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Forest Biomass Availability Analysis and Large-Scale Supply Options

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ABSTRACT

Finnish forest companies aim to produce biodiesel based on the Fischer-Tropsch process from forest residues. This study presents method to evaluate biomass availability and supply costs to the selected biorefinery site. Forest-owners ' willingness to sell, buyers ' market share, and regional competition were taken into account when biomass availability was evaluated. Supply logistics was based either on direct truck transportation deliveries from forest or on railway/waterway transportation via regional terminals. The large biomass need of a biorefinery demanded both of these supply structures, since the procurement area was larger than the traditional supply area used for CHP plants in Finland. The average supply cost was 17 €/MWh for an annual supply of 2 TWh of forest biomass. Truck transportation of chips made from logging residues covered 70% of the total volume, since direct forest chip deliveries from forest were the most competitive supply solution in terms of direct supply costs. The better supply security and lower vehicle capacity needs are issues that would favour also terminal logistics with other raw-material sources in practical operations. One finding was that the larger the biomass need, the less the variation in biomass availability and supply costs, since almost the whole country will serve as a potential supply area. Biomass import possibilities were not considered in this study.

KEYWORDS

Logistics; Forest Residues; Supply Chain; Biorefinery

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