



# MICHIGAN PRIMARY MILL SURVEY 2018



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## INTRODUCTION

Michigan primary mills were surveyed in 2019 as part of a periodic census conducted by the Michigan Department of Natural Resources (MDNR), in cooperation with the United States Department of Agriculture (USDA) Forest Service. Mills were canvassed to determine status and composition of the industry, volume of wood receipts, production of timber from Michigan forest lands, interstate movement of industrial roundwood, type of finished products produced, and amount and uses of mill residues. Data from the survey has been summarized in this report and will be used in the 2018 Timber Product Output (TPO) report to be prepared by the USDA Forest Service. See the forthcoming TPO report for a full analysis of roundwood production and mill receipt volumes. Individual mill volume responses will be kept confidential. Only primary mills were canvassed - those that process roundwood in the form of pulpwood, bolts, posts, poles, cabin logs, sawlogs, or that receive wood chips directly from the forest. Ninety percent of mills identified participated in the survey; 10%, or about 39 mills, could not be contacted or did not participate.

## DEFINITIONS

**Production:** Total roundwood volume harvested within the state (both processed in the state and unprocessed wood exported).

**Receipts:** Total roundwood volume processed by mills in the state (both in-state harvests, and imports from other states/countries).

**Roundwood:** Wood harvested from forests in the form of sawlogs, cabin logs, posts, poles, bolts, pulpwood, or chips.

## ROUNDWOOD RECEIPTS

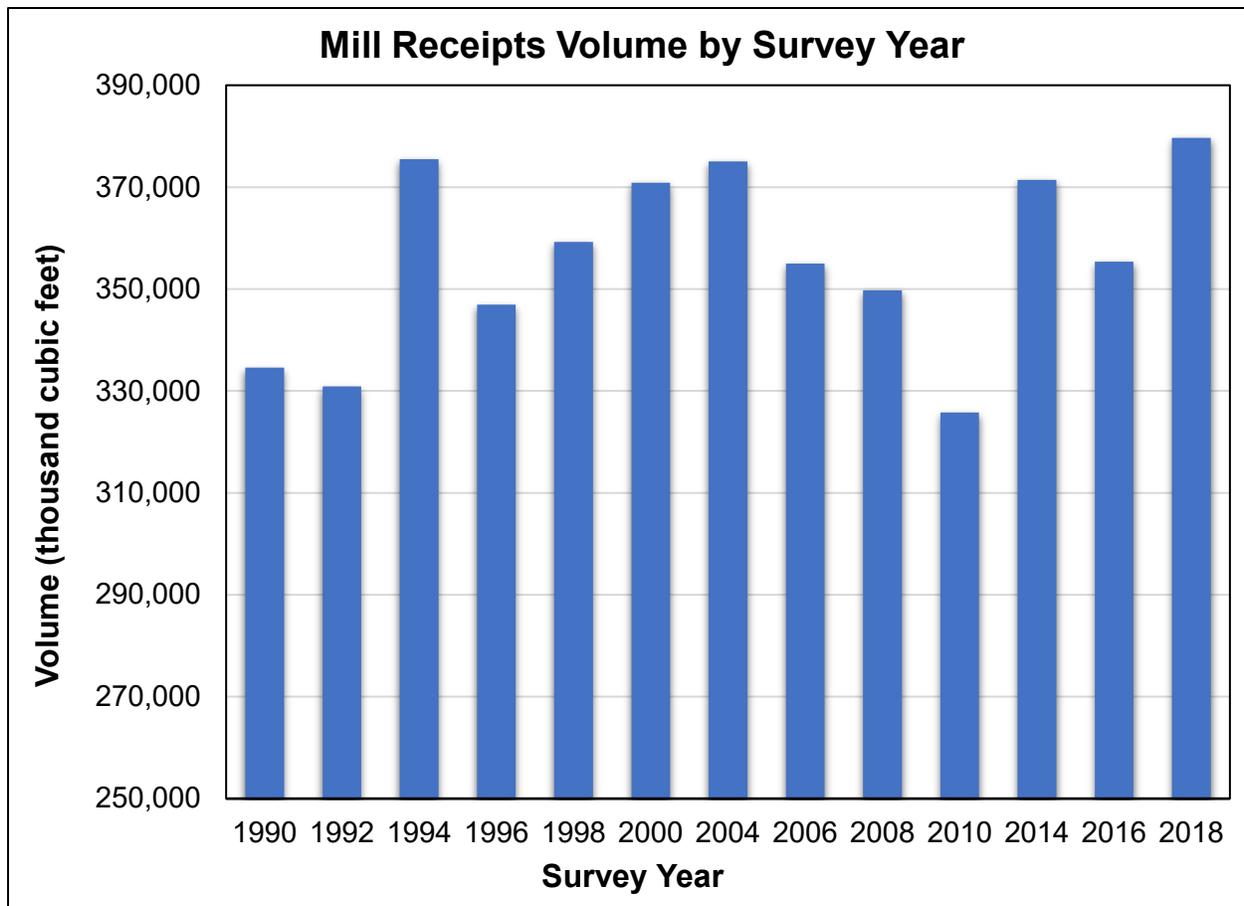
Most Michigan mills reported increases in 2018 roundwood receipts over 2016 survey levels. The total volume of roundwood receipts increased by 7%, from 355 million cubic feet in 2016 to 379 million cubic feet in 2018, or roughly on par with 2014's receipts of 371 million cubic feet. This appears to have largely been due to strong demand for industrial- and flooring-grade lumber and pulpwood products throughout 2018, and strong initial demand and rising prices for upper grade hardwood lumber in the first half of 2018. However, prices and demand for upper grade hard maple and oak lumber fell in the last half of 2018. Based on discussions with mills, this is most likely due to China trade restrictions. Logging conditions were also unusually wet in Michigan and much of the eastern U.S. through spring, summer and fall of 2018.

Table 1. Industrial roundwood receipts in thousand cubic feet, by mill type and survey year.

Mill Type	2000	2004	2006	2008	2010	2014	2016	2018
Sawmills	131,773	137,672	139,324	112,338	128,538	128,134	141,462	146,893
Veneer mills	9,372	6,431	6,378	5,947	5,091	4,038	3,683	3,294
Pulp & composite board mills	215,123	214,303	175,544	190,956	164,045	197,978	170,490	183,551
Industrial fuelwood	8,870	10,088	27,359	31,105	19,563	26,362	24,708	24,817
Post, pole, piling mills	3,841	4,395	5,731	7,380	6,174	5,111	6,014	6,636
Other products	1,884	2,183	634	2,030	2,337	9,792	9,043	14,499
<b>Total</b>	<b>370,863</b>	<b>375,072</b>	<b>354,970</b>	<b>349,755</b>	<b>325,748</b>	<b>371,414</b>	<b>355,400</b>	<b>379,690</b>

Notes: This table is adapted from Haugen, David E. 2016. Michigan timber industry, 2010. Resource Update FS-78. Newtown Square, PA: USDA FS, NRS. 5 p. The pulp & composite board mill type includes paper, corrugated media, OSB, composite siding, and hardboard/high density fiber board mills. Industrial fuelwood includes woody biomass energy plants, and residential heat pellet and biochar mills. Other products include cabin log, mulch, shavings, commercial firewood, and other miscellaneous product mills.

Figure 1. Michigan industrial roundwood receipts in thousand cubic feet, by survey year.



#### NUMBER OF MILLS

The number of active mills increased by 8% in 2018 to 305 facilities (Table 2). Of those, 22 mills were new – were established in 2017 or 2018. An additional 28 mills were idle, and 33 mills closed that had been active or idle in 2016. Nineteen of the active mills would not participate in the survey. The number of medium- and small-sized sawmills increased in 2018 (Table 3), however the number of mills can be misleading. The new mills discovered each survey cycle is usually in proportion to effort put into site visits.

Table 2. Number of active primary mills by mill type and survey year.

Mill Type	1990	2000	2004	2006	2008	2010	2014	2016	2018
Sawmills	344	262	233	242	235	216	213	233	257
Veneer mills	7	5	4	4	4	4	6	5	4
Pulp mills	6	6	6	4	4	3	3	3	3
Particleboard mills	5	6	6	4	4	4	4	4	4
Industrial fuelwood	8	5	4	6	6	6	8	8	9
Post, pole, piling mills	19	12	10	12	13	12	T11	9	10
Other products	16	13	13	14	17	18	14	20	18
<b>Grand Total</b>	<b>405</b>	<b>309</b>	<b>276</b>	<b>286</b>	<b>283</b>	<b>263</b>	<b>259</b>	<b>282</b>	<b>305</b>

Table 3. Number of active sawmills by sawmill size class and survey year.

Sawmills	1990	2000	2004	2006	2008	2010	2014	2016	2018
Large	26	36	37	37	33	37	40	48	48
Medium	107	82	65	69	58	47	54	59	77
Small	211	144	131	136	144	132	119	126	132
<b>Total</b>	<b>344</b>	<b>262</b>	<b>233</b>	<b>242</b>	<b>235</b>	<b>216</b>	<b>213</b>	<b>233</b>	<b>257</b>

New to the 2018 mill survey, sawmills were asked to estimate the percentage of their roundwood receipts that came from urban areas – cities, rights-of-way, and utility line trimming. Of the active sawmills, 17 estimated that they sourced 50% or more of their roundwood from urban areas; most were small sawmills. Four mulch makers sourced 50% or more of their wood from urban areas; one biomass energy plant sourced all its fuelwood from urban areas.

#### REGIONAL RECEIPTS AND PROCESSING OF ROUNDWOOD

About 73% of the 2018 roundwood receipt volume was from hardwood species, very similar to 2014 and 2016. About 91% of the wood processed by Michigan mills came from Michigan. About 9% of 2018 mill receipts was imported. Wisconsin and Canada were the largest sources of imported roundwood. These proportions were very similar to the pattern of receipts in 2016.

Table 4. Roundwood receipts volume by major species group and state or country of origin, in standard cords.

Major Species Group	Michigan	Wisconsin	Ontario, Canada	Other States	Total
Hardwood	3,220,874	161,890	87,555	20,053	3,490,372
Softwood	1,126,680	167,015	11,658	3,337	1,308,690
<b>Total</b>	<b>4,347,553</b>	<b>328,905</b>	<b>99,213</b>	<b>2,147</b>	<b>4,799,062</b>
<b>Percentage of Total</b>	<b>91%</b>	<b>7%</b>	<b>2%</b>	<b>0%</b>	<b>100.00%</b>

About 40% of the roundwood received was processed by mills in the Northern Lower Peninsula, and 30% by mills in Michigan’s Western Upper Peninsula. The least volume was processed in the Southern Lower Peninsula.

Table 5. Receipts volume by geographic location of mill, in thousand cubic feet, thousand board feet, standard cords, and percentage of total standard cords.

Region	Thousand Cubic Feet	Thousand Board Feet	Standard Cords	Percentage of Total Standard Cords
Western Upper Peninsula	115,793	226,511	1,462,571	30%
Eastern Upper Peninsula	73,122	56,755	923,662	19%
Northern Lower Peninsula	153,827	533,316	1,945,121	41%
Southern Lower Peninsula	36,948	162,391	467,708	10%
<b>Total</b>	<b>379,690</b>	<b>978,973</b>	<b>4,799,062</b>	<b>100%</b>

When examined by source or county of origin of the wood, the largest percentage of roundwood received from Michigan sources came from the forests in the Northern Lower Peninsula, followed by the Western Upper Peninsula. Most of the imported roundwood volume was received by mills located in the Upper Peninsula.

Table 6. Receipts volume by source of wood in thousand cubic feet, thousand board feet, standard cords, and percentage of total standard cords.

Region	Thousand Cubic Feet	Thousand Board Feet	Standard Cords	Percentage of Total Standard Cords
Western Upper Peninsula	88,560	91,399	1,118,569	23%
Eastern Upper Peninsula	59,782	86,124	755,242	16%
Northern Lower Peninsula	154,131	522,271	1,948,885	41%
Southern Lower Peninsula	41,474	166,735	524,858	11%
IMPORTED	35,743	112,444	451,508	9%
<b>Total</b>	<b>379,690</b>	<b>978,973</b>	<b>4,799,062</b>	<b>100%</b>

### SPECIES PROCESSED

Aspen, red pine, hard and soft maple, red oak, and ash comprised almost 3/4 of the total volume in cords processed in 2018. Among sawlog receipts, species comprising the most volume were red pine, hard maple, red oak, aspen and soft maple.

Overall receipts volumes were 7% higher than in 2016, but only 1% higher than the 2014 survey year. Ash receipts were 10% greater than 2016 volumes, and about 5 times 2014 volumes. White pine receipts also continued to climb, increasing 13% over 2016, and 67% higher than 2014. Northern white cedar, red oak, soft maple and aspen receipts each increased 6 to 7% over 2016. Hard maple increased 16% over 2016 volumes and was higher than 2014 and 2010 levels. Red pine receipts were only slightly higher than 2016, 2014, and 2010 levels. Jack pine receipts, on the other hand, continued to decline, dropping 41% relative to 2016.

Mill receipts have increased significantly for some species relative to 2004 levels. Annual receipts of basswood and red oak increased by 25% from 12 years ago; northern white cedar, red pine, and spruce by ~50%; ash has more than doubled. Red pine receipts increased by about 50% from 2004 levels – from 34 million to about 52 million cubic feet, or by about 227,000 cords. By contrast, jack pine consumption has decreased by about 84% since 2004, falling from about 458,000 to 71,740 cords in 2018.

Table 7. Hardwood species roundwood receipts, total volume in standard cords, and sawlog volume in thousand board feet, International ¼ rule.

Species	Total volume (standard cords)	Percentage of total volume	Volume of Sawlogs* (thousand board feet)	Percentage of sawlog volume
Aspen	956,610	20%	119,342	12%
Hard Maple	633,732	13%	154,657	16%
Soft Maple	491,785	10%	83,355	9%
Red Oak	408,345	9%	146,650	15%
Ash	388,667	8%	11,816	1%
Basswood	125,443	3%	14,890	2%
White Oak	74,112	2%	23,597	2%
Other hardwood	411,677	9%	51,946	5%
Hardwood subtotal	3,490,372	73%	606,254	62%

\*Volume of sawlogs includes all roundwood types: veneer logs, sawlogs, and bolts.

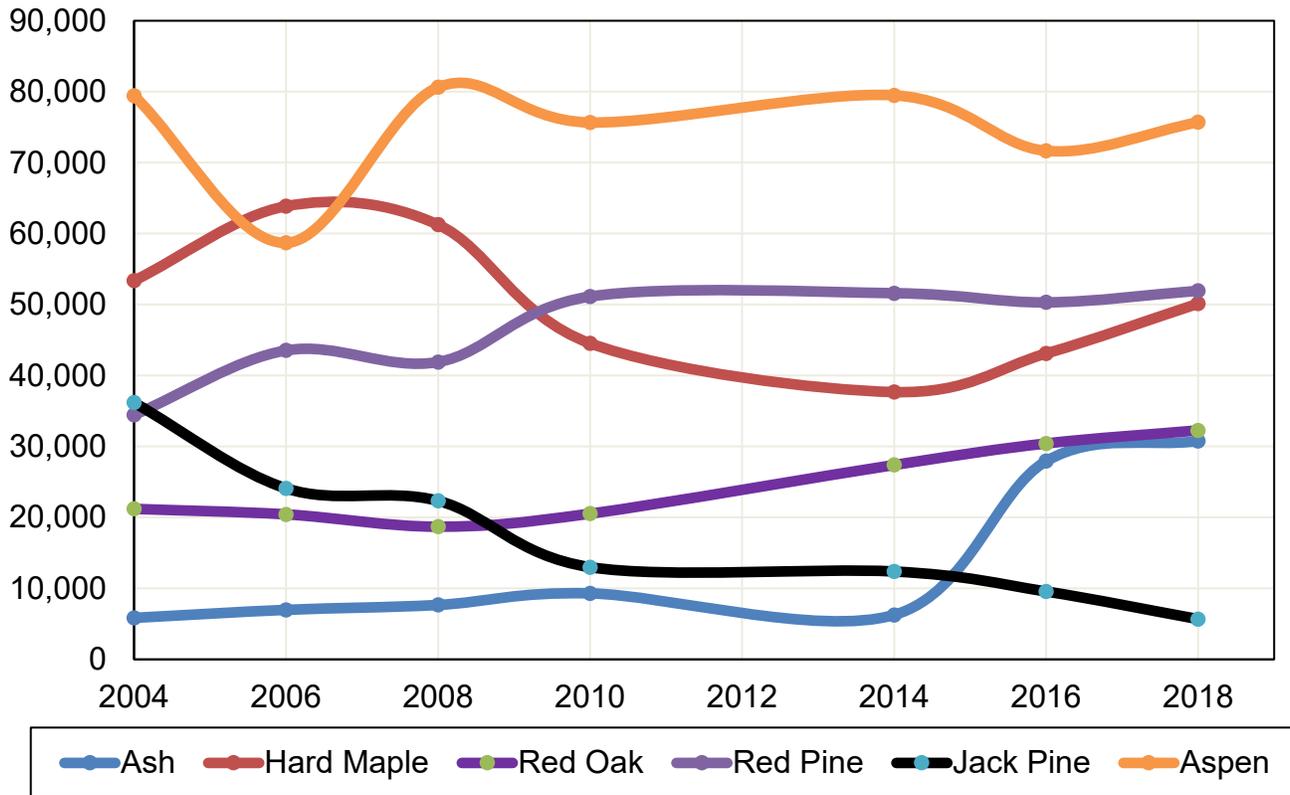
Table 8. Softwood species roundwood receipts, total volume in standard cords, and sawlog volume in thousand board feet, International ¼ rule.

Species	Total volume (standard cords)	Percentage of total volume	Volume of Sawlogs (thousand board feet)	Percentage of sawlog volume
Red Pine	656,610	14%	257,057	26%
Spruce	166,110	3%	51,285	5%
White Pine	138,114	3%	32,363	3%
Northern White-Cedar	86,984	2%	9,040	1%
Hemlock	85,787	2%	152	0%
Jack Pine	71,740	1%	21,334	2%
Other softwood	103,345	2%	1,487	0%
Softwood subtotal	1,308,690	27%	372,718	38%

\*Volume of sawlogs includes roundwood types veneer logs, sawlogs, and bolts.

Figure 2. Receipts of selected species by survey year, in thousand cubic feet.

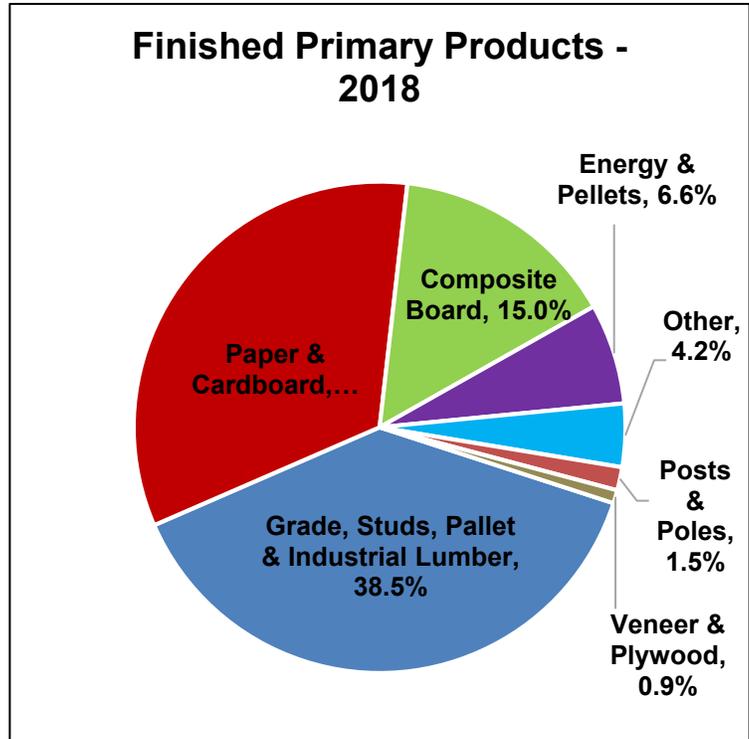
### Species receipts by survey year (MCF)



## KEY PRODUCTS PRODUCED

Respondents were asked to estimate the percentage of their roundwood receipts used to produce their mill's finished products. About 48% of the volume received by Michigan mills was used for production of paper, pulp, and composite board products (oriented strand board, composite siding, hardboard, and plywood), for a total of about 2.3 million cords.

Sawmills received 38% of roundwood or about 1.8 million cords for production of grade lumber, dimension lumber, pallet cut stock, crane mats and other industrial lumber. Grade lumber totaled about 12% of total roundwood receipts or about 304 million board feet (International ¼ inch rule). Stud mills received about 10%. Pallet products and cants were about 7 and 6% respectively of total roundwood receipts for a combined total of about 589,000 cords. Energy production including one pellet plant received about 314,000 cords, or about 7% of total roundwood receipts.



## MILL RESIDUES

Mills were asked to provide estimates of amount of bark, coarse residues, and shavings and sawdust (fine residue) produced from wood processed in 2018. About 70% of the active mills provided at least partial estimates of their residue production. Disposal of residues has been an issue of concern in 2016 through the present. Some mills had difficulty finding outlets for bark and sawdust. Mills reported estimates totaling about 5.1 million green tons of residues including bark; of that total about 2/3 was coarse and fine wood residues. More than half of the residue was produced at mills in the Northern Lower Peninsula (57%). About 20% was produced in the Western Upper Peninsula, and 11% and 12% in the Eastern Upper Peninsula and the Southern Lower Peninsula, respectively.

Table 9. Mill residues by major species group and residue type, in green tons.

Residue Type	Bark	Coarse	Fine	Total Residues	Percentage
Softwood	494,900	727,184	362,243	1,584,327	31%
Hardwood	1,267,513	1,465,009	847,378	3,579,900	69%
<b>Total</b>	<b>1,762,414</b>	<b>2,192,192</b>	<b>1,209,621</b>	<b>5,164,227</b>	<b>100%</b>

## RESIDUE USES

Mills were asked to indicate how they dispose of their manufacturing residues – how they dispose of their bark, coarse residue (slabs, edgings, cutoffs, chips) and fine residues (shavings and sawdust). For each type of residue, mills were asked to indicate what percentage of the volume generated went to various uses. Overall, about 1/4 of all residues were sold for mulch, and another 1/3 was used for industrial fuel, at biomass power generation plants or on-site. About 14% of all residue was used for animal bedding, and 22% was sold as raw material for manufacturing paper or composite board products.

By type of residue, about 54% of the bark residues were sold as industrial fuel to biomass energy plants or used on-site for fuel, and about 44% was sold for use as mulch. Among coarse residues, about 45% were used for manufacturing paper or composite products, about 23% for industrial fuel, and about 22% for mulch. About 64% of fine residues were used for mulch and animal bedding, and about 23% for industrial fuel, at other plants and on-site, or for manufacturing residential fuel pellets. About 9% of fine residues was used for manufacturing of paper or composite products.

Table 10. Disposal of mill residues by residue type and use, as a percentage of volume.

<b>Residue Use</b>	<b>Bark</b>	<b>Coarse</b>	<b>Fine</b>	<b>Use Total Volume</b>
Animal Bedding	0.0%	0.3%	59.7%	14%
Bio-energy pellets	0.0%	4.4%	0.9%	2%
Charcoal or chemical wood	0.0%	0.0%	0.8%	0%
Industrial fuel at other plants	25.0%	21.2%	14.9%	21%
Industrial fuel at this plant (on-site)	28.8%	1.5%	7.3%	12%
Manufacture of fiber/composite products	0.0%	44.8%	8.7%	22%
Mulch/soil additive (includes biochar)	44.3%	22.2%	4.6%	25%
Not Used (land fill, etc.)	1.4%	1.0%	2.5%	1%
Other bio-energy products (biodiesel, etc.)	0.0%	0.0%	0.1%	0%
Other miscellaneous uses (specify)	0.5%	0.0%	0.6%	0%
Residential fuelwood	0.0%	4.1%	0.0%	2%
Small dimension and other sawn products	0.0%	0.4%	0.0%	0%
<b>Subtotal - residue type volume total for reported uses</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

## BIOMASS ENERGY PLANTS

Michigan had 8 active biomass energy plants in 2018 that used wood residues to produce power. Seven of the plants used roundwood and timber harvest residues from forest land, or urban wood for fuel in the form of chips or ground wood. These plants also use mill and manufacturer residues for fuel - bark, chipped or ground coarse residues, and sawdust – and are an important outlet for disposal of these residues. The 8th plant only used manufacturing residues.

About 21% of the 2018 mill residues' volume is estimated to have been sold for industrial fuel at other plants, including the biomass energy plants. However, the biomass energy plants reported that about 38% of their fuel came from a combination of mill and manufacturer residues and recycled wood, or about 468,900 green tons. About 60% of the biomass energy plant fuel was from roundwood and harvest residues from forest sources, or about 714,624 green tons. About 1/3 came from mill and manufacturing residues, or about 500,000 green tons. About 3% of the biomass energy plants woody fuel came from urban area tree removals, and utility line and right-of-way maintenance, or about 37,380 green tons. Total woody fuel consumed by the energy plants in 2018 including recycled wood was estimated to be about 1.2 million green tons.

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