

Questions for the Biomass R&D Technical Advisory Feedstocks Subcommittee

BACKGROUND:

As identified by the National Biofuels Action Plan (NBAP) Board Action Area 3, feedstock logistics is an important element for a sustainable biofuel supply chain. The NBAP concludes that feedstock logistics has received limited attention and will need additional R&D in two main categories to achieve national goals:

- Logistics system design & management: Consider and design complete feedstock logistics systems based on feedstock type, geography, system interfaces, and ownership structures
- Technology development: Development and deployment of creative approaches to support efficient, economic, and sustainable biomass harvest and collection, storage, preprocessing, and transport

Summary

- For biofuels in general, the key social issues are the perception of Food vs Fuel and indirect land use.
- For woody biomass and crop residues, the key challenge is the market at an attractive price for the biomass. There may be some additional handling and storage issues.
- For dedicated energy crops and the key technical issues include development of seed, yield, harvest, transportation, storage and handling.
- Renewable Reserve – accounting for the renewability of biomass in energy production.
- Business Plan evaluation – new program for USDA/DOE to offer assistance to entrepreneurs.

QUESTIONS

1. *What do you believe are the inherent properties of biomass feedstocks that, when compared to other energy sources, make them difficult to deliver on a cost-competitive, environmentally sustainable, and socially acceptable basis?*

Cost Competitive

- Yield density (tons per acre)
- Infrastructure
 - Harvest of various feedstocks
 - Implications of newer feedstocks
 - Specialization based on feedstocks
 - Regional biorefineries
 - Making use of existing infrastructure

- Developing working models and logistics, leading to R&D recommendations
- Inputs
 - Irrigation (regional issues, feedstocks on marginal land)
 - Nutrients (N, P, K) (site dependent)
- Biomass competing with other industries as new types of feedstocks are developed
 - Market dynamics
 - Partnerships (or lack of)
 - Diverse feedstocks that vary regionally
 - Value chain participation

Environmental/Sustainability

- Sustainable agronomic practices
 - Growing new types of crops (brings up issues of conversion and economic sustainability)

Socially Acceptable

- Socially acceptable (myths vs. facts)
- Food vs. fuel issue
- Indirect land use (impact of various energy sources: biofuels, hydro, etc.)

2. *What importance should be placed on a systems approach to addressing biomass feedstock production?*

- Harvest, storage, transportation
 - Demonstration-scale projects
 - Developing methods for newer feedstocks, residues, etc.
- Developing a sustainable support system for feedstock production
 - Assistance (financial) needed for systems approach
 - Attracting capital by validating feedstocks and technologies and completing scientific and economic/cost analyses (creating team to review proposals, complete analyses)
 - Demonstrating integrated value chains (commercial projects)
- Co-evolution of breeding commercial feedstocks with commercial refining technologies
 - Making feedstocks more specific to certain pretreatments or technologies

3. *What are the most significant steps in the feedstock production process? For each of these steps, what are the most significant challenges to produce feedstocks? For each of the challenges and barriers identified for feedstock production and management, what are the key actions that could be undertaken to address them?*

Research programs to address the following critical issues:

- Variety development/breeding and improvement

- High costs
- Timing issues
- Commercial breeding programs
- Conduct research and streamline regulatory approval for biotechnology
- Conduct research and streamline crop protection
- Potential invasiveness
- Seed multiplication/propagation
 - Cost and resources required (especially for propagated seed)
- Establishment (agronomics)
 - Yield potential for dedicated energy crops (field trial based)
 - Seed quality, germination, planting depth, etc.
- Production
 - Water/irrigation
 - Fertilizer
 - Pesticides
 - Carbon sequestration
 - Farming practices (e.g., tillage)
- Harvesting
 - Frequency and timing of harvest of dedicated energy crops
 - Supplemental crops, residues, etc.
- Transportation
 - Logistical transportation research (impact on roadways, etc.)
 - Analysis of energy needed to transport crops
- Storage
 - Moisture content
 - Regional variability
 - Demonstrated storage loss at varying points
- Preparation/pretreatment

4. *What are the key challenges to maintaining conservation and ecosystem services, while maximizing promotion of biofuel feedstocks?*

- Unreasonable conservation practices will increase the cost of biofuels. Reasonable conservation practices have been adopted and should be adopted by the biofuels industry. Unreasonable practices would include environmental stasis, inability to harvest forest on federal lands, and indirect land use.
- For indirect land use and rainforest harvest, the federal government should develop mechanisms to address the deforestation issue.

5. *What are key mechanisms that could be put in place to optimize efficiency from effective interfacing between production, logistics, and conversion?*

- In order to maintain domestic energy security and job production, DOE should investigate the competitive barriers to domestic biofuel production. Barriers include farm labor costs, regulation, and fragmented land ownership. The value of energy independence versus the value of the energy should be examined.

6. *What should be the role of the Federal Government, Feedstock Production Interagency Working Group, and/or Biomass R&D Board in addressing these challenges and barriers?*

- Encourage agencies beyond energy and agriculture to become more active in addressing challenges and barriers.
- Support the establishment of a renewable reserve accounting system for biomass.
- Business Plan Evaluation – possible review and approval of business plans.