



# Sustainable Aviation Fuel

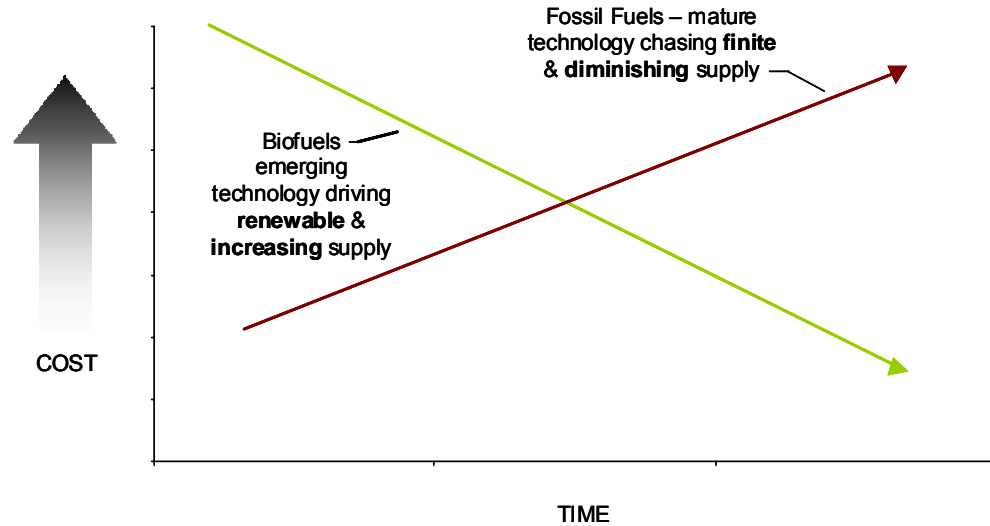
*General Overview*

*June 2010*

# Sustainable Aviation Fuels Drivers

## Challenge:

Fuel price and availability

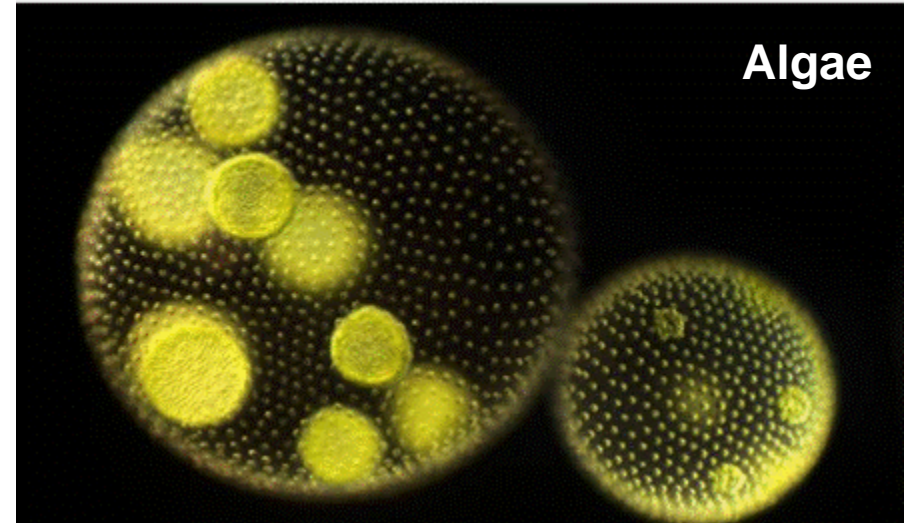


## Challenge:

Greenhouse gas emissions



# Viable and sustainable feedstock alternatives



*Viability is based on timing, technology and local resources*



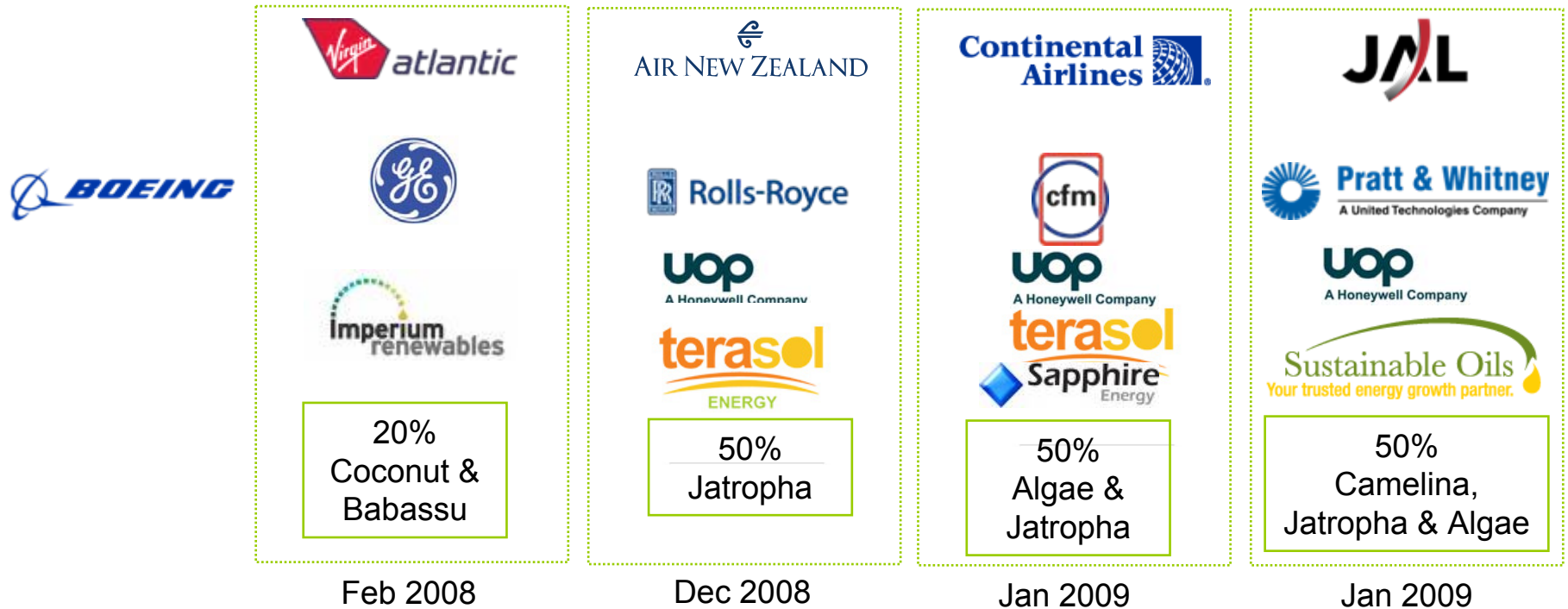
# The Industry Can't Afford New Infrastructure

- Meets jet fuel performance requirements
- Requires NO change to airplanes or engines
- Requires NO change to fuel distribution or handling systems
- Can be mixed or alternated with Jet-A fuel



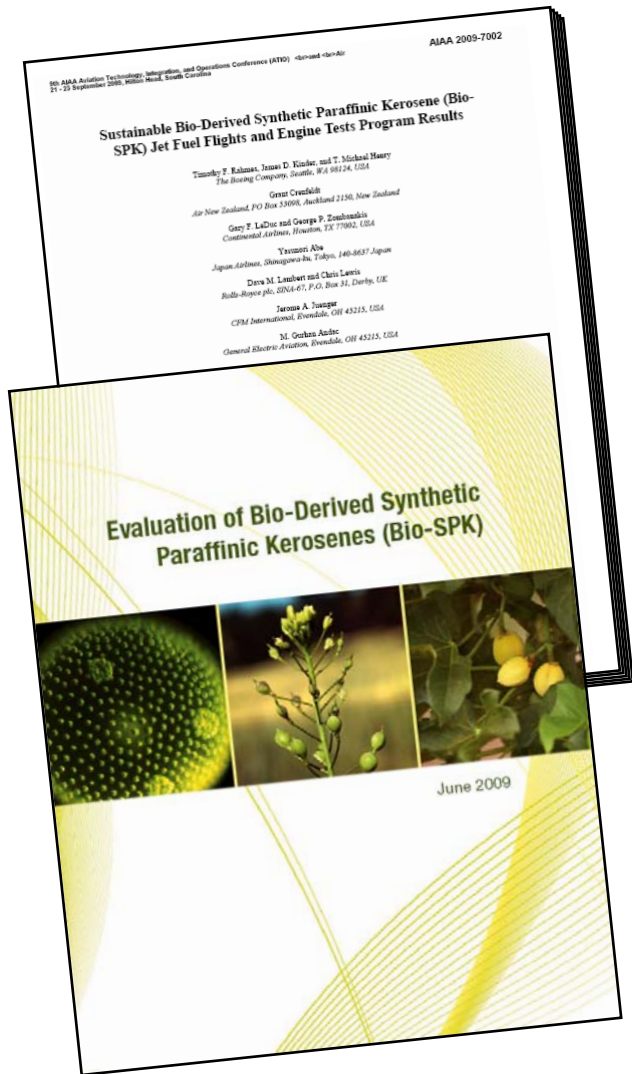
# Flight Tests Demonstrated Biofuel Viability

- ✓ Demonstrated technical feasibility
- ✓ Identified sustainable biofuel sources
- ✓ Promoted development of viable commercial markets
- ✓ Demonstrated diverse engine / airframe combinations



Increasing level of test objectives

# Flight Certification in 2010



- Paris Air Show executive summary – June
- AIAA technical conference – September
- Full Research Report – Early 2010
- Excellent fuel properties
  - Lower freeze point
  - Higher thermal stability
  - Higher energy content
  - Lower particulate emissions
- Targeting fuels approval in 2010

**All tests either met or exceeded expectations – fuel is superior**

# Reputational and Regulatory Drivers Mean Aviation Must Lead on Biofuel Sustainability Issues

Industry Approach: Create Sustainable Aviation Fuel Users Group

GOAL: Speed the creation of a viable market mechanism

Members using their fuel purchase power to drive commercial viability

- ☑ Sustainability MRV systems in place
- ☑ Technology/agronomy/plant science in place
- ☑ Fuel processing technology in place
- ☑ Viable feedstock and processing developers in place

  
AIR NEW ZEALAND

  
JAL

 QANTAS

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KLM

 TUI fly.com

  
ANA  
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cargolux

  
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BRITISH AIRWAYS

  
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AIRBUS

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ETIHAD AIRWAYS

  
GOL

  
TAM

<http://www.safug.org>

# Need to Avoid A Patchwork of Incompatible Biofuel Sustainability Standards



**Roundtable on Sustainable Biofuels is Most Credible and Accepted Process for Global Sustainability Standards Setting**



# RSB Standard

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- Comprehensive certification system
- Based on global sustainability requirements developed and approved through a multi-stakeholder process
- Address areas of concern - deforestation/land use, ghg emissions, social/labor, etc.
- Applies to all feedstocks and enables geographic and crop specific adaptations
- Not just aviation - all fuels...
  - **But Secretariat has recognized aviation's leadership in this area and is adjusting RSB's activities to use air as pioneers**
  - **Big opportunity to shape programs/criteria to work for aviation**

# RSB Members

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- Addax Bioenergy
- Airbus
- Amigos da Terra    Amazônia Brasileira
- Applied Environmental Research Foundation (AERF)
- Argentine Renewable Energy Chamber
- Associated Labour Unions-Trade Union Congress of the Philippines (ALU-TUCP)
- Bio-Partners
- Biogreen Oil
- Biojet Corporation
- Conservation International
- Cosmo Biofuels
- Fundacion Solar
- GOL
- Greenergy International
- Gulf Air
- Honeywell - UOP
- Lufthansa
- National Center for Appropriate Technology
- National Soybean Board –
- National Wildlife Federation
- Natural Resources Defense Council
- Neste Oil Corporation
- Oeko Institute
- Pace Energy & Climate Center
- Pangea
- Philippine Network of Rural Development Institutes
- Shell International Petroleum Limited
- Sierra Club
- Sustainable Biodiesel Alliance
- TAM
- The Boeing Company
- The Energy Research Institute
- The International Union for Conservation of Nature (IUCN)
- The National Union of Plantation and Agricultural Workers Uganda
- Trowel Development Foundation, Inc.
- UNCTAD
- Unica
- UNEP
- United Nations Foundation
- University of California, Berkeley
- Verno Systems, Inc.
- Commission for the Verification of Codes of Conduct
- WWF International

# RSB Structure & Process

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- **Multi-stakeholder process**

- Chamber structure: Farmers, biofuel producers, blenders, NGOs, governments, academia, financial institutions, trade unions, etc.
- Regional consultations across the globe with around 900 participants from more than 15 countries
- Boeing, other ATAG members active on transportation council

- **Consensus-driven**

- Chambers, Steering Board, Consultations

- **Strong focus on Governance & Transparency**

- **Applies globally - Regional adaptation possible**

- Not meant to undermine/replace regional work. Seek to complement, harmonize.
- Uses general terms such as 'significant' to remain flexible

- **Applies to liquid biofuels**

- Covers the entire biofuel chain of custody - feedstock production & processing, biofuel production, blending

# Benchmarking

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- **Benchmarking of other sustainability standards**

- Develop a benchmark architecture/framework for multiple and different sustainability & social standards
- User friendly tool, open source & open architecture
- Developed in conjunction with multiple project partners (ISEAL, Rainforest Alliance, private sector)
- Field & pilot testing

- **Regulatory benchmarking**

- Focus on specific regions and countries: Latin American countries, US Pacific Northwest, EU, Mozambique, Australia & NZ, China, Japan

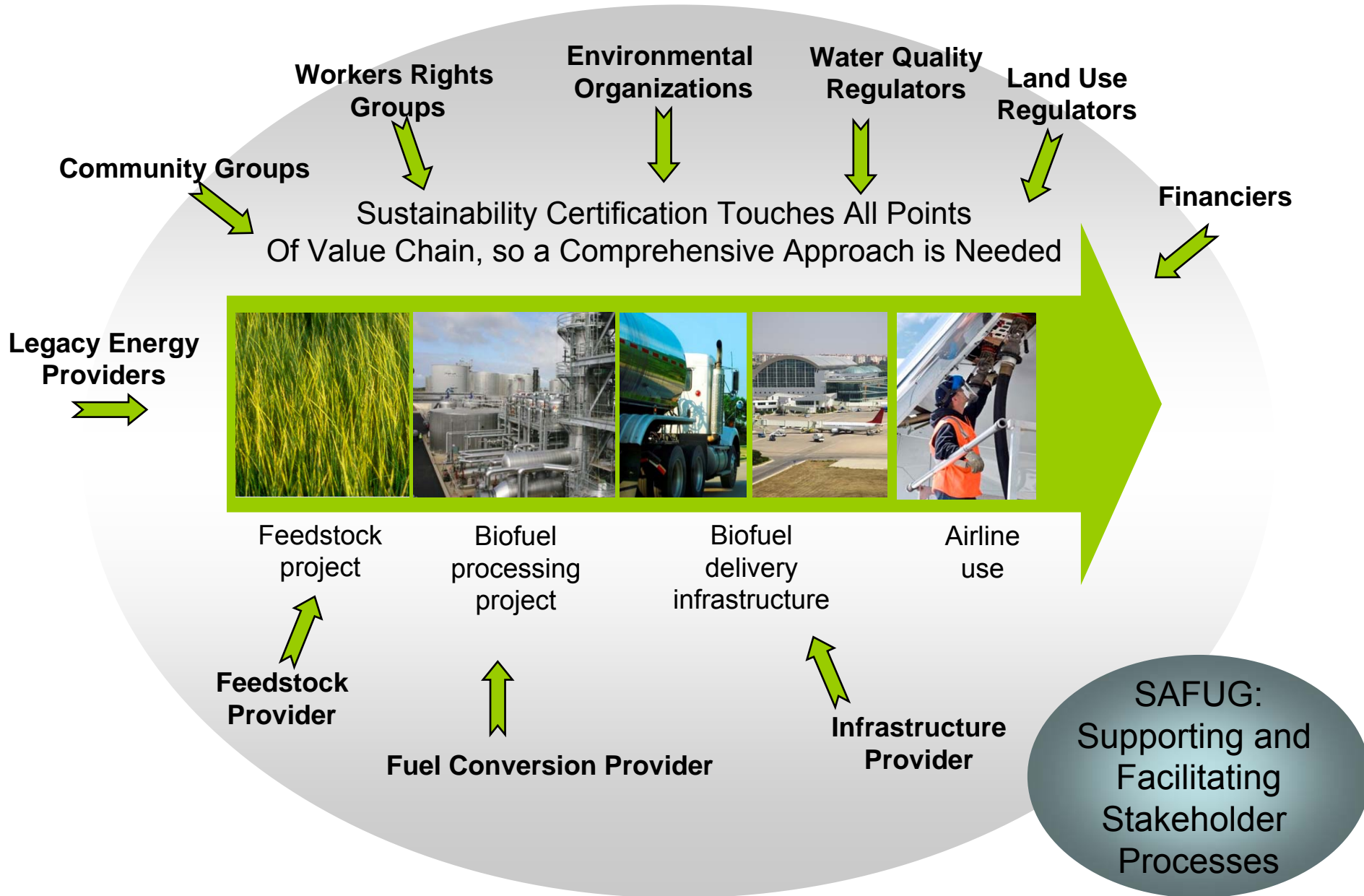


# Recent updates

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- **40 pilots projects underway worldwide- completion end of 2010**
- **Benchmarking ongoing**
- **June 2010: EU Commission sets up system for certifying sustainable biofuels**
  - RSB applying for recognition
- **Australia- legislation recognizes RSB**
- **ICAO expressed support at conference in Brazil 10/2009**

# A Comprehensive Effort Is Needed Benchmarking / Roadmapping is Underway



# All Regions are Active

- Finding effective regional solutions
- Airline led initiatives supported by SAFUG and stakeholders
- Connecting global efforts to share best practice from regions



**Payoff: Solid Platform to Help Launch A New Global Industry**