AFRI Sustainable Bioenergy and Bioproducts Challenge Area CAP Requirements

The following descriptions highlight aspects of the biomass supply chain project applicants must address:

Feedstock Development: Optimize yields and allow for reduced inputs.

• Maximize the range of feedstock phenotypes, through advanced genomics, breeding, and systems integration. Systems proposing transgenic crop development should give evidence of a reasonable pathway to deregulation to allow commercial deployment.

• Increase the geographic range where dedicated feedstocks may be grown with high yields and low inputs.

• Minimize water usage and nutrient, pesticide, and herbicide inputs through genetic improvement.

Sustainable Feedstock Production Systems: Optimize yields with minimal environmental impact.

• Identify best management practices (including, but not limited to, rotation or multi-cropping utilizing perennial systems) that minimize water usage; improve water quality, soil health, and air quality; reduce nutrient, pesticide, and herbicide inputs; and augment biodiversity.

• Evaluate (from field-to-watershed scales) impacts of bioenergy feedstock production on food, feed, or fiber production and identify strategies to minimize adverse impacts.

• Optimize agronomics, cropping systems, and silviculture.

Feedstock Logistics: Develop equipment and strategies with the scale and efficiency required for sustainable biomass production.

• Harvest and collection – Operations to acquire biomass from the point of origin and move it to a storage or queuing location. Examples include cutting, harvesting, collecting, hauling, and (often) some form of densification, such as baling or bundling.

• Storage – Operations essential for holding biomass material in a stable form until preprocessing or transport to the processing facility. Storage could be at locations near the harvesting areas, at the industrial facility, or both.

• Preprocessing – Processes that physically, chemically, or biologically transform biomass into a state more suitable for transport or for product conversion. Examples include densification, thermochemical processing, grinding, drying, chemically treating, ensiling, fractionating, and blending.

• Transportation – Movement of biomass through the logistics system from harvest and collection to the processing facility. Biomass transport options are generally constrained to

existing transportation infrastructure, such as truck, rail, barge, or pipeline. Develop new transportation technology including improved containers and lighter vehicles to reduce truck traffic and transportation costs, reduce impact on roads and bridges, and reduce undesirable social impacts.

• Health and Safety issues as they pertain to new systems integration and equipment.

System Performance Metrics, Modeling, Analysis, and Decision Tools: Generate social, environmental, and economic metrics and data to evaluate the sustainability as well as production performance of a regional system.

• Develop region and feedstock specific data management plans for Sustainability Performance Metrics and Data Acquisition methods.

• Validate region and feedstock specific sustainability performance metrics.

• Use existing and initial data to determine if performance metrics are valid and support sustainability performance objectives.

• Evaluate environmental impacts on:

- Soil quality and health
- Greenhouse gas emissions and carbon sequestration
- Biodiversity, beneficial insects, wildlife, and habitat
- Land-use change
- Water quality and availability
- Air quality

• Assess social and economic impacts or implications

• Develop decision-making tools