

STRATEGIC ASSESSMENT OF BIOFUELS POTENTIAL FOR THE WESTERN U.S.

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The technical feasibility of producing biofuels in the western United States is described using spatially explicit biomass resource supply curves, a detailed transportation network model for the region, and costs for converting biomass to refined biofuels. The study addresses the widespread concern over the environmental, geopolitical, and economic effects of the U.S. dependence on petroleum. The study is responding to state and federal legislative bodies who are setting goals for reducing the consumption of fossil fuels in the transportation sector using targets for the infusion of so-called “low-carbon” biofuels into the transportation fuel market. The use of biomass from municipal waste streams, forest thinnings, and herbaceous agricultural residues or energy crops for biofuels production can significantly reduce the net life cycle emissions of greenhouse gases in comparison with crude oil; the benefits from grain and other crops are less certain. This report and the accompanying models represent a significant step forward in understanding the potential for meeting policy goals based on near-term technological and infrastructure parameters. The paper presents biofuel supply curves estimating potential future supplies of liquid fuels from biomass in the western United States as a function of market price. The combined GIS network analysis and biorefinery optimization model was developed to:

- Spatially resolve biomass resource quantities and distributions throughout the Western Governor's Association region for major feedstock types,
- Map supporting transportation and biofuel-handling infrastructure to estimate biorefinery gate feedstock costs and biofuel distribution costs,
- Optimize biorefinery types, sizes, and locations for competing conversion technologies based on the objective of maximizing producer profit under a market price constraint.

The analysis focuses on the generation of biomass and biofuel supply curves over a year 2015 planning horizon. Total capacity for biofuels production is described for both the regional and state levels.

KEY WORDS: biofuels, agriculture residues, wood residues, thinnings, grease, herbaceous energy crops, biomass supply estimates, network analysis

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