



ICAO

ENVIRONMENT

# SUSTAINABLE ALTERNATIVE FUELS FOR AVIATION

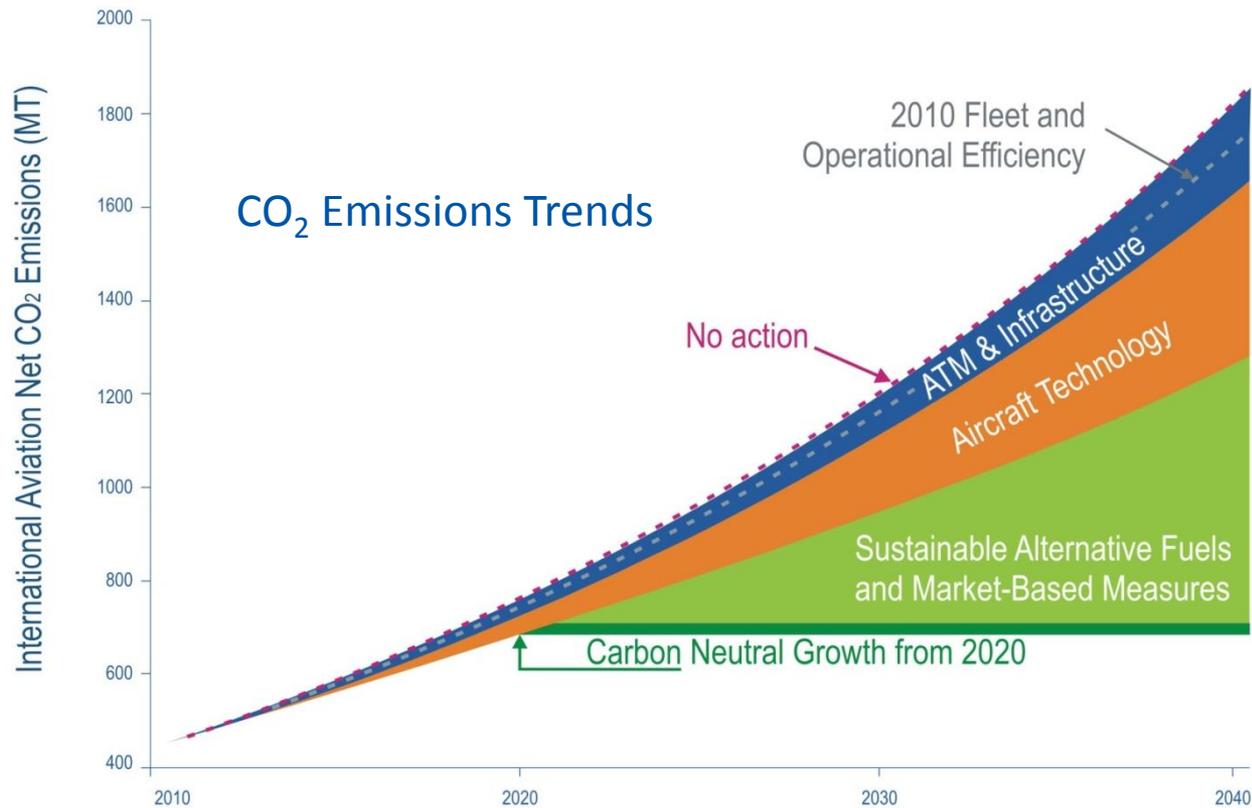
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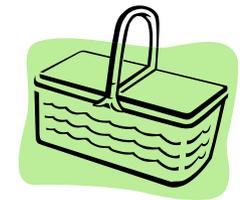


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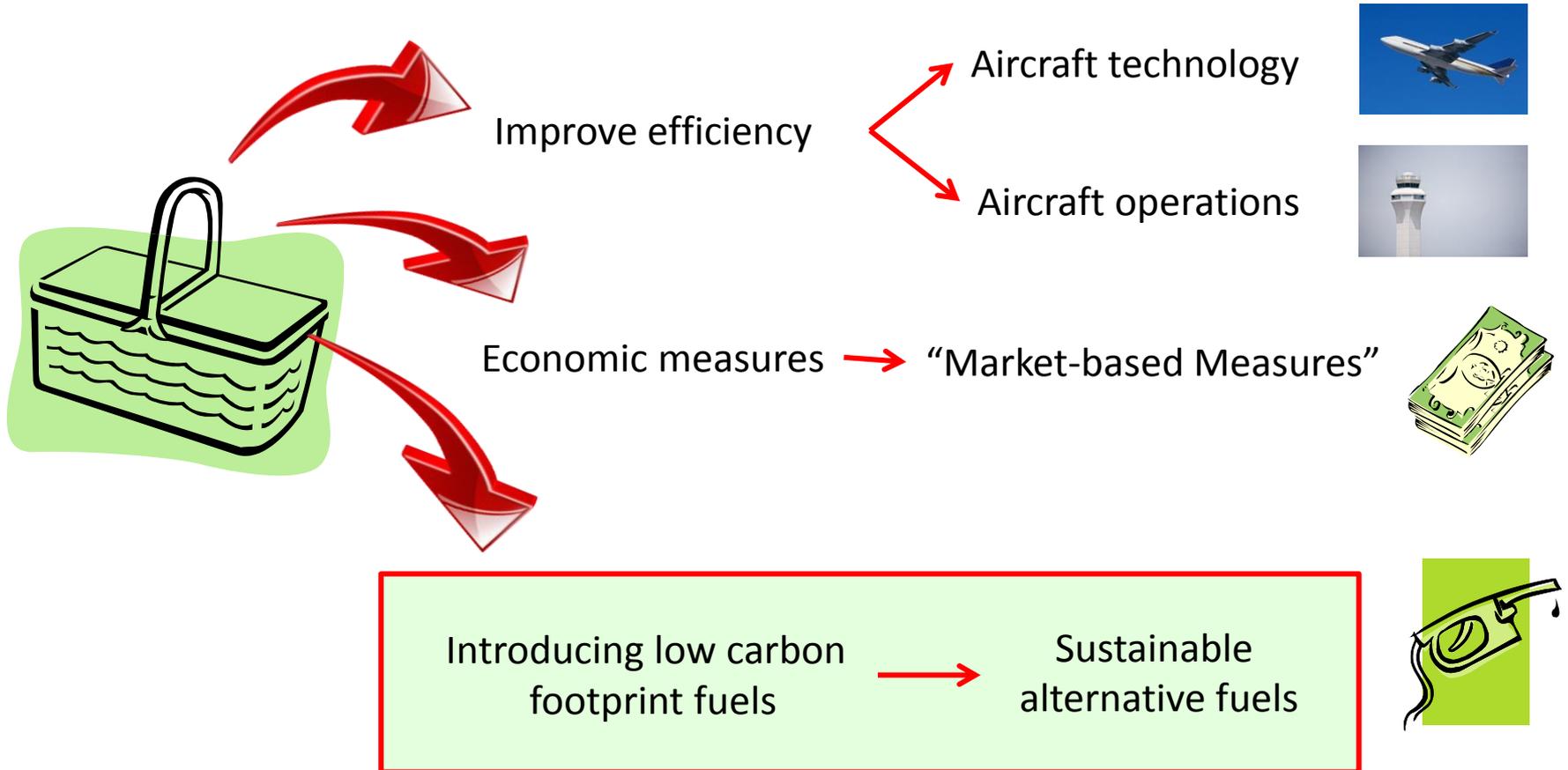
# Aspirational goals



“Basket of measures”



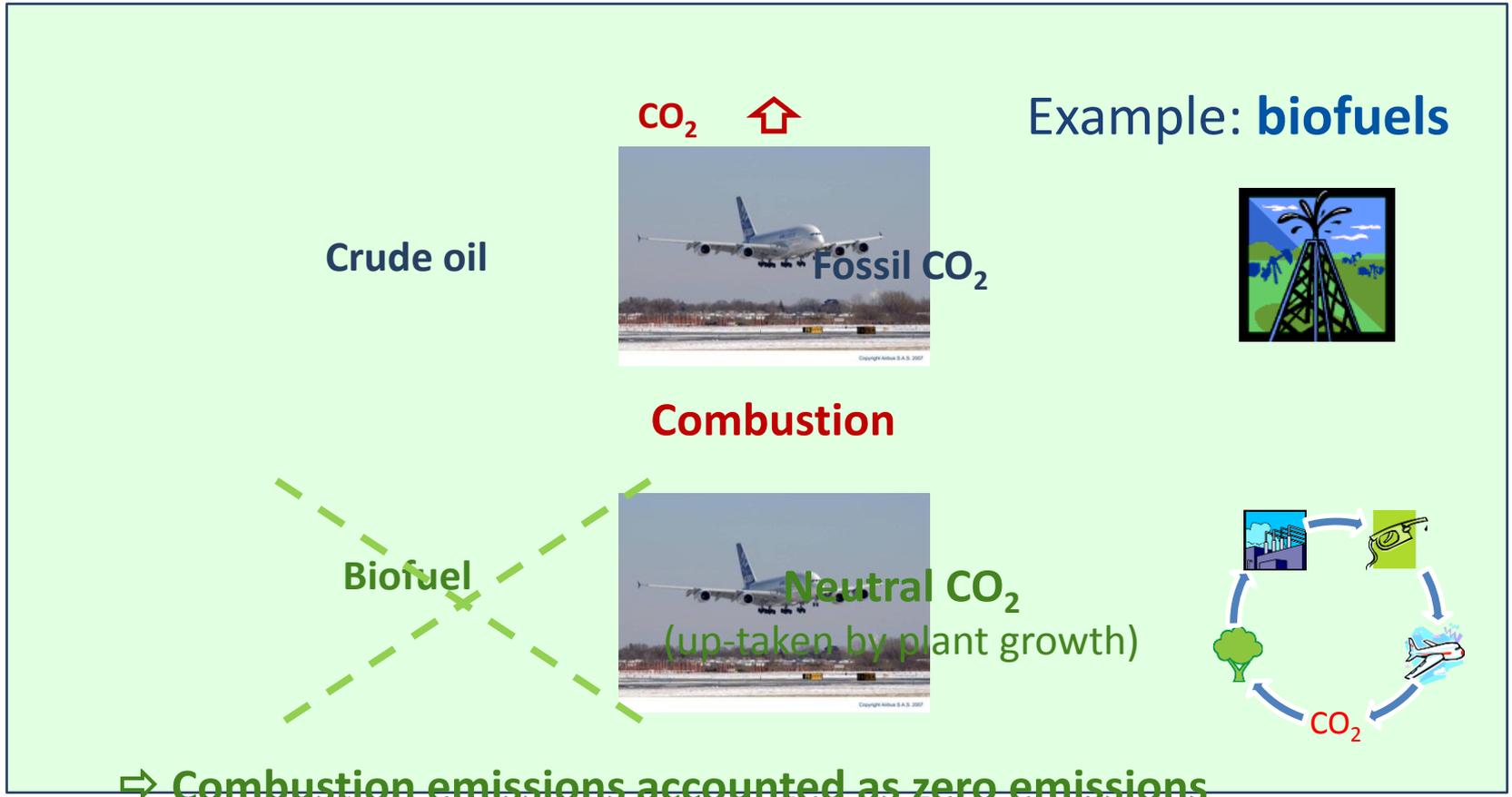
# Basket of measures



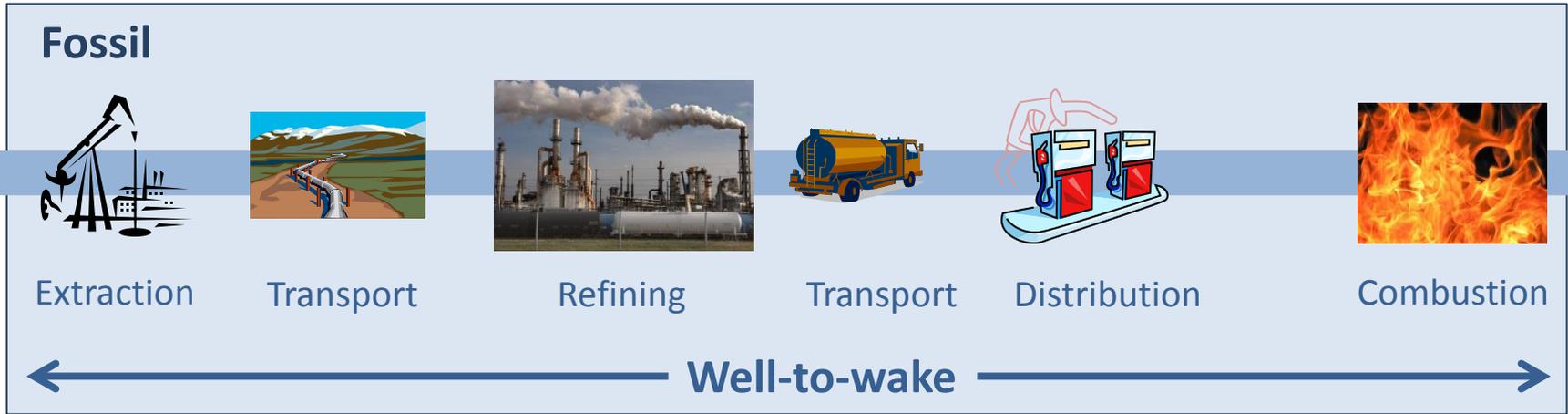
- **To reduce the carbon foot print of the fuel**
- **Without changing aircraft and infrastructure**
- Using **“drop-in”** fuels



# “Low carbon footprint” fuel



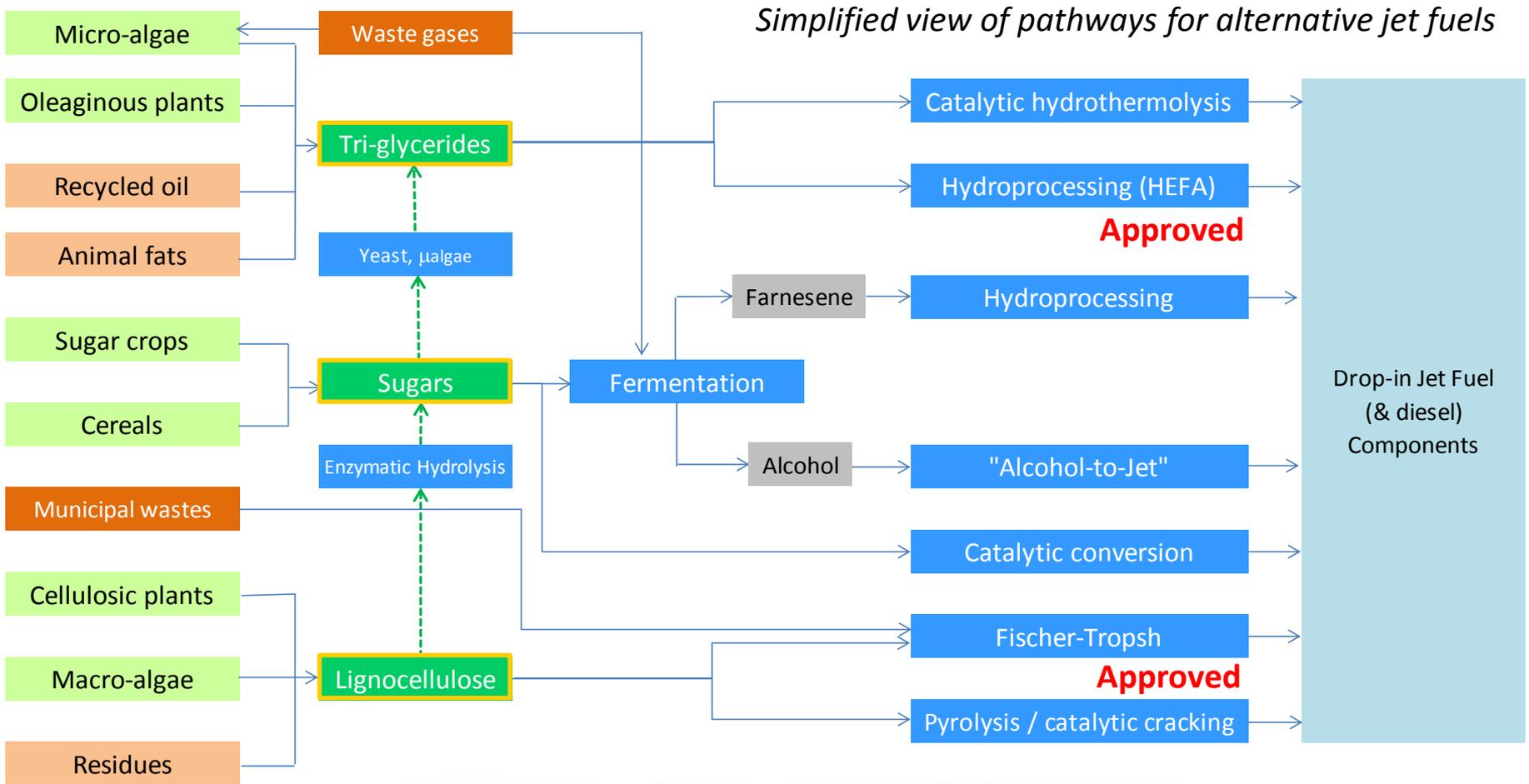
# Life cycle GHG emissions



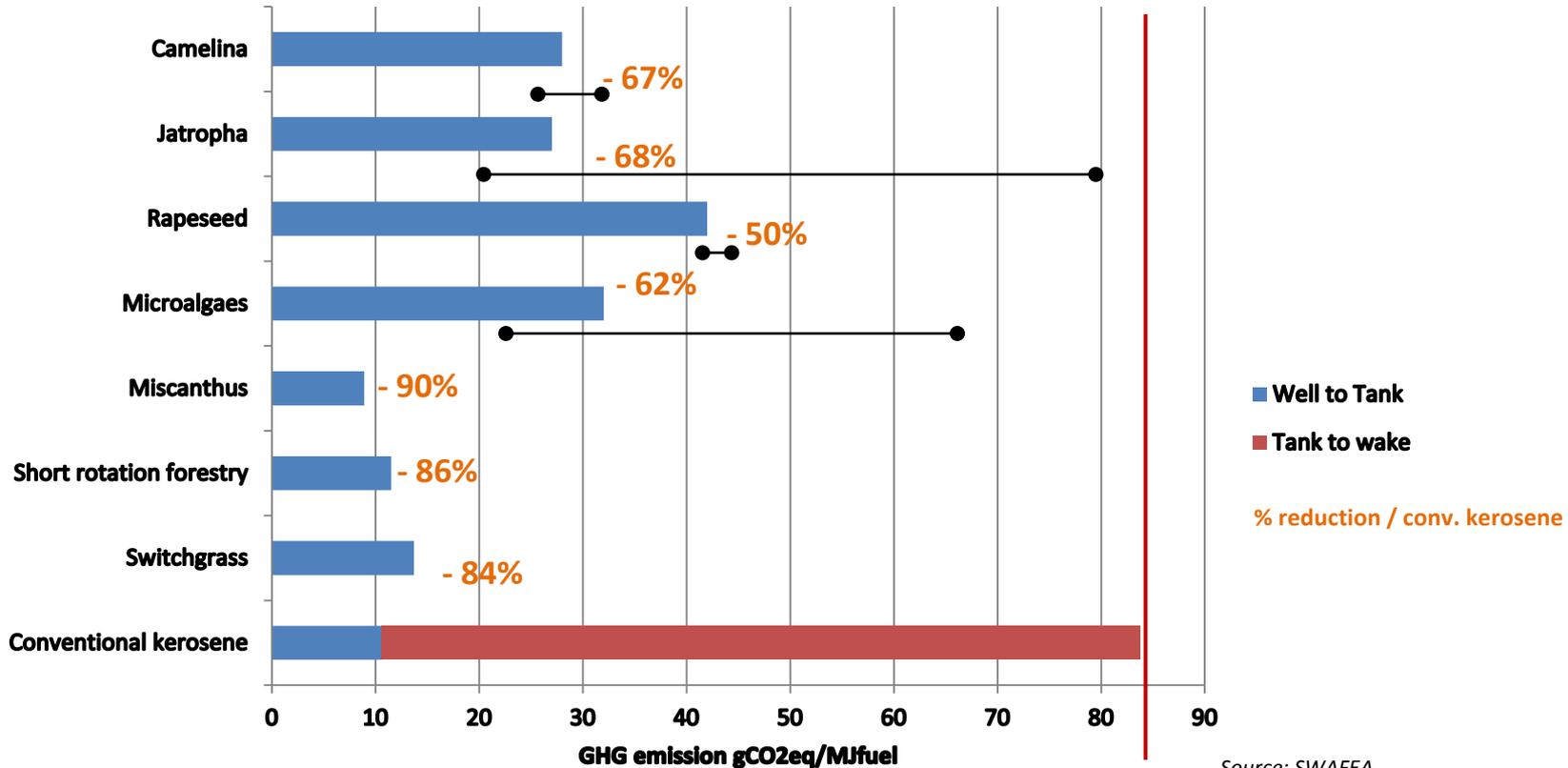
- **Biofuels used in road transportation are not suitable for use in aviation**
- **Severe constraints in use on aviation fuels**
  - Freezing point (- 47 °C)
  - Energy content
  - ...
- **Compatibility with existing system**  
⇒ **“DROP-IN” fuel**
- **Aviation fuels need to be approved**
  - ASTM, DEFSTAN,...
  - First alternative fuels approved in 2009 and 2011



# Pathways to sustainable fuels



## Potential GHG emissions of biofuels



\* with no land use change

● — ● Variation range (depending on cultivation conditions)



- **2 alternative fuel pathways approved**  
6 additional approvals underway at ASTM
  - **First commercial flights in 2011**  
More than 1500 flights by July 2012
  - **First regular flights initiated in 2013**
  - **First supply agreements signed by airlines**
- ⇒ **Feasibility is demonstrated, next step is to deploy**



- **Potential for significant emissions reductions**
  - Depends on feedstock type and cultivation, conversion process...
- **Emissions reductions achievable with existing aircraft**
- **Benefits will depend on:**
  - the availability of such fuels and the time profile of their deployment;
  - their actual lifecycle emissions reduction.
- **Challenges**
  - Decreasing production cost
  - Investment in feedstock production and conversion facilities
  - Ensuring sustainable deployment
  - ⇒ **Policy support from States is required**





**Resolution A36-22**  
Promote improved understanding

**Resolution A37-19**

**Rio+20: the ICAO's "Flightpath" Initiative**

**Resolution A38-18**

2007

2009

2010

2011

2012

2013

**Rio Conference**  
ICAO as a facilitator  
GFAAF Created

**Workshop**  
States, financial institutions and stakeholders

**ICAO SUSTAF Group**  
Input to Assembly



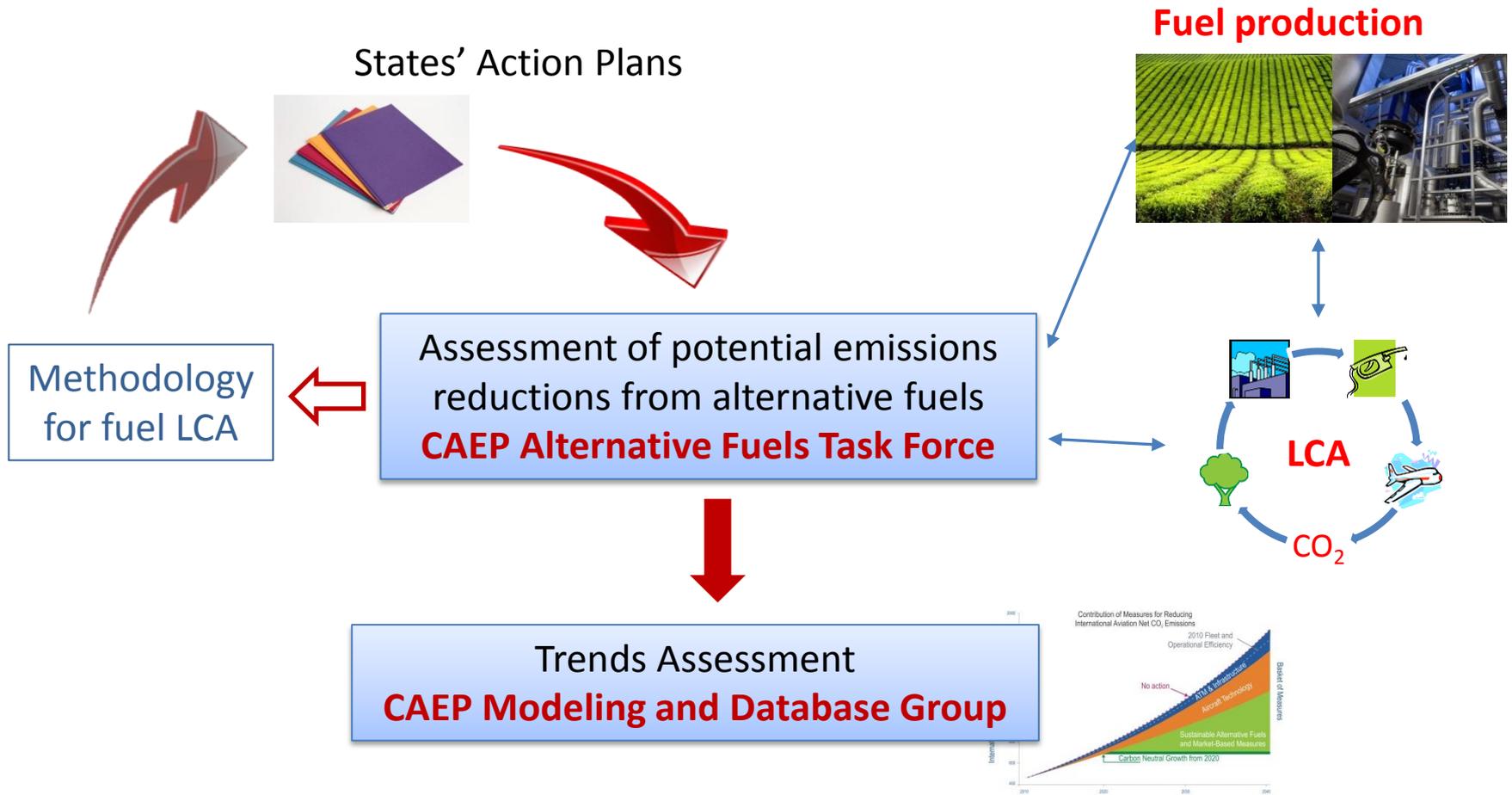
- **Development of coordinated national policy actions to accelerate the appropriate deployment of sustainable alternative jet fuels**
- **Measures to ensure sustainability of the fuels that should:**
  - Achieve net GHG emissions reductions on a life cycle basis
  - Respect areas of high importance for biodiversity, conservation and benefits from ecosystems
  - Contribute to local social and economic development, and avoid competition with food and water
- **Cooperation through ICAO to exchange information and best practices**
- **Need for increased harmonisation for sustainability**





- Member States, industry, financial institutions and other international organizations to actively participate in exchange of information and best practices and in further work under ICAO on sustainable alternative fuels for aviation
- Continue to maintain the ICAO Global Framework for Aviation Alternative Fuels (GFAAF)
- Collect information on progress of alternative fuels in aviation, to give a global view of the future use of alternative jet fuels and to account for changes in life cycle GHG emissions in order to assess progress toward achieving global aspirational goals
- Work with financial institutions to facilitate access to financing infrastructure development projects dedicated to sustainable aviation alternative fuels and incentives to overcome initial market hurdles





- **Promising solution but many challenges to address**
- **Cooperation among aviation stakeholders and with the energy sector is key, in particular to addressing sustainability and securing access of aviation to sustainable fuels**
- **International cooperation is the core of ICAO's activities**
  - Information/best practices sharing and dissemination
  - Global view to support decision making built on States' contributions





- Visit the GFAAF website  
<http://www.icao.int/environmental-protection/GFAAF/Pages/default.aspx>
- Read the SUSTAF experts group report (available on the GFAAF)
- Read Environmental Report 2013 chapter 4

ICAO > Environmental Protection > GFAAF

### ICAO Global Framework for Aviation Alternative Fuels

**Latest News**

The Australian Sustainable Aviation Fuels Initiative joins forces with the National aviation and aerospace association. 2013-08-12

EPA publishes the final 2013 rules for renewable fuels mandates 2013-08-07

The Global Framework for Aviation Alternative Fuels (GFAAF) was launched at the [ICAO Conference on Aviation and Alternative Fuels](#) in 2009 as part of ICAO strategy to support solutions that reduce aviation contribution to climate change.

It provides a continuously updated database about activities and development in the field of alternatives for aviation, as well as useful documentation and links, to support information sharing and dissemination for the benefit of aviation fuels community.

**New!** ICAO's SUSTAF Expert Group Report (May 2013):  
The Challenges for the Development and Deployment of Sustainable Alternative Fuels in Aviation

