



Summary for Public Release

Drop-In Renewable Jet Fuel from Brown Grease via the Biofuels ISOCONVERSION™ Process

**SUBMITTED UNDER FUNDING
OPPORTUNITY ANNOUNCEMENT**

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**Topic Area 1: Drop-in Renewable Jet Fuel
Blendstocks**

SUBMITTED TO

U.S. Department of Energy

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Energy

SUBMITTED BY

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A primary objective of this project is to demonstrate a “mature price goal” of less than \$3.00 per gallon of gasoline equivalent (GGE). This goal cannot be met starting with a clean, refined, bleached, deodorized (RBD), edible feed stocks that may cost \$0.30 to \$0.40/lb (\$2.25 to \$3.00/gallon). Therefore, the key to meeting this goal is to demonstrate the ability to process a very contaminated, low-cost feed stocks, such as brown grease that may cost less than \$0.10/lb (\$0.75/gallon).

ARA’s hydrothermal clean-up (HCU) process (patent pending) will remove metals, soaps, phospholipids, and other contaminants to produce a clean free fatty acid feedstock. The single-step HCU process allows for the use of low-cost feedstocks like brown grease, which most biofuel technologies cannot use without multiple cleanup operations that result in loss of yield and production of multiple waste streams.

HCU is the first step of the Biofuels ISOCONVERSION (BIC) process that includes Catalytic Hydrothermolysis (CH – the conversion step) followed by hydrotreating and distillation. The BIC process has been well-tested for converting relatively clean plant oils into naphtha, jet, and diesel fuels. Jet fuel produced by the BIC process is being certified for use by the U.S. Navy as a neat, renewable JP-5 that does not require blending with petroleum. It is also being certified for commercial use through the ASTM D4054 process, which will result in a new Annex to ASTM D7566. The ASTM conversion pathway is referred to as CHJ (Catalytic Hydrothermolysis Jet) and acceptable feed stocks include any lipid, triglyceride, or fatty acid-based renewable oil. The approval of the CHJ pathway will result in a new annex to ASTM D7566 to use jet fuel produced by the BIC process at a 50% blend rate with petroleum jet fuel.

Recent tests proved the feasibility of a modified HCU process to allow continuous cleanup of highly contaminated brown grease in a single step. This project will optimize the HCU technology for the cleanup of brown grease, develop operating protocols, develop a design basis for scale up, demonstrate performance in a 3 barrel per day pilot system, and produce sufficient renewable crude for hydrotreating, and distillation into 200 gallons of jet fuel meeting the ASTM D7566 CHJ Annex. Valuable coproducts from jet fuel production by the BIC process include diesel blend stocks, or neat renewable diesel that meets the ASTM D975 specification, and naphtha – a gasoline blending component.