



Board Action Area 3: Feedstock Logistics

The vast expansion in biofuels production and use mandated by EISA will require the development of new methods and equipment to collect, store, and pre-process biomass in a manner acceptable to biorefineries. These activities, which constitute as much as 20% of the current cost of finished cellulosic ethanol, are comprised of four main elements:

- **Harvesters & collectors** that remove feedstocks from cropland and out of forests.
- **Storage facilities** that support a steady supply of biomass to the biorefinery, in a manner that prevents material spoilage.
- **Preprocessing/grinding equipment** that transform feedstocks to the proper moisture content, bulk density, viscosity, and quality.
- **Transportation of feedstocks** from the field to the biorefinery (as noted in Board Action Area 5: Infrastructure).

Federal agencies are actively collaborating with universities and industry to address this critical segment of the biofuels supply chain. Despite the important role of logistics and the relative immaturity of the needed equipment, to date this area of the supply chain has received limited Federal attention. Increased attention and R&D effort will be required for this supply chain element to achieve targets for delivered biomass.

Next Steps

Highly effective process management must be integrated with specialized equipment to ensure feedstocks maintain quality, consistency, and reliability of supply over time, while maintaining a reasonable delivered cost. However, natural irregularities of the agricultural system, including year-to-year variations in production, crop rotations, and maintenance of soil nutrients over the long term make cost-cutting measures a challenge. The hurdles that must be overcome fall into two main categories:

- **Logistics enterprise design & management:** The design of feedstock collection, storage and preprocessing systems will vary based on feedstock type, regional geography, and system ownership structures. The challenge is to reduce labor and fuel costs which constitute virtually all the expenses in this supply chain element.
- **Technology development:** New technologies are required to support efficient, economic, and sustainable biomass collection and handling. These include creative approaches to moving feedstocks from field to plant, such as sending slurry through dedicated pipelines, single pass harvesters for agricultural residue collection during commodity crop harvest and in-forest grinders to enable forest residue densification at time of collection. Equipment is being developed and tested by industry and academia to facilitate the collection of these new biomass resources.

Biomass R&D Board Actions

- The Board will facilitate collaboration to develop and deploy logistics systems that can supply cellulosic feedstocks to demonstration facilities currently planned for construction. An active interface with private sector partners will be critical to the success of this research. A working group consisting of the USDA, DOE, and other agencies will lead a planning process to develop milestones culminating in the implementation of logistics systems demonstrations in partnership with industry.
- The Board will ensure that consideration of feedstock logistics issues is integrated into the work of both the Feedstock Production working group (Board Action Area 2) and the Board's Transportation Infrastructure activities (Board Action Area 5).

