Contribution 7 in session “Looking for efficient bioenergy supply chains“

Optimizing Bioenergy Supply Chain Configurations for the Northeastern United States

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In the Northeastern United States, as in many places around the country, interest has developed in the increased use of renewable resources for the production of energy. While regions such as the Southwest and central have focused on the development of solar and wind technologies; these technologies have limitations on their effectiveness. In the Northeast, biomass derived from forests and short rotation woody crops (SRWC), may hold the key for renewable energy production in the region. While woody biomass is a potential feedstock for a diverse set of energy development options, little emphasis has been placed on developing supply chains to efficiently deliver the resource to the end user. Developing efficient supply chains is predicated on identifying configurations that will optimize the harvest, extraction, transport, storage and preprocessing of the woody biomass resources to provide the lowest possible delivered price. The characteristics of woody biomass, such as spatial distribution and low bulk density, tend to make collection and transport difficult as compared to traditional energy sources. These factors, as well as others, have an adverse effect on the cost of the feedstock. The objective of this research is to identify potential supply chain alternatives, through the use of mathematical modeling, in particular mixed integer linear programming; that will potentially be able to provide sufficient quantities of biomass resources that can be utilized in the production of renewable energy at an economical price.