

## Project 66



# Evaluation of High Thermal Stability Fuels

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## Research Approach:

1. Fuel optimization: Leverage Project 65 models to predict fuel properties together with engine performance models to predict constraints & objectives within an optimization of fuel composition from a basis of 1128 molecules with known fuel properties.
2. Engine performance models (GE): **Assess efficiency impacts of reduced air cooling made possible by SAF with high thermal stability.** Develop sketch of fuel effects as a function of mission point and engine variation.

## Objective:

Evaluation of Engine Fuel Burn and Thermal Management Benefits with Use of High Thermal Stability Fuels

## Project Benefits:

Quantifying advantages of sustainable aviation fuel (SAF) supports argument to promote accelerated implementation.

An energy savings of a least 0.5% is predicted when superior thermal stability is leveraged by straight-forward design changes

## Major Accomplishments:

Development of Engine Performance Model with fuel composition sensitivity

First proof of concept paper published;

Boehm, Scholla, Heyne, Fuel, 2021.

<https://doi.org/10.1016/j.fuel.2021.121378>.

Incorporation of thermal model into the Jet Fuel Blend Optimizer (JudO)

Major expansion of molecular properties database

## Future Work / Schedule:

- Publish results of fuel optimization
- Identify value-added (golden) molecules
- Assess commercial viability of golden molecules
- Determine complex properties of optimized fuels