SUMMARY/ ABSTRACT FOR PUBLIC RELEASE

Under Topic Area 3b: Demonstration Scale-Up of Integrated Biorefineries (Final Design and Construction), the proposed AVAP Biorefinery: Enabling Net Zero™ project will construct and operate a 1.2 million gallon per year equivalent fully integrated biomass to cellulosic Sustainable Aviation Fuel (SAF) and renewable diesel demonstration plant. Valuable co-products will include second generation (2G) cellulosic sugars for conversion to biochemicals and a nanocellulose rubber masterbatch, the Nanocellulose Dispersion Composite™ (NDC), for the tire and rubber goods industries.

The proposed project would be Phase 2 of AVAPCO's "ABBA: Advanced Biofuels and Bioproducts with AVAP" project awarded for Phase 1 (Design Phase) under the DOE's 2016 FOA: Project Development for Pilot and Demonstration Scale Manufacturing of Biofuels, Bioproducts, and Biopower. Project partners include Petron Scientech, Byogy Renewables, Birla Carbon, and Clark Atlanta University.

Achievements of the Phase 1 project include:

- Integrated pilot scale production of SAF from woodchips under observation and technical validation by DOE and their Independent Engineer
- Continuous pilot scale production of BioPlus® nanocellulose and NDC for the tire and rubber goods industries
- Completion of the demonstration-scale basic engineering package and commercialization business plan
- Life Cycle Analysis conducted by Michigan Technological Institute showing up to a 93% reduction in Green House Gas Emissions compared to conventional jet and diesel

Goals of the Phase 2 project include:

- Produce cellulosic SAF and diesel from biomass that meets specifications ASTM D7566 and ASTM D975, respectively, for sale under the RFS2 program
- Produce SAF with aromatics for testing and certification of the ATJ SKA #2- 100% replacement fuel pathway
- Confirm Key Performance Indicators at demonstration-scale that support commercial scale production of SAF at a minimum sales price (MSP) equivalent to conventional jet fuel and a 2G sugar MSP of ≤$0.20/lb
- Produce NDC that gives the same performance benefits in tire compounds as obtained at previous scales (10% lower estimated rolling resistance, equivalent modulus and tensile strength, and improved tear strength) for extensive on-road tire trials
- Incorporation of underserved communities on project team and STEM mentorship