# Questions for the Biomass R&D Technical Advisory Feedstocks Subcommittee

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**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

**QUESTIONS**

**1. Agricultural resources (residues and herbaceous crops), forest resources (residues, energy crops, and energy wood), and other resources such as municipal solid waste, animal wastes, and algae have been identified as feedstocks with significant potential. For each of these resource groups, please consider the following:**

The Sub-committee feels it addressed this 1st question in their previous report-out in San Antonio on February 26th. View the following as additions to that report-out.

**a. 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 basis?**

Production of many feedstocks require substantial amounts of water, fertilizer and consume energy for land preparation, production, harvesting and transport to conversion facilities. These issues must be given attention in defining priority crops. This statement applies mainly to energy crops and not to agricultural residues, for which inputs are provided to produce the primary food or forestry product and the residues are a bonus.

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

The entire production scenario must be considered to get them to the plant gate. It is essential to determine the required volume and actual price to be paid to the biomass producer for a bone dry ton of biomass that makes it feasible to build and operate the biomass processing facility.

**c. What are the most significant steps in the feedstock logistics supply chain? For each of these steps, what are the most significant challenges to produce feedstocks? Is any one step more critical than another?**

The steps in the supply chain are:

- Planting or other method of production sustainability (finding suitable areas of land for lease or sale to be used for production)
- Harvesting (finding a harvesting system that allows production at an acceptable level and price)
- Transport to facility (finding locations that are an acceptable distance from the processing plant where transport costs are not to high)
- Conversion technology (having a processing and production method that reliably produces the desired product in a volume and price that supports the revenues of a profitable business )

The most important consideration is the ability to supply the amount of biomass (tonnage required to meet the economy of scale amounts at a price that allows for profit in the biomass (fuel / energy) conversion facility.

**d. For each of the challenges and barriers identified, what are the key actions that could be undertaken?**

Conform to the objectives stated above.

Call out: Markets are critical. It doesn't matter what or how much is being produced, if there's nobody buying it the system will not work.

**2. With all of the equipment manufacturers that exist in today's economy, why does the Federal government need to be involved in feedstock logistics research?**

The private sector is not willing to invest in farming and production systems under current economic conditions. The Federal Government must identify the percent of financing it must expend to buy down the risk for desired outcomes. This is ESSENTIAL—without these funds large companies like New Holland or John Deere would not commit into new feedstocks.

It should be noted that many regionally important cellulosic feedstocks will not be of the market scale to interest the major equipment and infrastructure companies, in a manner that many minor agricultural crops do not command their attention. Thus federal research funds and other incentives will play an important role in catalyzing the development of feedstock logistic equipment and systems for regionally important feedstock sources.

**3. Should research needs be addressed solely by policy incentives?**

No, it should be a combination of policy and funding. Policy does help, but without the cash for start-up it often doesn't matter. Policy can drive the market, but not necessarily research. The private sector should be directly involved with policy as they are often the most in touch with impediments for making tested technologies commercially viable. However, this should not be done at the expense of new research as it is not usually done by the private sector, which means R&D efforts need to be funded in addition to being supported by policy.

**4. At what scale should feedstock logistics research be focused?**
This should be a mutli-scale approach done on a case by case basis. There are different types of feedstocks, with different size suppliers, different sized producers, different conversion methodologies, different sized markets, etc. The end goal for all remains the same however: it needs to be big enough to make it economically feasible.

**5. What other recommendations do you have to the Logistics Interagency Working Group?**
There should be a balance support applied R&D and new basic science.

We should also be addressing cultural as well as technological barriers to using, growing, producing etc. biomass. This could be a done via a variety of means, the foremost of which would be education.

The group should prioritize the kind and amounts of product that they can document best fits with the national priorities. Then they should assess the state of the art for the identified conversion technologies. Funds should then be allocated to the improvement of feedstocks and production methods that are in the National Interest. In considering production technologies emphasis should be placed on state of the art reliability and flexibility.

Technologies such as biomass reformation (gasification) with catalytic conversion of syngas offers opportunities to produce Fischer Tropsch diesel, jet fuel, ethanol, methanol and hydrogen using the same technology base. This and other conversion technologies should be given appropriate consideration However as there is a conversion subcommittee we mention it here only to note that it is important conversion technologies be developed in synergy with anticipated feedstocks and with the possibility of dealing with a broad range of feedstocks.

Reliable biomass inventories are important, e.g. follow up to the billion ton study. These need to be available on a regional scale that address the biomass feedstock shed that might supply a conversion plant.

Also critical are long term contacts for feedstock producers.