Forest Products Industries' Economic Contributions: Pennsylvania, 2023

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Foreword

Pennsylvania has one of the most magnificent expanses of forest in the eastern United States. In addition to inspiring our state's name, these forests give many communities their sense of history and identity. Despite waves of harvesting, development, and fragmentation, the commonwealth still holds relatively steady, with nearly 60 percent of its land base covered by forest – a stunning 16.7 million acres. This forest base, in turn, supports a $39 billion forest products industry and many other jobs, directly or indirectly supported by the presence of the forest itself. Jobs and forests are inextricably linked; Pennsylvania's forests supply the raw materials used to sustain the forest products industry and other non-timber, recreation, and restoration jobs. To maintain a vibrant forest products industry and myriad other uses for forest materials, we must also conserve and care for the forest. The multibillion-dollar forest products industry of Pennsylvania employs more than 140,000 Pennsylvanians across the Commonwealth. The forest provides an array of valuable consumer products, including hardwood flooring, furniture, kitchen cabinets, railroad ties, high-quality papers, pallets and packing materials, landscaping mulch and firewood. These forest products are an important source of revenue and a material base for an industry that produces and generates critical jobs in Pennsylvania.

Our forests also provide a scenic backdrop to Pennsylvania's beautiful landscape. They provide places for citizens to escape from the hustle of modern life to recreate and enjoy the solitude of the natural world. Our forests offer diverse communities of plants and wildlife and provide protection for more than 25,000 miles of streams used for drinking water and recreation. They help clean our air and store carbon to mitigate the impacts of climate change. The fact that they provide all these benefits—while also contributing high-demand timber resources and economic returns to local, regional, and state economies of the eastern United States—makes them truly remarkable.

The Forest Products Industries' Economic Contributions: Pennsylvania report demonstrates and outlines how important the forest products industry is to Pennsylvania. This report summarizes the economic contribution of forest products industries in Pennsylvania, while also giving a glimpse into the last seven years and changes from pre-and post-COVID. This report provides an assessment of broad forest conditions and economic contributions of forest products industries in Pennsylvania. It is one of 20 coordinated and comparable state reports in the northeastern and midwestern U.S. providing an improved assessment of forests and the economies they support.

I hope you find this report useful and informative.

Seth Cassell 

Pennsylvania State Forester

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Executive Summary

Based on 2023 FIA estimates, Pennsylvania contains approximately 16.66 million acres of forest land, representing about 58.3 percent of its total land area. Of this forest base, 96.0 percent (16.00 million acres) is classified as timberland capable of producing commercial volumes of wood, while 4.0 percent consists of reserved or low-productivity forestland. Private ownership accounts for the majority of forest land at 68.7 percent (11.45 million acres), followed by state and local governments (27.4 percent; 4.57 million acres) and federal ownership (3.9 percent; 0.64 million acres). This report summarizes the economic contribution of forest products industries in Pennsylvania using IMPLAN 2023 data. This report also captures the pre-and post-COVID snapshots of forest products industries in Pennsylvania and shows the changes in last seven years.

Forest Product Industries

This report analyzes the economic contribution of Pennsylvania's forest products sector, which is composed of 32 individual economic sectors (while Pennsylvania has only 31 forest industries), 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 66,394 jobs and generated $27.55 billion in output, $8.67 billion in value added, and $5.46 billion in labor income. When indirect supply-chain linkages and induced household-spending effects are included, the sector's total economic footprint reached 141,021 jobs, $43.39 billion in output, $17.96 billion in value added, and $10.89 billion in labor income. The sector exerts a significant multiplier effect on the broader economy; for every direct job in the forest industry, 1.12 additional jobs are supported elsewhere in the state.

Leading Forest Products Industry Groups (direct contribution)

Among the seven aggregated groups, Secondary Solid Wood Products was the largest direct employer in 2023 (19,555 jobs), followed closely by Secondary Paperboard and Other Paper Products (19,034 jobs) and Wood Furniture (13,857 jobs). This employment structure highlights Pennsylvania's strength in downstream manufacturing rather than raw extraction. In terms of output, Secondary Paperboard and Other Paper Products produced the highest direct output at $12.22 billion, serving as the sector's financial anchor. Secondary Solid Wood Products generated $6.11 billion, while Primary Solid Wood Products contributed $3.49 billion, underscoring the value added through lumber processing and millwork. Wood Furniture ($3.03 billion) and Pulp, Paper, and Paperboard Mills ($2.17 billion) provided critical manufacturing contributions. Forestry, while the smallest contributor in dollar terms ($144.0 million), provided the essential biological inputs supporting the entire value chain.

Leading Individual Forest Products Sectors (direct contribution)

At the disaggregated level (31 sectors), Paperboard Container Manufacturing served as the top individual employer with 8,540 jobs. Financial dominance was similarly concentrated in this sector. Paperboard Container Manufacturing ranked first in Output ($5.22 billion), Value Added ($1.39 billion), and Labor Income ($789.0 million). Sanitary Paper Product Manufacturing emerged as a major driver, ranking second in Output ($4.05 billion) and Value Added ($1.35 billion) despite a smaller workforce. Wood Kitchen Cabinet and Countertop Manufacturing was a consistent top-tier performer, ranking second in employment (6,444 jobs). These rankings underscore a diverse economy: strong secondary manufacturing (Cabinets) supported by high-volume industrial processing (Paperboard and Sanitary Paper).

Pennsylvania's Forest Products Industries Compared to Other Pennsylvania Industries

The Forest Products sector remains a balanced pillar of Pennsylvania's natural resource economy. In 2023, it ranked second in employment and output when compared to Agriculture, Mining, and Commercial Fishing. The forest sector's direct output ($27.55 billion) was nearly three times larger than Agriculture ($9.25 billion) but trailed the massive Mining and Oil & Gas sector ($34.81 billion). In terms of employment, the 66,394 jobs supported by the forest industry accounted for 35.2 percent of the state's total natural resources workforce, surpassing Mining (41,372 jobs) but trailing Agriculture (80,276 jobs). Furthermore, within the statewide manufacturing landscape, Forest Products ranked as the fifth manufacturer by output ($26.86 billion) and the third largest employer, trailing only Food Manufacturing and Fabricated Metal Manufacturing.

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

From 2017 to 2023, the sector underwent a period of stabilization and resilience relative to other natural resource sectors. Direct employment decreased by 3.1 percent, while direct output declined by 2.0 percent in real terms. Despite the slight contraction in workforce size, the sector performed significantly better than Agriculture (which saw a 16.3% drop in jobs) and Mining (which saw a 13.5% drop in jobs). The total economic impact reflects this consolidation; while total jobs declined by 7.6 percent, the employment multiplier remained strong at 2.12, indicating that the industry's integration with the broader state economy remains strong and vital.

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 Pennsylvania's economy. They provide jobs, raw materials, and finished goods that generate additional economic activity throughout the state, region, and nation. Forests in Pennsylvania 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).

The Pennsylvania state forest system covers approximately 2.2 million acres, or about 12 percent of the Commonwealth's forested area, and state forest land occurs in 48 of Pennsylvania's 67 counties, with a large concentration in the north-central region. Within this system, about 1.2 million acres fall within management zones where active vegetation management and timber harvesting are used to support forest health, wildlife habitat, water quality, recreation, and a continuous supply of timber and other forest products.

In 2023, Pennsylvania state forest timber-sale activity scheduled approximately 39.3 million board feet and 28,004 Hundred Cubic Feet (HCF) of forest products for harvest, with 11,205 acres contracted for harvesting. These sales generated approximately $17.5 million in revenue to the Commonwealth, illustrating the continuing role of state-managed forests in supplying raw material to Pennsylvania's forest-products industries. The annual reports also show that the timber market experienced substantial volatility during the COVID and post-COVID period: production and pricing declined in 2020, increased sharply in 2021 with remodeling and housing demand, weakened again in 2022 with slowing economic conditions and fewer housing starts, and remained stagnant in 2023 with declines in major timber species.

A state report on FPI contributions on Pennsylvania 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 Pennsylvania 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

[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

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.

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 Pennsylvania, (ii) Economic Contributions of the Pennsylvania 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 Pennsylvania state

According to 2023 estimates from the USDA Forest Inventory and Analysis (FIA) program, Pennsylvania's total land area is about 28.60 million acres. Of this, approximately 16.66 million acres, or about 58.3 percent, meet the FIA definition of forest land, while the remaining 11.94 million acres (41.7 percent) are classified as non-forest area. 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 Pennsylvania's forest land base, timberland accounts for 15.99 million acres, or roughly 96.0 percent (Figure 1), and represents unreserved forest capable of producing at least 20 cubic feet of wood per acre per year. Reserved forestland comprises 622,655 acres (about 3.7 percent) and is withdrawn from timber utilization by legal or administrative designation. Other forestland totals 40,794 acres (about 0.2 percent), consisting of unreserved forests of low productivity, generally yielding less than 20 cubic feet per acre per year. In practical terms, approximately 16.0 million acres are

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.

available and biophysically suitable for commercial timber management, while about 663,000 acres are either reserved or too low in productivity to contribute materially to timber supply.

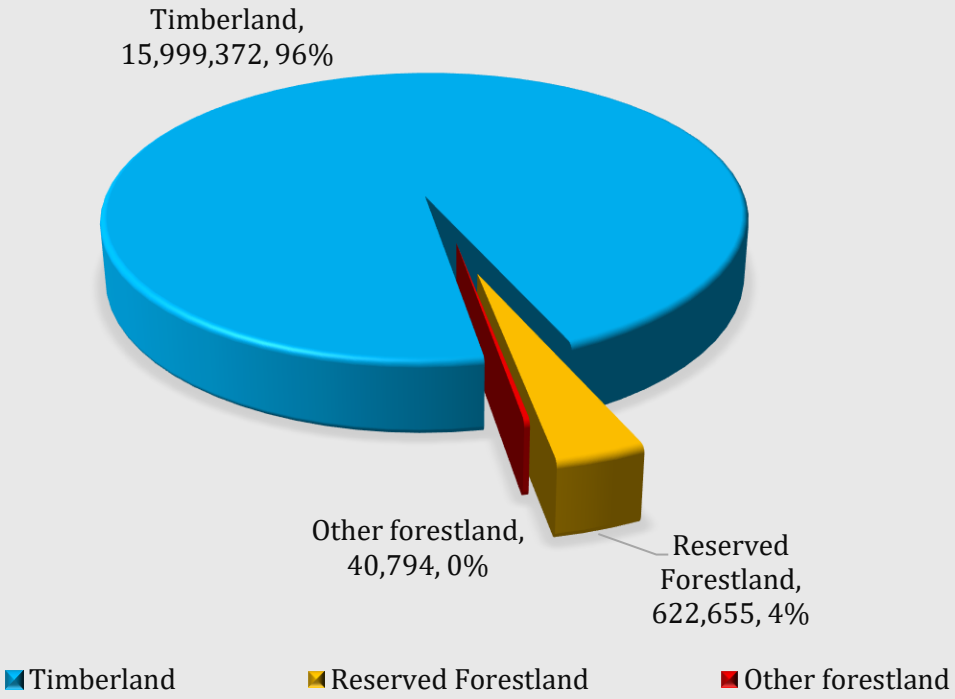

Figure 1: Pennsylvania Forest Land area in acres by Land use type, 2023 (US Forest Service).

Ownership of Pennsylvania's 16.66 million acres of forest land is distributed across federal, state, local, and private entities, with private landowners holding the dominant share. Private owners manage 11.45 million acres, accounting for about 68.7 percent of all forest land. State and local governments manage 4.57 million acres, or 27.4 percent, reflecting Pennsylvania's extensive state forest and state game land systems. Federal ownership totals 642,145 acres (3.9 percent), consisting of 514,843 acres of National Forest, primarily the Allegheny National Forest, and 127,302 acres managed by other federal agencies (Figure 2). This distribution highlights the importance of both private stewardship and state-managed public lands in sustaining Pennsylvania's forest resources.

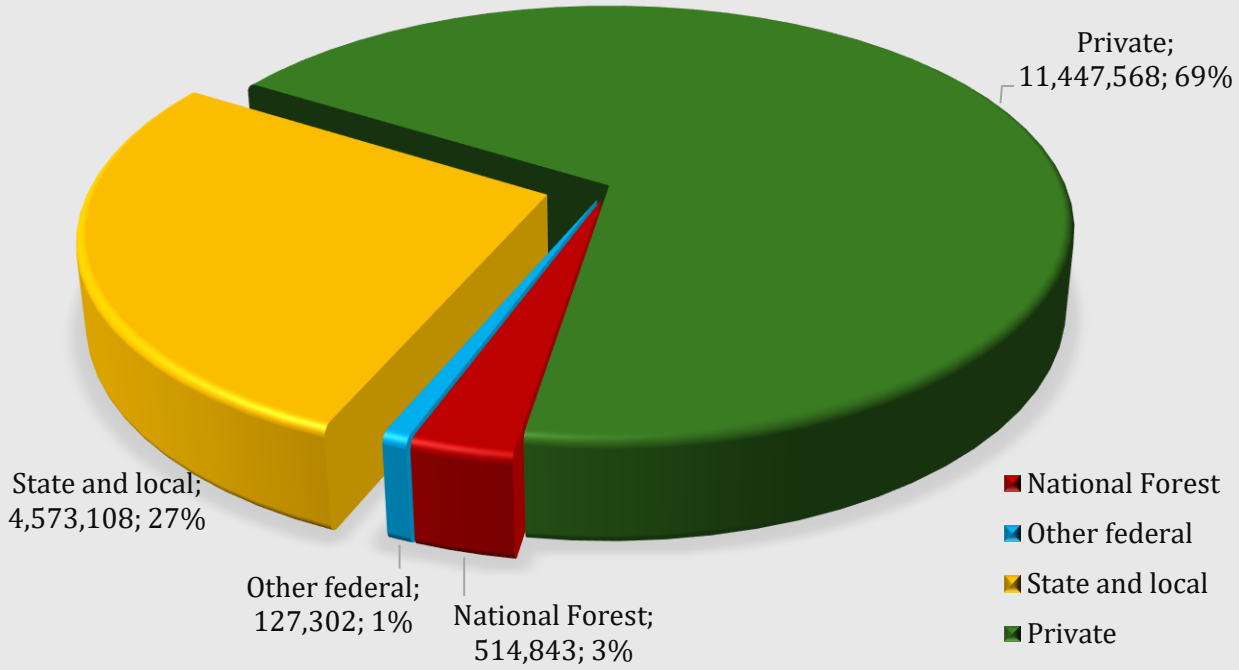

Figure 2: Pennsylvania Forest Land area in acres by Ownership group, 2023 (US Forest Service).

Pennsylvania's forest land is heavily hardwood-dominated. The oak/hickory forest-type group is the most extensive, covering 8.92 million acres, or 54 percent of all forest land (Figure 3). The maple/beech/birch group forms the second-largest category with 5.22 million acres (31 percent), reflecting the state's broad distribution of northern hardwoods across the Appalachian Plateau and Ridge-and-Valley regions. Together, these two groups account for 85 percent of the state's forest base. Additional hardwood types include other hardwoods (793,854 acres; 5 percent) and elm/ash/cottonwood (353,351 acres; 2 percent). Softwood and mixed-conifer types occupy a much smaller share: white/red/jack pine represents 453,880 acres, or 3 percent of forest land. The remaining 917,829 acres, or 6 percent, fall into several smaller mixed or less common forest-type groups. Overall, Pennsylvania's forests are dominated by mature hardwood systems, with softwoods and mixed types forming a limited but ecologically important portion of the landscape.

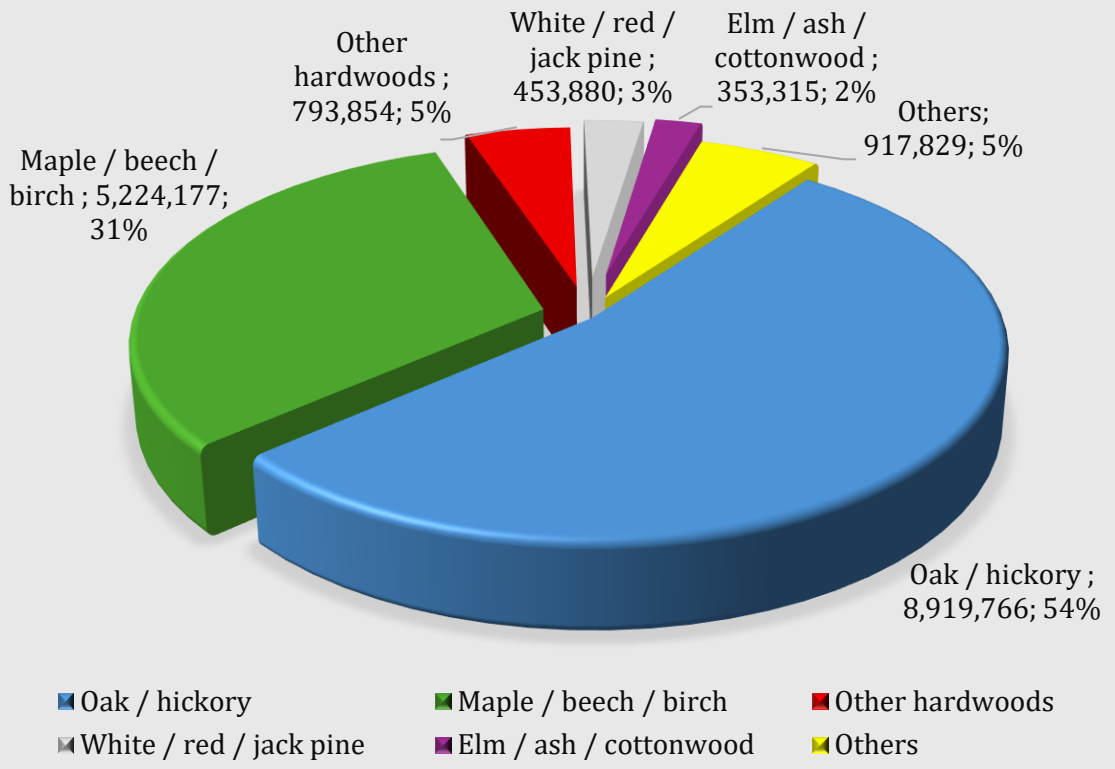

Figure 3*:* Pennsylvania Forest Land area in acres by Forest type group, 2023 (US Forest Service).

Pennsylvania contains one of the largest hardwood timber inventories in the eastern United States. The state's forests hold an estimated 39.59 billion cubic feet of net growing-stock volume (Table 1), of which 35.15 billion cubic feet (89 percent) is hardwood and 4.44 billion cubic feet (11 percent) is softwood. Private lands account for the majority of this resource, containing 26.38 billion cubic feet (67 percent), followed by state and local governments with 11.15 billion cubic feet (28 percent). National Forest lands hold 1.75 billion cubic feet (4 percent), and other federal lands contain less than 1 percent of the total.

Average annual net growth totals 546.8 million cubic feet per year, while average annual harvest removals total 269.1 million cubic feet and average annual mortality totals 396.6 million cubic feet per year. Net growth exceeds harvest removals by a ratio of about 2.0 to 1, indicating that removals remain 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 277.7 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 0.7 percent of standing volume, or about 3.4 million standard cords, while mortality represents about 1.0 percent of standing volume. Hardwoods account for most annual inventory flows, comprising 84.3 percent of net growth, 96.2 percent of harvest removals, and 91.2 percent of mortality. Harvest removals are concentrated on private lands,

which account for about 78.4 percent of total removals, followed by state and local ownerships at about 19.1 percent. Overall, these statewide indicators suggest that Pennsylvania's growing-stock inventory remains in a condition of positive net growth.

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

Description	Species group	National Forest	Other federal	State and local	Private	Not available	**Total**
Net volume	Hardwood	1,526,505	293,302	10,139,379	23,191,688	0	**35,150,873**
	Softwood	218,749	21,657	1,010,816	3,185,259	0	**4,436,481**
	Total	**1,745,254**	**314,959**	**11,150,195**	**26,376,947**	**0**	**39,587,354**
Average annual net growth	Hardwood	3,365	-1,265	81,219	375,844	1,793	**460,956**
	Softwood	2,259	-1,155	18,720	65,972	54	**85,851**
	Total	**5,625**	**-2,419**	**99,939**	**441,816**	**1,847**	**546,807**
Average annual harvest removals	Hardwood	5,714	880	50,981	201,217	0	**258,792**
	Softwood	34	0	493	9,766	0	**10,294**
	Total	**5,749**	**880**	**51,474**	**210,982**	**0**	**269,085**
Average annual mortality	Hardwood	18,936	5,877	113,627	223,384	0	**361,823**
	Softwood	859	1,619	8,145	24,132	0	**34,755**
	Total	**19,795**	**7,497**	**121,771**	**247,516**	**0**	**396,579**

† 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 represents 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 Pennsylvania 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)

Figure 4 illustrates the structural trends within Pennsylvania's Forest Products industries from 2017 through 2023. Over the seven-year period, the sector demonstrated relative stability despite a slight contraction. Total direct employment declined by 3.1% (a reduction of roughly 2,150 jobs), falling from 68,541 in 2017 to 66,394 in 2023. Real Industry Output followed a comparable trajectory, decreasing by 2.0% to $27.55 billion. However, the data reveals a notable divergence in the final year of the study; between 2022 and 2023, employment contracted while output rebounded by over $1 billion. This recent shift indicates a gain in labor productivity, suggesting that the sector has successfully maintained, and even increased, its value generation capabilities despite a tightening workforce.

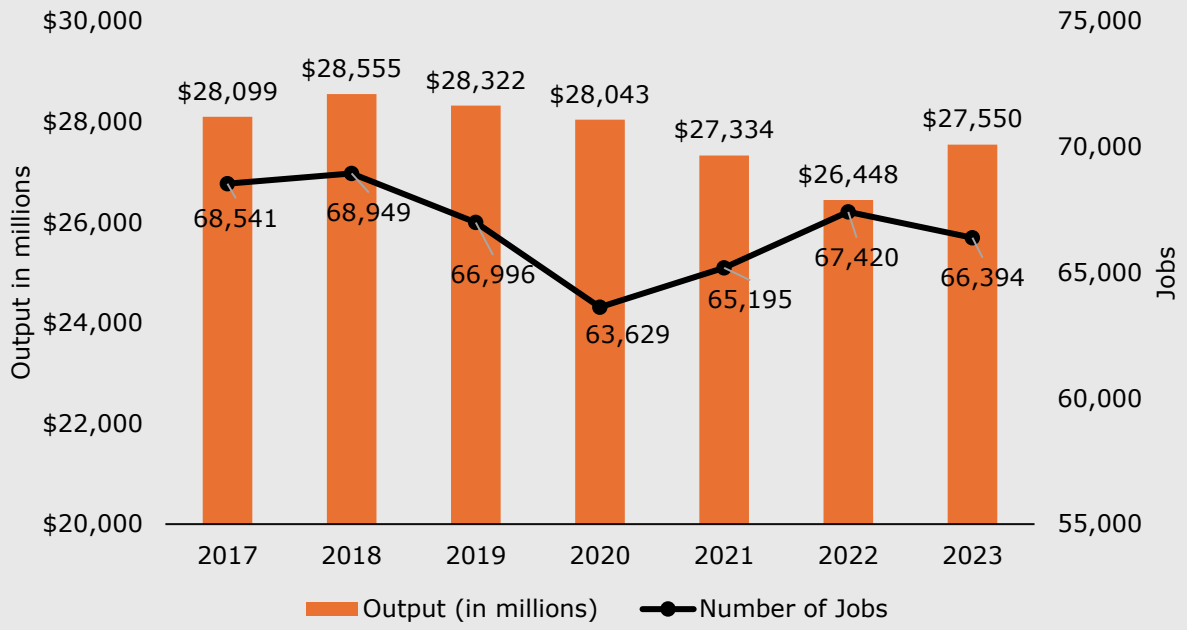

Figure 4: Direct output and employment, 2017–2023, Pennsylvania state forest products industries.

Figure 5 shows the trend in value added and labor income for Pennsylvania's forest products industries from 2017 through 2023. Real Value Added, representing the sector's contribution to Gross State Product, experienced a 5.2% decline, falling from $9.14 billion in 2017 to $8.67 billion in 2023. Notably, this contraction in value added was sharper than the drop in gross output (2.0%).

In terms of labor income (employee compensation and proprietor income), the trend remained tightly coupled with employment levels. Total real Labor Income decreased by 3.5% (to $5.46 billion), a trajectory nearly identical to the 3.1% reduction in the workforce observed over the same period. This structural alignment indicates that the sector has maintained a consistent wage standard rather than undergoing a drastic shift in capital intensity or labor composition. Consequently, the average real labor income per worker remained stable, adjusting slightly from roughly $82,600 in 2017 to $82,300 in 2023. This stability demonstrates that while the sector's overall footprint has tightened, it continues to sustain high-quality, high-wage employment opportunities without degrading worker compensation.

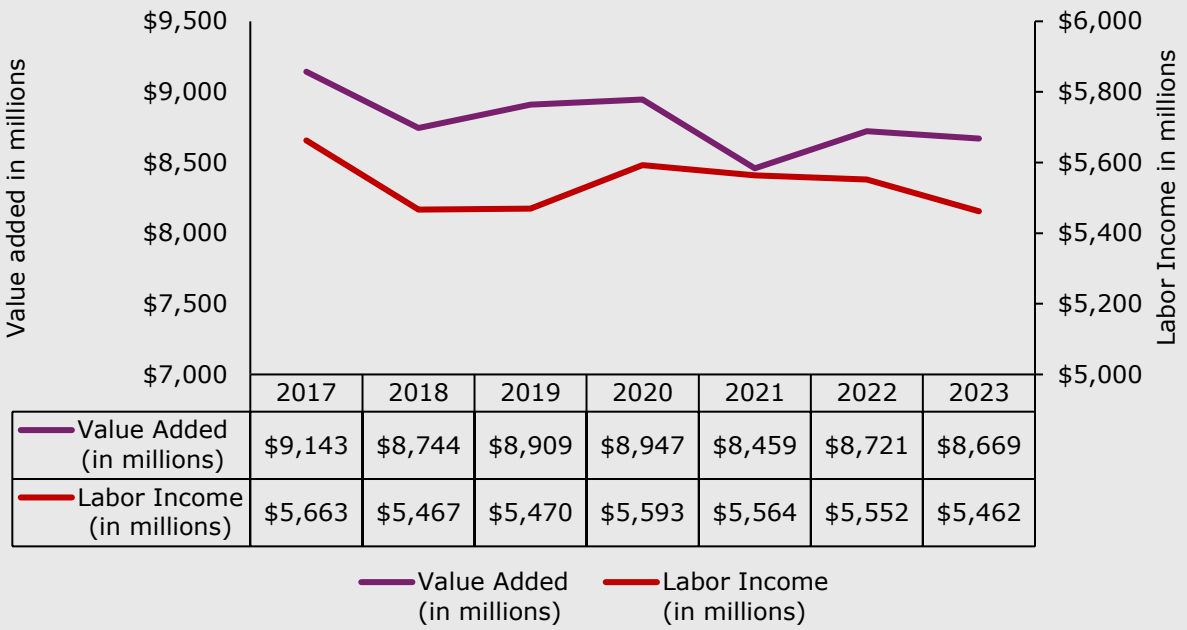

Figure 5: Direct value-added and labor income, 2017–2023, Pennsylvania state, forest products industries.

Direct and Total Contributions by Forest Product Industry Groups

In 2023, Pennsylvania's forest products industries directly employed 66,394 individuals, generated $27.55 billion in gross output, and contributed $8.67 billion in value-added to the state economy (Table 2). However, the sector's influence extends well beyond these direct operations. When accounting for indirect supply-chain purchases and induced household spending via the mixed-model approach, the sector's total economic contribution reached 141,021 jobs and $43.39 billion in total output.

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

	Employment	Labor Income	Value-added	Output
Direct in 2023	66,394	$5,462,102	$8,669,449	$27,550,099
Compared to 2017	-3.1%	-3.5%	-5.2%	-2.0%
Total in 2023	141,021	$10,892,607	$17,959,586	$43,390,677
Compared to 2017	-7.6%	-9.8%	-6.9%	-5.1%
Multipliers in 2023	2.12	1.99	2.07	1.57

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

Comparing these results with 2017 values reveals that the wider economic footprint is contracting at a steeper rate than the direct industry itself. While direct employment experienced a modest decline of 3.1% from 2017 to 2023, the total employment impact fell by 7.6%. This divergence suggests that efficiency gains or consolidations within the core forest sector have triggered an amplified contraction in the supporting industries. As the Forest sector tightens, its reduced demand for intermediate goods and local services has a magnified downward effect on the broader supply chain.

The calculated multipliers highlight the sector's deep integration into Pennsylvania's economy. The employment multiplier of 2.12 indicates that for every 100 direct job in the forest industry, roughly 112 additional jobs are supported elsewhere in the state economy. Furthermore, the Value-Added multiplier of 2.07 suggests that the sector generates slightly more economic wealth in the wider supply chain than it does directly, effectively doubling its contribution to the Gross State Product.

Table 3 reports the direct economic contributions of the seven industry groups, while Table 4 presents their total contributions including supply-chain effects. In 2023, the Secondary Solid Wood Products industry accounted for the largest share of direct employment, supporting 19,555 jobs, followed closely by Secondary Paperboard and other Paper Products (19,034 jobs) and Wood Furniture (13,857 jobs). However, in terms of financial impact, Secondary Paperboard and other Paper Products was the unequivocally dominant industry, generating the highest direct output ($12.22 billion) and value-added ($3.64 billion). This stark contrast highlights the significant value-generation capacity of finished paper manufacturing compared to the solid wood and furniture sectors. Conversely, Forestry was the smallest industry by output ($144 million) and value-added ($130.4 million). When supply-chain and induced effects are included, the rankings shift due to differential inter-industry linkages. Secondary Paperboard and other Paper Products emerged as the largest contributor to total employment, supporting 49,807 jobs statewide, overtaking the solid wood sectors. This sector also remained the largest economic driver in terms of total output ($19.01 billion) and total value-added ($7.56 billion).

Taken together, the manufacturing sectors drive the vast majority of Pennsylvania's forest economy. The combined paper manufacturing sectors (Pulp, Paper, and Paperboard mills plus Secondary Paperboard products) accounted for 52.2 percent of the sector's total direct output ($14.39 billion). Meanwhile, the solid wood value chain (Primary and Secondary Solid Wood Products) accounted for 38.9 percent of direct jobs (25,800 jobs). This distribution indicates that while the solid wood sectors are crucial for maintaining the state's employment base, the paper sectors provide the largest contribution to the state's gross industrial output.

Note: In Table 4, r*eaders 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 3: Direct Economic Contributions in Pennsylvania state, Industry Groups, 2023. †

Industries	Employment	Labor Income	Value-Added	Output
1.Forestry	2,161	$124,513	$130,381	$144,012
2.Logging	3,258	$351,976	$369,089	$382,433
3.Primary Solid Wood Products	6,245	$460,341	$761,978	$3,488,794
4.Secondary Solid Wood Products	19,555	$1,492,184	$1,880,714	$6,110,593
5.Wood Furniture	13,857	$1,008,209	$1,111,250	$3,029,043
6.Pulp, Paper, and Paperboard mills	2,283	$297,896	$780,375	$2,173,786
7.Secondary Paperboard and other Paper Products	19,034	$1,726,983	$3,635,662	$12,221,437

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

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

Industries	Employment	Labor Income	Value- Added	Output
1.Forestry	2,761	$163,007	$198,563	$253,547
2.Logging	5,074	$464,904	$565,130	$692,735
3.Primary Solid Wood Products	18,676	$1,444,486	$2,339,896	$6,061,795
4.Secondary Solid Wood Products	42,115	$3,116,861	$4,578,390	$11,051,096
5.Wood Furniture	25,124	$1,820,942	$2,490,801	$5,503,950
6.Pulp, Paper, and Paperboard mills	8,441	$772,714	$1,586,693	$3,611,615
7.Secondary Paperboard and other Paper Products	49,807	$4,011,016	$7,562,080	$19,010,375

† 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. The forestry group includes three industries: (1) timber tract operations, which involve managing forest lands primarily for the sale of standing timber; (2) maple syrup production (classified within "all other crop farming"); and (3) support activities for forestry. Firms providing support activities handle essential tasks such as estimating (cruising) timber, wildland firefighting, forest pest control, reforestation, and consulting on forestry economics and forest protection.

In 2023, the sector directly supported 2,161 jobs and generated $144.0 million in direct output. While Forestry is the smallest employer in the forest products value chain, it serves as the biological foundation for the entire industry. The sector exhibits a distinct economic profile characterized by minimal intermediate consumption but significant household-spending impacts. This disparity is driven by the sector's cost structure: a massive portion of Forestry's direct output flows directly into Labor Income ($124.5 million out of $144.0 million in output, or 86.5% of total output).

Notably, the Induced effects (driven by worker household spending) overwhelmingly outweigh the Indirect effects (driven by business-to-business supply chain purchases) in Pennsylvania:

- **Indirect Effect:** Only 17 jobs and $4.7 million in output. This reflects the nature of timber growing; it is land-intensive rather than supply-chain intensive, requiring fewer daily inputs from other industries compared to manufacturing sectors like sawmills or paper mills.
- **Induced Effect:** 583 jobs and $104.8 million in output. This suggests that the primary economic ripple of this sector comes from the income spent by its workforce in the local economy rather than the operational purchases of the businesses themselves.

When these effects are combined, the Forestry industry contributed a total of 2,761 jobs, $253.5 million in output, and $198.6 million in value-added to the Pennsylvania economy in 2023. The total output multiplier of 1.76 implies that every $100 of forestry products produced generates an additional $76 of economic activity throughout the state. Similarly, the employment multiplier of 1.28 indicates that for every 100 jobs in Forestry, 28 additional jobs are supported elsewhere in the state economy.

Table 5: Direct, Indirect, and Induced Economic Contributions of the Forestry Industry in Pennsylvania, 2023. [†]

	Employment	Labor Income	Value-Added	Output
Direct	2,161	$124,513	$130,381	$144,012

Indirect	17	$1,386	$2,436	$4,742
Induced	583	$37,108	$65,746	$104,793
Total	**2,761**	**$163,007**	**$198,563**	**$253,547**

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

Trend Analysis: Forestry (2017–2023)

As illustrated in Figure 6, the Forestry industry in Pennsylvania has exhibited a divergent trend between workforce expansion and financial output over the seven-year period. While the sector reached its peak economic contribution early in the cycle with $158.1 million in direct output in 2017, it subsequently entered a period of contraction, hitting a low of $118.2 million in 2021.

However, the industry has shown signs of recent stabilization and recovery. Between 2022 and 2023, direct output rebounded by 3.9% (rising from $138.6 million to $144.0 million). This recovery was supported by strong labor market demand, with direct employment growing by 5.4% (an addition of 111 jobs), reaching a period high of 2,161 jobs in 2023. Notably, while employment levels in 2023 have substantially surpassed the 2017 baseline (increasing by 15.9% overall), the total output remains 8.9% below the 2017 peak which indicates a decrease in the per-worker value of production during this recovery phase.

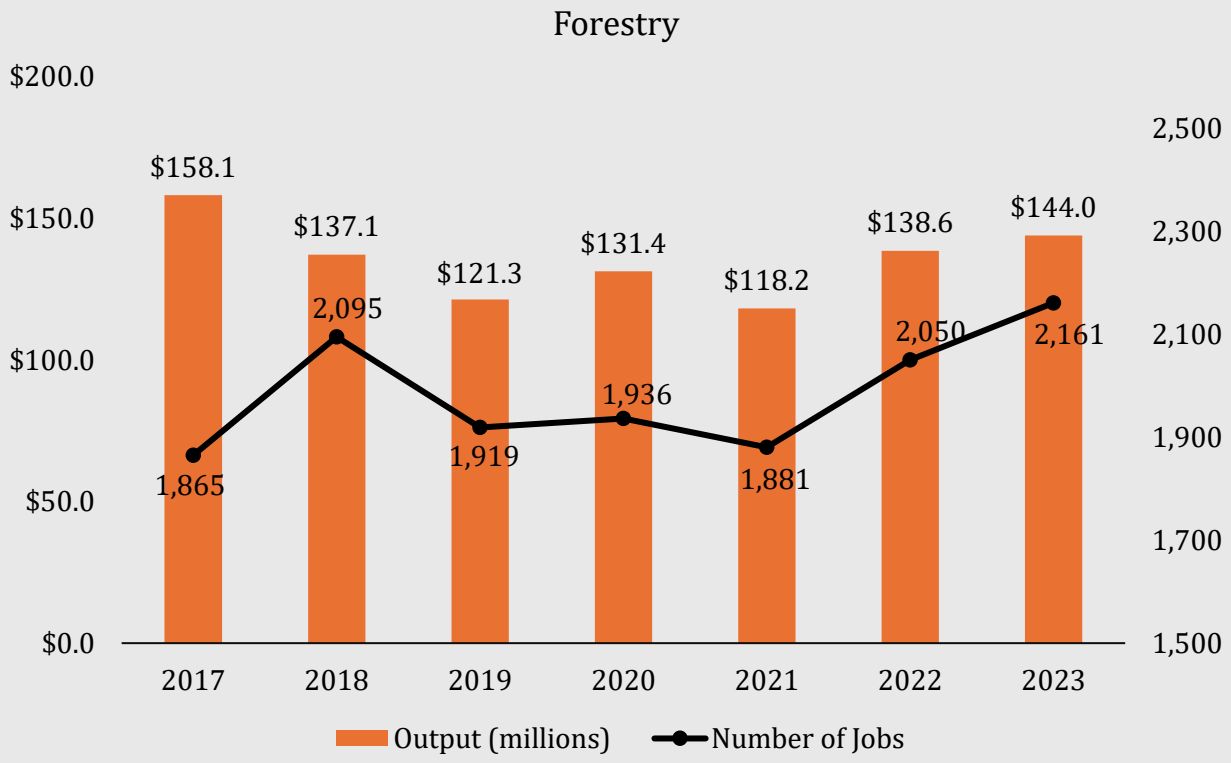

Figure 6: Trend in direct employment and output for the Forestry industry in Pennsylvania, 2017–2023.

Logging

Economic Contribution of Logging

The commercial logging sector consists of establishments primarily engaged in cutting timber, transporting logs, and producing chips in the field. Table 6 outlines the economic contributions of the Logging sector. In 2023, the sector directly supported 3,258 jobs in Pennsylvania. The sector generated $382.4 million in direct industry output and $369.1 million in Value-Added.

Multipliers for Logging reveal an industry that is highly labor-intensive with significant downstream impacts on local communities. The sector demonstrates a powerful link between industry activity and household spending. The Induced effects generated $300.7 million in output, which is over 30 times larger than the Indirect effects ($9.6 million). This disparity is driven by the sector's cost structure: a massive portion of Logging's direct output flows directly into Labor Income ($352.0 million out of $382.4 million in output, or 92.0% of total output). Because a high percentage of revenue is paid out as wages income to workers who live locally or as a proprietor, the re-spending of those income creates a substantial "induced" ripple throughout the state economy. Similar to the Forestry sector, Logging has a relatively small supply chain footprint ($9.6 million in indirect output). This reflects the nature of the business, where major inputs are primarily fuel, equipment, and stumpage, rather than processed intermediate goods.

When these effects are combined, the Logging industry contributed a total of 5,074 jobs, $692.7 million in output, and $565.1 million in value-added to the Pennsylvania economy in 2023. The total output multiplier of 1.81 implies that every $100 of logging output generates an additional $81 of economic activity throughout the state.

Table 6: Direct, Indirect, and Induced Economic Contributions of the Forestry Industry in Pennsylvania, 2023. †

	Employment	Labor Income	Value-Added	Output
Direct	3,258	$351,976	$369,089	$382,433
Indirect	142	$6,381	$7,376	$9,590
Induced	1,674	$106,547	$188,665	$300,713
Total	**5,074**	**$464,904**	**$565,130**	**$692,735**

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

Trend Analysis: Logging (2017–2023). As detailed in Figure 7, the Logging industry has experienced severe structural contraction, characterized by extreme volatility in output and a steady, linear erosion of the workforce. The sector's trajectory highlights the challenges of

operating in a market with shrinking outlets for wood fiber, particularly regarding low-grade timber.

The workforce has declined consecutively every year during the study period. Direct employment fell by 31.3% overall, dropping from a peak of 4,740 jobs in 2017 to a period low of 3,258 jobs in 2023. Financially, the sector suffered a massive correction early in the cycle, with output plummeting by 49.1% between 2017 and 2018 (falling from $874.3 million to $445.0 million).

Most notably, after a brief period of stabilization, the sector faced a renewed downturn in 2023. Direct output dropped by 17.7% year-over-year, falling from $464.9 million in 2022 to $382.4 million in 2023. Consequently, output per worker has crashed substantially, falling from approximately $184,000 in 2017 to $117,000 in 2023, which implies the difficulty of maintaining profitability as demand for fiber contracts.

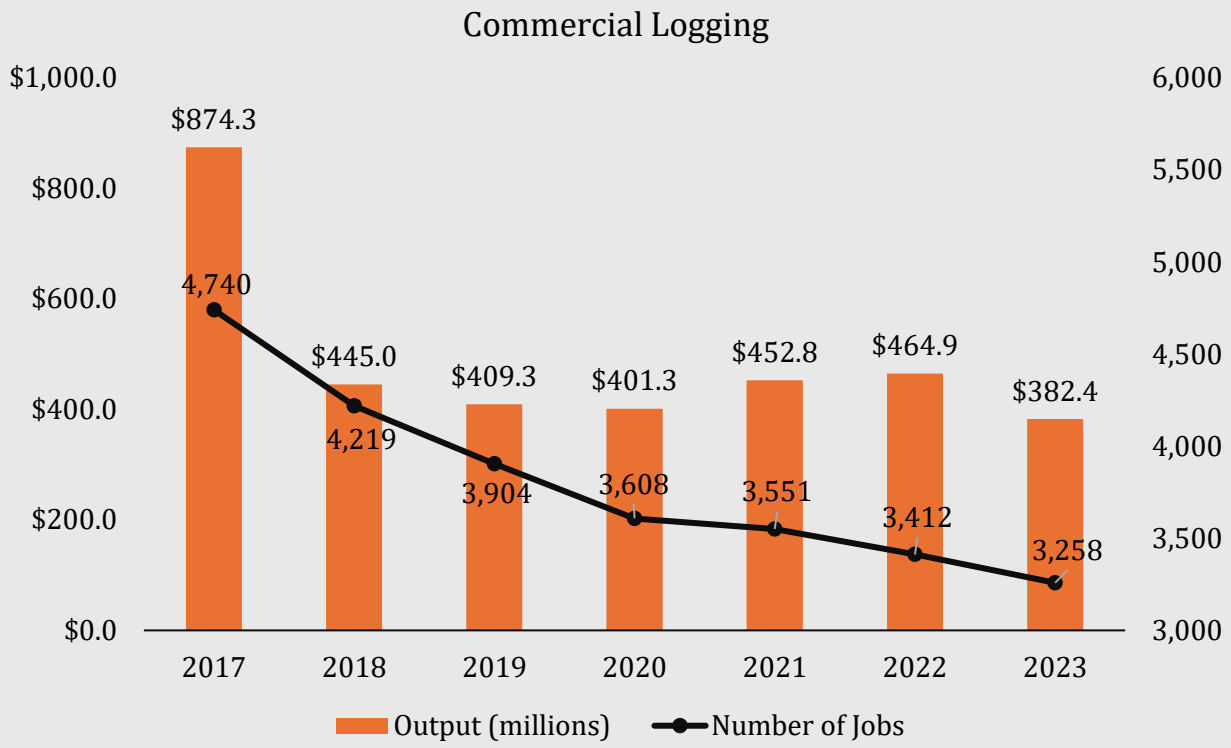

Figure 7: Trend in direct employment and output for the Logging industry in Pennsylvania, 2017–2023.

Primary Solid Wood Products

Economic Contribution of Primary Solid Wood Products

Table 7 outlines the economic contributions of the Primary Solid Wood Products industry, which includes electric power generation from biomass, sawmills, wood preservation, veneer and plywood manufacturing, and reconstituted wood product industries. In 2023, this manufacturing sector directly employed 6,245 workers and generated $3.49 billion in direct output. Notably, this sector generates substantial value through processing compared to Forestry and Logging, contributing nearly $762 million in direct Value-Added to the state economy.

The Primary Solid Wood Products industry exhibits the strongest backward linkages in the entire forest economy, characterized by an exceptionally high employment multiplier. Unlike the Logging sector, where induced effects (household spending) were dominant, this sector is driven by heavy supply chain integration. The Indirect Employment effect supports 7,344 jobs, a figure that actually exceeds the sector's own direct workforce. This unique structure illustrates that for every job inside this sector, more than one job is supported in the supply chain (primarily in logging, trucking, and maintenance sectors). The overall Employment Multiplier is 2.99, which means that every 100 direct jobs in primary wood manufacturing supports an additional 199 jobs elsewhere in the Pennsylvania economy. This is significantly higher than the multipliers for Forestry (1.28) or Logging (1.56), underscoring this sector's role as a "keystone" industry that anchors the wider forest supply chain.

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

	Employment	Labor Income	Value-Added	Output
Direct	6,245	$460,341	$761,978	$3,488,794
Indirect	7,344	$660,246	$1,003,481	$1,657,549
Induced	5,088	$323,898	$574,437	$915,452
Total	**18,676**	**$1,444,486**	**$2,339,896**	**$6,061,795**

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

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

As illustrated in Figure 8, the Primary Solid Wood Products industry has demonstrated remarkable resilience and financial growth, effectively maintaining strong economic output despite the workforce contraction seen elsewhere in the sector. While direct employment has experienced a gradual consolidation, declining by 8.3% over the seven-year period, real industry

output has surged to a period high, indicating a significant shift toward higher productivity and automation.

Most notably, the sector experienced a robust expansion in value in the most recent year, contrasting sharply with the upstream logging contraction. Between 2022 and 2023, direct output rose by 11.1%, climbing from $3.14 billion to $3.49 billion. This growth trajectory suggests that sawmills and wood processors have successfully capitalized on market conditions to maximize yield value. Conversely, the workforce contracted by 3.4% (a loss of 217 jobs) in the same period, settling at 6,245 jobs. This divergence highlights a dramatic rise in efficiency: output per worker has grown from approximately $396,000 in 2017 to over $558,000 in 2023, which shows a period of high-capacity utilization and increased value generation per board foot processed.

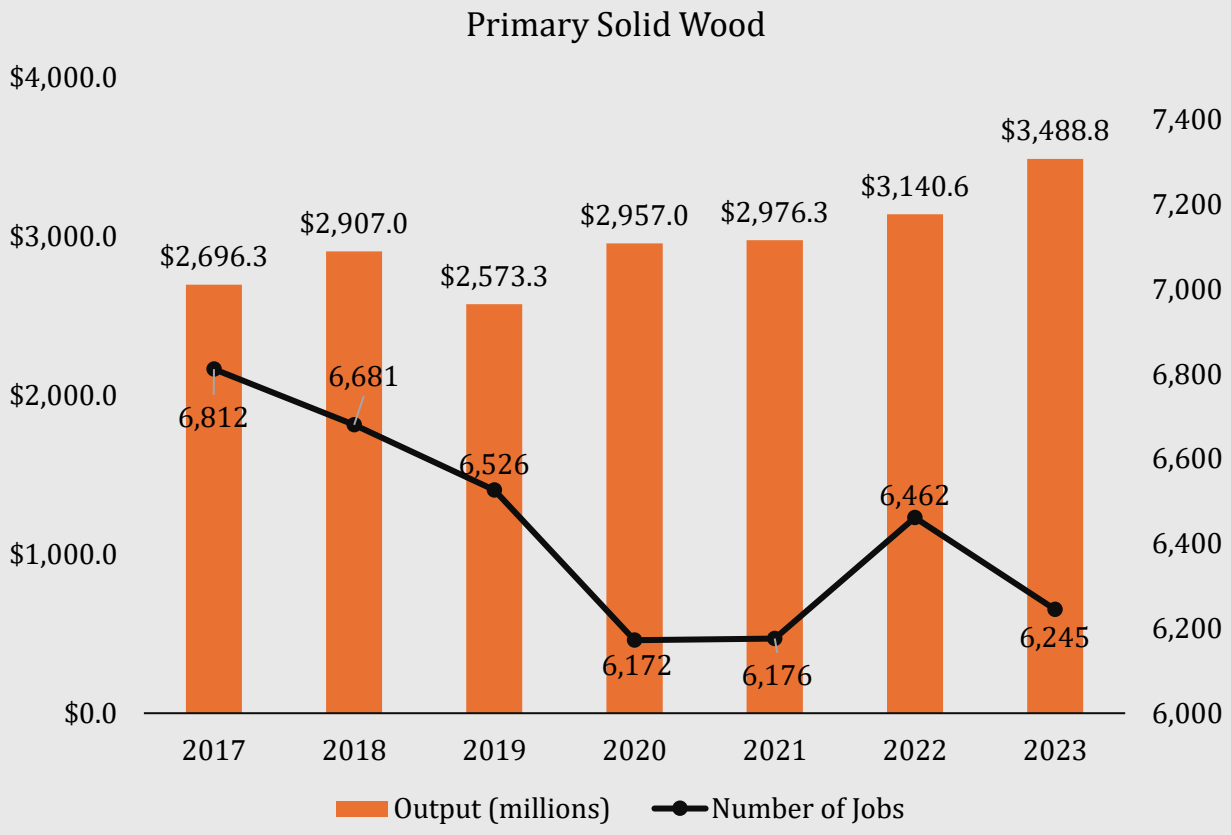

Figure 8: Trend in direct employment and output for the Primary Solid Wood Products industry in Pennsylvania, 2017–2023.

Secondary Solid Wood Products

Economic Contribution of Secondary Solid Wood Products

Table 8 details the economic contribution of the Secondary Solid Wood Products industry, a diverse value-added sector that encompasses industries such as engineered wood member and truss manufacturing; wood windows and doors manufacturing; cut stock, resawing lumber, and planing; other millwork, including flooring; wood container and pallet manufacturing; manufactured home production; prefabricated wood building manufacturing; and other miscellaneous wood product manufacturing. In 2023, this sector directly employed 19,555 workers and generated $6.11 billion in direct output.

The sector exhibits a robust employment multiplier of 2.15, indicating that for every 100 jobs created in secondary manufacturing, approximately 115 additional jobs are supported elsewhere in the Pennsylvania economy. While strong, this multiplier is notably lower than that of the Primary Solid Wood sector (2.99). 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. Consequently, the Indirect Employment effect (11,632 jobs), while substantial, is less proportional to the direct workforce than the indirect linkages seen in the primary stage.

When fully aggregated, the sector supports a total of 42,115 jobs and contributes $11.05 billion in total economic output. Financially, the sector is a highly effective value generator, contributing a total of $4.58 billion (multiplier of 2.43) in Value-Added to the Gross State Product. This reflects the significant economic lift achieved by transforming rough lumber into high-value finished construction components and consumer goods.

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

	Employment	Labor Income	Value-Added	Output
Direct	19,555	$1,492,184	$1,880,714	$6,110,593
Indirect	11,632	$928,901	$1,463,104	$2,973,435
Induced	10,928	$695,777	$1,234,572	$1,967,068
Total	**42,115**	**$3,116,861**	**$4,578,390**	**$11,051,096**

† 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)

As illustrated in Figure 9, the Secondary Solid Wood Products industry has demonstrated a robust and sustained expansion, effectively weathering market volatility to achieve record

economic performance. Unlike the extraction-based sectors that have faced structural contractions, this value-added manufacturing sector has secured substantial long-term growth in both workforce and financial output.

Over the seven-year period, real output expanded by 34.9%, rising steadily from $4.53 billion in 2017 to a peak of $6.11 billion in 2023. This trajectory highlights the sector's strength in capitalizing on high demand for finished wood products, such as cabinetry, flooring, and millwork, particularly during the post-pandemic construction boom.

Most notably, the sector's financial productivity surged in the most recent year. Between 2022 and 2023, direct output increased by 10.0% (jumping from $5.55 billion to $6.11 billion), marking the highest revenue point in the study period. However, this value creation coincided with a labor market correction; direct employment declined by 4.0% (a loss of 810 jobs), dropping from a peak of 20,365 in 2022 to 19,555 in 2023. Despite this recent dip, the workforce remains 4.9% larger than 2017 levels. The divergence in 2023, sharply rising output against a tightening workforce, suggests a structural shift toward greater automation and operational efficiency within Pennsylvania's secondary manufacturing facilities.

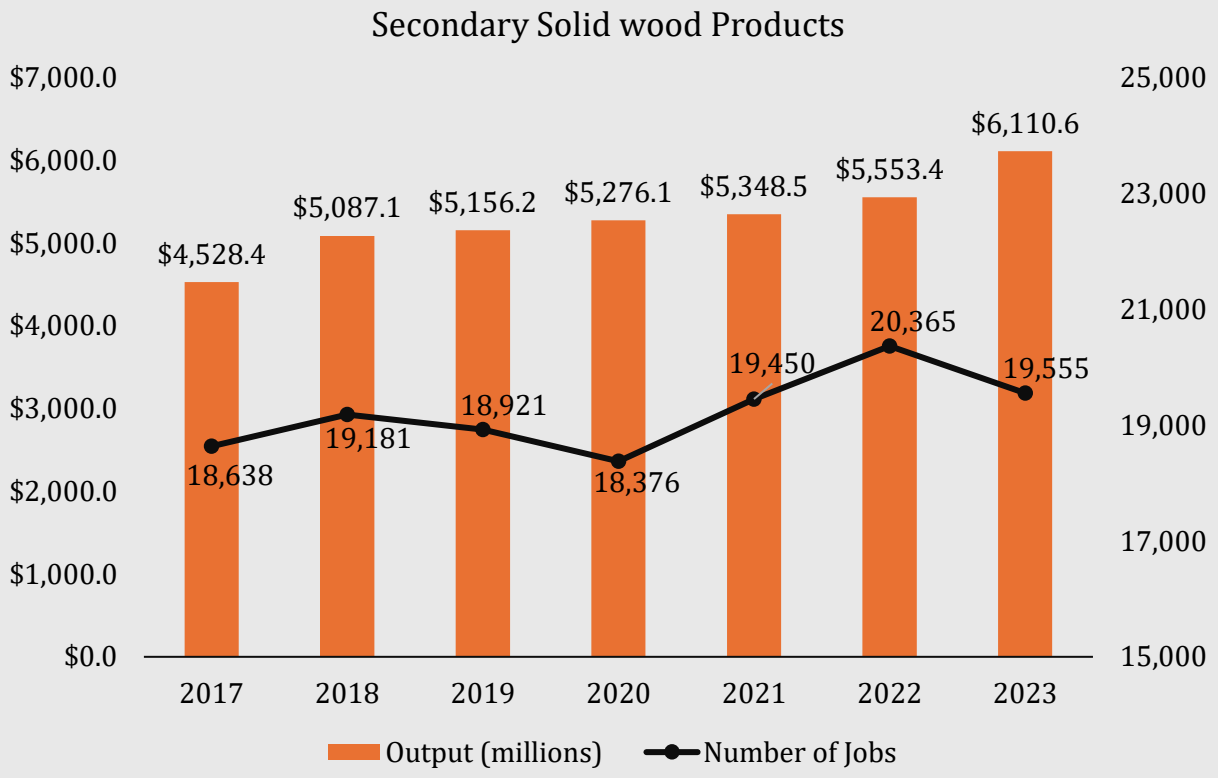

Figure 9: Trend in direct employment and output for the Secondary Solid Wood Products industry in Pennsylvania, 2017–2023.

Wood Furniture

Economic Contribution of the Wood Furniture Industry

The Wood Furniture group includes kitchen cabinet and countertop manufacturing; upholstered and non-upholstered household furniture; institutional and office furniture; custom architectural woodwork; and showcase and partition manufacturing. Table 9 details the economic contribution of the Wood Furniture Industry. As a consumer-facing sector, it plays a substantial role in Pennsylvania's forest economy, directly employing 13,857 workers and generating $3.03 billion in direct output in 2023.

The sector exhibits a distinct economic profile characterized by strong labor income effects. The implied Employment Multiplier is 1.81, indicating that for every 100 jobs in furniture manufacturing, 81 additional jobs are supported elsewhere in the state. A key structural feature of this industry is the prominence of Induced Effects in terms of employment. The sector's workforce spends a significant portion of its $1.01 billion in direct wages, salaries, benefits and as a proprietor income within the local economy, supporting 6,372 induced jobs, significantly more than the 4,894 jobs supported by the supply chain (Indirect effects). This suggests that the industry's most profound secondary impact is its ability to sustain local service sectors (such as healthcare, retail, and housing) through payroll spending. However, the Indirect effects remain the driver of transaction value; while the supply chain employs fewer workers than the induced sector, it generates higher gross output ($1.33 billion vs. $1.15 billion), reflecting the high value of material inputs like lumber, hardware, and textiles required for production.

Nevertheless, the sector remains a vital contributor, generating a total economic impact of $5.50 billion and supporting 25,124 total jobs statewide. Financially, it generates $2.49 billion in total Value-Added, showing its capacity to add significant economic value to raw materials through design and manufacturing.

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

	Employment	Labor Income	Value-Added	Output
Direct	13,857	$1,008,209	$1,111,250	$3,029,043
Indirect	4,894	$406,946	$659,466	$1,327,268
Induced	6,372	$405,787	$720,085	$1,147,638
Total	**25,124**	**$1,820,942**	**$2,490,801**	**$5,503,950**

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

Trend Analysis: Wood Furniture Industry (2017–2023)

As illustrated in Figure 10, the Wood Furniture industry in Pennsylvania has demonstrated significant resilience and stability, characterized by cyclical adjustments rather than the structural declines seen in primary manufacturing. The sector experienced a distinct expansion period that peaked in 2018 with $3.39 billion in output, followed by pandemic-related volatility in 2020. However, the industry has successfully recovered from these disruptions to maintain activity levels above its 2017 baseline.

By 2023, real output settled at $3.03 billion. This figure represents a 5.9% increase over 2017 levels ($2.86 billion), although it reflects a slight moderation from the recovery surge seen in 2021 and 2022. Employment trends have closely mirrored this output stability. The workforce stood at 13,857 jobs in 2023, effectively retaining the industry's employment base slightly above the 2017 starting point of 13,720. This long-term stability suggests that Pennsylvania's furniture manufacturers have successfully adapted to supply chain shifts and maintained a consistent market share despite broader economic headwinds.

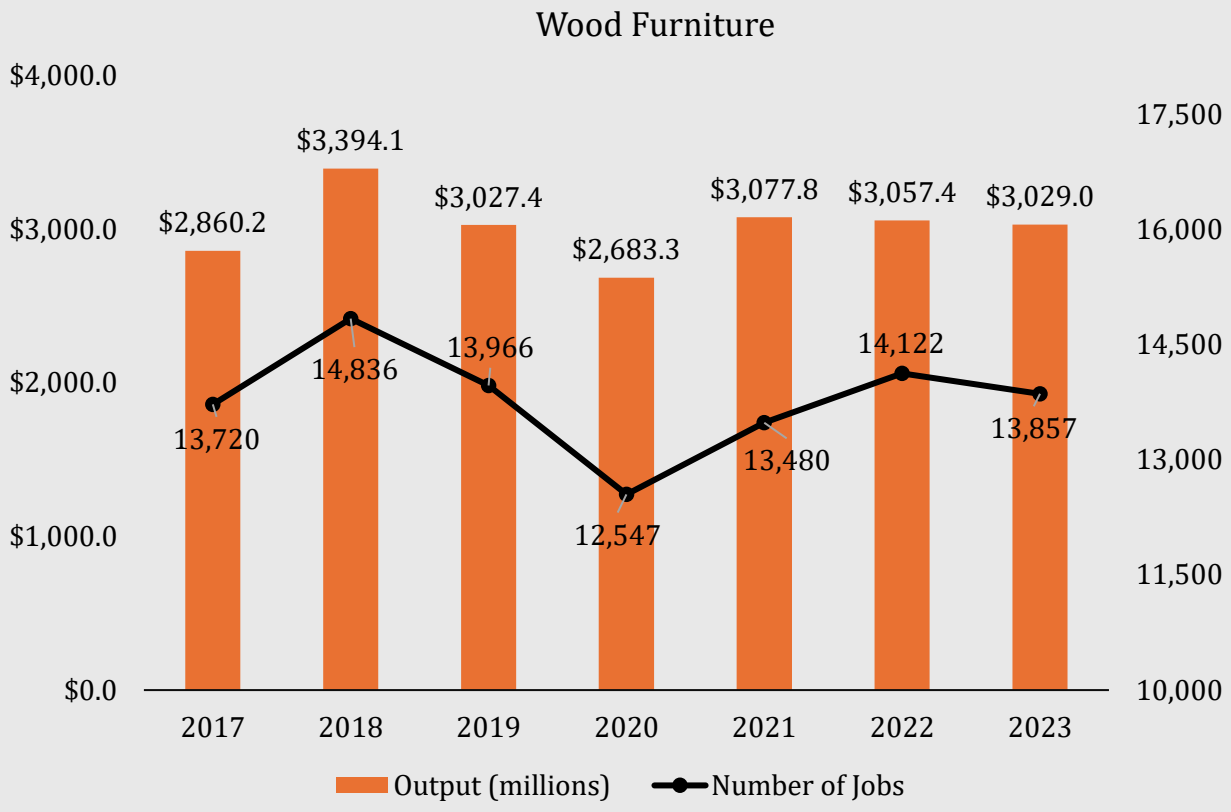

Figure 10: Trend in direct employment and output for the Wood Furniture industry in Pennsylvania, 2017–2023.

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, the state's most capital-intensive forest sector(Since Pennsylvania does not have any pulp mills, this group represents only paper and paperboard mills). In 2023, these facilities generated $2.17 billion in Direct Output and $780.4 million in Value-Added. Despite a smaller direct workforce of 2,283 employees compared to the solid wood sectors, the industry generates immense economic value per worker, reflecting high levels of automation and processing capacity.

The sector exhibits a powerful Employment Multiplier of 3.70, meaning that for every 100 jobs inside a Paper or Paperboard mill, nearly 270 additional jobs are supported elsewhere in Pennsylvania. A defining characteristic of this industry is that its Indirect Employment (3,454 jobs) significantly exceeds its Direct Employment (2,283 jobs). This "inverted" employment profile underscores the mill's role as an economic anchor; while the facility itself is lean on direct labor, its massive appetite for raw fiber, chemicals, energy, and logistics sustains a supply chain workforce larger than its own.

When fully aggregated, the sector supports a total of 8,441 jobs and generates $3.61 billion in total economic output. Furthermore, the quality of direct employment in this sector is exceptional; with total labor income of nearly $298 million distributed among 2,283 workers, the average annual compensation per direct job is approximately $130,500. This figure represents the highest average compensation in the entire forest economy, highlighting the sector's role in providing high-quality, technical employment.

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

	Employment	Labor Income	Value-Added	Output
Direct	2,283	$297,896	$780,375	$2,173,786
Indirect	3,454	$302,659	$500,785	$950,926
Induced	2,704	$172,159	$305,533	$486,902
Total	**8,441**	**$772,714**	**$1,586,693**	**$3,611,615**

† 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)

As illustrated in Figure 11, the Pulp, Paper, and Paperboard Mills sector in Pennsylvania has faced a structural contraction distinct from the cyclical volatility seen in other regions. Real economic output fell from a high of $3.41 billion in 2017 to $2.17 billion in 2023, a total decrease of 36.3%. Employment followed a similar downward trajectory, shedding over 900 jobs

since 2017 to reach 2,283 in 2023. Notably, the decline in output (36.3%) has outpaced the decline in employment (28.3%), suggesting a reduction in output productivity per worker or a shift in the state's manufacturing mix toward lower-margin paper products. However, the data indicates a clear turning point in 2023 following the sector's low in 2022. For the first time in the study period, the sector posted year-over-year growth in both metrics: output rebounded by 6.8% (up from $2.03 billion in 2022) and employment expanded by 3.7% (adding 82 jobs). This simultaneous recovery signals that the remaining mills may have successfully recalibrated operations to match current market demand.

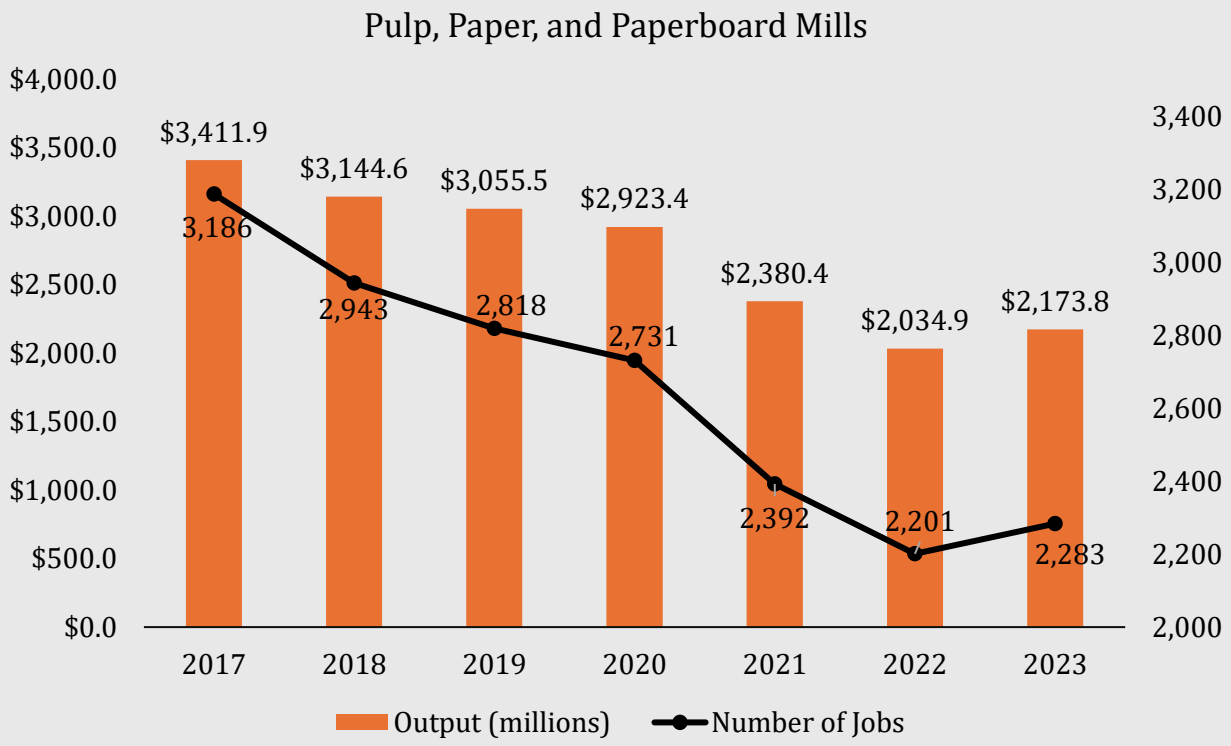

Figure 11: Trend in direct employment and output for the Pulp, Paper, and Paperboard Mills industry in Pennsylvania, 2017–2023.

Secondary Paperboard and Other Paper Products

Economic contribution: Secondary Paperboard and Other Paper Products Industry

Table 11 outlines the economic contribution of the Secondary Paperboard and Other Paper Products industry, which includes sanitary paper product manufacturing; paper bags, coated and treated paper manufacturing; stationery; paperboard container production; and other converted paper products. Facilities in this group primarily manufacture goods from purchased pulp, paperboard, or recycled materials. In 2023, this converting sector directly employed

19,034 workers, ranking as the second-largest employer in the forest sector, and generated a massive $12.22 billion in direct output, the highest of any individual forest industry group.

The sector demonstrates a robust capacity for job creation relative to its size, driven by strong backward linkages to the primary manufacturing base. The implied Employment Multiplier is 2.62, meaning that for every 100 jobs in a box plant or paper converter, roughly 162 additional jobs are supported throughout the state economy. Notably, the Indirect Employment (16,782 jobs) remains high relative to Direct Employment. This shows that these manufacturers source a substantial amount of their intermediate inputs, such as industrial paper rolls and paperboard, from within the region's primary mill network and other supply chain partners, thereby keeping supply chain spending localized.

In terms of total contribution, the sector supports a total of 49,807 jobs and contributes $19.01 billion in total economic output. Additionally, the sector is a highly efficient generator of wealth; with a direct Value-Added of $3.64 billion, it achieves a Value-Added-to-Output ratio of approximately 30%. This ratio is consistent with specialized manufacturing that adds significant value to raw commodities through conversion into consumer-ready goods.

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

	Employment	Labor Income	Value-Added	Output
Direct	19,034	$1,726,983	$3,635,662	$12,221,437
Indirect	16,782	$1,393,218	$2,317,957	$4,271,140
Induced	13,992	$890,815	$1,608,462	$2,517,799
Total	**49,807**	**$4,011,016**	**$7,562,080**	**$19,010,375**

† 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 Industry (2017–2023)

As illustrated in Figure 12, the Secondary Paperboard industry remains a dominant force in Pennsylvania's forest economy, though it has transitioned from a period of growth to one of stabilization. While the sector's output has contracted by 9.9% over the study period, falling from $13.57 billion in 2017 to $12.22 billion in 2023, it continues to generate significant economic activity, effectively anchoring the downstream supply chain. The trend reveals a divergence between workforce resilience and output value. While real output declined, direct employment has remained remarkably stable, decreasing only 2.8% over the seven-year period and actually expanding by nearly 800 jobs since the 2020 low. This 2021–2023 job recovery, occurring alongside flattened output, implies that the industry is becoming more labor-intensive or is shifting toward specialized, lower-volume packaging solutions required by the evolving

logistics economy. Further, this resilience in employment suggests that while the sector may not be expanding its financial footprint as aggressively as in prior years, it remains a critical and stable source of manufacturing jobs for the state.

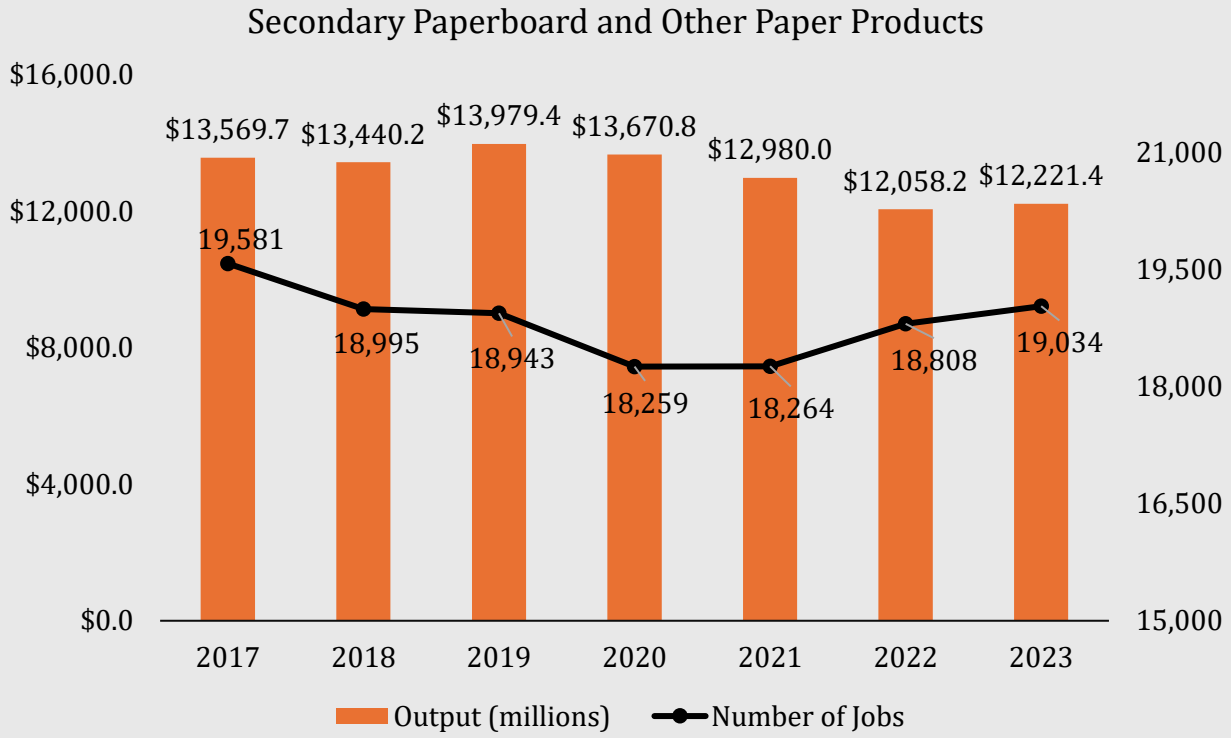

Figure 12: Trend in direct employment and output for the Secondary Paperboard and Other Paper Products industry in Pennsylvania, 2017–2023.

Top Forest Product Sectors

Pennsylvania's forest-products sector is represented by 31 IMPLAN industries , as the Pulp Mills sector does not appear in the state's 2023 industry mix. Pennsylvania's Forest sector is defined by strong secondary manufacturing and value-added processing. Paperboard Container Manufacturing serves as the sector's undisputed economic engine, securing the first rank across all four major indicators. It employs 8,540 workers and generates $789.0 million in labor income, highlighting its role as both a mass employer and a critical source of income. Wood Kitchen Cabinet and Countertop Manufacturing, the state's robust secondary solid wood manufacturing base, follows as the second-largest employer with 6,444 jobs.

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

Rank	Employment	Labor Income	Value added	Output
1	Paperboard container manufacturing (8,540)	Paperboard container manufacturing ($789,033)	Paperboard container manufacturing ($1,385,822)	Paperboard container manufacturing ($5,223,129)
2	Wood kitchen cabinet and countertop manufacturing (6,444)	Wood kitchen cabinet and countertop manufacturing ($432,234)	Sanitary paper product manufacturing ($1,345,476)	Sanitary paper product manufacturing ($4,047,898)
3	Sanitary paper product manufacturing (4,232)	Sanitary paper product manufacturing ($430,085)	Paper mills ($721,988)	Paper mills ($1,991,417)
4	Wood container and pallet manufacturing (4,175)	Commercial logging ($351,976)	Wood kitchen cabinet and countertop manufacturing ($495,394)	Sawmills ($1,893,751)
5	Sawmills (4,022)	Wood container and pallet	Paper bag and coated and treated paper	Paper bag and coated and treated paper

	manufacturing ($291,425)	manufacturing ($480,977)	manufacturing ($1,403,490)

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

In terms of economic output and value creation, the data reveals a high concentration of activity within the paper manufacturing sub-sectors. Paperboard Container Manufacturing produced $5.22 billion in gross output, further solidifying its status as the fiscal heavyweight of the Pennsylvania forest economy. Sanitary Paper Product Manufacturing emerged as a critical high-value sector, ranking second in both Output ($4.05 billion) and Value Added ($1.35 billion) despite ranking third in employment. This divergence suggests a high degree of capital intensity and automation within sanitary paper production compared to cabinetry sector.

A notable structural disconnect appears when analyzing the Paper Mills and Sawmills sectors. While Paper Mills does not rank among the top five employers, it is the third-largest contributor to Value Added ($722.0 million) and Output ($1.99 billion). This indicates an extremely high output-per-worker ratio characteristic of highly automated industrial processing. Conversely, Commercial Logging appears in the top five for Labor Income ($352.0 million) but does not rank in the top five for Employment or Output. This shows that while the direct headcount in logging may be lower than in manufacturing, the labor income generated per unit of production remains significant, likely due to the specialized and hazardous nature of the work or the structure of proprietorship income in the sector.

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

Excluding the forest-products industries themselves, Pennsylvania included 474 other IMPLAN sectors in 2023, representing the broader regional economy. Table 13 highlights the top ten non-forest industries most heavily impacted by Forest sector's economic activity. Together, these ten sectors account for 25,653 jobs, representing approximately 34.4 percent of all indirect and induced employment generated by the forest economy. The composition of these leading sectors reveals two primary mechanisms of economic impact:

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

Industries	Number of Jobs
Warehousing and storage	4,767
Truck transportation	3,335
Other real estate	2,898
Wholesale - Other durable goods merchant wholesalers	2,500
Hospitals	2,437
Couriers and messengers	2,300
Full-service restaurants	2,091
Employment services	1,921
Management of companies and enterprises	1,749
Limited-service restaurants	1,654
Total	**25,653**

- ***Logistics and Supply Chain Integration:*** The most significant structural linkages are observed in the warehousing and distribution of physical goods. Warehousing and Storage ranks as the single largest supporting sector, accounting for 4,767 jobs. This is followed closely by Truck Transportation (3,335 jobs), Wholesale - Other Durable Goods Merchant Wholesalers (2,500 jobs), and Couriers and Messengers (2,300 jobs). The dominance of these sectors underscores the forest industry's acute requirement for extensive logistics networks to manage the storage of inventory and the transport of high-volume raw materials and finished paper or lumber products to market.

- ***Induced Household and Service Demand:*** The prominence of service-oriented sectors illustrates the strong "induced" effects derived from the wages, salaries, and compensation paid to forest-sector employees. Other Real Estate ranks third overall with

2,898 jobs, which shows the demand for property and leasing services. Furthermore, the presence of Hospitals (2,437 jobs) and the combined impact of Full-service and Limited-service Restaurants (3,745 jobs total) demonstrates how the disposable income of the forest workforce sustains local employment in healthcare, dining, and essential community services.

In terms of economic output, the forest sector's influence shifts toward infrastructure and trade sectors. As detailed in Table 14, the top ten industries supported by forest-sector activity generated a combined $5.80 billion in 2023. The dominant category involves the movement and wholesale distribution of goods.

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

Industries	Output
Wholesale - Other durable goods merchant wholesalers	$899,336
Owner-occupied housing	$757,857
Truck transportation	$756,830
Other real estate	$553,856
Management of companies and enterprises	$512,297
Wholesale - Other nondurable goods merchant wholesalers	$507,976
Hospitals	$504,912
Electric power transmission and distribution	$480,990
Warehousing and storage	$474,047
Monetary authorities and depository credit intermediation	$353,951
Total	**$5,802,052**

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

The leading sector is Wholesale - Other Durable Goods Merchant Wholesalers, generating $899.3 million in output. When combined with Wholesale - Other Nondurable Goods Merchant Wholesalers ($508.0 million), the wholesale trade sector alone accounts for over $1.4 billion in economic activity supported by the forest industry. Truck Transportation generated $756.8 million, while Warehousing and Storage contributed $474.0 million, reflecting the critical role of freight and inventory management in the supply chain. Unlike the employment rankings, the output rankings highlight the sector's massive energy footprint. Electric Power Transmission and Distribution ranks eighth with $481.0 million, driven by the high electricity consumption of pulp and paper mills.

The presence of Owner-Occupied Housing as the second-largest sector ($757.9 million) is a significant indicator of the induced effect. In economic modeling, this sector represents the

imputed value of homeownership. Its high ranking confirms that forest sector jobs, particularly the high-wage manufacturing roles identified in previous tables, sustain high levels of homeownership and household wealth in Pennsylvania. Additionally, the sector supports $504.9 million in output for Hospitals and $553.9 million for Other Real Estate, further reflecting the essential spending power of the forest workforce within their local communities.

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 Pennsylvania's four primary natural resource sectors: Forest Products, Agriculture, Commercial Fishing/Hunting, and Mining (including Oil & Gas). The data shows that while the Mining sector generates the highest gross output, the Forest Products industry serves as a critical, balanced economic pillar that outperforms Agriculture in financial generation and Mining in employment.

With $27.55 billion in direct output, the forest sector generated 38.5 percent of the total output produced by this natural resources group. This figure is nearly three times larger than the Agricultural sector ($9.25 billion). In terms of workforce participation, the Forest Products sector provides a vital middle ground between agricultural and energy extraction. The sector supported 66,394 jobs in 2023, making it the second-largest employer among the natural resource industries. This workforce is approximately 60 percent larger than that of the Mining and Oil & Gas sector (41,372 jobs). Although Agriculture remains the largest employer with 80,276 jobs, the data suggests that Forest Products jobs are associated with significantly higher economic output per worker than agricultural roles.

The comparative trend analysis reveals that the Forest Products sector has acted as a stabilizing force relative to the volatility seen in other natural resource industries. Between 2017 and 2023, the forest sector experienced only modest adjustments, with employment declining by 3.1% and real output decreasing by just 2.0%. This stands in sharp contrast to the agriculture sector, which faced a structural contraction in its workforce (-16.3% jobs) and output (-10.7%), even as labor income strangely surged. Similarly, the Mining sector displayed significant volatility, with Value-Added plummeting by 30.0% and employment falling by 13.5%. The Commercial Fishing, Hunting, and Trapping sector faced the most severe decline, with employment dropping by 41.8% and Value-Added crashing by over 150%, rendering it a minor contributor to the aggregate total. Ultimately, the single-digit fluctuations in the forest economy reflect a resilience that the state's other extractive and agrarian sectors struggled to match over the study period.

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

Industry	Employment	Δ2017	Labor Income	Δ2017††	Value-Added	Δ2017††	Output	Δ2017††
1. Forest Products	66,394	-3.1%	$5,462,102	-3.5%	$8,669,449	-5.2%	$27,550,099	-2.0%
2. Commercial fishing, hunting & trapping	419	-41.8%	$1,591	-25.7%	$11,430	-151.8%	$15,559	28.0%
3. Mining, and oil & gas production	41,372	-13.5%	$5,514,664	39.6%	$20,714,411	-30.0%	$34,813,983	-3.2%
4. Agriculture production (plant crops and animals)	80,276	-16.3%	$3,233,437	80.2%	$4,333,006	2.4%	$9,247,700	-10.7%
Total	**188,461**	**-11.5%**	**$14,211,794**	**24.6%**	**$33,728,296**	**-21.4%**	**$71,627,341**	**-3.8%**

† 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 Pennsylvania'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 shows that the forest sector is a top-tier industrial anchor, ranking as the third-largest employer and a top-five generator of economic output. While Pennsylvania possesses a diverse manufacturing portfolio including massive chemical and metal industries, the forest sector remains a critical pillar of the "real economy," particularly in terms of workforce absorption.

The manufacturing employment landscape is defined by a "Big Three" dynamic involving Food Manufacturing, Fabricated Metal Manufacturing, and Forest Products Manufacturing. Food Manufacturing ranked first with 90,437 jobs, followed by Fabricated Metal (81,264 jobs) and Forest Products (60,850 jobs). Together, these three foundational sectors account for 40.1 percent of Pennsylvania's entire manufacturing workforce (232,551 out of 579,637 jobs). This concentration highlights that while sectors like Chemical Manufacturing may generate more gross output, the Forest Products industry serves as a primary driver of direct labor opportunities for the state's residents.

In terms of financial performance, the sector displays distinct efficiency characteristics when compared to its peers. Forest Products Manufacturing generated $26.86 billion in gross output and $8.08 billion in Value-Added, ranking fifth and fourth respectively among all manufacturing sectors. A deeper analysis of productivity reveals that the forest sector captures value more effectively than other labor-intensive industries. For instance, the sector generates approximately $132,800 in Value-Added per worker ($8.08B / 60,850 jobs). This figure notably exceeds the labor productivity of the state's top two employers: Food Manufacturing ($120,000 per worker) and Fabricated Metal Manufacturing ($114,200 per worker). This suggests that Pennsylvania's forest product manufacturers, despite being traditional heavy industries, operate with a higher degree of value-creation efficiency than the other dominant mass-employment sectors in the commonwealth.

Table 16: Manufacturing Industries in Pennsylvania state, 2023. †

Manufacturing Industries	Employment	Labor Income	Value Added	Output
Food	90,437	$6,336,416	$10,859,188	$50,699,250
Fabricated Metal	81,264	$6,860,603	$9,281,648	$26,975,867
Forest Products	60,850	$4,959,304	$8,082,612	$26,858,057
Machinery	45,184	$4,558,271	$6,931,080	$20,260,075
Chemical	41,328	$8,380,793	$22,039,854	$51,395,839
Transportation Equipment	36,392	$3,993,311	$6,009,570	$19,456,962
Plastics and Rubber Products	34,943	$2,931,003	$4,465,395	$15,400,144
Primary Metal	34,249	$3,829,479	$6,941,297	$40,794,870
Miscellaneous	31,837	$2,767,931	$4,446,084	$10,350,452
Electrical Equipment	25,405	$2,816,793	$4,301,655	$11,861,468
Computer and Electronic Product	25,385	$2,632,967	$4,191,307	$12,606,122
Printing	21,001	$1,386,539	$2,360,630	$4,534,273
Nonmetallic Mineral Product	20,243	$1,813,843	$3,249,286	$8,281,123
Beverage and Tobacco Product	14,011	$890,581	$2,185,998	$7,412,956
Textiles and Apparel	12,122	$700,566	$761,728	$2,604,775
Petroleum and Coal	4,988	$1,136,666	$6,140,040	$17,700,679
Total	**579,637**	**$55,995,066**	**$102,247,371**	**$327,192,912**
Compared to 2017	**-1.8%**	**0.1%**	**1.2%**	**-1.1%**

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

Summary

The forest products industry in Pennsylvania functions as a highly integrated economic system, spanning land management, extraction, primary processing, and advanced manufacturing. Using 2023 IMPLAN data, this study aggregates 32 economic sectors (however while Pennsylvania has only 31 forest industries) into seven industry groups to capture the full scope of direct activity and supply-chain ripples. In 2023, the sector directly supported 66,394 jobs and generated $27.55 billion in direct output. When accounting for indirect supply-chain purchases and induced household spending, the total economic contribution reached 141,021 jobs, $43.39 billion in output, and $17.96 billion in value added, and $10.89 billion as a labor income .

The industry exhibits strong economic leverage, evidenced by multipliers 2.12 for employment and 2.07 for value added. These figures underscore that the sector creates more wealth and supports nearly as many jobs in the broader economy as it does within its own fence lines.

Performance trends since 2017 reveal a sector in stabilization. While direct employment fell by 3.1 percent and direct output by 2.0 percent, the sector outperformed other natural resource industries in resilience. Real output per job currently stands at approximately $414,900 ($27.55 billion / 66,394 jobs), reflecting the state's focus on high-value manufacturing. Within the aggregated industry groups, Secondary Paperboard and Other Paper Products serves as the dominant engine for both employment and revenue, while Secondary Solid Wood Products remains a critical employment pillar.

At the disaggregated individual sector level, the economy is anchored by Paperboard Container Manufacturing and Wood Kitchen Cabinet Manufacturing, which lead in employment. This robust manufacturing base stimulates significant demand across the service economy, creating an economic impact that extends well beyond the woods and mills. The top ten non-forest industries impacted include Wholesale Trade, Truck Transportation, and Owner-Occupied Housing, which together account for billions in supported output. Overall, while Pennsylvania’s forest products industry has experienced a slight contraction in size since 2017, it remains the foundational pillar of the state’s rural and industrial economy, driving the majority of its natural resource output and providing critical high-wage manufacturing employment.

References

Bureau of Economic Analysis. (2023). Fundamental concepts. In NIPA handbook: Concepts and methods of the U.S. National Income and Product Accounts (Chapter 2). https://www.bea.gov/resources/methodologies/nipa-handbook/pdf/chapter-02.pdf

Coronado, C. J., McConnell, T. E., & Matthews, S. N. (2014). Economic impacts of timber product outputs in Ohio across timber market regions. BioResources, 9(4), 7579–7592. https://bioresources.cnr.ncsu.edu/resources/economic-impacts-of-timber-product-outputs-in-ohio-across-timber-market-regions/

IMPLAN Group LLC. (2023). IMPLAN® model: Data and software system [Data and software]. https://implan.com/

Khanal, N., Pokharel, R., Poudel, J., Gc, S., Shannon, E., Huff, E., & Finley, A. (2024). Analysis of location, feedstock availability, and economic impacts of potential mass timber processing facilities in Michigan. Forest Policy and Economics, 163, 103203. https://doi.org/10.1016/j.forpol.2024.103203

Lamsal, B., Cavo, M., & Wagner, J. E. (2025b). Decomposing the economic contribution of a sector: A case study of New York State's forest sector. Forest Science, 71, 423–444. https://doi.org/10.1007/s44391-025-00023-x

Lamsal, B., Poudel, J., & Pokharel, R. (2025a). Regional economic and employment impacts of industrial decline in the forest sector: Evidence from sawmill closures in Michigan. Forest Policy and Economics, 178, 103601. https://doi.org/10.1016/j.forpol.2024.103601

Leefers, L., Poudel, J., Neumann, D., & Public Sector Consultants. (2020). Forest products industries' economic contributions in the Northeast and Midwest. Public Sector Consultants.

Pokharel, M., Germain, R. H., Wagner, J. E., & Smith, W. B. (2023). Estimating a regional economic conservation benefit of using domestic hardwoods vs. apitong for trailer decking: A case study on US Army use. Forests, 14(7), 1428. https://doi.org/10.3390/f14071428

Poudel, J. (2022). Forest products industries' economic contributions: Michigan. Forest Resources Division, Michigan Department of Natural Resources.

Poudel, J., & Dahal, R. (2025). A comprehensive look at the forest products industry's economic contribution to the United States: Pre- and post-COVID analysis. Forest Policy and Economics, 172, 103440. https://doi.org/10.1016/j.forpol.2025.103440

Poudel, K., & Ochuodho, T. O. (2021). Forest sector dependence and economic well-being in Kentucky: An econometric analysis. Forest Science, 67(6), 659–669. https://doi.org/10.1093/forsci/fxab048

Watson, P., Cooke, S., Kay, D., & Alward, G. (2015). A method for improving economic contribution studies for regional analysis. Journal of Regional Analysis & Policy, 45(1), 1–15.

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.

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 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.

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

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	Nonupholstered 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.

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

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

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

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

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	252	$2,550	$3,516	$7,593
Forestry, forest products, and timber tract production	708	$75,733	$79,434	$86,387
Support activities for agriculture and forestry	1,201	$46,230	$47,431	$50,032
Total	**2,161**	**$124,513**	**$130,381**	**$144,012**

† 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	3,258	$351,976	$369,089	$382,433
Total	**3,258**	**$351,976**	**$369,089**	**$382,433**

† 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	124	$26,310	$87,367	$165,597
Sawmills	4,022	$268,207	$363,560	$1,893,751
Wood preservation	416	$34,805	$67,675	$340,178
Veneer and plywood manufacturing	670	$43,525	$63,453	$233,755
Reconstituted wood product manufacturing	1,012	$87,495	$179,924	$855,513
Total	**6,245**	**$460,341**	**$761,978**	**$3,488,794**

† 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	1,707	$152,760	$192,518	$698,133
Wood windows and door manufacturing	2,266	$172,190	$210,398	$671,413
Cut stock, resawing lumber, and planing	494	$30,718	$45,210	$179,634
Other millwork, including flooring	1,583	$128,231	$175,935	$516,447
Wood container and pallet manufacturing	4,175	$291,425	$343,618	$1,065,671
Manufactured home (mobile home) manufacturing	2,047	$160,226	$175,765	$631,591
Prefabricated wood building manufacturing	3,832	$288,378	$402,066	$1,367,803
All other miscellaneous wood product manufacturing	3,451	$268,256	$335,205	$979,902
Total	**19,555**	**$1,492,184**	**$1,880,714**	**$6,110,593**

† 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	6,444	$432,234	$495,394	$1,246,362
Upholstered household furniture manufacturing	1,036	$67,910	$77,064	$230,012
Nonupholstered wood household furniture manufacturing	1,214	$71,676	$80,333	$224,955
Institutional furniture manufacturing	1,059	$76,573	$86,915	$248,796
Wood office furniture manufacturing	488	$37,321	$45,970	$132,007
Custom architectural woodwork and millwork	1,295	$101,083	$55,186	$258,696
Showcase, partition, shelving, and locker manufacturing	2,322	$221,413	$270,388	$688,215
Total	**13,857**	**$1,008,209**	**$1,111,250**	**$3,029,043**

† 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	0	$0	$0	$0
Paper mills	2,101	$274,733	$721,988	$1,991,417
Paperboard mills	183	$23,163	$58,387	$182,369
Total	**2,283**	**$297,896**	**$780,375**	**$2,173,786**

† 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	8,540	$789,033	$1,385,822	$5,223,129
Paper bag and coated and treated paper manufacturing	2,685	$256,108	$480,977	$1,403,490
Stationery product manufacturing	1,961	$141,187	$187,222	$840,848
Sanitary paper product manufacturing	4,232	$430,085	$1,345,476	$4,047,898
All other converted paper product manufacturing	1,616	$110,570	$236,164	$706,072
Total	**19,034**	**$1,726,983**	**$3,635,662**	**$12,221,437**

† 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	227	$1,043	$2,191	$4,768
Forestry, forest products, and timber tract production	721	$68,839	$67,027	$85,906
Support activities for agriculture and forestry	917	$35,742	$31,983	$35,504
Total	**1,865**	**$105,624**	**$101,201**	**$126,178**

† 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	4,740	$423,218	$593,463	$697,606
Total	**4,740**	**$423,218**	**$593,463**	**$697,606**

† 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	5,006	$262,451	$284,908	$1,387,906
Wood preservation	311	$18,607	$29,021	$177,566
Veneer and plywood manufacturing	752	$37,095	$41,974	$198,772
Reconstituted wood product manufacturing	742	$52,420	$75,271	$387,094
Total	**6,812**	**$370,573**	**$431,174**	**$2,151,337**

† 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	1,563	$94,968	$101,200	$352,401
Wood windows and door manufacturing	2,015	$116,122	$134,432	$451,533
Cut stock, resawing lumber, and planing	467	$21,844	$26,987	$102,364
Other millwork, including flooring	1,812	$110,006	$130,683	$384,019
Wood container and pallet manufacturing	4,110	$206,075	$226,633	$645,504
Manufactured home (mobile home) manufacturing	1,694	$101,460	$135,474	$416,451
Prefabricated wood building manufacturing	3,294	$180,786	$193,326	$567,695
All other miscellaneous wood product manufacturing	3,683	$213,444	$246,492	$693,157
Total	**18,638**	**$1,044,705**	**$1,195,227**	**$3,613,125**

† 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	7,165	$393,178	$430,212	$1,077,670
Upholstered household furniture manufacturing	1,343	$70,314	$80,564	$268,200
Nonupholstered wood household furniture manufacturing	1,596	$80,077	$93,715	$214,893
Institutional furniture manufacturing	852	$49,822	$57,147	$165,165
Wood office furniture manufacturing	446	$26,638	$37,296	$99,292
Custom architectural woodwork and millwork	1,154	$74,338	$84,047	$193,784
Showcase, partition, shelving, and locker manufacturing	1,164	$87,550	$104,802	$263,111
Total	**13,720**	**$781,919**	**$887,782**	**$2,282,116**

† 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	0	$0	$0	$0
Paper mills	2,935	$331,066	$775,220	$2,490,967
Paperboard mills	251	$31,087	$71,750	$231,305
Total	**3,186**	**$362,153**	**$846,970**	**$2,722,271**

† 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	8,004	$668,739	$982,941	$3,881,151
Paper bag and coated and treated paper manufacturing	2,621	$218,188	$396,801	$1,263,843
Stationery product manufacturing	2,516	$154,001	$271,899	$955,413
Sanitary paper product manufacturing	5,080	$425,510	$1,658,992	$4,311,885
All other converted paper product manufacturing	1,359	$76,595	$111,380	$414,714
Total	**19,581**	**$1,543,033**	**$3,422,013**	**$10,827,005**

† 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	227	$1,276	$2,680	$5,976
Forestry, forest products, and timber tract production	721	$84,171	$81,956	$107,667
Support activities for agriculture and forestry	917	$43,702	$39,106	$44,498
Total	**1,865**	**$129,150**	**$123,742**	**$158,141**

† 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	4,740	$517,481	$725,645	$874,324
Total	**4,740**	**$517,481**	**$725,645**	**$874,324**

† 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	0	$0	$0	$0
Sawmills	5,006	$320,907	$348,366	$1,739,491
Wood preservation	311	$22,751	$35,485	$222,546
Veneer and plywood manufacturing	752	$45,358	$51,322	$249,125
Reconstituted wood product manufacturing	742	$64,095	$92,036	$485,152
Total	**6,812**	**$453,110**	**$527,209**	**$2,696,314**

† 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	1,563	$116,120	$123,740	$441,672
Wood windows and door manufacturing	2,015	$141,986	$164,374	$565,916
Cut stock, resawing lumber, and planing	467	$26,710	$32,998	$128,295
Other millwork, including flooring	1,812	$134,507	$159,790	$481,298
Wood container and pallet manufacturing	4,110	$251,975	$277,111	$809,023
Manufactured home (mobile home) manufacturing	1,694	$124,058	$165,648	$521,947
Prefabricated wood building manufacturing	3,294	$221,052	$236,386	$711,504
All other miscellaneous wood product manufacturing	3,683	$260,984	$301,394	$868,747
Total	**18,638**	**$1,277,392**	**$1,461,440**	**$4,528,402**

† 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	7,165	$480,751	$526,034	$1,350,665
Upholstered household furniture manufacturing	1,343	$85,976	$98,507	$336,141
Nonupholstered wood household furniture manufacturing	1,596	$97,913	$114,588	$269,330
Institutional furniture manufacturing	852	$60,919	$69,875	$207,005
Wood office furniture manufacturing	446	$32,572	$45,603	$124,444
Custom architectural woodwork and millwork	1,154	$90,896	$102,766	$242,874
Showcase, partition, shelving, and locker manufacturing	1,164	$107,050	$128,144	$329,762
Total	**13,720**	**$956,076**	**$1,085,518**	**$2,860,222**

† 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	0	$0	$0	$0
Paper mills	2,935	$404,804	$947,885	$3,121,978
Paperboard mills	251	$38,012	$87,731	$289,899
Total	**3,186**	**$442,816**	**$1,035,616**	**$3,411,877**

† 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	8,004	$817,687	$1,201,871	$4,864,324
Paper bag and coated and treated paper manufacturing	2,621	$266,785	$485,181	$1,583,999
Stationery product manufacturing	2,516	$188,301	$332,459	$1,197,438
Sanitary paper product manufacturing	5,080	$520,284	$2,028,499	$5,404,172
All other converted paper product manufacturing	1,359	$93,654	$136,188	$519,769
Total	**19,581**	**$1,886,713**	**$4,184,198**	**$13,569,702**

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