

# ASTM Qualification of Synthetic Aviation Turbine Fuel (SATF)

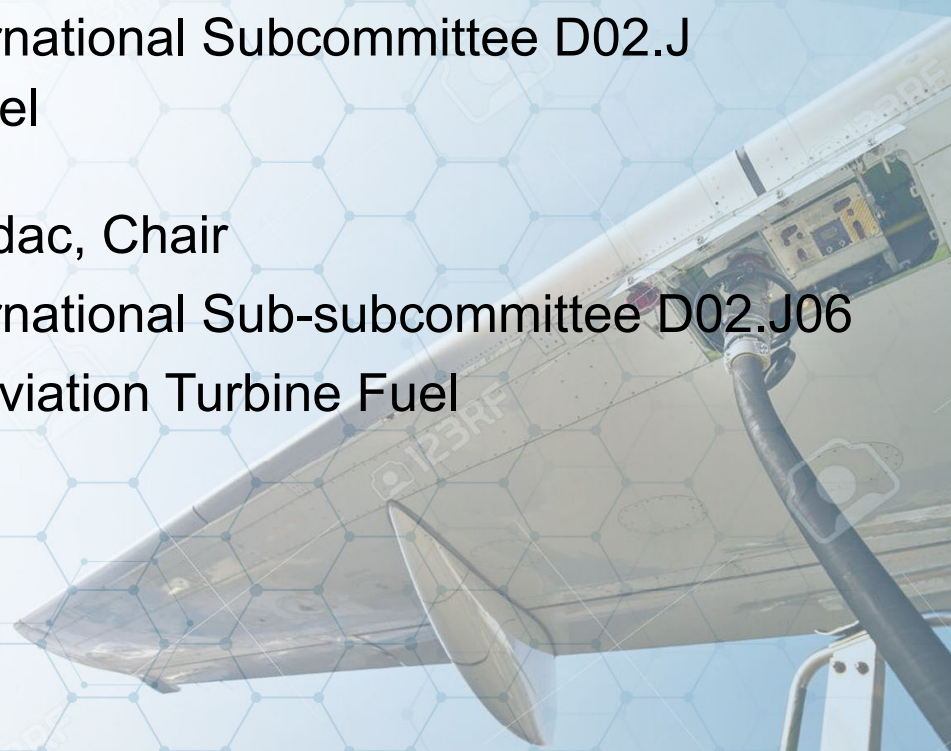


Virtual Meeting 2023

Mark Rumizen, Chair  
ASTM International Subcommittee D02.J  
Aviation Fuel

Gurhan Andac, Chair  
ASTM International Sub-subcommittee D02.J06  
Synthetic Aviation Turbine Fuel

June 16, 2023  
[www.caafi.org](http://www.caafi.org)



# Synthetic Aviation Turbine Fuel (SATF) Qualification

New SATF Meets Existing Operating Limitations, Therefore Approved to Use on Virtually All Existing Aircraft

**4** D1655 = D7566  
Conventional Jet Fuel Spec      Drop-In Jet Fuel Spec

ASTM Specification = Approval to Fly

**1**   
Aircraft Approved Operating Limitations Based on Industry Fuel Specifications

**3** ASTM D7566 Drop-In Jet Fuel Spec  
Then New SBC Annex Added to Drop-In Fuel Spec

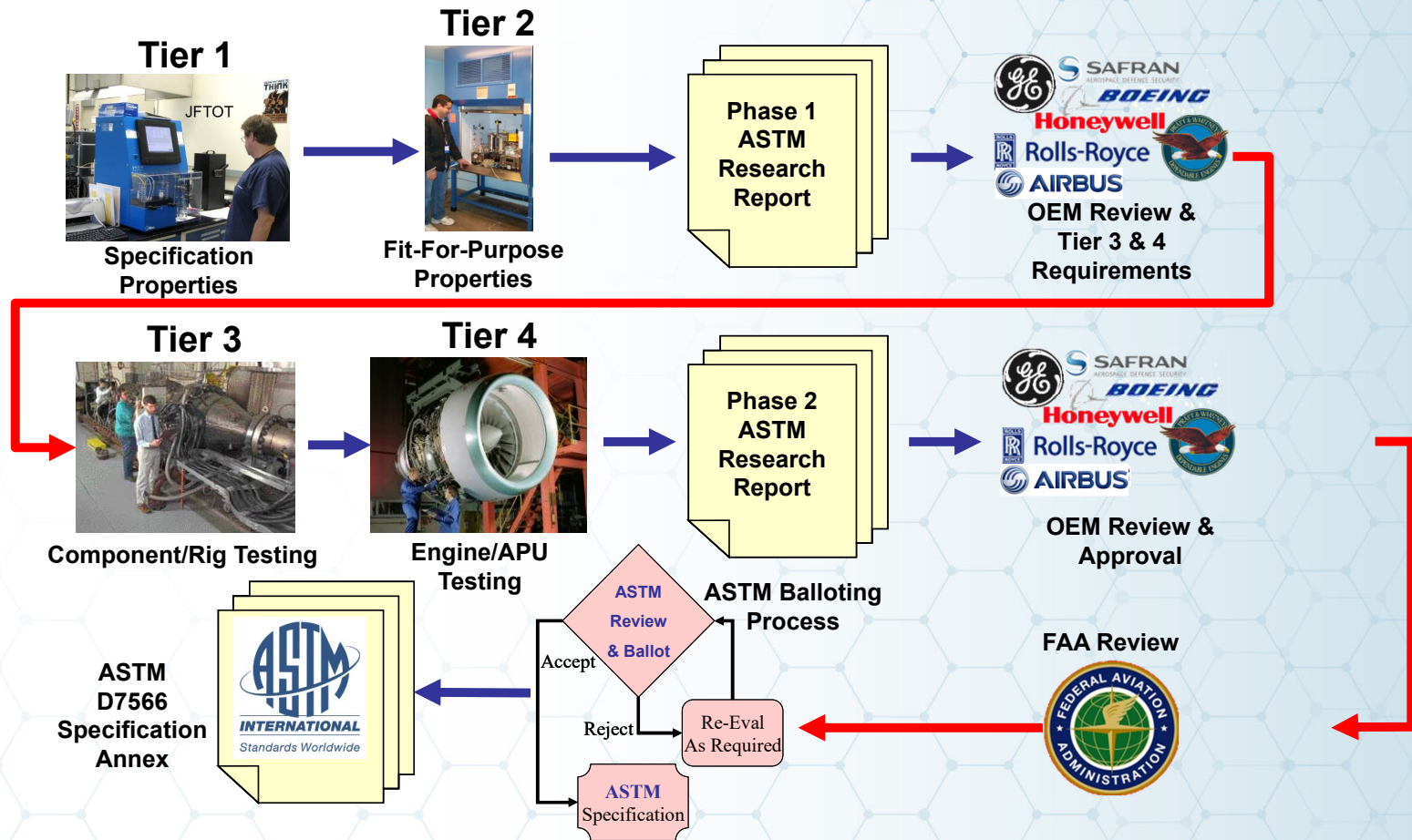
Synthetic Blending Component (SBC)

Jet A and Jet A-1 Fuel

**2** ASTM D4054 SATF Evaluation Process  
If New SATF Meets Conventional Jet Fuel Spec & Properties



# D4054 Technical Evaluation





# SATF Pre-Screening



Tier  $\alpha$

**Property/Performance Predictions**

- GCxGC,
- IR absorption, and/or
- NMR



Tier  $\beta$

**Critical Properties**

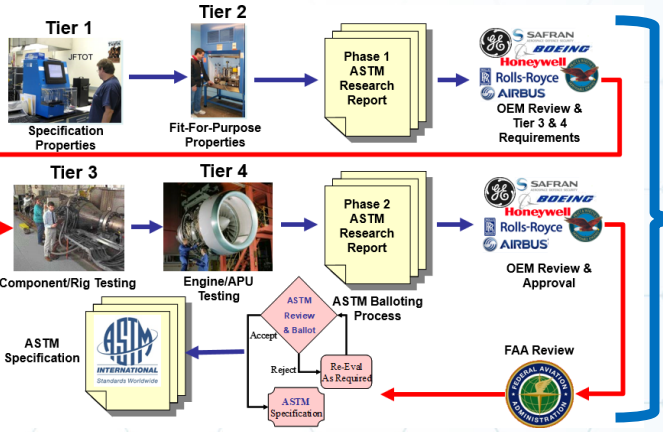
- DCN
- Density
- Distillation Curve
- Viscosity
- Surface Tension



*ml's of test fuel*

Pre-Screening Phase

Optimize/Refine Conversion Process/Composition



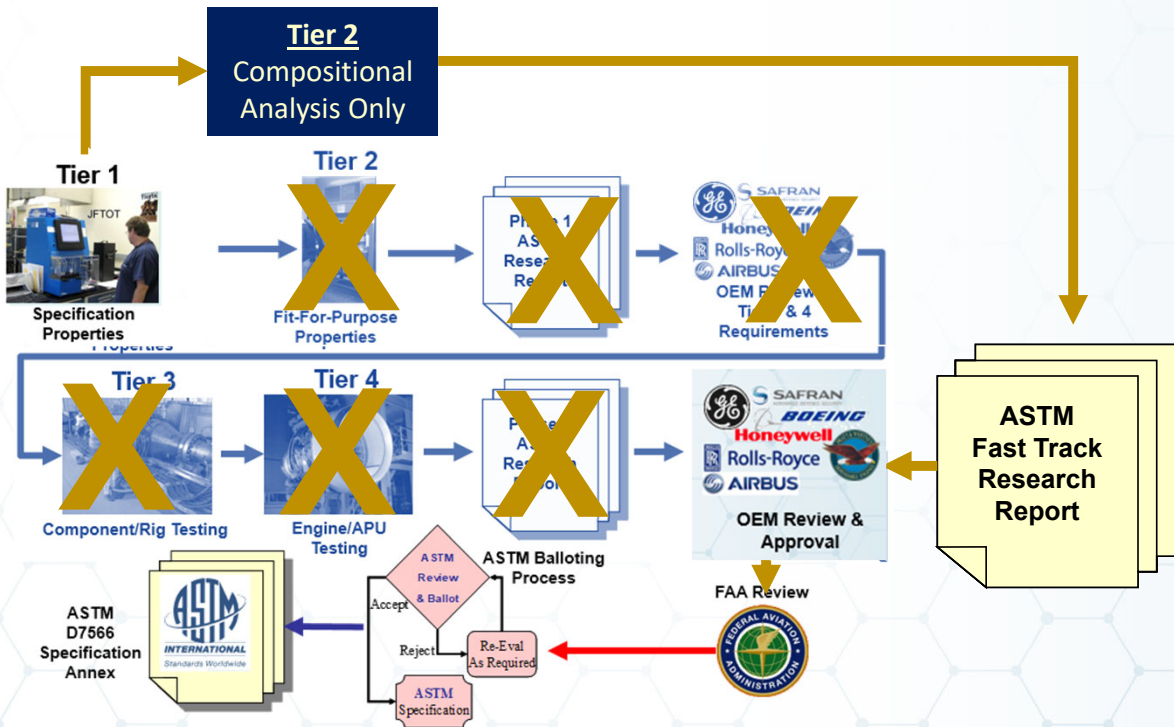
ASTM D4054 Evaluation Phase



*100's to 1000's of gallons of test fuel*



# D4054 Fast Track (Annex A4)



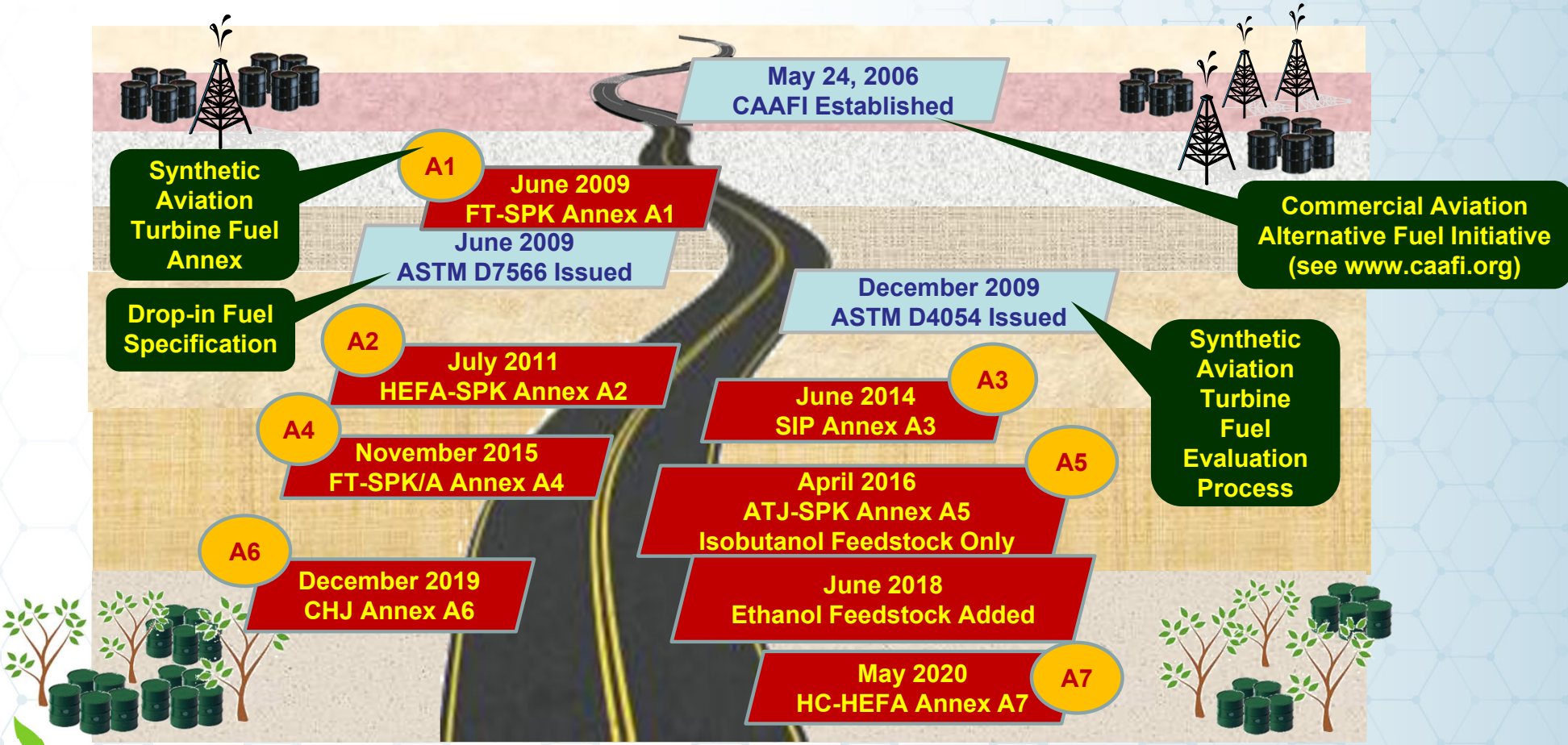
**Lite Testing Program For Synthetic Blending Components (SBCs) with Nominal Jet Fuel Properties and Composition, but...**

**Limited to a 10% Blend Percentage, and...**

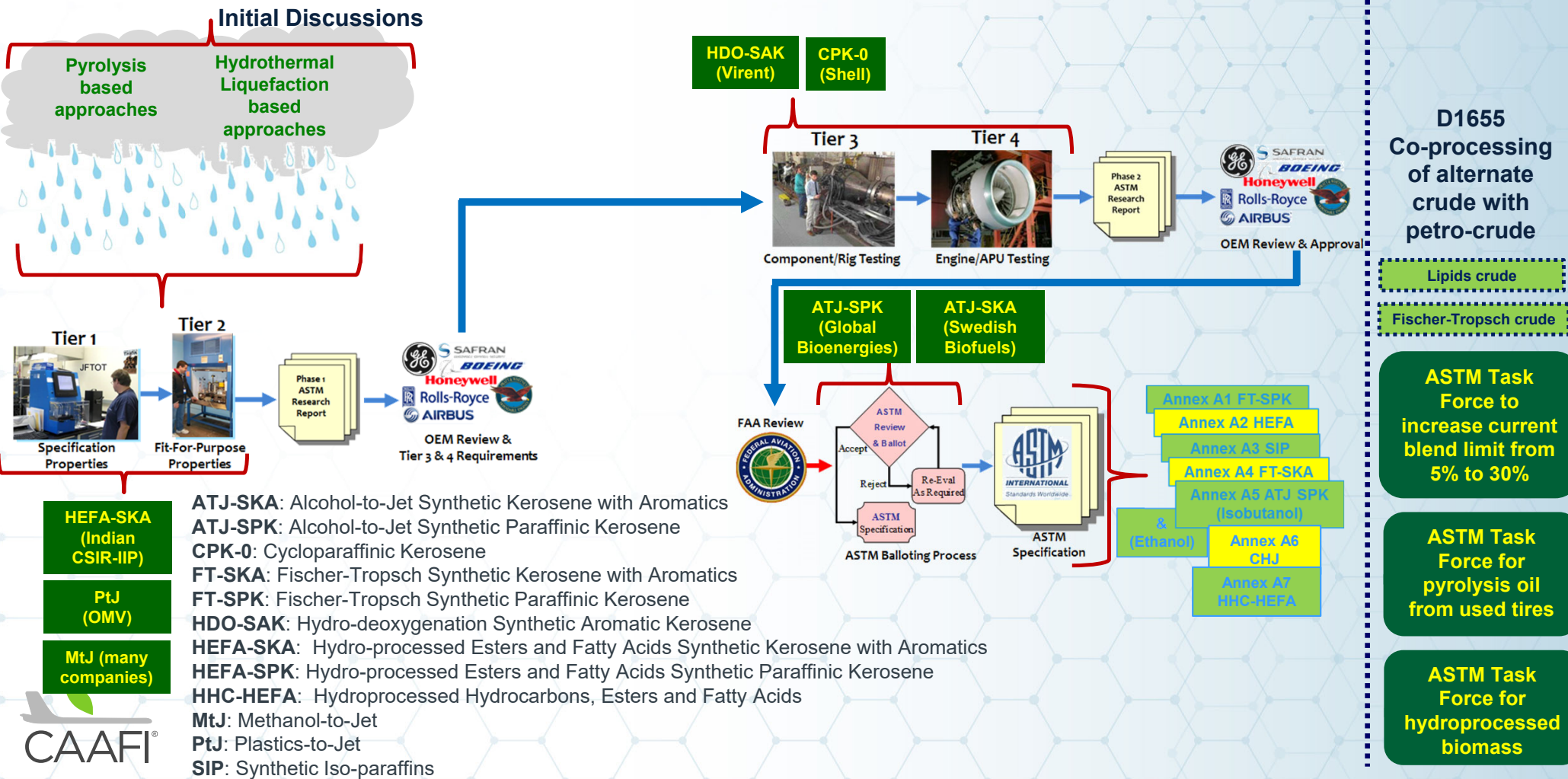
**Eligible for D4054 Clearinghouse Support**



# Qualification Status – Till now

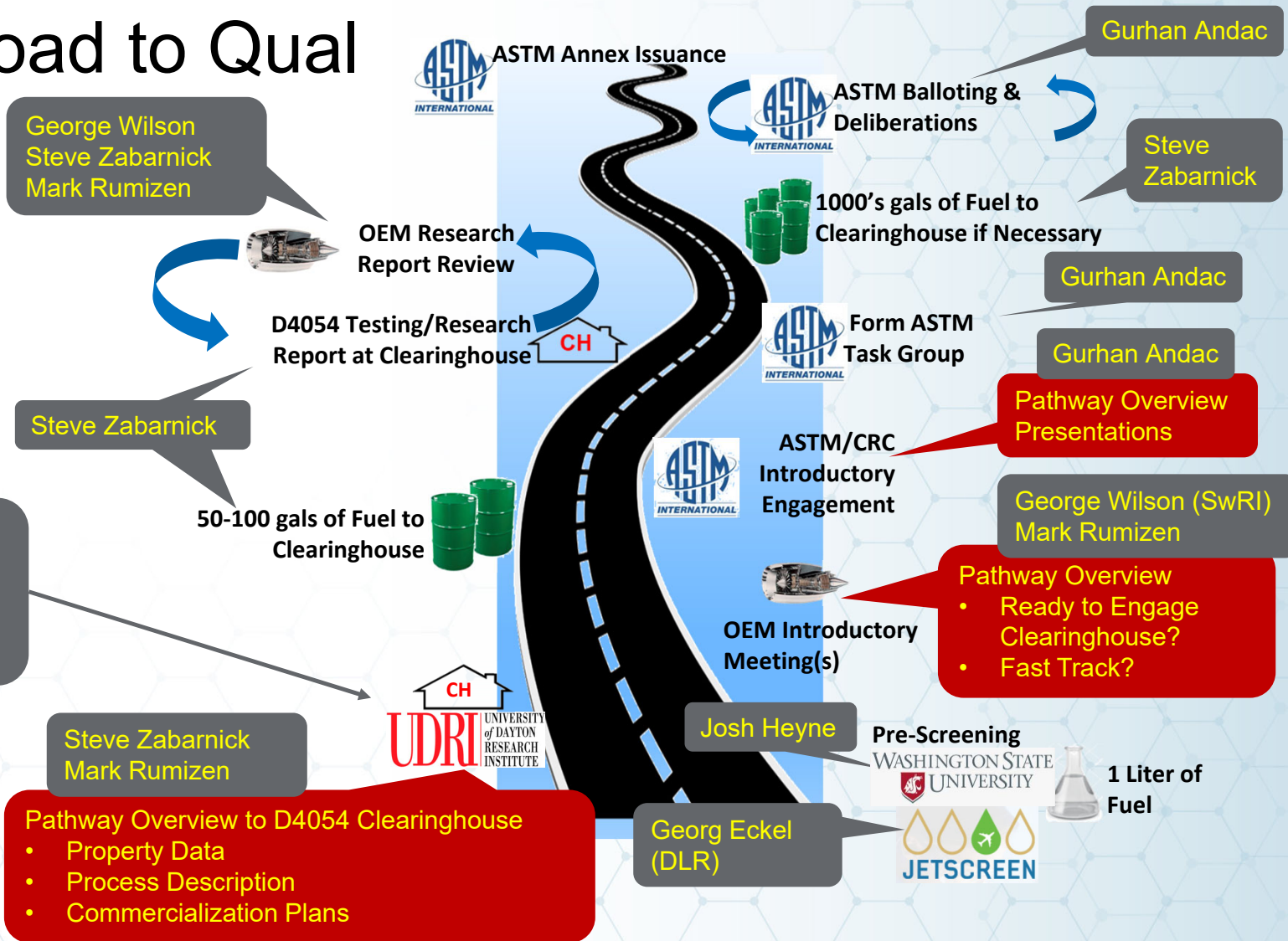


# Qualification Status – Next








# D4054 Road to Qual



# 100% SAF Standardization Status

Drop-in: not just compatible with particular engine and/or aircraft, but fleet-wide and infrastructure-wide compatible

100% SAF	Drop-in  or  + 	non-Drop-in
<b>Composition:</b>	Fully formulated Jet A/A-1	<b>Subset</b> of Jet A/A-1
<b>Applicability:</b>	Fleet Wide drop-in	<b>Designated</b> aircraft/engines only
<b>Example pathways:</b>	CHJ (D7566 Annex A6), FT-SKA (D7566 Annex A4), future: ATJ-SKA, HEFA-SKA, blending of blend components	FT-SPK (D7566 Annex A1) HEFA-SPK (D7566 Annex A2) ATJ-SPK (D7566 Annex A5) <i>certain types</i>
<b>Specification:</b>	ASTM D7566	<b>New standard</b> needed
<b>Regulatory Cert/Substantiation:</b>	No change	<b>Required</b> for each intended aircraft/engine model
<b>Infrastructure:</b>	No impact	<b>Separate</b> supply chain/handling/storage required

ASTM Task Force est. Apr '21

Chair: G. Andac (GE), Vice-Chair: M. Rumizen (FAA)

Approval of use of conforming 100% SAF as Jet A/A-1

ASTM Task Force est. Apr '22

Chair D. Parmenter (Airbus), Vice-Chair: A. Hobday (Rolls-Royce)

**NOT** approval of use as Jet A/A-1 or as a new fuel; to be used for  
testing and certification



# Thank You

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## Questions?