Food – Fuel Issues and Questions

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This panel was provided three questions. I will address each in turn and provide brief concluding remarks.

1) **What are the food/fuel issues for aviation biofuel production?**

   It is commonly argued that while there is a food-fuel issue with corn based ethanol, there is none with cellulosic biofuels. That is certainly not true. There is less, perhaps much less, of a food-fuel issue with cellulosic feedstocks or algae. However, the supply of land is finite. Much of the candidate land for biofuels in the U.S. is today used for pasture for livestock production or is used for hay for animal feed. While the food linkage is likely to be weaker for cellulosic feedstocks, it is not zero, and we do not have good estimates of the likely market interactions at this time.

   Another potential important issue is the interaction among animal feed markets, offset markets, and biofuel feedstock markets if we have cap and trade climate legislation in the U.S. Ruminant feed demand, offset demand, and biofuel demand all will be satisfied with essentially the same land. EIA in its assessment of the likely impacts of H.R. 2454, indicated carbon offsets from agriculture would likely play a very significant role in implementation of the legislation. Bruce McCarl also has preliminary work showing large land area going to offsets. We must gain a better understand of the interaction among these markets. We also need to better understand how these domestic markets would interact with global commodity markets and possibly induce global land use change.

2) **What government policies (federal and state) can accelerate biofuel for aviation production and combat food fuel issues?**

   Policies designed to reduce risk for investors will be most useful. For second generation biofuels, the main risks are technological, market price, and government policy. Government can work more effectively on the last two. Funding for research and development is helpful for reducing technology risk. Price risk can be addressed with policies that provide variable incentives for cellulosic biofuels. The incentive could be keyed to the price of crude oil. The variable incentive provides a safety net for biofuel producers when oil prices are low, and does not provide incentives for overproduction (and competition with food/feed) when oil prices are high.

   Another policy option would be competitive purchase contracts. Essentially, DOD would issue a RFP to purchase a fixed quantity per year, say 100 million gallons, of biofuels that meet its fuel specifications. The contract would need to

extend for at least 15 years. Companies would bid for the contract. This option reduces or eliminates price risk and government policy risk but not technology risk. Government policy risk is reduced because the contract terms would be fixed for 15 years and not subject to Congressional changes. The purchase contracts could be designed many different ways with flat pricing, price indices, min or max values, etc. Research is needed to examine the pros and cons of different contracting options.

3) **How can the Air Force contribute to developments in technology, organization and policy that would accelerate aviation biofuels development?**

Perhaps the best thing the Air Force could do is get some plants built through purchase contracts. The current state of second generation biofuels is that everyone wants to build the third plant, but no one the first plant. We need to have plants producing second generation biofuels in operation as quickly as possible. So jump start policies of one sort or another are needed.

Another advantage of the contracting approach is that the Air Force could include in RFP and contract terms conditions that would minimize food-fuel issues and environmental degradation.

A separate but also important issue for cellulosic feedstocks is that biofuels plants will need long term contracts for supply of the feedstock. Companies will not be willing to invest $400 million or more in plants without an assured feedstock supply. So provisions must be developed to enable contracting for feedstock and for the biofuel simultaneously with low administrative cost. Research is also needed on how best to accomplish this.

In terms of technology development and choice, we probably know enough today with some additional research to develop guidelines of prospective life-cycle GHG emission impacts of alternative pathways.

Concluding remarks

Second generation biofuels likely will have smaller impacts on food and feed markets than first generation biofuels. But research is needed to understand better the interactions among food/feed demands, carbon offset demands, and biofuels demands. We also need to better understand better global linkages and land use change impacts.

Policies designed to reduce risk such as variable subsidies, purchase contracts, price guarantees, etc. need to be evaluated and implemented if the Air Force wants to achieve substantial progress towards renewable biofuel utilization quickly. These contracts could be developed to include provisions to minimize adverse environmental and GHG impacts and also food-fuel impacts. But to do so will require improving our understanding of the issues and linkages involved.