ASCENT - FAA Center of Excellence for Alternative Jet Fuels and Environment

Michael P Wolcott
Director
Washington State University

R John Hansman
Co-Director
Massachusetts Institute of Technology

James Hileman, FAA Program Manager
Overview of ASCENT and our Partnerships
Discuss our Projects and Focus on AJ F
How we fit within the Larger Federal Landscape

Three Project Areas
1. AJ F Supply Chain Analysis and Regional Projects
2. AJ F Testing to Support Fuel Approval Process
Annual Budget $10+ million
Funding 54 Research Projects
Producing 119 Publications, Reports, Presentations
Educating 112 Students
With 70 Industrial Partners

ASCENT OVERVIEW
**ASCENT Team**

**Lead Universities:**
Washington State University (WSU)*
Massachusetts Institute of Technology (MIT)

**Core Universities:**
Boston University (BU)
Georgia Institute of Technology (Ga Tech)
Missouri University of Science and Technology (MS&T)
Oregon State University (OSU)*
Pennsylvania State University (PSU)*
Purdue University (PU)*
Stanford University (SU)
University of Dayton (UD)
University of Hawaii (UH)*
University of Illinois at Urbana-Champaign (UIUC)*
University of North Carolina at Chapel Hill (UNC)
University of Pennsylvania (UPenn)
University of Tennessee (UT)*
University of Washington (UW)*

* Denotes USDA NI FA AFRI - CAP Leads and Participants & Sun Grant Schools

**Advisory Committee - 58 organizations:**
- 5 airports
- 4 airlines
- 7 NGO/advocacy
- 9 aviation manufacturers
- 11 feedstock/fuel manufacturers
- 22 R&D, service to aviation sector
International Partnerships
ASCENT Focus Areas

**Alternative Jet Fuels**
- Feedstock Development, Processing and Conversion
- Regional Supply and Refining Infrastructure
- Environmental Benefits Analysis
- Aircraft Component Deterioration and Wear
- Fuel Performance Testing

**Environment**
- Aircraft Noise and Impacts
- Aviation Emissions and Impacts
- Aircraft Technology Assessment
- Energy Efficient Gate-to-Gate Aircraft Operations
- Aviation Modeling and Analysis
# ASCENT Project

## Research Topic Area

<table>
<thead>
<tr>
<th>Area</th>
<th>ASCENT Project Numbers</th>
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<tbody>
<tr>
<td>Analysis and Tools</td>
<td>10, 11, 12, 36, 37, 45, 46, 48</td>
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<td>Operations</td>
<td>15, 16, 23</td>
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<td>Noise</td>
<td>3, 4, 5, 6, 7, 8, 17, 23, 35, 38, 40, 41, 42, 43</td>
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<td>Emissions</td>
<td>Measurements: 2, 24, 33</td>
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<td>Air Quality: 18, 19, 20, 39, 48</td>
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<td>Climate: 13, 21, 22</td>
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<td>CO2 Standard: 14, 32</td>
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<td>Alternative Jet Fuels</td>
<td>AJ F Analysis: 1, 13, 21, 24, 32</td>
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<td>AJ F Testing: 25, 26, 27, 28, 29, 30, 31, 32, 33, 34</td>
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For project descriptions and other information see - [http://ascent.aero](http://ascent.aero)
Coordinated Federal Approach to AJF

- Enhance energy security;
- Expand domestic energy sources;
- Facilitate a diverse, secure, and reliable fuel supply;
- Contribute to price and supply stability;
- Reduce emissions that affect air quality and global climate;
- Generate economic and rural development; and
- Promote social welfare.
# Alternative Jet Fuel Interagency Working Group

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**Legend:**
- **X** indicates involvement in the respective area.
PROJECTS

alternative jet fuels
ASCENT Focus Areas

**Alternative Jet Fuels**

- Feedstock Development, Processing and Conversion
- Regional Supply and Refining Infrastructure
- Environmental Benefits Analysis
- Aircraft Component Deterioration and Wear
- Fuel Performance Testing
ASCENT Project 001 Supply Chain Focus

Advanced Analytical Tools

- Feedstock Production (w/ DOE)
- Feedstock Logistics (w/ Volpe)
- Facility Siting Tools
- Harmonized Conversion Techno-Economic Analysis (TEA)
- Stochastic TEA
- Life Cycle Analysis (LCA) (w/ DOE)
- Systems Dynamic Models for Technology Adoption (w/ DOE)
- Environmental Services
- Supply Chain Risk Assessment

International Efforts

- ICAO CAEP Support
- CORSIA

Tactical Regional Deployment

- CAAFI 50-states Initiative
- USDA Regional Supply Chain Assistance
ASCENT Focus Areas

Alternative Jet Fuels
Feedstock Development, Processing and Conversion
Regional Supply and Refining Infrastructure
Environmental Benefits Analysis
Aircraft Component Deterioration and Wear
Fuel Performance Testing
Research to support ASTM Intl Approvals

Support ASTM International evaluation of alternative jet fuels and improve evaluation process (ASCENT Projects 31, 33 and NJ FCP)

- Support ASTM certification & qualification testing activities to develop data for new approvals
- ASTM Clearinghouse
- OEM Review Process
- Data Gathering & Library
- Streamline approval process via the National Jet Fuels Combustion Program

D4054 Alternative Jet Fuel Approval Process
NATIONAL JET FUEL COMBUSTION PROGRAM

NJ FCP

Joshua Heyne (Dayton), Meredith Colket (UTRC Retired), Jeff Moder (NASA), Cecilia Shaw (FAA), Mohan Gupta (DOE), Tim Edwards (AFRL), Mel Roquemore (AFRL), Chiping Li (AFRL), Mark Rumizen (FAA)
Overview and Potential Impact of NJ FCP

**Vision**
Develop an experimental and analytical capability to facilitate OEM’s evaluation of fuel physical and chemical properties on engine operability and to streamline ASTM fuels approval process.

**IMPACT**
Early fuel screening (Tier 2.5), targeted Tier 3 and 4 tests, and increased OEM confidence
ASCENT Summary

The Aviation Sustainability Center is:

- Focusing on meeting aviation’s environmental and energy goals on noise, air quality, climate, and energy efficiency.
- Exploring ways to produce sustainable aviation fuels at scale, creating an industry with potential for large-scale economic development and job creation.
- Discovering science-based solutions to benefit the aviation industry and improve health and quality of life of those living and working around airports.

- Draws upon experts from around the country who collaborate worldwide
- Works within a network of federal and international agencies
- Plays a critical role in implementation of alternative jet fuels to decarbonize the aviation industry and support economic development
QUESTIONS