

# **Supply Chain Designs for Cellulosic Ethanol: A Study of Mississippi**

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## **Abstract**

The goal of this study is to design efficient supply chains for cellulosic ethanol (C-Ethanol), starting from harvesting the biomass till supplying C-Ethanol to the markets. The problem is modeled as a mixed integer programming (MIP) problem. Inputs to the model are the availability of biomass feedstock, as well as biomass transportation, inventory and processing costs. The model determines the number, size and location of biorefineries needed to produce C-Ethanol using the available biomass. The model also determines the amount of biomass shipped, processed and inventoried during a one year time period. The problem is solved by a commercial LP/MIP solver, CPLEX 9.0. We use the State of Mississippi as the testing ground of this model. We generate a number of scenarios based on the type and availability of biomass supply in the state. These scenarios are used to analyze the performance of the supply chains models developed.