

Cellulosic Biofuel Potential in the Northeast: A Scenario Analysis

Topic:

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Secure access to energy and food are two of the challenges facing the Northeast region of the US. An alternative to traditional biofuel feedstocks, which compete for land and water, is advanced biofuel feedstock in the form of net forest growth and woody wastes, of which the Northeast has abundant endowments. The federal government has committed to requiring 79.5 billion liters of advanced biofuel production annually by 2022.

This study introduces the production of biofuels, in particular cellulosic ethanol from woody biomass, in the economies of the Northeast as an alternative to gasoline. We evaluate both the capacity for its production and its cost competitiveness using an input-output model of consumption, production, and trade within the 13-state region. The model minimizes resource use required to satisfy given consumer demand for specified technological options and subject to resource constraints. We compile data from the technical literature quantifying state-level biofuel feedstock endowments and the process-level requirements for cellulosic ethanol production.

We find that exploiting this potential requires either restricting imports of gasoline or making the price of biofuels competitive through subsidies. Based on this initial investigation, we conclude that the region can produce significant amounts of advanced biofuel, up to 20.28 billion liters of cellulosic ethanol per year, which could satisfy nearly 12.5% of gasoline consumption that is now devoted to motorized transport in the region. Relying on import restrictions alone to assure full capacity utilization would increase the unit price of motor fuel in the region by 44%. Depending on the amount of subsidy, biofuel production could be competitive in some states but not in others. Using the 2007 spot price for gasoline in New York as a reference, a subsidy of \$0.29 per liter (or \$1.09 per gallon) would be required for the entire potential to be achieved.