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# AIRBUS Alternative Fuels

IFP Hopes and Issues

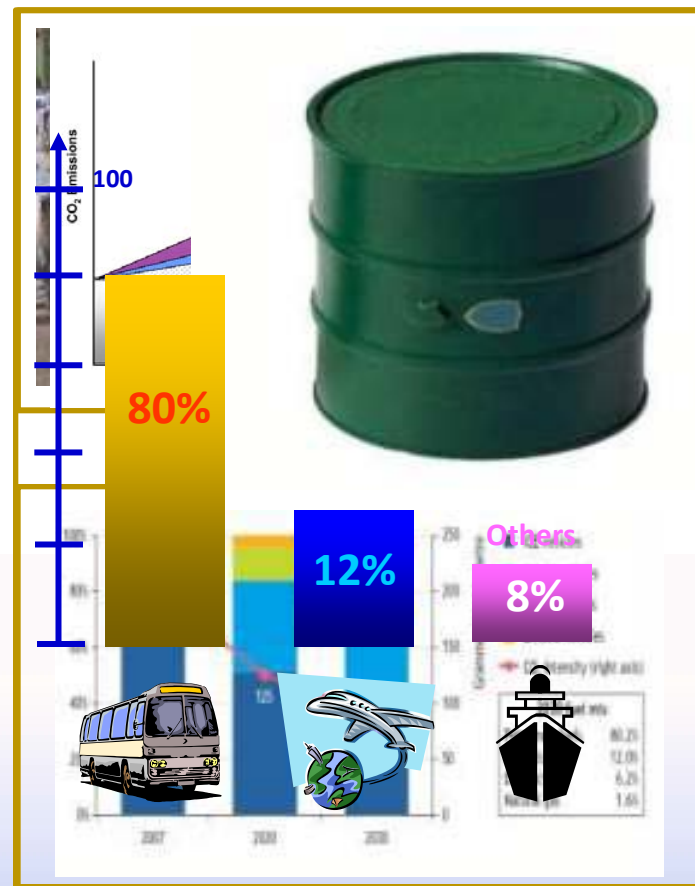


# Why bio-fuels for aviation ?

- **Attractive**
  - No infrastructure changes required
  - Drop-in fuel at any blend ratio
- **Important**
  - Potential for >50% CO2 reduction
  - High energy source – liquid fuel
  - Only mitigation option for aviation
  - Other modes of transport – choices

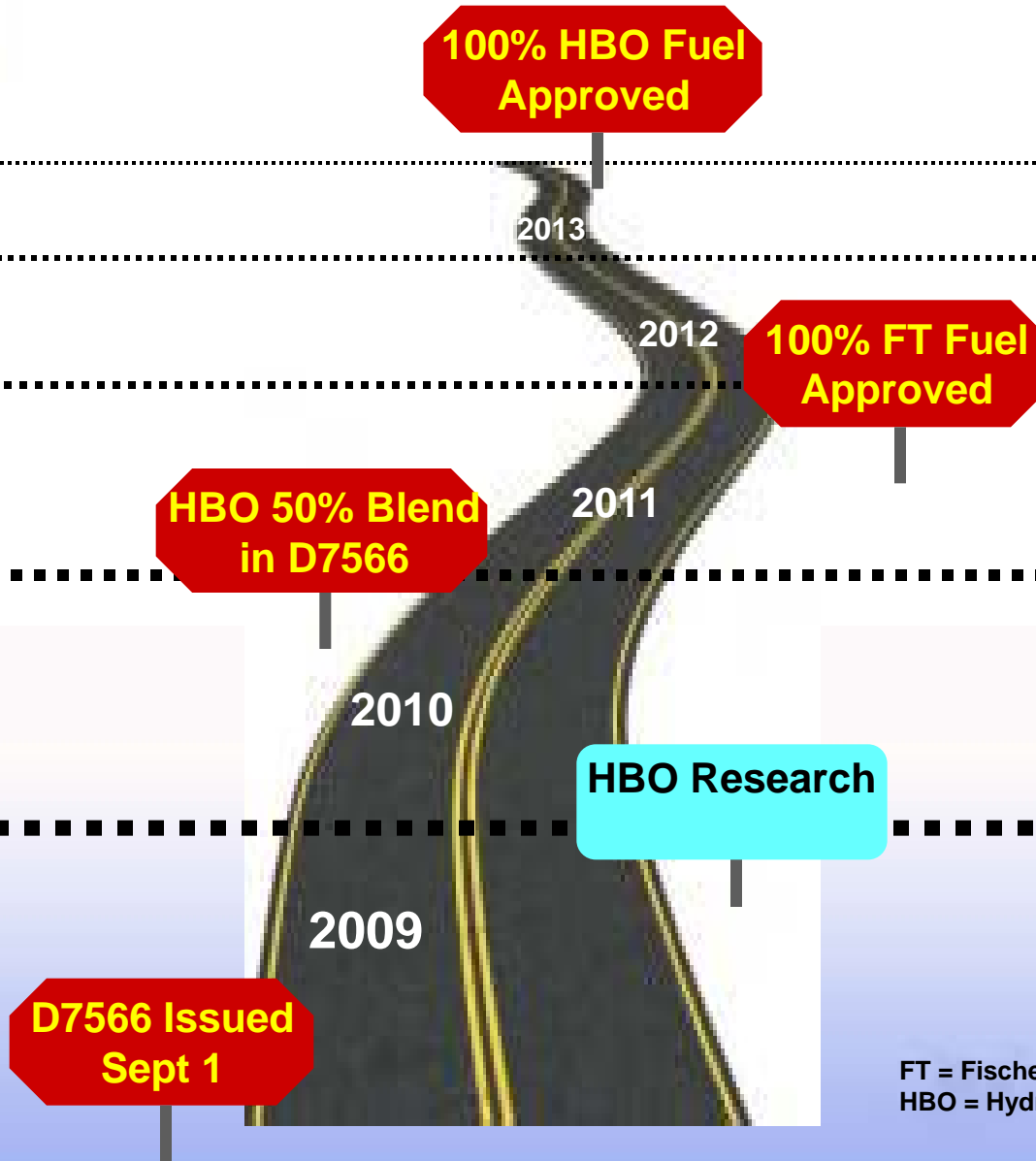
## Achievable

- **Achievable**
  - Relatively small fuel market
  - Manageable distribution
  - Sustainable!



Methods of transport by technology (IEA, Oct 2009)

# Approval Targets



FT = Fischer-Tropsch  
HBO = Hydrogenated Biomass Oils

# Hopes and Issues

**Alternative Fuels work!**

**Market based measure should partly finance R&T**

**Bio Fuel Commercialisation is 7 – 10 years away – too slow**

**Reduction of Aviation emissions requires investments in innovation**

**Biofuel availability in Europe is limited even for testing**

**30% Biofuel by 2030**

**Cross-Industry collaboration is essential**

**Aviation has limited solutions (Biofuels)**

**Missing common sustainability analysis Why invest?**

**Other industries have alternatives**

**Airlines are ready to use Bio Fuels**

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# What are the options?

		TYPE					Non "Drop-In"
		Conventional Jet Fuel ("Kerosene")	Alcohols	Bio Esters	Syn. Fuels	Hydrogenated bio-mass	Cryogenic Fuels
CATEGORY	Non-Renewable (Fossil)	Jet Fuel ✓			CTL GTL Exist ✓		Liquefied Natural Gas  ✗
	Renewable		Ethanol 35% lower energy content ✗	FAME* 10% lower energy content Freezes at -5°C ✗	BTL Approved ✓	Hydrogenated Vegetable Oils Future ✓	Liquid Hydrogen Low energy content per unit volume, Availability, Infrastructure. ✗

\* FAME = Fatty Acid Methyl Esters

CTL, GTL & BTL = Coal, Gas or Biomass to Liquid