

Certification of Alternative Fuel

Mark Rumizen

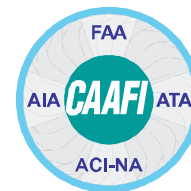
CAAFI Certification Qualification

FAA Aviation Fuels Specialist

ICAO Alternative Fuels Workshop

February 11, 2009



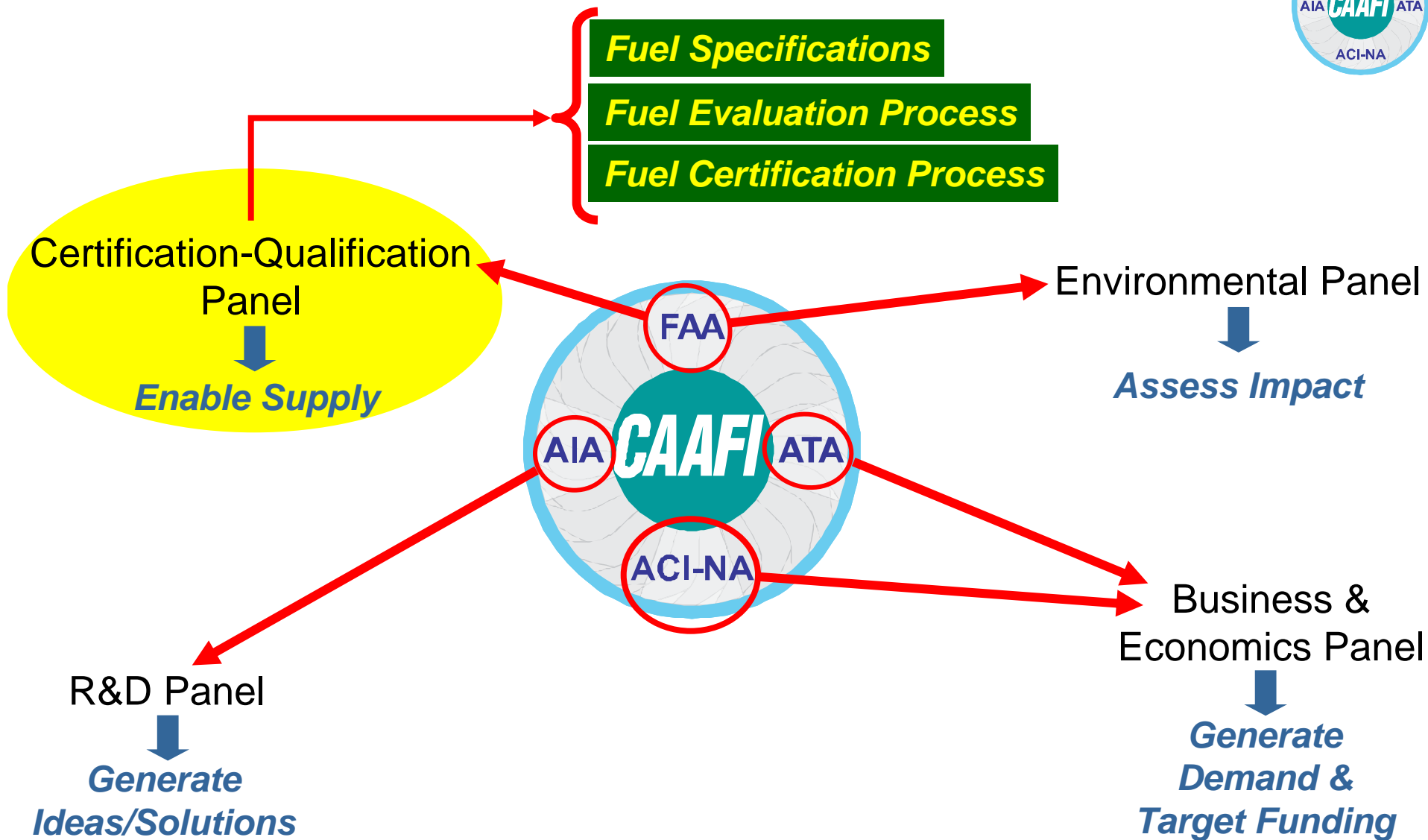


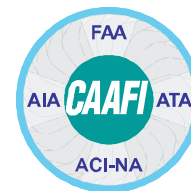
Presentation Overview

- **CAAFL Certification and Qualification**
- **Fuel Approval Process**
 - Fuel Specifications
 - Fuel Evaluation
 - Fuel Certification
- **Alternative Aviation Fuels Status**
 - Potential Alternative Fuels
 - Alternative Fuel Status
 - DXXXX Specification



CAAFI Certification and Qualification





Fuel Specifications



Aircraft Parts

FAA Oversight



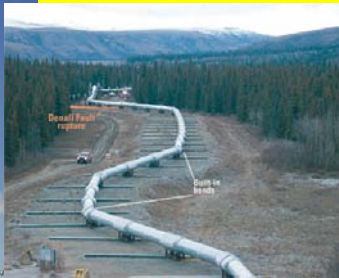
**Design
Char's &
Mfg**

**Eng'g
Drwgs**

Aviation Fuel

Industry Oversight

FAA Oversight

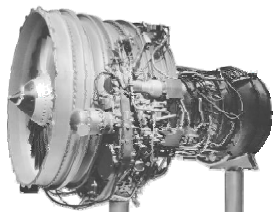


Fuel Specifications

**Performance
Properties**



FAA Regulatory Structure



- **33.7 - Engine Ratings and Operating Limitations**
 - Fuel Specification

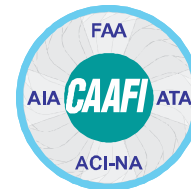


- **25.1521 - Powerplant Limitations**
 - Fuel Specification
- **25.1583 - Operating Limitations**
 - Powerplant limitations in Airplane Flight Manual

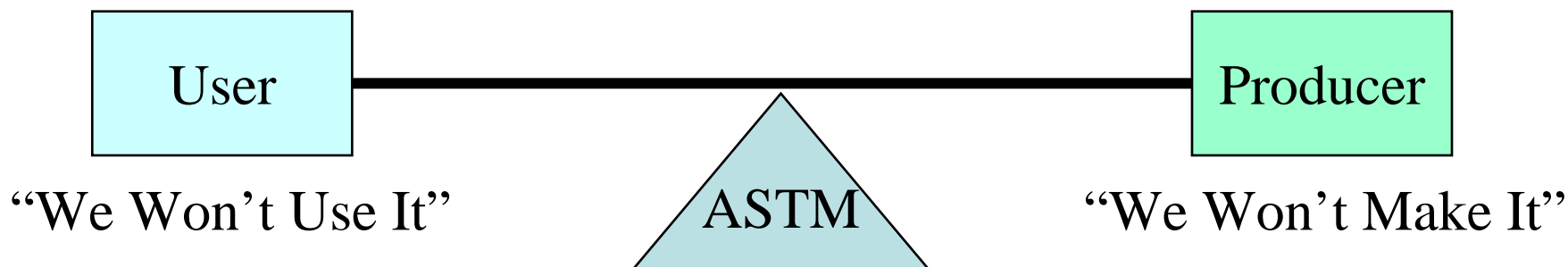


- **91.9 – Civil Aircraft Flight Manual**
 - no person may operate a civil aircraft without complying with the operating limitations specified in the approved AFM

ASTM



- **Specification-Writing Organization**
 - No Enforcement Role, but...
 - Convenient Venue to Review Industry “Oversight”
 - Equivalent to UK Aviation Fuels Committee (AFC)
 - DEF STAN 91-91 Jet Fuel Spec
- **Consensus-Based Organization**
 - Members Vote on Specifications
 - All Negative Votes Reconciled
- **Membership**
 - Users: Engine/Aircraft OEMs, Airlines, Military
 - Producers: Oil Cos, Additive Mfgs, Alt Fuel Cos.



Aviation Fuel Specifications

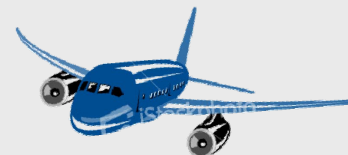


Aviation Gasoline



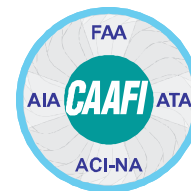
- **ASTM D910- 07a**
 - Aviation Gasolines
 - 100LL, 80/87, 91/98
- **ASTM D6227 - 04a**
 - Grade 82 Unleaded Aviation Gasoline (82UL)
- **Def Stan 91-90**
 - Gasoline, Aviation: Grades 80/87, 100/130 and 100/130 Low Lead

Jet Fuel



- **ASTM D1655 - 08a**
 - Aviation Turbine Fuels (Jet A/A-1)
 - **ASTM D6615 – 06**
 - Jet B Wide-Cut Aviation Turbine Fuel
 - **ASTM D7223 – 05**
 - Aviation Certification Turbine Fuel
 - **Def Stan 91-91**
 - Turbine Fuel, Aviation Kerosine Type, Jet A-1
- **ASTM DXXXX**
 - Aviation Turbine Fuel with Synthesized Hydrocarbons

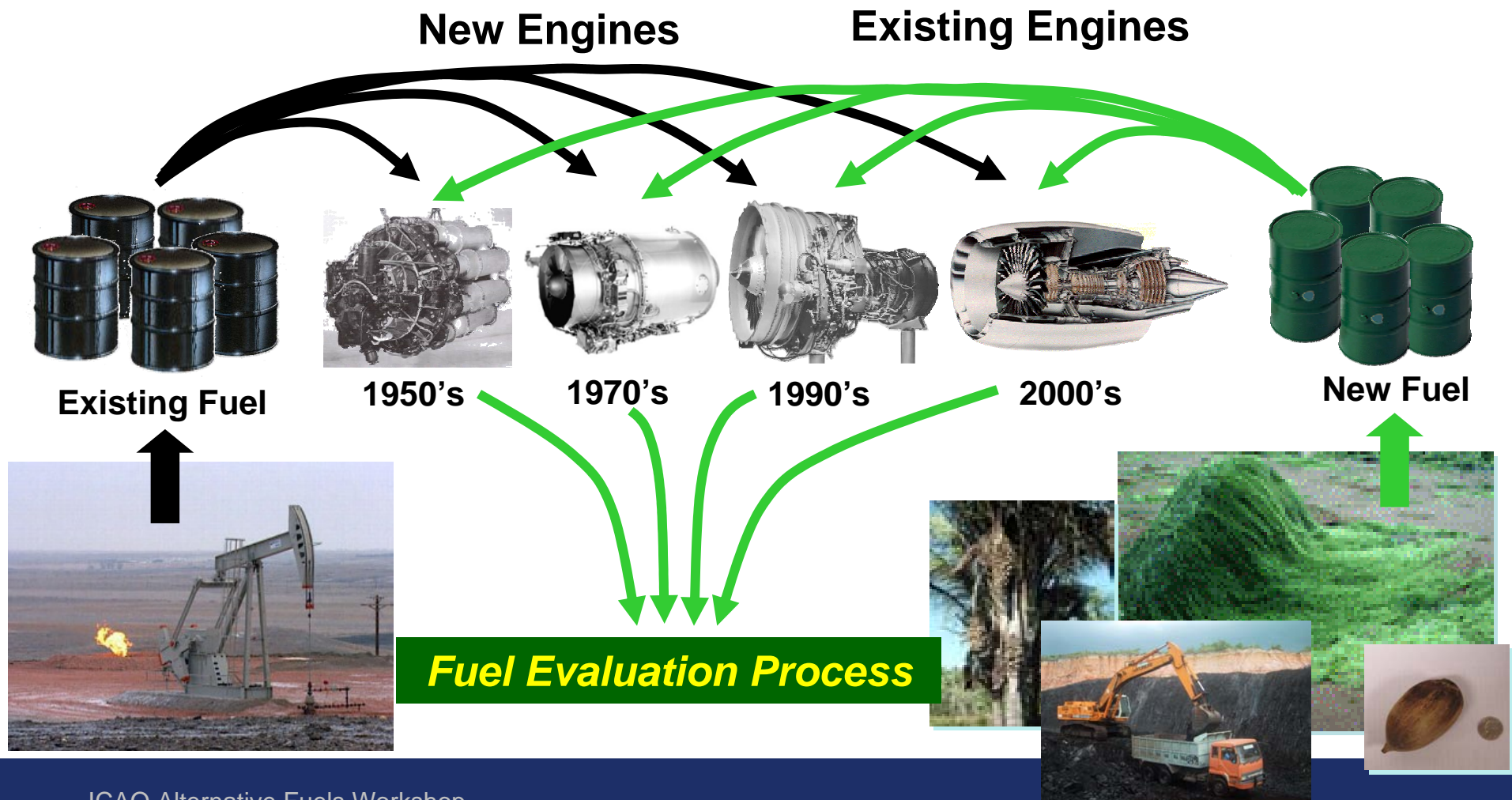
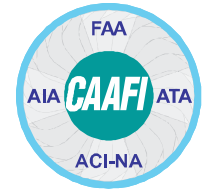




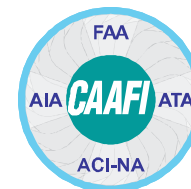
Fuel Evaluation



Fuel Evaluation



ASTM Fuel Evaluation Process



Specification Properties



Fit-For-Purpose Properties



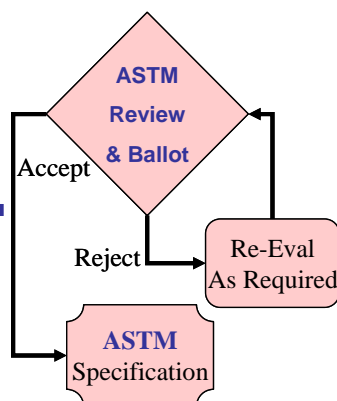
Component/Rig/APU Testing



Engine Testing



ASTM Specification

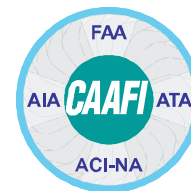


ASTM Balloting Process



OEM Review & Approval

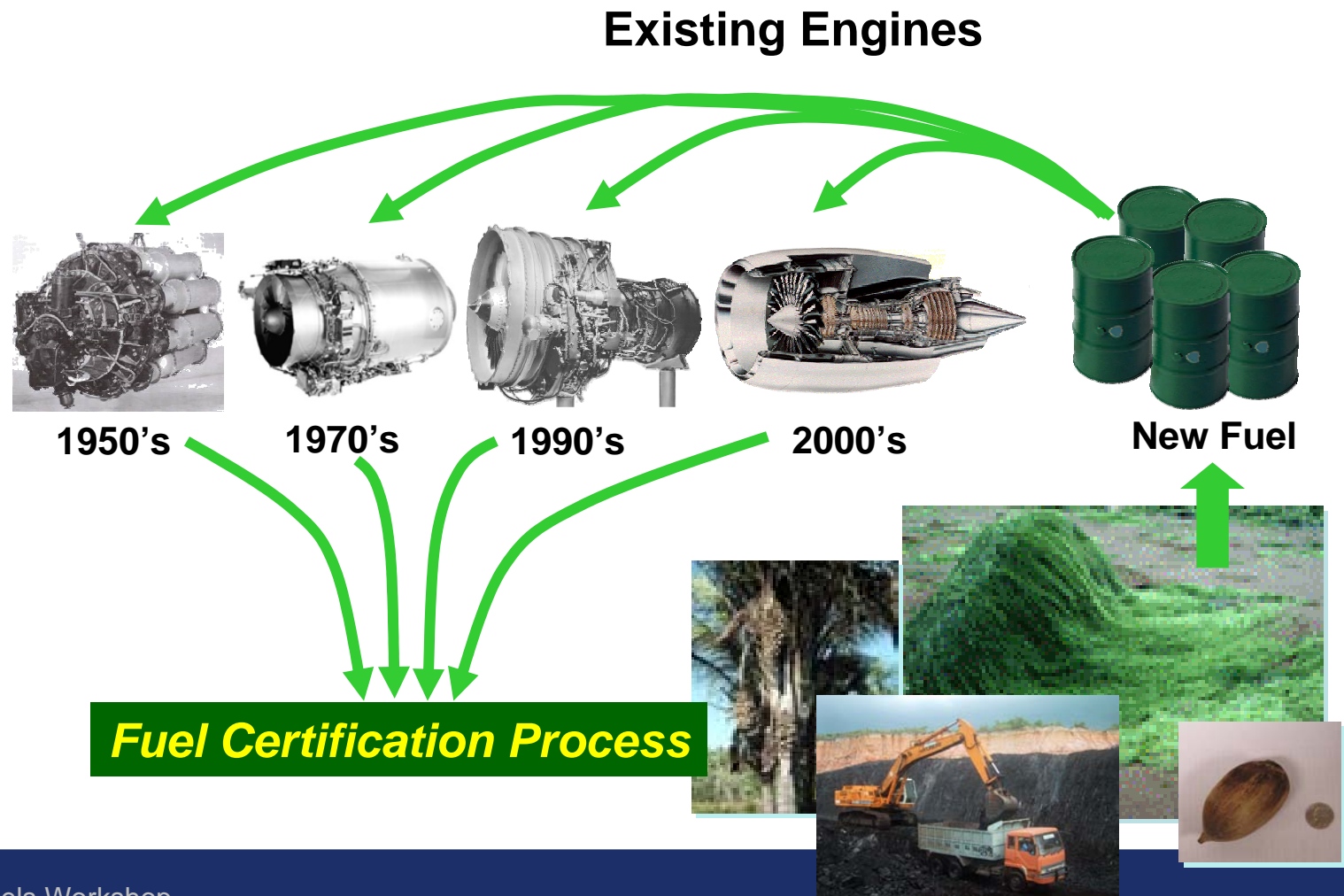
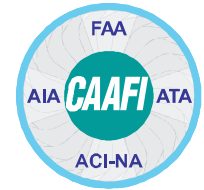




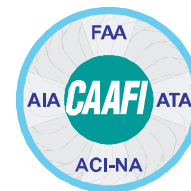
Fuel Certification



Fuel Certification



Draft FAA Certification Policy



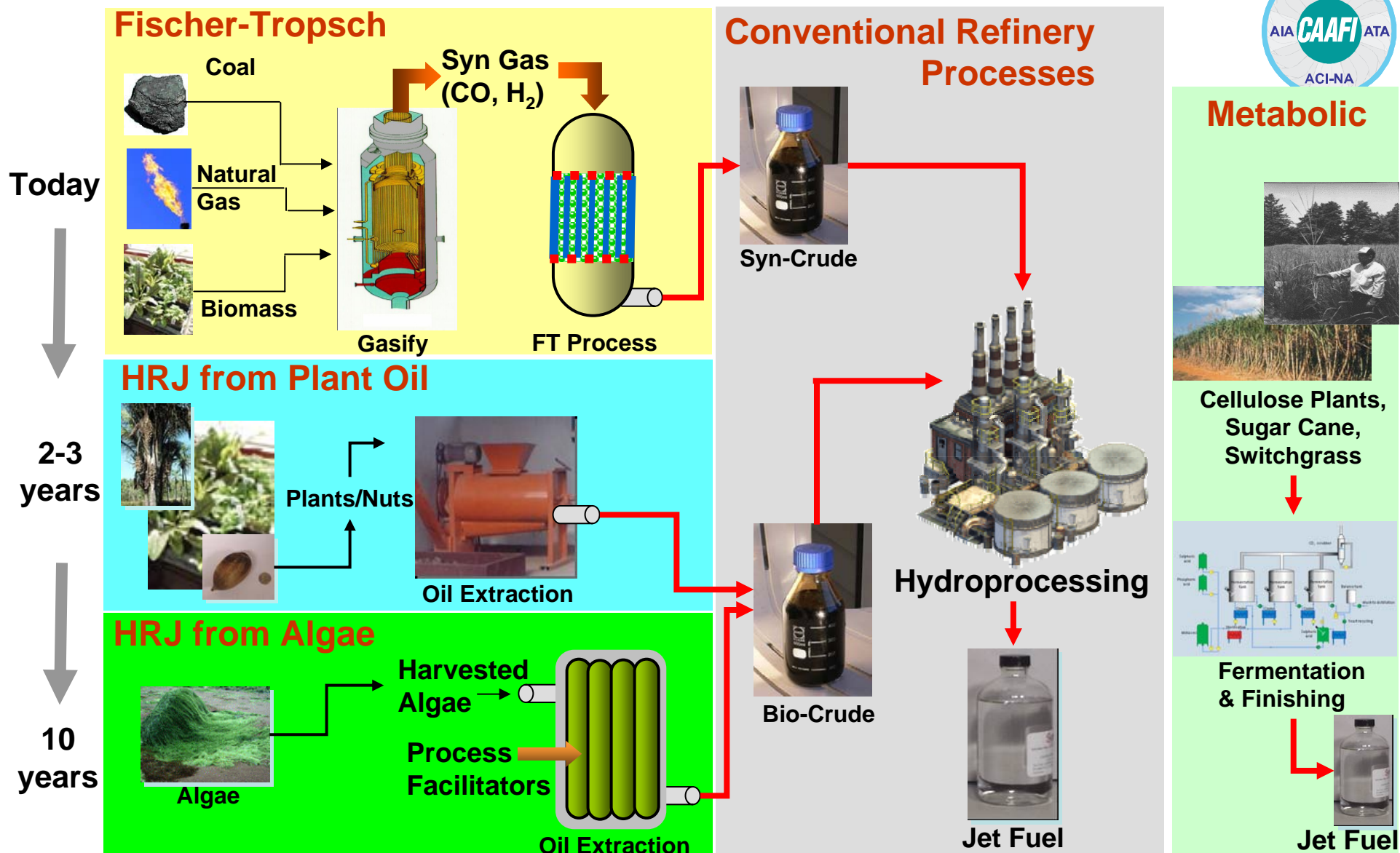
Aviation Fuel

Engine/Airplane

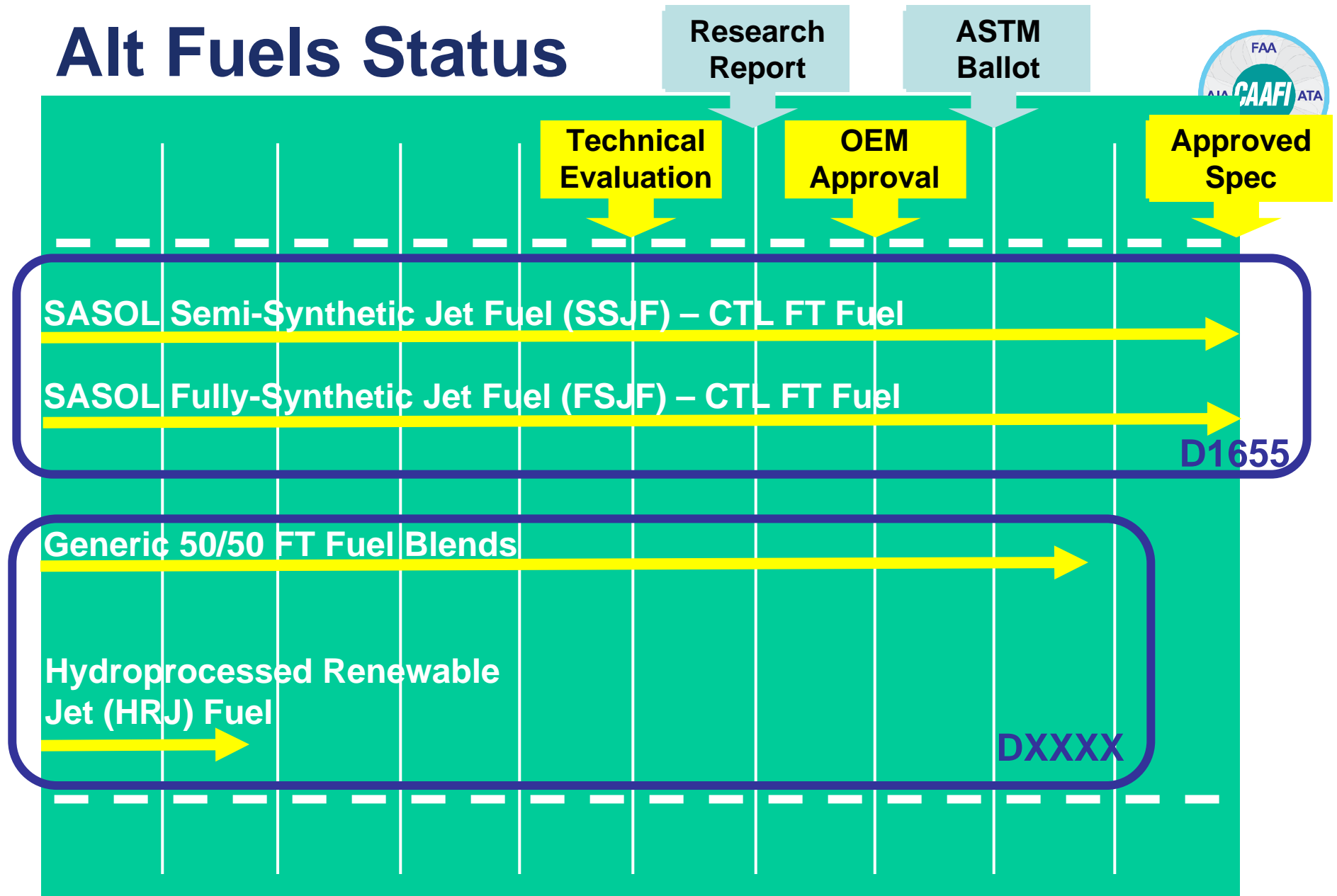
	Existing Specification	New Specification	Changed Specification
New & Modified	Jet A Equipment Certification 	Fuel Eval & Specification Equipment Certification	Fuel Eval & Specification Equipment Certification
Existing	Jet B Fuel-Only Equipment Certification 	Fuel Eval & Specification Fuel-Only Equipment Certification	 FT & HRJ Unchanged Operating Limitation



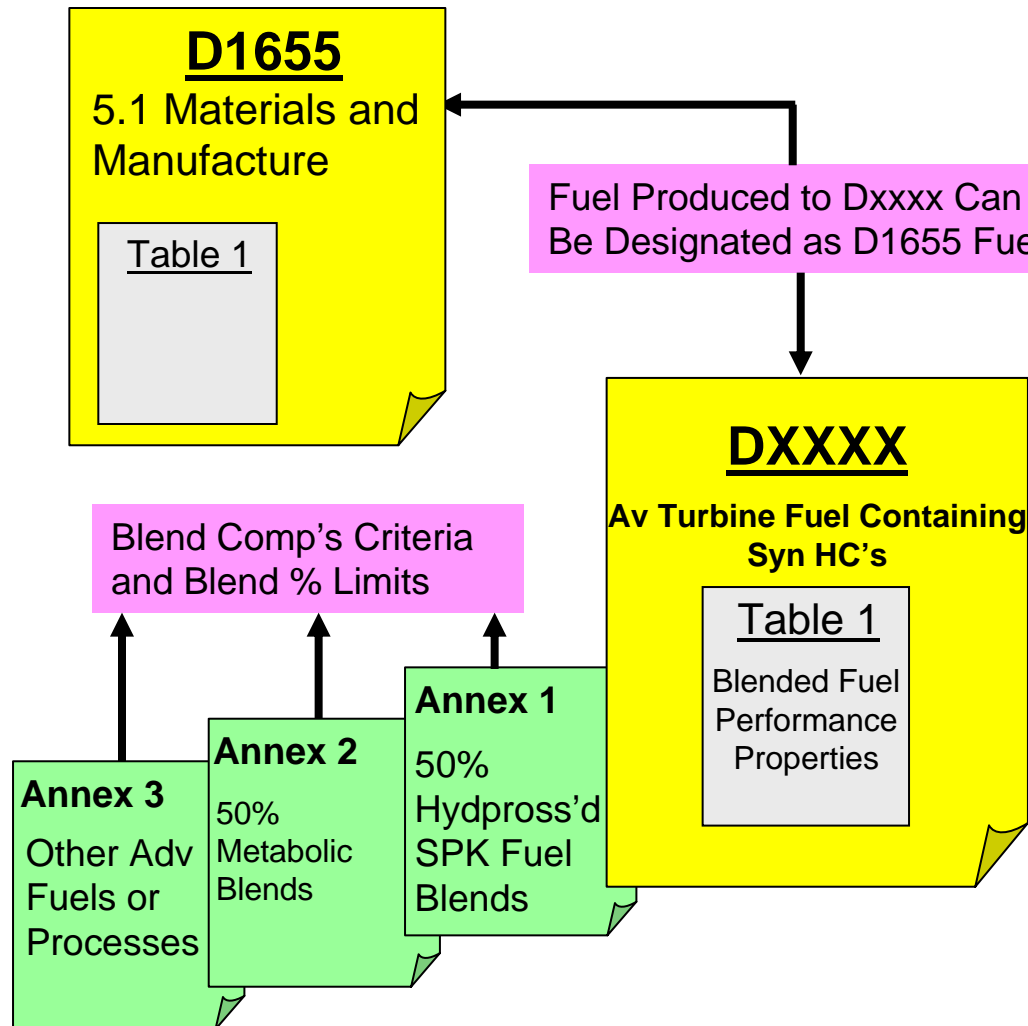
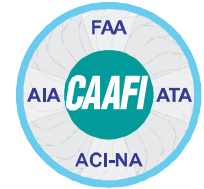
Potential Alternative Aviation Fuels



Alt Fuels Status



DXXXX Specification

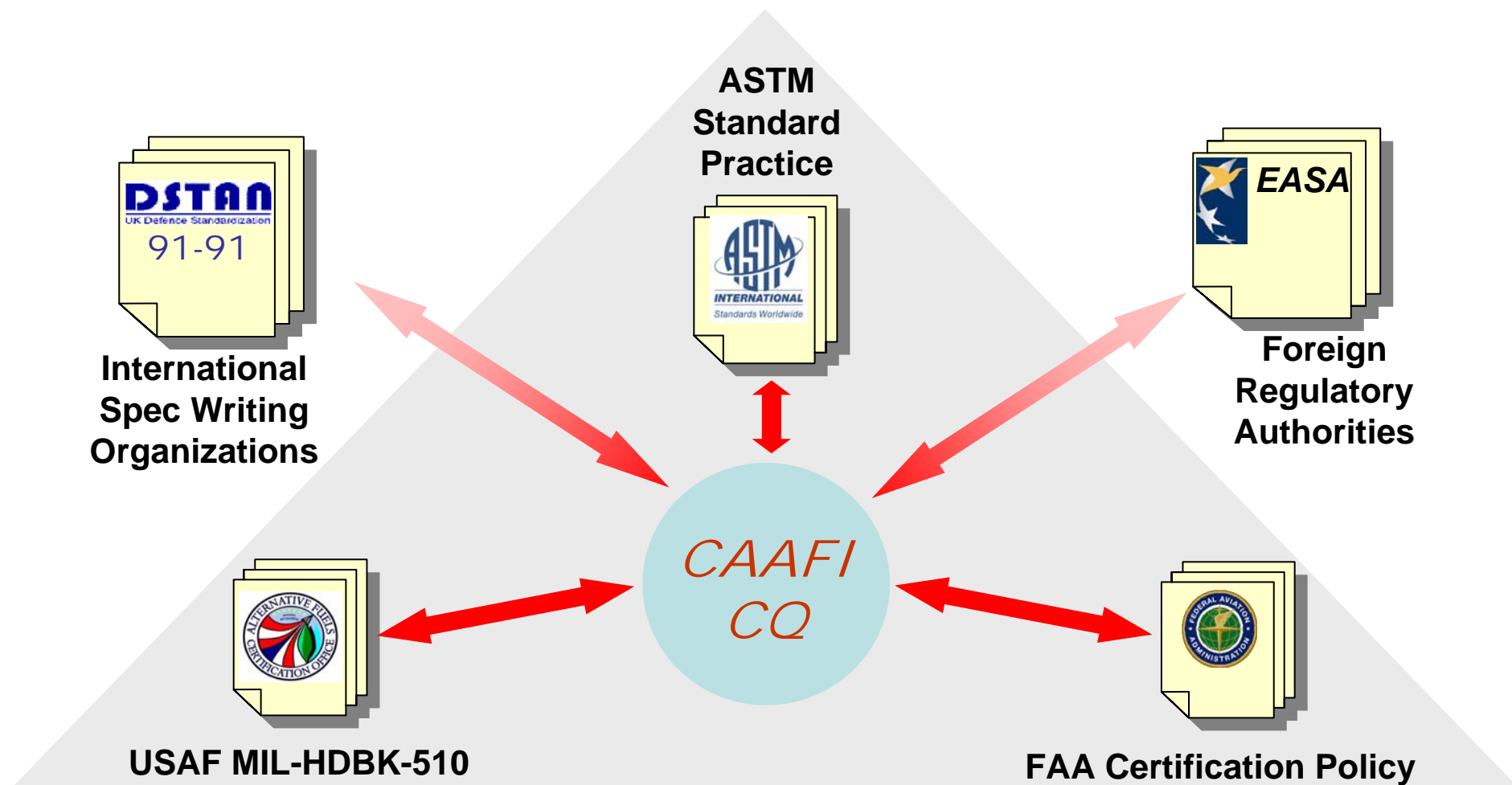
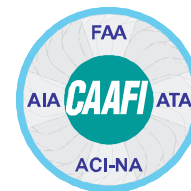


• Key Provisions

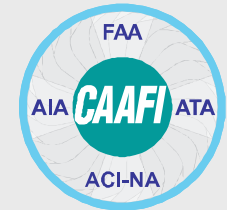
- Aviation Turbine Fuel Containing Synthesized Hydrocabrons
- Annex for Each Class of Synthetic Blending Component
- Allow Re-Certification to D1655
- Blend Syn Component with Conv Component OR D1655 Fuel
 - possible re-blending
 - But, no need for separate tracking
- Annex 1
 - Hydroprocessed SPK
 - **Includes 50% FT Fuel**
 - Hydroprocessed Renewable Jet (HRJ) Will be Next Fuel



CAAFI Certification & Qualification Panel



Thank You



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CAAfi Steering Committee

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