Economic potential for *Eucalyptus* production for jet fuel additives in the U.S.

U.S. DEPARTMENT OF ENERGY | Office of Science

Background

- Various terpenoid compounds can be converted to high-energy jet fuels (e.g., JP-10) or used as drop-in to Jet-A to boost efficiency.
- Certain *Eucalyptus* spp. offer a renewable source of terpenes due to their high foliar terpene content.

Approach

- We modeled the economics of annual coppice potential to produce 14.4 dry Mg ha^{-1} yr^{-1} of biomass with parallel conversion of foliar 1,8-cineole (terpene) to JP-10 and lignocellulosic biomass to bioJet and gasoline using a low and high feedstock price scenario.

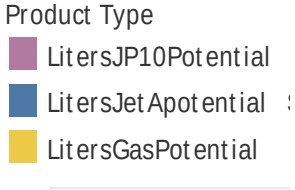
Conclusions

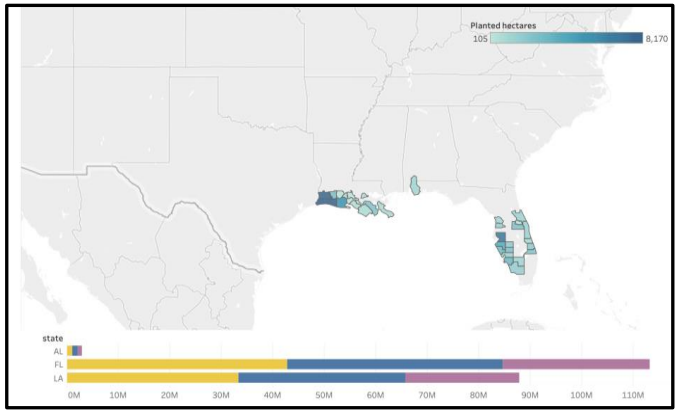
- JP-10 type fuel potential:
  - 51.4 million L yr−1 in 10 years under a \$110 t^{-1} scenario
  - 1.2 billion L yr^{-1} at year 20 under a \$220 t^{-1} scenario
- Potential value at a low price and near-term scenario is estimated at \$500 million with feedstock costs totaling approximately \$100 million.
- Production is primarily focused in the Gulf States coinciding with an established refinery industry, major military bases and airports.

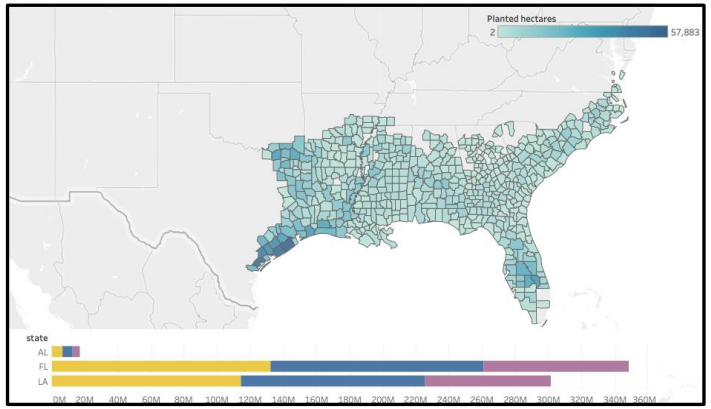
Significance

- The ramp up of potential supply would be contingent on: sustained interest, long-term contracts, and adequate technology (e.g., engineered elite lines of Eucalyptus suitable for the U.S.), infrastructure (e.g., harvesting), and public support for low-carbon fuels.

Production map and all fuel for 10 year low offered price (left) and 20 year high offered price (right) for select states.







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Economic potential for *Eucalyptus* production for Jet Fuel Additives in the U.S. (Cont'd)

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The authors regret that affiliation of D. Kainer and G. Tuskan did not include Center for Bioenergy Innovation, Oak Ridge National Laboratory, 1 Bethel Valley Rd, Oak Ridge, TN, 37781, USA. The authors would like to apologise for any inconvenience caused.