



Summary of Biomass Economic Research

The objective of the American Forest & Paper Association's (AF&PA's) biomass research was to assess how to best use America's untapped forest resources to promote the production of renewable energy and sustain the maximum number of jobs.

Two studies were commissioned to accomplish these ends. The first was a jobs study conducted by RISI and the second, a biomass supply study prepared by Forisk Consulting.

RISI Jobs Study

The RISI study found that for a given volume of wood consumption, the forest products industry sustains 5 times as many core jobs (i.e., mill jobs) and 9 times as many total jobs (includes logging, paper converting jobs, and downstream wood processing jobs) as the energy sector. For the paper industry, the respective ratios work out to be 4:1 and 8:1, and for the solid wood products sector, the ratios are 6:1 and 11:1.

	<u>Core Jobs</u>	<u>Total Jobs</u>
Forest Products Industry	5:1	9:1
Paper Sector	4:1	8:1
Solid Wood Sector	6:1	11:1

The energy sector was defined to include electricity generation (weighted at 71% of the total), wood pellet plants (25%), and biofuels (4%).

The RISI results are roughly consistent with a 2006 Confederation of European Paper Industries-sponsored jobs study conducted by Pöyry. This study, which focused on Europe, found that the paper industry supported 6 times as many direct jobs and 13 times as many total jobs as the electric utility sector. A Forest Products Association of Canada study released earlier this year found that pulp mills which are integrated to bioenergy support 5 times as many jobs for a given volume of wood consumption as compared with stand-alone bioenergy plants.

Forisk Biomass Supply Study

The Forisk study was designed to assess how much woody biomass could be collected for bioenergy without diverting wood from traditional end uses. It concluded that approximately 50 million dry tons of forest/unused manufacturing residues and urban wood waste could readily be collected without major capital investments.

According to AF&PA calculations, 50 million dry tons of wood could generate 60 billion kWh of electricity a year or about 1.5% of total U.S. electricity consumption. Looked at another way, 60 billion kWh of biomass electricity would represent a 50% increase in renewable energy generation (solar, wind, biomass, geothermal). Alternatively, 50 million dry tons of wood could be used to produce an estimated 4.5 billion gallons of cellulosic biofuels, or 28% of the 16 billion gallon national Renewable Fuels Standard mandate for 2022 by the Energy Independence & Security Act of 2007.

While the study indicates that some 50 million dry tons a year of wood are readily available from forest residues and urban wood waste, Forisk estimates that potential recovery could reach 75 million dry tons a year at a price point of \$40 a dry ton and 90 million dry tons at a price point of \$80 per dry ton.

Type	Readily Available*	Summary Supply Curves						
		\$20/dt	\$25/dt	\$30/dt	\$35/dt	\$40/dt	\$50/dt	\$80/dt
Logging Residues	28,442,631	36,681,589	36,681,589	36,681,589	48,708,693	54,727,763	59,401,641	59,401,641
Other Removals	11,083,030	0	0	0	0	11,083,030	11,083,030	16,637,480
Urban Wood Waste	8,328,051	3,094,301	3,847,302	6,091,148	7,959,082	8,328,051	8,867,566	10,044,564
Mill Residues	1,699,340	1,699,340	1,699,340	1,699,340	1,699,340	1,699,340	1,699,340	1,699,340
Total	49,553,052	41,475,230	42,228,230	44,472,077	58,367,115	75,838,184	81,051,577	87,783,025

See footnote for more detail*

Preliminary data from the U.S. Forest Service indicate that fuel treatments to reduce fire hazards could yield 60 million dry tons a year of wood, mostly from federal lands located in the West. However, conducting these fuel treatments would be costly and would likely face significant opposition from several environmental organizations.

The Forisk study projects that paper industry demand for pulpwood will be down slightly in 2020 compared with 2005, with most of the decline being offset by increased use of pulpwood-sized logs to make oriented strand board.

Hence, only about 5 million dry tons a year of pulpwood will be available for energy use under an estimating procedure being used in the update of the United States Department of Agriculture-Department of Energy's "Billion Ton Study." (According to the estimating procedure, half of the reduction in pulpwood demand by the forest products industry will be available for bioenergy.)

The Forisk study concluded that the best way to encourage development of the cellulosic bioenergy industry without hurting higher-value end uses was to focus on supply. In particular, the consulting firm recommended that supply be increased by incentivizing the planting of trees and facilitating the availability of loans to logging contractors to purchase equipment for the recovery of forest residues. In addition, the potential for fuel treatments on public lands should be explored.

In conclusion, the two research reports commissioned by AF&PA suggest that society would be better off if wood is permitted to flow unimpeded to its highest value end uses. However, there are logging residues, urban wood wastes and other sources that are being underutilized and can, therefore, be made available for bioenergy without jeopardizing manufacturing jobs. On the supply side, the government should encourage tree planting and facilitate loans to logging contractors to purchase equipment.

* Readily available is defined as (1) unused by other wood raw material consumers and (2) directly accessible with proven logging configurations without major capital investment. Includes logging residues at lowest cost point (\$13-15/dry ton), other removals (i.e., trees from land use changes) at \$40/dry ton on board truck cost, urban wood waste available at \$40/dry ton on board truck cost, and all unused mill residues. Costs do not include stumpage or hauling off of the collection site.