

Project Summary for Public Release

Background: Among renewable carbon resources, purpose-grown herbaceous energy crops, specifically switchgrass, miscanthus, and high-biomass sorghum, provide the highest potential supply from cropland. Commercial-scale deployment of these crops now requires their cost-effective transformation into high-quality, environmentally sustainable, conversion-ready



Figure 1. Comprehensive Evaluation of Regional Mobilization of Low-Carbon Intensity Herbaceous Feedstocks for Biofuels and Bioproducts (RM-Herb): Switchgrass, Miscanthus, and High-Biomass Sorghum.

herbaceous feedstocks for biofuels and bioproducts (Fig. 1).

To achieve this, we will link new and ongoing data streams from commercial scale, statistically rigorous, spatially distributed field trials of three major low carbon intensity (LCI) herbaceous energy crops with ecosystem service provision and technoeconomic analyses to fill critical knowledge gaps in producing environmentally sustainable CRHF. We will do this by building on our collaborative success over 20+ years of working with the Dept of Energy (DOE) and by using crop varieties, technologies, and methods already developed, often with DOE support. Our team members were major contributors to the DOE and Sun Grant Regional Feedstock Partnership and are

part of national labs or DOE Bioenergy Research Centers. Our industrial team members actively grow and sell biomass from >15,000 acres in the US today.

Project Goal: The overarching goal of this project is to develop and demonstrate a regional system to actively mobilize CRHFs for biofuels and bioproducts. Our focal herbaceous energy crops are switchgrass, miscanthus, and sorghum. Our specific objectives are to 1) demonstrate field-scale productivity, feedstock quality, and long-term resilience, 2) determine ecosystem service provisions, 3) quantify carbon intensity, and 4) evaluate TEA-LCA of conversion-ready feedstock production from planting to farm storage, and 5) coordinate all project aspects with the Regional Biomass Resource Hub Initiative coordinator, Idaho National Lab. At completion, we will have commercial-scale data and experience that, combined with other synergistic public and private efforts, will advance HEC readiness from early commercial to commercial switchgrass and miscanthus, from field-scale production to pre-commercial sorghum.

DOE Impacts: This BETO funding will generate the ground-truth commercial-scale data needed for the trusted valuation of LCI feedstocks, unleashing the HEC marketplace. It will also enable workforce cross-training across academy, industry, and nonprofit sectors, across crops and environments. The project will advance equity and inclusion as we support farmers, train those underrepresented in STEM, and locate project activities in underserved communities.