



Challenges to alternative ● aviation fuels - Policy makers' perspectives

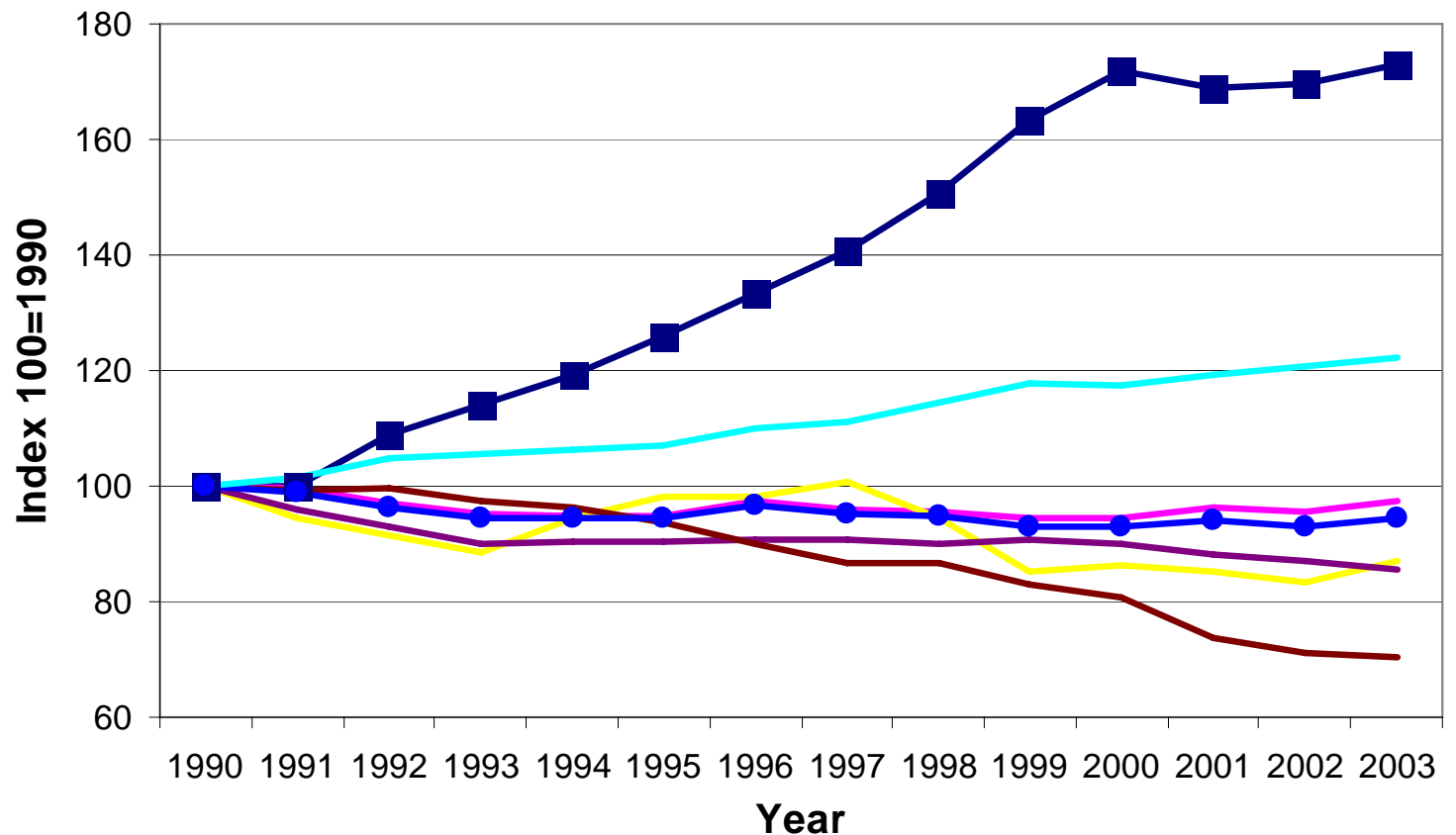
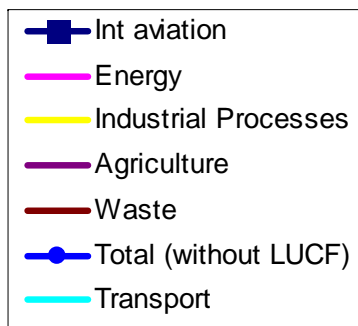
ICAO Workshop on Aviation and
Alternative Fuels, 10-12 February 2009

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Transport – Unit for the Single Sky and Modernisation of Air
Traffic Control
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11/02/2009

Why address aviation emissions?

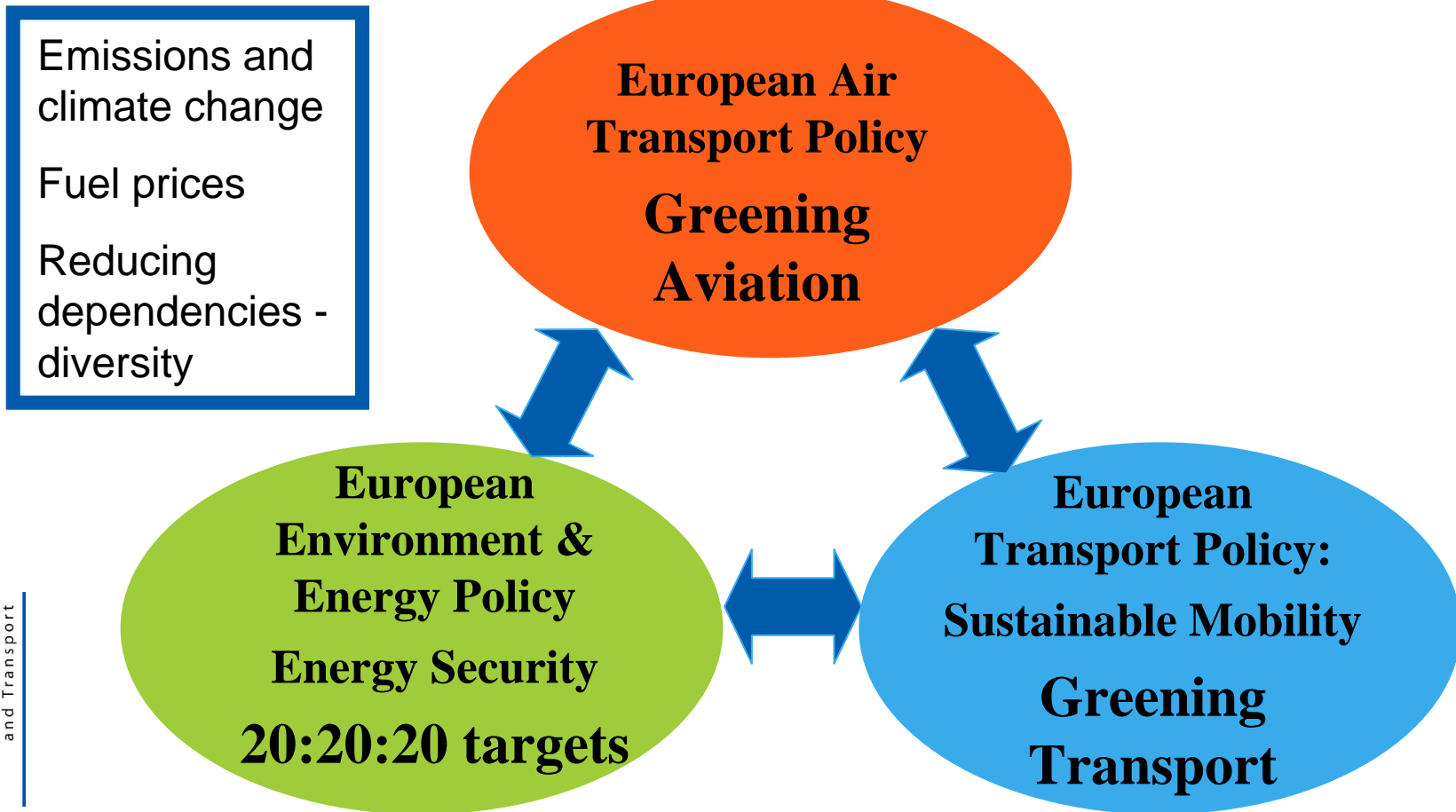
EU GHG emissions by sector as an index of 1990 levels



● Climate change context

- EU objective to limit temperature increases to 2°C
- EU has assumed leadership role:
 - » Firm independent commitment to achieve at least 20% GHG emission reductions by 2020, compared to 1990 levels
 - » Commitment to cut emissions to 30% below 1990 levels by 2020 in event that other developed countries make comparable commitments under a future global agreement

● Where to place alternative aviation fuels?
EU Energy and Transport policy background



● European Environment & Energy Policy

● **Security of supply:**

- » Infrastructure for energy supply
- » Diversification: **Renewable energy sources**
 - **Includes transport: Biofuels**

● **20:20:20 targets by 2020**

- » Minus **20%** greenhouse gas emissions
- » Improve energy efficiency by **20 %**
 - Incentives through Emissions Trading Scheme
 - Directive on energy performance of buildings applies
- » **20 %** market share for renewable energy sources
 - **New Renewable Energies Directive: 10% biofuels in transport**

● European Transport Policy

- **Greening Transport:**
 - » Commission Communication of 8 July 2008
 - » Contribution to the 20:20:20 targets
- **Problems to tackle:**
 - » Climate change – greenhouse gas emissions
 - » Local pollution
 - » Noise
 - » Congestion
 - » Accidents – safety
- **Strategies:**
 - » Getting the prices right – internalisation of external costs
 - Charging – Taxes - Emissions Trading System
 - » Targeted combination of legislation, infrastructure development, R&D and economic measures
- **No single instrument/measure sufficient to solve the problems!**

● European Air Transport Policy

- The EU's "comprehensive approach" to aviation's environment/climate change impact
 1. New Standards
 2. Support for Research and Development of New Technology
 3. ATM Modernisation
 4. Market-Based Measures
 5. International co-operation

● ATM Modernisation: Single Sky Policy

- Objective: to build in Europe a single airspace continuum with a single regulatory framework
- **Reduce fragmentation of airspace and ATM in Europe**
 - » Significant additional costs for airspace users (€ 1 Billion in 2007) due to non-optimised airspace design and air traffic management
 - » Air – ground integration needed, including airports
- **Improve environmental footprint of aviation**
 - » Aviation's share of EU greenhouse gas emissions (currently 3%) is predicted to increase
 - » Average flight route 50 km too long: CO2 5 Mil Tons
 - » Improved ATM & airport operations could reduce emissions by 7-12% per flight

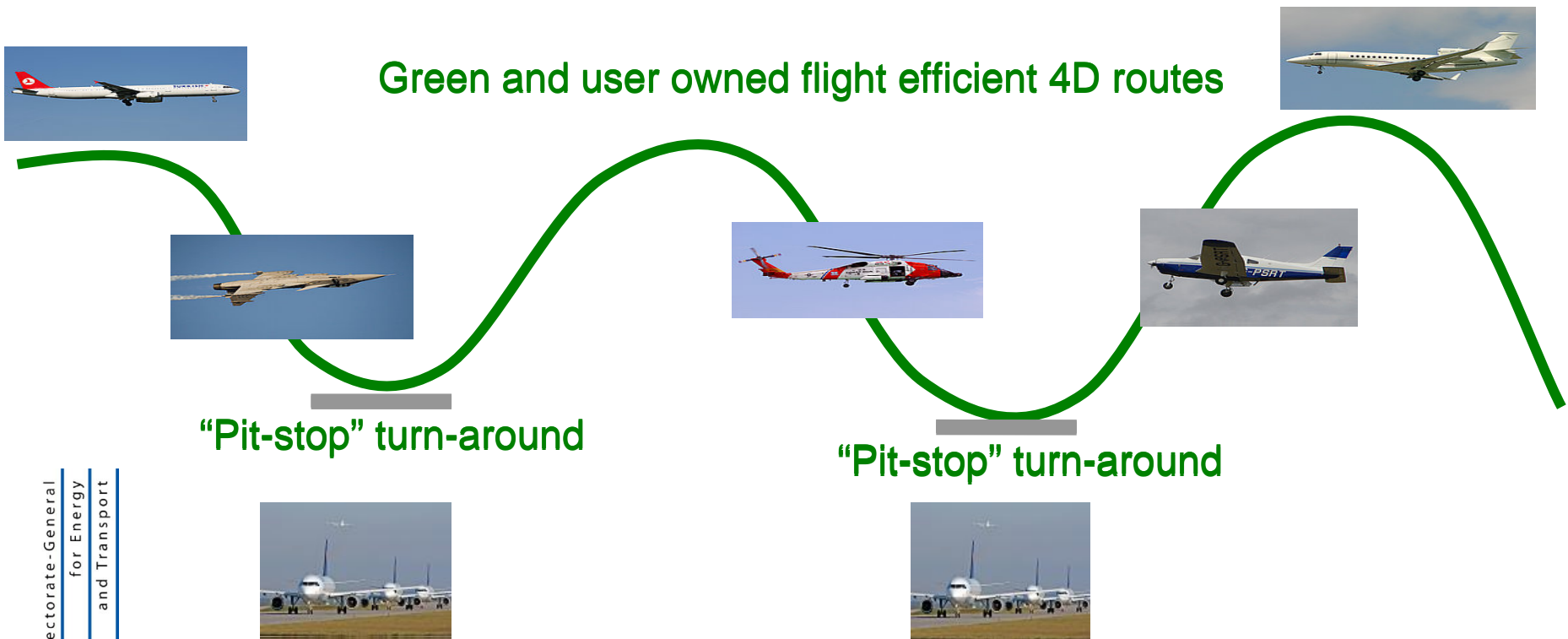
● SESAR: technological component of the Single Sky policy

- SESAR – Single European Sky ATM Research a comprehensive approach to traffic management, innovation and technology
- **Performance based approach**
 - » More efficient services (optimal use/increase of capacity)
 - » Reduce environmental impact
 - » Reduce costs
- **Expected environmental gains per flight: 10%**
- Stricter application of environmental constraints (e.g. noise abatement procedures)
- « **Safety first** »
- **ATM Master Plan:** roadmap 2009-2020
- **Public Private Partnership** with industry and Eurocontrol

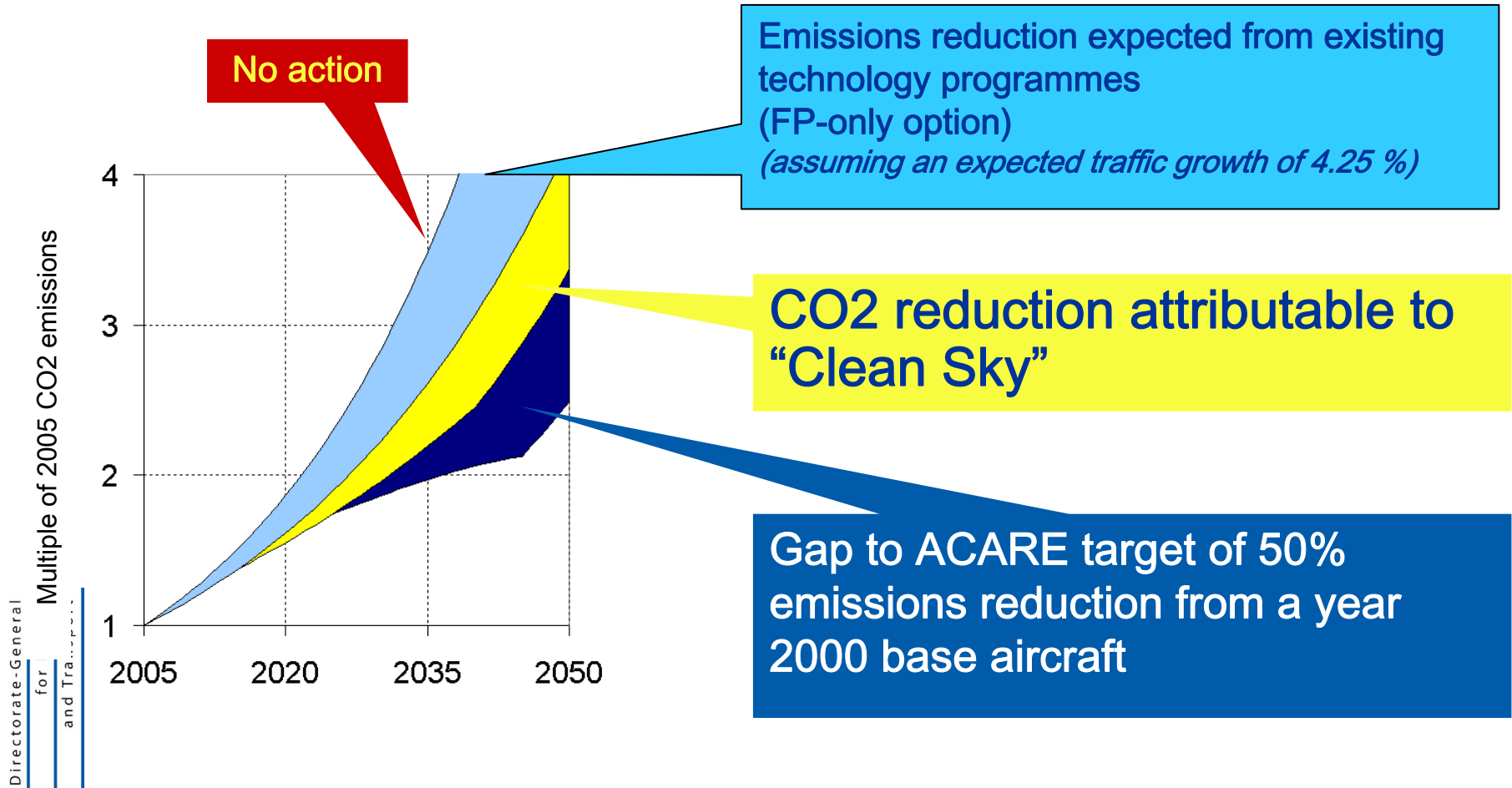


● Flight efficient ATM services

Business and Mission 4-D Trajectories
EnRoute-to-EnRoute



- Objective and industry commitment: minus 50% energy consumption and emissions (ACARE)



● Research & Development:

- **“Greening” aviation** and environmental research in the 7th EU Research Framework Programme (2007-2013)
- The **“Clean Sky” Joint Technology Initiative**
 - » Partnership EU-Industry
 - » 7 year lifespan to 2014
 - » €1.6bn budget - largest project ever financed by EU Framework Programmes
 - » 6 Integrated Technology demonstrators, including
 - Green engines
 - Systems for green operation
 - » Benefits
 - Accelerate delivery of new green technologies
 - Increase competitiveness of European industry
 - Encourage international aviation to follow suit
- **Energy research**: 2nd/3rd generation biofuels, CCS, hydrogen, poly-generation

● Economic – market base measures: The EU Emissions Trading Scheme (ETS)

- Central pillar of EU Climate Policy
- Applicable since 1 January 2005
- Covers more than 10,000 energy intensive installations
- Covers around 2 billion tonnes of CO2 emissions - 50% of EU's total emissions
- Implementation is taking place in phases with initial focus on CO2 from big industrial emitters
- **New: Covers flights to and from EU airports from 2012**
 - » **At the start of the scheme: 85% allowances free/through benchmarking, 15% auction**
 - » **Revenues from auctioning should be reinvested in emission reduction, climate change mitigation, R&D**
 - » **Biofuels count “0”**

● Why include aviation in the EU ETS ?

Emissions trading is

- Lowest cost instrument with pre-defined environmental outcome
- Endorsed by ICAO and compatible with the Chicago Convention and existing bilateral air services agreements
- Preferred option for the air transport industry and allows aviation sector to grow
- Third country provisions and complementary action at international level
- Estimated impact: reduction of over 190 Million tonnes of CO2 annually by 2020 compared to business as usual

● NOx emissions

- Commission commitment to European Parliament and Council to issue a proposal to address climate change impacts of aviation NOx emissions
- Shortlist of options examined:
 - (1) LTO NOx charge
 - (2) LTO NOx charge with distance factor
 - (3) En route NOx charge
 - (4) LTO NOx emissions standards
 - (5) Inclusion in ETS
- All options under active consideration

Biofuels in the new Renewable Energy Directive

- **Binding national targets** 2020 for renewable energy shares + indicative trajectory towards targets per Member State
- **10% renewable energy in transport** target confirmed (domestic production and imports)
- **Sustainability criteria** and monitoring for biofuels
- Member States national action plans – in 2010
- Monitoring and reporting mechanisms
- System of cooperation and flexibility mechanisms with Member States or third countries and “statistical transfers” between Member States to help reach targets cost effectively

● Sustainability criteria 1

● **General sustainability criterion:**

- » Minimum requirement for GHG saving, relative to fossil fuel, of at least 35%, **50% in 2017 (60% for new installations)**

● **Land with good agricultural and environmental condition:**

- » No general rules - 'Cross-compliance' rules in the EU's common agricultural policy will apply;
- » Reporting requirements to be defined;

● **Land with high carbon stock:**

- » Land use change (positive and negative) is counted in the greenhouse gas calculation

● Sustainability criteria 2

- Land with high biodiversity value: No raw material from:
 - » forest undisturbed by significant human activity
 - » highly biodiverse grassland
 - » nature protection areas (unless compatible with nature protection)
- Social sustainability
 - » Labour standards
 - » Food security
 - » Reporting to be defined

● Questions and requirements for alternative fuels 1

- In addition to safety and operational requirements...
- They must contribute to sustainable aviation and environmental – emission reduction objectives
 - Reduce environmental footprint of aviation
 - Lifecycle – sustainability criteria
 - Emissions in high altitudes
- Where are we in the development of alternatives?
What is the time horizon?
- Is sufficient supply available?: sources/feedstock, production, logistics, local supply...

● Questions and requirements 2

- **What is the market & business environment?**
 - » Is there a positive business case along the supply chain?
 - » Incentives for industry
 - » Energy supply - distribution
- **Links – interaction with other measures**
 - » ETS
 - » R&D
 - » Energy efficiency – ATM, airport & flight operations
- **Global dimension**
- **What role for policy makers?**

European Commission DG TREN: New feasibility study SWAFEA

- **establish a comparative analysis of alternative fuel options**
- **+ environmental + business case analysis;**
- **input to policy makers, suggest roadmap**

● Is there a need for a specific policy framework?

- Standardisation, certification
 - » Criteria
 - » Methodologies
- How to introduce possible alternatives in practice?:
 - » Environmental criteria – monitoring - verification
 - » Energy infrastructure, how to deal with variety of fuels, traceability
 - » Incentives for industry
 - » Steps in the innovation cycle
- Link and integration with other policy instruments
 - » ETS
 - » Renewable energies
 - » Security of energy supply
 - » R&D
 - » ATM
- International cooperation

Perspective today: Alternative fuels alone will not be sufficient to reach environmental objectives but might be able to provide an important contribution.



THANK YOU!

For more information :

http://ec.europa.eu/environment/climat/aviation_en.htm
http://ec.europa.eu/transport/air_portal/environment/index_en.htm