

Certification/Qualification

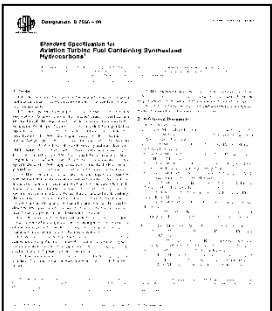
April 17, 2013



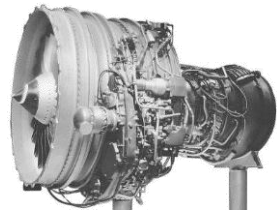
Mark Rumizen
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Airworthiness Regulations For Aviation Fuel

Regulatory Authorities Do Not Certify Fuel, They Certify Airplanes and Engines to Operate on Specified Fuel



ASTM Fuel Specification



Engine Operating Limitations

- Fuel Specification



Aircraft Operating Limitations

- Engine limitations Used for Aircraft



Aircraft Operator (Airlines) Operating Rules

- Must Adhere to Aircraft and Engine Limitations

Why is ASTM Approval so Important?

ASTM Qualification



**D7566 New Annex
Drop-In Fuel**



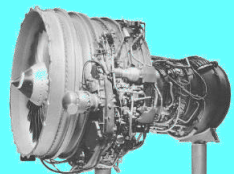
**New Spec
Non-Drop-In
Fuel**

**Unchanged
Operating
Limitation**

New Oper Limitation

**The Key to
Commercialization**

Airworthiness Certification



Re-Certify All Engines

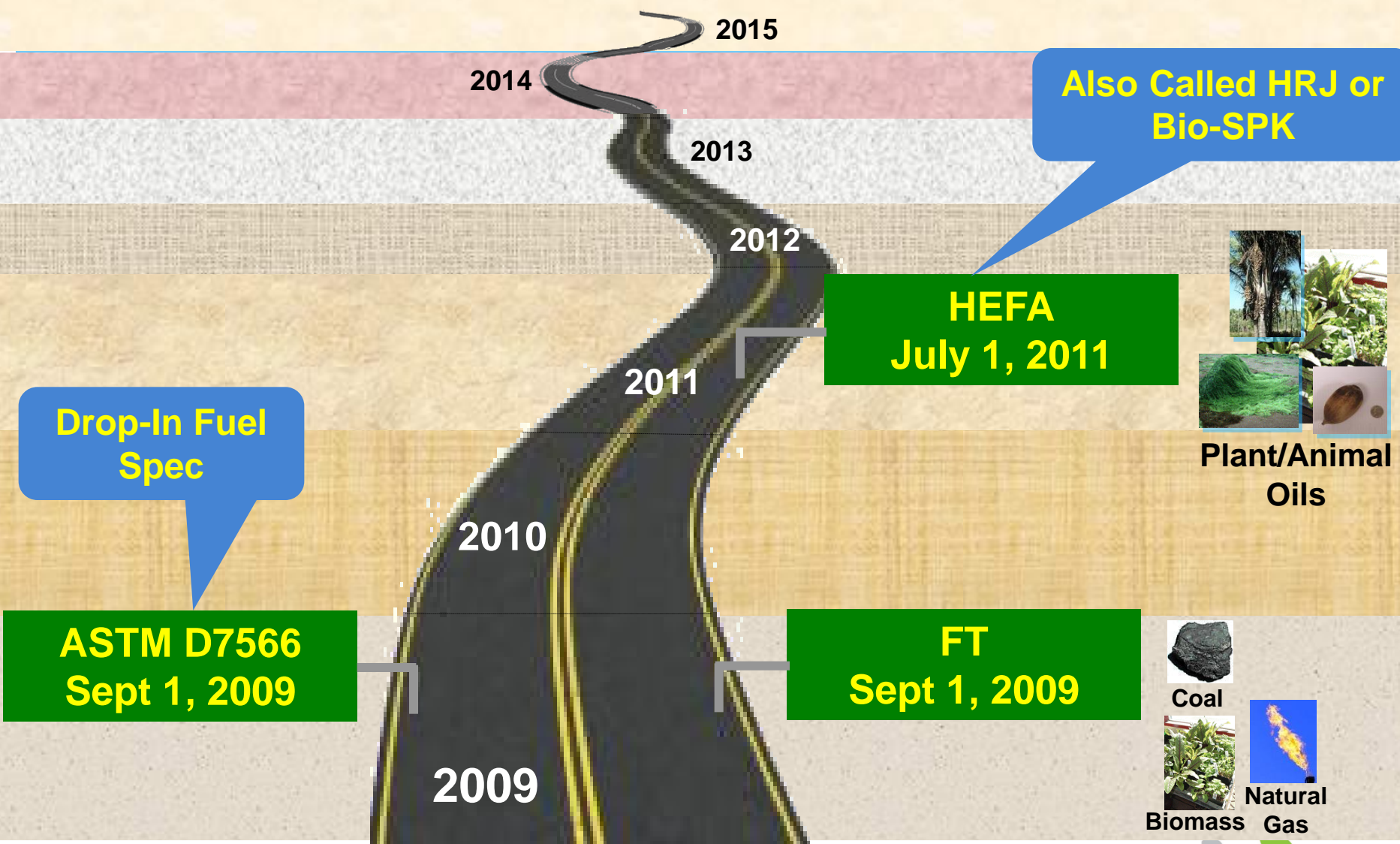


Re-Certify All Aircraft



**Approved for Airline
Operations**

Approved Alternative Jet Fuels



Drop-In Fuel Spec

**ASTM D7566
Sept 1, 2009**

**FT
Sept 1, 2009**

**HEFA
July 1, 2011**

Also Called HRJ or Bio-SPK



Plant/Animal Oils



Coal

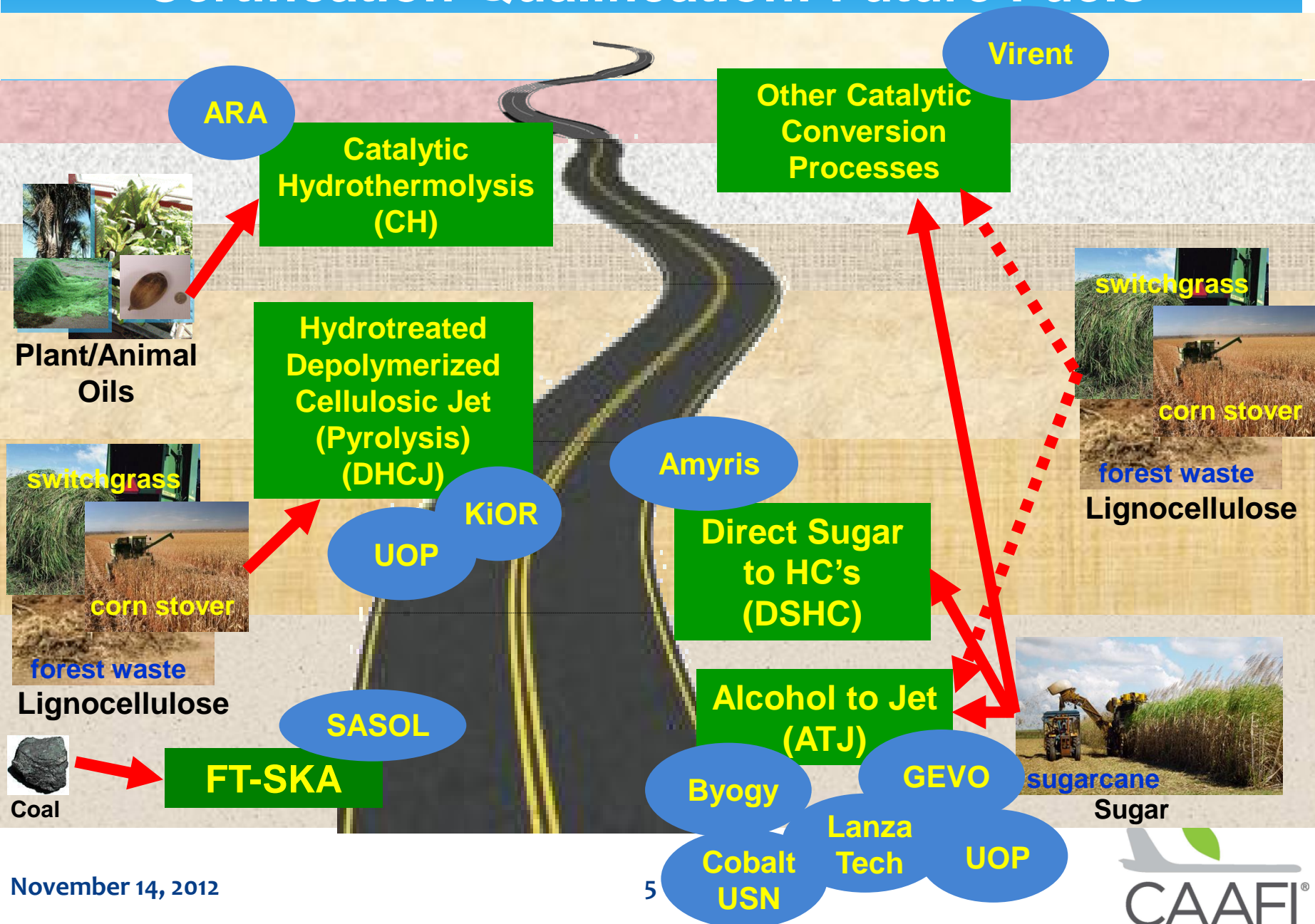


Biomass



Natural Gas

Certification-Qualification: Future Fuels



Thank You



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FUELING SOLUTIONS FOR
SECURE & SUSTAINABLE AVIATION