistic Scenario: 2015
- Pessimistic Scenario 2021

## ➤ Uncertainties

- Cost
- Impact of oil price vs. carbon pricing



<sup>1</sup> Defined as the threshold that biofuels represent at least 1% of total fleet fuel use.

# The Way Forward – Role of States

## ➤ Certification

- Support / accelerate certification efforts

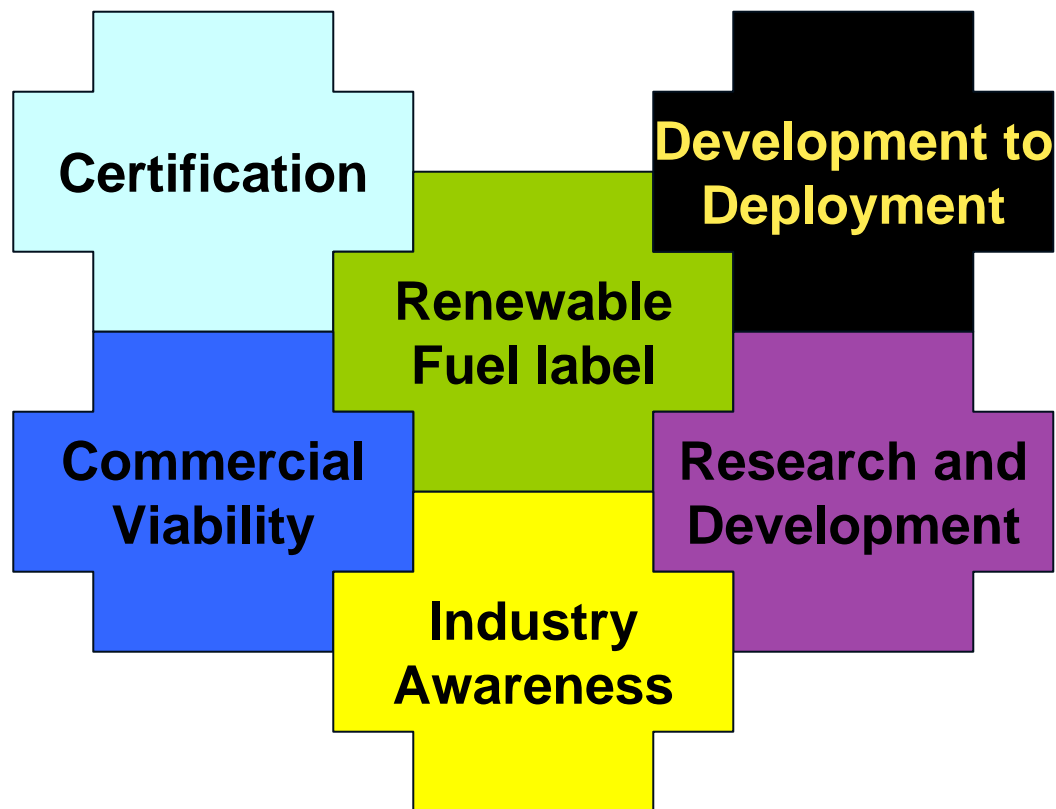
## ➤ Research

- Invest in R&D to explore / exploit biofuels development

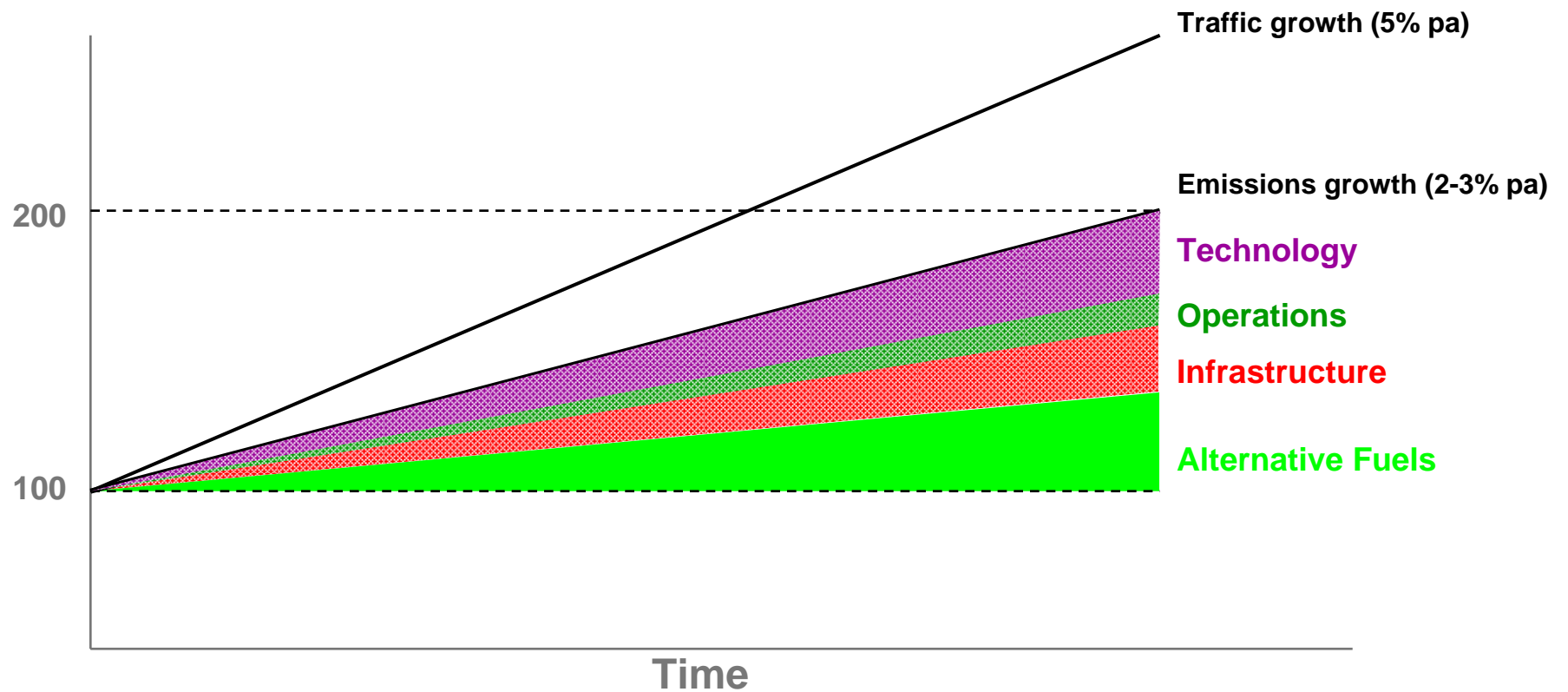
## ➤ Legal / Fiscal Frameworks

- Investment incentives
- Favourable tax regimes
- Low carbon recognition under ETS& similar schemes

# Alternative Fuel Strategy Elements



# Carbon Neutral Growth



# Conclusions

- **Aviation is perceived negatively with respect to climate change**
- **Alternative low-carbon energy sources are needed & available**
- **Complements work on technology, infrastructure and operations**
- **Bio-jet fuel looks the most promising**
- **Technologically proven**
- **Needs concerted stakeholder effort to certify, scale-up and commercialise**



**The Future's Bright  
The Future's Green!**





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