SWIFT: **S**ingle-pass, **W**eather **I**ndependent **F**ractionation **T**echnology for Improved Property Control of Corn Stover Feedstock

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Corn stover is an abundant source of biomass that can be utilized for bioenergy production, representing 70% of the available crop residues in the U.S. However, recent projections estimate that over 60% of corn stover will be collected at moisture levels that exceed 20%. This is incompatible with conventional baled logistics systems due to unwanted microbial degradation. For the 40% of the stover that could be utilized with the current technology, multiple other technical challenges exist. The result is a persistent lack of ability to produce a reliable feedstock. Consequently, there are no real existing markets in which this potentially-valuable cellulosic material can enter.

To solve this biomass challenge, a paradigm-shifting technology is being proposed. SWIFT, **S**ingle-pass, **W**eather **I**ndependent **F**ractionation **T**echnology, streamlines collection by eliminating multiple time-consuming, costly, non-value-added, field and weather-dependent steps that comprise the current technology in corn stover harvest. The novel approach employs four basic operations: whole-plant harvest, distributed anaerobic storage, co-transport of grain and stover, and fractionation at the biorefinery. SWIFT allows unprecedented control of the physical and chemical characteristics of corn stover biomass enabling a reliable commodity market for corn stover.

Based on previous work by our team and others, we are confident that the work proposed in this project will develop a **SWIFT process to produce a feedstock that meets or exceeds BETO's 2030 cost target of $2.50/GGE**. This assertion is supported by the following positive attributes:

A. Removing the need to dry corn grain for stable storage

B. Regulatory weight-limited transport of grain and stover to the biorefinery

C. Low-cost, single-pass harvest method that can reduce ash contamination to intrinsic structural ash of the standing plant

D. Expanded acreage able to participate in biomass harvest from 37% to 64% due to moisture-tolerant collection and storage approach

E. Reduction in pretreatment and hydrolysis costs by fractional utilization of stover