

2009 WASHINGTON STATE GREEN ECONOMY JOBS



FOREST PRODUCTS INDUSTRY

Employment Security Department
Karen T. Lee, Commissioner

Labor Market and Economic Analysis
Greg Weeks, Ph.D., Director

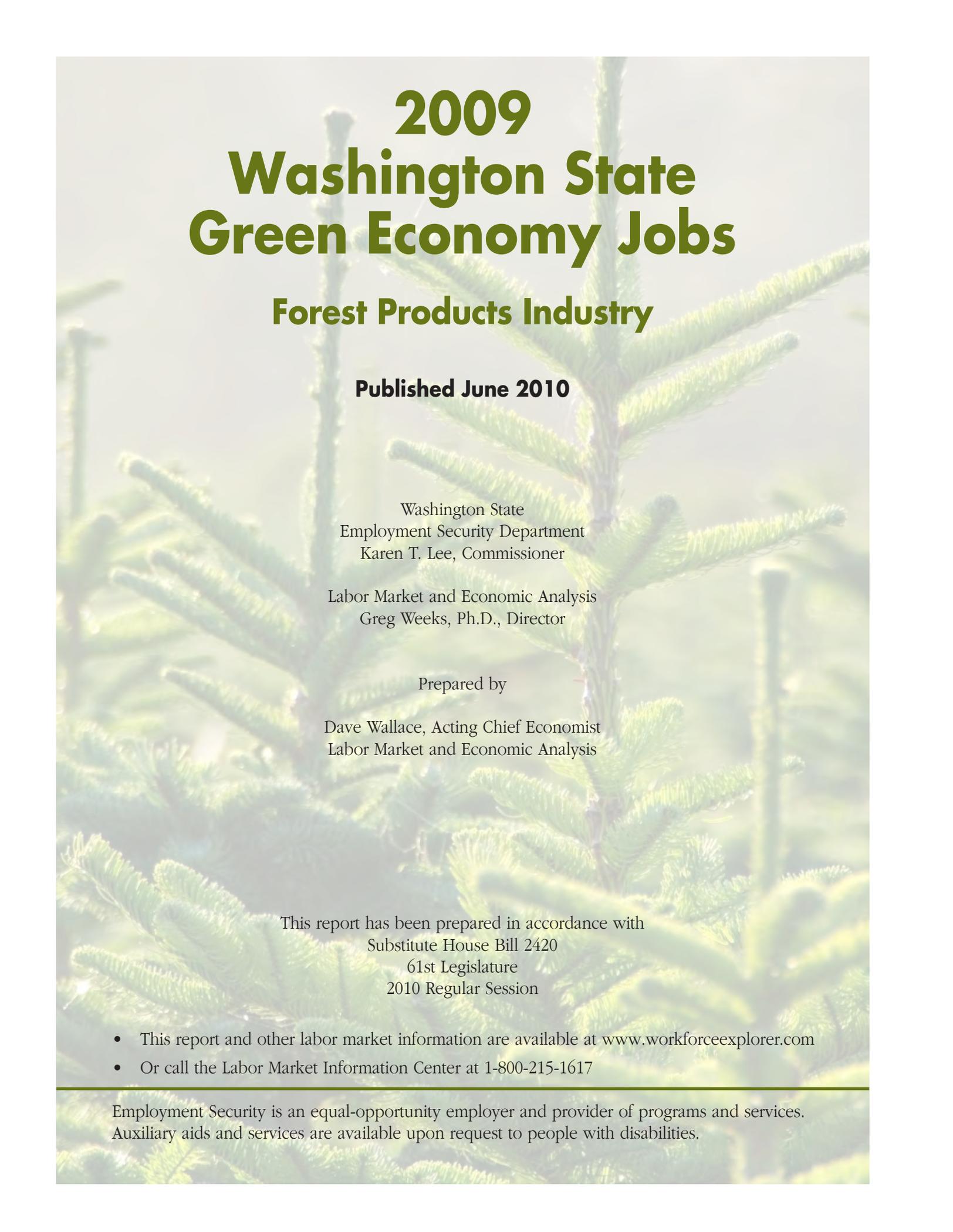


Washington State
Employment Security Department

Labor Market and Economic Analysis



June 2010



2009 Washington State Green Economy Jobs

Forest Products Industry

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Introduction

Substitute House Bill 2420¹, which passed during the 2010 legislative session, directs the Employment Security Department (ESD) to conduct labor market research to analyze the current labor market and projected job growth in the forest products industry.

In 2009, the Labor Market and Economic Analysis branch of the Employment Security Department published the *Washington State Green Economy Jobs* report², which identified the number and type of green economy sectors and employment in Washington. Findings from that report, specifically those pertaining to the forest products industry, are included here.

Background

The Evergreen Jobs Act (E2SHB 2227)³ was passed by the Legislature in 2009. The Act had several goals, including creating a skilled green jobs workforce. The legislation targeted the use of existing education and training funds and anticipated federal appropriations.

A year later (in 2010), SHB 2420 was passed by the Legislature. This legislation included the state's forestry industry as part of the renewable energy field. The bill recognized the importance of sustainable forestry in the success of biomass and green bio-industries.

The Legislature finds that the state's forest products industry plays a critical economic and environmental role, and that it is in the state's best interest to support and enhance the industry. The results of Washington's green economy jobs research, specifically the results pertaining to the forest products industry, is helpful.

Information from this report will be used to guide planning, strategy development, and investments to support future growth of Washington state's green economy.

It is important to note that because this report pulls existing data produced from the full green jobs report, but specific to the forest product group of industries, a word of caution

¹ Chapter 187, Laws of 2010

² For further information go to the [2009 Washington State Green Economy Jobs report](#)

³ Chapter 536, Laws of 2009



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Green jobs were found in the existing 2009 green jobs database among forestry and logging; supplement activities forestry; wood products manufacturing; and paper manufacturing.



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Photo by ©iStock/FarmLigonography

The Forest Products Industry group includes industries that grow, maintain, and harvest trees.



Photo by ©iStock/GeorgeClerk

is in order. The survey was designed to accurately estimate the number of green jobs for all major industry sectors. Sub-analyses, based on smaller sample sizes, can reduce the reliability of the findings and interpretation of the results. For this reason, readers should use the estimations in this report with these constraints in mind.

Defining Green Economy Jobs

The *2008 Washington State Green Economy Jobs* study was the first state agency-led survey of green economy jobs of its kind in the nation. Extensive research and survey designs discussed with study advisors led to forming core definitions for green economy industries and jobs that provided a basis for a rigorous scientific survey design and sampling procedure.⁴ These definitions were subsequently adopted, in whole or in part, by several other states and research studies.⁵ It was determined by the research team that these same foundational definitions should be continued for the 2009 study.

The definition used for the *2008* and *2009 Washington State Green Economy Jobs* reports (and for this report as well) is as follows:

The green economy is rooted in the development and use of products and services that promote environmental protection and energy security. It is composed of industries and businesses engaged in:

- Increasing energy efficiency
- Producing renewable energy
- Preventing and reducing environmental pollution
- Providing mitigation or cleanup of environmental pollution

Green jobs are those that promote environmental protection and energy security.

⁴ Reviews of existing research on green economy jobs show a wide variation in research results among different reports, often due to differences in the key definitions, assumptions, and analytical models employed by researchers. For a review of research on green economy jobs and research methods, see the [2008 Washington State Green Economy Jobs report](#).

⁵ The state of Oregon used Washington state's four core area definitions and added a fifth core area regarding support jobs such as education. Other states, including California, Colorado, Michigan, and Tennessee, use renewable energy and energy efficiency as part of their definitions regarding green-economy jobs.

Defining Green Economy Jobs within the Forest Products Industry

For the purposes of this report, the *Forest Products Industry* group includes industries that grow, maintain, and harvest trees as well as those involved in processing trees for products such as lumber, paper products, and secondary wood products. Green jobs were found in the existing 2009 green jobs database among the following industries: forestry and logging (North American Industry Classification System [NAICS] code 113), support activities forestry (NAICS 1153), wood products manufacturing (NAICS 321), and paper manufacturing (NAICS 322).



Photo by ©iStock/jstop123

Overall there are almost 1,500 jobs identified in this industry that are considered to be green.

Measuring Green Jobs in the Forest Products Industry

Table 1 displays the findings from the *2009 Washington State Green Economy Jobs* report that are specific to the forest products industry. These findings were based on responses from survey participants. Overall, there are almost 1,500 jobs identified in this industry that are considered to be green. The sawmill industry leads all others with almost 500 green jobs, followed by the logging industry with an estimated 321 green jobs in 2009.

Overall, green jobs identified among these forest products industries amount to 2 percent of all green jobs found throughout the economy. Green jobs contributed 10.1 percent of all employment within these industries. This is a much higher percent than for green jobs in all industries – 3.3 percent. Approximately one in five jobs (20.1 percent) in the support activities for the forest industry are estimated to be green. The wood container and pallet manufacturing industry (13 percent) and all other miscellaneous wood product manufacturing industry (10.8 percent) also exhibit high percentages of green jobs.

Table 1

Private- and Public-Sector Green Jobs within the Forest Products Industry

Sources: 2009 Washington State Green Jobs Survey and Preliminary Third Quarter 2008 QCEW Employment Security Department, Labor Market and Economic Analysis

INDUSTRIES	PRIVATE-SECTOR GREEN JOBS 2009	PERCENT OF TOTAL GREEN JOBS 2009	TOTAL EMPLOYMENT REPORTED THIRD QUARTER 2008	GREEN JOBS AS A PERCENT OF TOTAL INDUSTRY EMPLOYMENT
Logging*	321	0.4%	4,492	7.2%
Support Activities for Forestry	283	0.4%	1,408	20.1%
Sawmills	482	0.6%	7,277	6.6%
Wood Container and Pallet Manufacturing	152	0.2%	1,164	13.0%
All Other Misc. Wood Product Manufacturing	49	0.1%	456	10.8%
Paper (except Newsprint) Mills	205	0.3%	3,431	6.0%
Total Green Forestry Green Jobs	1,494	2.0%	14,798	10.1%
<hr/>				
Total Private-Sector Green Jobs	76,137	100.0%	2,494,886	3.1%
Total Private- and Public-Sector Green Jobs	99,319		3,005,549	3.3%

*The logging QCEW number includes 44 local government employees.



The most common green core area in the forest products industry is preventing and reducing environmental pollution. An example would be a trucking company using hybrid vehicles, or a farm that uses compost rather than petroleum-based fertilizers.

Forest Products Jobs by Core Area

As previously mentioned, the approach taken by the Employment Security Department has been to categorize all green jobs so they fall into at least one of the four core areas (increasing energy efficiency, producing renewable energy, preventing and reducing environmental pollution, or providing mitigation or cleanup of environmental pollution). As the core areas each represent a green activity, it is possible for a given green job to be engaged in more than one core area. For this reason, the number of core positions is larger than the estimated number of green jobs for both the full survey and this specific forest products industry report.

As shown in *Table 2*, the most common green core area in the forest products industry is preventing and reducing environmental pollution. More than half of the green activity is in this core area, most of which represent full-time employment (78 percent). People working in this core area typically produce a good or a service in a manner that produces less pollution. An example of this would include a trucking company that uses hybrid vehicles, or a farm that uses compost rather than petroleum-based fertilizers.

Twenty-eight percent of green forest products positions are found in producing renewable energy; 13.2 percent found in providing mitigation or cleanup of environmental pollution; and 5.4 percent in increasing energy efficiency. With the exception of increasing energy efficiency, a strong majority of positions are full time.

Table 2

Full- and Part-Time Forest Products Industry Positions by Core Area

Source: 2009 Washington State Green Jobs Survey

Employment Security Department, Labor Market and Economic Analysis

	INCREASING ENERGY EFFICIENCY		PRODUCING RENEWABLE ENERGY		PREVENTING AND REDUCING ENVIRONMENTAL POLLUTION		PROVIDING MITIGATION OR CLEANUP OF ENVIRONMENTAL POLLUTION	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Full Time	41	49.2%	375	86.9%	643	78.0%	176	86.3%
Part Time	42	50.8%	56	13.1%	182	22.0%	28	13.7%
Full Time and Part Time	83	100.0%	431	100.0%	825	100.0%	204	100.0%
Percent out of 1,543 Total Green Forestry Positions	5.4%		28.0%		53.5%		13.2%	

Note: In 2009 the total for green forest products industry positions by core area is higher than the total of all green jobs by 48. This is due to employers reporting in more than one core area for a given green job.

Green Occupations in the Forest Products Industry

The most common green occupation in the forest products industry is production workers, all other⁶. This occupation, which includes a variety of jobs working in the production of goods, was most commonly engaged in the preventing and reducing environmental pollution core area.

Table 3 lists the top 10 forest products industry occupations by core area. The preventing and reducing environmental pollution core area is the most common for production workers, all other, construction laborers, foresters, truck drivers, and fire fighters. Operating engineers and sawing machine setters are most likely to be working on producing renewable energy tasks. Janitors are only found in the providing mitigation or cleanup of environmental pollution core area. Other occupations are fairly evenly spread across different core areas.

To analyze the earnings and education or training levels of the green forest product occupations, data were extracted from



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Preventing and reducing environmental pollution is the most common core area for construction laborers, foresters, truck drivers, and fire fighters.

Table 3

Top 10 Forest Products Industry Occupations by Core Area Positions and Total Green Jobs

Source: 2009 Washington State Green Jobs Survey

Employment Security Department, Labor Market and Economic Analysis

FOREST PRODUCTS INDUSTRY OCCUPATIONS	GREEN POSITIONS BY CORE AREA				PERCENT OF TOTAL GREEN JOBS
	INCREASING ENERGY EFFICIENCY	PRODUCING RENEWABLE ENERGY	PREVENTING AND REDUCING ENVIRONMENTAL POLLUTION	PROVIDING MITIGATION OR CLEANUP OF ENVIRONMENTAL POLLUTION	
Production Workers, All Other	26	17	151	13	0.20%
Construction Laborers	0	1	141	43	0.19%
Operating Engineers and Other Construction Equip. Operators	5	59	54	37	0.20%
Forest and Conservation Workers	0	71	47	24	0.21%
Foresters	0	15	87	0	0.10%
Sawing Machine Setters, Operators, and Tenders, Wood	0	86	1	0	0.17%
Truck Drivers, Heavy and Tractor-Trailer	1	20	40	0	0.08%
Power Distributors and Dispatchers	0	37	0	0	0.07%
Janitors and Cleaners	0	0	0	35	0.03%
Fire Fighters	9	0	21	0	0.02%
Total Positions for the Top 10 Occupations	42	307	543	152	1.29%
Total Positions for All Forestry Products Occupations	83	431	825	204	1.54%

Note: Occupational titles ending with “All Other” are considered residual and combine occupations which don’t fit into other detailed codes.

⁶ All numbers are weighted based on the system designed to produce estimates for the entire state. The estimating cell is at the major industry sector level (two-digit NAICS) and is not designed to produce reliable occupational estimates at a more detailed industry level.



Photo by ©iStock/Bradford Shearer

Among the top green forest products occupations, power distributors and dispatchers have the highest annual wages.

sources external to the green jobs survey and for all industries (not just jobs or green forest products industries)⁷. This information is displayed in *Table 4*.

Using this approach, we can say that among the top green forest products occupations, power distributors and dispatchers have the highest annual wages (\$78,636), followed by fire fighters (\$64,186). Forest and conservation workers (\$22,985) have the lowest annual wage. That is likely in part due to the seasonal nature of the job, as the annual wage does not account for hours worked. Janitors and cleaners (\$26,064) followed by production workers, all other, have the second and third lowest wages, respectively.

Moderate on-the-job training, from one to 12 months, is the most common level of education/training among the top 10 forest products occupations. The foresters occupation generally requires a bachelor's degree, making it the occupation with the most stringent educational requirements among these top 10. Power distributors and dispatchers and fire fighters generally require long-term on-the-job training of more than 12 months.

Table 4

Statewide Annual Median Earnings and Top 10 Education/Training Levels for Green Occupations, 2009

Source: 2009 Occupational Employment Statistics (OES) Survey

Employment Security Department, Labor Market and Economic Analysis

FOREST PRODUCTS INDUSTRY OCCUPATIONS	MEDIAN ANNUAL EARNINGS	GREEN JOBS	EDUCATION/TRAINING
Production Workers, All Other	\$26,809	191	Moderate-term on-the-job training
Construction Laborers	\$33,309	185	Moderate-term on-the-job training
Operating Engineers and Other Construction Equip.Operators	\$54,132	154	Moderate-term on-the-job training
Forest and Conservation Workers	\$22,985	143	Moderate-term on-the-job training
Foresters	\$61,884	89	Bachelor's degree
Sawing Machine Setters, Operators, and Tenders, Wood	\$35,602	88	Moderate-term on-the-job training
Truck Drivers, Heavy and Tractor-Trailer	\$40,909	62	Moderate-term on-the-job training
Power Distributors and Dispatchers	\$78,636	37	Long-term on-the-job training
Janitors and Cleaners	\$26,064	35	Short-term on-the-job training
Fire Fighters	\$64,186	30	Long-term on-the-job training
Total Green Employment in Forest Products Industries		1,494	

Note: The earnings data are derived from all occupations, not just green occupations.

⁷ This information was not asked for as part of the full green jobs survey so as to lower the burden on employers and to maintain a high response rate.

Green Jobs Skills

In addition to eliciting information on tasks and occupations, the *2009 Washington State Green Jobs Survey* asked questions regarding skill differences. The information in this section is the direct reported numbers, which were not given any sample weights.

Overall, there were 199 responses within the forest products industries to the question, “Are the skills required for the reported green job different from the same job not engaged in a green activity?” As shown in *Table 5*, about 45 percent of the responses said that “skills are mostly the same,” making it the most common response. Just over 30 percent said that “skills are identical.” About 11 percent said “skills are mostly different.” One percent said “skills are entirely different.” And about 14 percent gave no value. It appears in these industries that green skills tend not to be distinct, as almost three-quarters of the firms responding said skills are either completely the same or nearly the same. All other miscellaneous wood product manufacturing was the only industry to buck that trend as the majority of responses said that skills were mostly different.



Table 5

Comparison of Forest Products Green Jobs Skills by Industry, 2009

Source: 2009 Washington State Green Jobs Survey

Employment Security Department, Labor Market and Economic Analysis

SKILLS REQUIREMENTS BY INDUSTRY AND CORE AREA											
FOREST PRODUCTS INDUSTRY OCCUPATIONS	NO SKILL VALUE IS GIVEN	PERCENT	SKILLS ARE IDENTICAL	PERCENT	SKILLS ARE MOSTLY THE SAME	PERCENT	SKILLS ARE MOSTLY DIFFERENT	PERCENT	SKILLS ARE ENTIRELY DIFFERENT	PERCENT	TOTAL JOBS
Logging	6	13.3%	17	37.8%	16	35.6%	5	11.1%	1	2.2%	45
Support Activities for Forestry	2	8.3%	14	58.3%	7	29.2%	1	4.2%	0	0.0%	24
Sawmills	14	18.4%	15	19.7%	37	48.7%	10	13.2%	0	0.0%	76
Wood Container and Pallet Mfg.	1	8.3%	7	58.3%	4	33.3%	0	0.0%	0	0.0%	12
All Other Misc. Wood Product Mfg.	2	18.2%	2	18.2%	1	9.1%	5	45.5%	1	9.1%	11
Paper (except News-print) Mills	2	6.5%	5	16.1%	24	77.4%	0	0.0%	0	0.0%	31
Subtotal Jobs	27	13.6%	60	30.2%	89	44.7%	21	10.6%	2	1.0%	199

Note: This table is based on direct reported information and is not weighted.

Conclusions

The forest products group of industries is well represented in the *2009 Washington State Green Jobs Survey*. Overall, it is estimated that over 10 percent of its employment is green; a much higher representation than the overall economy (3.3 percent). Sawmills have more green jobs than any other forest products industry.

These industries employ a variety of green occupations, most of which require moderate on-the-job training. Half of the top 10 occupations within the industry pay above-average wages, led by power distributors and dispatchers at \$78,636 annually.

Green job skills within these industries are generally not distinct from non-green occupations of a similar job title.

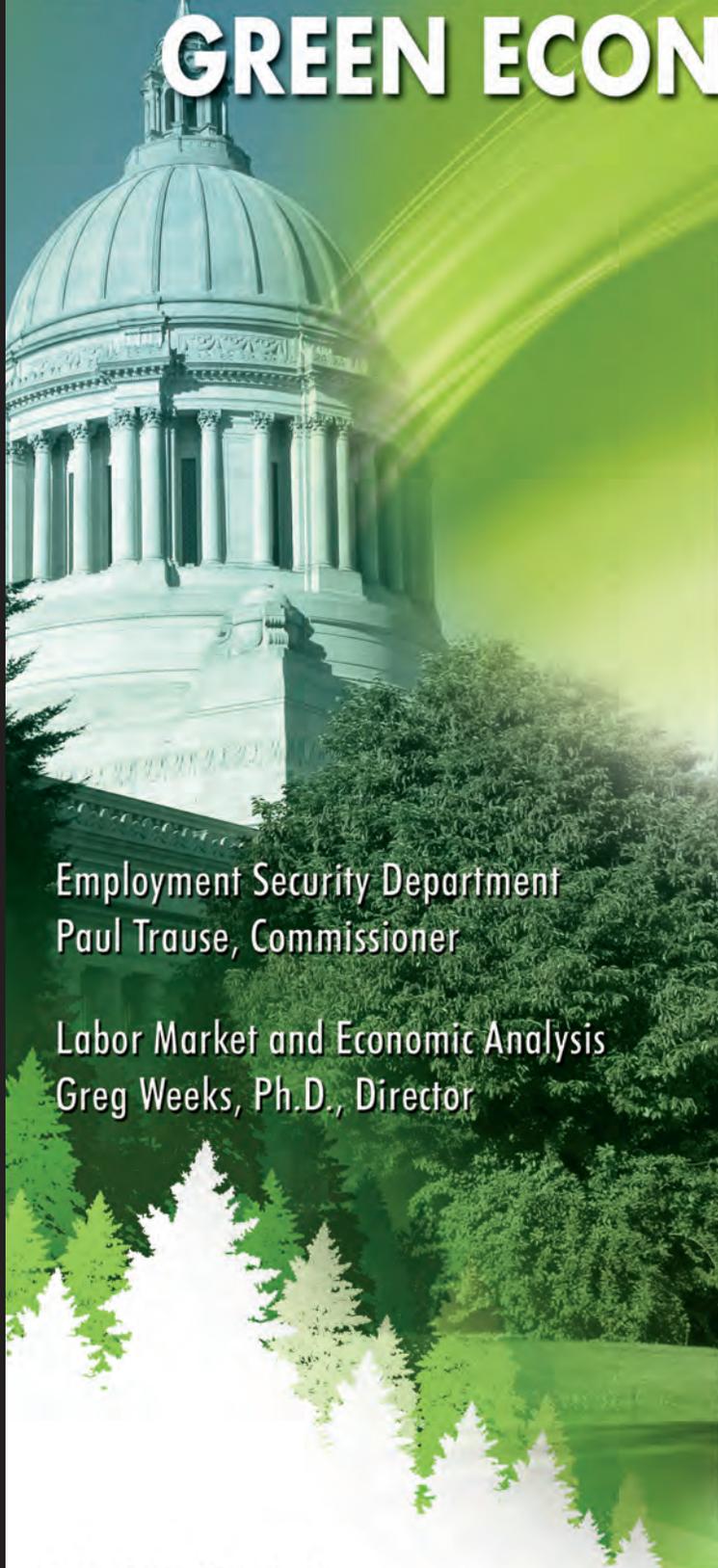


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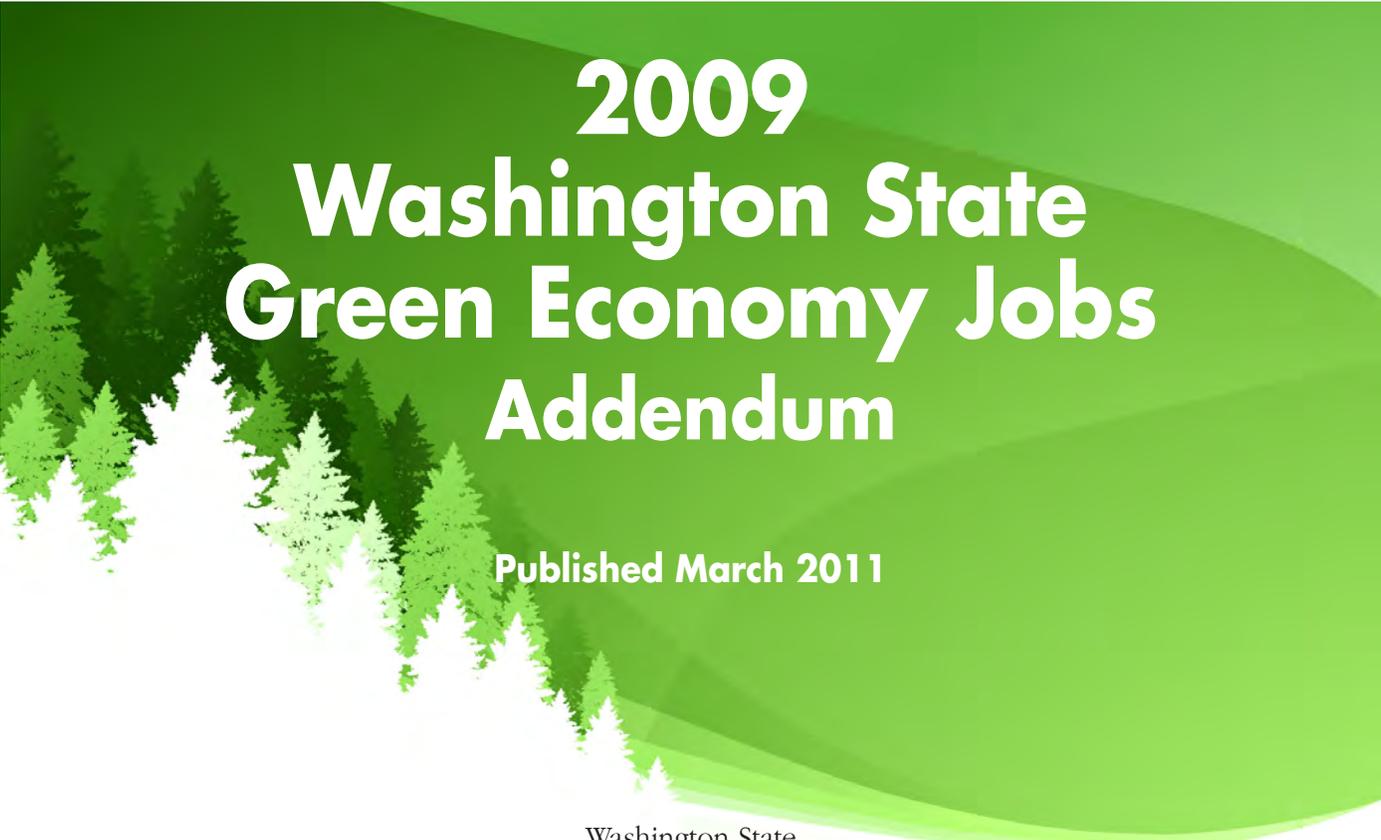


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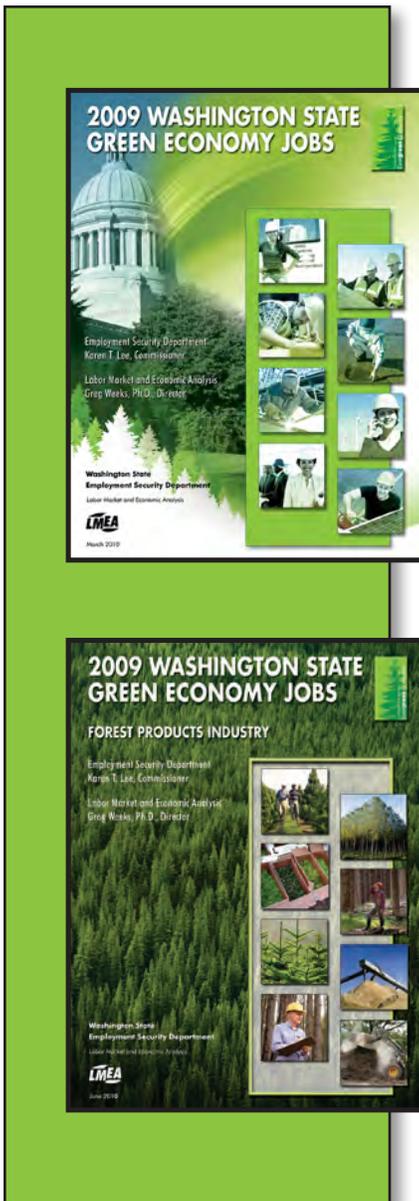
High Demand Industries Current and Projected Recruitment Job Skills

Engrossed Second Substitute House Bill 2227¹, passed in 2009, and Substitute House Bill 2420², passed in 2010, directed the Washington State Employment Security Department to conduct labor market research to analyze green economy jobs in Washington. In response, Employment Security published the *2009 Washington State Green Economy Jobs* report³ and the *2009 Washington State Green Economy Jobs – Forest Products Industry* report.⁴

This addendum addresses three topics not covered in the original reports:

- Proposing which industries should be considered high demand.
- Current and projected recruitment.
- Skill requirements of the green economy.

Information in this report is presented for each of these three topics first for all industries, and then specifically for the forest products industry. Additional information about family-sustaining wages and benefits from the *2009 Washington State Green Economy Jobs* report is also included in this addendum.



¹ Chapter 536, Laws of 2009

² Chapter 187, Laws of 2010

³ This report is available online at: www.workforceexplorer.com/admin/uploadedPublications/10258_Green_Jobs_Report_for_Web_2009.pdf.

⁴ This report is available online at: www.workforceexplorer.com/admin/uploadedPublications/10468_Green_Jobs_ForestProducts_09Wex.pdf.

Green Economy Jobs

High demand green industries

For the period between 2008 and 2018, 15 industries in Washington state are projected to have above average growth rates and significant green presence (more than 250 estimated green jobs in 2009). Electronic equipment manufacturing tops the list with a 10-year annual projected growth rate of 4.2 percent, compared to 0.9 percent estimated annual growth rate⁵ for all industries.

Exhibit 1 lists the top 15 green economy industries with projected high growth in Washington.

Exhibit 1. Top 15 High Growth Potential Green Industries Washington State, 2009

Source: Employment Security Department/LMEA, 2009 Washington State Green Economy Jobs Report

NAICS	INDUSTRY TITLE	2009 ESTIMATED GREEN JOBS	2008-2018 AVERAGE ANNUAL GROWTH
3353	Electrical Equipment Manufacturing	1,429	4.2%
5416	Management and Technical Consulting Services	1,216	3.0%
5617	Services to Buildings and Dwellings	6,771	2.9%
5112	Software Publishers	476	2.9%
5621	Waste Collection	1,025	2.7%
5629	Remediation and Other Waste Services	3,284	2.5%
5417	Scientific Research and Development Services	2,202	2.2%
5413	Architectural and Engineering Services	7,949	1.7%
4251	Electronic Markets and Agents and Brokers	2,575	1.6%
2213	Water, Sewage and Other Systems	363	1.4%
4247	Petroleum Merchant Wholesalers	490	1.2%
6111	Elementary and Secondary Schools	1,852	1.1%
6113	Colleges and Universities	755	1.1%
6112	Community Colleges	581	1.1%
4234	Commercial Equipment Merchant Wholesalers	306	1.0%

List is sorted by projected growth and only includes industries with more than 250 estimated green jobs in 2009. For the educational industries, 6111, 6112 and 6113, the growth rate is for the entire aggregated education sector.



Photo by ©iStock/BartCo

Between 2008 and 2018, 15 industries in Washington are projected to have above average growth and significant green presence.



Photo by ©iStock/gerenme

⁵ 2008 to 2018 growth projections are from the 2010 Washington State Labor Market and Economic Report, published by the Employment Security Department.

Current and projected green jobs recruitment

Using data from the Spring 2010 Job Vacancy Survey report⁶ and occupational projections, we can gauge current and future needs for workers in various occupations in Washington state. *Exhibit 2* identifies the top 25 occupations with green jobs showing the most growth potential between 2008 and 2018.

Market research analysts, while having relatively few green jobs (104), is the occupation with the highest projected growth rate, followed by landscapers and groundskeeping workers, and radiologic technolo-

Exhibit 2. Top 25 Washington State Green Jobs in Terms of Potential Job Growth Washington State, 2009

Source: Employment Security Department/LMEA, 2009 Washington State
Green Economy Jobs Report, Spring 2010 Job Vacancy Survey Report

SOC	OCCUPATION TITLE	ESTIMATED GREEN JOBS 2009	SPRING 2010 VACANCIES	PERCENT OPEN BEYOND 60 DAYS	2008-2018 AVERAGE ANNUAL GROWTH
193021	Market Research Analysts	104	0	0%	2.4%
373011	Landscaping and Groundskeeping Workers	1,099	153	38%	2.4%
292034	Radiologic Technologists and Technicians	417	69	28%	2.2%
474041	Hazardous Materials Removal Workers	719	8	0%	2.2%
537081	Refuse and Recyclable Material Collectors	375	37	0%	2.2%
339021	Private Detectives and Investigators	153	0	0%	2.0%
151032	Computer Software Engineers, Systems Software	287	1,929	23%	1.9%
151031	Computer Software Engineers, Applications	138	448	14%	1.9%
273042	Technical Writers	148	15	13%	1.7%
372011	Janitors and Cleaners	486	268	10%	1.6%
192042	Geoscientists, Except Hydrologists and Geographers	228	5	100%	1.6%
194091	Environmental Science and Protection Tech.	1,074	11	9%	1.5%
172051	Civil Engineers	5,772	74	6%	1.5%
119151	Social and Community Service Managers	156	75	0%	1.4%
171012	Landscape Architects	122	3	0%	1.4%
192041	Environmental Scientists and Specialists	2,222	0	0%	1.4%
151041	Computer Support Specialists	366	179	16%	1.4%
171022	Surveyors	205	0	0%	1.2%
151051	Computer Systems Analysts	139	212	12%	1.2%
193091	Anthropologists and Archeologists	100	3	0%	1.2%
192031	Chemists	246	18	30%	1.2%
192043	Hydrologists	156	0	0%	1.2%
171011	Architects, Except Landscape and Naval	2,232	13	0%	1.2%
119121	Natural Sciences Managers	108	0	0%	1.2%
537062	Laborers and Freight, Stock and Material Movers	616	262	11%	1.1%

List produced by sorting on 10-year growth and filtering out occupations with 100 or fewer green jobs.

⁶ Published by the Employment Security Department. The survey is available online at: www.workforceexplorer.com/admin/uploadedPublications/10467_JVSApril_2010Rep.pdf.

gists and technicians. Among these three occupations, employers had the most difficulty recruiting for landscapers and groundskeeping workers – 38 percent of positions were vacant for more than 60 days.

Employers reported having the most difficulty filling positions for computer software engineers. In spring 2010, there were 1,929 vacancies for systems software engineers and 448 vacancies for software applications engineers.

Skill requirements of the green economy

The most important skills for the top 25 green occupations are listed in *Exhibit 3*. Critical thinking, science and complex problem solving are among the skills required for many of these occupations.⁷

Exhibit 3. Most Important Skills for Top Green Jobs

Washington State, 2009

Source: Employment Security Department/LMEA, 2009 *Washington State Green Economy Jobs Report*, online.onetcenter.org

SOC	OCCUPATION TITLE	FIRST SKILL	SECOND SKILL	THIRD SKILL
119121	Natural Sciences Managers	Science	Critical Thinking	Reading Comprehension
119151	Social and Community Service Managers	Active Listening	Speaking	Social Perceptiveness
151031	Computer Software Engineers, Applications	Programming	Critical Thinking	Complex Problem Solving
151032	Computer Software Engineers, Sys. Software	Complex Problem Solving	Technology Design	Troubleshooting
151041	Computer Support Specialists	Active Listening	Speaking	Reading Comprehension
151051	Computer Systems Analysts	Active Learning	Reading Comprehension	Complex Problem Solving
171011	Architects, Except Landscape and Naval	Active Listening	Critical Thinking	Complex Problem Solving
171012	Landscape Architects	Time Management	Coordination	Active Listening
171022	Surveyors	Reading Comprehension	Mathematics	Writing
172051	Civil Engineers	Mathematics	Critical Thinking	Complex Problem Solving
192031	Chemists	Science	Complex Problem Solving	Reading Comprehension
192041	Environmental Scientists and Specialists	Reading Comprehension	Speaking	Critical Thinking
192042	Geoscientists	Reading Comprehension	Active Listening	Speaking
192043	Hydrologists	Science	Reading Comprehension	Writing
193021	Market Research Analysts	Reading Comprehension	Time Management	Writing
*193091	Anthropologists and Archeologists	Science	Reading Comprehension	Critical Thinking
194091	Environmental Science and Protection Techs	Reading Comprehension	Active Listening	Writing
273042	Technical Writers	Reading Comprehension	Writing	Time Management
*292034	Radiologic Technologists and Technicians	Speaking	Active Listening	Operation and Control
339021	Private Detectives and Investigators	Active Listening	Writing	Critical Thinking
372011	Janitors and Cleaners	Reading Comprehension	Active Listening	Speaking
373011	Landscaping and Groundskeeping Workers	Equipment Maintenance	Active Listening	Speaking
474041	Hazardous Materials Removal Workers	Operation Monitoring	Active Listening	Critical Thinking
537062	Laborers and Freight, Stock, Material Movers	Active Listening	Reading Comprehension	Instructing
537081	Refuse and Recyclable Material Collectors	Active Listening	Coordination	Equipment Maintenance

*The skill ranking was determined by a matching the combined O*NET detailed skill ranking by importance from the top six skills from both O*NET codes 19-3091.01; 19-3091.02 and 29-2034.01; 29-3091.02.*

⁷ Education and training requirements for these occupations are listed in Table 10 of the 2009 *Washington State Green Economy Jobs* report. The report is available online at: www.workforceexplorer.com/admin/uploadedPublications/10258_Green_Jobs_Report_for_Web_2009.pdf.

Green Economy Jobs in the Forest Products Industry

High demand green forest products industries

Industry projections for 2008 to 2018 show the top five forest products industries with green jobs will grow slower than the state average of .09 percent, and four of the five industries are projected to contract (*Exhibit 4*). This negative projected growth rate makes identifying high demand forest products industries challenging.

Though the growth rates are low, two of these industries could be strategically targeted because they show stronger growth relative to the other three industries. Support activities for forestry was the only green industry to see positive projected growth, adding an average 0.4 percent to its employment base annually over the 10-year projection period. Sawmills could also be considered strategic as it has the largest estimated green employment, and annual projected employment losses are as high as the other three industries combined.

Exhibit 4. Top 5 Forest Products Industry High Growth Potential Green Industries

Washington State, 2009

Source: Employment Security Department/LMEA, 2009 Washington State Green Economy Jobs Report

NAICS	INDUSTRY TITLE	2009 ESTIMATED GREEN JOBS	2008-2018 AVERAGE ANNUAL GROWTH
115310	Support Activities for Forestry	283	0.4%
321113	Sawmills	482	-1.1%
113310	Logging	321	-1.6%
321920	Wood Container and Pallet Manufacturing	151	-1.8%
321999	All Other Misc. Wood Product Manufacturing	49	-1.8%



Projections for 2008 to 2018 show the top five forest products industries with green jobs will grow slower than the state average.



Photo by ©iStock/Ligonography

Current and projected green jobs recruitment in the forest products industry

Using data from the Spring 2010 Job Vacancy Survey report and occupational projections, we can gauge current and future needs for workers in the forest products industry in Washington state. Janitors and cleaners and production workers were the two occupations with green jobs showing the highest projected growth.

Based on the amount of time positions remained vacant, three occupations in the forest products industry showed signs of being difficult to fill: truck drivers, heavy and tractor-trailer; water and liquid waste treatment plant and system operators; and carpenters. Vacancies in each of these occupations were more likely to be open for more than 60 days.

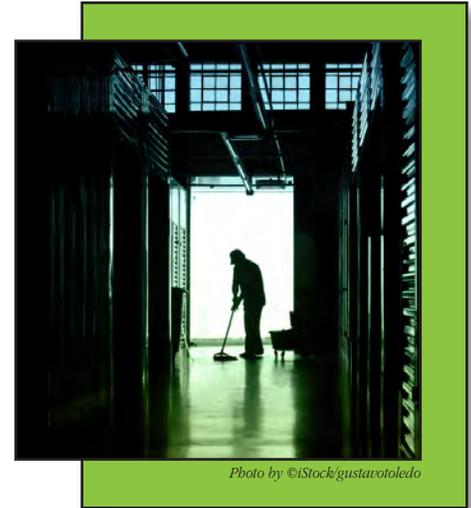


Photo by ©iStock/gustavotoleado

Exhibit 5. Top 10 Washington State Green Jobs in the Forest Products Industry in Terms of Potential Job Growth Washington State, 2009

Source: Employment Security Department/LMEA, 2009 Washington State Green Economy Jobs Report

SOC	OCCUPATION TITLE	ESTIMATED FOREST PRODUCTS GREEN JOBS 2009	SPRING 2010 VACANCIES	PERCENT OPEN BEYOND 60 DAYS	2008-2018 AVERAGE ANNUAL GROWTH
372011	Janitors and Cleaners	35	268	10.0%	1.6%
519199	Production Workers, All Other	125	277	10.0%	1.0%
332011	Fire Fighters	30	5	0.0%	0.8%
518031	Water and Liquid Waste Treatment Plant and System Operators	30	12	66.0%	0.8%
533032	Truck Drivers, Heavy and Tractor-Trailer	56	226	69.0%	0.5%
191031	Foresters	89	0	0.0%	0.1%
472073	Operating Engineers and Other Construction Equip. Operators	122	3	0.0%	0.0%
517041	Sawing Machine Setters, Operators and Tenders, Wood	88	5	0.0%	-0.4%
454011	Forest and Conservation Workers	143	0	0.0%	-0.9%
472031	Carpenters	23	77	33.0%	-0.9%

Skill requirements of the green economy in the forest products industry

Skill sets are available for nine of the top 10 green forest product industry occupations. As shown in *Exhibit 6*, active listening is the most common skill requirement, necessary in nine of the 10 occupations. Equipment maintenance and equipment selection were skills common to five of the 10 occupations with green jobs in the forest products industry.⁸

Exhibit 6. Most Important Skills for Top Green Jobs in the Forest Products Industry Washington State, 2009

Source: Employment Security Department/LMEA, 2009 Washington State Green Economy Jobs Report, online.onetcenter.org

SOC	OCCUPATION TITLE	FIRST SKILL	SECOND SKILL	THIRD SKILL
191031	Foresters	Time Management	Coordination	Science
332011	Fire Fighters	Equipment Maintenance	Active Listening	Judgment and Decision Making
372011	Janitors and Cleaners	Reading Comprehension	Active Listening	Speaking
454011	Forest and Conservation Workers	Equipment Selection	Active Listening	Coordination
472031	Carpenters	Mathematics	Time Management	Critical Thinking
472073	Operating Engineers and Other Construction Equipment Operators	Active Listening	Equipment Maintenance	Equipment Selection
517041	Sawing Machine Setters, Operators and Tenders, Wood	Operation and Control	Equipment Maintenance	Operation Monitoring
518031	Water and Liquid Waste Treatment Plant and System Operators	Reading Comprehension	Operation and Control	Troubleshooting
519199	Productions Workers, All Other	Skills data NOT available on O*NET		
533032	Truck Drivers, Heavy and Tractor-Trailer	Equipment Maintenance	Active Listening	Time Management

The skill ranking was determined by a matching the combined ONET detailed skill ranking by importance from the top six skills from both ONET codes 19-3091.01; 19-3091.02 and 29-2034.01; 29-3091.02.

⁸ Education and training requirements for these occupations are listed in Table 4 of the 2009 Washington State Green Economy Jobs – Forest Products Industry report. The report is available online at: www.workforceexplorer.com/admin/uploadedPublications/10468_Green_Jobs_ForestProducts_09Wex.pdf.

Family-sustaining Wages and Benefits

Occupations with green jobs have a wide range of earnings, from a low of \$33,309 for construction laborers to a high of \$102,417 for construction managers. Most occupations, including green jobs, are between these two extremes. Benefits data are not available at the occupation level.

Exhibit 7 shows the distribution of statewide median annual earnings for the top 25 occupations with private- and public-sector green jobs.⁹ The large employment numbers and associated earnings for these occupations suggest that green jobs provide considerable economic benefits to citizens and the state. The top 25 green occupations account for more than an estimated \$3.5 billion in average annual earnings. Estimated annual earnings for all green jobs are \$5.1 billion.

As shown, median annual earnings are generally highest for professional or technical occupations requiring long-term, post-secondary education and degrees. Managers, all other, command the highest median earnings at \$102,417, and engineers and architects account for the second-highest earnings level (\$71,000 to \$85,000) among the top 25 occupations.

The next tier of earnings includes a variety of skilled-trades jobs, such as carpenters, electricians and operating engineers. As a group, skilled-trades occupations related to the construction industry represent the largest employment in green jobs, with median annual earnings ranging from approximately \$40,000 to \$55,000.



Photo by ©iStock/Josh Hodge

Median annual earnings are generally highest for professional or technical occupations requiring long-term, post-secondary education and degrees.



Photo by ©iStock/Endopack

⁹ This information is from the 2009 *Washington State Green Economy Jobs* report.

Exhibit 7. Statewide Median Annual Earnings** for the Top 25 Occupations with Private- and Public-Sector Green Jobs, 2009
 Washington State, 2009
 Source: Employment Security Department/LMEA, 2009 Washington State Green Economy Jobs Report, Occupational Employment Statistics Survey

OCCUPATION TITLE	MEDIAN ANNUAL EARNINGS**	PRIVATE- AND PUBLIC-SECTOR GREEN JOBS WITHIN OCCUPATIONS
Managers, All Other*	\$102,417	2,020
Engineers, All Other*	\$94,362	1,262
Electrical Engineers	\$82,524	1,333
Environmental Engineers	\$78,251	2,057
Civil Engineers	\$75,362	5,772
Architects, except Landscape and Naval	\$71,228	2,232
Farm, Ranch and Other Agricultural Managers	\$70,231	1,206
Urban and Regional Planners	\$64,466	1,148
Environmental Scientists and Specialists, including Health	\$61,649	2,222
Electricians	\$56,961	5,467
Operating Engineers and Other Construction Equipment Operators	\$54,132	1,436
Plumbers, Pipefitters and Steamfitters	\$53,230	1,377
Heating, Air Conditioning and Refrigeration Mechanics and Installers	\$49,747	3,012
Carpenters	\$47,037	4,963
Bus Drivers, Transit and Intercity	\$43,491	4,626
Roofers	\$42,518	1,380
Truck Drivers, Heavy and Tractor-Trailer	\$40,909	2,659
Maintenance and Repair Workers, General	\$38,430	3,282
Agricultural Workers, All Other*	\$34,922	7,292
Bus Drivers, School	\$34,697	1,731
Painters, Construction and Maintenance	\$33,354	1,851
Construction Laborers	\$33,309	3,812
Production Workers, All Other*	\$26,809	1,983
Packers and Packagers, Hand	\$20,342	1,674
Retail Salespersons	N/A	1,106
Total of Private- and Public-Sector Green Jobs within Top 25 Occupations		66,901
Total of All Other Private- and Public-Sector Green Jobs, All Occupations		32,418
Total of All Private- and Public-Sector Green Jobs		99,319

*Occupational titles ending with “All Other” are considered residual and combine occupations which don’t fit into other detailed codes.

**The earnings data are derived from all occupations, not just occupations with green jobs. Estimated total wages for the top 25 occupations with green jobs are \$3.519 billion dollars and for all occupations with green jobs are \$5.133 billion dollars.

N/A - Data are not available.

Conclusion

Fifteen Washington industries with green jobs have 10-year growth projections above the state average. Electrical equipment manufacturing, management and technical consulting services and services to buildings and dwellings are projected to have the most growth. Current and projected recruitment for green jobs is highest for market research analysts, landscaping and groundskeeping workers and radiologic technologists and technicians. Employers had the most difficulty filling positions for software engineers. Critical thinking, science and complex problem solving are among the skills required for the top 25 green occupations.

For the period between 2008 and 2018, forest products industries with green employment are expected to contract 1.5 percent annually. The only forest products industry with projected growth is support activities for forestry. Occupations with the most projected growth include janitors and cleaners and production workers. Employers had the most difficulty recruiting heavy truck and tractor-trailer drivers and water and liquid waste treatment plant and system operators. Skills for green economy jobs in the forest products industry include equipment maintenance and selection and active listening.



Photo by ©iStock/WoodenDinosaur

Current and projected recruitment for green jobs is highest for:

- Market research analysts
- Landscaping and groundskeeping workers
- Radiologic technologists and technicians