

Food, Fuel and the Federal & State Policies That Influence Deployment Strategies

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Higher fuel prices increases the cost of defense, transportation, food, shelter, health care and clothes, and also leaves fewer dollars in federal, state and personal pockets to purchase these items. Our nation can reduce this trend; it will require shifts in government policy, and there are examples in our past, such as during WWII, where legislators successfully crafted policy that balanced the Nation's needs.

I will mention a few key areas where policy will play an increasingly important role in the deployment of biofuel for the Air Force and the Nation. These areas include the development of human talent, innovation, efficiencies, feedstocks, conversion technologies, and the availability of capital.

Our Nation needs to rebuild its expertise and love for science, engineering and technology. From this talent pool will come many of the solutions to the energy issues of today and beyond. An improved understanding of science within the general public will expedite needed changes and enable legislators to craft better science-based policy. It is in grade school that children are most enthusiastic about learning, and where teachers are least prepared to teach them about the wonders of science.

Innovation is what helped the U.S. flourish over the last century. Innovation, particularly on the scale we are discussing, needs policy that reduce the risks and hurdles faced by the companies. One-stop shops where various governmental agencies come together to discuss and help the company comply with regulations have proven effective. Policy is important, as is how the policy is implemented. Federal and state policies that established and fund small business innovation research programs and advanced technology programs have helped innovations succeed in the marketplace. In the food and biofuel areas, we should encourage policies that enhance public and private sector dollars, and collaborative efforts in research, development and extension/education.

Often overlooked, yet key to the deployment of biofuel, is a system-wide examination for efficiency gains. Efficiency couples economic and environmental goals and is usually compatible with the supporting infrastructure. Policy that addresses fuel efficiency goals, fund R&D that improve engine and aircraft design, biofuel yields from biomass, or biomass yields from an acre of land are examples.

Our nation has barely begun exploring the potential for feedstocks. When we look at the yield and quality advances in crop plants over the past 50 years it is reasonable to assume similar significant advances in biomass crops. The advances came as a result of genetics and improved growing conditions for the plant. Legislation that aided these advances

includes many Farm Bills (which funded USDA commodity and infrastructure programs and USDA and University R&D programs) and NSF funding which enhanced basic plant breeding and genetics. Future Farm and Energy Bills and NSF legislation can be equally effective in advancing biofuel crops. Policy that restricts biofuel production to a class of land, specific plant types, or cultural practices (such as the use of irrigation) should be avoided. As a plant scientist I worry when I hear “this crop can produce 30 tons to the acre without water, fertilizer or weed control”, as chances are good that data came from land that received timely rainfall and had a reasonable amount of plant nutrients stored in the soil.

Like the feedstocks, the conversion technologies that will help the Air Force and the nation reach its goals are still under development. New innovations in conversion technologies are emerging and need help. Yet, policies to aid the emerging biofuel industry are often too restrictive in its language, funding a specific conversion process, such as cellulosic ethanol, and setting the course for DOE funding strategies over the next several years. This has inhibited the advancement of possibly better conversion technologies that produce “drop-in” replacements such as “green” gasoline, jet A or diesel from cellulose or other bio-based feedstocks. It is challenging to write and implement policy in this rapidly changing area. Perhaps, by better defining the goal this trap can be avoided, DARPA appears to do reasonably well.

The capital market is essentially frozen; even the venture capitalists are reluctant to invest the substantial amounts it will take to move the Nation’s emerging biofuel industry forward. Delays in weaning the Air Force and our Nation off of imported oil further jeopardize America. The risk of lost revenue resulting from funding even 1,000 startups that fail is tiny compared to the benefit to the Nation of one startup that succeeds. For the next several years it is likely that we will need policy that ties guaranteed loan and grant programs directly to Treasury.

Air Force – in the biofuel area, as in all other areas, you must know your supply chain. The quality and reliability of your biofuel is going to be determined by many things including weather, feedstocks, producers (farmers/foresters), conversion technologies, storage and transport and the impact of changes in policy. You need an in-house team that knows this system inside and out and has sufficient authority to influence purchasing decisions, direct R&D, and inform policy makers of potential impacts.