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BIOMASS COULD PROVIDE 30 PERCENT OF U.S. ENERGY DEMAND BY 2030

A joint feasibility study conducted by the US Departments of Agriculture and Energy has concluded that the US has the potential to produce a billion dry tons of biomass per year, while still continuing to meet the nation's food, feed and export demands.

According to a proposed strategy outlined in the report, biomass from forest and agricultural lands could supply up to 30 per cent of energy demand in the US by 2030.

Download the report, "Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply" (April 2005; 78 pages) from either:

<http://www.eere.energy.gov/biomass/publications.html#feed>

or

http://feedstockreview.ornl.gov/pdf/billion_ton_vision.pdf

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Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply

<http://www.bioproducts-bioenergy.gov/news/DisplayRecentArticle.asp?idarticle=186>

The DOE Oak Ridge National Laboratory's Environmental Science Division, the USDA Forest Service, and the USDA Agricultural Research Service recently collaborated to generate the Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply study. In the Biomass R&D Technical Advisory Committee's Vision for Bioenergy and Biobased Products in the United States, far-reaching goals are set for the contribution of biomass to meet future energy needs. Authors of the feedstock study estimated that one-billion dry tons of biomass resources would be needed to reach these goals. The purpose of the feedstock study is to determine whether United States land resources are capable of sustainably producing that level of biomass resources. The study analyzed resources currently available on agricultural and forest lands and concluded that the U.S. is capable of producing enough biomass to generate the one billion annual dry tons needed to displace 30 percent of the country's petroleum consumption on a sustainable basis.

Forestlands account for an estimated 33 percent of the America's 2,263 million acres.¹ DOE and USDA estimate that 367 million sustainable dry tons of biomass feedstock are available annually from forestlands. This tonnage includes: 52 million dry tons from harvesting for fuel wood, 144 million dry tons from wood processing and pulp and paper mills, 47 million dry tons from urban wood residues, 64 million dry tons from logging and site clearing operations, and 60 million dry tons from forest fire hazard reduction efforts.²

In evaluating the feedstock to be generated from logging and site clearing and fire hazard thinning, the following assumptions were made: all forestland not currently accessible by roadways were excluded; all environmentally sensitive areas were excluded; equipment recovery limitations were considered; and recoverable forest materials categorized as either conventional forest products or biomass for bioenergy and biobased products.³

Agricultural lands are estimated to account for approximately 46 percent of the entire U.S. land base with 26 percent consisting of grassland pasture and range, and 20 percent consisting of cropland.⁴ DOE and USDA estimate that biomass feedstock available from agricultural lands, while still meeting food, feed and export demands, can supply 998 million sustainable dry tons of biomass feedstock annually. The 998 million dry tons includes the following: 428 million dry tons from crop residues, 377 million dry tons from perennial crops, 87 million dry tons of grains for biofuels, and 106 million dry tons from animal manure, process residue, and miscellaneous feedstocks.⁵

Assumptions made in the agricultural portion of the study include the following: yields of corn, wheat, and other small grains were increased by 50 percent; the residue-to-grain ratio for soybeans increased to two to one; harvest technology was capable of taking 75 percent of annual crop residues; all cropland was managed with no-till methods; 55 million acres of cropland, idle cropland, and cropland pasture were dedicated to the production of perennial bioenergy crops; all manure in excess of that which can be applied on-farm for soil improvement under anticipated EPA restrictions were used for biofuel; and all other available residues were utilized.⁶

Based on the amount of biomass feedstock available from both forest and agricultural lands, the study concludes that at least 1.3 billion sustainable dry tons are available annually to displace petroleum-based fuels and products. This supply amount can, displacing 30 percent of the current U.S. petroleum consumption, produce enough biofuels to meet more than one-third of the current demand for transportation fuels. Achieving this potential would result in a seven-fold increase in the production of biomass currently used for bioenergy and biobased products, which is estimated to be approximately 142 million dry tons.

Each of these activities illustrates the progress DOE and USDA are making to increase collaboration related to biomass R&D in response to the Biomass R&D Act of 2000.

Sources:

¹ Oak Ridge National Laboratory (US) [ORNL] and United States Forest Service (US) [USFS] and Agricultural Research Service (US) [ARS]. Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply. 2005. A feasibility study. Oak Ridge (TN): Oak Ridge National Laboratory [ORNL]; 2005 April. 3 p. Available from: ORNL, Oak Ridge, TN 37831; ORNL/TM - 2005/66

² *ibid.* p. xi

³ *ibid.* p. xi-xii

⁴ *ibid.* p. 3

⁵ *ibid.* p. xiii

⁶ *ibid.* p. xii

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