Biomass Program

Feedstock Interface R&D

Feedstock Supply System Logistics

Feedstock supply is a significant cost component in the production of biobased fuels, products, and power. The uncertainty of the biomass feedstock supply chain and associated risks are major barriers to procuring capital funding for start-up biorefineries. To facilitate the establishment of a reliable feedstock infrastructure, researchers are developing a robust feedstock supply logistics model to assess the availability of biomass delivery processes for specific biorefineries.

A dynamic simulation feedstock supply model has been developed to represent the various stages of biomass collection, processing, storage, and distribution activities associated with supplying corn stover to a biorefinery. The model will be used to investigate the impacts of climate, geographical, biological, operational, and logistical factors on the cost of delivering biomass and it will minimize the delivered biomass cost by selecting an optimum mix of biomass sources, machinery, handling processes, capacities, storage, and transportation systems.

Additionally, the model will be modifiable for the simulation of other agricultural residues, forest products, and mixed biomass resource systems.

R&D Pathway

Researchers have developed a flow network to represent biomass collection and delivery processes. They are developing mathematical models to describe processes and constraints, compiling operational data (soil and climate), and integrating the model with other system tools such as GIS. An optimization scheme to automatically select the lowest cost biomass supply system for a biorefinery will be included. The model will be validated using field data and expert advice, and implemented in collaboration with the existing industry and planned biorefineries.
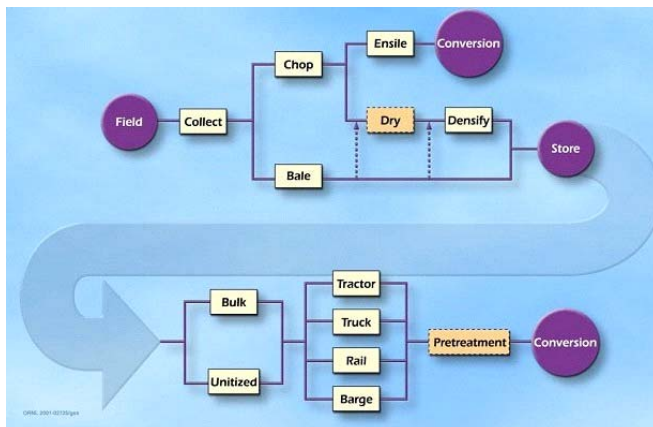
Biomass collection, storage, and delivery process options.

Benefits

- **Provide credible biomass availability data to biorefineries**
- **Reduce uncertainty and risk associated with the biomass feedstock supply chain**

Applications

The model will identify R&D needs for new collection and transport equipment and storage systems. The biomass availability data generated will assist new biorefineries in developing sound business plans.

Project Participants

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Project Period

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