

Technology, Organization, and Policy Needs to Support Aviation Biofuels Development

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In order for aviation biofuels production to reach target levels by 2017, substantial advances in the technology of biofuels production and in the organization of the biofuels supply chain will be required. Appropriate policy initiatives could support the development of the biofuels industry.

Commercialization of biofuel production technology is the most obvious requirement to achieve biofuel production goals. With aviation fuel requirements estimated at 71 million gallons per day (about 26 billion gallons per year), meeting 50 percent of this demand from biofuels would require 130 plants, each with annual production of 100 million gallons (similar to the capacity of current corn ethanol plants). However, no biofuels plants approaching this scale have yet been developed. (Several demonstration scale plants are currently under development, with support from the U.S. Department of Energy.) Clearly, meeting biofuel goals will require a major effort to commercialize biofuel technologies, with substantial investments in pilot and demonstration plants. Given the substantial risks associated with commercializing new technologies, public sector efforts could be key to stimulating biofuels development.

The Air Force could take several steps to support biofuels development. First, it could ensure potential producers of a market, by announcing a schedule of the quantities of biofuels it is prepared to purchase by specified dates, the specifications of the fuel, and the price (or algorithm for price determination). Other measures to encourage biofuels investments could include loan guarantees or similar financial incentives to support development of first generation plants.

A second major requirement for large-scale biofuels development is organizing a supply chain. Biofuel production on the scale envisioned will require about 150 million tons of biomass feedstock to be supplied annually. While the technology for harvesting and transporting agricultural residues (e.g., wheat straw, corn stover) or energy crops (e.g., switchgrass, poplar) clearly exists, it will be necessary to establish contracts between farmers and biofuel producers specifying quantities to be delivered, delivery schedule, quality specifications, and prices. Because the number of farmers supplying a single biofuel plant could run into the hundreds, it may be necessary to create a supply entity to coordinate biomass harvest, storage, and delivery. Another factor that may support the formation of a supply entity is that many farmers may not have the equipment needed to harvest and/or transport biomass, so that custom harvesting and/or transportation may be necessary.

Finally, the rapid development of a biofuels industry could likely be enhanced by appropriate public policy measures. These could range from additional support for R&D in

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technologies for biofuel production and for feedstock production, harvest, and transportation to loans or loan guarantees to support development of first generation biofuel plants. Another area for possible policy initiatives would be a program to support establishment of dedicated energy crops.

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