

**REPORT OF THE
VIRGINIA DEPARTMENT OF FORESTRY ON**

**The Availability And Delivered
Prices Of Wood Wastes Within
Virginia For Possible Use As
Energy Fuel In State Facilities**

**TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA**



HOUSE DOCUMENT NO. 13

**COMMONWEALTH OF VIRGINIA
RICHMOND
1994**



JAMES W. GARNER
State Forester

COMMONWEALTH of VIRGINIA
DEPARTMENT OF FORESTRY

Alderman & McCormick Roads
Box 3758, Charlottesville, Virginia 22903
(804) 977-6555 (V/TDD)

The Honorable L. Douglas Wilder
Governor of Virginia
and
The General Assembly of Virginia

The report transmitted herewith is pursuant to House Joint Resolution No. 582 of the 1993 Session of the General Assembly of Virginia. The Resolution requested the Department of Forestry to survey the availability and delivered prices of wood wastes within the Commonwealth that may be used as an energy fuel for state facilities and submit the report to the Governor and the 1994 Session of the Virginia General Assembly.

Table of Contents

	Page No.
1. Executive Summary	4
2. Preface	5
3. Introduction	6
4. Survey Results	7 - 9
5. References	10
6. Appendices	
A. Resolution No. 582	
B. Wood-by-Products Value	
C. Wood Residues Supplemental Information Form	
D. Sample of Wood Residue Data	
E. Map Showing Sawmills Per County	
F. Map Showing Sawmills Reporting Sawdust Sold for Fuel, 1992	
G. Lumber Production In Virginia, 1869-1992	

EXECUTIVE SUMMARY

Pursuant to the 1993 House Joint Resolution No. 582, the Virginia Department of Forestry was requested "to survey the availability and delivered prices of wood wastes within the Commonwealth".

Working with other state agencies and excellent cooperation from the sawmill industry, data was collected that provided answers to the questions requested in the Resolution.

The data showed:

- (1) The wood by-product sawdust is produced in large quantities and available to the highest market buyer.
- (2) Average delivered price for sawdust as a fuel was \$9.37 per ton. Prices ranged from \$5-\$15 per ton.
- (3) Average hauling distance was 58 miles with ranges from 1/2 mile to 210 miles (one way).
- (4) Sawdust will be available for many years judging from past and present sawmill production and the industry infrastructure.
- (5) A lack of markets for sawdust does not appear to be a hindrance to expansion of the Commonwealth's wood manufacturing industry.
- (6) If all other factors proved to be economically feasible for an energy plant, a state facility should be able to purchase sawdust for fuel.

PREFACE

House Joint Resolution No. 582 (see Appendix A) requested the Virginia Department of Forestry, "to survey the availability and delivered prices of wood wastes within the Commonwealth". The resolution was generated by recommendations set forth in the Report of the Virginia Coal and Energy Commission, Senate Document No. 41 – 1993 (Ref. 1).

The Coal and Energy report was examining the recommendation of the A. L. Philpott Southside Development Commission's 1992 report to "look at policies necessary to promote greater use of wood wastes as fuel at state facilities" (Ref. 2). While not stated specifically both reports were thinking of the use of sawdust as an energy fuel for state facilities (Discussion with Dr. Jack Muench, VPI, Blacksburg, Virginia – Ref. 3). This is primarily due to the ease of handling, equipment cost designed to burn the fuel, and relatively low cost of sawdust compared to other wood-by-products from primary processing facilities (see Appendix B).

Based on the understanding of the previously mentioned reports and the discussion with Dr. Muench, the availability of sawdust as an energy fuel for possible use in state facilities was studied. If fossil fuel prices rise significantly in the future other wood-by-products could be considered for analysis.

INTRODUCTION

To accomplish the Resolution, information and data on sawdust was obtained to answer the following:

- (1) Availability
- (2) Delivered prices
- (3) Hauling distances
- (4) Long-term availability
- (5) Quantitive data on lack of markets that restrict production or expansion of the wood industry in Virginia.

The method used to obtain the data was by mailing a survey form to each mill (see Appendix C). Those mills not returning the form were then contacted by Department of Forestry field personnel to obtain the data. A majority of the mills cooperated and only a few refused to give information. These forms, along with previous years survey data, historical production records maintained by Department of Forestry, industry contacts and knowledge of the sawmilling industry were used to accomplish the Resolution's request to the Department of Forestry.

SURVEY RESULTS

Availability

The Department considers as available any product that is produced. Generally this is available to the highest bidder and usually it is the market closest to the production spot due to transportation cost. Even though a product, in this case sawdust, is reported as being "used" does not mean it is totally unavailable to a new market. If that new market is closer to the production point chances are the new market will obtain the product.

In light of the above, production of a product becomes the key factor. The Department of Forestry has tracked the production of wood residues, especially sawdust, and their uses for many years (see Appendix D for example of residue data). A detailed report will be available later in the winter when all data is analyzed by the U.S. Forest Service, Asheville, North Carolina.

Sawdust production in 1992 is estimated to be about 1,222,000 tons. Sawdust is produced in all geographic provinces in Virginia (see Appendix E). Seventeen counties in Virginia do not have a sawmill. The other counties have one or more.

This survey showed that about 66 percent of the sawmills sold/or used sawdust for energy fuel in 1992 (see Appendix F). Southwest Virginia has the highest unused volumes of sawdust (approximately 45 percent) because there is no large industrial user, such as a pulp mill, in that area. All other geographic areas report that over 97 percent of the sawdust is used.

Delivered Prices

The delivered price for sawdust used for fuel is as follows:

<u>Delivered Price per Ton</u>	<u>No. Reporting</u>
\$ 0 - 5	10
5 - 7	21
7 - 9	45
9 - 11	90
11 - 13	26
<u>13 - 15</u>	<u>11</u>
	203

The average price per ton was \$9.37. This corresponds to the figure of \$10.00, which is often quoted as the average price for sawdust. The higher figures reported are for longer hauling distances and the low ones are for mills closer to the buyers plant.

Mileage of Delivered Residues

Firms reported transporting sawdust from a low of 1/2 mile to a high of 210 miles one way. The overall average distance for delivered sawdust for fuel was 58 miles. Some comments on the forms stated that while they have been successful in marketing their residue during the year it is becoming more difficult at certain times of the year. Generally this occurs during the summer months and periods when the buyers operation is shut down for vacation or repairs.

Judging from the location and number of sawmills in the state (Appendix E) all state facilities are within a reasonable hauling distance of sawdust being produced.

Long-Term Availability

Production of a product, sawdust in this case, means it is available to the highest value market the producer can find. Historical sawtimber production in Virginia indicates that sawdust has been produced in large quantities for many years (Appendix G). Based on the past production records and demands of the public for sawn wood products sawdust will be produced for a long time. While the records indicate a high percentage of the sawdust is "used", a higher value market buyer should be able to purchase it.

Lack of Markets for Wood By-Products

The Department of Forestry was requested "to develop quantitative of information documenting the extent to which the lack of net-revenue-generating by product markets are currently restricting or hindering expansion of the Commonwealth's wood product manufacturing industry" (Appendix A). During slow or low market periods, sawmill producers must stockpile their sawdust. This is because the market and price for their primary products is such that they can't afford to close the mill. However, at certain times of the year, for a few producers, lack of markets forces them to slow or shut down production for a short period of time.

Only 14 of 203 reporting firms (or 6.9 percent) reported a reduction in sawmill production due to lack of sawdust markets at sometime during the year. The lost volume was 10,391,000 board feet. Three firms accounted for 77 percent of the total; one of those three firms actually accounted for 58 percent of the total.

The stated reductions ranged from 52 thousand board feet to 6 million board feet (not being able to run a second shift) per year. The reduced production would equal a little less than one percent of Virginia's annual sawmill production.

CONCLUSIONS

1. Sawdust is produced and purchased in large quantities for energy fuel. Other uses include pulping, charcoal, particleboard, animal litter, and mulch. It is generally available to the highest value market. Unused sawdust amounts to about 7 percent of production in Virginia. Southwest Virginia has the most unused sawdust, amounting to about 45 to 50 percent of total production for the area.
2. Delivered prices for sawdust used as fuel range from \$5-\$15 per ton with the average, as reported on the survey, being \$9.37 per ton.
3. Sawdust is transported an average of 58 miles (one way) to the point of use, with a low of 1/2 mile to a high of 210 miles.
4. Past production records and existing sawmill infrastructures suggest sawdust will be available for many years into the future.
5. Lack of markets for sawdust does not appear to be a hindrance to expansion of the Commonwealth's wood manufacturing industry. Some production was lost but accounted for less than one percent of the states' annual sawmill production.

1993 SESSION

LD9158168

HOUSE JOINT RESOLUTION NO. 582

Offered January 26, 1993

Requesting the Department of Forestry to survey the availability and delivered prices of wood wastes within the Commonwealth.

Patrons—Councill, Abbitt, Bennett, Hull, Parker and Thomas

Referred to the Committee on Agriculture

WHEREAS, wood-waste fuels can reduce heat energy costs to the Commonwealth and provide economic stimulus to local wood products industries within the Commonwealth; and

WHEREAS, the lack of quantitative information about the potential availability of wood-waste fuels to the Commonwealth at specific locations, at present and over the long term, currently impedes the greater use of wood wastes for fuels by state facilities; and

WHEREAS, wood wastes' viability as a fuel at state facilities' central heating plants is tied closely to accessibility, availability and transportation costs; and

WHEREAS, currently, no data exists showing the location, availability, and delivered prices of wood waste from wood-processing facilities within the Commonwealth; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Department of Forestry be requested to survey the availability and delivered prices of wood wastes within the Commonwealth, subject to favorable action on a budget amendment providing sufficient agency funding for the survey, estimated to be \$20,000 - \$30,000. Such survey should show wood wastes' availability within reasonable hauling distances of major state facilities and installations within each county in Virginia, from sources within the Commonwealth. Such survey should also consider the need to assure the availability of fuel supplies over the long term. In conducting the survey, the Department of Forestry is also requested to develop quantitative information documenting the extent to which the lack of net-revenue-generating byproduct markets are currently restricting or hindering expansion of the Commonwealth's wood product manufacturing industry; and be it

RESOLVED FURTHER, That all agencies of the Commonwealth shall provide assistance upon request to the Department of Forestry, as appropriate, and that members of Virginia's wood product manufacturing industry are urged to furnish such assistance as the Department of Forestry, or any agency assisting it, may request; and be it

RESOLVED FINALLY, That the Department of Forestry be requested to report the survey's findings and conclusions to the Governor and the 1994 Session of the Virginia General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

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Official Use By Clerks			
Agreed to By			
The House of Delegates		Agreed to By The Senate	
without amendment	<input type="checkbox"/>	without amendment	<input type="checkbox"/>
with amendment	<input type="checkbox"/>	with amendment	<input type="checkbox"/>
substitute	<input type="checkbox"/>	substitute	<input type="checkbox"/>
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Date: _____		Date: _____	
_____		_____	
Clerk of the House of Delegates		Clerk of the Senate	

APPENDIX B

**WOOD BY-PRODUCTS VALUE FROM
PRIMARY PROCESSING PLANTS¹
(\$ PER GREEN TON)**

<u>Product</u>	<u>Softwood</u>	<u>Hardwood</u>
Sawmill Chip	\$22 - 27	\$18 - 22
Sawdust	\$ 5 - 15	\$ 5 - 15
Bark	\$15 - 30	\$15 - 30

¹ Source: *Pulpwood prices in the Southeast, 1991, USDA-Forest Service Experiment Station and telephone contact with residue buyers.*

APPENDIX C

WOOD RESIDUES SUPPLEMENTAL INFORMATION

Needed to respond to Legislative Resolution #582

1. During 1992, was your primary production (sawn products) reduced due to the lack of markets for the wood residues? If so, how much production was lost?

_____ MBF

2. The average delivered price for wood residues used for fuel is:

\$0-5 per green ton _____
5-7 per green ton _____
7-9 per green ton _____
9-11 per green ton _____
11-13 per green ton _____
13-15 per green ton _____

3. Mileage of delivered residues:

Minimum _____ miles
Maximum _____ miles
OR Average _____ miles

4. If some wood residues are not used, what is the cost for disposal?

\$ _____ per green ton
_____ tons not used

Disposal method (example- landfill) _____

COMPANY NAME _____

ADDRESS _____

APPENDIX D

TABLE IV
Virginia - 1989
Disposal of Residue at Primary
Wood-Using Plants

<u>Use of Residues</u>	<u>Bark</u>	<u>Course^{1/}</u>	<u>Sawdust</u>	<u>Shavings</u>	<u>Total</u>	<u>Percent</u>
		-----Green Tons-----				
Fiber Products	0	1,749,525	39,288	27,951	1,816,764	35
Particle/Flake Bd.	0	26,319	119,806	103,546	249,671	5
Sawn Product	0	72,119	0	0	72,119	1
Industrial Fuel	874,623	79,047	913,066	13,383	1,880,119	36
Domestic Fuel	23,337	88,075	18,742	0	130,154	2
Miscellaneous	560,987	31,487	171,395	45,424	809,293	16
Not Used	<u>41,959</u>	<u>68,212</u>	<u>112,317</u>	<u>8</u>	<u>222,496</u>	4
TOTAL	1,500,906	2,114,793	1,374,613	190,304	5,180,616	100

1/ Course – Slabs, edgings, trims, veneer cores, chips, etc.

Appendix G

LUMBER PRODUCTION FOR HARDWOOD AND SOFTWOOD IN VIRGINIA FROM 1869 - PRESENT (Thousand Feet, Board Measure)

<u>YEAR</u>	<u>SOFTWOOD</u>	<u>HARDWOOD</u>	<u>TOTAL</u>
1869	112,000	32,000	144,000
1879	222,000	95,000	317,000
1889	266,000	197,000	463,000
1899	717,207	241,912	959,119
1904	773,170	176,627	949,797
1905	531,617	183,580	715,197
1906	796,045	267,196	1,063,241
1907	984,665	427,812	1,412,477
1908	876,661	322,064	1,198,725
1909	1,460,133	641,583	2,101,716
1910	1,162,053	490,139	1,652,192
1911	932,498	427,292	1,359,790
1912	1,099,500	470,497	1,569,997
1913	864,008	409,945	1,273,953
1914	1,027,166	460,904	1,488,070
1915	627,275	292,218	919,493
1916	704,429	331,780	1,036,209
1917	648,697	294,182	942,879
1918	500,265	269,279	769,544
1919	695,112	402,926	1,098,038
1920	656,132	460,212	1,116,344
1921	550,665	214,820	765,485
1922	623,134	301,713	924,847
1923	687,819	399,296	1,087,115
1924	611,192	374,766	985,958
1925	584,660	355,516	940,176
1926	568,771	370,384	939,155
1927	476,556	320,805	797,361
1928	517,577	287,652	805,229
1929	543,808	316,192	860,000
1930	413,382	286,618	700,000
1931	366,294	183,706	550,000
1932	326,490	123,510	450,000
1933	461,899	108,101	570,000
1934	463,981	196,019	660,000
1935	498,619	201,381	700,000
1936	582,876	217,124	800,000
1937	587,906	252,094	840,000
1938	552,254	227,746	780,000
1939	636,854	273,769	910,623

<u>YEAR</u>	<u>SOFTWOOD</u>	<u>HARDWOOD</u>	<u>TOTAL</u>
1940	717,445	343,935	1,061,380
1941	901,513	384,118	1,285,631
1942	813,156	400,741	1,213,897
1943	662,150	435,920	1,098,070
1944	639,722	577,362	1,217,084
1945	547,392	447,272	994,664
1946	683,481	533,879	1,217,360
1947	739,857	426,210	1,166,067
1948	-----Not Available-----		
1949	652,026	381,034	1,033,060
1950	983,325	574,089	1,557,414
1951	815,535	612,739	1,428,274
1952	670,000	510,000	1,180,000
1953	642,000	498,000	1,140,000
1954	740,376	511,088	1,251,464
1955	662,000	593,000	1,255,000
1956	730,000	642,000	1,372,000
1957	616,000	434,000	1,050,000
1958	620,419	455,763	1,076,182
1959	660,000	494,000	1,154,000
1960	573,000	500,000	1,073,000
1961	517,000	508,000	1,025,000
1962	535,000	530,000	1,065,000
1963	557,000	627,000	1,184,000
1964	544,000	588,000	1,132,000
1965	530,000	605,000	1,135,000
1966	544,000	635,000	1,179,000
1967	515,000	602,000	1,117,000
1968	425,000	516,100	941,100
1969	517,400	788,000	1,305,400
1970	503,700	716,600	1,220,300
1971	421,600	625,500	1,047,100
1972	424,500	573,600	998,100
1973	463,000	639,400	1,102,400
1974	377,900	630,800	1,008,700
1975	381,700	524,800	906,500
1976	450,218	575,550	1,025,768
1977	518,322	652,000	1,193,000
1978	518,322	657,658	1,175,979
1979	532,300	657,500	1,189,800
1980	520,250	600,380	1,120,000
1981	468,200	595,600	1,063,800

<u>YEAR</u>	<u>SOFTWOOD</u>	<u>HARDWOOD</u>	<u>TOTAL</u>
1982	498,000	598,000	1,096,000
1983	607,155	684,764	1,294,919
1984	591,280	692,880	1,284,160
1985	568,368	591,759	1,160,127
1986	641,798	658,662	1,220,460
1987	577,562	731,060	1,308,662
1988	552,519	705,887	1,258,406
1989	528,593	710,285	1,238,878
1990	486,367	734,968	1,221,335
1991	484,967	680,062	1,165,022
1992	519,975	694,205	1,214,180