Forest Products Industries' Economic Contributions: West Virginia, 2023

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Executive Summary

Based on 2023 FIA estimates, West Virginia contains approximately 11.87 million acres of forest land, representing about 77.3 percent of the state's total land area of 15.37 million acres. Of this forest base, approximately 11.56 million acres (97.3 percent) are classified as timberland, defined as forest land capable of producing commercial volumes of wood. Reserved forestland accounts for 304,969 acres (2.6 percent), while other forestland represents a relatively small share at 10,267 acres (less than 0.1 percent). Non-forest land comprises approximately 3.49 million acres, or 22.7 percent of the state's total land area. Building on this land-use context, this report summarizes the economic contribution of West Virginia's forest products industries using IMPLAN 2023 data and examines changes in industry performance across the pre- and post-COVID period, with emphasis on trends observed over the past five years.

Forest Product Industries

This report analyzes the economic contribution of West Virginia's forest products sector, comprised of 25 individual economic sectors aggregated into seven industry groups: Forestry, Logging, Primary solid wood products, Secondary solid wood products, Wood furniture, Pulp, paper, and paperboard mills, and Secondary paperboard and other paper products. In 2023, these industries directly supported 8,398 jobs and generated $2.85 billion in output, $908.5 million in value added, and $500.0 million in labor income. When indirect supply-chain linkages and induced household-spending effects are included, the sector's total economic footprint reached 13,641 jobs, $3.86 billion in output, $1.46 billion in value added, and $811.1 million in labor income. The sector exerts a significant multiplier effect on the broader economy; for every 100 direct jobs in the forest industry, around 62 additional jobs are supported elsewhere in the state. non-forest sectors impacted include Wholesale Trade, Truck Transportation, Hospitals, and Real Estate, reflecting the substantial supply chain requirements and spending power of forest product companies and their employees.

Leading Forest Products Industry Groups (direct contribution)

Among the seven aggregated groups, Primary Solid Wood Products was the largest direct employer in 2023 (2,453 jobs), driven largely by the sawmill industry, followed by Secondary Solid Wood Products (2,307 jobs) and Wood Furniture (1,346 jobs). In terms of output, Primary Solid Wood Products also served as the sector's financial anchor, producing the highest direct output at $1.44 billion. Secondary Solid Wood Products contributed $760.4 million, highlighting the importance of the state's milling and construction supply chain, while Wood Furniture ($263.5 million) provided critical value-added manufacturing contributions. Forestry was the smallest contributor in dollar terms ($20.6 million) with 630 direct jobs, while the capital-

intensive Pulp, Paper, and Paperboard Mills generated $134.1 million in output with only 166 direct jobs.

Leading Individual Forest Products Sectors (direct contribution)

At the disaggregated level (25 sectors), Sawmills was the top individual employer with 1,702 jobs. Financial dominance was similarly concentrated in this primary processing sector. Sawmills ranked first in Output ($820.1 million) and Value Added ($172.4 million), and second in Labor Income ($82.3 million). Commercial Logging was a consistent top-tier performer, ranking first in Labor Income ($90.4 million) and second in employment (1,303 jobs), and Value Added ($124.0 million). Reconstituted Wood Product Manufacturing also emerged as a major driver, ranking second in direct output ($295.6 million).

West Virginia's Forest Products Industries Compared to Other West Virginia Industries

The Forest Products sector operates as a critical secondary pillar of West Virginia's natural resource economy. In 2023, it ranked second in output, value-added, and labor income when compared to Mining/Oil & Gas, Commercial fishing, hunting & trapping and Agriculture. While trailing the dominant Mining sector, the forest sector's direct output ($2.85 billion) was roughly 3 times larger than Agriculture ($964 million). In terms of employment, the 8,398 jobs supported by the forest industry accounted for roughly 14 percent of the state's total natural resources workforce, trailing Mining (28,636 jobs) and Agriculture (22,917 jobs). However, within the statewide manufacturing landscape, Forest Products ranked as the third largest employer (6,465 manufacturing jobs), trailing only Chemical Manufacturing and Transportation Equipment, and ranked fourth in total output ($2.70 billion).

Seven-years Trends in West Virginia's Forest Products Industries Economic Contribution

From 2017 to 2023, the sector underwent a period of significant structural transition and efficiency gains. Direct employment decreased by 16.9 percent, yet direct output increased by 2.7 percent in real terms. This divergence suggests a successful trend of capital deepening; while the workforce size contracted, the remaining operations invested in higher-value production, allowing the sector to generate more revenue with fewer workers. However, real labor income and value added declined by 21.4 percent, and 0.5 percent, respectively.

Glossary

Forestry Terms

Average annual harvest removals: The estimated volume of trees that were live at the time of the previous inventory and were either cut and removed by direct human activity related to harvesting or died as a result of silvicultural or land-clearing activity by the time of the current inventory.

Average annual mortality: The volume of trees that were live at the time of the previous inventory and are dead in the current inventory.

Average annual net growth: The change in merchantable bole volume of growing-stock trees (at least five inches diameter at breast height [DBH]) after deducting mortality volume, in cubic feet, on forest land.

Forest land: Land that is at least 10 percent stocked by trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. Forest land includes transition zones, such as areas between heavily forested and non-forested lands that are at least 10 percent stocked with trees and forest areas adjacent to urban and built-up lands, including pinyon-juniper and chaparral areas in the western U.S., and afforested areas. The minimum area for classification of forest land is one acre and 120 feet wide, measured stem-to-stem from the outermost edge. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest land if less than 120 feet wide.

Growing stock: Live trees of commercial species that meet minimum merchantability standards (at least five inches DBH). In general, these trees have at least one solid eight-foot section, are reasonably free of form defect on the merchantable bole, and at least 34 percent or more of the volume is merchantable. Excludes rough or rotten cull trees.

Timberland: A subset of forest land that produces or can produce crops of industrial wood and is not withdrawn from timber utilization by statute or administrative regulation. (Note: Areas qualifying as timberland can produce at least 20 cubic feet per acre per year of industrial wood in natural stands. Currently inaccessible and inoperable areas are included.)

Economic Contribution Terms

Direct effects/contributions: The direct contribution represents the economic activities (output, employment, labor income, and value-added) that occur within an industry or sector as a result of its existing production to satisfy current (exogenous) final demand. In contribution analysis, the direct effect corresponds to the sector's own production activities that maintain the structure of the regional economy. For example, the direct contribution of the forest products industry reflects its ongoing production and employment required to meet current local and export demand for forest-based goods.

Employment: The number of full- and part-time jobs associated with an industry.

Indirect effects/contributions: The indirect contribution captures the inter-industry linkages created when the industry purchases goods and services from other local industries. These transactions stimulate additional production, employment, and income along the supply chain. For instance, demand for wood products generates additional output in sectors such as transportation, wholesale trade, and equipment manufacturing that supply inputs to the forest industry. The magnitude of indirect contribution reflects the degree of interdependence and strength of local supply-chain relationships.

Induce effects/contributions: The induced contribution measures the additional economic activity generated by household spending of labor income earned through direct and indirect effects. When workers employed in the forest products and related supply-chain sectors spend their income on goods and services, such as housing, healthcare, or retail, it further stimulates regional economic activity. This household feedback effect represents the cyclical flow of income and expenditures within the economy.

Labor income: The dollar total of employee compensation and proprietor income; the latter is associated with self-employed individuals.

Output: The dollar measure of production within an area; it is also viewed as sales.

Social Accounting Matrix (SAM) multipliers: These multipliers are derived by dividing the sum of direct, indirect, and induced effects by the direct effects. The social accounts include payments made between households, households and government, and more. These are available for output, employment, labor income, and value-added and are used to assess the effects of changes in industry activity (i.e., "ripple effects").

Total effects/contributions: The sum of direct, indirect, and induced effects.

Value-added (also known as gross state product, or GSP): The sum of labor income, other property income (e.g., rents and profits), and indirect business taxes (e.g., excise and sales

taxes). It is the difference between an industry's total output and the cost of its intermediate inputs. The sum of value-added for all economic sectors within the region equals the total GSP.

Introduction

Forest products industries are an integral component of West Virginia's economy. They provide jobs, raw materials, and finished goods that generate additional economic activity throughout the state, region, and nation. Forests in West Virginia have always supported local and state economies and generated employment and income (Leefers 2014, 2015; Poudel, 2022). These forests form the foundation for a wide array of industries, supporting logging, sawmills, pulp and paper, wood products manufacturing, and furniture production. Collectively, the Forest Products Industry (FPI) contributes directly to the economic development of the region, while also supporting rural livelihoods, providing raw materials for construction and packaging, and generating substantial downstream linkages to other industries (Poudel and Dahal 2025; Lamsal et al. 2025a). The scale and diversity of activities across the FPI underscore its role as a major part of the broader manufacturing economy, contributing to value added and sustaining consumer demand (Lamsal et al. 2025b).

A state report on FPI contributions on West Virginia was previously published by Leefers et al. (2020) using 2017 IMPLAN data. The present update extends that effort using 2023 data, allowing for a comparison across time. This analysis measures how the performance of forest sector industries in West Virginia has shifted between 2017 and 2023 in terms of employment, output, labor income, and the Gross State Product (GSP), also known as value added[1]. Tracking these changes is essential, as it provides a clear picture of both long-term trends and the more recent disruptions caused by the COVID-19 pandemic. The pandemic had economy-wide effects on supply chains, consumer demand, and labor markets (Poudel and Dahal 2025; Lamsal et al. 2025b), and this report therefore captures the pre- and post-COVID conditions of the FPI within the region.

This trend analysis can be used in multiple ways by related stakeholders. For policymakers, it offers a benchmark for monitoring the health of one of the region's key resource-based industries and helps inform workforce development, investment, and rural economic policies. For industry stakeholders, it provides insight into productivity, competitiveness, and sectoral resilience, supporting strategic planning. For researchers and forest managers, it offers a consistent regional framework that connects forest resources with industrial performance and economic outcomes.

[1] The 2017 results in this report are based on data from the IMPLAN Pro desktop version, whereas the 2018–2023 results are based on the IMPLAN web platform. Because there are minor differences between the Pro and web versions, the 2017 estimates shown here may not exactly match 2017 results reproduced from the web version. To maintain consistency with the original 2017 report and ensure a valid basis for comparison and trend analysis, we use the original 2017 IMPLAN Pro data, and IMPLAN web data for all years from 2018 through 2023.

The inventory data used in this report were sourced from the U.S. Forest Service Forest Inventory and Analysis (FIA) database and the economic data were obtained from Impact Analysis for Planning (IMPLAN). These data and related information are presented in four major sections: (i) Forest Resources of West Virginia, (ii) Economic Contributions of the West Virginia FPIs, (iii) Comparing FPIs with other industries and neighbor states, and (iv) Summary. We acknowledge that, due to rounding, some values in the tables and figures may not sum to the exact total indicated.

Forest Resources of West Virginia state

According to 2023 estimates from the USDA Forest Inventory and Analysis (FIA) program, West Virginia's total land area totals 15.37 million acres. Of this, 11.87 million acres (77.3 percent) meet the FIA definition of forest land, while the remaining 3.49 million acres (22.7 percent) are classified as non-forest land. FIA defines forest land as land at least 10 percent stocked by trees of any size, including areas that formerly supported such tree cover and that will be naturally or artificially regenerated. Within West Virginia's forest land base, timberland accounts for 11.56 million acres, or 97.3 percent (Figure 1), and represents unreserved forest capable of producing at least 20 cubic feet of wood per acre per year. Reserved forestland comprises 304,969 acres (2.6 percent) and is withdrawn from timber utilization by legal or administrative designation. Other forestland totals 10,267 acres (0.1 percent) and consists of unreserved forests of low productivity, generally yielding less than 20 cubic feet per acre per year. In practical terms, approximately 11.56 million acres are available and biophysically suitable for commercial timber management, while about 315,236 acres are either reserved or too low in productivity to contribute materially to timber supply.

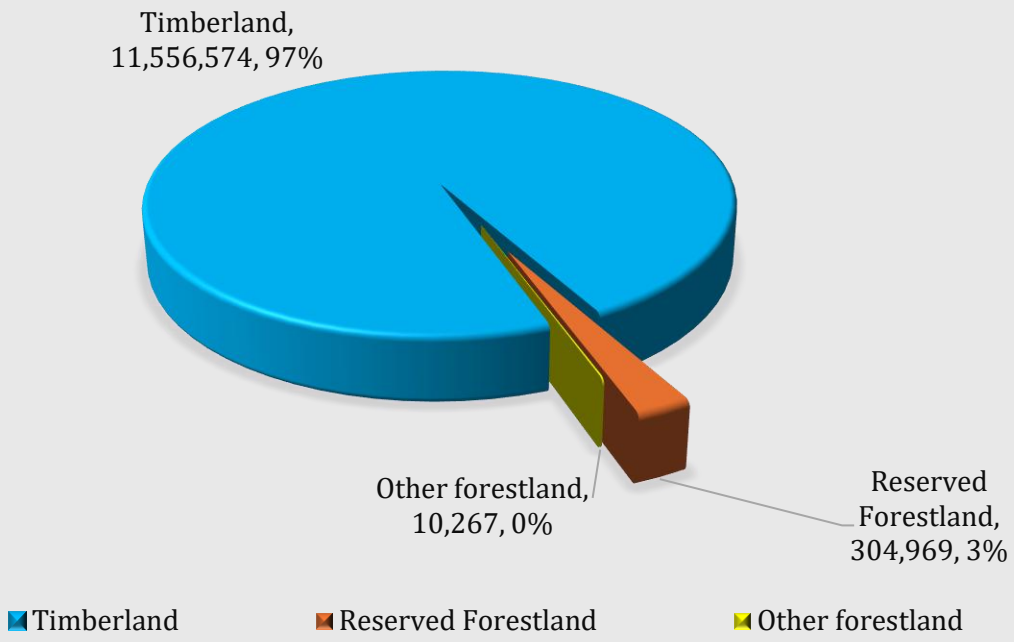

Figure 1: West Virginia Forest Land area in acres by Land use type, 2023 (US Forest Service).

Ownership of West Virginia's 11.87 million acres of forest land is distributed among federal, state and local, and private entities, with private owners holding the majority share. Private landowners manage 10.24 million acres (86.2 percent) of the state's forest land. State and local governments are responsible for 397,781 acres (3.4 percent), while federal ownership totals 1.24 million acres (10.4 percent). Within the federal category, National Forests account for 1.04 million acres (8.8 percent), and other federal agencies manage 197,651 acres (1.7 percent) (Figure 2).

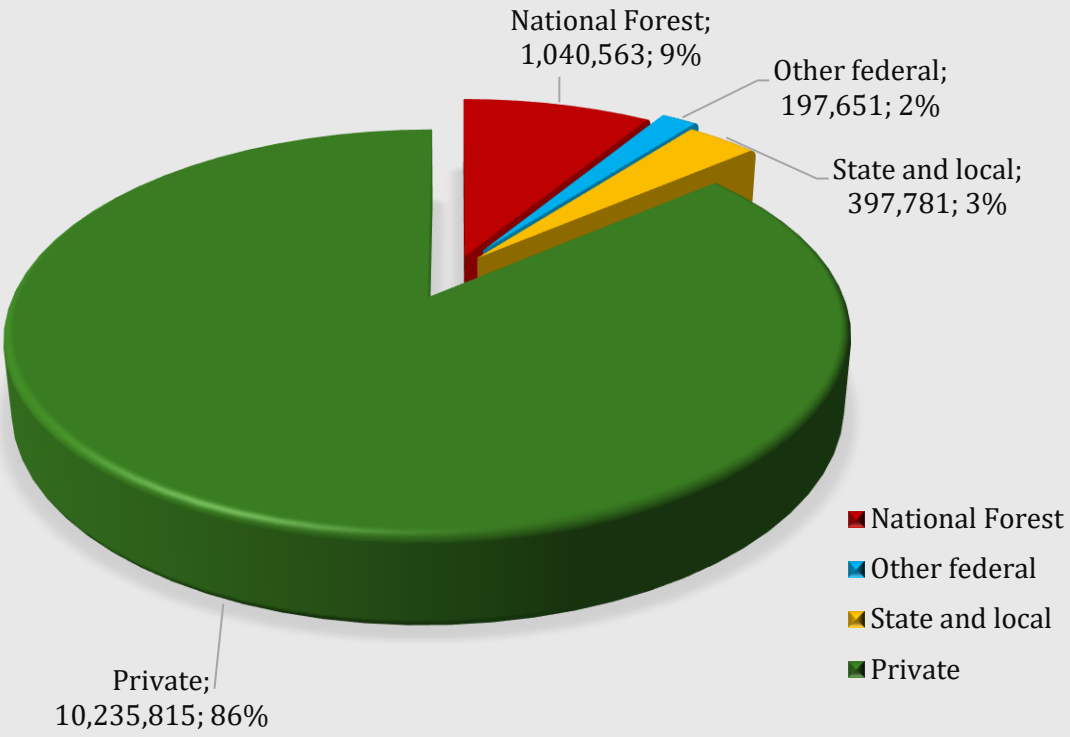

Figure 2: West Virginia Forest Land area in acres by Ownership group, 2023 (US Forest Service).

Hardwoods dominate West Virginia's 11.87 million acres of forest land. The oak/hickory forest-type group is the most extensive, occupying 8.43 million acres (71.0 percent) of the total forest area (Figure 3). The maple/beech/birch group is the second-largest at 2.38 million acres (20.0 percent), reinforcing the state's strong hardwood orientation. All remaining forest-type groups account for comparatively small shares of the land base, including oak/pine with 297,026 acres (2.5 percent) and elm/ash/cottonwood with 248,241 acres (2.1 percent). Loblolly/shortleaf pine totals 143,647 acres (1 percent), and the remaining 376,092 acres (3.2 percent) are distributed among other forest-type groups. Taken together, the principal hardwood-associated groups (oak/hickory, maple/beech/birch, and elm/ash/cottonwood) comprise approximately 93.1 percent of West Virginia's forest land, with conifer-dominated and mixed oak–pine types representing a relatively limited portion of the overall forest base.

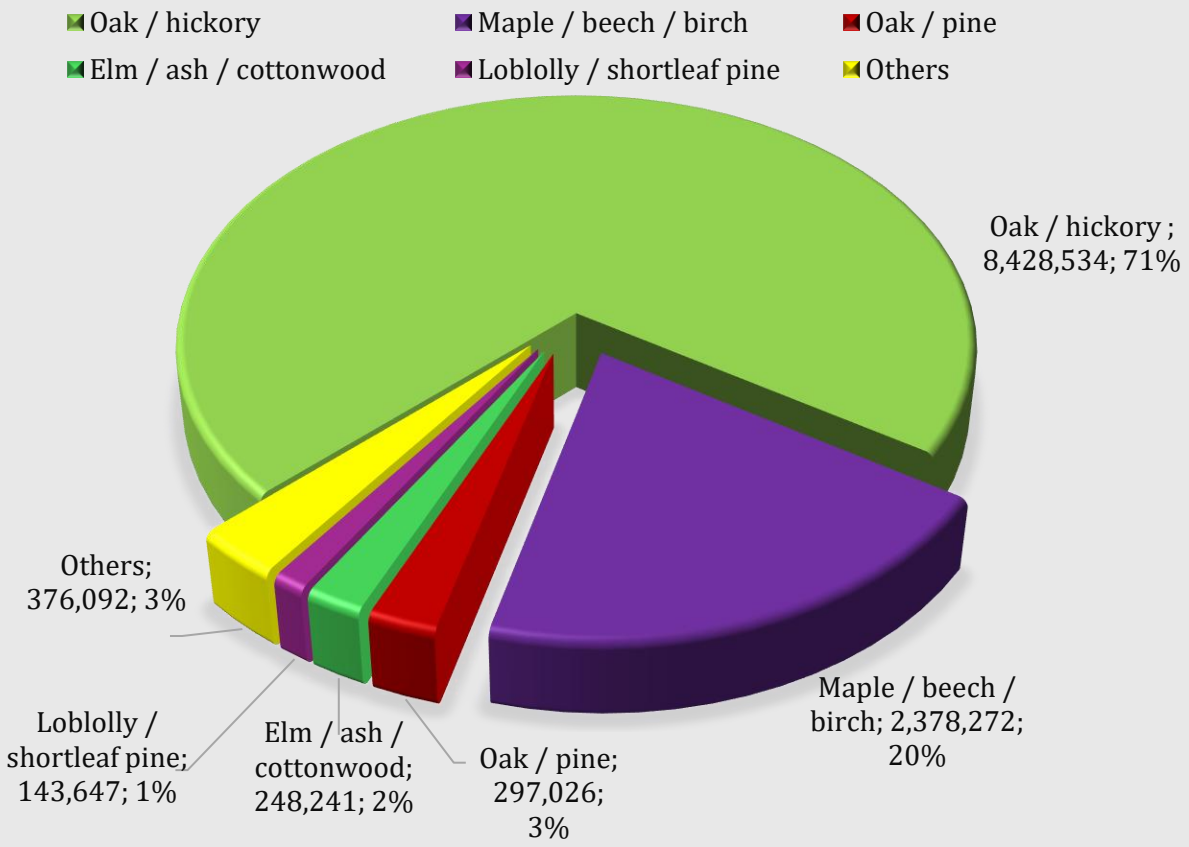

Figure 3*:* West Virginia Forest Land area in acres by Forest type group, 2023 (US Forest Service).

West Virginia's timber resource base is strongly hardwood-oriented and underpins a forest products supply chain that depends primarily on hardwood growing stock. The estimated volume of standing timber suitable for forest products (i.e., the marketable volume of growing stock) totals approximately 30.84 billion cubic feet (Table 1). Hardwoods comprise 29.02 billion cubic feet (94.1 percent) of this total, while softwoods account for 1.82 billion cubic feet (5.9 percent). By ownership class, private lands hold 25.67 billion cubic feet (83.2 percent) of growing-stock volume, followed by National Forest lands with 3.47 billion cubic feet (11.3 percent). State and local lands account for 1.06 billion cubic feet (3.4 percent), and other federal ownership totals 0.64 billion cubic feet (2.1 percent).

Average annual net growth totals 604.2 million cubic feet per year, while average annual harvest removals total 136.5 million cubic feet and average annual mortality totals 216.4 million cubic feet per year. Net growth exceeds harvest removals by a ratio of about 4.4 to 1, indicating that removals remain well below net biological growth statewide. Because net growth is already net of mortality, the implied annual net change in growing-stock volume is net growth minus harvest removals, or approximately 467.8 million cubic feet per year. This positive balance indicates continued expansion of growing-stock volume at the statewide level. Average annual harvest removals equal roughly 0.4 percent of standing volume, or about 1.7 million standard

cords, while mortality represents about 0.7 percent of standing volume. Hardwoods account for nearly all annual inventory flows, comprising 94.3 percent of net growth, 98.5 percent of harvest removals, and 92.2 percent of mortality. Harvest removals are concentrated on private lands, which account for about 97.7 percent of total removals. Overall, these statewide indicators suggest that West Virginia's growing-stock inventory remains in a condition of positive net growth.

Table 1: Characteristics of Growing Stock in West Virginia, 2023. †

Description	Species group	National Forest	Other federal	State and local	Private	Not available	**Total**
Net volume	Hardwood	2,935,996	586,386	981,380	24,518,320	0	**29,022,081**
	Softwood	537,214	49,291	80,868	1,150,919	0	**1,818,292**
	Total	**3,473,210**	**635,677**	**1,062,247**	**25,669,238**	**0**	**30,840,373**
Average annual net growth	Hardwood	36,456	7,762	14,350	508,479	2,592	**569,640**
	Softwood	8,165	857	1,483	23,975	118	**34,598**
	Total	**44,621**	**8,619**	**15,833**	**532,454**	**2,710**	**604,237**
Average annual harvest removals	Hardwood	2,352	127	667	131,316	0	**134,462**
	Softwood	5	0	0	1,993	0	**1,998**
	Total	**2,357**	**127**	**667**	**133,309**	**0**	**136,461**
Average annual mortality	Hardwood	22,934	6,221	8,289	162,011	0	**199,455**
	Softwood	4,443	638	227	11,622	0	**16,929**
	Total	**27,377**	**6,859**	**8,515**	**173,633**	**0**	**216,385**

† All amounts are in thousands of cubic feet.

Note: **Growing stock** is all live trees of commercial species that meet minimum merchantability standards. **Net volume** is net volume in cubic feet of growing stock for timber species, for trees greater than or equal to five inches in diameter, from a one-foot stump to a minimum four-inch top diameter, or to where the central stem breaks into limbs, all of which are less than four inches in diameter. **Net growth** is the average annual net growth of growing stock, in cubic feet, on forest land. **Annual mortality** is the average annual cubic foot mortality of live growing-stock trees (at least four inches DBH), in cubic feet, on forest land. **Harvest removals** are the average annual harvest removals, in cubic feet, of growing stock trees on forest land.

Economic contribution of the Forest Product Industries, 2023

The FPIs in this study are defined as 32 IMPLAN industries that were aggregated into seven analytic groups for consistent reporting across the state. This report follows the same industry grouping framework used in the 2017 report, which was originally developed through consultation with state forestry agencies and other stakeholders and represent a working consensus on what constitutes the regional FPI (Leefers et al. 2020; Poudel and Dahal 2025). The complete list of industries and groupings are presented in Appendix A.

The FPI encompasses a wide range of activities that begin with forest management and timber harvesting and extend through the conversion of raw materials into high-value finished goods. These activities include timber tract operations, nurseries, logging, sawmills, wood preservation, pulp and paper manufacturing, furniture production, and related downstream sectors (Poudel and Dahal 2025). The FPI is a cornerstone of the West Virginia economy, not only providing direct employment in logging, milling, and manufacturing but also supporting a much larger network of indirect and induced jobs in transportation, warehousing, wholesale trade, and retail (Leefers et al. 2020). Its health has far-reaching consequences for rural communities, where it is often one of the few sources of year-round employment, and for regional supply chains that depend on steady flows of wood, fiber, and paper products (Lamsal et al. 2025a).

Measuring these contributions requires more than simply counting jobs, mills, or other establishments. Contribution analysis is essentially a descriptive, ex-post accounting framework that traces how industries interact within a regional economy and support the economy (Lamsal et al. 2025b, Watson et al. 2015). It not only measures the direct transactions tied to a sector, but also the indirect effects in supplier industries and the induced effects from household spending that ripple outward. Economic contribution analysis depends on standardized frameworks that can translate government statistics into regional input–output models. The Bureau of Economic Analysis (BEA) provides the foundation through its Benchmark Input-Output Accounts, which map the flow of goods and services across industries and establish the structure of GDP by industry (BEA 2023). The Bureau of Labor Statistics (BLS) complements this with the Quarterly Census of Employment and Wages (QCEW) and occupational data, which provide details on employment and payroll. Further, the U.S. Census Bureau adds extra detail with the Economic Census and County Business Patterns, which track establishments, receipts, and industry-level production. IMPLAN harmonizes these data sources into a consistent input-output modeling framework for estimating regional economic contributions (IMPLAN 2023). IMPLAN is widely used in forest-sector economic research to estimate employment, output, labor income, and value-added effects associated with forest-products industries. Several forest-

sector studies have also paired IMPLAN with FIA data to link forest resource conditions with regional economic outcomes, including timber-product output in Ohio (Coronado et al. 2014), domestic hardwood substitution for imported trailer decking in New York (Pokharel et al. 2023), and potential mass timber processing facility development in Michigan (Khanal et al. 2024). IMPLAN also provides a bridge table that is important for defining the forest-products sectors included in this report. The bridge table is useful in both directions: it aggregates NAICS industries into IMPLAN sectors for modeling and identifies the NAICS components represented within each IMPLAN sector. Although this does not by itself constitute a formal sector disaggregation within IMPLAN, it provides the basis for constructing partial-sector estimates when external data are available.

This distinction is particularly important for forest sector analysis because several IMPLAN sectors contain both forestry and non-forestry components (Poudel and Dahal 2025). In this study, the IMPLAN bridge table was used to identify the relevant NAICS-defined activities embedded within broader IMPLAN sectors, and external data were then used to approximate the forest-related share of selected mixed sectors. For example, IMPLAN Sector 10 (All Other Crop Farming) includes a wide variety of agricultural activities such as alfalfa, peanut, and hemp farming, also in addition to maple syrup production. Using USDA maple syrup production data, only the maple syrup portion of Sector 10 was included in the FPI. Similarly, IMPLAN Sector 19 (Support Activities for Agriculture and Forestry) encompasses a broad spectrum of NAICS industries, including soil preparation, crop harvesting, farm labor contracting, and specialized support services for forestry. To avoid overstating the sector, only Support Activities for Forestry were retained in the FPI totals, using BLS employment and establishment data. Thus, the partial-sector estimates reported here reflect analyst-defined allocations based on the IMPLAN bridge table and supplementary data, rather than an automatic sector split performed within IMPLAN. In the 2017 report, several additional sectors were treated as partial sectors, IMPLAN 40 (Electric Power Generation, Biomass), IMPLAN 352 (Institutional Furniture Manufacturing), and IMPLAN 356 (Showcase, Partition, Shelving, and Locker Manufacturing), but in 2023, following stakeholder consensus and due to limited data to isolate wood-based components, these are treated as full sectors; consequently, the 2023 economic contribution estimates for these specific sectors appear higher and are not directly comparable to the 2017 figures. Any comparison between years should therefore be interpreted with caution.

Further, the 2023 analysis implemented the mixed endogenous-exogenous closure using the Output- and Employment -based multipliers formulation approach (Miller and Blair 2022; Lamsal et al. 2025a), whereas the 2017 report used the equivalent matrix-inversion approach. Since these approaches are alternative computational expressions of the same input–output framework and, under the same closure assumptions, these formulations are theoretically equivalent and yield the same multipliers and results.

Note on Data Consistency (2017 vs. 2018–2023): *Readers should interpret the sharp variance between 2017 and 2018 data with caution. The 2017 figures presented in this report are retained from previous studies that used the desktop-based IMPLAN Pro software. Data for 2018 through 2023 were generated using the modernized IMPLAN Cloud (Web) platform, which utilizes updated accounting frameworks and regional purchase coefficients. Although both sets of estimates are based on the same underlying input–output/SAM framework, they are not fully comparable in construction. IMPLAN revised its industry classification structure over time, moving from the 536-industry scheme used for 2013–2017 data years to the 546-industry scheme used for 2018–2022, and later to the 528-industry scheme beginning in 2023. IMPLAN also documents differences in trade-flow and regional purchase coefficient estimation between legacy Pro-era workflows and the current cloud environment. In addition, this report applies updated aggregation and sector-inclusion rules for selected forest-related industries. Accordingly, differences between 2017 and later years may reflect methodological discontinuity in addition to underlying economic change. Comparisons spanning 2017 to 2018 should therefore be interpreted with caution.*

Economic Performance Trends of Forest Product Industry (2017-2023)

Figures 4 and 5 illustrate the structural adjustments within West Virginia's Forest Sector over the seven-year study period. As shown in Figure 4, the sector has characterized a distinct divergence between its workforce size and production capacity. Total direct employment declined by 16.9% (a loss of 1,710 jobs), falling from 10,108 in 2017 to 8,398 in 2023. In contrast, real industry output exhibited a different trajectory. Output declined from $2.78 billion in 2017 to a low of $2.34 billion in 2019, then increased in the years that followed. By 2023, output reached $2.85 billion, exceeding the 2017 level by approximately 2.7 percent. The combination of declining employment and higher output resulted in a substantial increase in output per worker over the study period. Average output per job increased from approximately $275,000 in 2017 to about $340,000 in 2023. This pattern shows that changes in production were not proportional to changes in employment and reflects higher average output per worker within the sector over time.

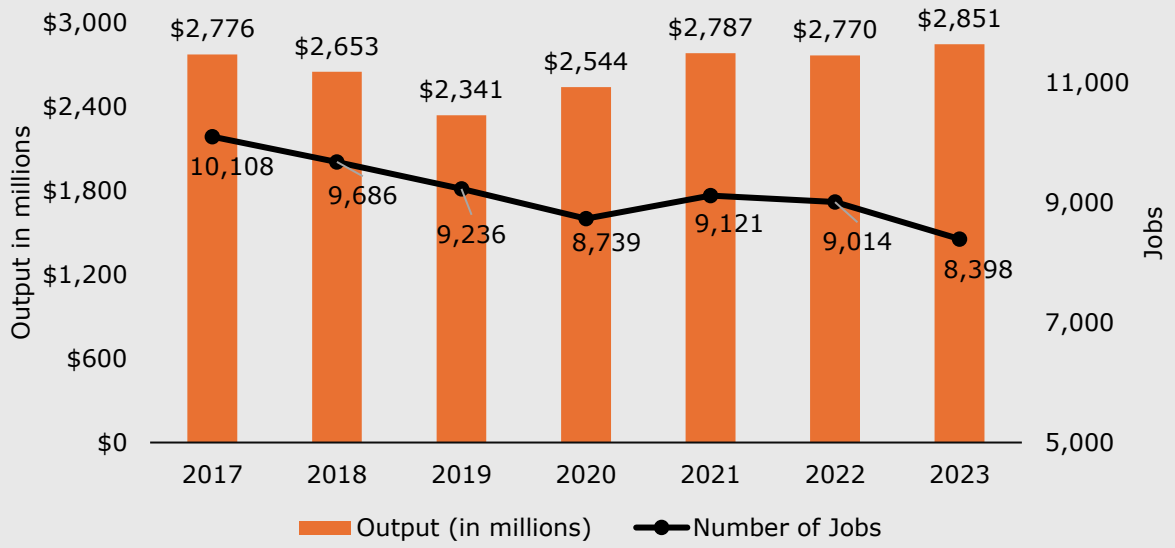

Figure 4: Direct output and employment, 2017–2023, West Virginia state forest products industries.

Figure 5 provides the trend of value added and labor income (includes employee compensation and proprietor income). Real value-added, the sector's contribution to GSP, displayed volatility early in the timeline, peaking at $1.01 billion in 2021, before settling at $908 million in 2023, effectively maintaining its 2017 economic footprint despite the workforce reduction. A more complex trend is observed in Labor Income, which contracted by 21.4% to $500 million. Unlike the gain in output efficiency, the total income contraction slightly outpaced the drop in employment. This trend suggests that while the sector has become significantly more productive in terms of physical output (generating roughly $339,000 in output per worker in 2023 compared to $274,000 in 2017), it has simultaneously achieved rigorous cost containment regarding labor expenses.

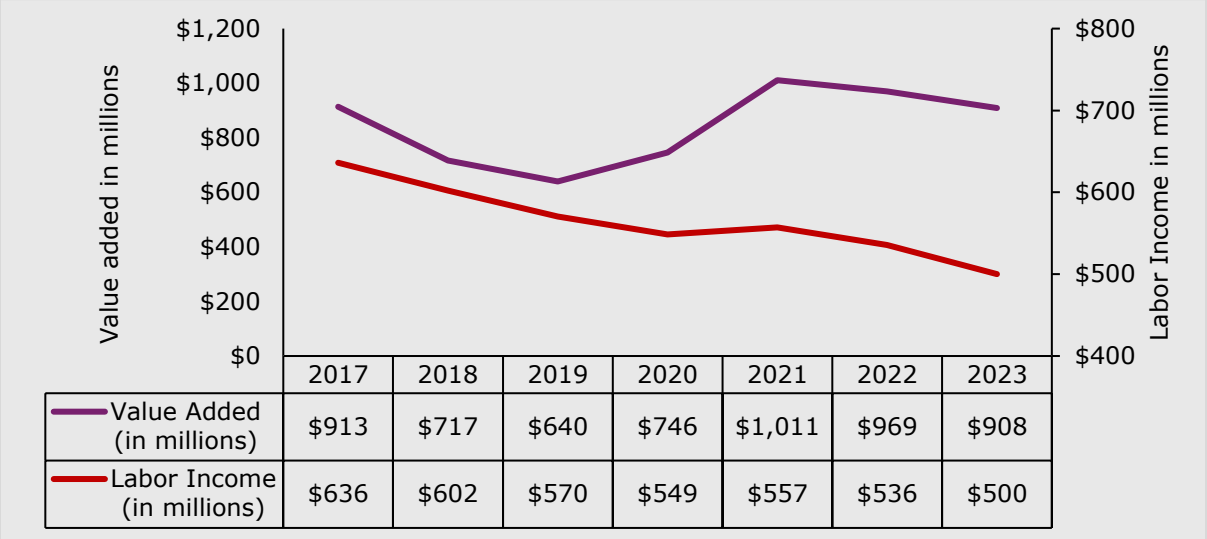

Figure 5: Direct value-added and labor income, 2017–2023, West Virginia state, forest products industries.

Direct and Total Contributions by Forest Product Industry Groups

In 2023, West Virginia's forest products industries directly provided 8,398 jobs, generated approximately $2.85 billion in gross output, and contributed around $908 million in value-added to the state economy. However, the sector's influence permeates the broader economy well beyond these facility gates. When accounting for indirect supply-chain transactions and induced household spending, the sector's total economic contribution reached 13,641 jobs and $3.86 billion in total output.

Table 2*:* Statewide Economic Contribution of Forest Products Industries, 2023. †

	Employment	Labor Income	Value-added	Output
Direct in 2023	8,398	$500,047	$908,471	$2,850,509
Compared to 2017	-16.9%	-21.4%	-0.5%	2.7%
Total in 2023	13,641	$811,094	$1,462,438	$3,860,200
Compared to 2017	-20.6%	-22.2%	-8.8%	-4.6%
Multipliers in 2023	1.62	1.62	1.61	1.35

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

Comparison with 2017 indicates differing trends between direct and total effects. Direct employment declined by 16.9 percent, while direct labor income decreased by 21.4 percent. Over the same period, direct value added remained largely unchanged (–0.5 percent), and direct output increased by 2.7 percent in real terms. In contrast, total employment and total output declined by 20.6 percent and 4.6 percent, respectively, suggesting reductions in indirect and induced activity relative to the base year. Declines in total labor income (–22.2 percent) and total value added (–8.8 percent) further reflect these changes in the broader economic footprint.

The 2023 multipliers indicate that the forest products industries continue to maintain meaningful linkages within the state economy. The employment multiplier of 1.62 indicates that every 100 direct jobs support an additional 62 jobs elsewhere in West Virginia. Similarly, the value-added multiplier of 1.61 implies that each dollar of value added generated directly by the sector supports an additional $0.61 in value added across other industries. Together, these results indicate that, despite declines in total employment and income effects relative to 2017, the forest products sector remains an important contributor to statewide economic activity through its supply-chain and household-spending linkages.

Table 3 reports the direct economic contributions of the seven industry groups, while Table 4 presents their total contributions including multiplier effects. In 2023, West Virginia’s forest sector is heavily weighted toward manufacturing. The Primary and Secondary Solid Wood Products sectors combined employed 4,760 individuals, representing nearly 57% of the sector's direct workforce. In contrast to the labor-intensive but lower-output Forestry sector (which generated $32,000 in output per worker), the manufacturing sectors demonstrated significantly higher productivity and capital intensity. Primary Solid Wood Products stood out as the cornerstone of the industry, generating the highest direct output ($1.44 billion) and Value-Added ($382.6 million). Similarly, the Pulp, Paper, and Paperboard Mills sector displayed extreme capital intensity, generating over $134 million in output with only 166 workers, translating to an output-per-worker ratio significantly higher than the rest of the sectors.

Table 3: Direct Economic Contributions in West Virginia state, Industry Groups, 2023. †

Industries	Employment	Labor Income	Value-Added	Output
1.Forestry	630	$17,604	$19,064	$20,649
2.Logging	1,303	$90,366	$124,015	$129,353
3.Primary Solid Wood Products	2,453	$138,017	$382,557	$1,437,114
4.Secondary Solid Wood Products	2,307	$129,511	$249,080	$760,390
5.Wood Furniture	1,346	$96,876	$74,101	$263,462
6.Pulp, Paper, and Paperboard mills	166	$13,771	$33,937	$134,114
7.Secondary Paperboard and other Paper Products	192	$13,901	$25,718	$105,427

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

When supply-chain and induced effects are included (Table 4), the rankings further solidify the centrality of wood manufacturing to the state's economy. Primary Solid Wood Products emerges as the overwhelming economic engine, supporting 5,846 total jobs and over $2 billion in total economic output. The robust multiplier effect in this sub-sector implies that sawmills and processing facilities maintain critical backward linkages to local logging operations, essentially driving demand for the upstream sectors, while providing the material base for forward linkages into construction and finishing. Taken together, the solid wood value chain is the dominant force in West Virginia's forest economy; the combined Primary and Secondary Solid Wood Products sectors accounted for approximately 77% of the sector's total direct output ($2.2 billion), highlighting the state's specialized role in lumber production and wood manufacturing rather than raw material export.

Note: *In Table 4, readers may observe that the sum of the economic contributions for the individual industries exceeds the reported total contribution for the Forest Sector as a whole as presented in Table 2. This difference is intentional and results from the "mixed-model" approach used to ensure accuracy.*

In Input-Output (I-O) analysis, simply adding the total contributions of individual sectors results in double-counting. This occurs because the output of one forest industry often serves as an input for another. For example, logs harvested by the Logging sector are inputs for the Furniture sector. If modeled individually and summed, the model counts both the direct value of the logs and the associated supply-chain ripples (indirect effects) twice: once as a production

requirement for the Furniture, and again as a direct output of the Logging sector. To provide the most accurate estimate, the aggregated total is calculated by treating the forest industries as a single economic unit. This method mathematically nets out all inter-industry transactions within the sector, ensuring that the final results reflect only the new economic value generated for the state economy.

Table 4: Total Economic Contributions in West Virginia state, Industry Groups, 2023. †

Industries	Employment	Labor Income	Value- Added	Output
1.Forestry	696	$21,068	$25,561	$31,462
2.Logging	1,722	$109,539	$159,406	$187,238
3.Primary Solid Wood Products	5,846	$348,805	$735,728	$2,032,652
4.Secondary Solid Wood Products	4,235	$243,625	$451,806	$1,183,055
5.Wood Furniture	2,145	$142,478	$156,638	$420,747
6.Pulp, Paper, and Paperboard mills	475	$33,196	$69,778	$203,293
7.Secondary Paperboard and other Paper Products	381	$25,412	$49,515	$142,568

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

Forestry

Economic Contribution of Forestry

Table 5 presents the economic contribution of the Forestry sector. For West Virginia, this group aggregates two primary industries: timber tract operations, which involve the management of forest lands for the sale of standing timber, and support activities for forestry. It is important to note that, the maple syrup production industry is not disclosed in the West Virginia dataset.

Table 5: Direct, Indirect, and Induced Economic Contributions of the Forestry Industry in West Virginia, 2023. †

	Employment	Labor Income	Value-Added	Output
Direct	630	$17,604	$19,064	$20,649
Indirect	3	$148	$287	$592
Induced	62	$3,316	$6,210	$10,221
Total	**696**	**$21,068**	**$25,561**	**$31,462**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

In 2023, the sector directly supported 630 jobs and generated $20.6 million in direct output. While Forestry serves as the biological foundation for the entire wood products value chain, its financial profile in West Virginia differs significantly from the manufacturing sectors. The data reveals a highly labor-intensive industry where the vast majority of gross output flows directly to workers rather than to intermediate supplies. Specifically, over 85% of the sector's direct output is allocated to Labor Income ($17.6 million out of $20.6 million).

This structural characteristic explains the sector's distinct multiplier effects. The employment multiplier is 1.10, indicating that for every 10 jobs in Forestry, roughly 1 additional job is supported elsewhere in the state. Analyzing the components of this multiplier reveals that the economic ripple effects are driven almost entirely by workforce spending rather than business supply chains.

- **Indirect Effect:** The sector generated negligible indirect impacts, supporting only 3 jobs and $592 thousand in output. This reflects the land-intensive nature of timber growing; unlike a sawmill that requires constant inputs of energy, parts, and logistics, forestry operations have minimal business-to-business purchasing requirements.
- **Induced Effect:** In contrast, the induced effect supported 62 jobs and $10.2 million in output. Because such a high percentage of the sector's output is retained as labor income, the primary economic contribution beyond the forest itself comes from the income spent by foresters and loggers within their local communities.

When these effects are combined, the Forestry industry contributed a total of 696 jobs, $31.5 million in output, and $25.6 million in value-added to the West Virginia economy in 2023. The total output multiplier of 1.52 implies that every $100 of output generated by forest management activities generates an additional $52 of economic activity throughout the state.

Trend Analysis: Forestry (2017–2023)

As illustrated in Figure 6, the Forestry industry in West Virginia exhibits substantial year-over-year volatility, consistent with a sector sensitive to seasonal conditions and market timing. The industry experienced a period of expansion mid-period, reaching a peak in 2021 with 940 jobs and $36.5 million in output. However, the trend reversed sharply in the final year of the study. Between 2022 and 2023, the sector underwent a significant contraction. Direct output decreased by 34.9% (falling from $31.8 million to $20.7 million), outpacing the 13.7% decline in employment. This disproportionate drop in output relative to workforce size implies a marked decline in labor productivity for 2023. The average output per worker fell to approximately $32,800, down from a peak of nearly $43,600 in 2022.

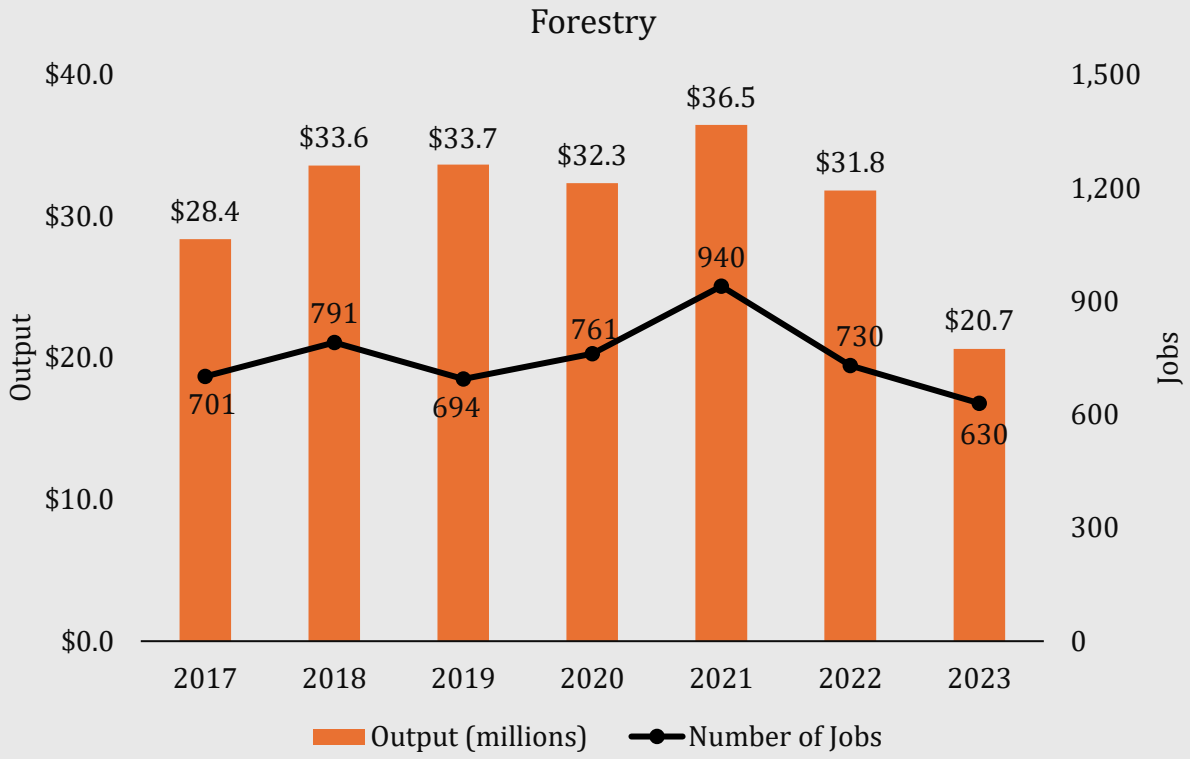

Figure 6: Trend in direct employment and output for the Forestry industry in West Virginia, 2017–2023.

Logging

Economic Contribution of Logging

The commercial logging sector consists of establishments primarily engaged in cutting and transporting timber, producing wood chips in the field, and providing related services such as stump removal. Table 6 outlines the economic contributions of this sector. In 2023, Logging served as a critical source of employment for West Virginia's forest economy, directly supporting 1,303 jobs. The sector generated $129.4 million in direct industry output and contributed $124.0 million in Value-Added to the state's GSP.

Multipliers for the Logging industry reveal a sector that is highly labor-intensive with significant downstream impacts on local households. The data demonstrates a powerful link between industry activity and community spending. The Induced effects generated $55.4 million in output, which is more than 20 times larger than the Indirect effects ($2.5 million). This disparity is driven by the sector's specific cost structure: a substantial portion of Logging's direct output flows directly into Labor Income ($90.4 million out of $129.4 million, or nearly 70% of total output).

Table 6: Direct, Indirect, and Induced Economic Contributions of the Logging Industry in West Virginia, 2023. †

	Employment	Labor Income	Value-Added	Output
Direct	1,303	$90,366	$124,015	$129,353
Indirect	80	$1,204	$1,733	$2,510
Induced	339	$17,969	$33,657	$55,375
Total	**1,722**	**$109,539**	**$159,406**	**$187,238**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

Because a high percentage of revenue is paid out as wages, salaries, benefits to workers and as a proprietor income, who typically reside locally, the re-spending of those wages creates a robust "induced" ripple throughout the state economy. Conversely, the sector has a relatively small supply chain footprint (only 80 jobs and $2.5 million in indirect output). This reflects the nature of the business, where major inputs are primarily fuel, equipment, and stumpage, rather than the complex intermediate goods required by downstream manufacturing.

When combining these effects, the Logging industry contributed a total of 1,722 jobs, $187.2 million in output, and $159.4 million in value-added to the state economy. The implied Output Multiplier is 1.45, meaning that for every $1.00 of timber harvested, an additional $0.45 of economic activity is generated elsewhere in West Virginia.

Trend Analysis: Logging (2017–2023)

Figure 7 illustrates a structural realignment within West Virginia's Logging industry. The most distinct feature of the seven-year period is the sharp contraction between 2017 and 2018, where Real Industry Output plummeted by nearly 67% (from $444.1 million to $145.3 million). Following this initial shock, the sector entered a phase of steady workforce attrition coupled with output stabilization. From 2018 through 2023, direct employment declined every single year, falling from 1,674 to 1,303 workers. Despite this continued loss of labor capacity, output remained relatively stable in the $125 million to $145 million range. This divergence in the latter half of the study period signals a gradual improvement in labor productivity following the 2018 realignment. By 2023, the industry generated approximately $99,300 in output per worker, a slight recovery from the lows of 2019 ($80,200 per worker).

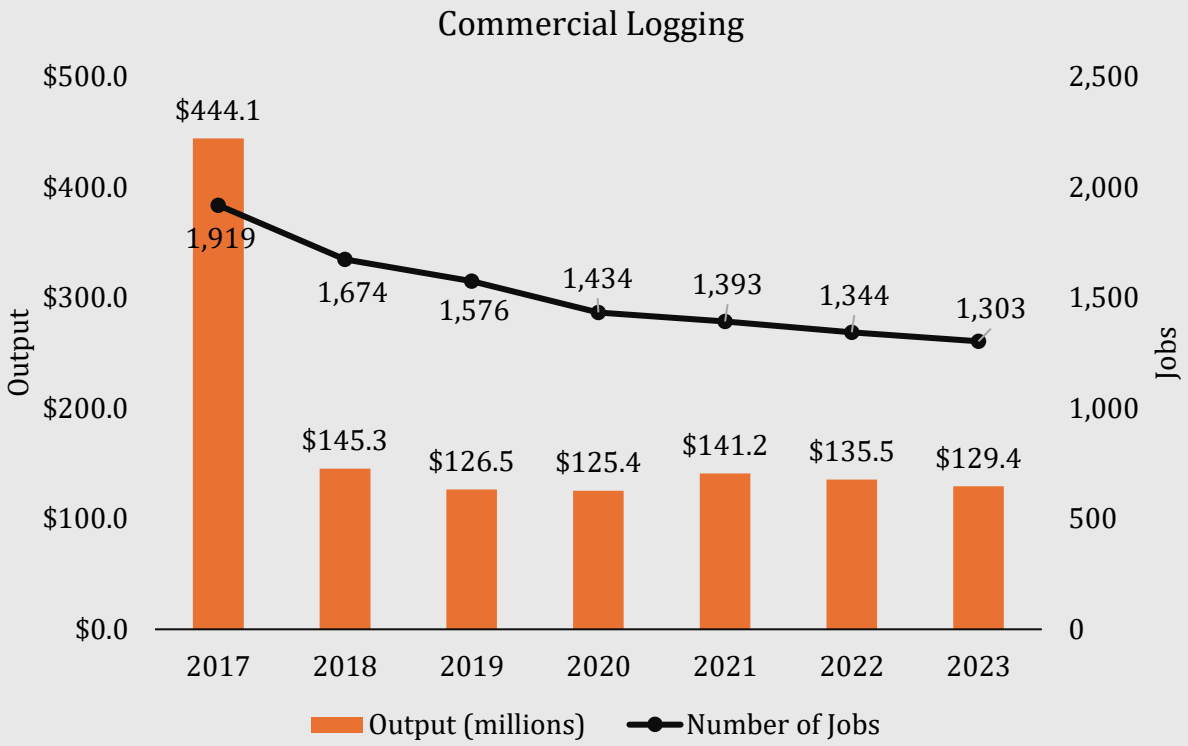

Figure 7: Trend in direct employment and output for the Logging industry in West Virginia, 2017–2023.

Primary Solid Wood Products

Economic Contribution of Primary Solid Wood Products

Table 7 outlines the economic contributions of the Primary Solid Wood Products industry. In West Virginia, this sector includes sawmills, wood preservation, veneer and plywood manufacturing, and reconstituted wood product industries (note: data for electric power generation via biomass is not disclosed or present in this dataset). In 2023, this manufacturing sector directly provided 2,453 jobs and generated $1.44 billion in direct output. Notably, this sector generates substantial economic value, contributing $382.6 million in direct Value-Added, which reflects the significant economic gains achieved by processing raw timber into finished lumber and structural materials.

The Primary Solid Wood Products industry exhibits the strongest backward linkages in the entire West Virginia forest economy. Unlike the upstream extraction sectors where induced effects were dominant, this sector is driven by deep supply chain purchases. The data reveals a critical structural dynamic: the Indirect Employment effect supports 2,369 jobs, a figure that nearly matches the sector's own direct workforce (2,453 jobs).

Table 7: Direct, Indirect, and Induced Economic Contributions of the Primary Solid Wood Products Industry in West Virginia, 2023. †

	Employment	Labor Income	Value-Added	Output
Direct	2,453	$138,017	$382,557	$1,437,114
Indirect	2,369	$156,403	$251,328	$427,910
Induced	1,024	$54,384	$101,842	$167,628
Total	**5,846**	**$348,805**	**$735,728**	**$2,032,652**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

The implied Employment Multiplier is 2.38 (5,846 Total / 2,453 Direct). This means that every 100 direct jobs in primary wood manufacturing support an additional 138 jobs elsewhere in the state economy. This underscores the sector's role as the "keystone" industry that anchors the wider forest supply chain; without the demand generated here, the extraction sectors (Forestry and Logging) would lack a sufficient local market.

When aggregating direct, indirect, and induced effects, the Primary Solid Wood Products industry contributed a total of 5,846 jobs, $2.03 billion in output, and $735.7 million in value-added to the state economy in 2023. By supporting nearly 6,000 jobs statewide, this industry serves as the primary economic engine for West Virginia's forest sector, effectively amplifying the value of the state's timber resources through manufacturing.

Trend Analysis: Primary Solid Wood Products (2017–2023)

Figure 8 reveals a striking divergence between employment trends and production value within the Primary Solid Wood Products industry. While the workforce has steadily contracted, declining by 13.5% from 2,836 jobs in 2017 to 2,453 in 2023, the sector has simultaneously achieved a robust expansion in physical output. Real Industry Output grew by 30.5% over the same period, rising from $1.10 billion to a peak of $1.44 billion. This inverse relationship signals an increase in labor productivity. The average output per worker surged from approximately $388,400 in 2017 to over $585,800 in 2023. Such a shift suggests that West Virginia sawmills and wood manufacturing facilities have successfully transitioned toward more capital-intensive operations.

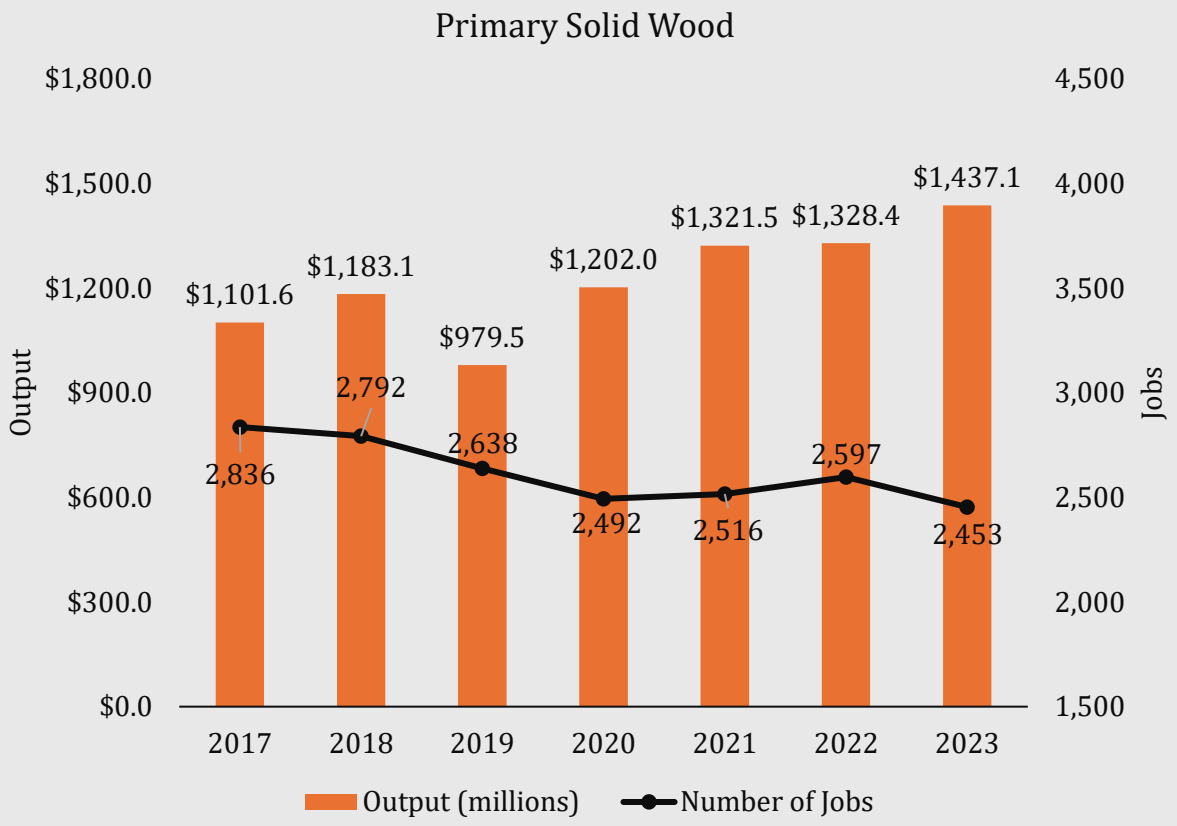

Figure 8: Trend in direct employment and output for the Primary Solid Wood Products industry in West Virginia, 2017–2023.

Secondary Solid Wood Products

Economic Contribution of Secondary Solid Wood Products

Table 8 presents the economic contribution of the Secondary Solid Wood Products industry. This diverse value-added sector encompasses industries such as engineered wood member and truss manufacturing, wood windows and doors manufacturing, millwork and flooring, wood container and pallet manufacturing, and miscellaneous wood product manufacturing (note: Manufactured home (mobile home) is not disclosed or present in this dataset). In 2023, this sector directly employed 2,307 workers and generated $760.4 million in direct output.

The sector exhibits a healthy employment multiplier of 1.84, which means that for every 100 jobs created in secondary manufacturing, around 84 additional jobs are supported elsewhere in the West Virginia economy. While robust, this multiplier is notably lower than that of the Primary Solid Wood sector (2.38). This distinction reflects the upstream supply chain dynamics. While Primary manufacturers purchase raw timber from labor-intensive logging operations, Secondary manufacturers primarily purchase processed lumber from capital-intensive sawmills or import intermediate wood components. Consequently, the Indirect Employment effect

(1,221 jobs) is significantly smaller than the sector's own direct workforce, whereas in the Primary sector, the indirect workforce nearly equaled the direct workforce.

When fully aggregated, the sector supports a total of 4,235 jobs and contributes over $1.18 billion in total economic output. Financially, the sector acts as an effective value multiplier, contributing a total of $451.8 million in Value-Added to the Gross State Product. A key structural feature of this group is its high retention of value. The ratio of direct Value-Added to Output in this sector (32.8%) is higher than in the Primary sector (26.6%).

Table 8: Direct, Indirect, and Induced Economic Contributions of the Secondary Solid Wood Products Industry in West Virginia, 2023. †

	Employment	Labor Income	Value-Added	Output
Direct	2,307	$129,511	$249,080	$760,390
Indirect	1,221	$76,565	$132,412	$306,926
Induced	706	$37,549	$70,315	$115,739
Total	**4,235**	**$243,625**	**$451,806**	**$1,183,055**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

Trend Analysis: Secondary Solid Wood Products (2017–2023)

Figure 9 illustrates a positive structural shift within the Secondary Solid Wood Products industry. Despite a gradual contraction in the workforce, decreasing by 11.7% from 2,613 employees in 2017 to 2,307 in 2023, the sector has successfully expanded its economic output. Real Industry Output grew from $642.5 million to a period high of $760.4 million in 2023, representing an 18.3% increase.

During the same period, real industry output increased overall, rising from $642.5 million in 2017 to $760.4 million in 2023, an increase of approximately 18.3 percent. Although output declined in some intermediate years, output in 2023 exceeded levels observed throughout the earlier part of the study period. The combination of lower employment and higher output resulted in an increase in average output per worker. Output per job increased from approximately $246,000 in 2017 to about $330,000 in 2023. This trend shows that the changes in production were not proportional to changes in employment and reflects higher average

output per worker in the Secondary Solid Wood Products industry over time.

Figure 9: Trend in direct employment and output for the Secondary Solid Wood Products industry in West Virginia, 2017–2023.

Wood Furniture

Economic Contribution of Wood Furniture

Table 9 outlines the economic contributions of the Wood Furniture industry. This group includes manufacturers of wood kitchen cabinets and countertops, non-upholstered household furniture, institutional furniture, custom architectural woodwork, and showcase/partition manufacturing. (Note: Data for Upholstered household furniture and Wood office furniture manufacturing are not disclosed or present in the West Virginia forest economy). In 2023, this sector directly employed 1,346 workers and generated $263.5 million in direct output.

The data highlights that Wood Furniture manufacturing operates with a distinct economic structure compared to the primary processing sectors. It maintains a significant labor intensity relative to its output, with approximately 37% of its direct gross output flowing directly to workers as Labor Income ($96.9 million out of $263.5 million). This substantial labor share reflects the "craft" nature of the industry, creating high-value custom goods (such as cabinetry and millwork) that rely heavily on skilled labor rather than just automated throughput.

Table 9: Direct, Indirect, and Induced Economic Contributions of the Wood Furniture Industry in West Virginia, 2023. †

	Employment	Labor Income	Value-Added	Output
Direct	1,346	$96,876	$74,101	$263,462
Indirect	375	$23,079	$40,357	$87,862
Induced	424	$22,523	$42,180	$69,422
Total	**2,145**	**$142,478**	**$156,638**	**$420,747**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

This labor intensity dictates the sector's multiplier dynamics. The Employment Multiplier is 1.59, meaning that every 100 direct jobs support an additional 59 jobs elsewhere. Notably, the Induced Employment effect (424 jobs) exceeds the Indirect Employment effect (375 jobs). This signals that the sector's primary leverage on the state economy comes from the income earned by its workforce, who subsequently spend that income in the local service economy, rather than from heavy demands on the industrial supply chain.

When fully aggregated, the Wood Furniture industry contributed a total of 2,145 jobs, $420.7 million in output, and $156.6 million in value-added to the West Virginia economy in 2023. While smaller in volume than the Primary Solid Wood sector, it remains a vital source of value-added manufacturing, converting processed lumber into high-value consumer and industrial goods.

Trend Analysis: Wood Furniture Industry (2017–2023)

Figure 10 presents the trajectory of the Wood Furniture industry in West Virginia. Over the seven-year period, the sector experienced a gradual but consistent contraction in its workforce, with direct employment declining by 11.9% from 1,527 in 2017 to 1,346 in 2023. Despite this reduction in jobs, the sector's financial performance remained resilient and generally upward-trending. Real Industry Output increased by 12.8% over the period, rising from $233.5 million to $263.5 million. This contrast between shrinking employment and growing output highlights a notable gain in labor productivity. The average output per worker rose from approximately $153,000 in 2017 to nearly $196,000 in 2023. This 28% increase in per-worker value suggests that while the sector is consolidating, the remaining manufacturers are shifting toward higher-value products or more efficient production methods, allowing them to generate more revenue

with a leaner workforce.

Figure 10: Trend in direct employment and output for the Wood Furniture industry in West Virginia, 2017–2023.

Pulp, Paper, and Paperboard Mills

Economic Contribution of Pulp, Paper, and Paperboard Mills

Table 10 details the economic contribution of the Pulp, Paper, and Paperboard Mills industry. This sector represents the most capital-intensive component of West Virginia's forest economy. In 2023, these facilities generated substantial financial flows despite a relatively small direct workforce. While employing only 166 workers (ranking well below the extraction and solid wood manufacturing sectors), the industry generated $134.1 million in Direct Output. This divergence between low headcount and high output, yielding approximately $808,000 in output per worker, signals an advanced level of automation and high-value continuous processing.

A defining characteristic of this industry in West Virginia is its "inverted" employment profile. The sector serves as an economic anchor where the supply chain workforce exceeds the workforce inside the facility itself. Specifically, the Indirect Employment (212 jobs) is larger than the Direct Employment (166 jobs). This indicates that the mills' operational requirements, including massive inputs of energy, maintenance services, fiber logistics, and wholesale

materials, sustain a larger external workforce than the mills employ directly. Consequently, the sector exhibits a strong Employment Multiplier of 2.86.

When fully aggregated, the sector supports a total of 475 jobs and generates $203.3 million in total economic output. Furthermore, the quality of direct employment in this sector is notable. With total labor income of $13.8 million distributed among 166 workers, the average annual labor income per direct job is approximately $83,000. This demonstrates that while the pulp and paper sector has a concentrated physical footprint, it remains a critical source of high-income, high-skill technical employment for the state.

Table 10: Direct, Indirect, and Induced Economic Contributions of the Pulp, Paper, and Paperboard Mills Industry in West Virginia, 2023. †

	Employment	Labor Income	Value-Added	Output
Direct	166	$13,771	$33,937	$134,114
Indirect	212	$14,248	$26,145	$53,218
Induced	97	$5,177	$9,695	$15,960
Total	**475**	**$33,196**	**$69,778**	**$203,293**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

Trend Analysis: Pulp, Paper, and Paperboard Mills (2017–2023)

Figure 11 displays a period of significant volatility and recent contraction for the Pulp, Paper, and Paperboard Mills sector in West Virginia. For most of the study period (2017–2022), the sector maintained a baseline of stability, even experiencing a growth spurt in 2022 where employment peaked at 280 jobs and output reached $219.7 million. However, 2023 marked a sharp structural correction.

Between 2022 and 2023, the industry experienced a dramatic downsizing event. Direct employment plummeted by 40.7% (dropping from 280 to 166 workers), accompanied by a 39.0% decline in output to $134.1 million. Despite this reduction in scale, the sector maintained its high capital intensity; the average output per worker remained exceptionally high at approximately $807,800 in 2023, showing that the remaining operations continue to be highly automated and productive relative to their workforce size.

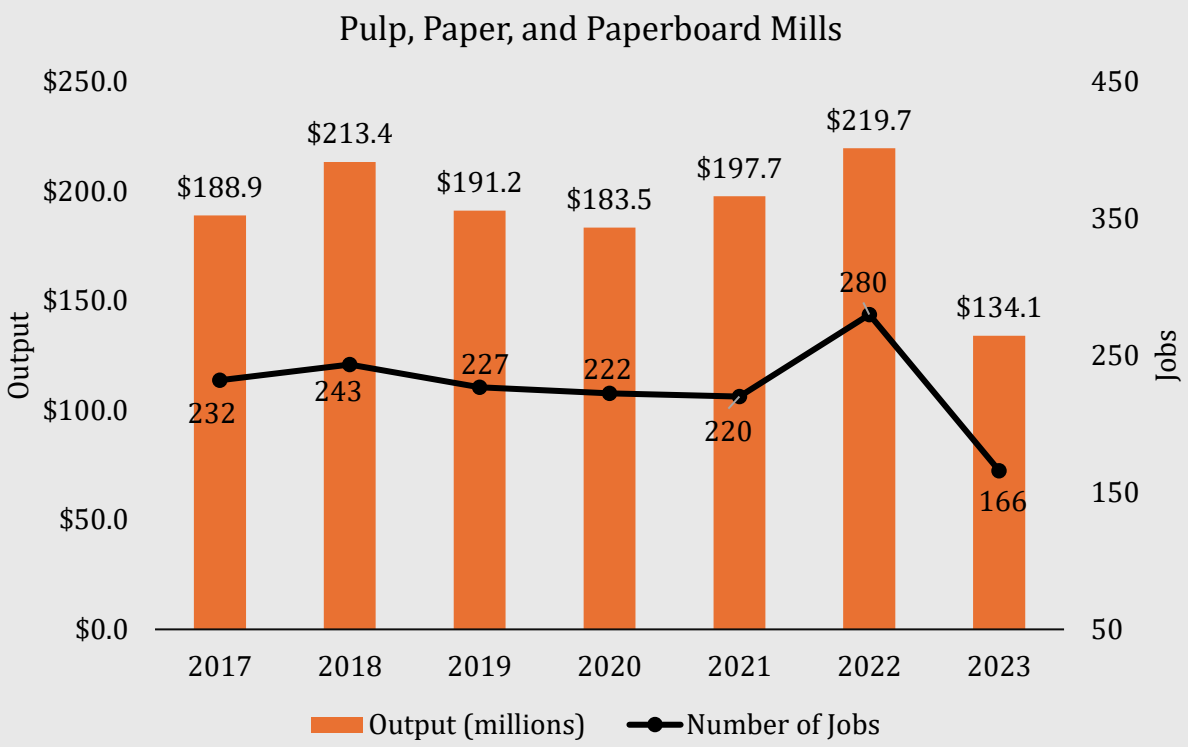

Figure 11: Trend in direct employment and output for the Pulp, Paper, and Paperboard Mills industry in West Virginia, 2017–2023.

Secondary Paperboard and Other Paper Products

Economic Contribution of Secondary Paperboard and Other Paper Products

Table 11 outlines the economic contribution of the Secondary Paperboard and Other Paper Products industry. This group encompasses manufacturers of paperboard containers, paper bags, coated and treated paper, and stationery products. It is important to note that data for sanitary paper products and other converted paper product manufacturing are not disclosed or present in the West Virginia forest economy. Facilities in this group primarily function as "converters," creating finished goods from purchased pulp, paperboard, or recycled materials.

In 2023, this converting sector was one of the smaller employers within the state's forest products industry (after Pulp, Paper, and Paperboard Mills), directly supporting 192 workers and generating $105.4 million in direct output. Despite its modest workforce size, the sector demonstrates high productivity, generating substantial output value relative to its labor inputs. The sector exhibits an Employment Multiplier of 1.99, indicating that for every 100 jobs in a box plant or paper converter, roughly 99 additional jobs are supported throughout the state economy. Examining the supply chain dynamics reveals that the Indirect Employment effect

supports 116 jobs. This significant figure relative to the direct workforce suggests that these manufacturers are active purchasers of intermediate goods and logistics services.

When all effects are considered, the industry supported a total of 381 jobs, $49.5 million in value added, and $142.6 million in total output statewide. Overall, while relatively small in terms of direct employment, industries of this type contribute measurable economic activity through supply-chain transactions and household-spending effects, extending their economic influence beyond direct employment..

Table 11: Direct, Indirect, and Induced Economic Contributions of the Secondary Paperboard and Other Paper Products Industry in West Virginia, 2023. †

	Employment	Labor Income	Value-Added	Output
Direct	192	$13,901	$25,718	$105,427
Indirect	116	$7,585	$13,018	$25,039
Induced	74	$3,926	$10,779	$12,102
Total	**381**	**$25,412**	**$49,515**	**$142,568**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars.

Trend Analysis: Secondary Paperboard and Other Paper Products (2017–2023)

Figure 12 presents a consistent trajectory of contraction for the Secondary Paperboard and Other Paper Products industry in West Virginia. The sector has faced steady downward pressure throughout the seven-year period, with no years of significant recovery. Direct employment declined by 31.7%, falling from 281 workers in 2017 to 192 in 2023. Real Industry Output followed a similar path, decreasing by 23.1% to $105.4 million. However, a comparison of the two trend lines reveals a positive underlying dynamic regarding efficiency. Because the workforce contracted more sharply than production value, the sector actually experienced a rise in labor productivity. The average output per worker increased from approximately $487,500 in 2017 to nearly $549,000 in 2023.

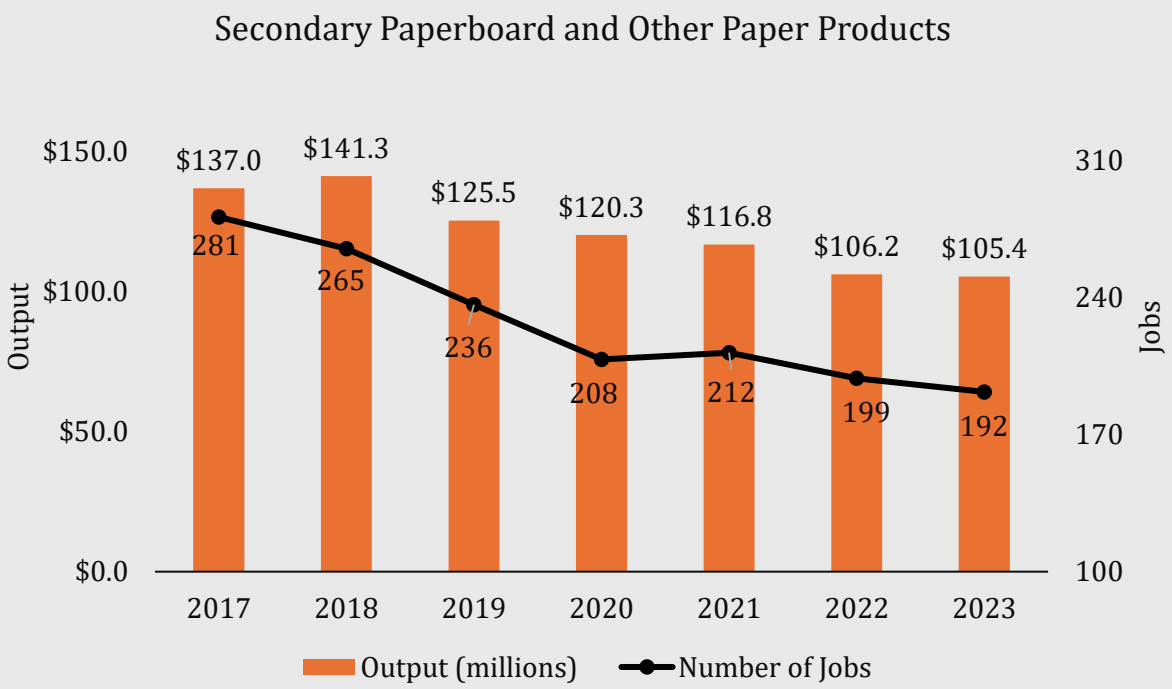

Figure 12: Trend in direct employment and output for the Secondary Paperboard and Other Paper Products industry in West Virginia, 2017–2023.

Top Forest Product Sectors

West Virginia's forest-products sector is represented by 25 IMPLAN industries, as seven forest-related sectors, used for the analysis: All other crop farming (Maple syrup production), Electric power generation - Biomass, Manufactured home (mobile home) manufacturing, cut stock and planing, Upholstered household furniture manufacturing, Wood office furniture manufacturing, Sanitary paper product manufacturing, and All other converted paper product manufacturing do not appear in the state's 2023 industry mix.

Among 25 industries, Sawmills serve as the sector's primary employment engine, ranking first with 1,702 jobs. This single industry accounts for approximately 20.3% of the entire forest sector workforce (based on the total of 8,398 jobs reported previously). It is followed by Commercial Logging with 1,303 jobs and Wood Kitchen Cabinet and Countertop Manufacturing with 980 jobs. Unlike regions where employment is dominated solely by either downstream manufacturers or upstream extraction, West Virginia displays a balanced top-tier workforce spread across primary processing (Sawmills), extraction (Logging), and secondary manufacturing (Cabinets and Millwork).

However, labor income contributions do not align directly with employment rankings. Commercial Logging is the largest contributor to labor income, generating $90.4 million statewide, despite employing fewer workers than Sawmills. This outcome reflects the income structure of the logging industry, which includes a substantial share of proprietor income. In contrast, Sawmills generated $82.3 million in labor income in 2023, with proprietor income recorded as –$3.3 million, indicating losses or adjustments within that component. Among secondary manufacturing industries, Wood Kitchen Cabinet manufacturing ranks third, contributing $71.9 million in labor income.

In terms of Output, economic activity is overwhelmingly concentrated in the Primary Solid Wood supply chain. Sawmills produced $820.1 million in 2023, representing roughly 28.8% of the sector's total direct output ($2.85 billion). The gap between the first and second-ranked industries is substantial; the second-highest producer, Reconstituted Wood Product Manufacturing, generated $295.6 million, followed by Other Millwork at $243.7 million. Notably, the top five output generators are all manufacturing-based, with no extraction sectors appearing in the top tier for gross sales.

A similar dominance is visible in Value-Added, where Sawmills contributed $172.4 million to the state's GSP. Commercial Logging ranked second ($124.0 million), followed by Reconstituted Wood Product Manufacturing ($107.1 million). This data highlights a distinct structural profile for West Virginia: the state's economic value is primarily driven by the solid wood value chain,

specifically the conversion of timber into lumber, structural panels, and millwork, rather than by pulp and paper manufacturing or raw material export alone.

Table 12: Top five industries in terms of direct Economic Contributions in West Virginia state, 2023. †

Rank	Employment	Labor Income	Value added	Output
1	Sawmills (1,702)	Commercial logging ($90,366)	Sawmills ($172,427)	Sawmills ($820,068)
2	Commercial logging (1,303)	Sawmills ($82,343)	Commercial logging ($124,015)	Reconstituted wood product manufacturing ($295,591)
3	Wood kitchen cabinet and countertop manufacturing (980)	Wood kitchen cabinet and countertop manufacturing ($71,862)	Reconstituted wood product manufacturing ($107,106)	Other millwork, including flooring ($243,654)
4	Other millwork, including flooring (747)	Other millwork, including flooring ($37,875)	Other millwork, including flooring ($82,895)	Wood preservation ($227,126)
5	Support activities for agriculture and forestry (601)	Engineered wood member and truss manufacturing ($37,237)	Wood kitchen cabinet and countertop manufacturing ($77,667)	Engineered wood member and truss manufacturing ($201,824)

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

Top Non-Forest Industries supported by the Forest Sector in 2023

Excluding the forest-products industries themselves, West Virginia included 395 IMPLAN sectors in 2023. The forest sector supported at least one job in 144 industries and at least ten jobs in 98 of those industries. In addition to the 8,398 direct jobs identified previously, the sector supported approximately 5,243 indirect and induced jobs in 2023. These additional positions, generated through supply chain purchases and workforce spending, are heavily concentrated in logistics, healthcare, and commercial services. Table 13 highlights the top ten non-forest industries most significantly impacted by this economic activity. Together, these ten sectors account for 1,977 jobs, representing roughly 37.7% of all indirect and induced employment generated by the forest economy.

Table 13: Top Ten Industries Impacted by West Virginia state's Forest Products Industries in terms of number of jobs in 2023.

Industries	Number of Jobs
Wholesale - Other durable goods merchant wholesalers	378
Truck transportation	298
Hospitals	246
Couriers and messengers	189
Warehousing and storage	177
Full-service restaurants	162
Other real estate	146
Limited-service restaurants	144
Employment services	129
Scenic & sightseeing transportation & support activities for transportation	108
Total	**1,977**

The composition of these top sectors reveals the specific mechanisms through which the forest sector interacts with the wider West Virginia economy:

- **Logistics and Commercial Trade:** The most profound linkages are found in the storage, sale, and movement of physical goods. Wholesale - Other Durable Goods ranks as the single largest supporting sector (378 jobs), reflecting the extensive network of building material distributors and equipment suppliers that serve the industry. West Virginia's profile is distinctly industrial; Truck Transportation ranks second (298 jobs), followed by Couriers and Messengers (189 jobs), Warehousing and Storage (177 jobs), and Support

Activities for Transportation (108 jobs). This shows that the forest sector is one of the primary drivers of the state's logistics infrastructure, requiring a robust heavy-transport network to move raw timber from the woods to mills and to distribute finished lumber and paper products to market.

- **Induced Household Spending:** The prominence of Hospitals (246 jobs), Full-Service Restaurants (162 jobs), Other Real Estate (146 jobs), and Limited-Service Restaurants (144 jobs) illustrates the "induced" power of the forest workforce. These positions are supported not by mill supply chains, but by the wages spent by forest-sector employees in their local communities. Further, the high ranking of healthcare and dining services suggests that the income paid to loggers and manufacturing workers are a critical source of revenue for essential local services and the hospitality sector.

- **Business Support Services**: Notably, appearance of Employment Services (129 jobs) in the top ten shows that forest product firms are significant consumers of corporate support services, likely to rely on external staffing agencies to manage seasonal labor fluctuations or specialized workforce needs.

In terms of output, as detailed in Table 14, the top ten industries supported by forest-sector activity generated a combined $427.5 million in 2023. The dominant category involves the movement and wholesale distribution of goods, reflecting the forest industry's reliance on complex logistics to move high volumes of timber and heavy finished products.

The leading sector is Wholesale - Other Durable Goods, generating $114.9 million in output. This underscores the vital role of the merchant wholesaler network in distributing West Virginia's lumber and wood products to national markets. However, the most distinct feature of the West Virginia data is the immense scale of the transportation sector. Truck Transportation ranks as the second-largest supporting industry, generating $62.9 million. When combined with Rail Transportation ($18.0 million), it becomes evident that the forest economy is one of the primary anchors for the state's freight infrastructure, requiring continuous investment in heavy-haul capabilities. The output rankings also highlight the sector's significant energy footprint. Electric Power Transmission and Distribution ranks fifth with $33.1 million, while Electric Power Generation - Fossil Fuel appears in the top ten with $18.8 million. This combined energy contribution of nearly $52 million reflects the intensive electricity consumption of sawmills and other secondary manufacturers.

Finally, the presence of Owner-Occupied Housing as the third-largest sector ($53.8 million) serves as a significant indicator of the "induced" effect. In economic modeling, this sector represents the imputed value of homeownership. Its high ranking shows that forest sector jobs sustain high levels of homeownership and household wealth across the state. This is further

reinforced by the Other Real Estate sector ($30.7 million) and Monetary Authorities ($23.8 million), suggesting that the income earned in the forest sector provide the financial stability required to support local property markets and banking institutions.

Table 14: Top Ten Industries impacted by West Virginia State's Forest Products Industries in terms of output production in 2023. †

Industries	Output
Wholesale - Other durable goods merchant wholesalers	$114,923
Truck transportation	$62,943
Owner-occupied housing	$53,753
Hospitals	$49,097
Electric power transmission and distribution	$33,063
Other real estate	$30,696
Monetary authorities and depository credit intermediation	$23,790
Insurance agencies, brokerages, and related activities	$22,498
Electric power generation - Fossil fuel	$18,773
Rail transportation	$17,992
Total	**$427,529**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

Importance of the Forest Products Industries in Context

Natural Resources and Agricultural Industries

To contextualize the economic importance of the forest economy, Table 15 compares the direct contributions of West Virginia's four primary natural resource sectors: Forest Products, Agriculture, Commercial Fishing/Hunting, and Mining (including Oil & Gas). The data reveals a natural resource landscape heavily dominated by the energy extraction sector, with Forest Products serving as a critical but smaller secondary pillar.

In terms of employment, the Mining and Oil & Gas sector was the largest employer, supporting 28,636 jobs, or approximately 47.7 percent of total employment across the four sectors. Agricultural Production followed with 22,917 jobs, while Forest Products ranked third with 8,398 jobs. Commercial Fishing, Hunting, and Trapping accounted for a relatively small share of employment, with 85 jobs statewide.

Economic contribution measures indicate substantial differences across sectors. Mining and Oil & Gas dominated in financial terms, generating $28.3 billion in output and $16.6 billion in value added, accounting for the majority of total production and income among the four sectors. Forest Products generated $2.85 billion in output and $908.5 million in value added, exceeding the economic output of Agricultural Production, which generated $963.6 million in output and $364.6 million in value added, despite employing nearly three times as many workers. These figures indicate higher average output and value added per worker in Forest Products relative to Agriculture.

Changes between 2017 and 2023 show divergent trends across sectors. Mining and Oil & Gas experienced a 16.0 percent decline in employment, while real output increased by 49.4 percent and labor income rose by 46.7 percent, indicating higher production levels relative to workforce size. Forest Products followed a similar, though less pronounced, pattern: employment declined by 16.9 percent, while real output increased by 2.7 percent and value added remained relatively stable (–0.5 percent). In contrast, Agricultural Production experienced relatively stable employment (+0.7 percent) alongside declines in output (–27.8 percent) and value added (–33.5 percent), indicating reduced economic output relative to workforce size. Commercial Fishing, Hunting, and Trapping showed large percentage changes, reflecting its small baseline and limited scale within the state economy.

Table 15: Natural Resources and Agricultural Production Industries in West Virginia state, 2023. †

Industry	Employment	Δ2017††	Labor Income	Δ2017††	Value-Added	Δ2017††	Output	Δ2017††
1. Forest Products	8,398	-16.9%	$500,047	-21.4%	$908,471	-0.5%	$2,850,509	2.7%
2. Commercial fishing, hunting & trapping	85	-4.5%	$262	22.0%	$5,197	-249.6%	$6,030	360.8%
3. Mining, and oil & gas production	28,636	-16.0%	$3,866,850	46.7%	$16,637,276	38.3%	$28,284,787	49.4%
4. Agriculture production (plant crops and animals)	22,917	0.7%	$72,016	-18.2%	$364,571	-33.5%	$963,639	-27.8%
Total	**60,035**	**-10.4%**	**$4,439,176**	**32.1%**	**$17,915,515**	**32.8%**	**$32,104,966**	**39.3%**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.
†† All percentage differences are calculated in real terms using 2023 constant dollars.

Manufacturing Industries

To assess the relative standing of the forest sector within West Virginia's industrial base, Table 16 compares the aggregated "Forest Products manufacturing" contribution against the state's other major manufacturing groups. Note that in this context, "Forest Products" refers specifically to the manufacturing sub-sectors (Groups 3 through 7), excluding the extraction activities of forestry and logging and other non-manufacturing sectors (IMPLAN codes 10, 15, 16, 19, and 40 see Appendix A). The data reveals that the forest sector in West Virginia operates as a top-tier cornerstone of the manufacturing economy.

In terms of scale, the manufacturing landscape is heavily influenced by the Chemical Manufacturing sector, which dominates all financial metrics with $11.3 billion in output and nearly $3 billion in value-added. However, regarding employment, the Forest Products Manufacturing sector ranks as the state's third-largest manufacturing employer. With 6,465 direct jobs, it sits nearly level with the second-ranked Transportation Equipment sector (6,660 jobs) and significantly outperforms other staple industries such as Primary Metals (4,407 jobs) and Food Manufacturing (4,458 jobs). Accounting for approximately 13.5 percent of the state's total manufacturing workforce, the forest industry represents a notable source of manufacturing employment.

While the Chemical and Primary Metal sectors generate significantly higher gross output ($11.3 billion and $6.4 billion, respectively) due to their extreme capital intensity, the Forest Products sector remains a vital financial contributor. It generated $2.7 billion in direct output, ranking fourth statewide. A critical structural insight is visible when comparing Value-Added. Despite the Primary Metal sector generating nearly 2.4 times the gross output of Forest Products ($6.4 billion vs. $2.7 billion), the Forest Products sector actually generates higher Value-Added ($765.4 million vs. $749.6 million).

The data also highlights the diverse nature of productivity within the state. While sectors like Chemical and Primary Metals generate massive output-per-worker figures ($1.49 million and $1.45 million, respectively), the Forest Products sector operates with a ratio of approximately $417,700 per worker. This figure is competitive with the broader manufacturing average, showing that while the sector is labor-rich, it maintains a high degree of operational efficiency and contributes substantially to the state's GSP.

Table 16: Manufacturing Industries in West Virginia state, 2023. †

Manufacturing Industries	Employment	Labor Income	Value Added	Output
Chemical	7,559	$997,075	$2,977,898	$11,256,289
Transportation Equipment	6,660	$653,635	$1,235,339	$4,001,182
Forest Products	6,465	$392,077	$765,393	$2,700,508
Food	4,458	$233,022	$299,423	$1,704,447
Primary Metal	4,407	$544,956	$749,622	$6,411,164
Fabricated Metal	4,404	$349,404	$567,861	$1,542,206
Plastics and Rubber Products	3,840	$265,384	$456,505	$1,638,982
Nonmetallic Mineral Product	2,493	$189,957	$422,959	$1,095,250
Machinery	2,226	$205,624	$233,892	$881,015
Miscellaneous	1,298	$82,207	$166,790	$434,730
Printing	1,252	$58,087	$86,951	$217,553
Computer and Electronic Product	710	$51,723	$29,712	$216,689
Beverage and Tobacco Product	692	$32,777	$112,888	$592,974
Electrical Equipment	513	$52,885	$62,500	$216,339
Petroleum and Coal	470	$81,125	$314,440	$1,732,106
Textiles and Apparel	370	$14,513	$14,267	$71,638
Total	**47,817**	**$4,204,452**	**$8,496,440**	**$34,713,070**
Compared to 2017	**-3.3%**	**-3.9%**	**-7.2%**	**-5.7%**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

Summary

The 2023 economic contribution report shows that the Forest Products sector remains a cornerstone of West Virginia's industrial economy and a vital engine for its rural workforce. In 2023, the Forest Products sector directly provided 8,398 jobs and generated $2.85 billion in direct economic output. The sector's influence extends deeply into the broader regional economy. When accounting for indirect supply chain purchases and induced household spending, the total contribution reached 13,641 jobs and $3.86 billion in total output. This indicates a robust employment multiplier of 1.62, meaning that for every 100 direct jobs in the forest sector, approximately 62 additional jobs are supported elsewhere in the West Virginia economy, primarily in logistics, transportation, and local services.

The industry exhibits a distinct structure heavily weighted toward value-added processing rather than simple raw material export. West Virginia's forest economy is driven by its manufacturing arms. The Primary and Secondary Solid Wood Products sectors serve as the undisputed leaders, combinedly accounting for nearly 77% of the sector's direct output. Sawmills alone generated $820.1 million in direct output, highlighting the state's specialized role as a producer of high-quality hardwood lumber and structural materials. While Logging remains a critical employment engine (1,303 jobs), the economic wealth is overwhelmingly generated by the downstream conversion of timber into finished goods.

Within the state's natural resources base, Forest Products operates as a critical secondary pillar alongside the dominant energy sector. While Mining, Oil, and Gas leads in total volume, the Forest Products sector significantly outperforms Agriculture, generating nearly three times the output ($2.85 billion vs. $0.96 billion) and offering substantially higher average labor income. In the broader manufacturing landscape, the forest sector functions as a top-tier employer, ranking as the third-largest manufacturing industry in the state with 6,465 jobs.

The study period (2017–2023) reveals a sector in the midst of a successful technological transition. While direct employment declined by 16.9%, real manufacturing output actually increased by 2.7%. This inverse trend signals a profound gain in productivity and efficiency. Ultimately, by converting local renewable timber resources into high-value lumber, cabinetry, and composite materials, the sector not only sustains the state's working landscape but also exports substantial wealth, solidifying its role as an enduring and evolving engine of West Virginia's economic identity.

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Appendix A: Forest Products Industries Groupings and IMPLAN Sectors

A1: Forestry Industry Grouping and IMPLAN Sectors

Industry Code	Industry name
10	All other crop farming***
15	Forestry, forest products, and timber tract production
19	Support activities for agriculture and forestry-*

Note: Sectors with an "*" indicate that only a portion of the sector is included in the forest products industries.
Sectors denoted by "***" indicate that the corresponding FPI is not present in West Virginia.

A2: Logging Industry Grouping and IMPLAN Sector

Industry Code	Industry name
16	Commercial logging

A3: Primary Solid Wood Products Industry Grouping and IMPLAN Sectors

Industry Code	Industry name
40	Electric power generation – Biomass***
124	Sawmills
125	Wood preservation
126	Veneer and plywood manufacturing
128	Reconstituted wood product manufacturing

Note: Sectors denoted by "***" indicate that the corresponding FPI is not present in West Virginia.

A4: Secondary Solid Wood Products Industry Grouping and IMPLAN Sectors.

Industry Code	Industry name
127	Engineered wood member and truss manufacturing
129	Wood windows and door manufacturing
130	Cut stock, resawing lumber, and planning
131	Other millwork, including flooring
132	Wood container and pallet manufacturing
133	Manufactured home (mobile home) manufacturing***
134	Prefabricated wood building manufacturing
135	All other miscellaneous wood product manufacturing

Sectors denoted by "***" indicate that the corresponding FPI is not present in West Virginia.

A5: Wood Furniture Industry Grouping and IMPLAN Sectors.

Industry Code	Industry name
348	Wood kitchen cabinet and countertop manufacturing
349	Upholstered household furniture manufacturing***
350	Non-upholstered wood household furniture manufacturing
352	Institutional furniture manufacturing**
353	Wood office furniture manufacturing***
354	Custom architectural woodwork and millwork
356	Showcase, partition, shelving, and locker manufacturing**

Note: Sectors with "**" indicate that it is treated as **full sector** in 2023; however in 2017 it was treated as a **partial (wood component only)** so the numbers are not strictly comparable.
Sectors denoted by "***" indicate that the corresponding FPI is not present in West Virginia.

A6: Pulp, Paper, and Paperboard Mills Industry Grouping and IMPLAN Sectors.

Industry Code	Industry name
136	Pulp mills
137	Paper mills
138	Paperboard mill

A7: Secondary Paperboard and Other Paper Products Industry Grouping and IMPLAN Sectors.

Industry Code	Industry name
139	Paperboard container manufacturing
140	Paper bag and coated and treated paper manufacturing
141	Stationery product manufacturing
142	Sanitary paper product manufacturing***
143	All other converted paper product manufacturing***

Sectors denoted by "***" indicate that the corresponding FPI is not present in West Virginia.

Appendix B. Detailed Economic Contribution Results of 2023

B1: Direct Economic Contribution by IMPLAN Sector, 2023

B1.1: Direct Economic Contributions, Forestry Sector Details, 2023. †

Industries	Employment	Labor Income	Value-Added	Output
All other crop farming	0	$0	$0	$0
Forestry, forest products, and timber tract production	29	$2,191	$2,661	$2,943
Support activities for agriculture and forestry	601	$15,413	$16,402	$17,706
Total	**630**	**$17,604**	**$19,064**	**$20,649**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.2: Direct Economic Contributions, Logging Sector Details (2023, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Commercial logging	1,303	$90,366	$124,015	$129,353
Total	**1,303**	**$90,366**	**$124,015**	**$129,353**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.3: Direct Economic Contributions, Primary Solid Wood Products Sector Details (2023, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Electric power generation - Biomass	0	$0	$0	$0
Sawmills	1,702	$82,343	$172,427	$820,068
Wood preservation	248	$15,903	$64,856	$227,126
Veneer and plywood manufacturing	221	$15,718	$38,169	$94,328
Reconstituted wood product manufacturing	282	$24,053	$107,106	$295,591
Total	**2,453**	**$138,017**	**$382,557**	**$1,437,114**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.4: Direct Economic Contributions, Secondary Solid Wood Products Sector Details (2023, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Engineered wood member and truss manufacturing	449	$37,237	$68,744	$201,824
Wood windows and door manufacturing	85	$5,302	$9,055	$26,319
Cut stock, resawing lumber, and planing	95	$4,752	$11,690	$37,547
Other millwork, including flooring	747	$37,875	$82,895	$243,654
Wood container and pallet manufacturing	431	$21,004	$32,669	$107,288
Manufactured home (mobile home) manufacturing	0	$0	$0	$0
Prefabricated wood building manufacturing	99	$4,404	$9,889	$34,788
All other miscellaneous wood product manufacturing	401	$18,936	$34,137	$108,971
Total	**2,307**	**$129,511**	**$249,080**	**$760,390**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.5: Direct Economic Contributions, Wood Furniture Sector Details (2023, 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Wood kitchen cabinet and countertop manufacturing	980	$71,862	$77,667	$191,854
Upholstered household furniture manufacturing	0	$0	$0	$0
Non-upholstered wood household furniture manufacturing	71	$4,109	$4,399	$12,810
Institutional furniture manufacturing	222	$15,525	$16,729	$50,659
Wood office furniture manufacturing	0	$0	$0	$0
Custom architectural woodwork and millwork	53	$4,409	-$25,795	$3,191
Showcase, partition, shelving, and locker manufacturing	21	$972	$1,102	$4,948
Total	**1,346**	**$96,876**	**$74,101**	**$263,462**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.6: Direct Economic Contributions, Pulp, Paper, and Paperboard Mills Sector Details (2023, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Pulp mills	60	$5,733	$10,804	$42,308
Paper mills	45	$4,204	$12,312	$39,705
Paperboard mills	61	$3,835	$10,822	$52,101
Total	**166**	**$13,771**	**$33,937**	**$134,114**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B1.7: Direct Economic Contributions, Secondary Paperboard and Other Paper Products Sector Details (2023, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Paperboard container manufacturing	133	$9,915	$18,641	$78,466
Paper bag and coated and treated paper manufacturing	35	$2,439	$4,963	$16,889
Stationery product manufacturing	24	$1,547	$2,113	$10,071
Sanitary paper product manufacturing	0	$0	$0	$0
All other converted paper product manufacturing	0	$0	$0	$0
Total	**192**	**$13,901**	**$25,718**	**$105,427**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B2: Direct Economic Contribution by IMPLAN Sector, 2017 (2017 USD)

B2.1: Direct Economic Contributions, Forestry Sector Details (2017, in Nominal 2017 USD). †

Industries	Employment	Labor Income	Value-Added	Output
All other crop farming	26	$2,456	$2,361	$3,043
Forestry, forest products, and timber tract production	633	$19,624	$16,850	$19,280
Support activities for agriculture and forestry	42	$0	$82	$330
Total	**701**	**$22,080**	**$19,293**	**$22,653**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B2.2: Direct Economic Contributions, Logging Sector Details (2017, in Nominal 2017 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Commercial logging	1,919	$135,237	$312,182	$354,327
Total	**1,919**	**$135,237**	**$312,182**	**$354,327**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.3: Direct Economic Contributions, Primary Solid Wood Products Sector Details (2017, in Nominal 2017 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Electric power generation - Biomass	0	$0	$0	$0
Sawmills	2,287	$96,466	$109,641	$613,454
Wood preservation	167	$10,271	$19,114	$98,614
Veneer and plywood manufacturing	172	$11,687	$13,159	$49,091
Reconstituted wood product manufacturing	210	$19,157	$29,370	$117,762
Total	**2,836**	**$137,581**	**$171,284**	**$878,921**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.4: Direct Economic Contributions, Secondary Solid Wood Products Sector Details (2017, in Nominal 2017 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Engineered wood member and truss manufacturing	491	$31,559	$33,486	$112,432
Wood windows and door manufacturing	100	$5,331	$6,530	$22,325
Cut stock, resawing lumber, and planing	96	$4,015	$5,722	$21,303
Other millwork, including flooring	1,213	$58,380	$76,655	$246,286
Wood container and pallet manufacturing	315	$10,387	$12,060	$44,127
Manufactured home (mobile home) manufacturing	0	$0	$0	$0
Prefabricated wood building manufacturing	39	$1,337	$1,456	$5,850
All other miscellaneous wood product manufacturing	358	$13,587	$16,929	$60,338
Total	**2,612**	**$124,596**	**$152,838**	**$512,661**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.5: Direct Economic Contributions, Wood Furniture Sector Details (2017, in Nominal 2017 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Wood kitchen cabinet and countertop manufacturing	1,169	$52,700	$40,176	$145,795
Upholstered household furniture manufacturing	0	$0	$0	$0
Non-upholstered wood household furniture manufacturing	239	$9,080	$4,816	$22,983
Institutional furniture manufacturing	48	$2,470	$1,756	$7,861
Wood office furniture manufacturing	0	$0	$0	$0
Custom architectural woodwork and millwork	65	$3,623	$2,698	$8,861
Showcase, partition, shelving, and locker manufacturing	6	$105	$76	$834
Total	**1,527**	**$67,978**	**$49,522**	**$186,334**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.6: Direct Economic Contributions, Pulp, Paper, and Paperboard Mills Sector Details (2017, in Nominal 2017 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Pulp mills	148	$10,584	$13,161	$89,237
Paper mills	0	$0	$0	$0
Paperboard mills	84	$5,911	$8,281	$61,511
Total	**232**	**$16,495**	**$21,442**	**$150,748**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B2.7: Direct Economic Contributions, Secondary Paperboard and Other Paper Products Sector Details (2017, in Nominal 2017 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Paperboard container manufacturing	71	$4,374	$5,361	$31,174
Paper bag and coated and treated paper manufacturing	105	$6,319	$8,072	$42,713
Stationery product manufacturing	105	$5,569	$7,035	$35,440
Sanitary paper product manufacturing	0	$0	$0	$0
All other converted paper product manufacturing	0	$0	$0	$0
Total	**281**	**$16,262**	**$20,468**	**$109,327**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2017 dollars value.

B3: Direct Economic Contribution by IMPLAN Sector, 2017 (2023 USD)

B3.1: Direct Economic Contributions, Forestry Sector Details (2017, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
All other crop farming	26	$3,003	$2,887	$3,814
Forestry, forest products, and timber tract production	633	$23,995	$20,603	$24,164
Support activities for agriculture and forestry	42	$0	$100	$414
Total	**701**	**$26,998**	**$23,590**	**$28,391**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.2: Direct Economic Contributions, Logging Sector Details (2017, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Commercial logging	1,919	$165,358	$381,714	$444,085
Total	**1,919**	**$165,358**	**$381,714**	**$444,085**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.3: Direct Economic Contributions, Primary Solid Wood Products Sector Details (2017, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Electric power generation - Biomass	491	$38,588	$40,944	$140,913
Sawmills	100	$6,518	$7,984	$27,980
Wood preservation	96	$4,909	$6,996	$26,699
Veneer and plywood manufacturing	1,213	$71,383	$93,728	$308,675
Reconstituted wood product manufacturing	315	$12,700	$14,746	$55,305
Total	0	$0	$0	$0

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.4: Direct Economic Contributions, Secondary Solid Wood Products Sector Details (2017, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Engineered wood member and truss manufacturing	1,169	$64,438	$49,124	$182,728
Wood windows and door manufacturing	0	$0	$0	$0
Cut stock, resawing lumber, and planing	239	$11,102	$5,889	$28,805
Other millwork, including flooring	48	$3,020	$2,147	$9,852
Wood container and pallet manufacturing	0	$0	$0	$0
Manufactured home (mobile home) manufacturing	65	$4,430	$3,299	$11,106
Prefabricated wood building manufacturing	6	$128	$93	$1,045
All other miscellaneous wood product manufacturing	**1,527**	**$83,119**	**$60,552**	**$233,536**
Total	1,169	$64,438	$49,124	$182,728

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.5: Direct Economic Contributions, Wood Furniture Sector Details (2017, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Wood kitchen cabinet and countertop manufacturing	148	$12,941	$16,092	$111,843
Upholstered household furniture manufacturing	0	$0	$0	$0
Non-upholstered wood household furniture manufacturing	84	$7,228	$10,125	$77,093
Institutional furniture manufacturing	**232**	**$20,169**	**$26,218**	**$188,935**
Wood office furniture manufacturing	148	$12,941	$16,092	$111,843
Custom architectural woodwork and millwork	0	$0	$0	$0
Showcase, partition, shelving, and locker manufacturing	84	$7,228	$10,125	$77,093
Total	**232**	**$20,169**	**$26,218**	**$188,935**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.6: Direct Economic Contributions, Pulp, Paper, and Paperboard Mills Sector Details (2017, in 2023 USD). †

Industries	Employment	Labor Income	Value-Added	Output
Pulp mills	148	$12,941	$16,092	$111,843
Paper mills	0	$0	$0	$0
Paperboard mills	84	$7,228	$10,125	$77,093
Total	**232**	**$20,169**	**$26,218**	**$188,935**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.

B3.7: Direct Economic Contributions, Secondary Paperboard and Other Paper Products Sector Details (2017, in real 2023 Dollars). †

Industries	Employment	Labor Income	Value-Added	Output
Paperboard container manufacturing	71	$5,348	$6,555	$39,071
Paper bag and coated and treated paper manufacturing	105	$7,726	$9,870	$53,533
Stationery product manufacturing	105	$6,809	$8,602	$44,418
Sanitary paper product manufacturing	0	$0	$0	$0
All other converted paper product manufacturing	0	$0	$0	$0
Total	**281**	**$19,884**	**$25,027**	**$137,022**

† All monetary values (Labor Income, Value-Added, and Output) are in thousands of U.S. dollars, adjusted to 2023 dollars value.