

2008 Washington State Green Economy Jobs *Addendum*



Employment Security Department
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Labor Market and Economic Analysis
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**Washington State
Employment Security Department**

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In 2008, the Washington Legislature passed Engrossed Second Substitute House Bill 2815, which created a framework to reduce greenhouse gases and increase clean-energy job sectors. Section 9 of the bill called for a baseline study of the state's green-economy jobs. The study would identify high-demand green industries and ways to create new green jobs, and would guide policies to support future growth of the state's green economy. The baseline study also created operational definitions for the green economy and used a random sample design to survey private-sector organizations.

While the *2008 Washington State Green Economy Jobs* report focused on establishing a baseline measure to track industry and job growth, this follow-up information focuses on three major areas:

- skill requirements for green occupations,
- career pathways, and
- wage and benefit ranges of jobs within green industries.

Executive Summary

Green-Skill Requirements – Most green jobs are not unique jobs with a new set of skills and knowledge, but rather, existing jobs with “a green focus.” The majority of the ten top-paying green occupations require advanced education and skills. These top-paying green jobs comprise such occupations as managers, engineers, and architects. Within this report, *Table 1* lists specific skills needed for these occupations.

Career Pathways – Many of the top-paying green occupations require medium- to long-term training of one to four years, usually require a bachelor's degree, and can earn from \$70,000 to \$82,000 annually.

Health Benefits – Of the top ten high-wage green occupations, the highest percentage of firms offering employee health benefits were firms that performed professional and technical services. Within that industry, 80 percent offered medical coverage to their full-time employees and 50 percent offered dental coverage.

Major Findings

Of the ten top-paying green occupations, the majority require a bachelor's degree or more, but a few require short-term preparation (for example, sheet metal workers and hazardous metal removal workers require apprenticeships or technical training of less than a year).

Industries that are most likely to employ the top ten green occupations by wage tended to offer more medical and dental benefits to their employees. These industries included professional, scientific, and technical services and manufacturing, with more than 70 percent offering medical benefits and more than 50 percent offering dental benefits to full-time employees. Construction firms offered medical benefits to a little over half of their employees. Administrative and support and waste management occupations offered full-time employees the least amount of benefits of the top four industry sectors, with 41 percent being offered medical and 29 percent offered dental benefits.

Following the completion of the *2008 Washington State Green Economy Jobs* report that was mandated by the Engrossed Second Substitute House Bill 2815, three items that were cited in the legislation required additional research.

This addendum includes:

- Descriptions of the skill requirements of green occupations.
- An outline of career pathways.
- Wage occupations and benefit ranges of jobs within green-economy industries.

Green jobs were defined as jobs that promote environmental protection and energy security. Green jobs are jobs that were reported in industries and businesses engaged in energy efficiency, preventing and reducing pollution, renewable energy and mitigation or cleaning up pollution.

Description of Data and Methodology

- I. **Occupations by Green-Occupation Skill Sets:** *Table 1* data for green occupations rely on existing skill-set data.

The data sources also provide knowledge requirements for each occupation listed:

www.workforceexplorer.com and O*net online (online.onetcenter.org and onetcodeconnector.org).

- II. **Green-Occupation Career Pathways:** *Table 2* shows a career pathways chart for the top ten high-wage green jobs.

- III. **High-Wage Occupations and Industry Benefits:** For this analysis, high-wage or family-sustaining wages are defined as “*the median wage or above.*”¹

Table 3 includes green-industry sectors, broken out by high-wage occupations and benefit ranges. The data for wages and skills cover all industries and occupations of which green industries and occupations are a part (Sources: www.workforceexplorer.com and O*net online (online.onetcenter.org and onetcodeconnector.org)).

The benefits range data were pulled from the most recent job benefits survey data developed by Employment Security Department’s Labor Market and Economic Analysis branch (LMEA). The data were matched by the North American Industry Classification System (NAICS) to fit the job benefits data.

- I. **Occupations by Green-Occupation Skill Sets**

Table 1 outlines some current knowledge and skill sets for the top-paying green occupations from the 2008 *Washington State Green Economy Jobs* report.

The top-paying occupations comprise four different occupational groups:

- Architects and Engineers
- Construction
- Life and Physical Sciences
- Management Occupations

Most green jobs are not unique jobs with a new set of skills and knowledge, but rather, existing jobs with “a green focus.”

¹Source of wage data is from the March 2008 Occupational Employment Statistics (OES) Survey, Employment Security Department, LMEA

The majority of the ten top-paying green occupations require advanced education and skills. For example, additional specialized training in green processes will be needed in many engineering professions.

Table 1: Skill Sets of Top Ten Green Occupations with Median Annual Wages²

Architecture and Engineering Occupations			
Civil Engineers – \$76,425	Mechanical Engineers – \$82,616	Electrical Engineers – \$81,486	Architects – \$70,398
Skills: <ul style="list-style-type: none"> • Reading Comprehension - • Complex Problem Solving - • Critical Thinking - • Active Listening - • Coordination - • Judgment and Decision Making - • Speaking - Knowledge: <ul style="list-style-type: none"> • Engineering and Technology - • Building and Construction - • Design - • Mathematics - • English Language - 	Skills: <ul style="list-style-type: none"> • Mathematics - • Complex Problem Solving - • Critical Thinking - • Reading Comprehension - • Science - Knowledge: <ul style="list-style-type: none"> • Engineering and Technology - • Mechanical - • Design - • Production and Processing - • Mathematics - 	Skills: <ul style="list-style-type: none"> • Active Listening - • Troubleshooting - • Critical Thinking - • Reading Comprehension - • Technology Design - Knowledge: <ul style="list-style-type: none"> • Engineering and Technology - • Computers and Electronics - • Mathematics - • English Language - • Design - 	Skills: <ul style="list-style-type: none"> • Active Listening - • Critical Thinking - • Complex Problem Solving - • Time Management - • Reading Comprehension - Knowledge: <ul style="list-style-type: none"> • Building and Construction - • Design - • Engineering and Technology - • English Language - • Administration and Management - • Mathematics -
Construction and Extraction Occupations			Life, Physical and Social Sciences Occupations
First-Line Supervisors/Managers of Construction – \$70,281	Hazardous-Materials Removal Workers – \$65,148	Sheet Metal Workers – \$58,865	Environmental Scientists and Specialists, Including Health – \$63,620
Skills: <ul style="list-style-type: none"> • Time Management - • Coordination - • Instructing - • Judgment and Decision Making - • Speaking - Knowledge: <ul style="list-style-type: none"> • Building and Construction - • Administration and Management - • Mathematics - • Customer and Personal Service - • Mechanical - 	Skills: <ul style="list-style-type: none"> • Operation Monitoring - • Active Listening - • Critical Thinking - • Equipment Maintenance - • Equipment Selection - Knowledge: <ul style="list-style-type: none"> • Chemistry - • Mechanical - • Education and Training - • English Language - • Public Safety and Security - 	Skills: <ul style="list-style-type: none"> • Mathematics - • Active Listening - • Installation - • Equipment Selection - • Instructing - Knowledge: <ul style="list-style-type: none"> • Mechanical - • Mathematics - • Building and Construction - • Design - • Production and Processing - 	Skills: <ul style="list-style-type: none"> • Active Listening - • Reading Comprehension - • Writing - • Critical Thinking - • Speaking - Knowledge: <ul style="list-style-type: none"> • English Language - • Chemistry - • Mathematics - • Biology - • Law and Government -
Management Occupations			
Construction Managers – \$100,962		Managers, All Other – \$103,718	
Skills: <ul style="list-style-type: none"> • Critical Thinking - • Active Listening - • Monitoring - • Reading Comprehension - • Time Management - 	Knowledge: <ul style="list-style-type: none"> • Building and Construction - • Administration and Management - • Customer and Personal Service - • Engineering and Technology - • Design - • English Language - 	Skills and Knowledge data not available on O*net because it is a composite occupation.	

Source: ESD, www.workforceexplorer.com, O*net online: online.onetcenter.org and onetcodeconnector.org.

²E2SHB 2815 Section 9 (3) (a) “Employment Security in consultations with named agency shall conduct labor market research to analyze...skill requirement of green economy industry employers.”

II. Career Pathways

Table 2 is a flow chart outlining the current skills and knowledge requirements for the top-paying green occupations (Sources: Michigan Department of Energy, Labor and Economic Growth; Michigan Green Jobs Report, 2009, page 57; www.coecc.net/green, Research Preview 2009 Green Industry and Jobs in California, page 10 and 11).

The career pathways diagram illustrates the possible progression through a person's career, beginning after high school up to a company owner. It also shows the training and duration of time needed ("short," "medium" or "long-term" preparation) to reach a person's occupational goals. In many cases, the probability of a short-term progression to a CEO/company owner may not be likely, depending on the size and type of company.

Career Preparation – Each career pathway requires different levels of training, education, and experience. There are three main groups of career preparation for the top ten green jobs:

- Short-term preparation
- Medium preparation
- Long-term preparation

Short-Term – For example, a worker engaged in removing hazardous material will usually require:

- high school degree, plus
- one month to a year of technical training, or
- on-the-job training.

This occupation earns a median wage of \$63,620 a year.

A sheet metal worker is another occupation with a relatively short preparation time. It usually requires:

- high school degree, plus
- either a technical certification from a technical college, or
- completion of an apprenticeship program.

This occupation earns a median wage of \$58,886 a year.

Medium – Medium preparation for an occupation usually is associated with one to four years of training. Occupations include:

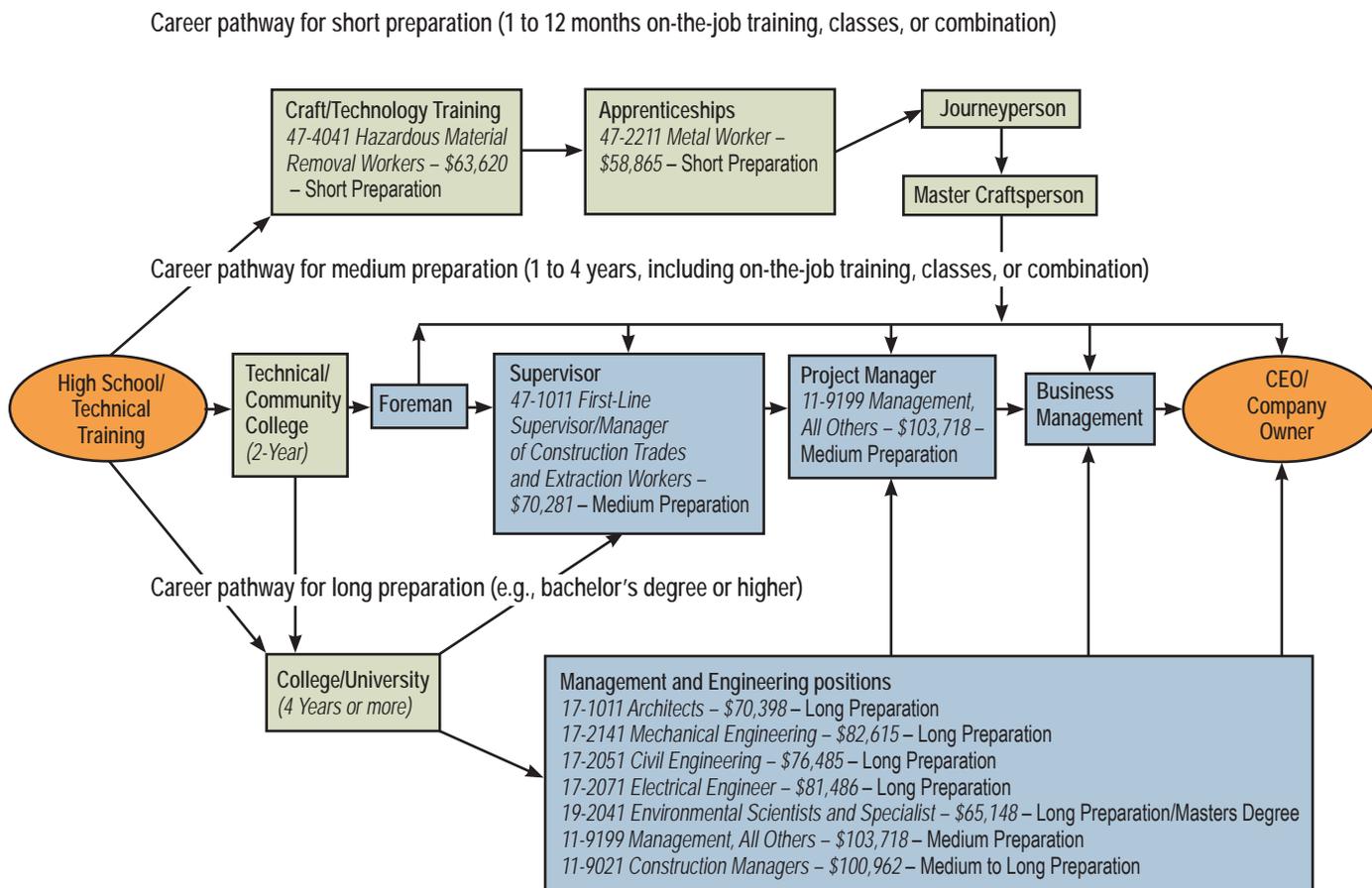
- first-line supervisors/managers of construction trades and extraction workers.

The median wage is \$100,962.

Long-Term – Long preparation for an occupation usually is associated with a bachelor's degree or higher. Occupations include:

- Architects, earning a median wage of \$70,398
- Mechanical engineers, earning \$82,616
- Civil engineers, earning \$76,425
- Electrical engineers, earning \$81,486

Table 2: The Top Ten High-Wage Green Jobs and Their Career Pathways³



KEY:
 Little Preparation: less than 1 month, usually on-the-job training
 Short Preparation: 1 to 12 months, usually on-the-job training classes or combination
 Medium Preparation: 1 to 4 years, including on-the-job training, classes or combination
 Long Preparation: e.g., bachelor's degree or higher

Source: Labor Market and Economic Analysis, 2008, www.careerinfonet.org 2008: www.org/cagrenjobs, 2008.

III. High-Wage Occupations and Benefits within Green-Economy Industries

High-Wage and Benefit Ranges – Section 9 of E2SHB 2815 requested information on high-wage occupations and benefit ranges associated with within green-economy industries. *Table 3* shows the ten top-paying green occupations and the primary industry sectors associated with those occupations, along with the percentage of firms that offer medical and dental to their part-time and full-time employees.

Four Major Industry Sectors – Although the top green occupations, based on wages, are employed across many industries, the majority of employment is in four industry sectors:

³In section 9 (4) Employment Security “...shall take into account which jobs within the green economy industries will be considered high wage occupations and occupations that are part of career pathways to the same, based on family sustaining wage benefits ranges.”

- professional, scientific, and technical services, such as civil engineering services or environmental consulting;
- construction, such as specialty trade contractors;
- administrative support and waste management and remediation services, which include remediation services involved in removing hazardous materials; and
- manufacturing, such as electrical equipment, appliance and components.

Table 3: High-Wage Green Occupations with Benefits by Main Industry Sector

Occupational Title	Primary Employer Industry Sector	Statewide Green Employment by Occupation	Full-Time Employees Percent of Firms		Part-Time Employees Percent of Firms	
			Offering Medical	Offering Dental	Offering Medical	Offering Dental
Managers, All Other	Manufacturing	396	73.6%	50.5%	7.8%	6.3%
Construction Managers	Construction	648	54.6%	34.0%	6.7%	3.8%
Mechanical Engineers	Professional, Scientific, and Technical Services	1,047	79.9%	50.7%	19.4%	13.5%
Electrical Engineers	Professional, Scientific, and Technical Services	458	79.9%	50.7%	19.4%	13.5%
Civil Engineers	Professional, Scientific, and Technical Services	2,085	79.9%	50.7%	19.4%	13.5%
Architects, Except Landscape and Naval	Professional, Scientific, and Technical Services	1,702	79.9%	50.7%	19.4%	13.5%
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	Construction	616	54.6%	34.0%	6.7%	3.8%
Environmental Scientists and Specialists, Including Health	Professional, Scientific, and Technical Serv.	409	79.9%	50.7%	19.4%	13.5%
Hazardous Materials Removal Workers	Administrative & Support and Waste Management	449	40.6%	29.1%	8.2%	7.5%
Sheet Metal Workers	Construction	401	54.6%	34.0%	6.7%	3.8%

Source: Employment Security Department, Labor Market and Economic Analysis, Washington State 2008 Green Economy Jobs; Occupations Industry Matrices, 2009; and Washington State Employee Benefits Survey Report, March 2009.

Health-Benefits Data Analysis – The highest percentage of firms offering employee health benefits were in industries composed of the highest skill level and educational attainment; professional and technical services. Of that industry, 80 percent offered medical benefits to their full-time employees, and 50 percent offered dental benefits.

Firms with the lowest percentage of employee benefits were administrative and support and waste-management industries. Only 41 percent offered medical benefits, and 29 percent offered dental benefits to their full-time employees.

Medical and Dental Benefits

Professional and technical service industry firms offered:

- medical benefits to 80 percent of full-time employees
- dental benefits to 50 percent of full-time employees
- medical benefits to 19 percent of part-time employees
- dental benefits to 14 percent of part-time employees

Construction industry firms offered:

- medical benefits to 55 percent of full-time employees
- dental benefits to 34 percent of full-time employees
- medical benefits to 7 percent of part-time employees
- dental benefits to 4 percent of part-time employees

Manufacturing industry firms offered:

- medical benefits to 74 percent of full-time employees
- dental benefits to 51 percent of full-time employees
- medical benefits to 8 percent of part-time employees
- dental benefits to 6 percent of part-time employees

Administrative & Support and Waste Management industry firms offered:

- medical benefits to 41 percent of full-time employees
- dental benefits to 29 percent of full-time employees
- medical benefits to 8 percent of part-time employees
- dental benefits to 8 percent of part-time employees