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# FAA ASCENT Center of Excellence D4054 Clearinghouse

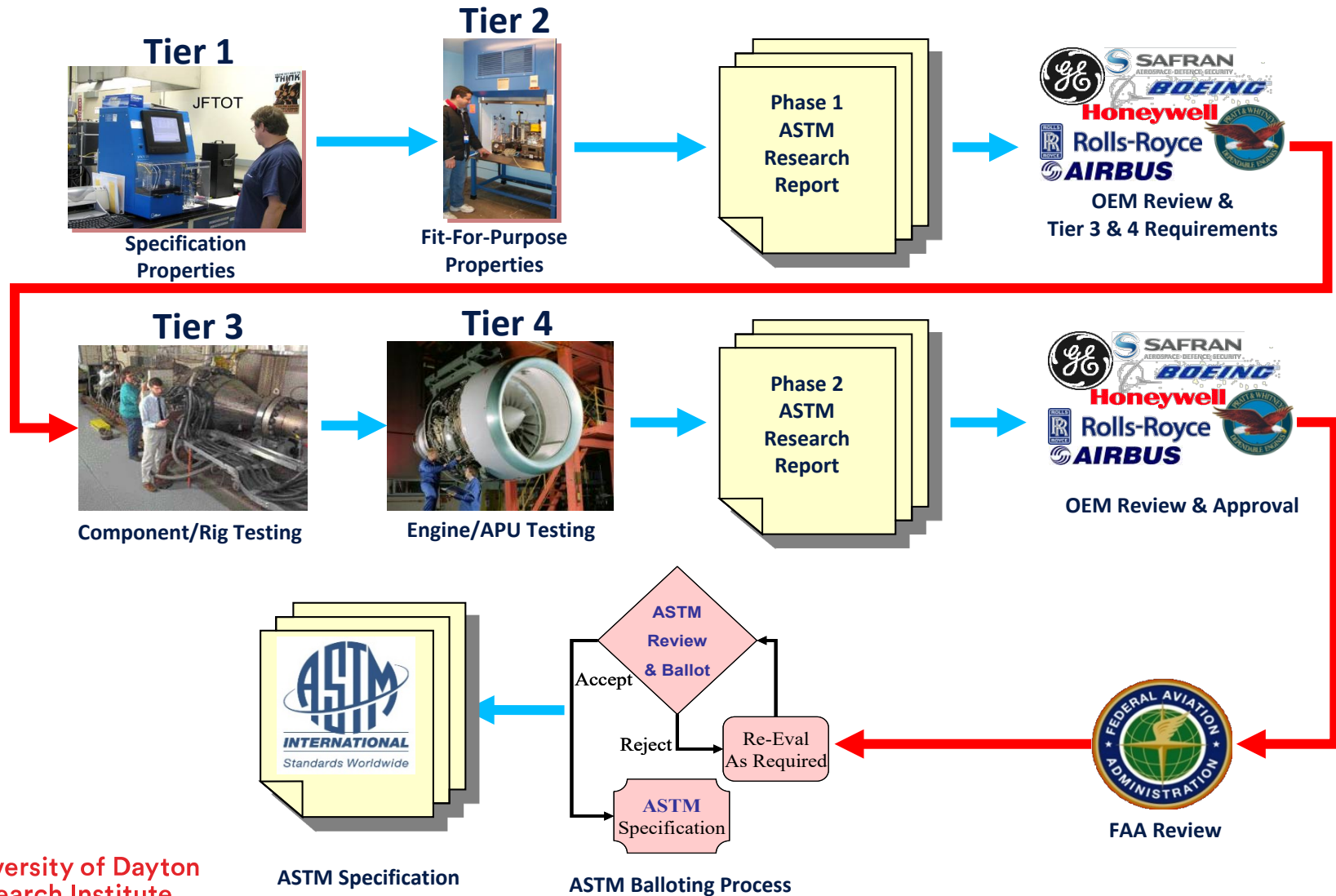
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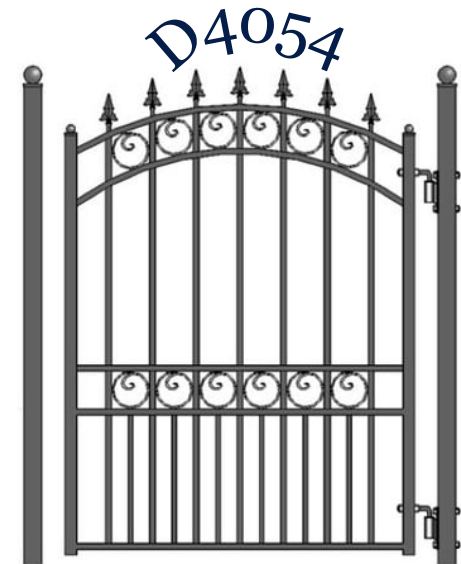
University of Dayton  
Research Institute

# D4054 Certification Process



# Clearinghouse Entry Process

- Submit overview of the candidate fuel production process, including feedstocks and key process steps
- Submit overview of the company's plans for commercialization and production scale-up
- Submit data showing results of testing the candidate fuel to ASTM D1655, Table 1
- Identify and provide contact information for primary and backup project focal points.
- Provide schedule for delivery of 100 gallons of neat test fuel
- Determine whether pursuing Fast Track (10% blend limit) or normal process



# Typical Fuel Producer Early Interactions

- Introductory discussion – feedstock, process, D4054 User's Guide/Process Guide, does product meet current D7566 annex?, possible new annex
- Producer compiles entry data – D7566 Table 1 properties, composition, feedstock, production processes, commercial plan to show viability
- Presentation to FAA/OEM committee for entry approval
- Presentation to ASTM D02.J06 subcommittee
- Creation of an ASTM Task Force with subsequent TF meeting
- Submission of 100 gallons to Clearinghouse
- Tier 1/2 testing, etc.



# FAA/OEM Committee

- Consists of representatives of all major engine and airframe OEMs
  - Pratt & Whitney, GE Aviation, Rolls Royce, Honeywell, Boeing, Airbus, Safran, Dassault, Embraer, Gulfstream, DeHavilland
- Coordinated by FAA, SwRI, UDRI
  - Mark Rumizen, George Wilson, Steve Zabarnick
- Normally meets 3x/year: 2x ASTM + UK MoD ASC meetings
- During covid we have been meeting virtually every 2-3 weeks
- OEM approval for use in their equipment
  - Alt fuel Phase 1 &2 before ASTM ballot



# ASCENT COE Cost Share Requirement

- FAA ASCENT COE requires 1:1 cost share from participating Universities
- UDRI requests in-kind or cash cost share from fuel producers
  - Examples of in-kind costs: facilities costs, fuel production, travel, etc.
  - U.S. Federal gov't funds/facilities cannot be used for cost share
- In-kind cost share documented in letter containing:
  - ASCENT Program: e.g., UDRI Project 31 “Alternative Jet Fuel Test and Evaluation”
  - Period of expenditure: needs to occur during ASCENT Project period
  - Description of in-kind cost share being provided and how it provides value to the ASCENT Project: e.g., candidate SPK production to support Tier 1/2 testing
  - Dollar value of in-kind cost share



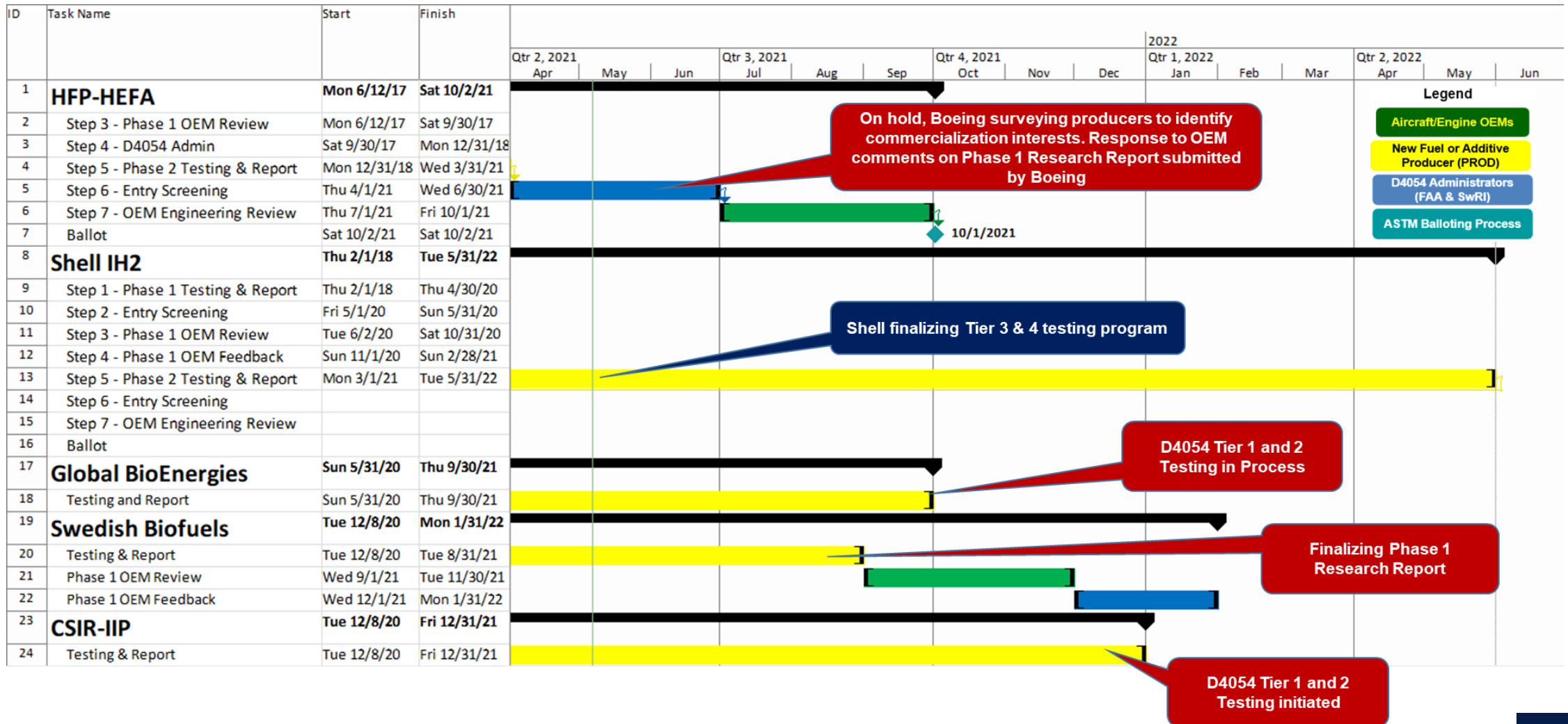


# New Clearinghouses – EU and UK

- Based on successes of FAA ASCENT Clearinghouse
  - Focus on UK/EU producers
  - Close coordination with USA Clearinghouse required
  - Able to help support OEMs (e.g., Airbus & Safran) to complement ASCENT support
- EU Clearinghouse
  - EASA “Facilitation Initiative” recommends creation of EU clearinghouse based on US clearinghouse
- UK Clearinghouse
  - Initially funded at £3M for one year – Spring 2021 launch
  - Needs GCxGC to complete Tier 1/2 capabilities

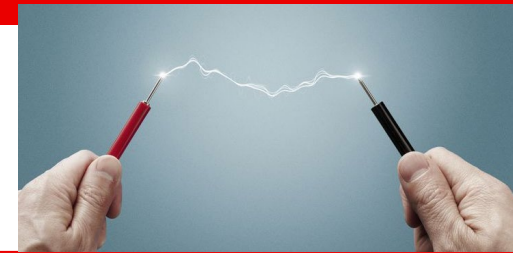


# Gantt Schedule for Current Fuels





# Current Candidates



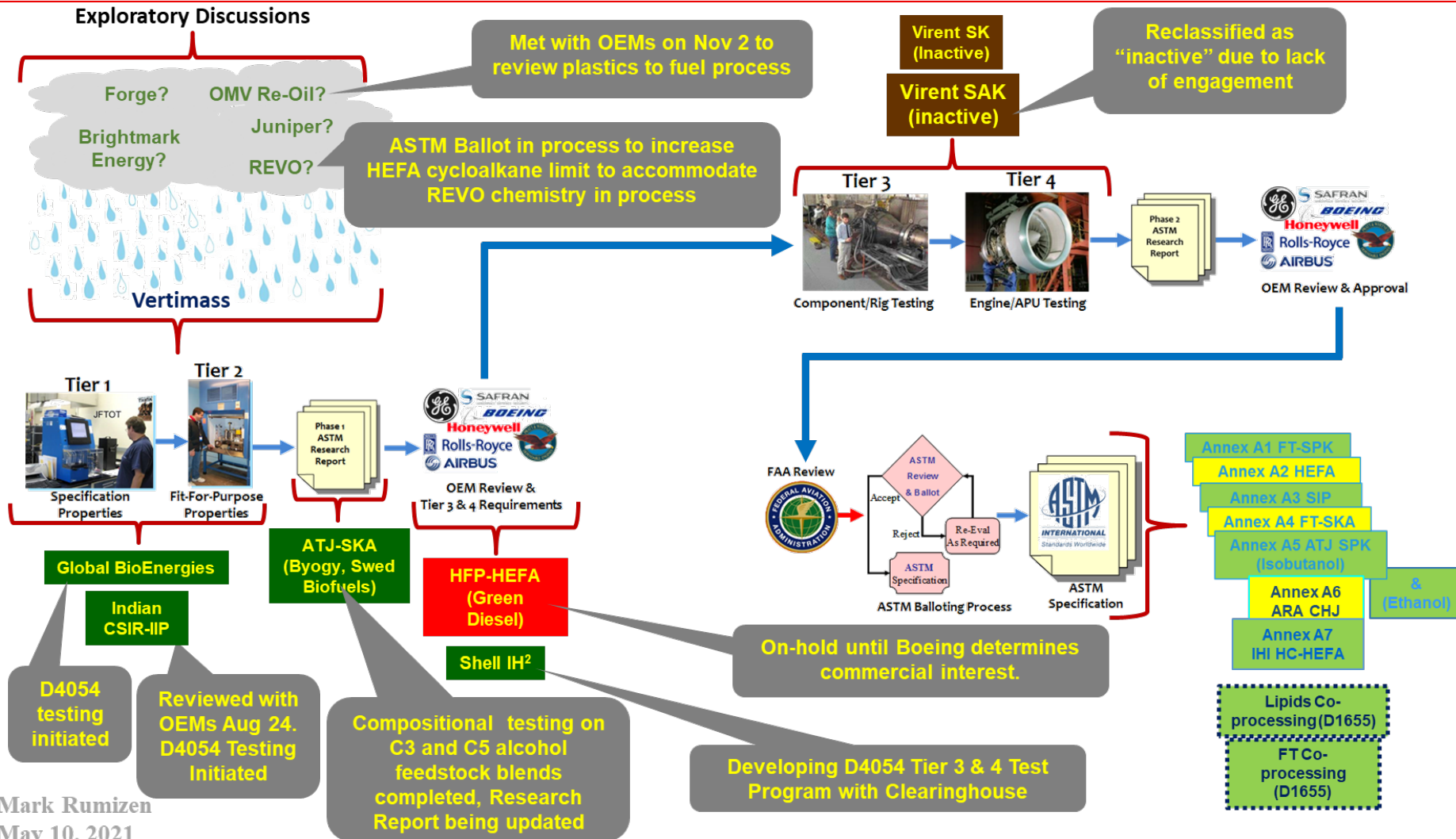
- **Shell IH<sup>2</sup>** – wood pyrolysis
  - Phase 1 report/review/feedback completed
  - Plan for Tier 3 testing – APU & combustor rig
  - Waiting on larger fuel volumes
- **Swedish Biofuels** – ATJ with variety of alcohols
  - completed additional testing for Phase 1 report -- other alcohols
  - Phase 1 report to be submitted to OEM panel next month
- **CSIR-IIP** – single step HEFA w/ aromatics
  - completed initial Tier 1/2 testing
- **Global Bioenergies (Rewofuel)** – sugars to isobutylene via fermentation
  - Various tests to complete Tier 1/2 testing
  - Available cash and in-kind cost share being discussed
- **HFP-HEFA** – light cut from “green diesel”
  - Boeing responded to Phase 1 review
  - Nesté no longer committed to commercialization

# New Candidates

- **OMV ReOil** – Austria
  - Used plastics to synthetic crude via pyrolysis
  - Fast Track or full (50%) approval?
- **Revo** – Japan
  - HEFA with higher cycloparaffins from UCO
  - Change HEFA annex to accommodate?
- **Forge Hydrocarbons** – Canada
  - Lipids to hydrocarbons – with aromatics & cycloparaffins
- **Prometheus Fuels** – USA
  - CO<sub>2</sub> from air, electrochemical conversion to alcohols using renewable energy
- **Alder Energy** – USA
  - NREL technology for pyrolysis oil – interested in the Fast Track
- **Green Lizard** – Northern Ireland
  - Biomass pyrolysis + upgrading
  - Fast track
- **Virent SAK** – USA
  - Sugars to aromatics (C<sub>9</sub> & C<sub>10</sub>)

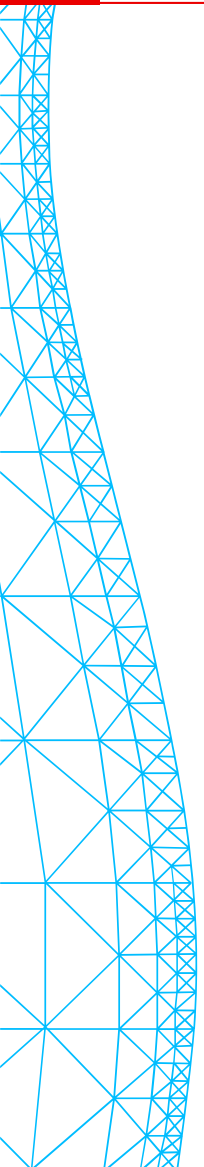


# Alt Fuels Status



Mark Rumizen  
May 10, 2021

# Backup



# Path to D7566 Annex Issuance

