

Idaho's Green Economy Comprehensive Report

IDAHO
DEPARTMENT OF LABOR
C.L. "BUTCH" OTTER, GOVERNOR
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Idaho's Green Economy Comprehensive Report

Fall 2011



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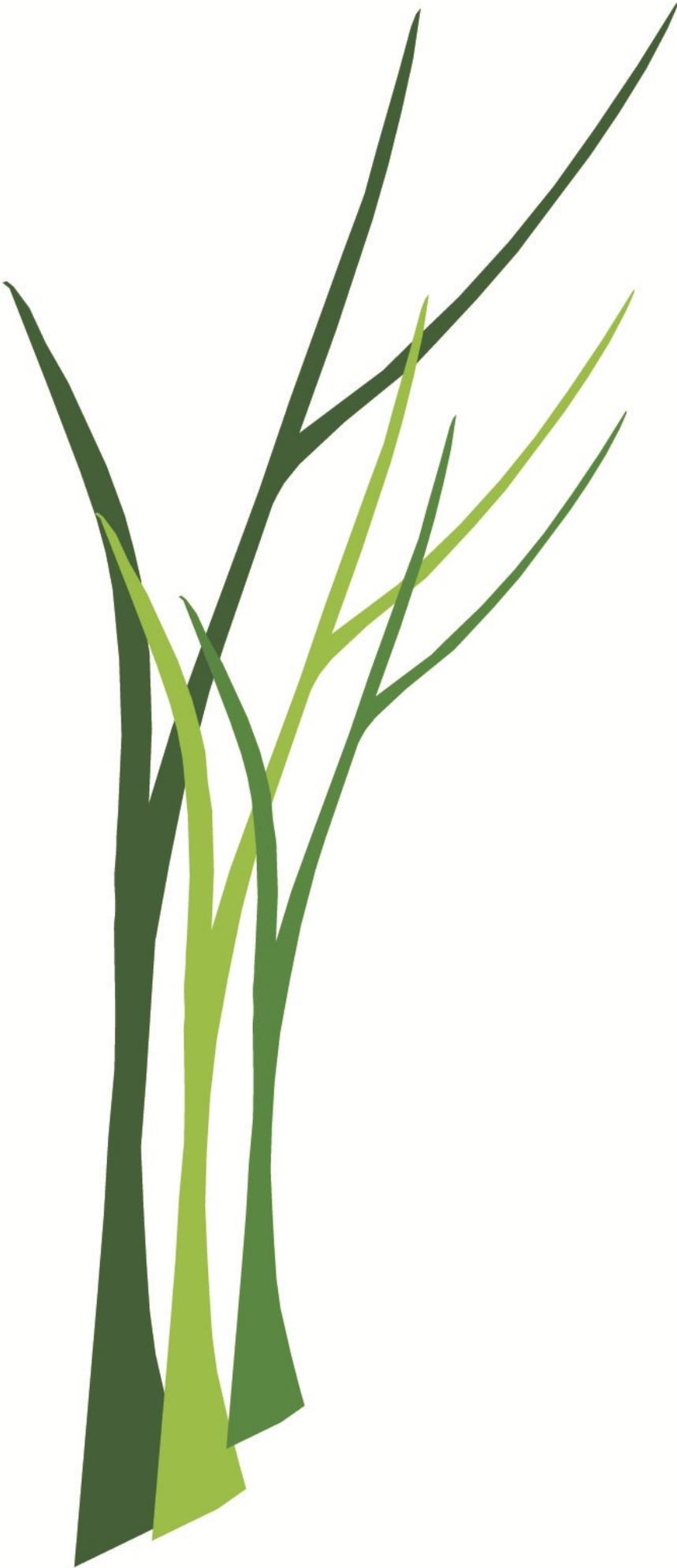
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Section I
**Idaho Green
Jobs Survey**



Executive Summary

The 2010 Idaho Green Job Survey is part of a research project funded by the American Recovery and Reinvestment Act of 2009. The purpose of the research is to establish the kinds of employment and number of jobs in Idaho that were considered to be green under a predefined definition. As the economy is expected to produce more of these types of jobs in the future, trained, skilled workers will be needed to succeed in those careers.

The Idaho Department of Labor definition:

A green job is one in which the work is essential to products or services in any of these core green areas:

- Renewable Energy and Alternative Fuels
- Energy Efficiency and Conservation
- Sustainable Agriculture and Natural Resource Conservation
- Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup.

The survey results revealed that green jobs account for 17,059 or almost 3 percent of all Idaho jobs. Almost 10 percent of Idaho's employers were estimated to have green jobs. The majority of those jobs, 32 percent, fall into the Pollution and Waste area, while jobs in the Renewable Energy and Alternative Fuels area were the least common at 17 percent.

Debunking the perception that green jobs were found only within certain industry sectors, this survey established that green employment exists in 19 of the 20 major industry classifications in Idaho. However, 60 percent of the employment is concentrated in three major industries. The industry that employed the most green workers — professional, scientific and technical services — included almost a quarter of all the green employment. Construction was next at 21 percent, followed by government at 17 percent.

In order to more closely track the industries with the most potential for green jobs growth, 23 industry subsectors – as defined by the North American Industrial Classification System or NAICS – were identified as having a higher-than-average concentration of employment in green jobs. In this report, these 23 subsectors are identified with icons representing three levels of green depending on the employment concentration. Six subsectors had the highest concentration of green employment identified with , eight had a moderately high concentration  and nine had a higher than average concentration .

The most common green job reported was construction laborer with a little more than 1,000 workers. The statewide median wage for all green jobs reported in the survey was \$17.30 per hour, which is nearly three dollars an hour more than the \$14.43 median wage for all jobs in Idaho.

The background requirements for Idaho's green jobs vary greatly, but more than half of the reported jobs require a certification and over 70 percent require experience related to the positions prior to hiring.

Over 60 percent of the green jobs were found clustered within three major occupation groups. The construction and extraction occupation group had the most green jobs with 23 percent, followed by the life, physical and social science occupation group at 19 percent and architecture and engineering occupation group with 11 percent.

Idaho Labor researchers identified 152 occupations that had a higher-than-average concentration of employment in green jobs. In this report, these 152 occupations are identified with icons representing three levels of green depending on the employment concentration. There were 48 occupations in level three  with the highest concentration of employment, 45 occupations at level two  and 59 in level one .

Of these 152 occupations, the top 20 occupations with the largest employment accounted for nearly 50 percent of all the green jobs in Idaho.

Four occupations -- heating, air conditioning and refrigeration mechanics and installers; electricians; crop, nursery and greenhouse farmworkers and laborers; and foresters -- are highlighted at the end of the report including the specific education, experience and wage information for each, which were collected from the survey. Informational interviews were conducted with employers who have workers in these green jobs to collect more in-depth qualitative information about these occupations.

When compared to the results of the Idaho Department of Labor 2010 Idaho Job Vacancy Survey conducted in spring 2010, the jobs with the most vacancies that could be classified as green were among recreation workers, heavy and tractor-trailer truck drivers and crop, nursery and greenhouse farmworkers and laborers.

The most optimistic results of the survey show that by 2012, green jobs were expected to increase 2.2 percent overall with 21 occupations having a projected increase of greater than 10 percent.

The goal of this research is to help jobs seekers and labor market professionals identify the careers of the future related to the greening of the economy and ensure future workers obtain the education, job training and experience necessary to succeed in those professions.

Introduction

The entire economy is undergoing change. Increased fuel prices are driving energy efficiency and development of renewable energy. Society is becoming more cognizant of limited natural resources and the need to sustain them. All of these things impact the work force, whether by increased environmental regulations, government incentives or a principal desire for a cleaner, pollution-free planet. This evolution is evident as demand has increased on companies that provide environmentally friendly goods and services, both new ones creating jobs in those areas and existing ones whose workers are modifying their skill sets to incorporate “green” practices.

As part of the American Recovery and Reinvestment Act of 2009, the Idaho Department of Labor received a competitively awarded State Labor Market Information Improvement grant to develop data on green industries and careers that clean and improve the environment and disseminate that information to prepare workers for careers in those occupations and industries. To obtain this information, the department surveyed businesses, conducted in-depth interviews with employers and compiled green-related education and training programs at Idaho colleges and universities.

The current system of labor market information collects data on both industries and occupations. Employers are classified by the North American Industry Classification System of codes, or NAICS, according to related production processes. Industry information is available from the Quarterly Census of Employment and Wages for number of employers, total industry employment, projected industry employment and total wages per industry.

Occupational information is available from the Occupational Employment Statistics program for total employment by occupation, occupational employment within industries and wage ranges. Occupations are classified according to the 2010 Standard Occupational Classification system, or SOC.

Labor market information for green occupations and industries is not readily available because “green” cuts across industry sectors and occupations. For example, a manufacturer can produce goods that may or may not be green. It is not possible to distinguish through the current industry codes whether a business is green. Similarly with occupations, an electrician may or may not work on projects that are considered green.

To gather information about green jobs, it was necessary to survey businesses to identify the industries that employ workers in green jobs and discover the occupations that perform work directly relating to the Idaho Department of Labor’s definition of green.

In summer 2010, the department surveyed 5,002 businesses about green jobs. For each of the green jobs, employers were asked to provide information such as the job’s education and experience requirements and expected salary.

This paper presents and analyzes the results of the 2010 Idaho Green Jobs Survey.

Definition

Before conducting the research, a definition was devised for green jobs in Idaho. Guided by the Workforce Information Council's recommendations, the Idaho Department of Labor created the following definition:

A green job is one in which the work is essential to products or services in any of these core green areas:

- Renewable Energy and Alternative Fuels**
- Energy Efficiency and Conservation**
- Sustainable Agriculture and Natural Resource Conservation**
- Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup.**

Examples of business processes in the **Renewable Energy and Alternative Fuels** category are manufacturing, production, construction, design, research, delivery, operation, storage and maintenance of wind, solar, biomass, hydro, geothermal, methane, nuclear and alternative transportation fuels such as ethanol and waste incineration as a fuel source.

The **Energy Efficiency and Conservation** area contains manufacturing, construction, installation and production of energy efficient products such as Energy Star-rated appliances and more efficient lighting, energy efficiency services, weatherization, building retrofitting/efficiency, energy efficient production processes, energy distribution improvements like the smart grid, transportation technology and battery development and storage improvement.

Sustainable Agriculture and Natural Resource Conservation refers to products and services to conserve, maintain and improve natural resources and the environment including low carbon agriculture, land management, water management and conservation, wetlands restoration, bioscience activities and environmental conservation.

Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup are activities related to controlling commercial, transportation and industrial emissions and pollution; water treatment, recycling operations, waste product management and treatment. Also included are controlling and reducing emissions of CO₂, other greenhouse gases, waste water and other pollutants. Environmental cleanup involves the cleanup and disposal of pollution, waste and hazardous materials; redevelopment of Superfund/Brownfield sites and landfill restoration. For this report, the area will also be referred to as "Pollution and Waste Control."

For this report, the terms employment and jobs are used interchangeably.

About the Survey

The 2010 Green Job Survey was designed to collect information about green occupations across all types of businesses in Idaho. The survey was distributed from June 18 through Sept. 10, 2010. The data collected helped identify industries and business processes as well as occupations throughout the state.

The random survey of 5,002 businesses drew an 81 percent response rate. The occupation and industry results were weighted and expanded by statewide employment for employers of more than two employees and weighted by Idaho Workforce Investment Act region and industry at the two-digit industry sector level.

The survey collected the following information:

- Jobs the company had where the work was essential to products or services in any of the four defined green areas: Renewable Energy and Alternative Fuels; Energy Efficiency and Conservation; Sustainable Agriculture and Natural Resource Conservation; and Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup.
- Job title and a description of the job duties.
- For each job title:
 - The total number of workers
 - An estimate of the number of workers expected to be employed in 2012
 - The number of employees working in each of the core green areas
 - Required education level
 - Required experience level
 - Typical wage or salary
 - License or certification requirement
 - Special skills required

What is and is Not a Green Job?

When conducting the survey, it became clear further clarification was needed on what constituted a green job. The official definition was that the work needed to be essential to products or services in any of the core green areas. Employers unable to distinguish whether job duties were essential were advised to determine whether workers spent at least 50 percent of their time performing the green business process.

A distinction also had to be drawn between businesses with green business practices and those with green jobs. Some businesses identified as green jobs those held by employees who merely participated in the company's green business practices. For example, if an office worker participated in a recycling program or a medical assistant performed hazardous waste disposal then the respondent would identify that job as green. However, unless a person's primary job responsibility involved a practice in one of the core green areas, that worker performing the minor green business practice would not be considered to have a green job. Research analysts followed up with businesses reporting green practices instead of green production processes to obtain an accurate response.

It is possible for a company to have green jobs related to green business practices. The office worker who recycles paper does not have a green job, but the sustainability officer who coordinates all of a company's recycling programs does.

The distinction between "direct" green jobs and "support" green jobs is also important. Companies producing green goods and services have many different types of employees. A direct green job directly affects the production of the product or service in the core green area. Truck drivers who move recycled materials would have direct involvement. These jobs are directly involved in the activity that produces revenue for the company. Examples are production workers, carpenters and engineers. "Support" green jobs do not directly affect the revenue-producing process but play an administrative or supporting role in the company. Examples of "support" green jobs are secretaries, accountants and information technology managers. The purpose of the survey was to capture only the "direct" green jobs where work is essential to one or more of the core green areas.

Overall Results of the Survey

There were an estimated 17,059 green jobs in Idaho, or 3 percent of total statewide covered employment. Green jobs were found in 19 out of 20 major industry sectors and represented 211 of the 840 unique occupations detailed in the Standard Occupational Classification system.

Other states have conducted similar studies with comparable results. Although definitions of green jobs varied widely, the percent of employment was similar. Oregon and Michigan report that 3 percent of their employment was green and California reports 3.7 percent.

IDAHO GREEN

TOTAL NUMBER OF GREEN JOBS	17,059
PERCENT OF GREEN JOBS	3%
% OF EMPLOYERS WITH GREEN JOBS	10%
% EMPLOYED BY CORE GREEN AREA	
Pollution & Waste Control	32%
Sustainable Agriculture	31%
& Natural Resource Conservation	
Energy Efficiency & Conservation	20%
Renewable Energy & Alternative Fuels	17%
Percent growth of green jobs projected by employers for 2012	2.2%
EDUCATION LEVEL	
No requirement	23%
High School Diploma/GED	27%
Some College	4%
Vocational Training	14%
Associates Degree	2%
Bachelor's Degree	23%
Advanced Degree	7%
EXPERIENCE REQUIRED	
No experience required	17%
Unrelated work experience	12%
Experience related to the position	72%
HOURLY WAGES	
\$7.25-11.00	20%
\$11.01-15.00	23%
\$15.01-20.00	20%
\$20.01-28.00	17%
>\$28.00	20%
MEDIAN WAGE	\$17.30
LICENSE OR CERTIFICATE REQUIRED	52%

Green Jobs Overall

Respondents were asked to identify one of the core green areas for each of the green jobs performed at their companies. Among the four core green areas, most jobs were split between Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup at 5,498 and Sustainable Agriculture and Natural Resource Conservation at 5,219. The other jobs were divided fairly closely between the other two areas – 3,372 jobs in Energy Efficiency and Conservation and 2,970 in Renewable Energy and Alternative Fuels.

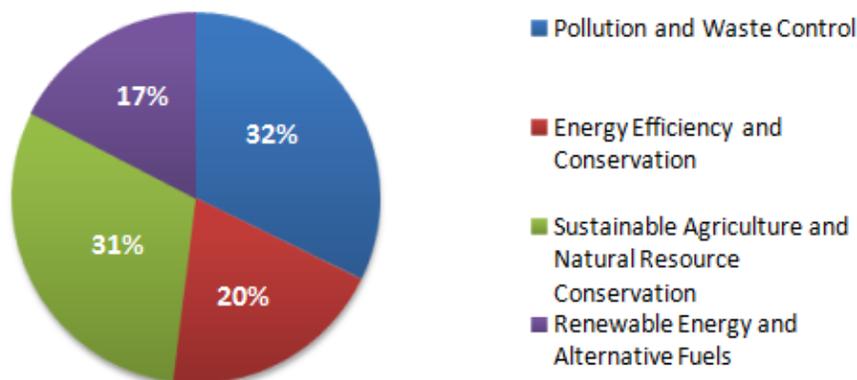
Examples of occupations reported in the Pollution and Waste Control area included hazardous materials removal workers; heavy and tractor-trailer truck drivers; environmental science and protection technicians including health; construction laborers; and refuse and recyclable material collectors.

Examples in the Sustainable Agriculture and Natural Resource Conservation area were crop, nursery and greenhouse farmworkers and laborers; zoologists and wildlife biologists; landscaping and groundskeeping workers; environmental scientists and specialists including health; and foresters.

Occupations found in the Energy Efficiency and Conservation area were heating, air conditioning and refrigeration mechanics and installers; construction laborers; plumbers, pipefitters and steamfitters; and roofers.

Renewable Energy and Alternative Fuels occupations included nuclear engineers, solar photovoltaic installers, electricians, wind turbine service technicians and earth drillers except for oil and gas.

Figure 1: Percent of Green Jobs by Core Green Area



Characteristics of Green Jobs

Businesses were asked to specify an exact wage for their green jobs. Those respondents unwilling to provide an exact wage were asked to provide the wage for which they would hire a person to perform that job. The average wage reported for all green jobs was \$20.50 an hour compared to the average of \$18.22 for all jobs in Idaho. The median wage reported for all green jobs was \$17.30 an hour compared to \$14.43 for all jobs, according to the Idaho Occupational Employment and Wage Survey 2010.

For each green occupation, the respondent was asked to provide the usually required education level. The selections included 1) no requirement, 2) high school diploma or GED, 3) some college, 4) vocational training, 5) associate degree, 6) bachelor's degree or 7) advanced degree.

Twenty-three percent of respondents did not specify a required education level — no requirement. Analyzing the remaining 77% of jobs that specified education requirements, 64 percent of those required education beyond high school. At least a bachelor's degree was required for nearly 40 percent of the green jobs with specified education levels.

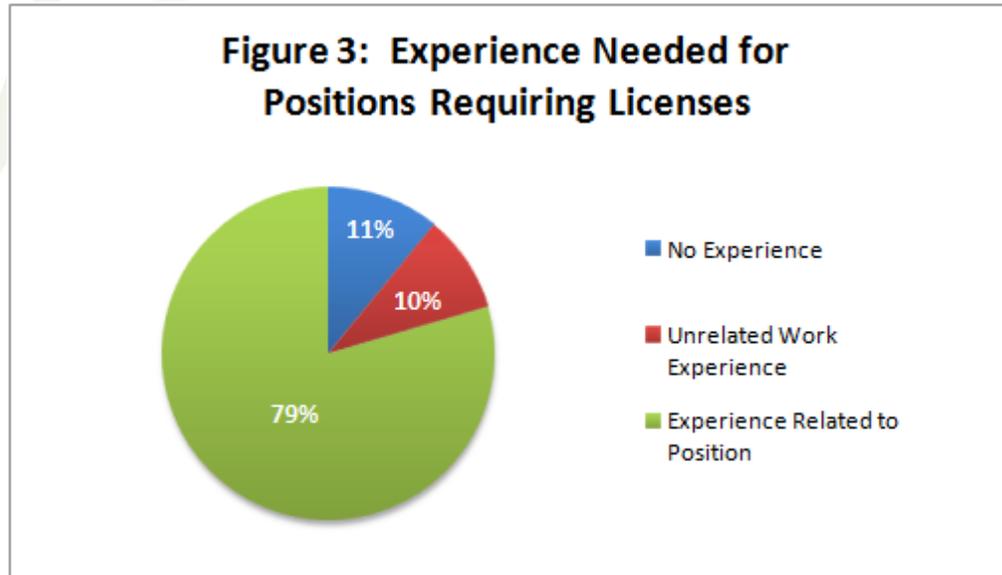
An important finding from the survey is that certifications and licenses were required for over half, or 52 percent, of the green jobs. Examples were wastewater operator's license, commercial driver's license, certified landscape technician, journeyman electrician's license, professional engineer's license, HAZMAT — hazardous materials — certification and LEED — Leadership in Energy and Environmental Design — certifications offered by the U.S. Green Building Council.

Certifications and licenses were required among all levels of education, even those jobs that listed “no requirement” for education. Jobs mandating vocational training and advanced degrees most often required certification. Occupations requiring vocational training were primarily the trades such as electrician, plumber and HVAC — heating, ventilating and air conditioning installer. Those requiring advanced degrees were often engineers in areas like nuclear and environmental engineering.

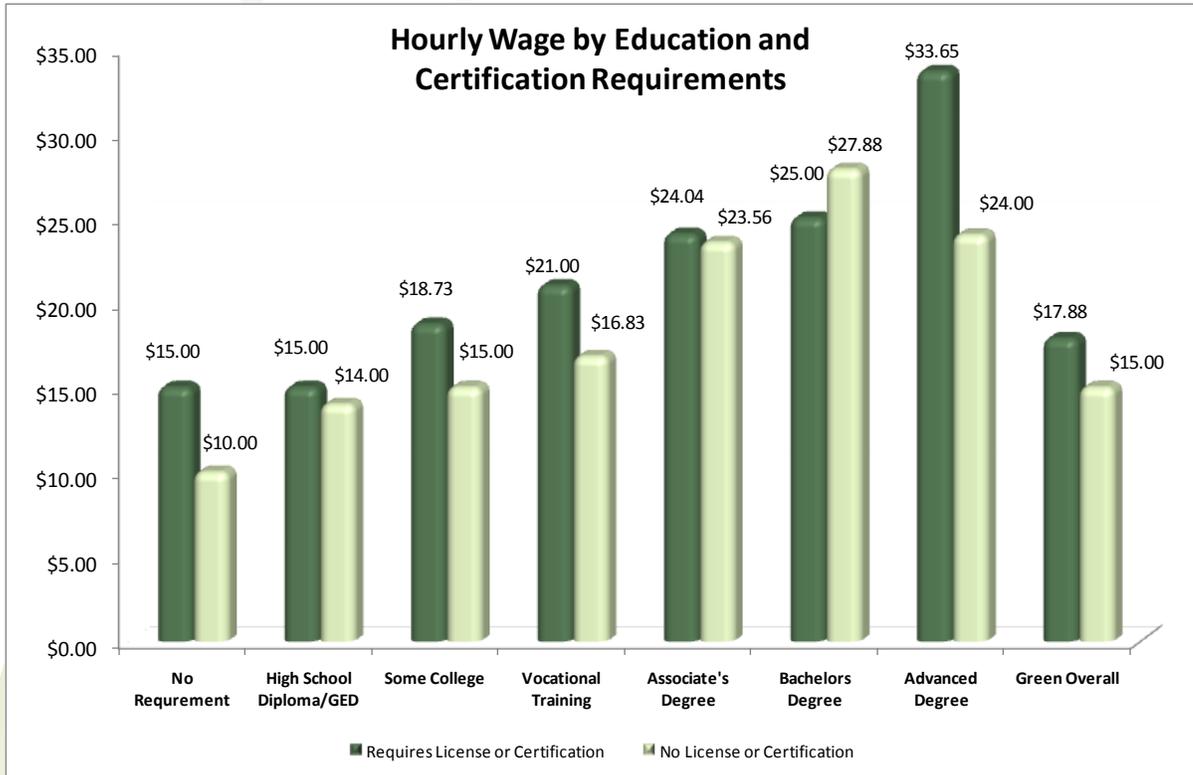
Jobs Requiring Certification or License by Education Requirement	
Education	Certification/ License
No Requirement	41%
High School Diploma/GED	51%
Some College	30%
Vocational Training	93%
Associates Degree	11%
Bachelor’s Degree	40%
Advanced Degree	64%
Total	52%

Interestingly, employers responded that 23 percent of their jobs had no requirement for education but designated that 41 percent of those jobs required a license or certification. This finding is telling in that either many employers do not consider licensing or certification as part of formal education, or they are less concerned with the education requirements for the license or certificate as long as the applicant has the required credential.

Along those lines, experience was the most sought after criteria. Respondents were asked what level of experience their green jobs required. Most green jobs – 72 percent – required experience related to the position. And by far, most green jobs requiring licenses or certificates also required experience related to the position – nearly 80 percent. So regardless of whether licenses were required, work experience will most likely be needed for those wanting to obtain a green job.



As would be expected, higher wages were reported when more education was required. A certification or license also generally resulted in higher wages.

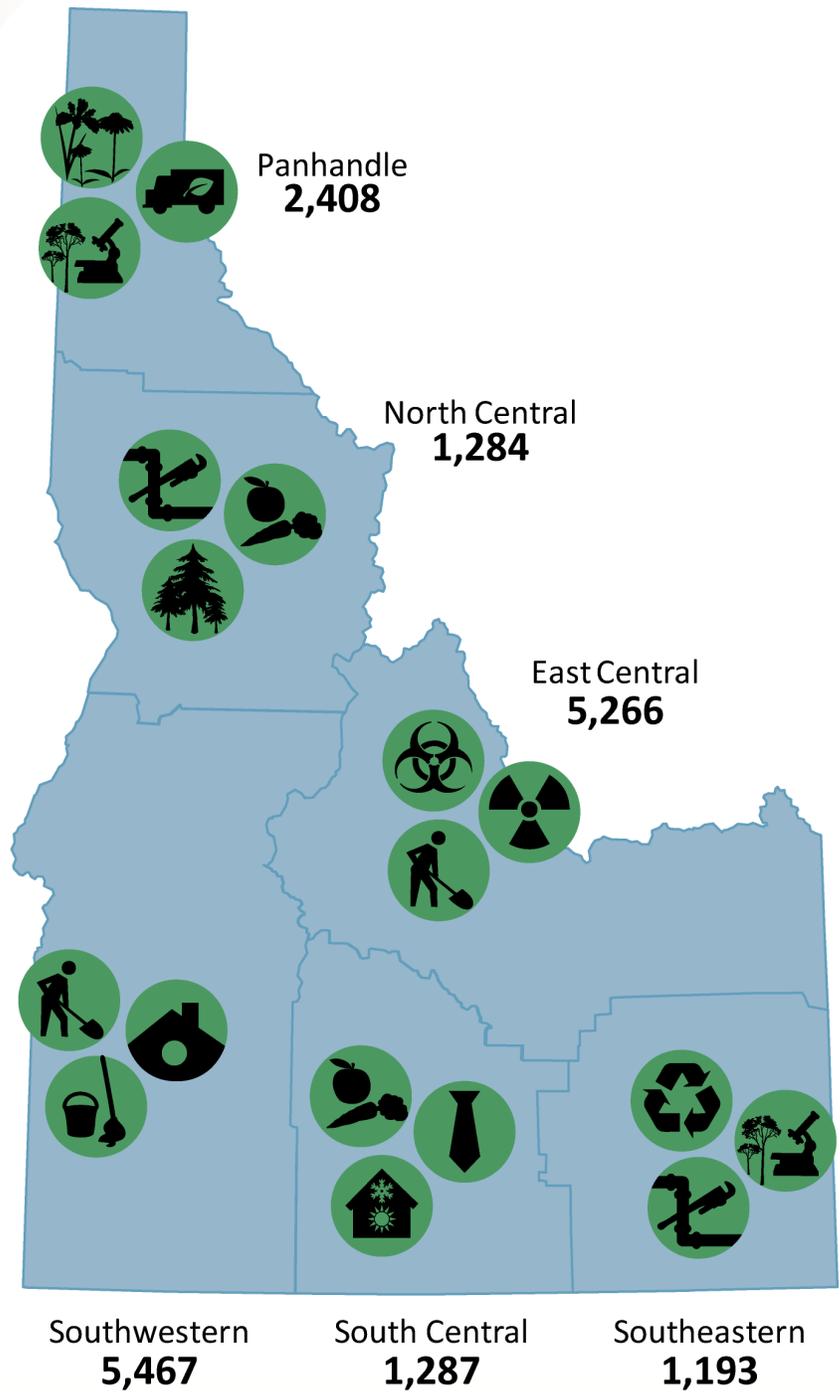


Regional Distribution of Green Jobs

Because of the small percentage of jobs reported overall — 3 percent statewide — caution must be used when interpreting employment numbers regionally. However in the interest of providing descriptive information, the results are reported in the maps on the following page and on page 28.

Green Jobs and Top Occupations by Region

-  Construction Laborers
-  Environmental Science and Protection Technicians, Including Health
-  Farmworkers and Laborers, Crop, Nursery and Greenhouse
-  Foresters
-  General and Operations Managers
-  Hazardous Materials Removal Workers
-  Heavy and Tractor-Trailer Truck Drivers
-  Heating, Air Conditioning, and Refrigeration Mechanics and Installers
-  Janitors and Cleaners, Except Maids and Housekeeping Cleaners
-  Landscaping and Groundskeeping Workers
-  Nuclear Technicians
-  Plumbers, Pipefitters and Steamfitters
-  Refuse and Recyclable Material Collectors
-  Roofers

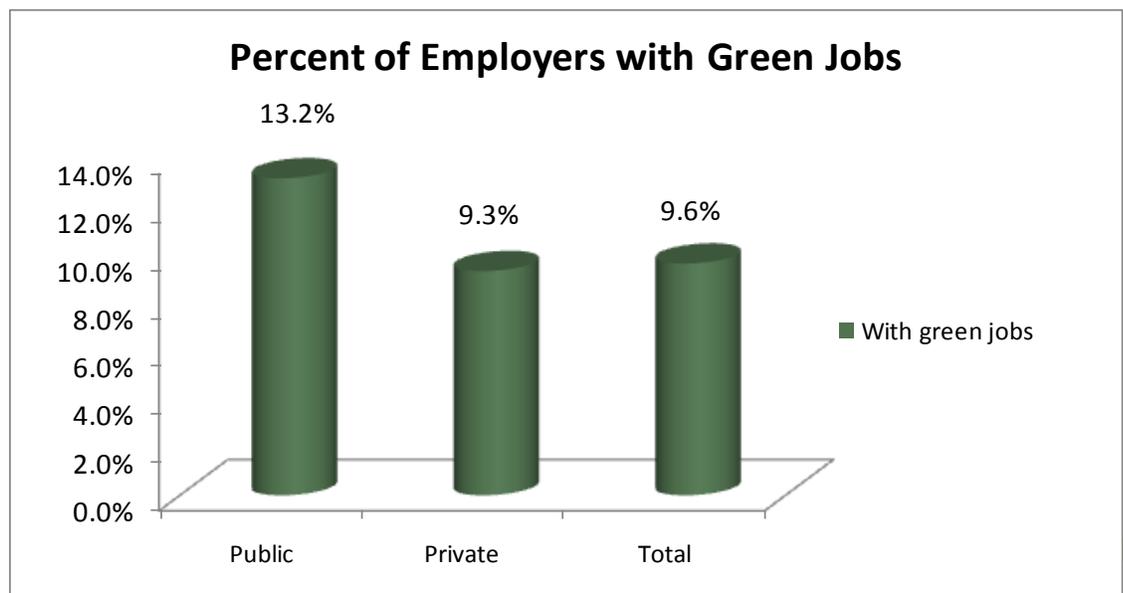
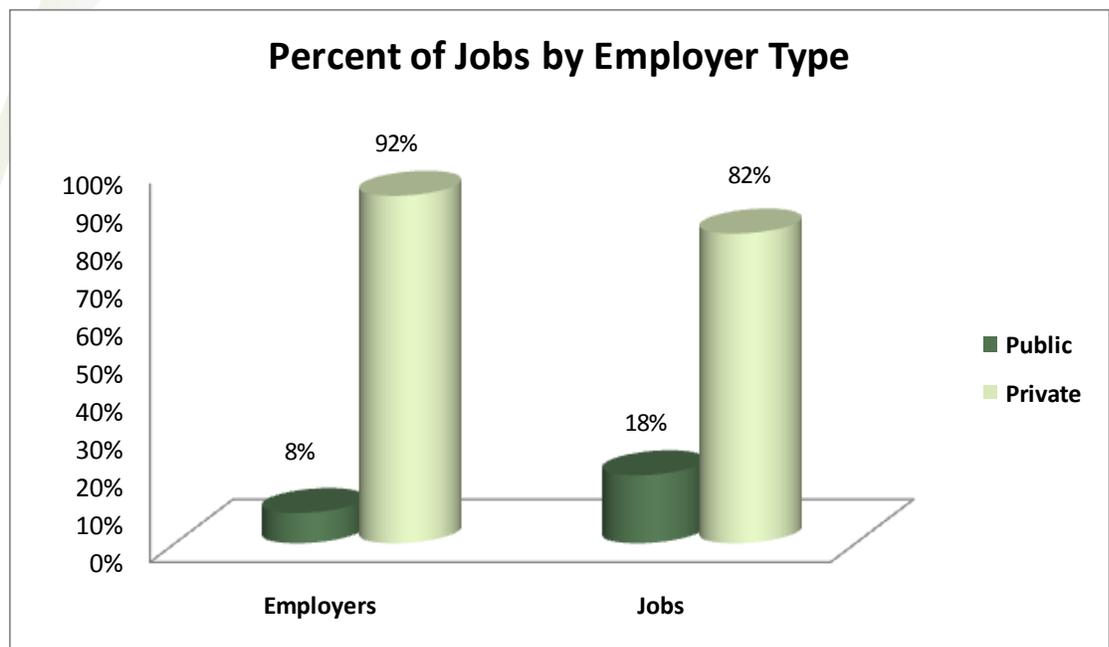


Employers with Green Jobs

An estimated 3,255 employers had green jobs, which is 9.6 percent of all employers.

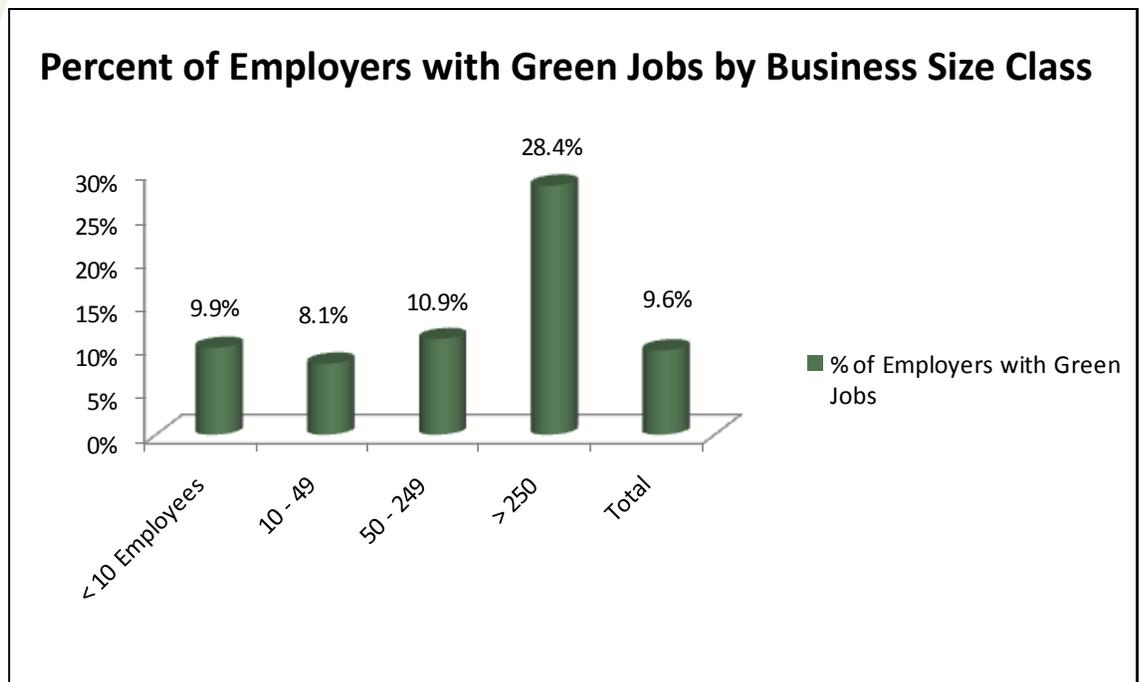
Ninety-two percent of employers with green jobs were privately owned and 8 percent were public sector. Private employers provided 82 percent of green jobs while the public sector provided 18 percent. Public sector employers include all levels of government plus public schools and public utilities.

However, a larger portion of government employers were green, – 13.2 percent – compared to the private sector at 9.3 percent.



When categorizing employers by the actual number of workers they employ, more businesses in the size class of fewer than 10 employees reported having green jobs. Percentage-wise, however, out of all employers surveyed, 28 percent of those who employed more than 250 workers reported having green jobs.

Number of Employers by Size Class	
# Employees	Employers with Green Jobs
Less than 10	1,443
10 - 49	916
50 - 249	848
250 or more	48
Total	3,255



The industry sector construction joined utilities, government and agriculture with the largest concentrations of employers with green jobs. The percent of employers varied widely by industry sector as shown in the table below.

The industries with the smallest numbers of employers were information; management of companies and enterprises; and mining, quarrying and oil and gas extraction sectors. The finance and insurance sector did not have enough businesses report to include in the analysis.

Employers were asked to describe business operations or processes that were green. Their answers were diverse. The more common included recycling; protecting forests, fish and wildlife; water and wastewater management; LEED (Leadership in Energy and Environmental Design) construction; solar and wind energy and Energy Star appliance installation.

Industry Sector Green Employers, Ranked by Concentration of Green Jobs

Industry Code	Industry Sector	Number of Employers	% of All Employers with Green Jobs	% of Sector Employers with Green Jobs
	Total	3,255	100%	10%
22	Utilities	68	2%	32%
23	Construction	1,101	34%	29%
92	Government	265	8%	27%
11	Agriculture, Forestry, Fishing and Hunting	312	10%	20%
71	Arts, Entertainment, Recreation	60	2%	13%
56	Administrative, Support, Waste Management, Remediation Services	200	6%	12%
54	Professional, Scientific, Technical Services	301	9%	12%
42	Wholesale Trade	201	6%	11%
21	Mining, Quarrying and Oil and Gas Extraction	11	<1%	11%
31-33	Manufacturing	150	5%	10%
44-45	Retail Trade	280	9%	6%
81	Other Services except Government	120	4%	6%
48-49	Transportation and Warehousing	67	2%	6%
55	Management of Companies, Enterprises	9	<1%	4%
61	Educational Services	33	1%	3%
53	Real Estate, Rental, Leasing	17	1%	2%
72	Accommodation, Food Services	36	1%	1%
51	Information	^	<1%	1%
62	Health Care, Social Assistance	15	<1%	<1%
52	Finance, Insurance	--	--	--

^Suppressed to ensure respondent confidentiality.

Industries

Every industry is vital to Idaho's overall economy, although the most direct effect on the green economy through green employment is with some of Idaho's smaller industry sectors. At the same time, Idaho's industry sectors with the largest employment did not have large numbers of green jobs. For instance, with almost 80,000 employees, health care and social assistance is Idaho's largest sector but provided less than 1 percent of green employment. Idaho's second largest industry sector, retail trade, employs just over 76,000 and was sixth in estimated green employment at just under 800 green jobs. Nineteen of the 20 NAICS sectors had green jobs counted for this report.

Idaho's Largest Industry Sectors by Number of Jobs

Code	NAICS Industry Sector	Statewide Est. Green Jobs	Statewide Jobs	Rank by Jobs	% Statewide Jobs
62	Health Care and Social Assistance	56	79,726	1	13.3%
44-45	Retail Trade	792	76,298	2	12.8%
61	Educational Services	136	57,637	3	9.6%
31-33	Manufacturing	1,388	53,402	4	8.9%
72	Accommodation and Food Services	53	49,295	5	8.2%
92	Government	2,893	43,137	6	7.2%
56	Administrative and Support and Waste Management and Remediation Services	779	37,853	7	6.3%
23	Construction	3,534	32,349	8	5.4%
54	Professional, Scientific and Technical Services	4,187	29,572	9	4.9%
42	Wholesale Trade	692	24,695	10	4.1%
11	Agriculture, Forestry, Fishing and Hunting	1,289	22,162	11	3.7%
48-49	Transportation and Warehousing	330	19,940	12	3.3%
52	Finance and Insurance	--	19,816	13	3.3%
81	Other Services (except Public Administration)	317	15,186	14	2.5%
51	Information	^	10,189	15	1.7%
71	Arts, Entertainment and Recreation	214	8,968	16	1.5%
55	Management of Companies and Enterprises	135	6,554	17	1.1%
53	Real Estate and Rental and Leasing	40	6,479	18	1.1%
22	Utilities	150	2,732	19	0.5%
21	Mining, Quarrying and Oil and Gas Extraction	57	2,110	20	0.4%
-	Statewide Total	17,059	598,134*	-	100.0%

^Suppressed jobs <20 to ensure respondent confidentiality.

*Difference of 34 with statewide jobs total and column total is due to unassigned NAICS at time of data pull, 2009 4th Quarter QCEW. The terms jobs and employment are used synonymously in report.

Green Jobs within Industries by Core Green Areas

Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup accounted for 32 percent, or 5,498, green jobs. No one industry sector dominated.

Three Largest Industry Sectors for Pollution and Waste Control			
NAICS Code	Sector	Jobs	% of Sector Green Jobs
54	Professional, Scientific and Technical Services	1,549	28%
23	Construction	833	16%
92	Government	636	12%

Sustainable Agriculture and Natural Resource Conservation provided 5,219, green jobs, 31 percent of all green employment.

Three Largest Industry Sectors for Sustainable Agriculture			
NAICS Code	Sector	Jobs	% of Sector Green Jobs
92	Government	2,158	41%
11	Agriculture, Forestry, Fishing and Hunting	1,170	22%
54	Professional, Scientific and Technical Services	779	15%

Energy Efficiency and Conservation had 20 percent, or 3,372 green jobs.

Largest Industry Sectors for Energy Efficiency and Conservation			
NAICS Code	Sector	Jobs	% of Sector Green Jobs
23	Construction	2,043	61%
44-45	Retail Trade	314	9%

Renewable Energy and Alternative Fuels generated the fewest green jobs at 17 percent, or 2,970.

Largest Industry Sectors for Renewable Energy and Alternative Fuels			
NAICS Code	Sector	Jobs	% of Sector Green Jobs
54	Professional, Scientific and Technical Services	1,738	60%
23	Construction	452	15%
31-33	Manufacturing	469	15%

Industry Sectors with Most Green Jobs			
Code	NAICS Industry Sector	Statewide Est. Green Jobs**	% Statewide Green Jobs
54	Professional, Scientific and Technical Services	4,187	24.5%
23	Construction	3,534	20.7%
92	Public Administration	2,893	17.0%
31-33	Manufacturing	1,388	8.1%
11	Agriculture, Forestry, Fishing and Hunting	1,289	7.6%
44-45	Retail Trade	792	4.6%
56	Administrative and Support and Waste Management and Remediation Services	779	4.6%
42	Wholesale Trade	692	4.1%
48-49	Transportation and Warehousing	330	1.9%
81	Other Services (except Public Administration)	317	1.9%
71	Arts, Entertainment, and Recreation	214	1.3%
22	Utilities	150	0.9%
61	Educational Services	136	0.8%
55	Management of Companies and Enterprises	135	0.8%
21	Mining, Quarrying, and Oil and Gas Extraction	57	0.3%
62	Health Care and Social Assistance	55	0.3%
72	Accommodation and Food Services	53	0.3%
53	Real Estate and Rental and Leasing	40	0.2%
51	Information	^	0.1%
52	Finance and Insurance	-	-
-	Statewide	17,059	100.0%

^Suppressed jobs <20 to ensure respondent confidentiality.

As seen in the table above, almost 78 percent of the 17,059 estimated green jobs were found in five of the industry sectors. The industry sectors of professional, scientific and technical services; construction; government; manufacturing; and agriculture, forestry, fishing and hunting each accounted for over 1,000 jobs.

Except for manufacturing, these five sectors also had higher concentrations of green employment to total employment. The average statewide concentration was 3 percent. While manufacturing's concentration was just 2.6 percent, professional, scientific and technical services was 14.2 percent, construction 10.9 percent, government 6.7 and agriculture, forestry, fishing and hunting 5.8 percent.

These industry sectors provide a wide variety of occupations identified as green. In Idaho, government, manufacturing and professional, scientific and technical services each have over 70 unique green occupations. Construction, retail trade and wholesale trade follow with 30 unique green occupations. Government was by far the most varied with 100 unique green occupations.

Industry Sectors with Highest Concentration of Green Jobs			
Code	NAICS Industry Sector	Concentration of Green Jobs	Rank
54	Professional, Scientific and Technical Services	14.2%	1
23	Construction	10.9%	2
92	Public Administration	6.7%	3
11	Agriculture, Forestry, Fishing and Hunting	5.8%	4
22	Utilities	5.5%	5
42	Wholesale Trade	2.8%	6
21	Mining, Quarrying and Oil and Gas Extraction	2.7%	7
31-33	Manufacturing	2.6%	8
71	Arts, Entertainment, and Recreation	2.4%	9
81	Other Services (except Public Administration)	2.1%	10
56	Administrative and Support and Waste Management and Remediation Services	2.1%	11
55	Management of Companies and Enterprises	2.1%	12
48-49	Transportation and Warehousing	1.7%	13
44-45	Retail Trade	< 1%	14
53	Real Estate and Rental and Leasing	< 1%	15
61	Educational Services	< 1%	16
51	Information	< 1%	17
72	Accommodation and Food Services	< 1%	18
62	Health Care and Social Assistance	< 1%	19
52	Finance and Insurance	-	-
-	Statewide	2.9%	-

AGRICULTURE, FORESTRY, FISHING AND HUNTING

With 22,200 jobs overall, agriculture, forestry, fishing and hunting is Idaho’s 11th largest industry sector. This sector comprises establishments primarily engaged in growing crops, raising animals, harvesting timber and fish and other animals from a farm, ranch or natural habitats. It had a green job concentration of 5.8 percent, and those 1,289 green jobs made up 8 percent of all green jobs in Idaho. These jobs were in 24 unique occupations. The most common were crop, nursery and greenhouse farmworkers and laborers; foresters; farm, ranch and aquacultural animal farmworkers; farmers, ranchers and other agricultural managers; and logging equipment operators.

Not surprisingly, 91 percent of this sector’s green jobs are in the Sustainable Agriculture and Natural Resource Conservation core area. Forty percent required a certification such as an applicator’s license while 67 percent did not require formal education beyond high school. Nearly 80 percent required experience related to the position.

Within this industry sector logging and beef cattle ranching and farming including feedlots provided about 40 percent of the sector’s green jobs.

Ag, Forestry, Fishing and Hunting Industry Level		
Code	NAICS Industry	Estimated # of Green Jobs
11115	Corn Farming	^
11119	Other Grain Farming	^
11121	Vegetable and Melon Farming	111
11133	Non-citrus Fruit and Tree Nut Farming	30
11141	Food Crops Grown Under Cover	25
11142	Nursery and Floriculture Production	21
11194	Hay Farming	^
11199	All Other Crop Farming	60
11211	Beef Cattle Ranching and Farming, including Feedlots	244
11212	Dairy Cattle and Milk Production	84
11231	Chicken Egg Production	^
11293	Fur-Bearing Animal and Rabbit Production	50
11321	Forest Nurseries and Gathering of Forest Products	158
11331	Logging	258
11511	Support Activities for Crop Production	91
11531	Support Activities for Forestry	116
-	Industry Total	1,289

^Suppressed jobs <20 to ensure respondent confidentiality.

CONSTRUCTION

Construction is Idaho’s eighth largest sector at just over 32,000 total jobs. Activities of this sector include erecting buildings and other structures, heavy construction other than buildings, as well as alterations, reconstruction, installation, maintenance and repair work. This sector had a green jobs concentration of 10.9 percent, and those 3,534 green jobs accounted for 21 percent of all green jobs in Idaho. These jobs fell into 30 unique occupations. Most common in construction were construction laborers; heating, air conditioning and refrigeration mechanics and installers; plumbers, pipefitters and steamfitters; roofers; electricians; and operating engineers and other construction equipment operators.

The majority of construction sector jobs, 58 percent, were in the Energy Efficiency and Conservation core area, followed by Pollution and Waste Control at 25 percent. Fifty-nine percent of jobs in the construction sector required a certification such as LEED – Leadership in Energy and Environmental Design – and 71 percent required experience related to the position.

Construction Industry Level		
Code	NAICS Industry	Estimated # of Green Jobs
23611	Residential Building Construction	552
23621	Industrial Building Construction	35
23622	Commercial and Institutional Building Construction	595
23711	Water and Sewer Line and Related Structures Construction	529
23731	Highway, Street, and Bridge Construction	^
23811	Poured Concrete Foundation and Structure Contractors	^
23813	Framing Contractors	94
23816	Roofing Contractors	235
23817	Siding Contractors	^
23819	Other Foundation, Structure and Building Exterior Contractors	40
23821	Electrical Contractors and Other Wiring Installation Contractors	159
23822	Plumbing, Heating and Air-Conditioning Contractors	905
23831	Drywall and Insulation Contractors	93
23891	Site Preparation Contractors	73
23899	All Other Specialty Trade Contractors	189
-	Industry Total	3,534

^Suppressed jobs <20 to ensure respondent confidentiality.

MANUFACTURING

Manufacturing is Idaho’s fourth largest sector at 53,400 total jobs. Activities in this sector are the mechanical, physical or chemical transformation of material, substances or components into new products. Among the top five green sectors, manufacturing had the lowest green job concentration at 2.6 percent but provided 8 percent of Idaho’s green jobs. These 1,388 green jobs were in 77 unique occupations. The most common were heavy and tractor-trailer truck driver; other food processing workers; and environmental science and protection technicians including health.

Green jobs in manufacturing were spread across all four core areas. A third, 34 percent, of the manufacturing jobs were in the Renewable Energy and Alternative Fuels core area followed by Pollution and Waste Control at nearly 30 percent. Certificates were required for 40 percent of those jobs, and related experience was required for 56 percent.

Manufacturing Industry Level		
Code	NAICS Industry	Estimated # of Green Jobs
31131	Sugar Manufacturing	^
31141	Frozen Food Manufacturing	81
31142	Fruit and Vegetable Canning, Pickling and Drying	^
31151	Dairy Product (except Frozen) Manufacturing	^
31161	Animal Slaughtering and Processing	^
31171	Seafood Product Preparation and Packaging	260
31491	Textile Bag and Canvas Mills	^
32111	Sawmills and Wood Preservation	38
32121	Veneer, Plywood and Engineered Wood Product Manufacturing	^
32191	Millwork	^
32199	All Other Wood Product Manufacturing	98
32531	Fertilizer Manufacturing	^
32619	Other Plastics Product Manufacturing	^
32621	Tire Manufacturing	24
32732	Ready-Mix Concrete Manufacturing	248
33141	Nonferrous Metal (except Aluminum) Smelting and Refining	^
33251	Hardware Manufacturing	^
33299	All Other Fabricated Metal Product Manufacturing	^
33331	Commercial and Service Industry Machinery Manufacturing	156
33341	Ventilation, Heating, Air-Conditioning and Commercial Refrigeration Equipment Manufacturing	57
33361	Engine, Turbine and Power Transmission Equipment Manufacturing	25
33399	All Other General Purpose Machinery Manufacturing	121
33441	Semiconductor and Other Electronic Component Manufacturing	73
33512	Lighting Fixture Manufacturing	^
33995	Sign Manufacturing	42
-	Industry Total	1,388 *

^Suppressed jobs <20 to ensure respondent confidentiality. *May not equal total due to industry suppression to ensure confidentiality.

PROFESSIONAL, SCIENTIFIC AND TECHNICAL SERVICES

With about 30,000 total jobs, professional, scientific and technical services ranked ninth among Idaho’s sector employment and had the largest green jobs concentration at 14.2 percent. This sector contains 4,187 green jobs, which is nearly a quarter of all green jobs and comprise 74 unique occupations. Some of the most common were hazardous materials removal workers, environmental science and protection technicians including health, nuclear technicians and mechanical engineers.

The majority of green jobs in this sector fell within the core areas of Renewable Energy and Alternative Fuels and Pollution and Waste Control, while 3 percent dealt with services in the Energy Efficiency and Conservation core area.

Of the green jobs in the professional, scientific and technical services industry sector, 90 percent required education beyond high school, and 70 percent required a bachelor’s or advanced degree. Sixty-eight percent required a certification such as a professional engineer license. Related experience was required for 85 percent of the jobs.

The industries of engineering services and research and development in the physical, engineering and life sciences provided 92 percent of all green jobs in this sector. These two industries were among the top three industries providing the most green jobs overall – nearly 10 percent in the case of engineering services and almost 13 percent for the other.

Professional and Technical Services Industry Level		
Code	NAICS Industry	Estimated # of Green Jobs
54121	Accounting, Tax Preparation, Bookkeeping and Payroll Services	^
54131	Architectural Services	49
54133	Engineering Services	1,643
54138	Testing Laboratories	70
54143	Graphic Design Services	^
54151	Computer Systems Design and Related Services	53
54161	Management Consulting Services	95
54162	Environmental Consulting Services	^
54169	Other Scientific and Technical Consulting Services	52
54171	Research and Development in the Physical, Engineering and Life Sciences	2,198
54199	All Other Professional, Scientific and Technical Services	^
-	Industry Total	4,187

^Suppressed jobs <20 to ensure respondent confidentiality.

GOVERNMENT

Government is Idaho’s sixth largest sector at just over 43,000 total jobs. The government, or public administration, sector consists of establishments of federal, state and local government agencies that administer, oversee and manage public programs and have executive, legislative or judicial authority over other institutions within a given area. This sector does not include public schools or public utilities. The 2,893 green jobs were 17 percent of all green jobs in Idaho, a concentration of 6.7 percent, and were spread over 100 unique occupations, the most variety of any sector. The most common occupations were zoologists and wildlife biologists, biological technicians, environmental scientists and specialists including health, firefighters and forest fire inspectors and prevention specialists.

The majority of green government jobs were in the Sustainable Agriculture and Natural Resource Conservation core area. A bachelor’s degree or higher was required for 58 percent of those jobs, and 83 percent required experience related to the position. Certifications were required for 34 percent.

Administration of conservation programs provided about 70 percent of all green government jobs at 2,004 and nearly 12 percent of all green jobs in Idaho. It is one of the top three industries providing the most green jobs in the state.

Government Industry Level		
Code	NAICS Industry	Estimated # of Green Jobs
92114	Executive and Legislative Offices, Combined	352
92312	Administration of Public Health Programs	21
92411	Administration of Air and Water Resource and Solid Waste Management Programs	28
92412	Administration of Conservation Programs	2,004
92611	Administration of General Economic Programs	365
92612	Regulation and Administration of Transportation Programs	34
92614	Regulation of Agricultural Marketing and Commodities	40
92811	National Security	50
-	Industry Total	2,893

Green Industries

The 20 NAICS industry sectors in the economy are split into 101 subsectors. The Idaho Department of Labor designated a list of 23 of those subsectors as green. Green industries for Idaho are based on a higher than average concentration of green jobs within the state as determined by the 2010 Idaho Green Jobs Survey and secondary sources.

-  Level 1 = Industries with a higher the average concentration of green employment.
-  Level 2 = Industries with a moderately high concentration of green employment.
-  Level 3 = Industries with the highest concentration of green employment.

Idaho Green Industries		
NAICS Subsector	Subsector	Rating
113	Forestry and Logging	
924	Administration of Environmental Quality Programs	
327	Nonmetallic Mineral Product Manufacturing	
562	Waste Management and Remediation Services	
236	Construction of Buildings	
541	Professional, Scientific and Technical Services	
333	Machinery Manufacturing	
238	Specialty Trade Contractors	
926	Administration of Economic Programs	
237	Heavy and Civil Engineering Construction	
115	Support Activities for Agriculture and Forestry	
221	Utilities	
443	Electronics and Appliance Stores	
423	Merchant Wholesalers, Durable Goods	
493	Warehousing and Storage	
453	Miscellaneous Store Retailers	
112	Animal Production	
111	Crop Production	
813	Religious, Grant making, Civic, Professional and Similar Organizations	
321	Wood Product Manufacturing	
212	Mining (except Oil and Gas)	
339	Miscellaneous Manufacturing	
928	National Security and International Affairs	

Occupation Groups

Most of Idaho’s green jobs were concentrated in a few of the major occupation groups. All of the occupations represented from the survey are shown in the table below. Occupations in community and social services, legal, health care support and food preparation, serving and related activities did not have any green jobs.

Over half of Idaho’s green jobs were found in three of the 22 major groups in the Standard Occupational Classification:

- Construction and extraction – 23 percent
- Life, physical and social science – 19 percent
- Architecture and engineering – 11 percent

Green Jobs by Major Occupational Group		
	Number	% of Total
Total	17,059	100%
Construction and Extraction	3,877	23%
Life, Physical and Social Science	3,157	19%
Architecture and Engineering	1,898	11%
Transportation and Material Moving	1,103	6%
Farming, Fishing and Forestry	1,091	6%
Production	1,066	6%
Installation, Maintenance and Repair	998	6%
Management Occupations	989	6%
Building and Grounds Cleaning and Maintenance	961	6%
Business and Financial	519	3%
Sales and Related	428	3%
Protective Service	342	2%
Office and Administrative Support	252	1%
Computer and Mathematical	227	1%
Personal Care and Service	69	<1%
Education, Training and Library	36	<1%
Healthcare Practitioners and Technical	26	<1%
Arts, Design, Entertainment, Sports and Media	21	<1%

Green jobs in construction and extraction occupation group were concentrated in Energy Efficiency and Conservation area at 45 percent and Pollution and Waste Control area at 38 percent. The more common occupations reported were construction laborers, electricians, hazardous materials removal workers, carpenters and equipment operators.

Fifty-six percent of the life, physical and social science occupation group green jobs were in Sustainable Agriculture and Natural Resource Conservation area and 31 percent in Pollution and Waste Control area. Commonly reported occupations were zoologists and wildlife biologists, foresters, environmental scientists, biological technicians and hydrologists.

Most of the architecture and engineering green jobs – 43 percent – were in Renewable Energy and Alternative Fuels area, but a significant percent are in Sustainable Agriculture and Natural Resource Conservation area – 24 percent. Common green occupations in architecture and engineering were civil engineers, environmental engineering technicians, landscape architects, nuclear engineers and mechanical drafters.

Core Green Areas

There was significant overlap of occupation groups employed in each of the core green areas. For example, the construction and extraction occupation group was either the largest or second largest employment percentage in three out of four core green areas. A breakdown of the occupation groups that comprise the largest percents of each of the core areas is in the table below.

Occupation Groups with Most Green Jobs within Core Area	
Pollution and Waste	
Construction and Extraction	26.8%
Life, Physical, and Social Science	18.0%
Transportation and Material Moving	15.6%
Building and Grounds Cleaning and Maintenance	10.0%
Energy Efficiency	
Construction and Extraction	52.0%
Installation, Maintenance and Repair	20.2%
Sustainable Agriculture	
Life, Physical and Social Science Occupations	33.6%
Farming, Fishing, and Forestry Occupations	19.4%
Renewable Energy	
Architecture and Engineering	27.7%
Construction and Extraction	16.6%
Life, Physical and Social Sciences	12.7%
Production	11.6%
Management	10.1%

By Region

East central Idaho had the highest concentration of green jobs in each of the three major occupational groups – construction and extraction, architecture and engineering and life, physical and social sciences. This was likely the result of the Idaho National Laboratory and its huge work force devoted to nuclear energy research and cleanup of the hazardous waste built up at the high-desert site since the late 1940s.

North central Idaho, where both the University of Idaho and Lewis-Clark State College are located, ran second in green job concentration in the three major occupation groups.

In contrast, south central Idaho had the lowest green jobs concentration among the six regions in the three top occupational groups. The region’s economy is heavily dependent on agriculture.

The population center, southwestern Idaho, was essentially in the middle of the six regions in terms of green job concentration, suggesting that despite providing 42 percent of all the state’s jobs, the green economy has not yet taken a secure hold on the regional economy.

North central and southeastern Idaho both posted green job concentrations similar to those of southwestern Idaho.



By Experience

Seventy-two percent of all green jobs required work experience related to the job.

The occupation groups that required the most experience are management at 96 percent, architecture and engineering at 91 percent, transportation and material moving at 90 percent, business and financial operations at 88 percent and computer and mathematics at 85 percent.

There are occupation groups at the other end of the scale that encompassed fewer occupations requiring some type of prior work experience.

But while these occupation groups potentially offer the most opportunity for people just beginning their working careers, more than half the jobs within each of these groups still required some kind of prior work experience. More than 53 percent of the occupations within the building and grounds cleaning and maintenance group require related work experience.

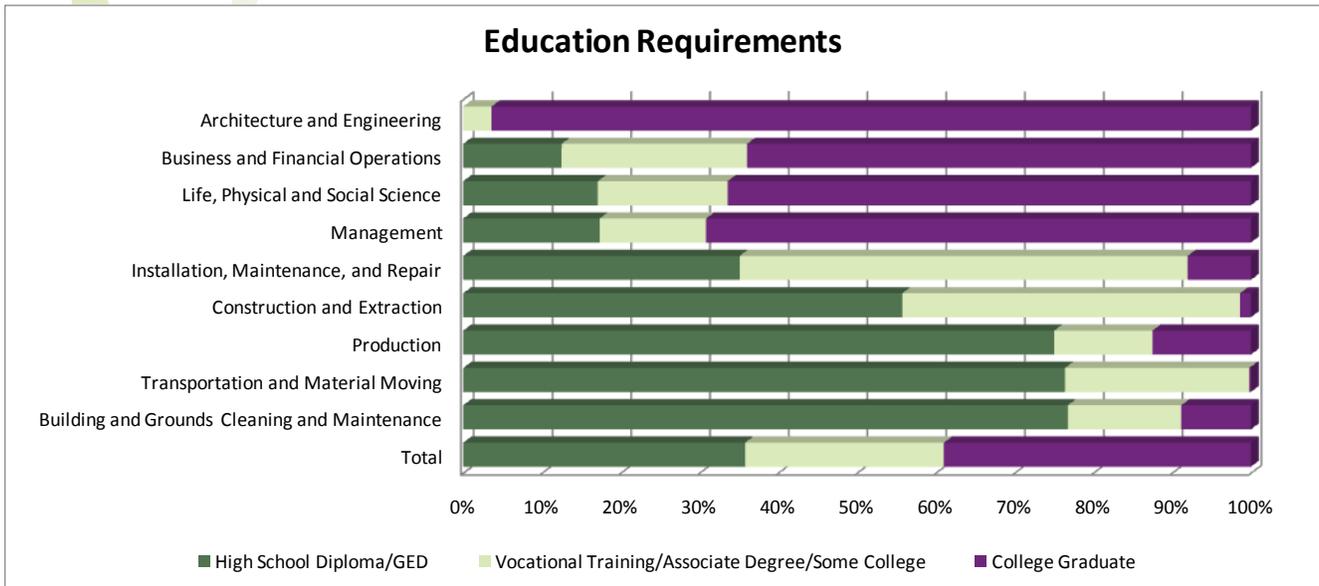
Occupations Requiring the Least Prior Experience			
Occupation	No Experience	Unrelated Experience	Related Experience
Building and Grounds Cleaning and Maintenance	46.3%	0.2%	53.5%
Sales	44.3%	12.9%	42.7%
Farming, Fishing and Forestry	35.0%	0.0%	65.0%
Production	32.6%	28.0%	39.3%
Installation, Maintenance and Repair	30.1%	0.3%	69.7%

By Education

Of the jobs that specified an education level, a high school degree was sufficient for a majority of occupations in the buildings and grounds cleaning and maintenance, transportation and material moving, production and construction and extraction groups.

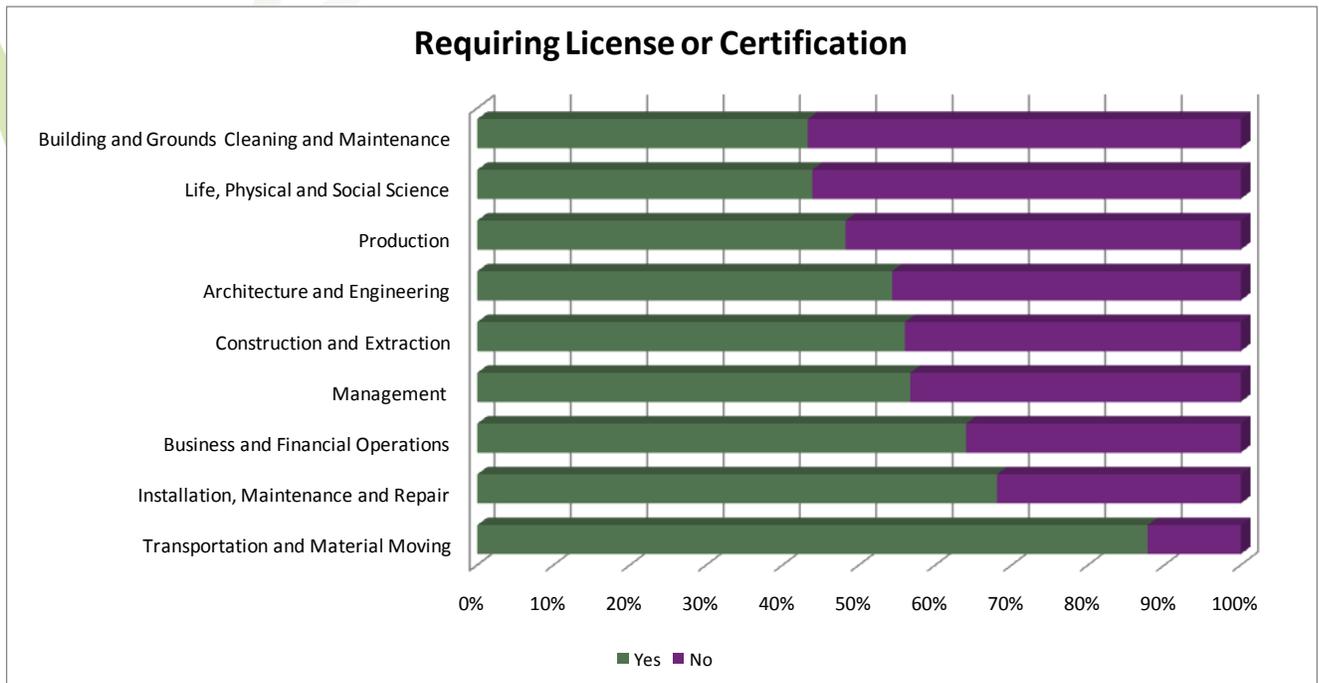
Vocational training was specified for more than half of the jobs in the installation, maintenance and repair occupation group. Construction and extraction occupations specified vocational training for over 40 percent of those green jobs.

One of the top three occupational groups providing the most green jobs — architecture and engineering — required a college degree for nearly all of their green jobs. The same was true for almost two-thirds of the green jobs in occupations in management and life, physical and social sciences and business and financial operations.



Certifications

Licenses or certifications were required for over half of the green jobs, and they varied by occupation. For example, workers in the transportation and material moving occupation group, one commonly reported license and certification combination was a commercial driver's licenses with a Solid Waste Association of North America — or SWANA — certification. Those jobs in the installation, maintenance and repair occupation group often required an HVAC (heating, ventilation and air conditioning) license.



By Wage

Wages varied widely for green jobs in the major occupation groups, but they generally paid more than other jobs in Idaho. The median hourly wage reported for green jobs in the survey was \$17.30, compared to the statewide median wage of \$14.33¹.

Measured against the federal poverty standard of \$10.60 an hour or less for a family of four in 2010², 16 percent of all green jobs paid less than the poverty rate. Nearly three of every four green jobs in occupations in the building and grounds cleaning and maintenance group and 45 percent of jobs in sales occupations paid under the poverty rate.

At the other end of the spectrum, 9 percent of green jobs paid over \$36 an hour or nearly \$75,000 a year. Of those, architecture and engineering occupations were the best paying of the green job sectors. Forty percent of its jobs paid over \$36 an hour.

The occupation groups that paid more than the median green wage are management, business and financial, architecture and engineering and life, physical and social science occupations. Transportation and material moving occupations had a median wage that was slightly higher than the median green wage.

As with most jobs, the pay level reflects the level of training and this applied for green jobs as well.

Hourly Wage Distribution for Green Jobs by Major Occupation Group

Occupation	Under \$10.61	\$10.61 - \$16.00	\$16.01 - \$23.00	\$23.01 - \$36.00	Above \$36.01	Median Wage
Total for Green Jobs	16%	29%	23%	23%	9%	\$17.30
Management Occupations	10%	9%	11%	39%	30%	\$28.90
Business and Financial Operations Occupations	3%	12%	32%	29%	24%	\$23.10
Architecture and Engineering Occupations	0%	4%	10%	46%	40%	\$35.00
Life, Physical and Social Science Occupations	3%	23%	25%	36%	13%	\$21.58
Protective Service Occupations	0%	89%	2%	9%	0%	\$15.00
Building and Grounds Cleaning and Maintenance Occupations	72%	17%	5%	5%	2%	\$10.00
Sales and Related Occupations	45%	15%	8%	24%	9%	\$14.00
Farming, Fishing and Forestry Occupations	36%	26%	32%	7%	0%	\$12.50
Construction and Extraction Occupations	14%	40%	24%	21%	1%	\$16.00
Installation, Maintenance and Repair Occupations	26%	41%	29%	4%	0%	\$14.00
Production Occupations	15%	55%	28%	2%	0%	\$14.00
Transportation and Material Moving Occupations	9%	37%	36%	18%	0%	\$17.50

¹Federal Register, Vol. 75, No. 148, Aug. 3, 2010, pp. 45628–45629.

²Occupational Employment & Wage Survey Fall 2010.

Green Occupations

The 22 occupation groups contain 840 standard occupation codes (SOC). Employers identified green jobs within 211 of those SOC codes. The Idaho Department of Labor further designated a list of 152 of those occupations as green. Green occupations for Idaho are based on a higher than average concentration of green jobs within the state as determined by the 2010 Idaho Green Jobs Survey and secondary sources.

- 🍃 Level 1 = Occupations with a higher-than-average concentration of green employment.
- 🍃 Level 2 = Occupations with a moderately high concentration of green employment.
- 🍃 Level 3 = Occupations with the highest concentration of green employment.

There are 48 occupations in level 3 with the highest concentration of employment 🍃, 45 occupations at level 2 🍃, and 59 in level 1 🍃.

The entire list of occupations may be found in Appendix 3.

Top 20 Occupations

Of the 211 unique occupations employers identified in the survey as providing 17,059 green jobs, 20 occupations accounted for nearly 50 percent of the total employment. Six are directly or indirectly related to construction, and six more are linked in some way to the environment. Since the top 20 occupations are the most common green jobs in Idaho, they provide the best examples of what constitutes a green job.

Green Rating	Occupation	Green Jobs	% of All Green Jobs	Median Wage
	Construction Laborers	1,007	5.9%	\$12.00
	Landscaping and Groundskeeping Workers	603	3.5%	\$10.00
	Hazardous Materials Removal Workers	599	3.5%	\$27.48
	Heavy and Tractor-Trailer Truck Drivers	570	3.3%	\$17.50
	Plumbers, Pipefitters, Steamfitters	536	3.1%	\$18.00
	Environmental Science and Protection Technicians Including Health	526	3.1%	\$11.00
	Heating, Air Conditioning, Refrigeration Mechanics and Installers	471	2.8%	\$14.00
	Farmworkers and Laborers, Crop, Nursery, Greenhouse	469	2.7%	\$10.00
	Operating Engineers and Other Construction Equipment Operators	411	2.4%	\$17.00
	Environmental Scientists and Specialists Including Health	391	2.3%	\$21.58
	Mechanical Engineers	312	1.8%	\$35.00
	Business Operations Specialists, All Other	310	1.8%	\$23.08
	Zoologists and Wildlife Biologists	291	1.7%	\$24.00
	Refuse and Recyclable Material Collectors	282	1.7%	\$15.00
	Production Workers, All Other	277	1.6%	\$13.52
	Biological Technicians	257	1.5%	\$11.00
	General and Operations Managers	250	1.5%	\$25.00
	Electricians	246	1.4%	\$24.00
	Foresters	244	1.4%	\$20.19
	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	244	1.4%	\$7.25
	Top 20 Total	8,297	48.6%	\$16.00

Eight of the top 20 occupations require a high school diploma or equivalency, and seven require a college degree. Thirteen require related experience. The spread of educational requirements offers opportunities to anyone who wants to work in Idaho's green economy.

Seventeen of the top 20 occupations had a median wage above \$10.60 an hour, which was the 2010 poverty line for a family of four.¹ The three with lower median wages – landscaping and groundskeeping; crop, nursery and greenhouse farmworkers and laborers; and janitors and cleaners except maids and housekeeping cleaners – require a high school education or less. The same is true for five others with median wages above \$10.60 – production, construction laborers, refuse and recyclable material collectors, operating engineers and other construction equipment operators and environmental science and protection technicians including health. Most of these occupations have high percentages of jobs requiring certifications.

According to the Idaho Department of Labor's 2008-2018 long-term occupation projections, 17 of the top 20 occupations will expand over the next decade. The exceptions are electricians, which will contract by 3 percent, and foresters and plumbers, pipefitters and steamfitters, both of which will essentially stagnate. Despite their total number falling by more than 100 by 2018, there will be a need for an average of 102 new electricians a year to fill openings created by retirements among the existing older work force.

¹Federal Register, Vol. 75, No. 148, August 3, 2010, pp. 45628–45629

Occupational Spotlights

The top 20 green occupations in Idaho reflect a wide range of career opportunities for those who want to be a part of Idaho’s emerging green economy. To provide a detailed look at some of these occupations, quantitative data were gathered through the Idaho Green Job Survey while qualitative information was developed through focus groups and interviews conducted in all six regions of the state. Regional teams consisting of a regional economist and business solutions specialists or other department staff focused on an industry or one or more occupations for analysis and then used their experience in their regions in selecting employers to discuss the industry or occupations.

Heating, Air Conditioning and Refrigeration Mechanics and Installers

Heating, air conditioning and refrigeration mechanics and installers including apprentices had a high green jobs concentration rating and was among the 10 occupations with the most green jobs, providing 2.8 percent of all green jobs in the state. As an occupation, HVAC fits almost completely into the green job definition, under the core green area of Energy Efficiency and Conservation.

Heating, Air Conditioning and Refrigeration Mechanics and Installers	
Total Green Jobs	471
Percent of all Green Jobs	2.8%
Median Wage	\$14.00
Energy Efficiency and Conservation	100%

Educational and experience requirements for HVAC workers are similar to those for other trades. For a majority of these jobs, 59 percent, require vocational training, and 63 percent require experience related to the position.

Focus group participants essentially confirmed the survey findings on education and experience. They were divided in their preference for hiring someone with vocational training or someone with no specific HVAC training or experience. Employers eschewing training pointed out that an inexperienced employee will work for them as an apprentice while completing an approved program. Many did agree that education was helpful in providing a base of understanding for future journeyman.

The licensure mandate for journeyman HVAC workers only became effective in July 2004, but it has quickly become the standard. A license or certification was required for 91 percent of all the HVAC jobs reported in the survey and for every journeyman HVAC job.

Other than a journeyman’s license, survey and focus group participants said a certification for refrigerant handling from the U.S. Environmental Protection Agency is useful. In several cases, certification is required for employment. Manufacturer-specific certifications are also needed for some products, but securing those can sometimes be financially prohibitive. Other certifications such as those offered by North American Technician Excellence Inc. were not considered essential but did help differentiate potential hires.

Focus group respondents cited the need for a broad range of skills. “What other industry is there,” one respondent summed up, “where we expect our people to have construction skills, electrical, controls, refrigeration, plumbing and computers. I mean it’s an awesome industry because there are so many facets to it, but I can’t think of another industry out there where you are expecting people to know all that.”

An overwhelming majority of HVAC mechanics and installers were employed by private companies, and the vast majority of them were in construction. Even though construction was hit hard by the recession, focus group participants were optimistic about the future. The U.S. Bureau of Labor Statistics agrees, projecting that the HVAC industry should experience much faster-than-average job growth and provide excellent employment opportunities. The Idaho Department of Labor’s 2008-2018 Long-Term Occupation Projections anticipate 14 percent growth in HVAC mechanics and installers through 2018.

Background Requirements for Heating, Air Conditioning and Refrigeration Mechanics and Installers	
HS/GED or Less	40.9%
Some College	59.1%
Bachelor’s Degree or Higher	0
Related Experience	62.5%
Certifications/Licenses	90.9%*

* Only apprentice positions were not required to have a license.

Electrician

Electricians account for 1.4 percent of Idaho’s green jobs. But while the occupation has a medium green rating, it does not fit as neatly into the green job definition as some of the others. Focus group participants said that to be considered green, electricians have to be more specialized – working in energy efficiency, renewable energy or alternative fuels. Less than 60 percent of the electrical companies contacted about participating in the focus groups reported any employees engaged in a green job.

Electricians	
Total Green Jobs	246
Percent of all Green Jobs	1.4%
Median Wage	\$24
Energy Efficiency and Conservation	61%
Renewable Energy and Alternative Fuels	39%

Most activities for green electricians involved upgrading lighting sources to more efficient LEDs — light-emitting diodes — and CFLs — compact fluorescent lights — and working on solar, wind, hydro, methane and other renewable energy projects. The survey found 61 percent of green electricians worked in the core green area of Energy Efficiency and 39 percent in Renewable Energy and Alternative Fuels. Focus group participants agreed with that distribution because they see energy efficient upgrades more prevalent in Idaho than renewable energy projects, mainly due to cost. They said a lighting project can pay for itself in as little as a few months while renewable energy projects can take several years. But participants believe that would change.

As with other trades, the survey found a great majority – 79 percent – of green electrician jobs required vocational education, and all of them required a license or certification, most commonly a journeyman’s license. Focus group participants said other certifications could be required depending on the job – certification from the National Institute for Certification in Engineering Technologies for fire alarms, for example. The North American Board of Certified Energy Practitioners (NABCEP) – Photovoltaic installer’s certification is often requested by customers installing solar equipment. However, this certification is rare in Idaho due to the limited number of solar projects. The requirement to sit for the NABCEP certification exam is to have completed and monitored two solar installations, of which Idaho has had a limited number. There were only seven certified electricians in the state in 2010.

Background Requirements for Electricians	
HS/GED or Less	13.2%
Some College	78.6%
Bachelor's Degree or Higher	8.1%
Related Experience	86.8%
Certifications/Licenses	100%

Nearly all green electricians were employed by private companies, and 82 percent worked in construction. Focus group participants had a very positive outlook for the future. Between upgrading the current infrastructure for more efficiency and more renewable energy projects as power becomes more and more expensive, participants felt that there will be plenty of green work for electricians in the years to come. The Bureau of Labor Statistics is not as optimistic, however. It expects average employment growth with good job prospects with demand greatest for electricians with the widest range of skills. According to the Idaho Department of Labor 2008-2018 Long-Term Occupation Projections, there is a projected 3 percent decline in the total number of electricians working in Idaho. But the occupation has one of the 10 highest annual replacement rates in Idaho – just over 100 a year on average through 2018 – so opportunities remain good in this trade.

Crop, Nursery and Greenhouse Farmworkers and Laborers

Crop, nursery and greenhouse farmworkers and laborers account for 2.7 percent of Idaho's green jobs and have a medium green rating. The majority – 89 percent – are in the core green area of Sustainable Agriculture and Natural Resource Conservation. Employers said in the interviews that methods of sustainable agriculture and natural resource conservation like tape drip irrigation are integral parts of their businesses.

Farmworkers and Laborers, Crop, Nursery and Greenhouse	
Total Green Jobs	469
Percent of all Green Jobs	2.7%
Median Wage	\$10
Pollution and Waste Control	9.9%
Energy Efficiency and Conservation	1.6%
Renewable Energy and Alternative Fuels	88.5%

Nearly one quarter of the crop, nursery and greenhouse farmworker and laborer jobs required a bachelor’s degree or higher. Only a fraction required some postsecondary education short of a college degree. The survey also shows that 71 percent of the positions require related work experience. None of the farmers interviewed listed colleges as a major source of training or education. These farmers said new green farmworkers are generally trained through an informal process of mentorships. The only requirements they discussed were an interest in agriculture and the ability to perform a lot of physical labor.

Only 40 percent of the green farmworker jobs required a certification, and most of those were a chemical applicator’s license. Certifications in water use and horticulture were also mentioned. A number of the farmers interviewed said they avoided pesticides and herbicides as much as possible from both a business perspective and a desire to maintain the land. Others used chemical fertilizers to increase crop yields. Most of the farmers interviewed operated family owned farms and had a great desire to pass the land on to future generations.

Almost all the green farmworkers were employed by private enterprises, primarily in the agriculture, forestry, fishing and hunting industry. Farmworker employers anticipate a comparatively bright future for this occupation, confirmed by the Idaho Department of Labor’s 2008-2018 long-term occupation projections. Farmworkers are the tenth highest demand occupation with an average of 400 openings a year in Idaho. With projected growth through 2018 at 15.5 percent, 150 of those annual openings will be new jobs while the other 250 replace existing workers.

Background Requirements for Farmworkers and Laborers, Crop, Nursery and Greenhouse	
HS/GED or Less	74.8%
Some College	1.2%
Bachelor’s Degree or Higher	24.0%
Related Experience	71.2%
Certifications/Licenses	40.2%

 **Foresters**

Foresters account for 1.4 percent of Idaho’s green jobs, and the occupation has a high green rating. A forester’s main responsibility is to manage the use and development of forests, rangelands and other natural resources so the occupation fits well in the Department’s green job definition. The survey found 97 percent of foresters work in the core green area of Sustainable Agriculture and Natural Resource Conservation.

Foresters	
Total Green Jobs	244
Percent of all Green Jobs	1.4%
Median Wage	\$20.19
Energy Efficiency and Conservation	1.8%
Sustainable Agriculture and Natural Resource Conservation	97.0%
Renewable Energy and Alternative Fuels	1.2%

Education and experience are important in this occupation. The survey found 97 percent of the jobs as foresters required a bachelor’s degree or higher and 94 percent required related experience. Interviewed employers had mixed feelings about current education programs for forestry, but experience in forestry or agriculture was seen as valuable.

Certifications were not a priority for foresters. Eighteen percent of the survey respondents listed them as a must. Knowledge of agriculture and geographic information systems (GIS) along with the ability to communicate were skills interviewed employers said are useful in this occupation.

Two of three forester jobs identified in the survey were in the private sector, and employers who were interviewed cited significant differences in responsibility between private sector and government foresters. Private sector foresters tend to have multiple responsibilities while government foresters tend to be more specialized. The majority of jobs in this occupation – 58 percent – are in agriculture, forestry, fishing and hunting, while 35 percent are in government.

Projections and interviewee opinions differ on future expectations for foresters. The Department's 2008-2018 Long-Term Occupation Projections anticipate the number of foresters to remain essentially unchanged in Idaho through 2018. Average annual openings for foresters are forecast at just two. Interviewed employers, however, believed the field is changing and foresters with a diverse skill set will always be in demand. They said many foresters are getting close to retirement and will need to be replaced.

Background Requirements for Foresters	
Some College	3.3%
Bachelor's Degree or Higher	96.7%
Related Experience	94.3%
Certifications/Licenses	18.3%

Potential Green Job Vacancies

As part of the Labor Market Information Improvement grant provided through the 2009 federal stimulus program, the Idaho Department of Labor conducted a Job Vacancy Survey in spring 2010 covering all industries in Idaho. This survey included a question about green jobs.

Of the 3,165 survey respondents, 390 employers, or 12 percent, said they had green jobs on their payrolls. This matched the 356 employers, or 11 percent of the 3,314 employers, initially responding to that question in the 2010 Idaho Green Jobs Survey.

While the vacancy survey did not ask if a vacant job was green, the job vacancy data for occupations with high green job concentrations provides some insight into the green job vacancy rate.

The occupations listed below are those identified as green with the largest number of vacancies. These varied jobs included recreation workers, compliance officers, heavy and tractor-trailer truck drivers, farm workers and laborers and nuclear engineers.

Vacancies for the top 20 occupations – both green and non-green jobs – totaled 998 or 10 percent of all vacancies in the state.

Spring 2010 Job Vacancies in Occupations with High Green Job Concentrations				
Top 20	Green Rating	SOC Code	Occupation	Vacant Jobs
		39-9032	Recreation Workers	372
*		53-3032	Heavy and Tractor-Trailer Truck Drivers	336
*		45-2092	Farmworkers and Laborers, Crop, Nursery and Greenhouse	193
		51-3099	Food Processing Workers, All Other	154
*		37-3011	Landscaping and Groundskeeping Workers	95
		13-1041	Compliance Officers	79
		53-7051	Industrial Truck and Tractor Operators	78
*		19-1032	Foresters	76
*		11-1021	General and Operations Managers	71
		17-2161	Nuclear Engineers	67
		49-9099	Installation, Maintenance and Repair Workers, All Other	60
*		47-2073	Operating Engineers and Other Construction Equipment Operators	46
*		47-2152	Plumbers, Pipefitters, Steamfitters	44
*		47-2061	Construction Laborers	29
*		19-4020	Biological Technicians	24
*		17-2140	Mechanical Engineers	23
*		37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	23
*		49-9021	Heating, Air Conditioning, Refrigeration Mechanics and Installers	11

Green Jobs Projected Employment

Employers were asked during the survey to forecast their green jobs employment to 2012. Forty-seven percent declined, and 15 percent anticipated their green jobs employment would be lower in 2012 than it was in 2010. Based on responses, it appears this pessimism is prompted by the uncertain economic outlook rather than doubts about the future of any particular industry. Despite the economic outlook, overall green employment was projected to increase 2.2 percent. In contrast, the Department's current 2009-2011 Short-term Occupational Employment Statistics show a growth rate of .61 percent for all occupations for two years.

Twenty-one occupations with a positive outlook for 2012 had employer-projected green job increases of at least 10 percent. Insulation workers may be in the lead due to Idaho Statute 63-3022B, which is an income tax deduction for new insulation for residences in Idaho. Expanded federal tax credits for insulation expired in 2010, but are expected to continue at lower levels.

Green Rating	SOC	Occupation	Jobs 2010*	Jobs 2012*	Percent Increase
	47-2131	Insulation Workers, Floor, Ceiling and Wall	77	118	52.7%
	37-3012	Pesticide Handlers, Sprayers and Applicators, Vegetation	42	63	50.5%
	49-9041	Industrial Machinery Mechanics	12	18	50.0%
	13-1023	Purchasing Agents, Except Wholesale, Retail and Farm Products	16	24	46.9%
	37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	242	349	44.4%
	17-2141	Mechanical Engineers	92	128	38.4%
	47-2231	Solar Photovoltaic Installers	62	79	28.9%
	47-2073	Operating Engineers and Other Construction Equipment Operators	335	426	27.2%
	49-9021	Heating, Air Conditioning and Refrigeration Mechanics and Installers	306	389	27.2%
	40868	Construction Managers	110	136	23.5%
	19-1031	Conservation Scientists	39	48	23.4%
	19-4093	Forest and Conservation Technicians	50	61	22.7%
	51-9199	Production Workers, All Other	277	326	17.9%
	19-1029	Biological Scientists, All Other	89	105	17.8%
	53-7081	Refuse and Recyclable Material Collectors	259	304	17.6%
	51-8031	Water and Wastewater Treatment Plant and System Operators	177	208	17.4%
	37-3011	Landscaping and Groundskeeping Workers	600	693	15.4%
	45-1011	First-Line Supervisors of Farming, Fishing and Forestry Workers	56	64	14.8%
	17-2051	Civil Engineers	80	91	13.5%
	47-2061	Construction Laborers	775	878	13.3%
	49-1011	First-Line Supervisors of Mechanics, Installers and Repairers	72	80	10.9%

*Estimated employment numbers for 2010 and 2012 are based only on responses to expected employment in 2012.

Conclusion

Idaho's green employment is diverse throughout the economy. Nearly every industry has some level of green employment and there are many different types of occupations that can be considered green.

The green economy is expected to grow due to market forces demanding reduced energy costs and environmental regulation aimed at sustaining natural resources. Currently green jobs comprise 3 percent of Idaho's employment, and nearly 10 percent of Idaho's employers have one or more green jobs at their place of business.

The majority of green jobs are found within the construction, professional, scientific and technical and government industries. The green job with by far the most employment is construction worker.

Green jobs can be had at any education level and tend to have higher wages than jobs in general. Specialized skills vary by occupation. However, for job seekers looking for employment in a green job, it important to realize that over half of these green jobs require some type of certification. Also, most employers of green jobs require experience related to the position. It is incumbent on the job seeker to seek related education and training for the careers they are seeking. Labor market professionals should ensure that these opportunities are provided for the careers most in demand in Idaho.

Despite many employers' uncertainty about the economy in general, it is expected that green employment will increase slightly. Twenty-one green occupations are projected to have an employment increase greater than 10 percent by 2012.

The Idaho Department of Labor intends to continue tracking the growth of the occupations and industries identified within this survey as "green." As part of the ARRA — American Recovery and Reinvestment Act of 2009 — grant under which this research is conducted and funded, further study will be undertaken to obtain in-depth information regarding education, training and special skills related to green jobs. A supply gap analysis will be conducted on the educational and training opportunities provided in Idaho. For other certain occupations, career ladders or lattices will be developed to assist job seekers in determining where to best apply their existing skills. The goal is to provide improved labor market information to labor market participants, whether they be job seekers, employers or education and training providers.

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Appendix 1: 2010 Green Jobs Survey Methodology

Survey Design

The survey was devised primarily to collect information about occupations. The survey collected information on:

- Whether the company has any jobs where the work is essential to products or services in any of the core green areas, and if so, what are the business operations or processes involved in those green areas. The open-ended question was intended to collect qualitative information to catalog the green business operations and processes and also to help identify whether a listed occupation was indeed green.
- Job title and a description of the job duties.
- For each job title:
 - The number of employees working in each of the core green areas and the total number of workers.
 - An estimate of the number of workers expected to be employed in 2012.
 - Required education level.
 - Required experience level.
 - Typical wage or salary.
 - License or certification requirement.
 - Open-end request for a list of special skills required for the position.

The survey instrument was offered in both Web and mail versions, and telephone calls were made to non-responding businesses to conduct the survey over the phone.

Sampling

SAMPLE FRAME

The sample universe consisted of records from the Quarterly Census of Employment and Wages, known as QCEW, which are the records of businesses that pay unemployment insurance in Idaho. These covered businesses included most public and private employment, except some non-profit operations or domestic services, military and non-incorporated self-employed business owners.

SAMPLE DESIGN

A sample of 5,002 businesses was randomly selected from 2009 fourth quarter QCEW records of approximately 55,798 businesses.

To ensure a representative sample, the sample was stratified by the North American Industry Classification System sectors and business size. The business size classifications are 0-4 employees, 5-49 employees, 50-249 employees and more than 249 employees. Businesses with more than 249 employees were sampled with certainty. The sample was also allocated using the Neyman method that assigns more sample in larger strata with more variability.

All covered two-digit NAICS industries in the survey were sampled without any over-sample.

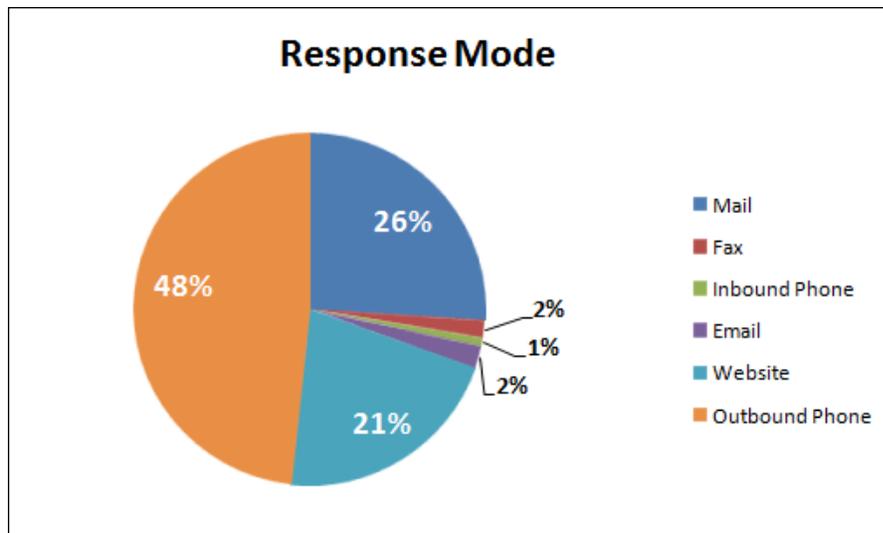
Data Collection

SURVEY MODES

The multimodal survey was conducted from June 18 through Sept. 10. Businesses were first notified of the survey with an insert in their quarterly unemployment insurance tax bill mailed in April 2010. The survey officially kicked off with a press release and media announcement on June 18. Businesses received a postcard in the mail with a link to an Idaho Department of Labor Web page with an online version of the survey. The first round of survey mailings went out on July 7 with subsequent rounds on July 16, and Aug. 16. All returned mail and non-responding businesses were followed up by telephone.

TABLE OF MODES

Response Mode	Number of Responses
Mail	1,014
Fax	61
Inbound Phone	30
Email	83
Website	830
Outbound Phone	1886
Total	3,904



Source: 2010 Green Jobs Survey responses, N=3,904

Response Rate

The survey achieved an overall response rate of 81 percent. Of the 5,002 Idaho businesses surveyed, 3,904 completed the survey. The refusal rate of contacted businesses was 3 percent.

The sample dispositions are:

Response Status	Description	Count
20	Refused	121
30	Out of business	152
31	Postal return	1
33	Invalid location	5
40	Out of scope	10
60	Nonresponse	806
70	Unusable response	3
91	Mail	1,014
92	Fax	61
93	Inbound phone	30
94	Email	83
95	Web	830
97	Outbound phone	1,886

The response rate was calculated by dividing the number of completed interviews by the number of eligible respondents plus a portion of the unknown respondents. Eligible respondents included completed surveys and refused surveys. Ineligible respondents are those employers who are out of business or no longer have operations in Idaho. The number of unknown respondents was multiplied by the eligibility rate to determine the portion of unknown respondents considered eligible. The eligibility rate was the number of eligible respondents divided by the total number of eligible and ineligible respondents.

RESPONSE BIAS

As part of the cleaning process, the Idaho Department of Labor re-contacted employers who reported having green jobs but did not describe a green-related business operation or process in the fourth question. Upon further review, those reported jobs that did not fit the criteria for Idaho's definition were eliminated from the survey. Because of the stringent evaluation process, there is little probability of over-reporting green jobs.

On the other hand, there may be an element of under-reporting for some occupations, particularly in the online or mail modes due to response bias. Businesses that did not readily identify with the green definition did not indicate having green jobs. In those cases, we did not follow up to ascertain whether the business was correct in its self-assessment. During the occupation evaluation, it became clear that businesses within the same industry with similar staffing patterns would differ in their reporting of green jobs.

An example of under-reporting is found within the Heating, Air Conditioning and Refrigeration Mechanics and Installers occupation. The survey responses included 39 establishments in the residential plumbing and HVAC contractor industry – NAICS 238211 – and non-residential plumbing and HVAC contractor industry – NAICS 238222. Twenty-five businesses indicated they had green jobs while 14 indicated they did not. Assuming similar staffing patterns between the industries, 36 percent of HVAC contractors did not count their HVAC installers as being in a green occupation.

Weighting

The survey results were weighted in a method consistent with the 2010 Idaho Job Vacancy Survey, which was sampled with an identical design. For data consistency purposes, businesses with fewer than two employees in the sampled quarter were excluded from the weighting and analysis for this report. The final number of businesses included in the survey report is 3,670, and 356 indicated they had green jobs.

The occupation results were expanded by statewide employment for employers with more than two employees and weighted by Idaho Workforce Investment Area region and industry at the two digit level.

The industry results were expanded by number of employers with two or more employees statewide and weighted by Idaho Workforce Investment Area region and industry at the two-digit level.

Appendix 2: Idaho Green Industries

The 20 industry sectors in the economy are split into 101 subsectors. The Idaho Department of Labor designated a list of 23 of those subsectors as green. Green industries for Idaho are based on a higher than average concentration of green jobs within the state as determined by the 2010 Idaho Green Jobs Survey and secondary sources.

-  Level 1 = Industries with a higher the average concentration of green employment.
-  Level 2 = Industries with a moderately high concentration of green employment.
-  Level 3 = Industries with the highest concentration of green employment.

Idaho Green Industries		
NAICS Subsector	Subsector	Rating
113	Forestry and Logging	
924	Administration of Environmental Quality Programs	
327	Nonmetallic Mineral Product Manufacturing	
562	Waste Management and Remediation Services	
236	Construction of Buildings	
541	Professional, Scientific and Technical Services	
333	Machinery Manufacturing	
238	Specialty Trade Contractors	
926	Administration of Economic Programs	
237	Heavy and Civil Engineering Construction	
115	Support Activities for Agriculture and Forestry	
221	Utilities	
443	Electronics and Appliance Stores	
423	Merchant Wholesalers, Durable Goods	
493	Warehousing and Storage	
453	Miscellaneous Store Retailers	
112	Animal Production	
111	Crop Production	
813	Religious, Grant making, Civic, Professional and Similar Organizations	
321	Wood Product Manufacturing	
212	Mining (except Oil and Gas)	
339	Miscellaneous Manufacturing	
928	National Security and International Affairs	

Appendix 3: Green Occupations

The 22 occupation groups contain 840 standard occupation codes (SOC). Employers identified green jobs within 211 of those SOC codes. The Idaho Department of Labor further designated a list of 152 of those occupations as green. Green occupations for Idaho are based on a higher than average concentration of green jobs within the state as determined by the 2010 Idaho Green Jobs Survey and secondary sources.

-  Level 1 = Occupations with a higher-than-average concentration of green employment.
-  Level 2 = Occupations with a moderately high concentration of green employment.
-  Level 3 = Occupations with the highest concentration of green employment.

There are 48 occupations in level 3 with the highest concentration of employment,  45 occupations at level 2  and 59 in level 1 .

SOC Code 2010	SOC Title	Green Category
11-9013	Farmers, Ranchers and Other Agricultural Managers	
11-9041	Architectural and Engineering Managers	
17-1011	Architects, Except Landscape and Naval	
17-1012	Landscape Architects	
17-2011	Aerospace Engineers	
17-2041	Chemical Engineers	
17-2081	Environmental Engineers	
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	
17-2161	Nuclear Engineers	
17-3025	Environmental Engineering Technicians	
19-1023	Zoologists and Wildlife Biologists	
19-1031	Conservation Scientists	
19-1032	Foresters	

Level 1 =  Level 2 =  Level 3 = 

APPENDIX 3

SOC Code 2010	SOC Title	Green Category
19-2012	Physicists	
19-2031	Chemists	
19-2041	Environmental Scientists and Specialists, Including Health	
19-2042	Geoscientists, Except Hydrologists and Geographers	
19-2043	Hydrologists	
19-2099	Physical Scientists, All Other	
19-4031	Chemical Technicians	
19-4041	Geological and Petroleum Technicians	
19-4051	Nuclear Technicians	
19-4091	Environmental Science and Protection Technicians, Including Health	
19-4093	Forest and Conservation Technicians	
25-1032	Engineering Teachers, Postsecondary	
25-1053	Environmental Science Teachers, Postsecondary	
29-9011	Occupational Health and Safety Specialists	
29-9012	Occupational Health and Safety Technicians	
33-1021	Forest Fire Fighting and Prevention Supervisors	
33-2022	Forest Fire Inspectors and Prevention Specialists	
33-3031	Fish and Game Wardens	
37-3012	Pesticide Handlers, Sprayers and Applicators, Vegetation	
37-3013	Tree Trimmers and Pruners	
45-2011	Agricultural Inspectors	

Level 1 =  Level 2 =  Level 3 = 

APPENDIX 3

SOC Code 2010	SOC Title	Green Category
45-2099	Agricultural Workers, All Other	
45-3011	Fishers and Related Fishing Workers	
45-4011	Forest and Conservation Workers	
47-2031	Carpenters	
47-2131	Insulation Workers, Floor, Ceiling and Wall	
47-2132	Insulation Workers, Mechanical	
47-2231	Solar Photovoltaic Installers	
47-4041	Hazardous Materials Removal Workers	
49-9021	Heating, Air Conditioning and Refrigeration Mechanics and Installers	
49-9081	Wind Turbine Service Technicians	
51-8011	Nuclear Power Reactor Operators	
51-8013	Power Plant Operators	
51-8031	Water and Wastewater Treatment Plant and System Operators	
53-7081	Refuse and Recyclable Material Collectors	
11-9121	Natural Sciences Managers	
11-9021	Construction Managers	
13-1041	Compliance Officers	
13-1199	Business Operations Specialists, All Other	
15-2099	Mathematical Science Occupations, All Other	
17-2051	Civil Engineers	
17-2071	Electrical Engineers	

Level 1 =  Level 2 =  Level 3 = 

APPENDIX 3

SOC Code 2010	SOC Title	Green Category
17-2112	Industrial Engineers	
17-2131	Materials Engineers	
17-2141	Mechanical Engineers	
17-301	Architectural and Civil Drafters	
17-3013	Mechanical Drafters	
17-3023	Electrical and Electronics Engineering Technicians	
17-3029	Engineering Technicians, Except Drafters, All Other	
19-1013	Soil and Plant Scientists	
19-1022	Microbiologists	
19-1029	Biological Scientists, All Other	
19-2032	Materials Scientists	
19-3051	Urban and Regional Planners	
19-4021	Biological Technicians	
19-4099	Life, Physical and Social Science Technicians, All Other	
25-1041	Agricultural Sciences Teachers, Postsecondary	
25-9021	Farm and Home Management Advisors	
33-2011	Firefighters	
37-1012	First-Line Supervisors of Landscaping, Lawn Service and Groundskeeping Workers	
37-3011	Landscaping and Groundskeeping Workers	
45-1011	First-Line Supervisors of Farming, Fishing and Forestry Workers	
45-2092	Farmworkers and Laborers, Crop, Nursery and Greenhouse	
45-2093	Farmworkers, Farm, Ranch and Aquacultural Animals	

Level 1 =  Level 2 =  Level 3 = 

APPENDIX 3

SOC Code 2010	SOC Title	Green Category
45-4021	Fallers	
45-4022	Logging Equipment Operators	
45-4029	Logging Workers, All Other	
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	
47-2061	Construction Laborers	
47-2111	Electricians	
47-2152	Plumbers, Pipefitters and Steamfitters	
47-2181	Roofers	
47-3012	Helpers--Carpenters	
47-3019	Helpers, Construction Trades, All Other	
47-4011	Construction and Building Inspectors	
47-4099	Construction and Related Workers, All Other	
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation and Relay	
49-9031	Home Appliance Repairers	
49-9044	Millwrights	
51-9197	Tire Builders	
11-1021	General and Operations Managers	
11-3051	Industrial Production Managers	
11-9199	Managers, All Other	
13-1021	Buyers and Purchasing Agents, Farm Products	
13-2099	Financial Specialists, All Other	

Level 1 =  Level 2 =  Level 3 = 

APPENDIX 3

SOC Code 2010	SOC Title	Green Category
15-1132	Software Developers, Applications	
15-1152	Computer Network Support Specialists	
15-2041	Statisticians	
17-2072	Electronics Engineers, Except Computer	
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	
17-2199	Engineers, All Other	
17-3019	Drafters, All Other	
17-3022	Civil Engineering Technicians	
17-3026	Industrial Engineering Technicians	
19-1042	Medical Scientists, Except Epidemiologists	
19-3091	Anthropologists and Archeologists	
19-3099	Social Scientists and Related Workers, All Other	
19-4011	Agricultural and Food Science Technicians	
19-4061	Social Science Research Assistants	
25-2032	Career/Technical Education Teachers, Secondary School	
25-9031	Instructional Coordinators	
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	
37-2019	Building Cleaning Workers, All Other	
39-7011	Tour Guides and Escorts	
39-9032	Recreation Workers	
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	
41-9031	Sales Engineers	
45-2091	Agricultural Equipment Operators	

Level 1 =  Level 2 =  Level 3 = 

APPENDIX 3

SOC Code 2010	SOC Title	Green Category
47-2051	Cement Masons and Concrete Finishers	
47-2073	Operating Engineers and Other Construction Equipment Operators	
47-2211	Sheet Metal Workers	
47-5021	Earth Drillers, Except Oil and Gas	
49-1011	First-Line Supervisors of Mechanics, Installers and Repairers	
49-2011	Computer, Automated Teller and Office Machine Repairers	
49-3022	Automotive Glass Installers and Repairers	
49-3023	Automotive Service Technicians and Mechanics	
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	
49-3041	Farm Equipment Mechanics and Service Technicians	
49-3091	Bicycle Repairers	
49-3093	Tire Repairers and Changers	
49-9041	Industrial Machinery Mechanics	
49-9071	Maintenance and Repair Workers, General	
49-9098	Helpers--Installation, Maintenance and Repair Workers	
49-9099	Installation, Maintenance and Repair Workers, All Other	
51-2022	Electrical and Electronic Equipment Assemblers	
51-2099	Assemblers and Fabricators, All Other	
51-3099	Food Processing Workers, All Other	
51-4121	Welders, Cutters, Solderers and Brazers	
51-8021	Stationary Engineers and Boiler Operators	
51-8099	Plant and System Operators, All Other	

Level 1 =  Level 2 =  Level 3 = 

APPENDIX 3

SOC Code 2010	SOC Title	Green Category
51-9023	Mixing and Blending Machine Setters, Operators and Tenders	
51-9041	Extruding, Forming, Pressing and Compacting Machine Setters, Operators and Tenders	
51-9199	Production Workers, All Other	
53-2012	Commercial Pilots	
53-3032	Heavy and Tractor-Trailer Truck Drivers	
53-7021	Crane and Tower Operators	
53-7032	Excavating and Loading Machine and Dragline Operators	
53-7051	Industrial Truck and Tractor Operators	

Level 1 =  Level 2 =  Level 3 = 

Appendix 4: North American Industry Classification System

Code	NAICS Industry	Industry Description
11	Agriculture, Forestry, Fishing and Hunting	Establishments primarily engaged in growing crops, raising animals, harvesting timber and harvesting fish and other animals from a farm, ranch or their natural habitats.
21	Mining, Quarrying, and Oil and Gas Extraction	Establishments that extract naturally occurring mineral solids such as coal and ores; liquid minerals such as crude petroleum and gases such as natural gas.
22	Utilities	Establishments engaged in the provision of the following utility services: electric power, natural gas, steam supply, water supply and sewage removal.
23	Construction	Establishments primarily engaged in the construction of buildings or engineering projects; the preparation of sites for new construction; subdividing land for sale as building sites.
31-33	Manufacturing	Establishments engaged in the mechanical, physical or chemical transformation of materials, substances or components into new products.
42	Wholesale Trade	Establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise.
44-45	Retail Trade	Establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise.
48-49	Transportation and Warehousing	Establishments providing transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation and support activities related to modes of transportation.
51	Information	Establishments engaged in the processes of producing and distributing information and cultural products; providing the means to transmit or distribute these products as well as data or communications; processing data.
52	Finance and Insurance	Establishments primarily engaged in financial transactions (transactions involving the creation, liquidation or change in ownership of financial assets) and/or in facilitating financial transactions.
53	Real Estate and Rental and Leasing	Establishments primarily engaged in renting, leasing or otherwise allowing the use of tangible or intangible assets and establishments providing related services.
54	Professional, Scientific and Technical Services	Establishments that specialize in performing professional, scientific and technical activities for others.
55	Management of Companies and Enterprises	Establishments that hold the securities of (or other equity interests in) companies and enterprises for the purpose of owning a controlling interest or influencing management decisions or establishments (except government establishments) that administer, oversee and manage establishments of the company or enterprise and that normally undertake the strategic or organizational planning and decision-making role of the company or enterprise.
56	Administrative and Support and Waste Management and Remediation Services	Establishments performing routine support activities for the day-to-day operations of other organizations.
61	Educational Services	Establishments that provide instruction and training in a wide variety of subjects.
62	Health Care and Social Assistance	Establishments providing health care and social assistance for individuals.
71	Arts, Entertainment and Recreation	Establishments that operate facilities or provide services to meet varied cultural, entertainment and recreational interests of patrons.
72	Accommodation and Food Services	Establishments providing customers with lodging and/or preparing meals, snacks and beverages for immediate consumption.
81	Other Services (except Public Administration)	Establishments engaged in providing services not specifically provided for elsewhere in the classification system, including equipment and machinery repairing, promoting or administering religious activities, grantmaking, advocacy, drycleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services and dating services.
92	Public Administration	Establishments of federal, state and local government agencies that administer, oversee and manage public programs and have executive, legislative or judicial authority over other institutions within a given area.

Source: North American Industry Classification System, U.S. Census Bureau, 2007. <http://www.census.gov/eos/www/naics/index.html> Accessed 08/19/2010.

Appendix 5: Standard Occupational Classification System

Major Occupational Group	Sample Occupations
Management Occupations	Education Administrators, Sales Managers, Food Service Managers
Business and Financial Operations Occupations	Appraisers, Accountants, Fundraisers, Human Resource Specialists
Computer and Mathematical Occupations	Web Developers, Mathematicians, Computer Support Specialists
Architecture and Engineering Occupations	Architects, Civil Engineers, Drafters, Engineering Technicians
Life, Physical and Social Science Occupations	Foresters, Psychologists, Nuclear Technicians, Economists
Community and Social Service Occupations	Rehabilitation Counselors, Social Workers, Religious Workers
Legal Occupations	Lawyers, Judges, Court Reporters, Paralegals
Education, Training, and Library Occupations	Postsecondary Teachers, Librarians, Teacher Assistants
Arts, Design, Entertainment, Sports and Media Occupations	Graphic Designers, Technical Writers, Photographers, Reporters
Healthcare Practitioners and Technical Occupations	Pharmacists, Registered Nurses, Paramedics, MRI Technologists
Healthcare Support Occupations	Dental Assistants, Phlebotomists, Nursing Assistants
Protective Service Occupations	Police Officers, Firefighters, Security Guards, Lifeguards
Food Preparation and Serving Related Occupations	Cooks, Fast Food Workers, Bartenders, Waiters and Waitresses
Building and Grounds Cleaning and Maintenance Occupations	Tree Trimmers, Maids, Pest Control Workers
Personal Care and Service Occupations	Hairdressers, Childcare Workers, Travel Guides, Personal Care Aides
Sales and Related Occupations	Cashiers, Travel Agents, Real Estate Sales Agents
Office and Administrative Support Occupations	Secretaries, Tellers, Customer Service Representatives, Dispatchers
Farming, Fishing and Forestry Occupations	Agricultural Inspectors, Farmworkers, Logging Workers
Construction and Extraction Occupations	Construction Laborers, Painters, Extraction Workers
Installation, Maintenance and Repair Occupations	Motorcycle Mechanics, Air Conditioning Installers, Appliance Repairers
Production Occupations	Assemblers, Bakers, Machinists, Cabinetmakers, Power Plant Operators
Transportation and Material Moving Occupations	Airline Pilots, Ambulance Drivers, Crane Operators, Material Movers

Source: U.S. Department of Labor, Bureau of Labor Statistics, *2010 Standard Occupational Classification*. <http://www.bls.gov/soc/home.htm>. Accessed Aug. 23, 2010.

Appendix 6: Survey Materials

2010 Green Jobs Survey

Your business has been selected to receive a survey about green jobs in Idaho. This survey is important for helping the Idaho Department of Labor identify emerging occupations and to determine the impact of the green economy in Idaho.

Please visit our Web site to take the survey:

labor.idaho.gov/greenjobssurvey

For more information, contact
greenjobs.survey@labor.idaho.gov
or 208-332-3570, ext. 5675

IDAHO
DEPARTMENT OF LABOR
C.L. "BUTCH" OTTER, GOVERNOR
ROGER B. MADSEN, DIRECTOR

APPENDIX 6

IDAHO
DEPARTMENT OF LABOR

C.L. "BUTCH" OTTER, GOVERNOR
ROGER B. MADSEN, DIRECTOR

July 19, 2010

Dear Idaho Employer:

Your company has been selected to represent your industry in a 2010 Idaho Green Jobs Survey conducted by the Idaho Department of Labor. This study is important to create a better prepared work force that will help meet the changing needs of businesses and in turn improve Idaho's economy. Your response is important to not only represent your business but others like yours.

The purpose of this study is to establish an estimate of the current and projected number of "green jobs" in Idaho so we can identify occupations that are emerging or transforming as the economy evolves to incorporate more environmentally-friendly business practices.

On the enclosed questionnaire, we ask you for information about your company's jobs and whether they fall within certain defined "green" areas. We estimate this survey will take 5 to 15 minutes to complete.

- **ONLINE:** Go to labor.idaho.gov/greenjobssurvey and click on **Take The Survey**. To start answering the questions, enter the 6-digit survey ID number that appears at the top right-hand corner of the survey.
- **PAPER:** Complete the enclosed survey and return it to us in the postage-paid reply envelope.
- **FAX** the completed survey to us at (208) 334-6455.
- **CALL** us at (208) 332-3570 ext 5675, or toll-free at (800) 772-2553, ext 5675.

Please complete the survey by **Aug. 10, 2010**, so we can include your company's information in our study. If you do not have any "green jobs" to report **we still need your response**. A "no" response is just as important as a "yes." Please use one of the options above to complete the survey.

If you have any questions or need assistance to complete the survey, send us an e-mail at greenjobs.survey@labor.idaho.gov or call us at the numbers listed above. Survey results will be available within six months on our Web site at <http://lmi.idaho.gov>. The Idaho Department of Labor thanks you for your time and participation.

Sincerely,



Georgia Smith, Deputy Director
Communications & Research

CENTRAL OFFICE • 317 West Main Street • Boise, Idaho 83735 • Tel: 208-332-3570 • labor.idaho.gov

Equal Opportunity Employer

APPENDIX 6

**Idaho Green Jobs Survey
Frequently Asked Questions – Survey Responses**

I do not have any green jobs. Do I still need to complete the survey?

Yes. A “no” response is just as important as a “yes” response for defining green jobs.

I do not have any green jobs right now, but I expect to have some in the future. Should I include those?

Yes, if you can project the number of workers you will need in 2012.

I am not sure if my business has work related to one of the core green areas. Can you help me determine this?

We have provided examples on an enclosed page to help you determine whether the type of work your business does may be related to one of those activities. Please refer to this to make this determination for yourself.

We prefer to hire someone with a bachelor’s degree, but we will accept a lower education level if the person has enough experience. Which education level do I choose?

Select the absolute minimum education level that you will accept, even if you would prefer an applicant with a higher level.

What do you mean by “unrelated work experience?”

Unrelated work experience is any type of employment that is not similar to the position you are posting. Some employers want the applicant to have held some type of job before, regardless of whether it is in the same line of work.

The wages for this position will depend on the person’s experience. Can I write in a range for the wages?

Please provide a single value for the wages. Use the wage that you expect to offer a typical candidate for this position.

What do you mean by “special skills?”

Some positions require specialized training either before hiring or shortly after hiring. Some examples include a Professional Engineer License, vocational training installing photo-voltaic equipment, LEED certification or apprenticeship training. If you need more room, please use additional paper to describe all of the skills required for the position.

Does a driver’s license count as a required license or certification?

A driver’s license counts if it is a requirement to be considered for the position, or if a specific driver’s license, such as a CDL, must be obtained upon hire.



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APPENDIX 6

Green Jobs Survey Frequently Asked Questions – General Information

How did you get my information?

We obtained your number through a random sample of employers who paid unemployment insurance last year. This helps us ensure that we are getting a wide variety of responses from employers all across Idaho.

How will this information be used?

Researchers will create a report showing the numbers and types of green jobs by business size and industry. Survey findings will be used as part of making important investment decisions on education and training programs needed in Idaho.

Is this confidential?

Absolutely. Your responses are private and confidential. Information provided in your responses will be compiled with other employers to create a statewide report. No individual response will be identifiable.

Who should complete this survey?

Anyone with knowledge of the company's recruiting or hiring can complete the survey. The survey requests that a contact person is identified in case we have questions about information included in the survey.

Am I required by law to fill out this survey?

No, but the success of the survey and the quality of the results depends on employers who complete the form. Not every employer in the state will receive this survey. With your participation, labor market information about Idaho that businesses, economists, government officials, students and many more rely on will be as accurate as possible.

I don't have information available for some of the questions. What should I do? Any information you can provide is helpful. For instance, you may be able to report the name of a green job, but not an education level.

How much time will this take to complete?

On average it will take less than 10 minutes of your time.

Will I be charged to get a copy of the results?

No. Like most labor market information, the results of the 2010 Green Jobs Survey will be available free of charge on the Idaho Department of Labor's Web site.

Who do I contact if I have more questions about this survey?

Please call the Research & Communications Bureau at the Idaho Department of Labor at (800) 772-2553, ext. 5675 or e-mail us at greenjobs.survey@labor.idaho.gov.



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APPENDIX 6

Core Green Areas

How do I know if our company has jobs where the work is essential to products or services in any of the listed areas?

The descriptions provided with each category below should help you determine if you have jobs that would fall within the category. Keep in mind the categories are not limited to the examples listed below.

Renewable Energy and Alternative Fuels

Manufacturing, production, construction, design, research, delivery, operation, storage and maintenance of wind, solar, biomass, hydro, geothermal, methane, nuclear and alternative transportation fuels such as ethanol and waste incineration as a fuel source.

Energy Efficiency and Conservation

Manufacturing, construction, installation, production of energy efficient products (such as Energy star rated appliances, more efficient lighting), energy efficiency services, weatherization, building retrofitting/efficiency, energy efficient production processes, energy distribution improvements (smart grid), transportation technology, and battery development and storage improvement.

Sustainable Agriculture and Natural Resource Conservation

Products and services to conserve, maintain and improve natural resources and the environment, including low carbon agriculture, land management, water management and conservation, wetlands restoration and environmental conservation. Includes bioscience related activities.

Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup

Activities related to controlling commercial, transportation and industrial emissions and pollution; water treatment, recycling operations, waste product management and treatment. Includes controlling and reducing emissions of CO₂, other greenhouse gases, waste water and other pollutants. Environmental remediation including the cleanup and disposal of pollution, waste and hazardous materials; Superfund/Brownfield redevelopment and landfill restoration.



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2010 Idaho Green Jobs Survey

Survey ID: [Unique ID#]

<p>DIRECTIONS</p> <p>Please direct this survey to the manager or human resources professional responsible for hiring and recruitment at this location of your business.</p> <p>For your convenience, you may complete the survey in any of the following ways:</p>		<p>[Trade_Name] [ATTN] [Address] [Address 2] [City], [State] [Zip]</p> <p>Respond for the business located at: [PL_Addr1] [Unit_Dese] [PL_City], [PL_State] [PL_ZIP] Estimated employment at this location: [EMP]</p> <p>Please submit your responses by August 10.</p>
	Online at http://labor.idaho.gov/greenjobssurvey	
	Fax to the Idaho Department of Labor at (208)334-6455	
	Call us at (208)332-3570, ext. 5675 or toll-free at (800) 772-2553 ext. 5675.	
	Mail using the enclosed postage-paid envelope.	

PART A – About Your Business
This section requests information about the business, institution or organization listed above in the right-hand box.

<p>1. Total number of employees: _____</p> <p><i>If you have multiple locations, please complete this survey only for the Idaho location listed in the upper right hand box of this form.</i></p>	<p>3. Does your company have any jobs where the work is essential to products or services in any of these core green areas?</p> <p>RENEWABLE ENERGY AND ALTERNATIVE FUELS ENERGY EFFICIENCY AND CONSERVATION SUSTAINABLE AGRICULTURE AND NATURAL RESOURCE CONSERVATION POLLUTION AND WASTE PREVENTION, REDUCTION AND MANAGEMENT AND ENVIRONMENTAL CLEANUP</p> <p><input type="checkbox"/> Yes Continue to Question 4 below.</p> <p><input type="checkbox"/> No You have completed the survey. Please return it using the above instructions.</p>
<p>2. Who is responding to this survey?</p> <p>Your name _____</p> <p>Title _____</p> <p>Phone Number _____</p> <p>E-mail Address _____</p>	<p>4. Describe your company's business operations or processes involving the areas listed in Question 3.</p> <p style="text-align: right;"><i>Continue to Part B on reverse</i> </p>

[UI#]

APPENDIX 7 — SURVEY INSTRUMENT PAGE 2

Part B—Green Jobs Survey

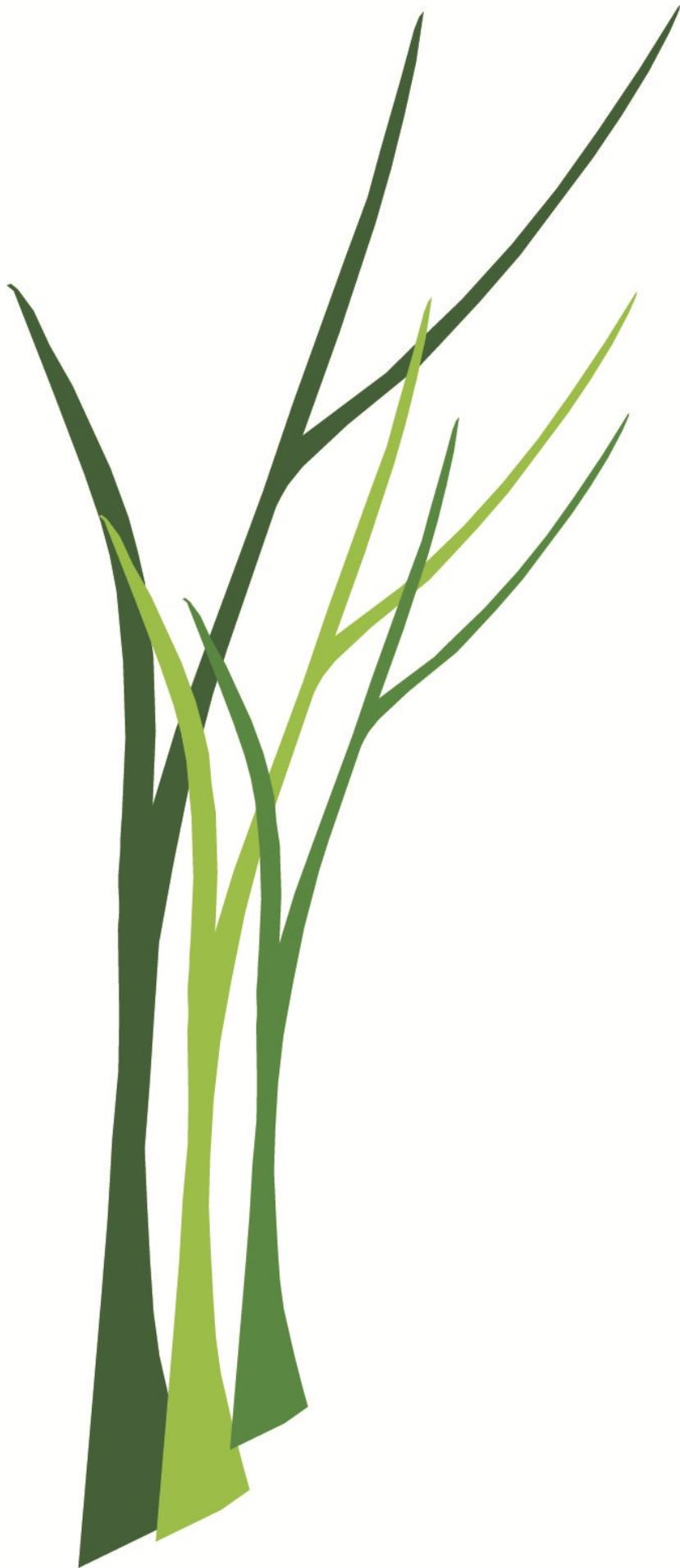
6-digit unique identifier

Green Job Titles <i>(include a brief description)</i>	Number of employees working in the core green areas				Total number of workers in this position.	Total number of workers you expect to employ in this position in 2012.	What education level is usually required?	What experience is usually required?	What is the typical wage or salary?	Is a license or certification required?		List special skills required for this position, if any.
	Renewable Energy & Alternative Fuels	Energy Efficiency & Conservation	Sustainable Agriculture & Natural Resource Conservation	Pollution & Waste Prevention, Reduction & Management						Y	N	
<ul style="list-style-type: none"> Please list the job titles of the employees whose work is essential to one of the core green areas listed in Question 3. Include only positions referenced for this location. Include full-time, part-time, seasonal, temporary and permanent positions. Exclude consultants, outside contractors and others not considered employees. 	<ul style="list-style-type: none"> Count the number of employees for each position whose work is essential to each of the core green areas listed in each column below. Do not count any employee more than once. If someone works in more than one core green area, select the area in which s/he works the most amount of time. 						Enter one of the following codes: 1 = No requirement 2 = HS Diploma/GED 3 = Some College 4 = Vocational Training 5 = Associates Degree 6 = Bachelor's Degree 7 = Advanced Degree	Enter one of the following codes: A = No experience required B = Unrelated work experience C = Experience related to position	Indicate if hourly, monthly or annual. Enter actual wage. If <u>part time</u> , enter hourly wages only.			<i>Please include: licenses, certificates, specialized vocational training or job-related experience.</i>
Examples:												
Civil Engineer: designs systems for LEED commercial construction	1		1		2	3	6	B	\$85,000	X		LEED certificate
Solar Installer: installs solar panels in commercial construction	5				5	10	4	C	\$20/hr		X	technical training in PV installation

Need more space? Photocopy this page or contact us at (800)772-2553, ext. 5675 for another copy.

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Idaho Department of Labor, Communications & Research
317 W. Main St., Boise, ID 83735



Section II
Idaho
Green Jobs
Interviews

Introduction

Through the American Recovery and Reinvestment Act of 2009, the Idaho Department of Labor received a competitively awarded State Labor Market Information Improvement grant to develop data on the green economy – industries and careers that clean and improve the environment. This information is to be disseminated so workers can prepare for careers in those occupations and industries. In compiling the data, a survey was distributed from June 18 to Sept. 10, 2010, to identify industries and occupations as green and provide quantitative data on green jobs. To supplement the survey data, in-depth interviews and focus groups were conducted with workers and employers from a cross section of identified green occupations. The interviews and focus groups provided an opportunity to collect qualitative information from individuals in each field. This report is based entirely on those interviews and focus groups.

Executive Summary

The highlighted occupations represent a wide range of opportunities for current and future Idaho workers. The variety of skills, educational backgrounds, certifications and interests presents opportunities for most anyone.

Pervasive for these occupations are communication and computer skills that are sometimes hard to find.

Communication, both written and oral, was singled out as crucial for these green jobs. Those doing the hiring want workers proficient in conveying ideas, explaining products and detailing services to both coworkers and customers – skills that can be transferred to any of the highlighted jobs.

Computer skills are important for several occupations today and will be even more important in the future. Even primarily outdoor occupations rely on computers to improve and organize work. Developing computer skills and keeping them up to date not only gets workers a job today but prepares them for future jobs and promotions.

While formal education is not required for every one of these occupations, experience is generally a deciding factor in filling these jobs. Several occupations put in-field experience ahead of education even when a degree is considered a must. Managers see experience related to the work of the occupation, regardless of the source, as showing a commitment and interest in the field – something they highly value.

Certifications are another matter. When certification is required by law, hiring managers expect it. But if certification is optional, then it can be used to distinguish among job applicants. The time, commitment and interest required to get optional certifications is a quality managers look for in hires although not to the degree that in-field experience is sought.

Communication, both written and oral, was singled out as crucial for these green jobs.

Northern and North Central Regions

FORESTERS AND FOREST TECHNICIANS

Idaho is rife with forests, especially in the northern regions of the state, which fosters a large forestry industry. While portions of this industry are declining at sawmills and paper mills, the Bureau of Labor Statistics still projects some growth by 2018. While not staggering, it is estimated as high as 2.5 percent,¹ and any growth is positive, especially when the industry's products depend on a delicate resource. In northern and north central Idaho, the focus was on foresters and forestry technicians, occupations that involve a multitude of activities surrounding the management of both public and private forests.

FORESTERS

The Bureau of Labor Statistics² defines foresters as workers who “manage public and private forested lands for economic, recreational and conservation purposes. May inventory the type, amount and location of standing timber, appraise the timber's worth, negotiate the purchase and draw up contracts for procurement. May determine how to conserve wild-life habitats, creek beds, water quality and soil stability and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth and determine optimal harvesting schedules.” By itself, this definition contains several activities that fall under the Idaho Department of Labor's Green Job Definition. The Green Job Survey confirmed this and foresters are classified in the highest green category.

Differences between private and public foresters were discussed during the interviews. Typically, private foresters have to fulfill many different responsibilities for their companies while public foresters can be more specialized in areas like ecology, biology and hydrology. On the other hand, private foresters need a broader understanding of forestry and are expected to be knowledgeable in all the pertinent life and physical sciences.

Interviewees discussed two different private foresters, consulting and industry. Consulting foresters work directly with private landowners while industry foresters work for employers in the wood products industry. Consultants offer a wide range of independent natural resource management services to promote healthy, growing, diverse forests. They provide information and advice to the landowners on the proper species for a specific site, what management options are available and how to tailor activities to suit their personal goals. Consultants are hired by a landowner on a fee basis and work directly for the individual landowner. Consultants can usually provide more in-depth and comprehensive services than natural resource professionals employed by public agencies.

The skills required of a private forester are diverse and evolving with the industry. As landowners' needs and goals have changed over the past few years, completely new ideas and training have developed. Foresters today not only need to know how to grow a highly productive forest but how to manage various wildlife species, aesthetics, old growth and water quality. Important for foresters are computer knowledge, communication, work ethic, agricultural knowledge and firefighting skills.

¹National Employment Matrix, <http://www.bls.gov/data/>.

²Standard Occupational Classification, <http://www.bls.gov/soc/2010/soc191032.htm>.

Very valuable are computer skills, particularly in geographic information systems, an advanced program used for mapping. One interviewee said mapping skills could tip the balance in hiring decisions. Other software experience in database programs and growth simulators is also beneficial.

Along with computer skills, workers with backgrounds in agriculture or firefighting tended to have more connection to the outdoors and possessed skills that let them work well in wilderness environments, survival skills for example.

The private sector puts a lot of stock in actual in-field experience, which is usually obtained through public agencies employment. Forestry technician is one of the more common occupations that can provide experience in this field.

Skills like a strong work ethic and communication were emphasized by every interviewee. They said the work of consulting foresters involves more salesmanship than more traditional foresters since they must convince land owners of the benefit of their services. This aspect of a forester's occupation underscores the value of good communication skills.

While education is important in becoming a forester, hands-on experience is even more valuable. Most interviewees said they looked for college degrees in hiring foresters along with the professional certifications a forester can receive. The University of Montana's forestry program gets high praise from the industry because it has the most applied experience.

Interviewees did not require certifications, but they said possessing one makes foresters more employable and demonstrates their dedication. That is especially true for the Certified Forester certification from the Society of American Foresters.³ This certificate requires a four-year degree, experience in the field and an examination along with continuing education to maintain certification.

While not a certification for foresters, interviewees discussed the importance the Sustainable Forest Initiative certification⁴ because clients are demanding it. This certification is for organizations and has many requirements, and the foresters working for these organizations have to be in compliance with the standards, which involve continuing education classes, seminars and conferences.

According to the Idaho Department of Labor's 2008-2018 Long-Term Projections, the number of foresters will decline slightly over the next several years, and few annual openings are projected for this occupation. Those interviewed had a more positive outlook, however, mentioning that demand for wood remains despite a decline in the number of mills. Today's mills tend to be larger and consume more timber than the older ones. Feeding these mills is an ever-increasing number of private landowners. The needs of those landowners will maintain the demand for foresters with the right temperament, personality and training.

³Society of American Foresters website, <http://www.safnet.org/>.

⁴Sustainable Forest Initiative certification, <http://www.sfiprogram.org/>.

Two interviewees believe there will be an emerging market for foresters in carbon sequestration.* One said his organization has been involved with carbon sequestration for almost a decade. Selling carbon credits on the market as an offset for companies burning fossil fuels lets organizations generate money more quickly. Usually an organization waits decades for the harvest to see a return on its investment. Sequestration offers a much swifter return, and foresters who are experts in this field will be in high demand when legislation dealing with carbon markets becomes law or treaties like the Kyoto Protocol are enforced.

**Terrestrial carbon sequestration is the process through which carbon dioxide from the atmosphere is absorbed by trees, plants and crops through photosynthesis and stored as carbon in the biomass of tree trunks, branches, foliage and roots and soils as described on the web at <http://www.epa.gov/sequestration/faq.html>. The term "sinks" is also used to refer to forests, croplands and grazing lands and their ability to sequester carbon. Agriculture and forestry activities can also release CO2 into the atmosphere. A carbon sink occurs when carbon sequestration is greater than carbon releases over time.*



FOREST TECHNICIAN

Forest technician is a broad occupational title for employees who fight fires, plant trees, build trails and perform many technical tasks for government and privately owned forests. For example, the Forest Service identifies technicians as Helitack workers, smokejumpers, fire engine operators, dispatchers, technician supervisors, timber sale preparers and administrators, air tanker base crewmen, lookouts, fire prevention specialists, recreationists and crewmen working on trails and timber stand improvement.

Becoming a technician is the most common way to gain the experience required to compete for professional-level jobs such as forester, both public and private. This hands-on experience is highly desired because it demonstrates familiarity and training the industry needs in its workers. However, not all forest technician jobs are entry level. The timber sale preparation and administration occupations can require significant knowledge of harvesting methods as well as many years of experience.

Most seasonal hires are forest technicians. Although several year-round jobs are classified as forest technicians, the majority are temporary. Since many are filled by students, the seasonal nature of the jobs is a benefit rather than a detriment. Year-round technicians usually are higher level, more experienced workers who help with budgets, conduct training and do planning, supply ordering and other preparations for the next summer. These technicians also may be involved in prescribed burning and other environmental projects.

Technicians are the backbone of several forest companies. Many technician jobs do not require a college degree and they present wide-ranging combinations of challenging and interesting work. Forest hiring needs for technicians are largely determined by the natural resource problems of the geographic area and the types of access needed.

Technician support is vital to programs that include firefighting and prevention, improving roads and building trails, insect and disease control and reforestation and habitat improvement. Technicians assist professional foresters, engineers, biologists, contractors and landowners on projects important to managing the forest for renewable resources and natural values. Technicians can also apply their knowledge of techniques and procedures in instrumentation, data collection for environmental impact studies to meet federal environmental requirements, for compliance inspections or timber sales.

Technicians perform numerous duties in preventing and fighting forest fires. Activities such as thinning and other fire load reduction efforts are used to improve and protect forests. Another technique called under-burning has also been employed in recent years. Under-burning requires a higher level of training than entry-level technicians have so these jobs represent the potential for upper mobility. The thinning process produces a fair amount of woody biomass. One interviewee mentioned that there is no market for biomass right now so a lot of it is chipped and left in the woods. If there was a biomass market, there would be more thinning activity, which is critical in maintaining the health of the forests.

In silvaculture, forestry technicians are involved in timber sales preparation including timber cruising, GIS mapping and inventory examinations; timber harvest activities like timber appraisal, controlling log quality and timber procurement; stand management and reforestation activities.

Many forestry technicians work in reforestation on both public and private land. They plant trees on land that has been logged or destroyed by fire or industrial use. They take charge of the work crews that plant trees or assist foresters who check for evidence of harmful insects and tree diseases. They also plant grass or groundcover crops to prevent soil erosion.

Forest technician jobs are physically demanding. They require stamina and the ability to hike while carrying equipment over steep terrain. Good eyesight is vital, especially for firefighters and lookout workers. Technician jobs often require skilled use of forestry instruments, electronic devices and field data recorders. Increasingly, they require knowledge of geographic information systems and global positioning systems.

Several avenues of job growth exist for forest technicians, but competition is particularly steep for professional-level jobs. In some national forests, people spend 30 years or more as temporary employees. Specialized experience is often the deciding factor in moving to different occupations along with a willingness to move geographically to get the varied experience managers value.

The outlook for forest and conservation technicians is varied. The Bureau of Labor Statistics projects employment nationally to grow about 9 percent by 2018. Most of the growth is expected on state and local government payrolls. The Idaho Department of Labor projects forest and conservation technicians in Idaho will decline 2.4 percent from 2,427 in 2008 to 2,370 in 2018. But even with that decline, there should be more than 100 job openings a year in Idaho to replace technicians who have retired or moved on.

Southwestern Region

ZOOLOGISTS AND WILDLIFE BIOLOGISTS

Along with ample forests, Idaho has an abundance of wildlife. Zoologists and biologists are involved in studying and protecting this natural resource. The Bureau of Labor Statistics defines zoologists and wildlife biologists as those who “study the origins, behavior, diseases, genetics and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats.”⁵ This is work that fits well into the Idaho Department of Labor’s Green Job Definition under Sustainable Agriculture and Natural Resource Conservation. But wildlife biologists maintained their jobs involved in all four of the defined green areas.

Participants stated that wildlife biologists perform work essential to all four core areas – impact studies, education and implementation of processes or technologies that lessen the impact on wildlife. One example is an impact study looking at the effect of proposed wind farms on birds and other animals. Another is educating biofuel producers on technologies and processes that can prevent ecological damage.



Skills important to wildlife biologists are fairly diverse. Some are shared with other targeted occupations. In addition to the needed foundation in wildlife biology, participants cited as important skills communication, counting, observation, field craft, safety awareness, critical thinking and decision making and project and financial management along with a passion for the outdoors.

...Wildlife biologists perform work essential to all four core areas...

But communication is at the top of the list as the most used and hardest to find skill. Communication and negotiating skills, written and oral, are critical for wildlife biologists. “By nature, most biologists are introverts,” one participant said, “so we do great studies and we do great papers and we know all kinds of things, and then we hide in our cubicle never speaking to anybody and nothing ever gets done.”

Critical thinking, decision making and project and financial management skills are linked directly to effective problem solving and important for wildlife biologists, who spend much of their time working on their own. They must be able to make wise choices based on available facts in determining the best way to use limited resources. Managing a project within budget constraints is “not as sexy as going out and collecting the information about wildlife, but that’s part of the job,” one participant said.

As with foresters and forestry technicians, field craft and safety awareness foster confidence in working in the wilderness and other remote locations around the state. These skills can be taught on the job, but participants preferred seeing activities in an applicant’s background that imply some knowledge to begin with. Hunting, fishing and skiing backgrounds tend to attract people with field craft and wilderness safety skills, and some universities are now offering semester-long field courses to provide students with these skills.

⁵Standard Occupational Classification, <http://www.bls.gov/soc/2010/soc191023.htm>.

While not a skill in the normal sense, love of the outdoors is seen as a must for wildlife biology aspirants. “This is a passion field,” a participant said. “I didn’t get into this for the money, and it’s paid off exactly that way.” Others contended that because of the lower salary and the rarity of permanent, full-time jobs people without a passion for wildlife and the outdoors leave early in their careers to pursue other avenues, leaving the field to a very dedicated group of individuals.

Observation and counting skills underpin a biologist’s work since they enable him to look beyond the surface, to “see something and tie it into what it is,” as one participant said, and then accurately quantify the event. While sounding very simple and of little importance, “counting is a lot harder than it seems when you have to count 30,000 ducks that are flying over your head,” a participant said. “There’s actually some skill involved. It’s like sticking your head in a beehive and trying to count the bees; it’s difficult. Being able to estimate large numbers is really a skill that gets overlooked.”

A bachelor’s degree is the bare minimum educational requirement for this field, and a master’s degree is a ticket to work. One participant said over two-thirds of his department staff had master’s degrees or doctorates. Managers also liked to see degrees in specific subjects like zoology or ecology rather than boarder disciplines like environmental science. Several participants had high praise for the programs offered by the University of Idaho, but found the curriculums for all the wildlife biology degrees at Idaho universities provided a solid biological foundation. One improvement they would like to see though is more communication and legal classes to enhance the skills of prospective hires.

Experience is also mandatory for a job in this field, but participants said it could be gained many ways. Internships, university based field work, volunteer work and traditional paid experience all qualify. The deciding factor in hiring is often how much experience since commitment to and passion for the work is measured by the time applicants spend getting experience in their fields.

Certifications, on the other hand, play a minor role in hiring. Managers do not require them. Among the certifications mentioned were the Certified Wildlife Biologist from The Wildlife Society,⁶ Fisheries Professional from the American Fisheries Society⁷ and Certified Professional in Rangeland Management from the Society of Range Management.⁸

According to the Bureau of Labor Statistics,⁹ the majority of zoologists and wildlife biologists work for state or federal governments. The rest work in management, scientific and technical consulting services. More government jobs depend on the political climate, but participants believed that looming conservation legislation should increase demand for zoologists and wildlife biologists. The Bureau of Labor Statistics, however, projects that over 70 percent of the 2.5 percent increase in wildlife biology jobs by 2018 will be in private industry, not state and federal governments.

⁶The Wildlife Society website, <http://joomla.wildlife.org>.

⁷American Fisheries Society website, <http://www.fisheries.org>.

⁸Society of Range Management website, <http://www.rangelands.org>.

⁹National Employment Matrix, <http://www.bls.gov/data/>.

The Idaho Department of Labor forecasts an almost 4 percent increase. Participants tempered their outlook, believing that while there will be growth the real job opportunities will be in replacing retirees. One participant said 25 people retired in his multistate region in 2010 alone.



HEATING, AIR CONDITIONING AND REFRIGERATION MECHANICS AND INSTALLERS

This occupation fits neatly into the Idaho Department of Labor’s Green Job Definition under energy efficiency. Heating, air conditioning and refrigeration mechanics and installers are described by the Bureau of Labor Statistics¹⁰ as “those who install or repair heating, central air conditioning or refrigeration systems including oil burners, hot-air furnaces and heating stoves.” The HVAC industry as a whole is heavily involved in conserving energy with high-efficiency products. Only one company of 11 contacted during recruitment said none of the four core green areas applied to its work. Participants said equipment restrictions mandate a certain level of efficiency from heating and cooling units.

According to the Environmental Protection Agency’s Energy Star program,¹¹ as much as half of the energy used in a home can be traced to heating and cooling so significant savings are possible by improving these systems. There remains disagreement over the true benefit from these improvements because Idaho’s comparatively low energy rates extend the pay-back period on high-end equipment – up to 50 years by one estimate.

Participants also cited the possibility that the costs of the increased natural resources required to manufacture the larger coils used in high-efficiency equipment might outweigh the benefits.

As with other occupations, HVAC skills are diverse. “What other industry is there where we expect our people to have construction skills, electrical, controls, refrigeration, plumbing and computers. I mean it’s an awesome industry because there are so many facets to it, but I can’t think of another industry out there where you are expecting people to know all that.”

Among the most prized were skills in electricity, computers, refrigeration and refrigerants, plumbing, welding, construction, layout, energy flows along with technical knowledge of the equipment from specific manufacturers.

... HVAC skills are diverse. “What other industry is there where we expect our people to have construction skills, electrical, controls, refrigeration, plumbing and computers. I mean, it’s an awesome industry. . .”

Electrical knowledge, especially about low voltage wiring, was specifically singled out. Managers want knowledge of wiring and ladder diagrams and the ability to diagnose and repair electrical problems in HVAC setups. It is not uncommon for workers in this field to have a Specialty Electricians License or even a Journeyman’s Electrician License in addition to an HVAC license.

¹⁰Standard Occupational Classification, <http://www.bls.gov/soc/2010/soc499021.htm>.

¹¹Environmental Protection Agency’s Energy Star program website, http://www.energystar.gov/index.cfm?c=heat_cool.pr_hvac.

Computer proficiency is becoming crucial for the future. Most systems can now be diagnosed with a computer, and some even require computers for startup and controls. Participants called computer proficiency an important portable skill that can be transferred to similar industries or specializations within the HVAC industry.

Technical skills like the ability to read and follow complex procedures outlined in manuals and other documents are becoming increasingly important. The increased complexity of new systems leaves little room for error in installation and startup. Incorrect startup can decrease both the efficiency and life span of new equipment.

Residential work requires knowledge of construction, knowing how buildings are built and how to use basic tools. Since most HVAC work is done after the walls and flooring are in place, installers and mechanics must know how things are put together, and employers give weight to that kind of background.

The HVAC Journeyman's License program¹² is still in its infancy in Idaho, and participants had some negative reactions. The law grandfathered in some under-qualified HVAC contractors, and competing against people willing to cut important corners in a price-sensitive industry is difficult. Additionally, the licensing test is based solely on the law, leaving out practical skills. The four-year apprenticeship that should address practical skills is viewed as inadequate because it is not specific. Most participants believed an HVAC Journeyman's License does not mean the holder can do the work.

Environmental Protection Agency certification for refrigerant handling was generally required since most HVAC work requires handling refrigerant. But it is possible to be a HVAC mechanic or installer and not work with refrigerant.

On-the-job training was stressed continually by participants as integral to becoming an HVAC journeyman. Regardless of the quality of the training program, a new journeyman needs a lot of hands-on experience to be proficient.

Manufacturers' training classes and some specialized certifications such as those in air balance, combustion efficiency and carbon monoxide detection and avoidance are not typically required, but managers typically want their employees to earn these certifications and learn to perform more advanced services. In the past, the manufacturers would offer regional classes where HVAC workers could get additional education and certification on a particular piece of equipment. But now businesses have to send employees out of town for this training, and paying travel, room and board on top of salary and the class fees is a real barrier for employers.

¹²Idaho Division of Building Safety website, <http://dbs.idaho.gov>.



There were divided opinions on certifications from North American Technician Excellence Inc. and the Refrigeration Service Engineers Society. No one requires them, and while some participants felt these certificates could help choose among applicants, others pointed out that they are hard to obtain and not even available in some areas.

Participants blamed their inability to find qualified installers and mechanics on general disinterest in the trade itself and a lack of quality training locally although there was some disagreement on that point.

The participants also were split over the value of some college-level training programs in the region. While one required the training and rewarded workers with raises as they progressed through it, another said he had had little success with the training and preferred to do it internally.

While most are open shops, the group gave local unions high marks for their training, but there was confusion caused by the fact that both the United Association of Pipefitters and the Sheet Metal Workers International Association represent HVAC workers. Most participants did not know which union offered what training. But one gave raises to employees as they progressed through the union training.

Several participants said they had trouble getting employees interested in training when they offered it, and most believe that the trades in general have been discouraged in high schools as viable occupations in favor of pushing students to go to college. Several maintained that new HVAC installers and mechanics are selecting the career not because they have an interest or pride in the trade but because there is nothing better for them. The industry is being hurt by a stigma that HVAC work is degrading, and they support any initiative that shows students the benefits of a career in the trades.

The industries employing HVAC mechanics and installers run the gamut. Most are plumbing, heating and air conditioning contractors, but other industries employ them¹³ because of their reliance on internal climate control.

The job outlook for HVAC mechanics and installers is very good. The Bureau of Labor Statistics projects much faster than average job growth nationally for HVAC journeymen. The Idaho Department of Labor's 2008-2018 Long-Term Projections show a 14 percent increase in HVAC mechanics and installers. One participant was hiring 10 entry level employees himself.

HVAC mechanics and installers also have several avenues for career progression. Installers can train to become service technicians or go into sales or management. Managers are constantly looking for employees who want leadership responsibilities whether it is with training, sales or project managers. Project manager, estimator and instructor are good examples of 'next steps' for the HVAC journeyman.

¹³Occupational Outlook Handbook, <http://www.bls.gov/oco/ocos192.htm>.



ELECTRICIANS

Electricians do not fit completely into the Idaho Department of Labor's Green Job Definition. A separation exists between standard electrical work and green electrical work. The Bureau of Labor Statistics defines electricians as those who "install, maintain and repair electrical wiring, equipment and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems or electrical control systems."¹⁴ During recruitment, less than 60 percent of contacted electrical companies said they had green jobs on their payroll. The companies that responded positively had electricians working on projects that improved energy efficiency or installed or maintained renewable energy systems.

Energy efficiency is seen as an important industry, and the market for energy efficiency and conservation has been significant since the oil crisis in the 1970s. Since then all market segments from industrial to residential have been looking for ways to conserve energy. Driving energy efficiency is a favorable payoff horizon. Participants said that energy efficient upgrades such as lighting improvements or energy management systems can pay from themselves in as little as two months but typically no more than two years factoring in subsidies.

Renewable energy is not as common as energy efficiency but is gaining traction. Projects in solar, wind and methane power generation exist but are not common, primarily because renewable energy projects have trouble being financially viable. Because Idaho has low electricity costs, the payoff point for solar projects can take as long as 20 years. Participants anticipate this will change as coal power plants provide an ever increasing amount of Idaho's power. Currently most renewable energy projects involve public buildings and are being financed with federal stimulus money from the American Recovery and Reinvestment Act. Participants were optimistic that more private companies will begin taking advantage of renewable energy opportunities.

Mathematics is a crucial skill for electricians, whose work involves algebraic formulas and even some trigonometry, and because most work for service-based companies, communication skills are important as they deal with people in their homes.

As union shops under the International Brotherhood of Electrical Workers, most participants gave good marks to their system of finding skilled employees. Supplied with electricians from the union's rotating pool, these employers said the overwhelming majority of electricians they have hired over the years have been well qualified, crediting the five-year apprenticeship and continuing education for creating a talented labor pool. The training programs are kept up to date on new green technologies, and in the last two years, solar has been added to an apprentice's training.

A Journeyman Electrician's License issued by the state Division of Building Safety is the only credential required. Four years of experience and four years of approved apprenticeship education are needed to obtain a license, and renewals require 24 hours of continuing

... *e*nergy efficient upgrades such as lighting improvements or energy management systems can pay from themselves in as little as two months but typically no more than two years factoring in subsidies.

¹⁴Standard Occupational Classifications, <http://www.bls.gov/soc/2010/soc472111.htm>.

education during the three years the license is valid. The National Joint Apprenticeship and Training Committee, which handles the apprenticeship programs for the International Brotherhood of Electrical Workers and the National Electrical Contractors Association, has a five-year apprenticeship program compared to Idaho's four.

Participants said the North American Board of Certified Energy Practitioners'¹⁵ Photo-Voltaic Installers Certification is also beneficial for those working with solar energy. Certification, however, requires two qualified installations that have been monitored and inspected, and consumers want certified installers to begin with so there are no projects on which electricians can get their qualifying work. The board's website states there are only seven certified installers in Idaho.

As with the HVAC participants, these employers also expressed concern the trades are generally perceived as an inferior career when they should be viewed equally with college programs, providing good wages and benefits. "Our guys are professionals," a participant said. "You've got to think of it as doctors, accountants or anything else. They go to school and are trained specifically in this program for five years. This isn't an industry that you can just walk in off the street and be proficient at. It takes a lot of education, a lot of training to learn to do what we do."

Most electricians work for electrical contractors, but according to the Bureau of Labor Statistics,¹⁶ almost 9 percent are self-employed. The bureau projects that electrical contractors will increase employment by as much as 23 percent by 2018, and a majority of those jobs will be for electricians. There will also be job growth for helper-electricians and first-line supervisors.

Participants believe the job outlook for electricians is very good, and one repeated a projection that electricians might become more important than general contractors because upgrading the nation's existing electrical infrastructure will be extensive and needed very soon. They believe the best opportunities will go to electricians with the widest range of skills. The Idaho Department of Labor projects a decline in electricians through 2018, but the occupation is near the top in demand based on annual openings, reflecting the large number of older workers in this occupation.

Electricians have several options for career advancement. Journeymen can become a foreman, who run an entire project instead of just a crew. That could lead to general foremen, who run even larger projects. Estimating and project management would follow, and eventually electricians can become superintendents overseeing multiple jobs or go into business for themselves as electrical contractors. One of the participants actually took that path from journeyman to superintendent before branching out and starting his own company.

"This isn't an industry that you can just walk in off the street and be proficient at. It takes a lot of education, a lot of training to learn to do what we do."

¹⁵North American Board of Certified Energy Practitioners website, <http://www.nabcep.org/>.

¹⁶Occupational Outlook Handbook, <http://www.bls.gov/oco/ocos206.htm>.

South Central Region

POWER PLANT OPERATOR

In order for an electrician to have something to work with, electricity must be generated. Under the Idaho Department of Labor's Green Job Definition power generation using renewable resources or alternative fuels is classified as green. In Idaho, there is an abundance of electricity generated by renewable resources. Geothermal has a presence in the south central region of Idaho.

Naturally heated brine pumped from the Earth heats a chemical, changing it from liquid to gas to turn a turbine and generate electricity. After the brine has given off its heat, it is injected back into the ground, having never come into direct contact with the chemical that is driving the turbines. Nothing is used up. Only heat energy is transferred.

The occupation responsible for the smooth operation and maintenance of geothermal power plants is a power plant operator. The Bureau of Labor Statistics defines power plant operators as those who "control, operate or maintain machinery to generate electric power."¹⁷ While not all are classified as green, those working in one of the renewable or alternative power generation fields are.

Many skills are required of a power plant operator – multi-tasking in areas from chemical testing and troubleshooting equipment to safety and maintenance. Hiring lower skilled workers leads to a steep learning curve. An average of three years is needed to become competent.

Operators need skills in instrumentation and control, electrical, mechanical, millwright, advanced welding and computers. But these are broader industry skills rather than those specific to green jobs. "This is a process plant and we want process skills, industry level process skills are what we are looking for," a participant explained. "The fact that we happen to be green is incidental to what we are doing. It is certainly primary to us in the marketplace that we operate, but for the person coming in what I am looking for is a skill set that fits the operation of a power generation plant."

Geothermal power generation based on an industrial level process, allows for cross utilization of skill sets from the many other industries such as food processing plants, drilling, mining and exploration, utilities and the military, which has its own power plants and deals with thermodynamics. Participants said individuals with trade backgrounds like electricians and welder/fabricators are also sought for their skills.

While participants believed the level of training in the region was adequate, they cited some problems in finding people with appropriate computer skills such as knowledge of database software like Access and of spreadsheet programs.

"...What I am looking for is a skill set that fits the operation of a power generation plant."

¹⁷Standard Occupational Classification, <http://www.bls.gov/soc/2010/soc518013.htm>.

For the most part, power plant operators fall into the electric power generation, transmission and distribution industry.¹⁸ The Bureau of Labor Statistics projects a national decline of 15 percent in this industry by 2018 because of advancing technology. As the technology for power generation develops, fewer workers are needed. “We can operate this 1,800 acre facility, patch worked over six square miles, with one guy and a laptop computer in the truck which is networked” into the plant’s Supervisory Control and Data Acquisition system, which monitors and controls the plant, one participant said. “And we can literally operate the plant from five miles in any direction. That is how we compress it. It is not to just eliminate positions. It is to optimize the skill set of that individual so that he can be where the problem is.” So even though the need for electricity and power generation will most certainly increase in the future as population rises, staff to operate the plants will not. That makes a high level of skill mandatory to get one of these jobs.

The Bureau of Labor Statistics projects a slight decline in the number of power plant operators nationally by 2018. For Idaho however, Idaho Department of Labor forecasts a 16 percent increase over the same period. While green energy will most likely grow through tax incentives and public demand, the real job opportunities will come as the aging work force retires. The last big growth spurt occurred during the 1970s and 1980s when a lot of exploratory operations were financed. With high wages and stability, there has been minimal turnover in the intervening decades. But now the time has come for those workers to retire, opening opportunities for a new generation.



PLANT AND SYSTEMS OPERATORS, ALL OTHER

A second source of renewable energy is biomass. The most common biomass power generation comes from burning organic material to heat the turbine. But in south central Idaho power is being generated by converting refuse or manure from dairies into methane gas, using bacteria in an oxygen-free environment to break down waste material. The bacteria produce methane gas as a byproduct, and the power plant captures the methane and uses it to fuel engines that generate electricity.

Operators of this plant fall into the Bureau of Labor Statistics’ occupation labeled plant and systems operators, all other because it does not fit in any of the other occupational groups.

As with power plant operators, employers are looking for highly skilled individuals. The ideal candidate for methane biomass plant operator should have an understanding of hydrology, biology and wastewater chemistry and knowledge of the gas elements of the process. Most of the current operators have a background in food processing plant maintenance. All operators are trained on the job, learning the components of the process from power generation to the use of the equipment that separates manure solids and dries them for a secondary market. Computer skills are needed for documentation and reporting, but operators must have logic, the ability to troubleshoot, initiative and flexibility. They should have a

¹⁸ National Employment Matrix, <http://www.bls.gov/data/>.

strong disposition for accepting the physical and dirty demands of the job, which involves occasions where the operator must physically enter the manure canal to ensure the process is free flowing.

There are few educational opportunities locally targeted at this particular occupation. Food processing workers are a good starting point, but they need additional training to work as a biomass plant operator. One participant cited Michigan State University's training opportunities, but the industry would prefer a local program to further these skills, emphasizing processes, sciences and systems related to the methane biomass industry versus the maintenance and repair of plants.

The Bureau of Labor Statistics projects a decline nationally in this occupation through 2018. But the Idaho Department of Labor anticipates growth in the state. The number of operators is small, and the growth is only 17, but these are high-paying jobs. Government requirements for larger percentages of power from renewable resources could boost the prospects in this occupation.



The Raft River geothermal power plant near Malta, Idaho. *Photo: U.S. Geothermal Inc.*

Southeastern Region

FARMERS, RANCHERS AND OTHER AGRICULTURAL MANAGERS

Farmers, ranchers and other agricultural managers are defined by the Bureau of Labor Statistics as those who “plan, direct or coordinate the management or operation of farms, ranches, greenhouses, aquacultural operations, nurseries, timber tracts or other agricultural establishments. May hire, train and supervise farm workers or contract for services to carry out the day-to-day activities of the managed operation. May engage in or supervise planting, cultivating, harvesting and financial and marketing activities.”¹⁹

While farming is not a green occupation as a whole, farming that is linked to sustainable agricultural practices, natural resource conservation and organic farming would be included in the Idaho Department of Labor’s Green Job Definition.

Interviews with eastern Idaho organic farmers using a mix of agricultural business models found a deep concern for maintaining their land in a sustainable fashion to pass on to other generations. They eschewed pesticides and herbicides and embraced water conservation and the view that green practices bring the best quality product to consumers.

At the same time they were realistic about pure organic farming. “Organic is great, but here in eastern Idaho, at this time, it is not financially feasible to run an entire farm that way,” one acknowledged. To be competitive, organic practices need to be mixed with conventional agriculture. While avoiding chemical pesticides and herbicides is an essential business practice, several farmers agreed that non-organic fertilizers were more effective than organic fertilizers, and used in limited amounts that have the least impact on soil and water they were necessary for good yields and to sustain their businesses. Those not using non-organic fertilizers reported lower crop yields. All avoided pesticides and herbicides in response to consumer preference, and each reported being questioned by consumers on this issue, but none had fielded questions about non-organic fertilizers.

The desire to work hard and an interest in agriculture are paramount in organic farming, but operators also benefit from knowledge of accounting, marketing, agricultural economics, sales, plant biology, chemistry, soil science, and weeds and other pests which reduce crop yields. This diversity provides a glimpse of a farm manager’s many responsibilities.

Marketing, however, stood out as a very desirable skill that promotes profitability.

All (interviewees) avoided pesticides and herbicides in response to consumer preference, and each reported being questioned by consumers on this issue.



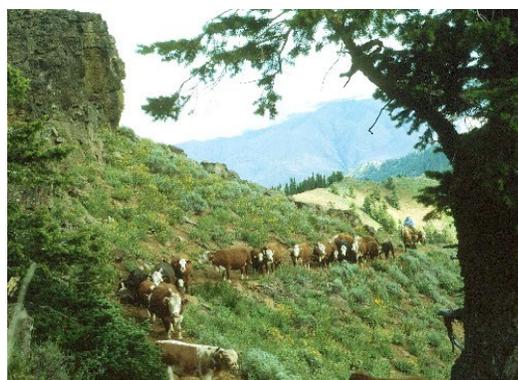
¹⁹Standard Occupational Classification, <http://www.bls.gov/soc/2010/soc119013.htm>.

Rather than formal postsecondary education, an informal mentoring process is the major method of training new green farmers. Several interviewees described their introduction to organic farming as an informal internship of several months with already established organic farmers. The University of Idaho Extension programs are also very useful, providing valuable training and information on organic farming practices.

Resources offered by the Idaho Department of Agriculture were seen as less helpful. Programs like the Certified Organic Program are viewed as geared more towards large scale producers, and some Idaho farmers have considered seeking organic certification from Montana, which is viewed more favorably even though the Idaho Department of Agriculture's certification process is the same as Montana's.

Access to suitable land is a real barrier to new organic operations even as demand for organic products rises beyond the ability of existing operators to meet it.

Most farmers, ranchers and other agricultural managers are employed in the animal and crop production industry.²⁰ The Bureau of Labor Statistics projects a slight employment decline in animal production and a 5 percent decline in crop production by 2018. But the contraction is in the occupations supporting agricultural managers, reflecting a more streamlined and consolidated sector.



Idaho photo : U.S. Department of Agriculture.



Idaho photo: U.S. Department of Agriculture.

Focus group participants see growth and a bright future for the occupation despite existing barriers. The Idaho Department of Labor's 2008-2018 Long-Term Occupation Projections forecast the number of farm, ranch and other agricultural managers to grow almost 28 percent by 2018 with more than 200 annual openings as workers leave the field or retire. This projection puts farm, ranch and other agricultural managers in the top 5 percent of in-demand occupations in Idaho.

²⁰ National Employment Matrix, <http://www.bls.gov/data/>.

East Central Region

BIOLOGICAL SCIENTISTS, ALL OTHER

Biotechnology scientists and engineers are considered green under the Idaho Department of Labor's Green Job Definition because it uses microbial and enzymatic systems to enhance renewable energy production, petroleum substitution and bioremediation. Bioremediation uses microorganisms, fungi, green plants or their enzymes to remove contaminants.

The Bureau of Labor Statistics does not have a specific job description for biotechnology scientists and engineers. These occupations end up falling into the residual occupation category called biological scientists, all other.

Some of the most important skills required for biotechnology scientists and engineers are also the most difficult to find – proficiency in bioinformatics, proteomics and biochemistry – because the fields are changing and advancing at a very rapid pace. To a lesser degree, however, some of these skills can be obtained on the job. Biochemistry is more commonly recognized than proteomics or bioinformatics. Proteomics focuses on the structure and function of proteins. Bioinformatics applies statistics and computer science to molecular biology to understand the biological process. Gaining familiarity with these subjects is primarily obtained in college while pursuing bachelor's, master's and doctoral degrees in a relevant field.

No specific certifications are required, and while not as important as education, experience is always desirable because it signals increased versatility.

The majority of workers in the biological scientists, all other occupation are employed by the federal government. The next highest concentration is in educational services, according to the Bureau of Labor Statistics.²¹ The bureau projects jobs in both sectors will increase 10 percent nationally by 2018.

The next step in the career pathway for biotechnology scientists and engineers is to add personnel management and business development responsibilities. Participants said leadership skills will be required in this growing field to organize workloads so research is performed efficiently. Job growth is a result of new and cost-effective applications being found for scientific advances. Since this occupation fits into a residual classification, an exact growth projection is not possible, but the Idaho Department of Labor 2008-2018 Long-Term Occupational Projections forecasts 1 percent growth by 2018 in the category of biological scientists, all other.

Some of the most important skills required for biotechnology scientists and engineers are also the most difficult to find . . . because the fields are changing and advancing at a very rapid pace.

²¹National Employment Matrix, <http://www.bls.gov/data/>.



ENVIRONMENTAL ENGINEERS

Environmental engineers earn their green designation by using environmental systems and regulatory expertise to minimize and mitigate environmental consequences of potentially harmful projects. Environmental engineers are described by the Bureau of Labor Statistics as those who “research, design, plan or perform engineering duties in the prevention, control and remediation of environmental hazards using various engineering disciplines. Work may include waste treatment, site remediation or pollution control technology.”²² Their expertise is vital in incorporating sustainable practices into current and future operations.

Environmental engineers need a diverse skill set that has evolved in response to new sustainability requirements established in 2007. These requirements cover engineering and industrial process and energy; waste reduction and elimination; greenhouse gas analysis, inventory and reduction; and environmental requirements analysis and implementation. But because environmental engineering now covers such an expanse of activity, few people possess the skills needed in all areas. Required of environmental engineers, however, is knowledge of industrial operations and systems, environmental systems and ecology. They also need expert knowledge of environmental regulations and their potential impact.

Education is paramount in this field. Those hired for this occupation usually come from engineering or environmental science backgrounds and often have experience in energy management, environmental compliance and impact analysis.

The development of sustainable practices and impacts is generating the demand for new skills, but they can typically be learned on the job if the person already has basic engineering and science skills. Many government and non-profit organizations provide training in this area, and quite a bit of the training can be done through Internet resources. Besides web-based self-learning classes, traditional classroom training is available with certification examinations.

Although certifications are available for work in this area, they are not required by government employers although they tend to demonstrate certain skill levels. These certifications include a Professional Engineer license, Certified Energy Manager qualification, LEED Professional certification and Registered Environmental Professional designation.



Environmental engineering students on assignment. *Photo: University of Montana.*

²²Standard Occupational Classification, <http://www.bls.gov/soc/2010/soc172081.htm>.

The U.S. Department of Energy currently provides in-house certification for Certified Energy Manager. Certifications for LEED Professional and Registered Environmental Professional can be obtained through third-party private organizations. The Environmental Protection Agency and private vendors provide many options for environmental regulatory or impact analysis training.



According to the Bureau of Labor Statistics,²³ environmental engineers are mostly employed by management, scientific and technical consulting services and by federal, state and local governments. The bureau forecasts 83 percent growth for management, scientific and technical consulting services, and while environmental engineers make up only a small part of this sector's employment, the forecasted growth bodes well for this occupation.

With expanding environmental requirements, an increased understanding of sustainability and short- and long-term effects of greenhouse gasses, participants agreed that environmental engineering has a solid future. The Idaho Department of Labor's 2008-2018 Long-Term Occupational Projections estimated environmental engineers will grow more than 35 percent by 2018.

The next step in the career pathway of an environmental engineer tends to be based on successful leadership capabilities. Project management offers an advancement opportunity. Continued superior performance can also lead to organizational management positions.



Top: Workers install solar photovoltaic panels. *Photo: University of California San Diego.*

Bottom: Idaho National Laboratory professionals help K-12 teachers learn more about STEM concepts — science, technology, engineering and mathematics. *Photo: Idaho National Laboratory.*

²³National Employment Matrix, <http://www.bls.gov/data/>.

Methodology

Teams in the six Idaho Department of Labor Workforce Investment Act areas chose occupations or industries for analysis. In each area, the regional labor economist and a business solutions specialist or other department staff used regional employment and secondary information on green jobs to pick the targeted occupations and industries. Employers were then screened to identify those with the targeted green jobs as defined by the Idaho Department of Labor.* Workers in those occupations and hiring managers were then recruited for interviews or focus groups to provide more detailed information about what makes the occupation green, what core green area did their work take place in, skills, education, certifications, problems in the field, ideas for improvement and outlook for the future.

***Idaho Department of Labor's Green Job Definition**

A green job is one in which the work is essential to products or services in any of these core green areas:

- Renewable Energy and Alternative Fuels
- Energy Efficiency and Conservation
- Sustainable Agriculture and Natural Resource Conservation
- Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup



Section III
**Green
Employment
and Wages**

Introduction

An analysis of Idaho's green economy by the Idaho Department of Labor under a federal stimulus grant has found that the state ranks near the top nationally for the concentration of green employment.

This report focuses on employment and wages attributed to the green economy both in Idaho and around the country. Taxonomy of green occupations and their concentration ratios were derived from the 2010 Idaho Green Job Survey data and applied to all 50 states. This method of analysis provides a good starting point for comparing green employment and wages across the nation.

Other Key Findings

- Idaho ranks high in projected green employment growth for 2010-2018.
- Green job median wages are higher than the states' median wages for all employment, suggesting that green jobs pay better than average.

Taxonomy

No standard national green occupation data exists so data from the 2010 Idaho Green Job Survey were used to compare Idaho's green employment to other states. This survey classified a green job as one in which the work is essential to products or services in:

- Renewable Energy and Alternative Fuels
- Energy Efficiency and Conservation
- Sustainable Agriculture and Natural Resource Conservation
- Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup.

From the information collected through the survey and secondary sources, an occupational taxonomy was developed. This occupation taxonomy defined 152 occupations in the 2010 Standard Occupation Classification as green. A crosswalk back to the 2000 classifications reduced the list to 144 unique six-digit occupations. Employment and wage data for all 50 states were then extracted from Economic Modeling Specialists Inc. using this taxonomy. Idaho's green taxonomy list is in Appendix 1 on page 11.

Idaho's green taxonomy may skew some analysis in favor of Idaho, but in the absence of a national standard, it at least allows a basic comparison across states. In the future, the U.S. Bureau of Labor Statistics will have data on green jobs for the nation as a whole. Comparisons of employment and wages using a nationally advocated taxonomy may yield different results.

Employment by Year

Instead of comparing total green employment among states, which is essentially a ranking based on population, percentages of green employment were compared. The total number of green jobs by state was divided by total state employment. This percentage describes the portion of each state's work force that is green under Idaho's taxonomy. By finding the percentages of each state's total jobs that are green and comparing them, population is less of a factor.

Idaho fared well when compared to other states' green employment percentages. Regionally and nationally, Idaho was second only to Wyoming in the percentage of green jobs to total state employment for 2002. By 2010, Idaho's green job percentage decreased almost 3 percentage points and was barely passed by Montana in the regional rankings, falling to fourth nationally behind North Dakota. This gap is projected to widen slightly by 2018, but Idaho holds on to the same place. Ranking for all states is in Appendix 2 on page 15.

Table 1: Percent of Total State Employment Identified as Green*

Rank	2002	Rank	2010	Rank	2018
1	Wyoming 27.6%	1	Wyoming 27.3%	1	Wyoming 27.1%
2	Idaho 27.1%	2	Montana 24.5%	2	Montana 24.0%
3	Montana 25.7%	4	Idaho 24.5%	4	Idaho 23.4%
8	Oregon 23.7%	13	Oregon 21.9%	17	Oregon 21.1%
23	Washington 21.8%	23	Washington 21.0%	23	Washington 20.6%
37	Utah 20.4%	34	Utah 19.5%	34	Utah 19.1%
44	Nevada 18.7%	49	Nevada 16.7%	49	Nevada 16.2%

*This is assuming that all employment in green occupations is green.
Source: EMSI Complete Employment — 4th Quarter 2010.

Farmers, ranchers, heavy and tractor-trailer truck drivers and general and operations managers account for most of Idaho's green jobs. These occupations top Idaho's green employment for each of the three years.

Table 2: Top Occupations, Assuming All Employment in Green Occupations is Green*

2002			2010			2018		
SOC	Occupation Title	Total Employment	SOC	Occupation Title	Total Employment	SOC	Occupation Title	Total Employment
11-9012	Farmers and ranchers	22,059	11-9012	Farmers and ranchers	20,098	11-9012	Farmers and ranchers	19,162
53-3032	Truck drivers, heavy and tractor-trailer	13,796	53-3032	Truck drivers, heavy and tractor-trailer	14,615	53-3032	Truck drivers, heavy and tractor-trailer	16,758
11-1021	General and operations managers	13,275	11-1021	General and operations managers	13,049	11-1021	General and operations managers	13,913
45-209A	Miscellaneous agricultural workers	12,608	45-209A	Miscellaneous agricultural workers	11,487	11-9199	Managers, all other	12,821
47-2031	Carpenters	10,996	11-9199	Managers, all other	10,227	45-209A	Miscellaneous agricultural workers	10,681
37-2011	Janitors and cleaners, except maids and housekeeping cleaners	9,872	37-2011	Janitors and cleaners, except maids and housekeeping cleaners	10,482	37-2011	Janitors and cleaners, except maids and housekeeping cleaners	11,381

*This is assuming that all employment in green occupations is green.
Source: EMSI Complete Employment — 4th Quarter 2010.

Perhaps a better way to calculate green employment is to factor in the concentration of green jobs within each occupation. During the Idaho Green Job Survey analyses, few occupations were found to have 100 percent green employment. In order to account for this, the weighted employment from the 2010 Idaho Green Job Survey was divided by the estimated total employment for each green occupation. This percentage, the concentration of green jobs per occupation, was then applied to every state’s green occupation employment totals, leaving a more accurate calculation of each state’s green workers. It is important to note that states won’t necessarily have the same concentration percentages as Idaho, but for this study, they were assumed to be equal. It was also assumed that the concentration of green jobs within each occupation will remain constant over time.

Using this method, Idaho still fared well but not as high. With almost 2 percent of Idaho jobs designated green, Idaho comes in behind Wyoming and Washington in 2002. By 2010, however, Idaho is passed by Montana. Even though Idaho loses some ground each highlighted year, the state is still in the top 10 nationally. A table of rankings for all states is in Appendix 3 on page 16.

Table 3: Percent of Total State Employment Identified as Green by Concentration Percentage								
Rank	2002		Rank	2010		Rank	2018	
4	Wyoming	2.24%	3	Wyoming	2.27%	2	Wyoming	2.29%
5	Washington	2.05%	4	Washington	1.94%	5	Washington	1.87%
6	Idaho	1.97%	7	Montana	1.87%	6	Montana	1.83%
8	Montana	1.91%	8	Idaho	1.78%	8	Idaho	1.72%
9	Oregon	1.80%	12	Oregon	1.68%	13	Oregon	1.61%
34	Utah	1.51%	33	Utah	1.47%	32	Utah	1.47%
49	Nevada	1.34%	50	Nevada	1.18%	50	Nevada	1.13%

Source: EMSI Complete Employment — 4th Quarter 2010.

Similar to the first technique, the occupations with the most green employment in Idaho change little from year to year. Construction laborers, farmers, ranchers and miscellaneous agricultural workers* topped Idaho’s list of green employment with respect to concentration.

Table 4: Top Occupations, Using Green Employment Concentration

2002			2010			2018		
SOC	Occupation Title	Total Employment	SOC	Occupation Title	Total Employment	SOC	Occupation Title	Total Employment
47-2061	Construction laborers	1,072	47-2061	Construction laborers	1,063	47-2061	Construction laborers	1,184
11-9012	Farmers and ranchers	860	11-9012	Farmers and ranchers	784	11-9012	Farmers and ranchers	747
45-209A	Miscellaneous agricultural workers	650	45-209A	Miscellaneous agricultural workers	592	45-209A	Miscellaneous agricultural workers	661
47-2152	Plumbers, pipefitters and steamfitters	552	53-3032	Truck drivers, heavy and tractor-trailer	569	53-3032	Truck drivers, heavy and tractor-trailer	653
53-3032	Truck drivers, heavy and tractor-trailer	537	47-2152	Plumbers, pipefitters and steamfitters	512	37-3011	Landscaping and grounds keeping workers	601
19-4021	Biological technicians	505	37-3011	Landscaping and grounds keeping workers	510	45-3011	Fishers and related fishing workers	592

Source: EMSI Complete Employment — 4th Quarter 2010.

Employment by Core Green Area

The Idaho Department of Labor’s Green Job Definition includes four distinct core areas. To see how Idaho compares to other states in the nation by core area, the percentage breakdown of every state’s green employment was calculated. The 2010 Idaho Green Job Survey found that occupations can be involved in different core green areas based on the nature of the work. To include that, the percentage breakdown of each occupation into core green areas found in the Green Job Survey was applied to every occupation’s employment with respect to Idaho’s green concentration levels. Just as the analysis done above, all states were assumed to have the same concentration and occupation breakdowns into core green areas that Idaho has.

Table 5: Idaho’s Green Job Definition

A green job is one in which the work is essential to products or services in any of these core green areas:
• Renewable Energy and Alternative Fuels
• Energy Efficiency and Conservation
• Sustainable Agriculture and Natural Resource Conservation
• Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup

2010 Idaho Green Jobs Survey report, Idaho Department of Labor.

*A combination of four Standard Occupation Classifications: 45-2091 agricultural equipment operators; 45-2092 farmworkers and laborers, crop, nursery and greenhouse; 45-2093 farmworkers, farm, ranch and aquacultural animals; 45-2099 agricultural workers, all other.

Idaho doesn't top the list in any one core green area, implying a mix of green jobs from the various areas. The majority of Idaho's green jobs fall into Sustainable Agriculture and Natural Resource Conservation and Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup. When compared to the other states in 2010, Idaho ranked 19th in Sustainable Agriculture and Natural Resource Conservation and 24th in the Pollution and Waste Control category. The last two areas, Renewable Energy and Alternative Fuels and Energy Efficiency and Conservation, make up a smaller portion of Idaho's green jobs. When compared to the rest of the country, Idaho lands at 41st and 43rd respectively. Employment for the core green areas is shown for all states in Appendix 4 on page 17.

Table 6: Percent Breakdown of Green Employment into the Four Core Green Areas

Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup			Sustainable Agriculture and Natural Resource Conservation		
Rank	State	%	Rank	State	%
10	Wyoming	29.7%	3	Montana	43.3%
11	Nevada	29.6%	5	Oregon	41.6%
13	Utah	29.3%	9	Wyoming	36.5%
24	Idaho	28.1%	10	Washington	36.2%
45	Montana	25.4%	19	Idaho	31.8%
47	Oregon	23.7%	36	Utah	27.2%
48	Washington	23.7%	44	Nevada	26.6%

Energy Efficiency and Conservation			Renewable Energy and Alternative Fuels		
Rank	State	%	Rank	State	%
3	Nevada	26.1%	8	Washington	22.4%
11	Utah	23.3%	23	Utah	20.2%
41	Idaho	19.3%	37	Nevada	17.6%
44	Oregon	18.4%	42	Oregon	16.2%
46	Wyoming	18.2%	43	Idaho	16.0%
47	Montana	18.1%	44	Wyoming	15.6%
48	Washington	17.7%	48	Montana	13.2%

Source: EMSI Complete Employment — 4th Quarter 2010.

Growth

Using forecasted total employment for 2018 from EMSI, percentage increases by state for green employment were compared. Idaho is near the top of the list for forecasted growth from 2010 to 2018. When comparing total employment of green occupations Idaho is 12th at a 10 percent projected increase. Leading the growth in Idaho are managers, all other; truck drivers, heavy and tractor-trailer; and miscellaneous agricultural workers. These occupations account for nearly 25 percent of the growth.

After the concentration percentages are applied, Idaho moves up to tenth with an 11 percent projected increase. By this measure, occupations that are adding the most jobs are fishers and related fishing workers, construction laborers and landscaping and grounds keeping workers. Growth in green jobs for all states is shown in Appendix 5 on page 18.

Regionally, Idaho is second only to Utah, which comes in at the top of both lists.

Table 7: 2010-2018 Green Jobs Growth by State

Using Total Employment*			Using Concentration Percentages		
Rank	State	Percentage	Rank	State	Percentage
1	Utah	16.8%	1	Utah	19.5%
12	Idaho	10.0%	10	Idaho	11.4%
18	Wyoming	9.0%	15	Wyoming	10.5%
26	Montana	7.5%	27	Montana	7.8%
27	Nevada	7.3%	33	Nevada	6.1%
28	Washington	7.1%	37	Oregon	5.2%
38	Oregon	5.5%	39	Washington	5.1%

*This is assuming that all employment in green occupations is green.
Source: EMSI Complete Employment — 4th Quarter 2010.

Table 8: Top Growth Occupations 2010-2018

Using Total Employment*			Using Concentration Percentages		
SOC	Occupation Title	Total Employment	SOC	Occupation Title	Total Employment
11-9199	Managers, all other	2,163	45-3011	Fishers and related fishing workers	132
53-3032	Truck drivers, heavy and tractor-trailer	2,143	47-2061	Construction laborers	122
45-209A	Miscellaneous agricultural workers	1,334	37-3011	Landscaping and groundskeeping workers	91
49-9042	Maintenance and repair workers, general	1,039	19-2041	Environmental scientists and specialists, including health	90
15-1081	Network systems and data communications analysts	1,010	53-3032	Truck drivers, heavy and tractor-trailer	83

*This is assuming that all employment in green occupations is green.
Source: EMSI Complete Employment — 4th Quarter 2010.

Wages

To compare wages, every state’s median hourly wage for all occupations was subtracted from its median hourly wage for green occupations . Idaho is 41st with the median hourly wage for green jobs \$1.51 more than all occupations. A table showing this difference for all states is in Appendix 6 on page 19.

Notable among border states are Nevada at third and Washington at eighth. Nevada’s green jobs median hourly wage is \$4.93 higher than the state’s median hourly salary, while Washington’s is \$3.94 higher. All states and the District of Columbia had higher green job median wages than total job median wages, suggesting that green jobs pay more than non-green jobs.

Table 9: Difference Between State Median Wage and Green Occupation Median Wage 2010		
Rank	State	Wage Difference
3	Nevada	\$4.93
8	Washington	\$3.94
18	Utah	\$3.03
21	Wyoming	\$2.61
29	Oregon	\$2.21
41	Idaho	\$1.51
44	Montana	\$1.36

Source: EMSI Complete Employment — 4th Quarter 2010.

Data Sources

Idaho Department of Labor contracts with Economic Modeling Specialists Inc. to obtain occupational employment estimates for all 50 states. EMSI bases occupation estimates “on EMSI’s industry data and regional staffing patterns taken from the Occupational Employment Statistics program (U.S. Bureau of Labor Statistics). Wage information is partially derived from the American Community Survey.” Idaho culled EMSI data for years 2002 through 2018.

There are differences between the data sets of the Idaho Department of Labor and EMSI. EMSI’s “complete” employment figures are higher than the department’s “covered” employment data, which includes only employment covered by the unemployment insurance program. EMSI’s “complete” employment estimates also include employment outside the unemployment insurance program like the self-employed and the military, pulling data from a variety of sources.

In addition to EMSI, the 2010 Idaho Green Job Survey collected data pertaining to the employment, employment concentrations, core green area breakdowns and wages as well as the basis for the green occupation taxonomy used.

Appendix 1: Idaho's Green Taxonomy

Idaho's Green Taxonomy: Modified to Work with EMSI data		
SOC Code	Description	2010 Idaho Median Hourly Wage
11-1021	General and operations managers	\$29.92
11-3051	Industrial production managers	\$34.01
11-9011	Farm, ranch, and other agricultural managers	\$18.12
11-9012	Farmers and ranchers	\$7.57
11-9021	Construction managers	\$14.32
11-9041	Engineering managers	\$49.37
11-9121	Natural sciences managers	\$40.82
11-9199	Managers, all other	\$13.69
13-1021	Purchasing agents and buyers, farm products	\$19.62
13-1041	Compliance officers, except agriculture, construction, health and safety, and transportation	\$20.53
13-1199	Business operation specialists, all other	\$24.30
13-2099	Financial specialists, all other	\$23.57
15-1031	Computer software engineers, applications	\$31.65
15-1081	Network systems and data communications analysts	\$13.29
15-2041	Statisticians	\$27.08
15-2099	Mathematical scientists, all other	\$15.27
17-1011	Architects, except landscape and naval	\$25.20
17-1012	Landscape architects	\$19.58
17-2011	Aerospace engineers	\$35.46
17-2041	Chemical engineers	\$50.95
17-2051	Civil engineers	\$29.75
17-2071	Electrical engineers	\$39.00
17-2072	Electronics engineers, except computer	\$34.43
17-2081	Environmental engineers	\$29.89
17-2111	Health and safety engineers, except mining safety engineers and inspectors	\$41.93
17-2112	Industrial engineers	\$38.32
17-2131	Materials engineers	\$40.30
17-2141	Mechanical engineers	\$38.46
17-2151	Mining and geological engineers, including mining safety engineers	\$29.45
17-2161	Nuclear engineers	\$47.60
17-2199	Engineers, all other	\$34.09
17-3011	Architectural and civil drafters	\$20.29
17-3013	Mechanical drafters	\$23.20

Continued on next page.

APPENDIX 1

Idaho's Green Taxonomy: Modified to Work with EMSI Data (cont.)		
SOC Code	Description	2010 Idaho Median Hourly Wage
17-3019	Drafters, all other	\$19.36
17-3022	Civil engineering technicians	\$20.23
17-3023	Electrical and electronic engineering technicians	\$24.94
17-3025	Environmental engineering technicians	\$21.31
17-3026	Industrial engineering technicians	\$19.79
17-3029	Engineering technicians, except drafters, all other	\$21.14
19-1013	Soil and plant Scientists	\$18.42
19-1022	Microbiologists	\$32.71
19-1023	Zoologists and wildlife biologists	\$27.15
19-1029	Biological scientists, all other	\$26.30
19-1031	Conservation scientists	\$27.35
19-1032	Foresters	\$26.38
19-1042	Medical scientists, except epidemiologists	\$22.91
19-2012	Physicists	\$48.98
19-2031	Chemists	\$35.79
19-2032	Materials scientists	\$25.84
19-2041	Environmental scientists and specialists, including health	\$27.45
19-2042	Geoscientists, except hydrologists and geographers	\$26.18
19-2043	Hydrologists	\$29.86
19-2099	Physical scientists, all other	\$28.08
19-3051	Urban and regional planners	\$24.05
19-3091	Anthropologists and archeologists	\$26.15
19-3099	Social scientists and related workers, all other	\$20.32
19-4011	Agricultural and food science technicians	\$14.46
19-4021	Biological technicians	\$13.84
19-4031	Chemical technicians	\$14.32
19-4041	Geological and petroleum technicians	\$11.18
19-4051	Nuclear technicians	\$27.51
19-4061	Social science research assistants	\$12.98
19-4091	Environmental science and protection technicians, including health	\$11.87
19-4093	Forest and conservation technicians	\$14.91
19-4099	Life, physical, and social science technicians, all other	\$16.64
25-2032	Vocational education teachers, secondary school	\$22.26
25-9021	Farm and home management advisors	\$24.10
25-9031	Instructional coordinators	\$19.95
29-9011	Occupational health and safety specialists	\$27.12
29-9012	Occupational health and safety technicians	\$10.04
33-1021	First-line supervisors/managers of fire fighting and prevention workers	\$27.45
33-2011	Fire fighters	\$16.57

Continued on next page.

APPENDIX 1

Idaho's Green Taxonomy: Modified to Work with EMSI Data (cont.)

SOC Code	Description	2010 Idaho Median Hourly Wage
33-2022	Forest fire inspectors and prevention specialists	--
33-3031	Fish and game wardens	\$22.91
37-1012	First-line supervisors/managers of landscaping, lawn service, and grounds keeping workers	\$12.71
37-2011	Janitors and cleaners, except maids and housekeeping cleaners	\$10.24
37-2019	Building cleaning workers, all other	\$12.72
37-3011	Landscaping and grounds keeping workers	\$10.30
37-3012	Pesticide handlers, sprayers, and applicators, vegetation	\$12.24
37-3013	Tree trimmers and pruners	\$11.06
39-6021	Tour guides and escorts	\$10.61
39-9032	Recreation workers	\$9.27
41-4011	Sales representatives, wholesale and manufacturing, technical and scientific products	\$28.58
41-9031	Sales engineers	\$34.92
45-209A	Miscellaneous agricultural workers	\$10.48
45-1099	Supervisors, farming, fishing, and forestry workers	\$13.97
45-2011	Agricultural inspectors	\$13.01
45-3011	Fishers and related fishing workers	\$7.81
45-4011	Forest and conservation workers	\$12.10
45-4021	Fallers	\$15.19
45-4022	Logging equipment operators	\$13.86
45-4029	Logging workers, all other	\$14.06
47-1011	First-line supervisors/managers of construction trades and extraction workers	\$19.41
47-2031	Carpenters	\$14.03
47-2051	Cement masons and concrete finishers	\$15.28
47-2061	Construction laborers	\$12.15
47-2073	Operating engineers and other construction equipment operators	\$17.34
47-2111	Electricians	\$19.45
47-2131	Insulation workers, floor, ceiling, and wall	\$13.57
47-2132	Insulation workers, mechanical	\$15.09
47-2152	Plumbers, pipefitters, and steamfitters	\$16.88
47-2181	Roofers	\$13.43
47-2211	Sheet metal workers	\$18.88
47-3012	Helpers, carpenters	\$11.46
47-3019	Helpers, construction trades, all other	\$11.19
47-4011	Construction and building inspectors	\$20.13
47-4041	Hazardous materials removal workers	\$22.80

Continued on next page.

APPENDIX 1

Idaho's Green Taxonomy: Modified to Work with EMSI Data (cont.)		
SOC Code	Description	2010 Idaho Median Hourly Wage
47-4099	Construction and related workers, all other	\$25.70
47-5021	Earth drillers, except oil and gas	\$16.40
49-1011	First-line supervisors/managers of mechanics, installers, and repairers	\$22.38
49-2011	Computer, automated teller, and office machine repairers	\$14.56
49-2095	Electrical and electronics repairers, powerhouse, substation, and relay	\$28.97
49-3022	Automotive glass installers and repairers	\$12.14
49-3023	Automotive service technicians and mechanics	\$15.51
49-3031	Bus and truck mechanics and diesel engine specialists	\$17.17
49-3041	Farm equipment mechanics	\$18.64
49-3091	Bicycle repairers	\$10.69
49-3093	Tire repairers and changers	\$11.12
49-9021	Heating, air conditioning, and refrigeration mechanics and installers	\$15.00
49-9031	Home appliance repairers	\$11.13
49-9041	Industrial machinery mechanics	\$18.89
49-9042	Maintenance and repair workers, general	\$13.65
49-9044	Millwrights	\$21.17
49-9098	Helpers--Installation, maintenance, and repair workers	\$10.54
49-9099	Installation, maintenance, and repair workers, all other	\$10.99
51-2022	Electrical and electronic equipment assemblers	\$11.83
51-2099	Assemblers and fabricators, all other	\$11.07
51-4121	Welders, cutters, solderers, and brazers	\$14.16
51-8011	Nuclear power reactor operators	--
51-8013	Power plant operators	\$22.89
51-8021	Stationary engineers and boiler operators	\$18.28
51-8031	Water and liquid waste treatment plant and system operators	\$15.45
51-8099	Plant and system operators, all other	\$31.77
51-9023	Mixing and blending machine setters, operators, and tenders	\$14.97
51-9041	Extruding, forming, pressing, and compacting machine setters, operators and tenders	\$15.35
51-9051	Furnace, kiln, oven, drier, and kettle operators and tenders	\$16.20
51-9197	Tire builders	\$11.37
51-9199	Production workers, all other	\$12.41
53-2012	Commercial pilots	\$18.41
53-3032	Truck drivers, heavy and tractor-trailer	\$15.82
53-7021	Crane and tower operators	\$21.38
53-7032	Excavating and loading machine and dragline operators	\$16.12
53-7051	Industrial truck and tractor operators	\$13.67
53-7081	Refuse and recyclable material collectors	\$12.80
Statewide		\$16.63

Source: EMSI Complete Employment — 4th Quarter 2010.
2010 Idaho Green Jobs Survey Report, Idaho Department of Labor

Appendix 2: Percent of State Employment Identified as Green

Percent of Total State Employment Identified as Green*								
2002			2010			2018		
Rank	State/Area	% Green Employment	Rank	State/Area	% Green Employment	Rank	State/Area	% Green Employment
1	Wyoming	27.6%	1	Wyoming	27.3%	1	Wyoming	27.1%
2	Idaho	27.1%	2	Montana	24.5%	2	Montana	24.0%
3	Montana	25.7%	3	North Dakota	24.5%	3	North Dakota	23.9%
4	North Dakota	24.5%	4	Idaho	24.5%	4	Idaho	23.4%
5	Arkansas	24.5%	5	Arkansas	23.5%	5	Oklahoma	23.2%
6	South Dakota	23.9%	6	Iowa	23.2%	6	Arkansas	23.1%
7	Iowa	23.7%	7	Oklahoma	23.2%	7	Iowa	22.8%
8	Oregon	23.7%	8	Alaska	23.0%	8	Alaska	22.7%
9	Alaska	23.6%	9	South Dakota	22.9%	9	South Dakota	22.3%
10	Kentucky	23.2%	10	Nebraska	22.1%	10	Kansas	21.9%
11	Oklahoma	23.1%	11	Kansas	22.0%	11	West Virginia	21.7%
12	Maine	22.9%	12	Maine	22.0%	12	Maine	21.7%
13	Colorado	22.7%	13	Oregon	21.9%	13	Nebraska	21.7%
14	Nebraska	22.6%	14	New Mexico	21.9%	14	New Mexico	21.6%
15	Tennessee	22.3%	15	Kentucky	21.8%	15	Alabama	21.2%
16	Alabama	22.3%	16	West Virginia	21.7%	16	Kentucky	21.2%
17	Kansas	22.3%	17	Alabama	21.6%	17	Oregon	21.1%
18	Minnesota	22.3%	18	Louisiana	21.6%	18	Louisiana	21.1%
19	New Mexico	22.2%	19	Mississippi	21.4%	19	Mississippi	20.9%
20	Michigan	22.1%	20	Colorado	21.1%	20	Colorado	20.8%
21	Vermont	22.1%	21	Texas	21.1%	21	Texas	20.8%
22	New Hampshire	21.9%	22	Tennessee	21.1%	22	New Hampshire	20.7%
23	Washington	21.8%	23	Washington	21.0%	23	Washington	20.6%
24	Texas	21.7%	24	New Hampshire	20.9%	24	Wisconsin	20.5%
25	West Virginia	21.7%	25	Minnesota	20.8%	25	District of Columbia	20.4%
26	Missouri	21.7%	26	Vermont	20.8%	26	Tennessee	20.3%
27	Louisiana	21.6%	27	Wisconsin	20.8%	27	Vermont	20.3%
28	Wisconsin	21.6%	28	District of Columbia	20.8%	28	Minnesota	20.2%
29	Mississippi	21.5%	29	Indiana	20.5%	29	Indiana	20.2%
30	Indiana	21.3%	30	Michigan	20.4%	30	Virginia	20.1%
31	Virginia	21.1%	31	Missouri	20.3%	31	Michigan	20.0%
32	District of Columbia	21.0%	32	Virginia	20.3%	32	Missouri	19.8%
33	North Carolina	20.7%	33	Maryland	20.0%	33	Maryland	19.7%
34	Maryland	20.7%	34	Utah	19.5%	34	Utah	19.1%
35	Arizona	20.7%	35	North Carolina	19.4%	35	North Carolina	19.1%
36	California	20.7%	36	Illinois	19.2%	36	Illinois	18.9%
37	Utah	20.4%	37	California	19.2%	37	Ohio	18.9%
38	Delaware	20.3%	38	Ohio	19.2%	38	California	18.8%
39	Illinois	20.3%	39	South Carolina	19.0%	39	South Carolina	18.7%
40	South Carolina	20.3%	40	Georgia	19.0%	40	Georgia	18.5%
41	Georgia	20.1%	41	Arizona	18.8%	41	Arizona	18.4%
42	Ohio	20.0%	42	Hawaii	18.3%	42	Hawaii	18.4%
43	Florida	19.5%	43	Florida	18.3%	43	Florida	18.2%
44	Nevada	18.7%	44	Pennsylvania	18.0%	44	Pennsylvania	17.8%
45	Pennsylvania	18.6%	45	Delaware	17.7%	45	Connecticut	17.2%
46	New Jersey	18.5%	46	Connecticut	17.4%	46	Massachusetts	17.2%
47	Connecticut	18.4%	47	Massachusetts	17.4%	47	Delaware	17.2%
48	Hawaii	18.3%	48	New Jersey	17.3%	48	New Jersey	17.1%
49	Massachusetts	18.3%	49	Nevada	16.7%	49	Nevada	16.2%
50	Rhode Island	16.4%	50	Rhode Island	16.0%	50	Rhode Island	16.0%
51	New York	16.2%	51	New York	15.4%	51	New York	14.9%

*This is assuming that all employment in green occupations is green.

Source: EMSI Complete Employment — 4th Quarter 2010.

Appendix 3: Percent of State Employment Identified as Green by Concentration

Percent of Total State Employment Identified as Green by Concentration Percentage								
2002			2010			2018		
Rank	State	% Green	Rank	State	% Green	Rank	State	% Green
1	Alaska	4.02%	1	Alaska	3.75%	1	Alaska	3.52%
2	Maine	2.49%	2	Maine	2.33%	2	Wyoming	2.29%
3	Delaware	2.34%	3	Wyoming	2.27%	3	Maine	2.23%
4	Wyoming	2.24%	4	Washington	1.94%	4	New Mexico	1.87%
5	Washington	2.05%	5	New Mexico	1.90%	5	Washington	1.87%
6	Idaho	1.97%	6	Louisiana	1.89%	6	Montana	1.83%
7	Louisiana	1.96%	7	Montana	1.87%	7	Louisiana	1.79%
8	Montana	1.91%	8	Idaho	1.78%	8	Idaho	1.72%
9	Oregon	1.80%	9	Delaware	1.74%	9	Maryland	1.70%
10	New Mexico	1.78%	10	Maryland	1.70%	10	Alabama	1.67%
11	Michigan	1.76%	11	Alabama	1.69%	11	West Virginia	1.65%
12	Colorado	1.76%	12	Oregon	1.68%	12	Colorado	1.63%
13	Maryland	1.73%	13	Colorado	1.65%	13	Oregon	1.61%
14	Alabama	1.73%	14	West Virginia	1.65%	14	North Dakota	1.61%
15	Vermont	1.71%	15	Vermont	1.63%	15	Vermont	1.61%
16	West Virginia	1.66%	16	Texas	1.61%	16	Texas	1.59%
17	Texas	1.66%	17	North Dakota	1.61%	17	Virginia	1.59%
18	Virginia	1.64%	18	District of Columbia	1.60%	18	South Dakota	1.58%
19	South Carolina	1.63%	19	Virginia	1.58%	19	Kansas	1.58%
20	District of Columbia	1.62%	20	Arkansas	1.57%	20	Delaware	1.57%
21	Arkansas	1.61%	21	Kansas	1.57%	21	District of Columbia	1.55%
22	Massachusetts	1.59%	22	South Dakota	1.56%	22	Arkansas	1.55%
23	New Hampshire	1.56%	23	Michigan	1.56%	23	South Carolina	1.53%
24	Kansas	1.56%	24	South Carolina	1.53%	24	Massachusetts	1.53%
25	Indiana	1.55%	25	Massachusetts	1.53%	25	Oklahoma	1.53%
26	Arizona	1.55%	26	Mississippi	1.53%	26	Iowa	1.52%
27	California	1.55%	27	Iowa	1.51%	27	Michigan	1.51%
28	South Dakota	1.54%	28	Indiana	1.49%	28	Mississippi	1.50%
29	North Dakota	1.54%	29	New Hampshire	1.49%	29	New Hampshire	1.48%
30	Wisconsin	1.53%	30	Oklahoma	1.49%	30	Indiana	1.48%
31	North Carolina	1.53%	31	Wisconsin	1.49%	31	Wisconsin	1.48%
32	Mississippi	1.52%	32	Hawaii	1.48%	32	Utah	1.47%
33	Kentucky	1.52%	33	Utah	1.47%	33	Kentucky	1.45%
34	Utah	1.51%	34	California	1.45%	34	Hawaii	1.45%
35	Florida	1.50%	35	Kentucky	1.45%	35	California	1.43%
36	Hawaii	1.50%	36	North Carolina	1.43%	36	Nebraska	1.42%
37	Iowa	1.50%	37	Tennessee	1.41%	37	North Carolina	1.41%
38	Tennessee	1.48%	38	Arizona	1.40%	38	Florida	1.38%
39	New Jersey	1.48%	39	Ohio	1.40%	39	Tennessee	1.38%
40	Ohio	1.48%	40	Nebraska	1.40%	40	Ohio	1.38%
41	Minnesota	1.45%	41	Florida	1.39%	41	Arizona	1.37%
42	Connecticut	1.45%	42	Minnesota	1.36%	42	Minnesota	1.35%
43	Oklahoma	1.43%	43	Pennsylvania	1.35%	43	Connecticut	1.34%
44	Pennsylvania	1.41%	44	Connecticut	1.35%	44	Pennsylvania	1.34%
45	Missouri	1.40%	45	Rhode Island	1.34%	45	Rhode Island	1.32%
46	Rhode Island	1.40%	46	New Jersey	1.34%	46	Missouri	1.31%
47	Georgia	1.39%	47	Missouri	1.33%	47	New Jersey	1.30%
48	Nebraska	1.37%	48	Georgia	1.31%	48	Georgia	1.28%
49	Nevada	1.34%	49	Illinois	1.24%	49	Illinois	1.23%
50	Illinois	1.34%	50	Nevada	1.18%	50	Nevada	1.13%
51	New York	1.21%	51	New York	1.16%	51	New York	1.12%

Source: EMSI Complete Employment — 4th Quarter 2010.

Appendix 4: Percent of Employment by Core Green Areas

Percent Breakdown of Each State's Green Employment into the Four Core Green Areas											
Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup			Sustainable Agriculture and Natural Resource Conservation			Energy Efficiency and Conservation			Renewable Energy and Alternative Fuels		
Rank	State/Area	% Empl	Rank	State/Area	% Empl	Rank	State/Area	% Empl	Rank	State/Area	% Empl
1	New Mexico	33.6%	1	Alaska	62.9%	1	Florida	27.9%	1	District of Columbia	29.7%
2	West Virginia	32.7%	2	Maine	51.2%	2	New Hampshire	26.6%	2	Michigan	25.8%
3	South Carolina	31.0%	3	Montana	43.3%	3	Nevada	26.1%	3	Connecticut	24.5%
4	New York	30.5%	4	South Dakota	41.9%	4	Virginia	24.1%	4	Ohio	24.0%
5	Pennsylvania	30.5%	5	Oregon	41.6%	5	New York	24.1%	5	Maryland	23.3%
6	Tennessee	30.4%	6	North Dakota	38.6%	6	Rhode Island	23.8%	6	Alabama	22.8%
7	Illinois	29.9%	7	Hawaii	37.4%	7	Connecticut	23.7%	7	Indiana	22.7%
8	New Jersey	29.8%	8	Oklahoma	36.8%	8	Louisiana	23.6%	8	Washington	22.4%
9	Indiana	29.8%	9	Wyoming	36.5%	9	Arizona	23.4%	9	Kansas	22.1%
10	Wyoming	29.7%	10	Washington	36.2%	10	Georgia	23.4%	10	California	22.0%
11	Nevada	29.6%	11	Louisiana	34.3%	11	Utah	23.3%	11	Virginia	21.9%
12	Nebraska	29.5%	12	Massachusetts	34.0%	12	Illinois	23.3%	12	Delaware	21.8%
13	Utah	29.3%	13	Mississippi	33.7%	13	Pennsylvania	22.9%	13	Illinois	21.5%
14	Vermont	29.2%	14	Nebraska	33.0%	14	Tennessee	22.9%	14	South Carolina	21.4%
15	Georgia	29.1%	15	Iowa	32.8%	15	Missouri	22.6%	15	Arizona	20.9%
16	Iowa	28.8%	16	Minnesota	32.5%	16	Nebraska	22.3%	16	New Jersey	20.8%
17	District of Columbia	28.8%	17	Arkansas	32.3%	17	Texas	22.3%	17	Kentucky	20.7%
18	New Hampshire	28.3%	18	Rhode Island	32.0%	18	Alabama	22.2%	18	Georgia	20.6%
19	Wisconsin	28.3%	19	Idaho	31.8%	19	Indiana	22.0%	19	Pennsylvania	20.6%
20	Arkansas	28.3%	20	Wisconsin	31.4%	20	North Carolina	21.8%	20	Texas	20.4%
21	Ohio	28.2%	21	Kansas	31.3%	21	Vermont	21.7%	21	Minnesota	20.4%
22	North Carolina	28.1%	22	North Carolina	31.1%	22	Mississippi	21.6%	22	New York	20.3%
23	Arizona	28.1%	23	Missouri	31.1%	23	Oklahoma	21.6%	23	Utah	20.2%
24	Idaho	28.1%	24	Colorado	30.9%	24	Maryland	21.5%	24	Colorado	20.1%
25	North Dakota	28.0%	25	California	30.9%	25	Arkansas	21.3%	25	Wisconsin	20.1%
26	Minnesota	28.0%	26	Kentucky	30.8%	26	Michigan	21.2%	26	New Mexico	20.0%
27	Maryland	27.9%	27	Vermont	29.9%	27	Iowa	21.1%	27	Tennessee	19.9%
28	Delaware	27.9%	28	Texas	29.8%	28	Colorado	21.1%	28	New Hampshire	19.8%
29	Missouri	27.9%	29	Delaware	29.4%	29	Ohio	21.0%	29	Massachusetts	19.8%
30	Colorado	27.8%	30	Alabama	29.1%	30	Delaware	20.9%	30	West Virginia	19.6%
31	Kentucky	27.8%	31	Florida	28.8%	31	South Carolina	20.9%	31	Vermont	19.2%
32	Texas	27.6%	32	West Virginia	28.7%	32	New Jersey	20.8%	32	North Carolina	19.0%
33	California	27.4%	33	New Jersey	28.6%	33	Massachusetts	20.7%	33	Louisiana	18.8%
34	Mississippi	27.2%	34	District of Columbia	27.7%	34	Kentucky	20.7%	34	Missouri	18.4%
35	Hawaii	27.2%	35	Arizona	27.6%	35	Wisconsin	20.2%	35	Rhode Island	18.2%
36	South Dakota	26.9%	36	Utah	27.2%	36	Hawaii	20.1%	36	Arkansas	18.1%
37	Virginia	26.8%	37	Maryland	27.2%	37	Kansas	20.1%	37	Nevada	17.6%
38	Kansas	26.5%	38	New Mexico	27.2%	38	California	19.7%	38	Mississippi	17.5%
39	Michigan	26.4%	39	Virginia	27.2%	39	West Virginia	19.6%	39	Iowa	17.2%
40	Florida	26.3%	40	Georgia	27.0%	40	South Dakota	19.4%	40	Florida	17.0%
41	Rhode Island	26.0%	41	Tennessee	26.8%	41	Idaho	19.3%	41	Oklahoma	16.3%
42	Connecticut	26.0%	42	South Carolina	26.8%	42	New Mexico	19.2%	42	Oregon	16.2%
43	Alabama	25.9%	43	Ohio	26.7%	43	Minnesota	19.2%	43	Idaho	16.0%
44	Massachusetts	25.5%	44	Nevada	26.6%	44	Oregon	18.4%	44	Wyoming	15.6%
45	Montana	25.4%	45	Michigan	26.6%	45	North Dakota	18.2%	45	Hawaii	15.3%
46	Oklahoma	25.3%	46	Pennsylvania	26.1%	46	Wyoming	18.2%	46	Nebraska	15.2%
47	Oregon	23.7%	47	Connecticut	25.8%	47	Montana	18.1%	47	North Dakota	15.1%
48	Washington	23.7%	48	Indiana	25.6%	48	Washington	17.7%	48	Montana	13.2%
49	Louisiana	23.3%	49	Illinois	25.3%	49	Maine	17.1%	49	Maine	12.2%
50	Maine	19.6%	50	New Hampshire	25.3%	50	District of Columbia	13.8%	50	South Dakota	11.9%
51	Alaska	16.3%	51	New York	25.2%	51	Alaska	11.3%	51	Alaska	9.5%

Source: EMSI Complete Employment — 4th Quarter 2010.

Appendix 5: Percent Green Job Growth by State 2010-2018

Green Jobs Growth by State 2010-2018					
Using Total Employment			Using Concentration Percentages		
Rank	State	% Growth	Rank	State	% Growth
1	Utah	16.8%	1	Utah	19.5%
2	Texas	16.0%	2	Texas	16.3%
3	Florida	13.9%	3	Florida	13.9%
4	Virginia	12.7%	4	Virginia	13.8%
5	Arizona	12.1%	5	South Dakota	13.3%
6	North Carolina	11.6%	6	Oklahoma	12.2%
7	Alabama	10.7%	7	Arizona	11.8%
8	Georgia	10.6%	8	North Carolina	11.7%
9	Mississippi	10.4%	9	Alabama	11.5%
10	New Mexico	10.4%	10	Idaho	11.4%
11	Arkansas	10.1%	11	Georgia	11.3%
12	Idaho	10.0%	12	Mississippi	10.6%
13	Oklahoma	9.7%	13	Arkansas	10.6%
14	Maryland	9.3%	14	South Carolina	10.6%
15	Kansas	9.1%	15	Wyoming	10.5%
16	South Dakota	9.1%	16	New Mexico	10.4%
17	South Carolina	9.1%	17	Kansas	10.4%
18	Wyoming	9.0%	18	Nebraska	10.4%
19	Colorado	8.9%	19	Maryland	10.1%
20	Rhode Island	8.8%	20	Colorado	9.0%
21	Hawaii	8.6%	21	Iowa	8.8%
22	Connecticut	8.4%	22	Illinois	8.7%
23	New Hampshire	7.9%	23	Connecticut	8.5%
24	Illinois	7.7%	24	New Hampshire	8.5%
25	California	7.6%	25	California	8.4%
26	Montana	7.5%	26	North Dakota	8.0%
27	Nevada	7.3%	27	Montana	7.8%
28	Washington	7.1%	28	Kentucky	7.6%
29	Louisiana	6.9%	29	Minnesota	7.1%
30	Nebraska	6.8%	30	Massachusetts	6.6%
31	Alaska	6.8%	31	Rhode Island	6.6%
32	New Jersey	6.5%	32	Indiana	6.4%
33	District of Columbia	6.3%	33	Nevada	6.1%
34	Delaware	6.2%	34	Hawaii	5.8%
35	Massachusetts	6.0%	35	Vermont	5.3%
36	Iowa	5.8%	36	Tennessee	5.3%
37	Indiana	5.8%	37	Oregon	5.2%
38	Oregon	5.5%	38	West Virginia	5.1%
39	North Dakota	5.4%	39	Washington	5.1%
40	Minnesota	5.2%	40	District of Columbia	4.9%
41	West Virginia	5.0%	41	New Jersey	4.7%
42	Michigan	4.7%	42	Ohio	4.4%
43	Ohio	4.7%	43	Michigan	3.9%
44	Vermont	4.2%	44	Wisconsin	3.9%
45	Kentucky	4.2%	45	Louisiana	3.6%
46	Tennessee	3.8%	46	Pennsylvania	3.4%
47	Pennsylvania	3.5%	47	Missouri	3.2%
48	Maine	3.2%	48	New York	2.9%
49	Wisconsin	3.2%	49	Alaska	1.3%
50	New York	2.6%	50	Maine	-0.3%
51	Missouri	2.3%	51	Delaware	-1.5%

Source: EMSI Complete Employment — 4th Quarter 2010.

Appendix 6: Difference from State Median Salary

Difference from State Median Salary, 2010				
Rank	State/Area	\$ Difference	Green Median	State Median
1	District of Columbia	\$5.94	\$37.67	\$31.73
2	New Jersey	\$4.98	\$25.65	\$20.67
3	Nevada	\$4.93	\$21.78	\$16.85
4	Maryland	\$4.35	\$24.00	\$19.65
5	Connecticut	\$4.30	\$25.53	\$21.23
6	California	\$4.28	\$24.38	\$20.10
7	Colorado	\$3.95	\$22.23	\$18.28
8	Washington	\$3.94	\$23.38	\$19.44
9	Alaska	\$3.85	\$24.00	\$20.15
10	Hawaii	\$3.75	\$21.43	\$17.68
11	Delaware	\$3.55	\$22.76	\$19.21
12	Virginia	\$3.55	\$22.80	\$19.25
13	Massachusetts	\$3.50	\$25.37	\$21.87
14	New Hampshire	\$3.36	\$21.41	\$18.05
15	Michigan	\$3.32	\$20.78	\$17.46
16	Illinois	\$3.32	\$22.24	\$18.92
17	Arizona	\$3.23	\$19.97	\$16.74
18	Utah	\$3.03	\$18.79	\$15.76
19	Texas	\$2.70	\$20.09	\$17.39
20	Louisiana	\$2.62	\$18.12	\$15.50
21	Wyoming	\$2.61	\$19.19	\$16.58
22	New Mexico	\$2.45	\$18.45	\$16.00
23	New York	\$2.38	\$23.55	\$21.17
24	Rhode Island	\$2.35	\$21.25	\$18.90
25	Minnesota	\$2.29	\$20.61	\$18.32
26	North Carolina	\$2.29	\$18.59	\$16.30
27	Pennsylvania	\$2.27	\$19.81	\$17.54
28	Ohio	\$2.23	\$19.01	\$16.78
29	Oregon	\$2.21	\$19.57	\$17.36
30	South Carolina	\$2.20	\$17.27	\$15.07
31	Indiana	\$2.18	\$18.20	\$16.02
32	Alabama	\$2.18	\$17.65	\$15.47
33	Wisconsin	\$2.10	\$18.71	\$16.61
34	North Dakota	\$1.99	\$17.19	\$15.20
35	Georgia	\$1.85	\$18.63	\$16.78
36	Kansas	\$1.81	\$17.91	\$16.10
37	Missouri	\$1.78	\$17.98	\$16.20
38	Florida	\$1.73	\$17.58	\$15.85
39	Nebraska	\$1.69	\$17.24	\$15.55
40	South Dakota	\$1.67	\$15.93	\$14.26
41	Idaho	\$1.51	\$16.63	\$15.12
42	West Virginia	\$1.44	\$16.05	\$14.61
43	Iowa	\$1.40	\$16.79	\$15.39
44	Montana	\$1.36	\$15.38	\$14.02
45	Tennessee	\$1.32	\$16.86	\$15.54
46	Oklahoma	\$1.24	\$16.27	\$15.03
47	Mississippi	\$1.05	\$15.22	\$14.17
48	Maine	\$0.96	\$16.59	\$15.63
49	Arkansas	\$0.69	\$15.18	\$14.49
50	Vermont	\$0.65	\$16.86	\$16.21
51	Kentucky	\$0.57	\$16.23	\$15.66

Source: EMSI Complete Employment — 4th Quarter 2010.

Appendix 1: Idaho's Green Taxonomy

Idaho's Green Taxonomy: Modified to Work with EMSI data		
SOC Code	Description	2010 Idaho Median Hourly Wage
11-1021	General and operations managers	\$29.92
11-3051	Industrial production managers	\$34.01
11-9011	Farm, ranch, and other agricultural managers	\$18.12
11-9012	Farmers and ranchers	\$7.57
11-9021	Construction managers	\$14.32
11-9041	Engineering managers	\$49.37
11-9121	Natural sciences managers	\$40.82
11-9199	Managers, all other	\$13.69
13-1021	Purchasing agents and buyers, farm products	\$19.62
13-1041	Compliance officers, except agriculture, construction, health and safety, and transportation	\$20.53
13-1199	Business operation specialists, all other	\$24.30
13-2099	Financial specialists, all other	\$23.57
15-1031	Computer software engineers, applications	\$31.65
15-1081	Network systems and data communications analysts	\$13.29
15-2041	Statisticians	\$27.08
15-2099	Mathematical scientists, all other	\$15.27
17-1011	Architects, except landscape and naval	\$25.20
17-1012	Landscape architects	\$19.58
17-2011	Aerospace engineers	\$35.46
17-2041	Chemical engineers	\$50.95
17-2051	Civil engineers	\$29.75
17-2071	Electrical engineers	\$39.00
17-2072	Electronics engineers, except computer	\$34.43
17-2081	Environmental engineers	\$29.89
17-2111	Health and safety engineers, except mining safety engineers and inspectors	\$41.93
17-2112	Industrial engineers	\$38.32
17-2131	Materials engineers	\$40.30
17-2141	Mechanical engineers	\$38.46
17-2151	Mining and geological engineers, including mining safety engineers	\$29.45
17-2161	Nuclear engineers	\$47.60
17-2199	Engineers, all other	\$34.09
17-3011	Architectural and civil drafters	\$20.29
17-3013	Mechanical drafters	\$23.20

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APPENDIX 1

Idaho's Green Taxonomy: Modified to Work with EMSI Data (cont.)		
SOC Code	Description	2010 Idaho Median Hourly Wage
17-3019	Drafters, all other	\$19.36
17-3022	Civil engineering technicians	\$20.23
17-3023	Electrical and electronic engineering technicians	\$24.94
17-3025	Environmental engineering technicians	\$21.31
17-3026	Industrial engineering technicians	\$19.79
17-3029	Engineering technicians, except drafters, all other	\$21.14
19-1013	Soil and plant Scientists	\$18.42
19-1022	Microbiologists	\$32.71
19-1023	Zoologists and wildlife biologists	\$27.15
19-1029	Biological scientists, all other	\$26.30
19-1031	Conservation scientists	\$27.35
19-1032	Foresters	\$26.38
19-1042	Medical scientists, except epidemiologists	\$22.91
19-2012	Physicists	\$48.98
19-2031	Chemists	\$35.79
19-2032	Materials scientists	\$25.84
19-2041	Environmental scientists and specialists, including health	\$27.45
19-2042	Geoscientists, except hydrologists and geographers	\$26.18
19-2043	Hydrologists	\$29.86
19-2099	Physical scientists, all other	\$28.08
19-3051	Urban and regional planners	\$24.05
19-3091	Anthropologists and archeologists	\$26.15
19-3099	Social scientists and related workers, all other	\$20.32
19-4011	Agricultural and food science technicians	\$14.46
19-4021	Biological technicians	\$13.84
19-4031	Chemical technicians	\$14.32
19-4041	Geological and petroleum technicians	\$11.18
19-4051	Nuclear technicians	\$27.51
19-4061	Social science research assistants	\$12.98
19-4091	Environmental science and protection technicians, including health	\$11.87
19-4093	Forest and conservation technicians	\$14.91
19-4099	Life, physical, and social science technicians, all other	\$16.64
25-2032	Vocational education teachers, secondary school	\$22.26
25-9021	Farm and home management advisors	\$24.10
25-9031	Instructional coordinators	\$19.95
29-9011	Occupational health and safety specialists	\$27.12
29-9012	Occupational health and safety technicians	\$10.04
33-1021	First-line supervisors/managers of fire fighting and prevention workers	\$27.45
33-2011	Fire fighters	\$16.57

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APPENDIX 1

Idaho's Green Taxonomy: Modified to Work with EMSI Data (cont.)

SOC Code	Description	2010 Idaho Median Hourly Wage
33-2022	Forest fire inspectors and prevention specialists	--
33-3031	Fish and game wardens	\$22.91
37-1012	First-line supervisors/managers of landscaping, lawn service, and grounds keeping workers	\$12.71
37-2011	Janitors and cleaners, except maids and housekeeping cleaners	\$10.24
37-2019	Building cleaning workers, all other	\$12.72
37-3011	Landscaping and grounds keeping workers	\$10.30
37-3012	Pesticide handlers, sprayers, and applicators, vegetation	\$12.24
37-3013	Tree trimmers and pruners	\$11.06
39-6021	Tour guides and escorts	\$10.61
39-9032	Recreation workers	\$9.27
41-4011	Sales representatives, wholesale and manufacturing, technical and scientific products	\$28.58
41-9031	Sales engineers	\$34.92
45-209A	Miscellaneous agricultural workers	\$10.48
45-1099	Supervisors, farming, fishing, and forestry workers	\$13.97
45-2011	Agricultural inspectors	\$13.01
45-3011	Fishers and related fishing workers	\$7.81
45-4011	Forest and conservation workers	\$12.10
45-4021	Fallers	\$15.19
45-4022	Logging equipment operators	\$13.86
45-4029	Logging workers, all other	\$14.06
47-1011	First-line supervisors/managers of construction trades and extraction workers	\$19.41
47-2031	Carpenters	\$14.03
47-2051	Cement masons and concrete finishers	\$15.28
47-2061	Construction laborers	\$12.15
47-2073	Operating engineers and other construction equipment operators	\$17.34
47-2111	Electricians	\$19.45
47-2131	Insulation workers, floor, ceiling, and wall	\$13.57
47-2132	Insulation workers, mechanical	\$15.09
47-2152	Plumbers, pipefitters, and steamfitters	\$16.88
47-2181	Roofers	\$13.43
47-2211	Sheet metal workers	\$18.88
47-3012	Helpers, carpenters	\$11.46
47-3019	Helpers, construction trades, all other	\$11.19
47-4011	Construction and building inspectors	\$20.13
47-4041	Hazardous materials removal workers	\$22.80

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APPENDIX 1

Idaho's Green Taxonomy: Modified to Work with EMSI Data (cont.)		
SOC Code	Description	2010 Idaho Median Hourly Wage
47-4099	Construction and related workers, all other	\$25.70
47-5021	Earth drillers, except oil and gas	\$16.40
49-1011	First-line supervisors/managers of mechanics, installers, and repairers	\$22.38
49-2011	Computer, automated teller, and office machine repairers	\$14.56
49-2095	Electrical and electronics repairers, powerhouse, substation, and relay	\$28.97
49-3022	Automotive glass installers and repairers	\$12.14
49-3023	Automotive service technicians and mechanics	\$15.51
49-3031	Bus and truck mechanics and diesel engine specialists	\$17.17
49-3041	Farm equipment mechanics	\$18.64
49-3091	Bicycle repairers	\$10.69
49-3093	Tire repairers and changers	\$11.12
49-9021	Heating, air conditioning, and refrigeration mechanics and installers	\$15.00
49-9031	Home appliance repairers	\$11.13
49-9041	Industrial machinery mechanics	\$18.89
49-9042	Maintenance and repair workers, general	\$13.65
49-9044	Millwrights	\$21.17
49-9098	Helpers--Installation, maintenance, and repair workers	\$10.54
49-9099	Installation, maintenance, and repair workers, all other	\$10.99
51-2022	Electrical and electronic equipment assemblers	\$11.83
51-2099	Assemblers and fabricators, all other	\$11.07
51-4121	Welders, cutters, solderers, and brazers	\$14.16
51-8011	Nuclear power reactor operators	--
51-8013	Power plant operators	\$22.89
51-8021	Stationary engineers and boiler operators	\$18.28
51-8031	Water and liquid waste treatment plant and system operators	\$15.45
51-8099	Plant and system operators, all other	\$31.77
51-9023	Mixing and blending machine setters, operators, and tenders	\$14.97
51-9041	Extruding, forming, pressing, and compacting machine setters, operators and tenders	\$15.35
51-9051	Furnace, kiln, oven, drier, and kettle operators and tenders	\$16.20
51-9197	Tire builders	\$11.37
51-9199	Production workers, all other	\$12.41
53-2012	Commercial pilots	\$18.41
53-3032	Truck drivers, heavy and tractor-trailer	\$15.82
53-7021	Crane and tower operators	\$21.38
53-7032	Excavating and loading machine and dragline operators	\$16.12
53-7051	Industrial truck and tractor operators	\$13.67
53-7081	Refuse and recyclable material collectors	\$12.80
Statewide		\$16.63

Source: EMSI Complete Employment — 4th Quarter 2010.
2010 Idaho Green Jobs Survey Report, Idaho Department of Labor

Appendix 2: Percent of State Employment Identified as Green

Percent of Total State Employment Identified as Green*								
2002			2010			2018		
Rank	State/Area	% Green Employment	Rank	State/Area	% Green Employment	Rank	State/Area	% Green Employment
1	Wyoming	27.6%	1	Wyoming	27.3%	1	Wyoming	27.1%
2	Idaho	27.1%	2	Montana	24.5%	2	Montana	24.0%
3	Montana	25.7%	3	North Dakota	24.5%	3	North Dakota	23.9%
4	North Dakota	24.5%	4	Idaho	24.5%	4	Idaho	23.4%
5	Arkansas	24.5%	5	Arkansas	23.5%	5	Oklahoma	23.2%
6	South Dakota	23.9%	6	Iowa	23.2%	6	Arkansas	23.1%
7	Iowa	23.7%	7	Oklahoma	23.2%	7	Iowa	22.8%
8	Oregon	23.7%	8	Alaska	23.0%	8	Alaska	22.7%
9	Alaska	23.6%	9	South Dakota	22.9%	9	South Dakota	22.3%
10	Kentucky	23.2%	10	Nebraska	22.1%	10	Kansas	21.9%
11	Oklahoma	23.1%	11	Kansas	22.0%	11	West Virginia	21.7%
12	Maine	22.9%	12	Maine	22.0%	12	Maine	21.7%
13	Colorado	22.7%	13	Oregon	21.9%	13	Nebraska	21.7%
14	Nebraska	22.6%	14	New Mexico	21.9%	14	New Mexico	21.6%
15	Tennessee	22.3%	15	Kentucky	21.8%	15	Alabama	21.2%
16	Alabama	22.3%	16	West Virginia	21.7%	16	Kentucky	21.2%
17	Kansas	22.3%	17	Alabama	21.6%	17	Oregon	21.1%
18	Minnesota	22.3%	18	Louisiana	21.6%	18	Louisiana	21.1%
19	New Mexico	22.2%	19	Mississippi	21.4%	19	Mississippi	20.9%
20	Michigan	22.1%	20	Colorado	21.1%	20	Colorado	20.8%
21	Vermont	22.1%	21	Texas	21.1%	21	Texas	20.8%
22	New Hampshire	21.9%	22	Tennessee	21.1%	22	New Hampshire	20.7%
23	Washington	21.8%	23	Washington	21.0%	23	Washington	20.6%
24	Texas	21.7%	24	New Hampshire	20.9%	24	Wisconsin	20.5%
25	West Virginia	21.7%	25	Minnesota	20.8%	25	District of Columbia	20.4%
26	Missouri	21.7%	26	Vermont	20.8%	26	Tennessee	20.3%
27	Louisiana	21.6%	27	Wisconsin	20.8%	27	Vermont	20.3%
28	Wisconsin	21.6%	28	District of Columbia	20.8%	28	Minnesota	20.2%
29	Mississippi	21.5%	29	Indiana	20.5%	29	Indiana	20.2%
30	Indiana	21.3%	30	Michigan	20.4%	30	Virginia	20.1%
31	Virginia	21.1%	31	Missouri	20.3%	31	Michigan	20.0%
32	District of Columbia	21.0%	32	Virginia	20.3%	32	Missouri	19.8%
33	North Carolina	20.7%	33	Maryland	20.0%	33	Maryland	19.7%
34	Maryland	20.7%	34	Utah	19.5%	34	Utah	19.1%
35	Arizona	20.7%	35	North Carolina	19.4%	35	North Carolina	19.1%
36	California	20.7%	36	Illinois	19.2%	36	Illinois	18.9%
37	Utah	20.4%	37	California	19.2%	37	Ohio	18.9%
38	Delaware	20.3%	38	Ohio	19.2%	38	California	18.8%
39	Illinois	20.3%	39	South Carolina	19.0%	39	South Carolina	18.7%
40	South Carolina	20.3%	40	Georgia	19.0%	40	Georgia	18.5%
41	Georgia	20.1%	41	Arizona	18.8%	41	Arizona	18.4%
42	Ohio	20.0%	42	Hawaii	18.3%	42	Hawaii	18.4%
43	Florida	19.5%	43	Florida	18.3%	43	Florida	18.2%
44	Nevada	18.7%	44	Pennsylvania	18.0%	44	Pennsylvania	17.8%
45	Pennsylvania	18.6%	45	Delaware	17.7%	45	Connecticut	17.2%
46	New Jersey	18.5%	46	Connecticut	17.4%	46	Massachusetts	17.2%
47	Connecticut	18.4%	47	Massachusetts	17.4%	47	Delaware	17.2%
48	Hawaii	18.3%	48	New Jersey	17.3%	48	New Jersey	17.1%
49	Massachusetts	18.3%	49	Nevada	16.7%	49	Nevada	16.2%
50	Rhode Island	16.4%	50	Rhode Island	16.0%	50	Rhode Island	16.0%
51	New York	16.2%	51	New York	15.4%	51	New York	14.9%

*This is assuming that all employment in green occupations is green.

Source: EMSI Complete Employment — 4th Quarter 2010.

Appendix 3: Percent of State Employment Identified as Green by Concentration

Percent of Total State Employment Identified as Green by Concentration Percentage								
2002			2010			2018		
Rank	State	% Green	Rank	State	% Green	Rank	State	% Green
1	Alaska	4.02%	1	Alaska	3.75%	1	Alaska	3.52%
2	Maine	2.49%	2	Maine	2.33%	2	Wyoming	2.29%
3	Delaware	2.34%	3	Wyoming	2.27%	3	Maine	2.23%
4	Wyoming	2.24%	4	Washington	1.94%	4	New Mexico	1.87%
5	Washington	2.05%	5	New Mexico	1.90%	5	Washington	1.87%
6	Idaho	1.97%	6	Louisiana	1.89%	6	Montana	1.83%
7	Louisiana	1.96%	7	Montana	1.87%	7	Louisiana	1.79%
8	Montana	1.91%	8	Idaho	1.78%	8	Idaho	1.72%
9	Oregon	1.80%	9	Delaware	1.74%	9	Maryland	1.70%
10	New Mexico	1.78%	10	Maryland	1.70%	10	Alabama	1.67%
11	Michigan	1.76%	11	Alabama	1.69%	11	West Virginia	1.65%
12	Colorado	1.76%	12	Oregon	1.68%	12	Colorado	1.63%
13	Maryland	1.73%	13	Colorado	1.65%	13	Oregon	1.61%
14	Alabama	1.73%	14	West Virginia	1.65%	14	North Dakota	1.61%
15	Vermont	1.71%	15	Vermont	1.63%	15	Vermont	1.61%
16	West Virginia	1.66%	16	Texas	1.61%	16	Texas	1.59%
17	Texas	1.66%	17	North Dakota	1.61%	17	Virginia	1.59%
18	Virginia	1.64%	18	District of Columbia	1.60%	18	South Dakota	1.58%
19	South Carolina	1.63%	19	Virginia	1.58%	19	Kansas	1.58%
20	District of Columbia	1.62%	20	Arkansas	1.57%	20	Delaware	1.57%
21	Arkansas	1.61%	21	Kansas	1.57%	21	District of Columbia	1.55%
22	Massachusetts	1.59%	22	South Dakota	1.56%	22	Arkansas	1.55%
23	New Hampshire	1.56%	23	Michigan	1.56%	23	South Carolina	1.53%
24	Kansas	1.56%	24	South Carolina	1.53%	24	Massachusetts	1.53%
25	Indiana	1.55%	25	Massachusetts	1.53%	25	Oklahoma	1.53%
26	Arizona	1.55%	26	Mississippi	1.53%	26	Iowa	1.52%
27	California	1.55%	27	Iowa	1.51%	27	Michigan	1.51%
28	South Dakota	1.54%	28	Indiana	1.49%	28	Mississippi	1.50%
29	North Dakota	1.54%	29	New Hampshire	1.49%	29	New Hampshire	1.48%
30	Wisconsin	1.53%	30	Oklahoma	1.49%	30	Indiana	1.48%
31	North Carolina	1.53%	31	Wisconsin	1.49%	31	Wisconsin	1.48%
32	Mississippi	1.52%	32	Hawaii	1.48%	32	Utah	1.47%
33	Kentucky	1.52%	33	Utah	1.47%	33	Kentucky	1.45%
34	Utah	1.51%	34	California	1.45%	34	Hawaii	1.45%
35	Florida	1.50%	35	Kentucky	1.45%	35	California	1.43%
36	Hawaii	1.50%	36	North Carolina	1.43%	36	Nebraska	1.42%
37	Iowa	1.50%	37	Tennessee	1.41%	37	North Carolina	1.41%
38	Tennessee	1.48%	38	Arizona	1.40%	38	Florida	1.38%
39	New Jersey	1.48%	39	Ohio	1.40%	39	Tennessee	1.38%
40	Ohio	1.48%	40	Nebraska	1.40%	40	Ohio	1.38%
41	Minnesota	1.45%	41	Florida	1.39%	41	Arizona	1.37%
42	Connecticut	1.45%	42	Minnesota	1.36%	42	Minnesota	1.35%
43	Oklahoma	1.43%	43	Pennsylvania	1.35%	43	Connecticut	1.34%
44	Pennsylvania	1.41%	44	Connecticut	1.35%	44	Pennsylvania	1.34%
45	Missouri	1.40%	45	Rhode Island	1.34%	45	Rhode Island	1.32%
46	Rhode Island	1.40%	46	New Jersey	1.34%	46	Missouri	1.31%
47	Georgia	1.39%	47	Missouri	1.33%	47	New Jersey	1.30%
48	Nebraska	1.37%	48	Georgia	1.31%	48	Georgia	1.28%
49	Nevada	1.34%	49	Illinois	1.24%	49	Illinois	1.23%
50	Illinois	1.34%	50	Nevada	1.18%	50	Nevada	1.13%
51	New York	1.21%	51	New York	1.16%	51	New York	1.12%

Source: EMSI Complete Employment — 4th Quarter 2010.

Appendix 4: Percent of Employment by Core Green Areas

Percent Breakdown of Each State's Green Employment into the Four Core Green Areas											
Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup			Sustainable Agriculture and Natural Resource Conservation			Energy Efficiency and Conservation			Renewable Energy and Alternative Fuels		
Rank	State/Area	% Empl	Rank	State/Area	% Empl	Rank	State/Area	% Empl	Rank	State/Area	% Empl
1	New Mexico	33.6%	1	Alaska	62.9%	1	Florida	27.9%	1	District of Columbia	29.7%
2	West Virginia	32.7%	2	Maine	51.2%	2	New Hampshire	26.6%	2	Michigan	25.8%
3	South Carolina	31.0%	3	Montana	43.3%	3	Nevada	26.1%	3	Connecticut	24.5%
4	New York	30.5%	4	South Dakota	41.9%	4	Virginia	24.1%	4	Ohio	24.0%
5	Pennsylvania	30.5%	5	Oregon	41.6%	5	New York	24.1%	5	Maryland	23.3%
6	Tennessee	30.4%	6	North Dakota	38.6%	6	Rhode Island	23.8%	6	Alabama	22.8%
7	Illinois	29.9%	7	Hawaii	37.4%	7	Connecticut	23.7%	7	Indiana	22.7%
8	New Jersey	29.8%	8	Oklahoma	36.8%	8	Louisiana	23.6%	8	Washington	22.4%
9	Indiana	29.8%	9	Wyoming	36.5%	9	Arizona	23.4%	9	Kansas	22.1%
10	Wyoming	29.7%	10	Washington	36.2%	10	Georgia	23.4%	10	California	22.0%
11	Nevada	29.6%	11	Louisiana	34.3%	11	Utah	23.3%	11	Virginia	21.9%
12	Nebraska	29.5%	12	Massachusetts	34.0%	12	Illinois	23.3%	12	Delaware	21.8%
13	Utah	29.3%	13	Mississippi	33.7%	13	Pennsylvania	22.9%	13	Illinois	21.5%
14	Vermont	29.2%	14	Nebraska	33.0%	14	Tennessee	22.9%	14	South Carolina	21.4%
15	Georgia	29.1%	15	Iowa	32.8%	15	Missouri	22.6%	15	Arizona	20.9%
16	Iowa	28.8%	16	Minnesota	32.5%	16	Nebraska	22.3%	16	New Jersey	20.8%
17	District of Columbia	28.8%	17	Arkansas	32.3%	17	Texas	22.3%	17	Kentucky	20.7%
18	New Hampshire	28.3%	18	Rhode Island	32.0%	18	Alabama	22.2%	18	Georgia	20.6%
19	Wisconsin	28.3%	19	Idaho	31.8%	19	Indiana	22.0%	19	Pennsylvania	20.6%
20	Arkansas	28.3%	20	Wisconsin	31.4%	20	North Carolina	21.8%	20	Texas	20.4%
21	Ohio	28.2%	21	Kansas	31.3%	21	Vermont	21.7%	21	Minnesota	20.4%
22	North Carolina	28.1%	22	North Carolina	31.1%	22	Mississippi	21.6%	22	New York	20.3%
23	Arizona	28.1%	23	Missouri	31.1%	23	Oklahoma	21.6%	23	Utah	20.2%
24	Idaho	28.1%	24	Colorado	30.9%	24	Maryland	21.5%	24	Colorado	20.1%
25	North Dakota	28.0%	25	California	30.9%	25	Arkansas	21.3%	25	Wisconsin	20.1%
26	Minnesota	28.0%	26	Kentucky	30.8%	26	Michigan	21.2%	26	New Mexico	20.0%
27	Maryland	27.9%	27	Vermont	29.9%	27	Iowa	21.1%	27	Tennessee	19.9%
28	Delaware	27.9%	28	Texas	29.8%	28	Colorado	21.1%	28	New Hampshire	19.8%
29	Missouri	27.9%	29	Delaware	29.4%	29	Ohio	21.0%	29	Massachusetts	19.8%
30	Colorado	27.8%	30	Alabama	29.1%	30	Delaware	20.9%	30	West Virginia	19.6%
31	Kentucky	27.8%	31	Florida	28.8%	31	South Carolina	20.9%	31	Vermont	19.2%
32	Texas	27.6%	32	West Virginia	28.7%	32	New Jersey	20.8%	32	North Carolina	19.0%
33	California	27.4%	33	New Jersey	28.6%	33	Massachusetts	20.7%	33	Louisiana	18.8%
34	Mississippi	27.2%	34	District of Columbia	27.7%	34	Kentucky	20.7%	34	Missouri	18.4%
35	Hawaii	27.2%	35	Arizona	27.6%	35	Wisconsin	20.2%	35	Rhode Island	18.2%
36	South Dakota	26.9%	36	Utah	27.2%	36	Hawaii	20.1%	36	Arkansas	18.1%
37	Virginia	26.8%	37	Maryland	27.2%	37	Kansas	20.1%	37	Nevada	17.6%
38	Kansas	26.5%	38	New Mexico	27.2%	38	California	19.7%	38	Mississippi	17.5%
39	Michigan	26.4%	39	Virginia	27.2%	39	West Virginia	19.6%	39	Iowa	17.2%
40	Florida	26.3%	40	Georgia	27.0%	40	South Dakota	19.4%	40	Florida	17.0%
41	Rhode Island	26.0%	41	Tennessee	26.8%	41	Idaho	19.3%	41	Oklahoma	16.3%
42	Connecticut	26.0%	42	South Carolina	26.8%	42	New Mexico	19.2%	42	Oregon	16.2%
43	Alabama	25.9%	43	Ohio	26.7%	43	Minnesota	19.2%	43	Idaho	16.0%
44	Massachusetts	25.5%	44	Nevada	26.6%	44	Oregon	18.4%	44	Wyoming	15.6%
45	Montana	25.4%	45	Michigan	26.6%	45	North Dakota	18.2%	45	Hawaii	15.3%
46	Oklahoma	25.3%	46	Pennsylvania	26.1%	46	Wyoming	18.2%	46	Nebraska	15.2%
47	Oregon	23.7%	47	Connecticut	25.8%	47	Montana	18.1%	47	North Dakota	15.1%
48	Washington	23.7%	48	Indiana	25.6%	48	Washington	17.7%	48	Montana	13.2%
49	Louisiana	23.3%	49	Illinois	25.3%	49	Maine	17.1%	49	Maine	12.2%
50	Maine	19.6%	50	New Hampshire	25.3%	50	District of Columbia	13.8%	50	South Dakota	11.9%
51	Alaska	16.3%	51	New York	25.2%	51	Alaska	11.3%	51	Alaska	9.5%

Source: EMSI Complete Employment — 4th Quarter 2010.

Appendix 5: Percent Green Job Growth by State 2010-2018

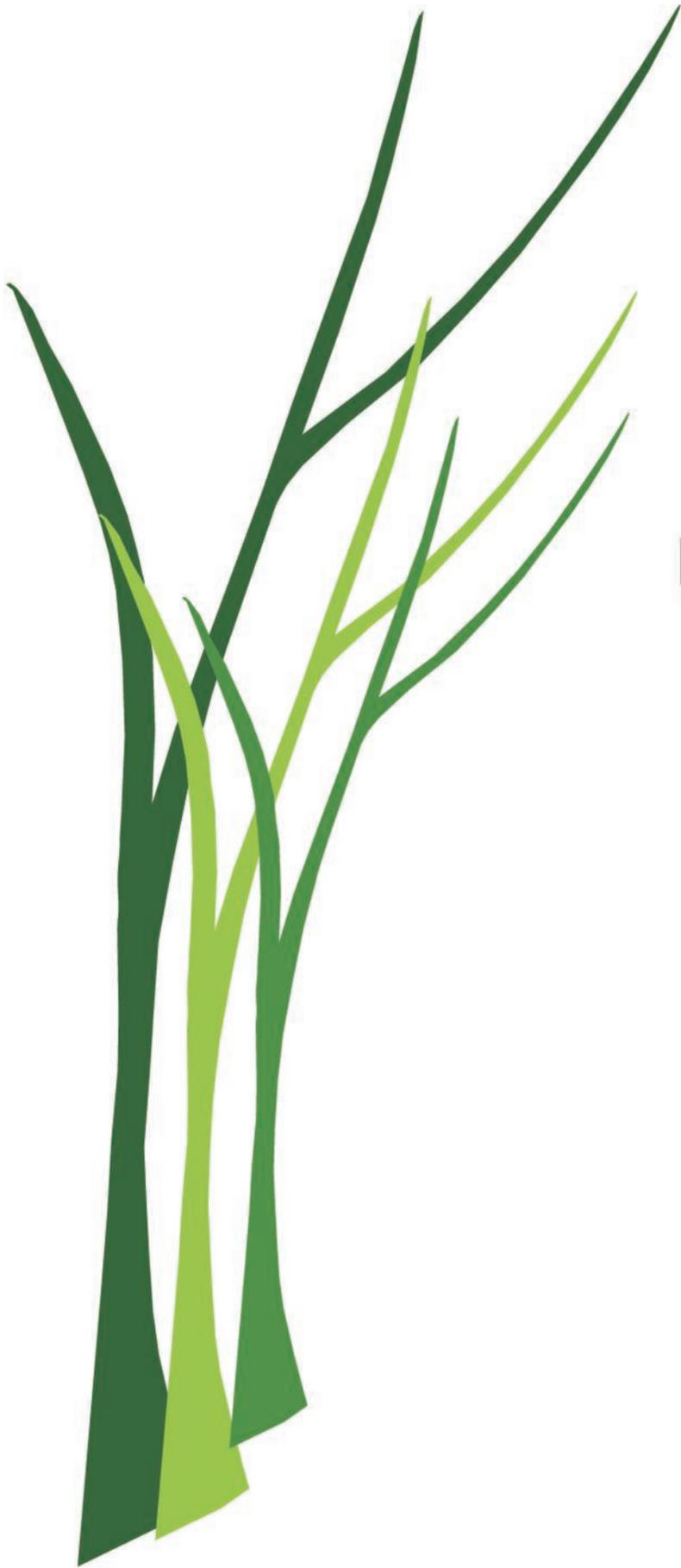
Green Jobs Growth by State 2010-2018					
Using Total Employment			Using Concentration Percentages		
Rank	State	% Growth	Rank	State	% Growth
1	Utah	16.8%	1	Utah	19.5%
2	Texas	16.0%	2	Texas	16.3%
3	Florida	13.9%	3	Florida	13.9%
4	Virginia	12.7%	4	Virginia	13.8%
5	Arizona	12.1%	5	South Dakota	13.3%
6	North Carolina	11.6%	6	Oklahoma	12.2%
7	Alabama	10.7%	7	Arizona	11.8%
8	Georgia	10.6%	8	North Carolina	11.7%
9	Mississippi	10.4%	9	Alabama	11.5%
10	New Mexico	10.4%	10	Idaho	11.4%
11	Arkansas	10.1%	11	Georgia	11.3%
12	Idaho	10.0%	12	Mississippi	10.6%
13	Oklahoma	9.7%	13	Arkansas	10.6%
14	Maryland	9.3%	14	South Carolina	10.6%
15	Kansas	9.1%	15	Wyoming	10.5%
16	South Dakota	9.1%	16	New Mexico	10.4%
17	South Carolina	9.1%	17	Kansas	10.4%
18	Wyoming	9.0%	18	Nebraska	10.4%
19	Colorado	8.9%	19	Maryland	10.1%
20	Rhode Island	8.8%	20	Colorado	9.0%
21	Hawaii	8.6%	21	Iowa	8.8%
22	Connecticut	8.4%	22	Illinois	8.7%
23	New Hampshire	7.9%	23	Connecticut	8.5%
24	Illinois	7.7%	24	New Hampshire	8.5%
25	California	7.6%	25	California	8.4%
26	Montana	7.5%	26	North Dakota	8.0%
27	Nevada	7.3%	27	Montana	7.8%
28	Washington	7.1%	28	Kentucky	7.6%
29	Louisiana	6.9%	29	Minnesota	7.1%
30	Nebraska	6.8%	30	Massachusetts	6.6%
31	Alaska	6.8%	31	Rhode Island	6.6%
32	New Jersey	6.5%	32	Indiana	6.4%
33	District of Columbia	6.3%	33	Nevada	6.1%
34	Delaware	6.2%	34	Hawaii	5.8%
35	Massachusetts	6.0%	35	Vermont	5.3%
36	Iowa	5.8%	36	Tennessee	5.3%
37	Indiana	5.8%	37	Oregon	5.2%
38	Oregon	5.5%	38	West Virginia	5.1%
39	North Dakota	5.4%	39	Washington	5.1%
40	Minnesota	5.2%	40	District of Columbia	4.9%
41	West Virginia	5.0%	41	New Jersey	4.7%
42	Michigan	4.7%	42	Ohio	4.4%
43	Ohio	4.7%	43	Michigan	3.9%
44	Vermont	4.2%	44	Wisconsin	3.9%
45	Kentucky	4.2%	45	Louisiana	3.6%
46	Tennessee	3.8%	46	Pennsylvania	3.4%
47	Pennsylvania	3.5%	47	Missouri	3.2%
48	Maine	3.2%	48	New York	2.9%
49	Wisconsin	3.2%	49	Alaska	1.3%
50	New York	2.6%	50	Maine	-0.3%
51	Missouri	2.3%	51	Delaware	-1.5%

Source: EMSI Complete Employment — 4th Quarter 2010.

Appendix 6: Difference from State Median Salary

Difference from State Median Salary, 2010				
Rank	State/Area	\$ Difference	Green Median	State Median
1	District of Columbia	\$5.94	\$37.67	\$31.73
2	New Jersey	\$4.98	\$25.65	\$20.67
3	Nevada	\$4.93	\$21.78	\$16.85
4	Maryland	\$4.35	\$24.00	\$19.65
5	Connecticut	\$4.30	\$25.53	\$21.23
6	California	\$4.28	\$24.38	\$20.10
7	Colorado	\$3.95	\$22.23	\$18.28
8	Washington	\$3.94	\$23.38	\$19.44
9	Alaska	\$3.85	\$24.00	\$20.15
10	Hawaii	\$3.75	\$21.43	\$17.68
11	Delaware	\$3.55	\$22.76	\$19.21
12	Virginia	\$3.55	\$22.80	\$19.25
13	Massachusetts	\$3.50	\$25.37	\$21.87
14	New Hampshire	\$3.36	\$21.41	\$18.05
15	Michigan	\$3.32	\$20.78	\$17.46
16	Illinois	\$3.32	\$22.24	\$18.92
17	Arizona	\$3.23	\$19.97	\$16.74
18	Utah	\$3.03	\$18.79	\$15.76
19	Texas	\$2.70	\$20.09	\$17.39
20	Louisiana	\$2.62	\$18.12	\$15.50
21	Wyoming	\$2.61	\$19.19	\$16.58
22	New Mexico	\$2.45	\$18.45	\$16.00
23	New York	\$2.38	\$23.55	\$21.17
24	Rhode Island	\$2.35	\$21.25	\$18.90
25	Minnesota	\$2.29	\$20.61	\$18.32
26	North Carolina	\$2.29	\$18.59	\$16.30
27	Pennsylvania	\$2.27	\$19.81	\$17.54
28	Ohio	\$2.23	\$19.01	\$16.78
29	Oregon	\$2.21	\$19.57	\$17.36
30	South Carolina	\$2.20	\$17.27	\$15.07
31	Indiana	\$2.18	\$18.20	\$16.02
32	Alabama	\$2.18	\$17.65	\$15.47
33	Wisconsin	\$2.10	\$18.71	\$16.61
34	North Dakota	\$1.99	\$17.19	\$15.20
35	Georgia	\$1.85	\$18.63	\$16.78
36	Kansas	\$1.81	\$17.91	\$16.10
37	Missouri	\$1.78	\$17.98	\$16.20
38	Florida	\$1.73	\$17.58	\$15.85
39	Nebraska	\$1.69	\$17.24	\$15.55
40	South Dakota	\$1.67	\$15.93	\$14.26
41	Idaho	\$1.51	\$16.63	\$15.12
42	West Virginia	\$1.44	\$16.05	\$14.61
43	Iowa	\$1.40	\$16.79	\$15.39
44	Montana	\$1.36	\$15.38	\$14.02
45	Tennessee	\$1.32	\$16.86	\$15.54
46	Oklahoma	\$1.24	\$16.27	\$15.03
47	Mississippi	\$1.05	\$15.22	\$14.17
48	Maine	\$0.96	\$16.59	\$15.63
49	Arkansas	\$0.69	\$15.18	\$14.49
50	Vermont	\$0.65	\$16.86	\$16.21
51	Kentucky	\$0.57	\$16.23	\$15.66

Source: EMSI Complete Employment — 4th Quarter 2010.



Section IV
**Idaho Green
Statutes,
Incentives and
Programs**

Green Statutes, Incentives and Programs

Idaho has a number of laws, incentives and programs to encourage sustainable, renewable and alternative energy sources. This research presents details about these provisions so policy makers can decide whether additional resources will contribute to sound and consistent economic growth. Researchers identified and categorized 117 incentives from among four core green areas in Idaho:

- Renewable Energy and Alternative Fuels (21)
- Energy Efficiency and Conservation (32)
- Sustainable Agriculture and Natural Resource Conservation (43)
- Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup (21)

To limit the scope of this study, researchers focused on incentives either up for discussion during the 2011 Legislative session or identified by program administrators as unique opportunities. Appendix A has a more comprehensive catalogue of programs and statutes with reference websites.



Renewable Energy and Alternative Fuels



Residential Alternative Energy Device Tax Deduction¹

The Alternative Energy Device Tax Deduction allows a taxpayer to deduct from their taxable income the cost of acquiring, constructing and installing wood, pellet, solar, wind, geothermal and natural gas and propane devices in the taxpayer's residence. The deduction is limited to 40 percent of the cost in the first year and 20 percent of the cost in each of the next three years.

No single year's deduction may exceed \$5,000. A taxpayer who buys a residence may claim any unused deduction associated with that residence subject to the restrictions noted above.

INCENTIVE TYPE: Individual Income Tax Deduction

AUTHORITY: Idaho Code 63-3022C

ADMINISTRATOR: Idaho State Tax Commission

HISTORY: This tax deduction was initially enacted in 1976. This deduction was amended in 1994 to add natural gas and propane heating units and to require that replaced wood burning stoves be surrendered to the Idaho Department of Environmental Quality.

CRITERIA: Deduction is \$5,000 maximum in any year capped at \$20,000 total.

¹www.dsireusa.org and <http://legislature.idaho.gov/idstat/Title63/T63CH30SECT63-3022C.htm>

IMPLICATIONS: This program has been active in Idaho for the past 34 years and in the last five years, Idaho has seen only minimal growth in total alternative energy device deduction claims. In FY 2009 this deduction cost the state \$351,000 in lost tax revenue.²

CY2006	CY2007	CY2008	CY2009	CY2010*	CY2011*
\$309	\$355	\$362	\$351	\$363	\$377

* Projected Figures

CURRENT STATUS: No changes were implemented during the 2011 legislative session.

COMPARABLE PROGRAMS: No surrounding state offers personal deductions to stimulate growth of renewable energy and alternative fuels.



Property Tax Exemptions for Wind and Geothermal Energy Producers⁴

In lieu of property taxes, wind and geothermal energy producers pay a tax of 3 percent of their gross energy earnings.

INCENTIVE TYPE: Property tax reduction

AUTHORITY: Idaho Code 63-602JJ and 63-3502B

ADMINISTRATOR: Idaho Tax Commission

HISTORY: To ease the burden on wind farms during initial years of operation, the Idaho Legislature in 2007 restructured the method of taxation for producers of wind energy from a property tax to a tax on production. In 63-602JJ the state created an exemption from property tax for wind energy operators and in 63-3502B established a gross receipts formula.

In 2008, Idaho amended 63-602JJ and 63-3502B to include geothermal energy producers under this method of taxation. Under these policies commercial wind operators and geothermal energy producers, excluding those regulated by the Idaho Public Utilities Commission, are exempt from paying taxes on real estate, fixtures or property related to their renewable energy systems. This incentive available only to commercial establishments will sunset July 1, 2011.

CRITERIA: Wind and geothermal energy producers pay a tax of 3 percent of their gross energy earnings instead of paying property taxes.

²Idaho State Tax Commission, 2011

³http://dfm.idaho.gov/Publications/EAB/GFRB/GFRB11/TaxStructure_Jan2010.pdf

⁴www.dsireusa.org

IMPLICATIONS: Table 2 below shows the growth in wind and geothermal energy projects following enactment of Idaho Code Sections 63-602JJ and 63-3502B.

Year	Projects (1)	County (2)	Gross Tax Receipts from Wind Farm and Geothermal Projects (in thousands of dollars)
2008	3	4	\$272.88
2009	5	5	\$485.36
2010	7	5	\$643.32

- (1) Some projects repeat into the next year
- (2) Some projects overlap counties

To ascertain the effectiveness of moving from a property tax, the department obtained project counts and gross tax receipt amounts from the Idaho Tax Commission. Prior to passage of HB 189 and HB 529 in 2008 there were three wind and geothermal projects in Idaho. Since 2008 Idaho has experienced a 133 percent increase in projects and a 135 percent increase in overall gross tax receipts. Yet while overall tax receipts have grown with project growth, a micro-study of installation projects prior to and following the tax shift indicates a tax reduction to producers of roughly 74 percent.⁶ While this study has not accounted for all factors promoting growth of wind and geothermal projects, the reduced tax liability certainly played a role in attracting these types of projects to Idaho.

CURRENT STATUS: No changes were implemented during the 2011 legislative session.

COMPARABLE PROGRAMS:

MONTANA – Corporate Property Tax Reduction for New/Expanded Generating Facilities

The first of three property tax incentives is available to plants producing at least one megawatt of electricity using solar, photovoltaic, land fill gas, wind, biomass, geothermal, small hydroelectric and fuel cells. This incentive reduces the local mill levy for the first nine years of operation. The first five years are taxed at 50 percent and the remaining four years at a rate declining 10 percentage points a year until the full tax is due in the 10th year. This incentive is only available to commercial and industrial businesses.⁷

⁵Idaho State Tax Commission, 2011
⁶Idaho State Tax Commission, 2011
⁷www.dsireusa.org and <http://www.deq.mt.gov/Energy/renewable/taxincentrenew.mcp#15-24-1401>

Generation Facility Corporate Tax Exemption

This property tax incentive applies to new energy generating facilities for the first five years of operation. Eligible recipients include solar, wind, geothermal, biomass, fuel cell and small hydroelectric and methane generators. Under this statute, MCA 15-6-225, the property value is assessed annually and adjusted based on trend and inflation rates. This incentive is available only to commercial and industrial businesses.⁸

Renewable Energy Systems Exemption

Unlike the previous two incentives, this incentive is available to residential, multifamily residential and agriculture as well as commercial and industrial. It applies to an extensive list of alternative forms of energy production including passive solar, photovoltaic, wind, solid waste, biomass, geothermal, small hydropower, low-emission wood or biomass combustion systems and fuel cells. Nonresidential establishments are eligible for a 100 percent exemption of their initial investment up to \$100,000 in value for up to 10 years; private households are eligible for 100 percent of their initial investment up to \$20,000 for up to 10 years.⁹

NEVADA – *Property Tax Abatement for Green Buildings*

The first of three property tax incentives, this partial tax abatement is available to LEED certified non-residential and multifamily residential buildings. The amount of abatement is based on a three tier-eight point rating system and does not apply to taxes for public education. In addition, the abatement does not apply to buildings which are designed, built or acquired using public funding.¹⁰

Renewable Energy Producers Property Tax Abatement

Nevada's second property tax incentive is available to new and expanding renewable energy commercial and utility producers. Those producing a minimum of 10 megawatts using solar, wind, biomass, fuel cells, geothermal or hydro and those producing at least 25,840,000 British thermal units per hour using solar are eligible for a 55 percent abatement for 20 years. For these establishments to be eligible, they must also meet four job creation and quality measures. In addition this abatement is only available to private, nonresidential producers.¹¹

⁸ www.dsireusa.org and <http://www.deq.mt.gov/Energy/renewable/taxincentrenew.mcp#15-6-225>

⁹ www.dsireusa.org and <http://www.deq.mt.gov/Energy/renewable/taxincentrenew.mcp#15-6-224>

¹⁰ <http://energy.state.nv.us/energy-efficiency/green-building-abatement.html> and www.dsireusa.org

¹¹ <http://renewableenergy.state.nv.us/TaxAbatement.htm> and www.dsireusa.org

Renewable Energy Systems Property Tax Exemption

This final tax exemption is available to commercial, industrial and residential buildings where electricity is generated using solar, wind, geothermal, solid waste and hydroelectric systems. This exemption allows the full value of the equipment to be subtracted from the assessed value of the building for the life of the equipment. In addition, this exemption cannot be claimed if any other state abatement or exemptions are claimed on the building.¹²

OREGON – *Renewable Energy Systems Exemption*

Oregon has a property tax incentive that covers roughly 16 eligible renewable technology devices ranging from passive solar space heaters and solar pool heating to landfill gas, wind, biomass, hydroelectric, geothermal electric, fuel cells, methane gas and geothermal direct use. This property tax exemption is available to commercial, industrial and residential purchasers. In all instances the value these technology devices add to property may not be included in determining property value for taxation purposes. This exemption only applies to those using the system for personal production, not for production on the energy market.¹³



Alternative Electricity-Producing Equipment Sales Tax Rebate¹⁴

Sales tax is rebated on the cost of machinery, equipment and support facilities used to directly generate at least 25 kilowatts of electricity from fuel cells, low impact hydro, wind, geothermal resources, biomass, cogeneration, sun or landfill gas as the principal source of power, effective until July 1, 2011.

INCENTIVE TYPE: Sales Tax

AUTHORITY: Idaho Code 63-3622QQ

ADMINISTRATOR: Idaho State Tax Commission

HISTORY: In April 2005 63-3622QQ was added to the Idaho Statutes covering sales tax.¹⁵

CRITERIA: To qualify, taxpayers and their contractors must pay sales and use tax on their purchases of property. Only after certifying the project will generate at least 25 kilowatts of electricity can the taxpayer file a refund request for 100 percent remittance of the paid tax. Taxpayers who are eligible for the sales tax refund under 63-3622QQ only have until the last day of the third calendar year following the year in which the taxes were paid to solicit a refund from the Idaho Tax Commission. Eligible entities include commercial, industrial and residential.

¹²<http://www.leg.state.nv.us/NRS/NRS-701A.html#NRS701ASec200> and www.dsireusa.org

¹³www.dsireusa.org and <http://egov.oregon.gov/ENERGY/RENEW/Solar/Support.shtml>

¹⁴www.dsireusa.org and <http://legislature.idaho.gov/idstat/Title63/T63CH36SECT63-3622QQ.htm>

¹⁵http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=ID08F&re=1&ee=1

IMPLICATIONS: According to the Idaho Tax Commission, since the program’s inception, roughly 91 percent of all requests have been funded, saving investors in renewable energy equipment roughly \$4.3 million.¹⁶ Table 3 shows the number of lifetime requests by equipment type. Since 2005, there have been a total of 11 requests for this sales tax refund.

Type of Equipment	Number of Refund Requests
Fuel Cell	0
Low Impact Hydro	3
Wind	3
Geothermal Resources	1
Biomass	3
Co-generation	0
Solar	1
Landfill Gas	0

CURRENT STATUS: The Idaho Senate on April 7, 2011, rejected extending the program through 2014, which would have given alternative energy developers a 6 percent break in energy production equipment. Therefore the sales tax deduction will sunset on July 1, 2011.¹⁸

COMPARABLE PROGRAMS:

NEVADA – *Renewable Energy Sales and Use Tax Abatement*

Nevada initially instituted renewable energy sales and use tax abatement in July 2009. This abatement applies to new or expanding operators who generate at least 10 megawatts of electricity by solar, wind, biomass, fuel cell, geothermal or hydro. Abatement begins upon delivery of equipment. Tax liability is limited to 2.6 percent through June 30, 2011, and 2.25 percent from July 1, 2011 through June 30, 2049. In addition to creating 10 megawatts, qualifying projects must also meet job creation and job quality requirements. This abatement does not apply to governmental entities or residential properties.¹⁹

¹⁶Idaho State Tax Commission, 2011

¹⁷Idaho State Tax Commission, 2011

¹⁸<http://www.chem.info/News/FeedsAP/2011/04/topics-alternative-energy-idaho-senate-kills-much-debated-energy-rebate/>

¹⁹www.dsireusa.org and <http://renewableenergy.state.nv.us/TaxAbatement.htm>

UTAH – *Renewable Energy Sales Tax Exemption*

Utah’s renewable energy sales tax exemption began July 1, 2004, and covers equipment and machinery purchased or leased to generate at least 20 kilowatts of new electricity or at least one megawatt of increased electricity from wind, solar, biomass, landfill gas, anaerobic digestion, hydroelectricity and geothermal. This exemption covers 100 percent of the sales tax and is set to sunset on June 30, 2019. Eligible entities include commercial, industrial and utility.²⁰

WASHINGTON – *Renewable Energy Sales and Use Tax Exemption*

Beginning in 1996 Washington enacted a sales tax exemption of 100 percent for equipment used that generates at least one kilowatt of electricity using fuel cells, wind, sun, biomass, tidal, geothermal, anaerobic digestion or land fill gas. Tax statutes were updated in 2006 to include solar water heating systems, and the entire statute — RCW 82.08.02567 — expired July 1, 2009. Prior to expiration, new legislation was passed to extend the statute for all the aforementioned equipment. This new statute allows for 100 percent exemption through July 1, 2011, and then reduces the amount to 75 percent through June 30, 2013. Eligible entities include commercial, residential and the general public.²¹



Energy Efficiency and Conservation



Idaho Energy Efficient State Building Act²²

This act encourages state projects financed through the General Fund, state Permanent Building Fund or the Idaho State Building Authority to meet enhanced energy efficiency standards.

INCENTIVE TYPE: Energy Standards for Public Buildings

AUTHORITY: Idaho Code 39-2901 – 39-2904

ADMINISTRATOR: Division of Public Works

HISTORY: Initially enacted in May 2008, this provision is set to expire on July 1, 2013.

CRITERIA: This provision calls for all major facility projects in Idaho beginning in 2009, when prudent and fiscally feasible, to meet a target of at least 10 percent to 30 percent energy efficiency compared to projects of equal scope on similar sites. Covered are construction or renovation projects greater than 5,000 gross square feet of occupied space. Only renovations costing at least 50 percent of the current building value are considered eligible.

²⁰www.dsireusa.org and http://geology.utah.gov/sep/incentives/salestax_exempt.htm

²¹<http://apps.leg.wa.gov/RCW/dispo.aspx?cite=82.08.02567> <http://apps.leg.wa.gov/RCW/dispo.aspx?cite=82.08.835> and www.dsireusa.org

²²<http://www.legislature.idaho.gov/idstat/Title39/T39CH29.htm> and www.dsireusa.org

IMPLICATIONS: Table 4 below shows a marked decline in the number of energy efficiency state building projects between 2009 and 2010. This decline can most likely be attributed to recessionary spending cuts rather than negative effects from enactment of Idaho Code 39-2901 – 39-2904.

Year	# of Projects
2009	10
2010	2

CURRENT STATUS: Idaho Code 39-2901 – 39-2904 is scheduled to sunset on July 1, 2013.

COMPARABLE PROGRAMS:

MONTANA – *Energy Efficiency Standards for Public Buildings*

Enacted in 2009, this program applies to new and major renovation of state buildings as well as new state-leased buildings. When cost effective, the new construction must exceed the effective International Conservation Code by 20 percent. In addition, state agencies, the University of Montana and the Montana Department of Labor must collaboratively develop and adopt high performance building standards. At a minimum the standards should optimize energy performance, life-cycle performance, environmental sustainability and building maintenance, functionality and durability.²⁴

NEVADA – *Nevada State Energy Reduction Plan*

This plan calls for a 20 percent reduction in grid-based energy purchases for all state-owned buildings by 2015. NRS 333.4611 provides authority for setting standards for the Purchasing Division of the Department of Administration that favor Energy Star products. Eligible renewable purchases include passive solar space heat, solar water heat, solar space heat, photovoltaics, wind, biomass, geothermal heat pumps, CHP/Cogeneration, biogas and small hydroelectric. In addition, the state Public Works Board is charged with creating and implementing guidelines for the purchase and use of energy efficient projects in all state owned buildings.²⁵

²³State of Idaho Division of Public Works Annual Report – Energy Efficient State Buildings, 2009 and 2010

²⁴<http://data.opi.mt.gov/bills/mca/17/7/17-7-213.htm>

²⁵www.dsireusa.org and <http://www.leg.state.nv.us/>

OREGON – *Solar Energy Systems on Public Buildings*

Effective Jan. 1, 2008, House Bill 2620 requires 1.5 percent of the total contract price for new construction or renovation of public buildings costing more than \$1 million be earmarked for solar energy technology. The program and its rules are overseen by the Oregon Department of Energy.²⁶

State Energy Efficiency Design Program

Established in 1991 and updated in 2001, this program requires state agency capital improvement projects as of June 30, 2001, to exceed the Oregon State Building Code by at least 20 percent. This applies to all state agencies and post-secondary education institutions except community colleges.²⁷

UTAH – *State Building Energy Efficiency Program*

Enacted in 2006, this program promotes energy savings and efficiency for state buildings. It provides funding, tools and cost-efficient methods for energy efficient design, construction and operation. The program is overseen by the Division of Facilities Construction and Management. When feasible and practical, this agency purchases energy efficient products, tracks state agency energy consumption and provides the governor an energy savings report. The program established an advisory council to assist with development and implementation of the energy design standards. According to design standards, any new capital developments after June 1, 2009, must be LEED Silver. Funding for this program is repealed on July 1, 2016.²⁸

WASHINGTON – *Green Building and Energy Reduction Standards for State Agencies*

This state building program enacted by Executive Order 05-01 in 2005 directs state agencies to adopt green building practices in all new construction and remodels costing over 60 percent of the assessed value. In addition, by Sept. 1, 2009, they should strive to reduce energy purchases by 10 percent from FY 2003 levels. This reduction should occur using practical and cost effective means including energy efficiency programs and on-site renewable resources. Additionally high performance public buildings such as schools and state buildings must at least meet LEED silver status.²⁹

²⁶ www.dsireusa.org and <http://oregon.gov/ENERGY/CONS/PublicSolar.shtml>

²⁷ <http://www.oregon.gov/ENERGY/CONS/SEED/> and www.dsireusa.org

²⁸ www.dsireusa.org

²⁹ www.dsireusa.org and WA Executive Order 05-01



Insulation Income Tax Deduction³⁰

A 100 percent tax deduction is available to Idaho residents on homes built before 1976 for the cost of installing and purchasing additional insulating materials.

INCENTIVE TYPE: Personal Deduction

AUTHORITY: Idaho Code 63-3022B

ADMINISTRATOR: Idaho State Tax Commission

HISTORY: Enacted in 1976.

CRITERIA: Idaho residents with homes built before 1976 are eligible for the tax deduction on insulation including fiberglass insulation, weather stripping, double pane windows and storm doors and windows. These materials must be in addition to materials already in the home. In the initial year, 40 percent of the cost up to \$5,000 may be deducted.

IMPLICATIONS: Table 5 shows that this statute is still used consistently over the past several years. It is expected that this will eventually taper off since eligible homes have to exist or been under construction before 1976.

CY2006	CY2007	CY2008	CY2009*	CY2010*	CY2011*	CY2012*
\$731	\$769	\$789	\$762	\$785	\$809	\$843

*Projected Figures

CURRENT STATUS: No changes were implemented during the 2011 legislative session.

COMPARABLE PROGRAMS: No surrounding state offers personal deductions to encourage energy conservation through enhanced home insulation.

³⁰<http://www.legislature.idaho.gov/idstat/Title63/T63CH30SECT63-3022B.htm>

³¹<http://dfm.idaho.gov/Publications/EAB/GFRB/GFRBIndex.html>



Sustainable Agriculture and Natural Resource Conservation

Land Used to Protect Wildlife and Wildlife Habitat Tax Exemption³²

Property tax exemption is available to agricultural land set aside for wildlife habitat or managed as a conservation easement.

INCENTIVE TYPE: Property Tax Incentive

AUTHORITY: Idaho Code 63-605

ADMINISTRATOR: Idaho State Tax Commission

HISTORY: Effective Jan. 1, 2007

CRITERIA: This exemption is available to private, nonprofit corporations with a federal tax exemption 501(c) (3) or entities that have a conservation agreement with those nonprofits. Eligible lands must initially document the wildlife protection agreement and in subsequent years provide progress reports and an application for appraisal, assessment and taxation before April 15. Tax exemption status will be removed from the property if the annual application and progress report is not filed by the April 15 deadline. All conservation agreements must include abatement of noxious weeds.

IMPLICATIONS: Statewide implications of this exemption are not available. Wildlife habitat designations are handled by each county assessor, and there is no centralized system to track this land use category.

CURRENT STATUS: Application for appraisal, assessment and taxation for eligible lands for the tax year 2011 expired on April 15, 2011. For landowners seeking this exemption for the 2012 tax year, applications must be filed with their local county assessor between Jan. 1 and April 15, 2012.

COMPARABLE PROGRAMS:

OREGON – *Wildlife Habitat Conservation and Management Program*

Oregon's private lands used to protect and enhance wildlife are eligible for the wildlife habitat special assessment under ORS 308a.400-430, which allows such property to be assessed at rates equal to farm or forest special assessments. Landowners with state Department of Fish and Wildlife-approved wildlife habitat conservation and management plans may apply to the county assessor for this special property assessment. Lands shall be periodically inspected by the Department of Fish and Wildlife to ensure they are being managed according to the wildlife habitat and conservation plan on file. If not in compliance, landowners have six months to implement the plan or they will be disqualified from the program.³³

³²<http://legislature.idaho.gov/idstat/Title63/T63CH6SECT63-605.htm>

³³<http://www.leg.state.or.us/ors/308a.html> and www.dfw.state.or.us/lands/whcmp/brochure.pdf

Riparian Land Tax Credit Program

Oregon has another tax incentive for removing farmland from production. ORS 315.113 allows owners who voluntarily take out of production farm land less than 35 feet from a river, stream or other natural watercourse. In exchange they receive a tax credit for 75 percent of the lost crop income.³⁴

WASHINGTON – *Improvements to benefit fish and wildlife habitat, water quality and water quantity*

Washington's tax incentive program applies to property improvements to assist fish and wildlife habitat and improve water quantity and quality. Improvements made in these areas are tax exempt if they are part of a written conservation plan approved by a conservation district. Claims must be filed annually with the county assessor, and the exemption will only remain valid if the landowner certifies that the improvements in the plan are maintained as originally approved or amended.³⁵



Resource Conservation and Rangeland Development Loan Program³⁶

Provides long-term, low-interest loans to farmers and ranchers for resource management projects and improvements. Program administered by the Idaho Soil and Water Commission.³⁷

INCENTIVE TYPE: State Loan Program

AUTHORITY: Idaho Code 22-2730-32

ADMINISTRATOR: Idaho Soil and Water Conservation Commission

HISTORY: This bill was effective in September 1986 with amendments in April 1994 and March 2010.³⁸

³⁴<http://www.leg.state.or.us/ors/315.html>

³⁵<http://apps.leg.wa.gov/RCW/default.aspx?cite=84.36.255>

³⁶<http://www.scc.idaho.gov/loans.htm> and <http://adm.idaho.gov/adminrules/rules/idapa02/0501.pdf>

³⁷http://www.scc.idaho.gov/pdf/RCRDP_Policy_Effective_Feb_15_2011.pdf

³⁸<http://adm.idaho.gov/adminrules/rules/idapa60/0501.pdf>

CRITERIA: Single loan limit of \$200,000 and a \$300,000 maximum for any individual borrower. Interest rates for this program range from 3 percent to 6 percent depending on the length of the loan. Eligible projects include:

- Conserving soil and water resources
- Promoting efficient and beneficial use of the state water resources through implementation of Total Maximum Daily Loads
- Improving riparian areas for multiple use
- Conserving and improving fish and wildlife habitat
- Increasing productivity of crop land, orchards, pasture and hayland, rangeland and woodland

IMPLICATIONS: This is a popular program with 194 active loans and a total principle balance of \$7,995,655.³⁹

Below are FY2010 and lifetime statistics.

RCRDP Loan Program Accomplishments	FY2010 Totals	Program Totals
Loans Approved	12	577
Total Loans Commitments	\$730,864	\$30,121,895

Loans approved during fiscal year 2010 included projects to reduce soil erosion and consumptive water use by:

- Converting acres of flood irrigation to pipeline, pump and sprinkler systems
- Purchasing no-till or direct-seed drills to replace traditional tillage equipment
- Installing pumps to livestock watering troughs, which improves riparian area and reduces nonpoint source pollution in waterways

In addition to funding critical conservation projects, the commission with legislative approval provided more flexibility in the loan policies and procedures, increasing the individual loan limit to \$200,000 to keep up with rising costs associated with agricultural production.⁴¹

³⁹http://www.scc.idaho.gov/pdf/PerfRpt_SCCFY10_DFM.pdf

⁴⁰http://www.scc.idaho.gov/pdf/PerfRpt_SCCFY10_DFM.pdf

⁴¹http://www.scc.idaho.gov/pdf/PerfRpt_SCCFY10_DFM.pdf

CURRENT STATUS: Resource Conservation and Rangeland Development Loan applications were due April 15, 2011, for Soil and Water Conservation Commission consideration May 18, 2011.

COMPARABLE PROGRAMS:

NATIONAL— *Conservation Loan Program*

In September 2010 the U.S. Department of Agriculture announced a national conservation loan program to help farmers mitigate upfront costs for implementing conservation plans to reduce soil erosion, improve water quality and promote sustainable agricultural practices. Loans of up to \$300,000 are available through the Farm Service Agency and loans up to \$1.112 million from lenders working with the agency.⁴²

MONTANA – *Range Improvement Loan Program*

Montana has had a range improvement loan program since 1979. This program provides loans up to \$75,000 at 3 percent interest for up to 10 years to landowners undertaking rangeland improvements. This program requires initial application including a conservation plan to the local conservation district.⁴³

UTAH – *Agricultural Resource Development Loan Program*

A 3 percent loan is made to farmers for a maximum of 12 years. The loan includes a one-time administration fee of 4 percent. The program intends to conserve soil and water resources; increase agricultural yields for croplands, orchards, pasture, range and livestock; maintain and improve water quality; conserve and develop on-farm energy and reduce damages to agriculture caused by flooding, drought or other natural disasters.⁴⁴



Environmental Quality Incentives Program⁴⁵

This initiative provides a voluntary conservation program for farmers, ranchers and owners of private, non-industrial forest that promotes agricultural production, forest management and environmental quality as compatible national goals. It offers financial and technical help to assist eligible producers to implement conservation practices on eligible agricultural land. The national priorities are:

- Reducing nonpoint source pollution such as nutrients, sediment, pesticides or excess salinity in impaired watersheds consistent with Total Daily Maximum Loads, where available; reducing surface and groundwater contamination; and reducing contamination from agricultural point sources such as concentrated animal feeding operations

⁴²http://www.fsa.usda.gov/FSA/newsReleases?area=newsroom&subject=landing&topic=ner&newstype=news-rel&type=detail&item=nr_20100902_rel_0438.html

⁴³http://dnrc.mt.gov/cardd/consdist/range_improvements.asp

⁴⁴<http://ag.utah.gov/divisions/conservation/loans.html>

⁴⁵<http://www.nrcs.usda.gov/programs/eqip/index.html#intro>

- Conserving ground and surface water resources
- Reducing emissions such as particulate matter, nitrogen oxides, volatile organic compounds and ozone precursors and depleters that contribute to air quality impairment violations of National Ambient Air Quality Standards
- Reducing soil erosion and sedimentation from unacceptable levels on agricultural land
- Promoting at-risk species habitat conservation

INCENTIVE TYPE: Federal financial and technical assistance

AUTHORITY: Food Security Act of 1985, Farm Security and Rural Investment Act of 2002 and Food, Conservation and Energy Act of 2008.

ADMINISTRATOR: National Resource Conservation Service

HISTORY: The program was approved in 1996 as an amendment to the Food Security Act of 1985, also known as the Farm Bill, and reauthorized in the Farm Security and Rural Investment Act of 2002 and the Food, Conservation and Energy Act of 2008.

CRITERIA: Project funding limit is \$300,000; special projects \$450,000. Assistance is not to exceed 75 percent of incurred cost or forgone income. Idaho eligible programs are Conservation Innovation Grants, Cooperative Conservation Partnership Initiative, EQIP Conservation Activity Plans, Organic Program Initiative and Agricultural Water Enhancement Program.

IMPLICATIONS: There are more contracts submitted for consideration than can be funded. Below is Idaho’s finalized allocation for 2009.

Payments per Agricultural Acre	Number of Contracts	Estimated Unfunded Application Dollars	Financial Assistance Dollars Obligated	Number of Unfunded Applications
\$1.10	261	\$31,625,551	\$10,818,177	1,383

⁴⁶<http://www.nrcs.usda.gov/programs/eqip/2009data/fundingdata.html>

CURRENT STATUS: The number of contracts in Idaho increased by 20 percent from FY2009 to FY2010 while financial assistance to the state increased by 15 percent.

Active or Completed Contracts	Total Acres	Financial Assistance Obligated
313	297,847	\$12,463,639

Recently Idaho was selected as a pilot state for the new “Spill Prevention, Control and Countermeasure Conservation Activity.”⁴⁸

COMPARABLE PROGRAMS: This is a federal program. The chart below compares Idaho’s 2009 allocations with the contiguous states.

State	Payments per Agricultural Acre	Number of Contracts	Estimated Unfunded Application Dollars	Financial Assistance Dollars Obligated	Number of Unfunded Applications
Idaho	\$1.10	261	\$31,625,551	\$10,818,177	1,383
Montana	\$.33	637	\$40,376,782	\$21,168,732	2,645
Nevada	\$.97	79	\$8,189,015	\$5,990,113	292
Oregon	\$.74	396	\$19,890,647	\$11,284,665	1,302
Utah	\$1.42	327	\$46,407,472	\$14,662,071	1,724
Washington	\$.98	367	\$37,661,017	\$13,471,338	1,682
Wyoming	\$.38	411	\$12,845,294	\$10,907,884	1,094
U.S.	\$.72	31,960	\$1,361,337,261	\$731,099,112	110,077

⁴⁷<http://www.nrcs.usda.gov/programs/eqip/2010data/acres-and-dollars.html>

⁴⁸<http://www.nrcs.usda.gov/programs/eqip/2009data/fundingdata.html>



Water Quality Program for Agriculture⁴⁹

This program leverages and matches federal, state and private funds to provide financial incentives to apply conservation practices to protect and enhance water quality and fish and wildlife habitat.⁵⁰ Project sponsors may be soil conservation districts, irrigation districts, canal companies, individuals or other agricultural or grazing interests. Cost-sharing may be provided for up to 90 percent of the cost of approved practices. The program may be integrated with other funding programs, providing total incentives do not exceed 100 percent of the allowable practice cost. Matching funds must total at least 25 percent of project costs. Matching funds include all project time and expenses not reimbursed by state funds.

INCENTIVE TYPE: State Cost-Sharing

AUTHORITY: Idaho Code 22-2734 and the federal Clean Water Act, PL 92-500⁵¹

ADMINISTRATOR: The Idaho Soil and Conservation Commission

HISTORY: This law was effective Jan. 1, 1998, and updated in 2008. In FY2011, the program plans:

- 13 ongoing priority areas
- Five completed priority areas
- 11,000 acres treated

CRITERIA: Program cost-sharing is limited to \$50,000 per participant contract unless otherwise authorized by the Soil and Water Conservation Commission. Project funding is based on:

- Idaho's Total Maximum Daily Load schedule
- Endangered Species Act status
- Groundwater quality protection area
- Beneficial uses affected
- Relative ability of the proposed treatment to protect the resource
- Readiness of the sponsor and anticipated participants to proceed
- Availability of technical assistance
- Availability of supplementary funding
- Completed watershed plan

⁴⁹http://www.scc.idaho.gov/programs_services/waq.htm

⁵⁰http://www.scc.idaho.gov/pdf/PerfRpt_SCCFY10_DFM.pdf

⁵¹http://www.scc.idaho.gov/pdf/PerfRpt_SCCFY10_DFM.pdf

IMPLICATIONS: The commission assisted 22 local conservation districts and 84 landowners in FY2010. The state’s investment of \$736,470 was leveraged by federal and landowner investments totaling \$1,619,299. See table 10 below:

Division	# of Districts	WQPA	Federal	Landowner	Total
Northern Idaho	4	\$78,871	\$91,235	\$22,471	\$192,577
North Central Idaho	5	\$328,081	\$14,619	\$170,961	\$513,661
Southwestern Idaho	4	\$94,351	\$43,087	\$84,269	\$221,707
South Central Idaho	5	\$189,092	\$17,119	\$84,816	\$291,045
Southeastern Idaho	2	\$30,794	\$14,185	\$16,263	\$61,242
East Central	2	\$15,281	\$207,191	\$116,595	\$339,067
Total	22	\$736,470	\$387,454	\$495,375	\$1,619,299

Of the 22 projects listed, 16 were still active at the conclusion of FY2010.

Active Projects	Closed Out Projects
16	6

This Water Quality Program for Agriculture investment in 18,337 critical acres resulted in:

- 59,790 feet of fencing
- 17,137 acres of cropland under nutrient management plans
- 5,604 acres of residue management
- 14 watering facilities⁵⁴

⁵²http://www.scc.idaho.gov/pdf/PerfRpt_SCCFY10_DFM.pdf

⁵³http://www.scc.idaho.gov/pdf/PerfRpt_SCCFY10_DFM.pdf

⁵⁴http://www.scc.idaho.gov/pdf/PerfRpt_SCCFY10_DFM.pdf

CURRENT STATUS: The Idaho Soil and Water Conservation Commission issued its latest Summary Outline of Procedures and Requirements in November 2010.

COMPARABLE PROGRAMS:

OREGON – *Oregon Conservation Reserve Enhancement Program*

Program was established in 1998 as a partnership between the state of Oregon and the U.S. Department of Agriculture. Funding is available to agricultural landowners to protect water quality, restore river and stream embankments and protect fish and wildlife. Agricultural landowners are required to sign a contract with the Conservation Reserve Enhancement Program. Landowners who participate in this program receive annual conservation payments and are eligible for reimbursements of up to 75 percent of costs for restoration practices.⁵⁵

WASHINGTON – *Centennial Clean Water Grant Program - WAC 173-95A-100*

The Washington Department of Ecology offers technical and financial assistance for wetland conservation, riparian reclamation, groundwater restoration and best management practices on private property. Funding is regulated by the Integrated Funding Act, WAC 173-95A-015.⁵⁶



Pollution and Waste Prevention, Reduction and Management and Environmental Cleanup



Idaho Brownfields Assessment Program⁵⁷

This federal program assists states, tribes and municipalities in minimizing the uncertainties of contamination associated with brownfields, properties contaminated by prior industrial use. The program allows the Environmental Protection Agency to review property to determine the nature and extent of contamination. The work is conducted by EPA contractors and is worth approximately \$50,000.

INCENTIVE TYPE: Grant

AUTHORITY: Small Business Liability Relief and Brownfield Revitalization Act H.R. 2869. Title II-Brownfields Revitalization and Environmental Restoration, Subtitle A, Sec. 211.⁵⁸

ADMINISTRATOR: Idaho Department of Environmental Quality

⁵⁵http://oregon.gov/ODA/NRD/water_crep.shtml

⁵⁶<http://apps.leg.wa.gov/WAC/default.aspx?cite=173-95A-100>

⁵⁷<http://yosemite.epa.gov/r10/>

[cleanup.nsf/7780249be8f251538825650f0070bd8b/005df9235f56290e882567990080b48f?OpenDocument](http://www.epa.gov/brownfields/laws/hr2869.htm)

⁵⁸<http://www.epa.gov/brownfields/laws/hr2869.htm>

HISTORY: Brownfields are properties once used as industrial sites but now vacant. These sites frequently require some kind of cleanup to be economically viable. In 2002, President George W. Bush signed the Small Business Liability Relief and Brownfields Revitalization Act, which provided competitive grants to the state environmental quality offices. Idaho was successful in securing cleanup grants, assessment grants and a grant to start a revolving loan fund.

CRITERIA: All brownfield sites are eligible if they are proposed by an eligible applicant, who is someone not directly responsible for any of the contamination. The Idaho Department of Environmental Quality gives preference to publicly owned sites or sites that currently have redevelopment plans in place. The involvement of a site, once public, makes the property far more desirable.

IMPLICATIONS: The assessment program has many success stories in Idaho. The program typically has up to \$400,000 a year for site-assessment work on a first-come-first-served basis. But it will be transitioning into a competitive structure starting in the summer of 2011 and should be fully competitive by FY2013. If any funds are left over after this process, they will be allocated on a first-come-first-served basis.

Table 12: Sample of Idaho Brownfields Assessment Projects⁵⁹

Site Assessments	Money Allocated	Permanent FTE's Created	Temporary FTE's Created	Other Benefits
Bayhorse Mining District, Custer County	\$50,000	2		600 Acres of Idaho State Park Created
American Linen Building, Boise	\$10,000 ¹	45	45	
Mikes Cleaners, Weiser	\$26,000	3		
Frank Field Air Strip, Canyon County	\$13,000	4		
9 Storage Tanks Removed Behind Big City Coffee, Boise	\$67,000	13		
Jack's Urban Meeting Place, Boise ²	\$90,000	unknown	unknown	

*FTE: Full-time employee .

¹ 1.5 million in improvements.

² Once construction estimated at \$70 million begins, dozens of construction workers will be employed for at least one year. Many potential FTEs will be created.

⁵⁹Idaho Department of Environmental Quality, 2011

CURRENT STATUS: Funds for the current year are fully obligated until Oct. 1, 2011. In 2013 the process is moving from a first-come-first-served to a competitive application process with leftover money available on a first-come-first-served basis.⁶⁰

COMPARABLE PROGRAMS: This is a federal program available to all states.



Idaho Brownfields Revolving Loan Fund⁶¹

The revolving loan fund makes nearly \$3 million available to help qualifying borrowers finance the cleanup of brownfield properties. The loan fund is managed by an Idaho coalition of six local economic development organizations and the Department of Environmental Quality. Money from the Brownfields Revolving Loan Fund may be used to cover a number of site situations that do not pose an immediate threat to public health or safety. Eligible site activities include prevention, abatement or removal of hazardous substances or contaminants that might threaten public safety, drinking water supplies or sensitive ecosystems.

INCENTIVE TYPE: Loan

AUTHORITY: Small Business Liability Relief and Brownfields Revitalization Act H.R. 2869. Title II-Brownfields Revitalization and Environmental Restoration, Subtitle A, Sec. 211

ADMINISTRATOR: Idaho Department of Environmental Quality

HISTORY: On Jan. 11, 2002, President George W. Bush signed into law the Small Business Liability Relief and Brownfields Revitalization Act, under which the Environmental Protection Agency provides financial assistance to eligible applicants through four competitive grant programs – assessment, revolving loan funds, cleanup and job training.

The Idaho Department of Environmental Quality received grants for a revolving loan fund, cleanup and assessment. The revolving loan fund's goal is to finance the cleanup of brownfields properties to promote economic development, reinvestment and job creation and retention. Loans are structured to encourage borrowers to put properties back into productive use.

CRITERIA: Projects are eligible for up to \$1.2 million but not more than 80 percent of total project costs. Maximum loan length is five years, but repayment is immediately due when a project is refinanced or sold. All loans require collateral. Loan interest may vary from zero up to prime plus 2 percentage points. There is a \$500 loan application fee and a loan origination fee of up to 2 percent. Scheduled repayment is required. Recipients are required to join the Voluntary Cleanup Program, which helps them develop their cleanup plans.

⁶⁰Idaho Department of Environmental Quality, 2011

⁶¹<http://idahobrownfields.com/index.cfm?fuseaction=desk.faq>

IMPLICATIONS: Jobs have been created in the cleanup process and through the expansion of businesses to formerly unusable sites. The Brownfields Revolving Loan Fund is unique in that it provides the only business loans available for cleanup.

CURRENT STATUS: The original Idaho grant was for \$3 million. A supplemental grant increased this amount to \$4.5 million. Currently the balance in the revolving loan fund is \$2.6 million.

COMPARABLE PROGRAMS: This is a federal program available to all states.



Idaho DEQ Materials Management/Recycling Grant ⁶²

This grant program is funded by the Environmental Protection Agency to enhance existing or initiate new recycling, reuse or waste prevention efforts targeting a particular waste stream and residential or commercial recycling services, reuse programs and waste prevention programs. Local governments, solid waste districts, health districts, Indian tribes, public and private universities and colleges and public and private nonprofit institutions are eligible.

INCENTIVE TYPE: Grant

AUTHORITY: Environmental Protection Agency under the Resource Conservation and Recovery Act's Hazardous Waste Grant

ADMINISTRATOR: Idaho Department of Environmental Quality

HISTORY: Initially funded in 2010

CRITERIA: Grants up to \$30,000. No match is required.

IMPLICATIONS: Eighteen eligible applications were received in response to the Materials Management/Recycling Grant announcement. One successful applicant, Idaho County, received the full \$30,000 award to enhance its recycling efforts.⁶³

CURRENT STATUS: Funding for the region was originally to be provided every other year, but national budget cuts in 2010 may mean no additional cash beyond the amounts provided in 2010.⁶⁴

COMPARABLE PROGRAMS: The Environmental Protection Agency's Region 10 provides funding to Idaho, Oregon, Alaska and Washington to support materials management and recycling.

⁶²http://www.deq.idaho.gov/Applications/NewsApp/showNews.cfm?news_id=3122&CFID=66490&CFTOKEN=12282666

⁶³Idaho Department of Environmental Quality, 2011

⁶⁴Idaho Department of Environmental Quality, 2011



Water or Air Pollution Control Facilities Exemption⁶⁵

A property tax exemption is provided for infrastructure designed, installed or used in eliminating, controlling or preventing air or water pollution. Final authority for calculating the exempt portion of the facilities, installation, machinery or equipment rests with the State Tax Commission or county assessor.

INCENTIVE TYPE: Property Tax Exemption

AUTHORITY: Idaho Code 63-602P

ADMINISTRATOR: Idaho State Tax Commission

HISTORY: Bill 796 was signed into law by Governor Dirk Kempthorne March 31, 2006. The current tax exemption is an amendment of House Bill 484.⁶⁶

CRITERIA: The State Tax Commission or county assessor determines the amount of property tax exemption applicable to facilities for water or air pollution control. But public facilities, which already use or house pollution control equipment, do not qualify for this exemption.

All Counties	2005	2006	2007	2008	2009	2010
TOTAL	9,237,230	5,847,299	5,326,149	5,603,313	2,327,019	5,742,962

IMPLICATIONS: Upon enactment, the Tax Commission estimated that this legislation would reduce General Fund revenues by \$1.05 million. The fiscal impact of this bill depends on what pollution control devices are used and the sales taxes, which are not collected, would now be exempt.

CURRENT STATUS: Currently the program is accepting applications. Interested parties may visit the Department of Environmental Quality for additional information.

COMPARABLE PROGRAMS:

MONTANA – Class five property taxable percentage law, 15-6-135

This law has been in place since Dec. 13, 2002. Property designated by Montana law (15-6-135) as Class Five property is taxed at 3 percent of market value. Air and water pollution control equipment have the potential to qualify for a reduction in taxes. Certification needs to be completed and the applicant must be in compliance with all current rules and laws. This can mean substantial savings and incentives for businesses that contribute to clean air and water.⁶⁸

⁶⁵<http://www.legislature.idaho.gov/idstat/Title63/T63CH6SECT63-602PPrinterFriendly.htm>

⁶⁶<http://legislature.idaho.gov/legislation/2006/H0484.html>

⁶⁷Idaho State Tax Commission, 2011

⁶⁸<http://www.mtrules.org/gateway/ruleno.asp?RN=42.20.511>

NEVADA – Exemption of property used for control of air or water pollution

Nevada state law 361.077 allows tax exemptions for all property, both real and personal, that is used to control or improve water or air quality – a facility, a method or a device. This property can include land, a building and machinery. Once requirements have been met, a person may file an affidavit declaring the project, device or facility qualified for the tax exemption.⁶⁹

UTAH – Tax relief to encourage investment in facilities through sales and use tax exemption

Utah tax code 19-2-123 encourages development of pollution control and elimination facilities through a sales and use tax exemption. It encourages green jobs by expanding existing plants and offers tax savings as incentives to build new plants. This includes tax exemptions for all materials and equipment purchased or leased for pollution control.⁷⁰

WYOMING – Tax exemption for facilities and equipment used for pollution control

As provided by section 35-11-1103, Wyoming Statutes, 1998, persons interested must apply to the county assessor's office where the equipment is located. The assessor will determine which portion of equipment is exempt.⁷¹

⁶⁹<http://www.leg.state.nv.us/Division/Legal/LawLibrary/NRS/NRS-361.html#NRS361Sec077>

⁷⁰<http://le.utah.gov/dtForms/code.html>

⁷¹<http://revenue.state.wy.us/uploads/Excise%20exemption%20list.pdf> and [http://revenue.state.wy.us/PortalVBVS/uploads/Pollution%20Exemption%20Form%20\(Final%20Draft\).pdf](http://revenue.state.wy.us/PortalVBVS/uploads/Pollution%20Exemption%20Form%20(Final%20Draft).pdf)

Appendix 1: Green Statutes, Incentives and Programs Catalog



Renewable Energy and Alternative Fuels

Title	Administered By	Link
Avista Utilities - Net Metering	Avista Utilities	Avista Utilities - Net Metering
BEF - Solar 4R Schools	Bonneville Environmental Foundation	BEF - Solar 4R Schools
Idaho Consumer Choice & Fuel Independence Act of 2007	Idaho Department of Agriculture	http://legislature.idaho.gov/legislation/2007/H0151.html
Renewable Energy Project Bond Program	Idaho Energy Resources Authority	Renewable Energy Project Bond Program
Energy efficiency loans, residential & commercial	Idaho Office of Energy Resources	http://www.energy.idaho.gov/financialassistance/energyloans.htm
Solar Easements	Idaho Office of Energy Resources	Solar Easements
Idaho Power - Net Metering	Idaho Power	Idaho Power - Net Metering
Income Tax Credit for Capital Investment in Biofuel Infrastructure	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH30SECT63-3029M.htm
Alternative Fuels Tax Refund	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH24SECT63-2423.htm
Residential Alternative Energy Device Tax Deduction	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH30SECT63-3022C.htm
Property Tax Exemptions for Wind & Geothermal Energy Producers	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH6SECT63-602JJ.htm
Alternative Electricity-Producing Equipment Sales Tax Rebate	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH36SECT63-3622QQ.htm
Sales Tax Exemption for Research & Development Equipment at the INL	Idaho State Tax Commission	http://legislature.idaho.gov/idstat/Title63/T63CH36SECT63-3622BB.htm
Residential Renewable Energy Tax Credit	Internal Revenue Service	http://www.irs.gov/newsroom/article/0,,id=206875,00.html
Modified Accelerated Cost-Recovery System (MACRS) & Bonus Depreciation (2008-2012)	Internal Revenue Service	http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US06F&re=1&ee=1
Rocky Mountain Power - Net Metering	Rocky Mountain Power	Rocky Mountain Power - Net Metering
Wind Powering America	U.S. Department of Energy	Wind Powering America
Alternative Fuels & Advanced Vehicles Data Center	US Department of Energy	Alternative Fuels and Advanced Vehicles Data Center
Green Power Network	US Department of Energy	Green Power Network
2008 Farm Bill Initiatives	USDA, Rural Development	http://www.rurdev.usda.gov/Energy.html

APPENDIX 1



Energy Efficiency and Conservation *(cont. from previous page)*

Title	Administered By	Link
Avista Utilities (Electric) - Commercial Energy Efficiency Incentives Program	Avista Utilities	Avista Utilities (Electric) - Commercial Energy Efficiency Incentives Program
Avista Utilities (Electric) - Commercial Lighting Energy Efficiency Program	Avista Utilities	Avista Utilities (Electric) - Commercial Lighting Energy Efficiency Program
Avista Utilities (Gas & Electric) - Commercial Food Equipment Rebates	Avista Utilities	Avista Utilities (Gas and Electric) - Commercial Food Equipment Rebates
Avista Utilities (Gas) - Commercial Energy Efficiency Incentives Program	Avista Utilities	Avista Utilities (Gas) - Commercial Energy Efficiency Incentives Program
Avista Utilities (Gas) - Residential Energy Efficiency Rebate Programs	Avista Utilities	Avista Utilities (Gas) - Residential Energy Efficiency Rebate Programs
Weatherization Assistance Program	Community Action Partnership Association of Idaho (CAPAI)	http://www.idahocommunityaction.org/programs/weatherization-html/
Save Energy Now	Department of Energy	http://www1.eere.energy.gov/industry/saveenergynow/assessments.html
Industrial Assessment Centers	Department of Energy/ University of Washington, Oregon State University	http://iac.rutgers.edu/about.php
Energy Efficiency Standards for Public Buildings	Division of Public Works	http://www.legislature.idaho.gov/idstat/Title39/T39CH29SECT39-2904.htm
Idaho Building Energy Code	Idaho Division of Building Safety & local building code adopters	Idaho Building Energy Code
Idaho Falls Power - Energy Efficient Heat Pump Loan Program	Idaho Falls Power	Idaho Falls Power - Energy Efficient Heat Pump Loan Program
Idaho Falls Power - Residential Energy Efficient Appliance Program	Idaho Falls Power	Idaho Falls Power - Residential Energy Efficient Appliance Program
Idaho Falls Power - Residential Weatherization Loan Program	Idaho Falls Power	Idaho Falls Power - Residential Weatherization Loan Program
Idaho Falls Power - Commercial Energy Conservation Program	Idaho Falls Power	Idaho Falls Power - Commercial Energy Conservation Program
Idaho Falls Power - Residential Energy Efficiency Rebate Program	Idaho Falls Power	Idaho Falls Power - Residential Energy Efficiency Rebate Program
Idaho Falls Power - Commercial Energy Conservation Loan Program	Idaho Falls Power	Idaho Falls Power - Commercial Energy Conservation Loan Program
Idaho Power - Commercial Custom Efficiency Program	Idaho Power	Idaho Power - Commercial Custom Efficiency Program
Idaho Power - Easy Upgrades for Simple Retrofits Rebate Program	Idaho Power	Idaho Power - Easy Upgrades for Simple Retrofits Rebate Program

Continued on next page.

APPENDIX 1



Energy Efficiency and Conservation *(cont. from previous page)*

Title	Administered By	Link
Idaho Power - Irrigation Efficiency Rewards Rebate Program	Idaho Power	Idaho Power - Irrigation Efficiency Rewards Rebate Program
Idaho Power - New Building Efficiency Program	Idaho Power	Idaho Power - New Building Efficiency Program
Idaho Power - Rebate Advantage for New Manufactured Homes	Idaho Power	Idaho Power - Rebate Advantage for New Manufactured Homes
Idaho Power - Residential Energy Efficiency Rebate Programs	Idaho Power	Idaho Power - Residential Energy Efficiency Rebate Programs
Insulation Income Tax Deduction	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH30SECT63-3022B.htm
Intermountain Gas Company (IGC) - Gas Heating Rebate Program	Intermountain Gas	Intermountain Gas Company (IGC) - Gas Heating Rebate Program
Residential Energy Conservation Subsidy Exclusion (Personal)	Internal Revenue Service	http://www.energysavvy.com/rebates/ID/residential-alternative-energy-tax-deduction-idaho-01/
Kootenai Electric Cooperative - Residential Efficiency Rebate Program	Kootenai Electric Cooperative	Kootenai Electric Cooperative - Residential Efficiency Rebate Program
Northern Lights Inc. - Energy Conservation Rebate Program	Northern Lights, Inc.	Northern Lights Inc. - Energy Conservation Rebate Program
Rocky Mountain Power - Energy FinAnswer	Rocky Mountain Power	Rocky Mountain Power - Energy FinAnswer
Rocky Mountain Power - FinAnswer Express	Rocky Mountain Power	Rocky Mountain Power - FinAnswer Express
Rocky Mountain Power - Residential Energy Efficiency Rebate Program	Rocky Mountain Power	Rocky Mountain Power - Residential Energy Efficiency Rebate Program
Energy Efficient Mortgages	U.S. EPA & U.S. Department of Energy	http://www.energystar.gov/index.cfm?c=mortgages.energy_efficient_mortgages

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Sustainable Agriculture and Natural Resource Conservation

Title	Administered By	Link
Conservation Reserve Program (CRP)	Farm Service Agency	http://www.nrcs.usda.gov/programs/crp/
Right to Farm	Idaho Courts	http://legislature.idaho.gov/idstat/Title22/T22CH45SECT22-4501.htm
Access Yes!	Idaho Fish & Game	http://fishandgame.idaho.gov/ifwis/huntplanner/accessyesguide.aspx
Landowner Incentive Program (LIP)	Idaho Fish & Game	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=9546
Upper Salmon Basin Watershed Project	Idaho Fish & Game	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=13667
Idaho Watershed Initiative	Idaho Fish & Game, U.S. Fish & Wildlife Service	http://fishandgame.idaho.gov/cms/wildlife/iwi/
Habitat Improvement Program (HIP)	Idaho Fish & Game, U.S. Fish & Wildlife Service	http://fishandgame.idaho.gov/cms/wildlife/hip/
Resource Conservation & Rangeland Development Loan Program (RCRDP)	Idaho Soil & Water Conservation Commission	http://www.scc.idaho.gov/programs_services/rcrdp.html
Water Quality Program for Agriculture (WQPA)	Idaho Soil & Water Conservation Commission	http://www.scc.idaho.gov/programs_services/waq.htm
Agricultural Water Quality Program	Idaho State Department of Agriculture	http://www.agri.idaho.gov/Categories/Environment/water/objectives.php
ISDA's Noxious Weed Cost Share Program	Idaho State Department of Agriculture	http://www.agri.state.id.us/Categories/PlantsInsects/NoxiousWeeds/indexnoxweedmain.php
ISDA Mormon Cricket & Grasshopper Control Program	Idaho State Department of Agriculture, Animal & Plant Health Inspection Service (APHIS)	http://www.idahoag.us/Categories/PlantsInsects/GrasshopperMormonCricketControlProgram/indexgrasshopperMChome.php
Tax Exemption for Land Used to Protect Wildlife & Wildlife Habitat	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH6SECT63-605.htm
Federal Reforestation Tax Credit & Amortization	Internal Revenue Service	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=6285
Sustainable Agriculture Research & Education (SARE)	National Institute of Food & Agriculture; Cooperative Extension Service; Agriculture Agents	http://www.law.cornell.edu/uscode/html/uscode07/usc_sec_07_00005801----000-.html
Private Landowner Network	PLN, U.S. Forest Service,	http://www.privatelandownernetwork.org/grantprograms/
Clean Water Act (CWA)	U.S. Environmental Protection Agency (EPA)	http://www.epa.gov/oecaagct/lcwa.html
National Fish Passage Program	U.S. Fish & Wildlife Management Assistance Office	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=6269
Private Stewardship Grants Program	U.S. Fish & Wildlife Service	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=6268

Continued on next page.

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Sustainable Agriculture and Natural Resource Conservation

(cont. from previous page)

Title	Administered By	Link
Partners for Fish & Wildlife Program	U.S. Fish & Wildlife Service	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=2188
Conservation Reserve Enhancement Program (CREP)	USDA	http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=cep
Noninsured Crop Disaster Assistance Program (NAP)	USDA Farm Service Agency	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=17324
Supplemental Revenue Assistance Payments (SURE) Program	USDA Farm Service Agency	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=17325
Biomass Crop Assistance Program (BCAP)	USDA Farm Service Agency	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=12570
Conservation Loan Program	USDA Farm Service Agency	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=20886
State Acres for Wildlife Enhancement (SAFE) also known as CP38	USDA Farm Service Agency	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=11881
Forest Land Enhancement Program (FLEP)	USDA Forest Service	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=9606
Forest Legacy Program (FLP)	USDA Forest Service	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=9614
Environmental Quality Incentives Program (EQIP)	USDA Natural Resources Conservation Service	http://www.nrcs.usda.gov/programs/eqip
Cooperative Conservation Partnership Initiative (CCPI)	USDA Natural Resources Conservation Service	http://www.id.nrcs.usda.gov/programs/ccpi/index.html
The Conservation Innovation Grant program (CIG)	USDA Natural Resources Conservation Service	http://www.id.nrcs.usda.gov/programs/cig/index.html
CSP - Idaho Conservation Stewardship Program	USDA Natural Resources Conservation Service	http://www.id.nrcs.usda.gov/programs/new_csp/index.html
Sage-grouse Initiative	USDA Natural Resources Conservation Service	http://www.id.nrcs.usda.gov/programs/sage_grouse/index.html
Agricultural Management Assistance (AMA)	USDA Natural Resources Conservation Service	http://www.nrcs.usda.gov/programs/ama/index.html
(EQIP) Organic Initiative	USDA Natural Resources Conservation Service	http://www.nrcs.usda.gov/programs/eqip/organic/index.html
Grassland Reserve Program (GRP)	USDA Natural Resources Conservation Service	http://www.nrcs.usda.gov/programs/GRP/
Wetlands Reserve Program	USDA Natural Resources Conservation Service	http://www.nrcs.usda.gov/programs/wrp/
Highly Erodible Land & Wetland Conservation (HELC/WC) Compliance Provisions	USDA Natural Resources Conservation Service	http://www.nrcs.usda.gov/programs/compliance/
Farm & Ranch Lands Protection Program (FRPP)	USDA Natural Resources Conservation Service	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=1661
Conservation of Private Grazing Land Program (CPGL)	USDA Natural Resources Conservation Services	http://www.privatelandownernetwork.org/yellowpages/resource.aspx?id=1583

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Pollution and Waste Prevention, Reduction and Environmental Cleanup

Title	Administered By	Link
Environmental Education Grants	EPA's Office of Environmental Education	http://www.epa.gov/enviroed/grants.html
State Clean Diesel Program	EPA's Office of Environmental Education	http://www.epa.gov/cleandiesel/prgstate.htm
Exchange Network Grant	EPA's office of Environmental Information Exchange Network	http://www.epa.gov/Networkg/grants/index.html
Materials Management/Recycling Grant	Idaho Department of Environmental Quality	http://www.deq.idaho.gov/Applications/NewsApp/showNews.cfm?news_id=3122&CFID=66490&CFTOKEN=12282666 http://www.deq.idaho.gov/waste/assist_citizen_comm/grant_application_1110.pdf
Waste Management: DEQ's Online Recycling Directory	Idaho Department of Environmental Quality	http://www.deq.idaho.gov/waste/recycling/recycle_home.cfm
E3: Energy, Economy & Environmental Low/No Cost Technical Assistance	Idaho Department of Environmental Quality	http://www.deq.idaho.gov/multimedia_assistance/p2/lean_p2.cfm
Idaho Brownfields Revolving Loan Fund	Idaho Department of Environmental Quality & Sage Community Resources	http://idahobrownfields.com/index.cfm?fuseaction=desk.faq
Brownfields Assessment Program	Idaho Division of Environmental Quality (DEQ); U.S. Environmental Protection Agency	http://www.raconline.org/funding/funding_details.php?funding_id=672
Idaho Agricultural Pollution Abatement Plan	Idaho Soil & Water Conservation Commission	http://www.scc.idaho.gov/programs_services/agplan.html
Idaho OnePlan Carbon Sequestration	Idaho Soil & Water Conservation Commission	http://www.oneplan.org/CarbonSequestration.asp
Pesticide Container Recycling Program (CROP)	Idaho State Department of Agriculture	http://www.agri.state.id.us/Categories/Pesticides/container/indexcontainermain.php
Property Tax Exemption: Facilities for Water or Air Pollution Control	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH6SECT63-602PPrinterFriendly.htm
Partial Tax Exemption for Remediated Land	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH6SECT63-602CC.htm
Tax Credit for Qualified Equipment Utilizing Postconsumer Waste or Postindustrial Waste	Idaho State Tax Commission	http://legislature.idaho.gov/idstat/Title63/T63CH30SECT63-3029D.htm
Pollution Control Equipment	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH36SECT63-3622XPrinterFriendly.htm
Containers Sales Tax Exemption	Idaho State Tax Commission	http://www.legislature.idaho.gov/idstat/Title63/T63CH36SECT63-3622E.htm
Pollution Prevention (P2) Grants	U.S. Environmental Protection Agency	http://www.epa.gov/p2/pubs/grants/index.htm
E-Cycle Program	U.S. Environmental Protection Agency	http://epa.gov/epawaste/partnerships/plugin/reuse.htm



Section V
**Idaho Green
Projections and
Economic Impact**

Idaho Green Projections and Economic Impact

The economic impact of Idaho’s green economy was twice as great as the percentage of Idaho jobs with a direct environmental focus in 2010.

The projected green jobs and occupations identified through research under the State Labor Market Information Improvement Grant secured from the federal government in 2010 are spread throughout Idaho’s entire economy and workforce. Nineteen of the 20 major industries include some level of a green workforce.



When those broad industrial sectors are disaggregated into more individual descriptive sectors, subsectors with higher concentrations of green workers emerge so their economic impact in Idaho in terms of jobs and earnings can be measured.

Having determined the level of concentration and developed a hierarchy of greenness, the greenest industries in Idaho are expected to grow by 23 percent over the next decade, significantly faster than the rest of Idaho’s economy, which is only expected to grow about 16 percent. Those very green industries alone are expected to produce over 20,000 jobs in the next 10 years.

Green Industry Projections				
Green Taxonomy	Estimated 2008 Jobs for Industries with Green Jobs	Projected 2018 Jobs for Industries with Green Jobs	Projected Total Growth	Percentage Growth
Minimally Green*	299,535	353,112	53,577	18%
Modestly Green	172,476	198,289	25,813	15%
Moderately Green	57,033	59,756	2,724	5%
Very Green	88,155	108,835	20,680	23%
Idaho All Industry	714,540	825,847	111,307	16%

~ Official Idaho industry projections are conducted at the three-digit NAICs level.

*The Minimally Green category includes the occupations that reported green jobs in the survey, but had lower concentration than the statewide average.

Ten specific industries were identified as Idaho’s greenest. They alone will produce an estimated 7,500 additional jobs over the next decade, and 970 of them will be green jobs. Another 1,000 green jobs will open up due to attrition through promotions, retirements and for other reasons. Those 2,000 green jobs and the other 5,500 jobs in those top 10 industries alone will directly inject over \$68 million in new earnings into Idaho’s economy in today’s dollars.

TOP 10 Industries Producing Most Jobs in Very Green Occupations 2008 - 2018	2010 Existing Jobs		Industry Earnings		Green Jobs Projections	
	Estimated Total Jobs in Entire Industry in 2010	Estimated GREEN Jobs in Industry in 2010	2010 Earnings Per Worker	Green Workers 2010 Total Annual Earnings	New Very Green Jobs by 2018	Additional Earnings Per Green Worker
Research and Development in the Physical, Engineering and Life Sciences	7,800	2,200	\$92,800	\$204,160,000	350	\$32,480,000
Administrative Mgt. and General Mgt. Consulting Services	3,100	100	\$53,800	\$5,380,000	200	\$10,760,000
Hazardous Waste Collection	770	30	\$106,200	\$3,186,000	100	\$10,620,000
Solid Waste Landfill	140	140	\$41,300	\$5,782,000	100	\$4,130,000
Remediation Services	350	160	\$53,200	\$8,512,000	50	\$2,660,000
Janitorial Services	8,000	230	\$11,800	\$2,714,000	50	\$590,000
Engineering Services	4,200	1,600	\$74,200	\$118,720,000	50	\$3,710,000
Other Scientific and Technical Consulting Services	1,000	50	\$47,000	\$2,350,000	50	\$2,350,000
Environmental Consulting Services	900	10	\$59,300	\$593,000	10	\$593,000
Solid Waste Collection	900	10	\$38,100	\$381,000	10	\$381,000
Totals (May not add due to rounding)	27,160	4,530	N/A	\$351,778,000	970	\$68,274,000

- Subindustry data incorporate EMSI projections.

But measuring the total economic impact on Idaho’s workforce requires accounting for all green jobs in Idaho’s economy and those created because of green. Idaho has an estimated 17,000 green jobs today under the state’s official green jobs definition. (See report at [http://labor.idaho.gov/publications/Idaho Green Jobs Survey 2010.pdf](http://labor.idaho.gov/publications/Idaho_Green_Jobs_Survey_2010.pdf)). These green workers are estimated to earn an average wage of \$20.50 an hour, generating total earnings of \$725 million, or around 3.5 percent, of Idaho’s total economy. Applying multipliers developed by Economic Modeling Specialists Inc. to the direct jobs shows another \$407 million in indirect and induced earnings have been created in Idaho’s green economy for almost \$1.3 billion in earnings, about 5.4 percent, of total state wages and salaries.

Again using EMSI multipliers, those 17,000 direct green jobs in 2010 are estimated to have generated another 14,700 jobs for 31,700 jobs in all resulting from Idaho's green industrial sector, about around 5 percent of total jobs.

ALL GREEN Economic Impact (Level 0,1,2,3)							
EMSI Total Mult.	Sales	Earnings	Jobs	TOTAL Green Base and Supported Industries Economic Impact			
				JOB	Avg. Wage	Annual Earnings	Mode
				17,000	\$ 20.50	\$ 724,880,000	Existing Green Cluster
				14,620	\$ 18.22	\$ 554,062,912	Outside Cluster
				31,620		\$ 1,278,942,912	Total Cluster and Support
Impact of Direct Investment in Green							
				Input JOBS below	Avg. Wage	Annual Earnings	Mode
				100	\$ 20.50	\$ 4,264,000	Direct Investment
				48	\$ 20.50	\$ 2,046,720	Inside Cluster
				86	\$ 18.22	\$ 3,259,194	Outside Cluster
				234		\$ 9,569,914	Total Impact of Investment

VERY GREEN Economic Impact (Level 3)							
EMSI Total Mult.	Sales	Earnings	Jobs	Very Green Base and Supported Industries Economic Impact			
				JOB	Avg. Wage	Annual Earnings	Mode
				5,154	\$ 20.50	\$ 219,766,560	Existing Green Cluster
				4,948	\$ 18.22	\$ 187,511,261	Outside Cluster
				10,102		\$ 407,277,821	Total Cluster and Support
Impact of Direct Investment in Green							
				Input JOBS below	Avg. Wage	Annual Earnings	Mode
				100	\$ 20.50	\$ 4,264,000	Direct Investment
				53	\$ 20.50	\$ 2,259,920	Inside Cluster
				96	\$ 18.22	\$ 3,638,170	Outside Cluster
				249		\$ 10,162,090	Total Impact of Investment

TOP TEN GREEN Sub-industries Economic Impact (Level 3 GROWTH)							
EMSI Total Mult.	Sales	Earnings	Jobs	Top Ten Green Base and Supported Industries Economic Impact			
				JOB	Avg. Wage	Annual Earnings	Mode
				4,470	\$ 20.50	\$ 190,600,800	Existing Green Cluster
				5,051	\$ 18.22	\$ 191,424,567	Outside Cluster
				9,521		\$ 382,025,367	Total Cluster and Support
Impact of Direct Investment in Green							
				Input JOBS below	Avg. Wage	Annual Earnings	Mode
				100	\$ 20.50	\$ 4,264,000	Direct Investment
				65	\$ 20.50	\$ 2,771,600	Inside Cluster
				113	\$ 18.22	\$ 4,282,429	Outside Cluster
				278		\$ 11,318,029	Total Impact of Investment

And for future direct investment in green jobs, for every one new job created in the defined green industries another 1.34 jobs are created beyond that direct investment both inside and outside the green cluster. Those figures are even more significant the greener the industry. Those jobs are created across the full industry spectrum from government and high technology to retail and other service industries. This direct investment in the green economy not only is a driver in Idaho's economy for creating jobs and earnings but also puts Idaho's workforce and industry in a better strategic position for competing in the global economy where the stakes are high in many of the sectors that make up the green economy.

INVESTMENT

Additional jobs created for every one job created in the defined green industries.



1.34

Green Projections

The Green Job Survey developed a taxonomy for the occupations identified as green. The taxonomy levels are based on a higher-than-average concentration of green jobs within the state and secondary sources. Very Green occupations have the highest concentration of green employment followed by Moderately Green while Modestly Green occupations have just a slightly higher-than-average concentration of green employment. Those with a lower-than-average concentration were not categorized as green but do include at least some green jobs. For this paper, they were put under a Minimally Green category so they could be added to the analysis.

The Very Green and the residual Minimally Green categories had a fractionally higher annualized growth rate than all non-green jobs. Overall, the lower annualized growth rate for the other two categories brings down the total green jobs growth rate to 1.15 percent, almost a third of a percentage point less than the growth rate of all jobs.

Green Jobs Projections				
Green Taxonomy	Estimated 2008 Green Jobs	Projected 2018 Green Jobs	Projected Growth	Annualized Growth
Minimally Green*	1,115	1,297	182	1.52%
Modestly Green	3,382	3,800	418	1.17%
Moderately Green	6,566	7,095	529	0.78%
Very Green	5,154	5,995	841	1.52%
Total Green Jobs	16,217	18,187	1,970	1.15%
Total Non-Green Jobs	698,322	807,655	109,333	1.47%

*The Minimally Green category includes the occupations that reported green jobs in the survey, but had lower concentration than the statewide average

When looking at the total employment for occupations that included some green jobs, only the residual Minimally Green category is growing faster than all occupations. But since this category contains almost 30 percent of the state's jobs and has a below-average green concentration, it means little.

Projections for Occupations with Green Jobs

Green Taxonomy	Estimated 2008 Total Jobs in Occupations w/Green Jobs	Projected 2018 Total Jobs in Occupations w/Green Jobs	Total Growth	Annualized Growth
Minimally Green*	197,184	230,928	33,744	1.59%
Modestly Green	89,138	100,949	11,811	1.25%
Moderately Green	62,316	68,066	5,750	0.89%
Very Green	31,021	34,116	3,095	0.96%
Total Green Occupations	379,659	434,059	54,400	1.35%
Total All Occupations	714,539	825,842	111,303	1.46%

*The Minimally Green category includes the occupations that reported green jobs in the survey, but had lower concentration than the statewide average

Only the Very Green category is growing faster than the occupations encompassing it. The Very Green category is projected to grow half again as fast as total employment in those occupations.

Green Jobs v. Green Occupations

Education or Training Level	Green Jobs	Occupations with Green Jobs
Short-term on-the-job training	1.65%	1.49%
Moderate-term on-the-job training	0.58%	1.42%
Long-term on-the-job training	0.71%	0.42%
Work experience in a related occupation	0.99%	1.20%
Postsecondary vocational training	1.25%	1.44%
Associate degree	1.36%	1.12%
Bachelor's degree	1.31%	1.54%
Bachelor's or higher degree, plus work experience	1.07%	1.33%
Master's degree	1.90%	1.90%
Doctoral degree	1.52%	2.13%
Minimally Green*	1.52%	1.59%
Modestly Green	1.17%	1.25%
Moderately Green	0.78%	0.89%
Very Green	1.52%	0.96%
All Green Levels	1.15%	1.35%
All Occupations		1.46%

The result is much the same when green jobs are broken down by education and training requirements. Only green jobs requiring short-term on-the-job training, long-term on-the-job training or associate degrees are projected to grow faster than occupations as a whole. Green jobs requiring master's degrees are projected to grow at the same rate to all jobs in those occupations, but the rest of the categories are projected to grow more slowly.

*The Minimally Green category includes the occupations that reported green jobs in the survey, but had lower concentration than the statewide average

The Very Green category, having both the highest concentration of green jobs and the highest projected annualized growth, will be the focus of this analysis.

The fastest growing green job by percentage change is hazardous materials removal worker at 42 percent by 2018. That is followed by environmental engineer at 37 percent and water and liquid waste treatment plant and system operator at 35 percent. Four of the five fastest growing green jobs had a median wage above the Idaho statewide median of \$14.43 an hour in 2008.

Fastest Growing Occupations												
SOC Code	Statewide	2008	2018	2008-2018							Education or Training Level	Green Level
	Occupational Title	Employment		Net Change	Annual Openings*	Percent Change	Green Median	Green Mean	OES Median	OES Mean		
47-4041	Hazardous Materials Removal Workers	307	437	130	21	42.35%	\$27.48	\$25.50	\$22.82	\$22.11	Moderate-term on-the-job training	Very Green
17-2081	Environmental Engineers	203	277	74	12	36.45%	\$34.00	\$33.89	\$30.50	\$34.18	Bachelor's degree	Very Green
51-8031	Water and Liquid Waste Treatment Plant and System Operators	179	241	62	10	34.64%	\$16.50	\$17.44	\$15.98	\$16.47	Long-term on-the-job training	Very Green
29-9011	Occupational Health and Safety Specialists	25	33	8	2	32.00%	\$34.62	\$36.89	\$30.67	\$29.15	Bachelor's degree	Very Green
37-3013	Tree Trimmers and Pruners	22	29	7	1	31.82%	\$13.00	\$12.74	\$14.53	\$13.41	Short-term on-the-job training	Very Green

*Annual Openings include openings due to growth and replacement needs.

The top five green occupations with the most projected green employment account for 36 percent of all the Very Green jobs and 12 percent of total green employment in 2018. The occupation with the most projected green employment is heating, air conditioning and refrigeration mechanic and installer at 538 jobs in 2018. Environmental scientist and specialist including health is next with 487 jobs followed by hazardous materials removal worker with 437.

Highest Employment Occupations												
SOC Code	Statewide	2008	2018	2008-2018							Education or Training Level	Green Level
	Occupational Title	Employment	Net Change	Annual Openings*	Percent Change	Green Median	Green Mean	OES Median	OES Mean			
49-9021	Heating, Air Conditioning and Refrigeration Mechanics and Installers	471	538	67	14	14.23%	\$14.00	\$14.72	\$16.45	\$17.33	Postsecondary vocational training	Very Green
19-2041	Environmental Scientists and Specialists, Including Health	391	487	96	20	24.55%	\$21.58	\$27.45	\$27.22	\$30.85	Master's degree	Very Green
47-4041	Hazardous Materials Removal Workers	307	437	130	21	42.35%	\$27.48	\$25.50	\$22.82	\$22.11	Moderate-term on-the-job training	Very Green
53-7081	Refuse and Recyclable Material Collectors	282	349	67	15	23.76%	\$15.00	\$14.74	\$13.58	\$13.81	Short-term on-the-job training	Very Green
19-4091	Environmental Science and Protection Technicians, Including Health	278	336	58	18	20.86%	\$11.00	\$15.51	\$12.67	\$15.23	Associate degree	Very Green

*Annual Openings include openings due to growth and replacement needs.

The green occupations with the most annual openings represent good opportunities for those seeking work in a green field. For Idaho, hazardous materials removal workers, environmental scientists and specialists including health and environmental science and protection technicians including health account for the most annual green job openings with a combined 59 openings.

Highest Demand Occupations												
SOC Code	Statewide	2008	2018	2008-2018							Education or Training Level	Green Level
	Occupational Title	Employment		Net Change	Annual Openings*	Percent Change	Green Median	Green Mean	OES Median	OES Mean		
47-4041	Hazardous Materials Removal Workers	307	437	130	21	42.35%	\$27.48	\$25.50	\$22.82	\$22.11	Moderate-term on-the-job training	Very Green
19-2041	Environmental Scientists and Specialists, Including Health	391	487	96	20	24.55%	\$21.58	\$27.45	\$27.22	\$30.85	Master's degree	Very Green
19-4091	Environmental Science and Protection Technicians, Including Health	278	336	58	18	20.86%	\$11.00	\$15.51	\$12.67	\$15.23	Associate degree	Very Green
53-7081	Refuse and Recyclable Material Collectors	282	349	67	15	23.76%	\$15.00	\$14.74	\$13.58	\$13.81	Short-term on-the-job training	Very Green
49-9021	Heating, Air Conditioning and Refrigeration Mechanics and Installers	471	538	67	14	14.23%	\$14.00	\$14.72	\$16.45	\$17.33	Post-secondary vocational training	Very Green

*Annual Openings include openings due to growth and replacement needs.

Not all green jobs are growing. The occupations with the greatest decline in green employment by 2018 include forest and conservation worker, fisher and related fishing worker and floor, ceiling and wall insulation worker. These occupations are projected to lose 13 jobs by 2018, which accounts for 9 percent of all the projected green job losses.

Declining Occupations												
SOC Code	Statewide	2008	2018	2008-2018						Education or Training Level	Green Level	
	Occupational Title	Employment	Net Change	Annual Openings**	Percent Change	Green Median	Green Mean	OES Median	OES Mean			
45-4011	Forest and Conservation Workers	74	69	-5	2	-6.76%	\$10.65	\$12.78	*	*	Moderate-term on-the-job training	Very Green
45-3011	Fishers and Related Fishing Workers	93	88	-5	3	-5.38%	*	*	*	*	Moderate-term on-the-job training	Very Green
47-2131	Insulation Workers, Floor, Ceiling and Wall	91	88	-3	3	-3.30%	\$20.00	\$18.75	\$13.88	\$14.20	Moderate-term on-the-job training	Very Green
47-2031	Carpenters	151	147	-4	2	-2.65%	\$21.00	\$19.08	\$15.80	\$17.57	Long-term on-the-job training	Very Green
19-4093	Forest and Conservation Technicians	108	106	-2	5	-1.85%	\$20.00	\$18.30	*	*	Associate degree	Very Green

*Information suppressed due to confidentiality.
 **:Annual Openings include openings due to growth and replacement needs.

The top green occupations by education include physicist, hydrologist and geoscientist and geographers. These occupations usually require either doctorates or master's degrees with a projected increase of 31 jobs by 2018.

Occupations by Education or Training												
SOC Code	Statewide	2008	2018	2008-2018							Education or Training Level	Green Level
	Occupational Title	Employment	Net Change	Annual Openings*	Percent Change	Green Median	Green Mean	OES Median	OES Mean			
19-2012	Physicists	43	54	11	3	25.58%	\$47.21	\$48.24	\$52.17	\$54.73	Doctoral degree	Very Green
19-2043	Hydrologists	136	149	13	5	9.56%	\$40.00	\$35.29	\$33.29	\$34.88	Master's degree	Very Green
19-2042	Geoscientists, Except Hydrologists and Geographers	27	34	7	1	25.93%	\$26.44	\$29.13	\$30.76	\$32.70	Master's degree	Very Green
19-2041	Environmental Scientists and Specialists, Including Health	391	487	96	20	24.55%	\$21.58	\$27.45	\$27.22	\$30.85	Master's degree	Very Green
11-9011	Farm, Ranch and Other Agricultural Managers	177	227	50	9	28.25%	*	*	\$29.42	\$31.06	Bachelor's or higher degree, plus work experience	Very Green

*Annual Openings include openings due to growth and replacement needs.

Methodology

As part of the American Recovery and Reinvestment Act of 2009, the Idaho Department of Labor received a competitively awarded grant to develop tools to effectively identify and measure jobs in renewable energy and alternative fuels, energy efficiency and conservation, sustainable agriculture and natural resource conservation and pollution and waste prevention, reduction and management and environmental cleanup. A by-product of this effort was the ability to model occupational projections to determine the potential outlook for Idaho businesses, job seekers and students.

Projection modeling was based on applying occupational concentration ratios developed during the 2010 Idaho Green Jobs Survey to the department's 2008-2018 long term occupation projections. Specifically, the 2010 Idaho Green Jobs Survey identified 211 unique occupations using 2010 Standard Occupational Classifications. A crosswalk was used to convert the data back to 2000 SOCs, leaving a total of 206 unique green occupations.

This list of 206 green occupations was used to calculate concentration ratios of green jobs to all jobs within a green occupation. These concentration ratios were then applied to the 2008-2018 occupation projections. This allows the green projections to mirror the department's standard projections in terms of variables available for analysis – base period, projection period, net change, percentage change, annual openings and education or training levels.

Using this approach assumes a constant growth rate between green and non-green jobs within an identified green occupation. It also assumes the concentration ratio remains static over the 10-year period. Further research will be necessary to determine whether these assumptions hold true.



Section VI
**Idaho Green
Human Capital
Report**

Idaho Human Capital

As part of the American Recovery and Reinvestment Act of 2009, the Idaho Department of Labor received a State Labor Market Information Improvement Grant to conduct research related to green occupations. The purpose is to ascertain the current condition of green employment in the state of Idaho and to project which occupations and industries are expected to provide jobs in the future.

As part of the grant-related research, analysts compiled supply and demand data on certain occupations to identify workforce gaps.

The primary research commenced with the 2010 Idaho Green Jobs Survey of 5,000 Idaho businesses to establish the number and types of green jobs in Idaho. Employers reported over 211 unique occupations with green jobs. The 30 with the largest green employment in Idaho were analyzed. But the analysis has provided only a tool for beginning to evaluate certain occupations. The data available for the occupations is insufficient to conduct a complete gap analysis. The assessment follows.

Projected Demand for Green Jobs

Demand can be estimated from various sources – short-term and long-term projections, vacancy information, real-time labor market information analysis and consulting with industry experts on particular occupations. For this report, demand is estimated using the growth rate from the 2008-2018 Idaho Department of Labor Long-Term Projections, 2010 Idaho Job Vacancy Survey and 2010 Idaho Green Jobs Survey.

The projected demand for each of the top 30 occupations is displayed in Table 1 on page 7. The estimated demand is derived from the Idaho Department of Labor 2008-2018 Long-Term Projections growth rate. The number of annual openings includes new positions due to growth as well as replacement positions due to persons retiring or otherwise leaving the occupation.

The estimated vacancies come from primary research for the Idaho Department of Labor's 2010 Idaho Job Vacancy Survey. Employers were asked to describe their then-current job vacancies and whether each vacancy was a newly created position. Twenty-four of the top 30 green occupations reported job vacancies.

The 2010 number of green workers is estimated from the 2010 Idaho Green Jobs Survey. The 2010 annual green openings are calculated using the same growth rate as the 2008-2018 long-term projections. These jobs are a subset of the 2008-2018 annual openings.

The occupations with the largest number of annual openings are also the ones with the most overall employment in Idaho. Of the top 30 occupations, the ones with the most overall employment in Idaho are retail salesperson, general and operations manager and heavy and tractor-trailer truck driver. Retail salesperson is the occupation with the largest employment in the state, and it also has the largest number of annual openings at 1,161. Heavy and tractor-trailer truck driver is the fourth largest in employment and is the green occupation with the second largest number of annual openings with 519. General and operations manager is the fifth largest occupation in employment statewide and has the third largest number of annual openings at 477. Not surprisingly, retail salespersons and heavy tractor-trailer truck drivers also had the most vacancies in 2010. The high demand for these occupations is correlated with their high employment.

Of the occupations with the most green employment, construction laborer is first followed by landscaping and groundkeeping worker, hazardous materials removal worker and heavy and tractor-trailer truck driver. However, construction laborer is not the occupation with the highest number of annual green openings. Landscaping and groundskeeping worker, hazardous materials removal worker, heavy and tractor-trailer truck driver, farmworker and laborer for crop, nursery and greenhouse and environmental scientist and specialist including health each have over 20 annual green openings.

The occupations with the highest percentage of annualized growth are architectural and engineering manager, hazardous materials removal worker and environmental engineer.

Projected Supply for Green Jobs

Occupations with verifiable barriers to entry such as a license are easier to capture for calculating the potential supply of workers into that occupation. For other occupations that require a minimum level of education such as engineers, a secondary resource for estimating a supply base is the count of graduates from educational program that prepare students for work in that occupation.

It is much more difficult to calculate the supply of workers for those occupations requiring less than postsecondary education such as on-the-job training. Theoretically, any employable person with the ability to learn the job is counted in the supply. This includes persons overqualified for the occupation. In fact, many persons currently in occupations with short-term on-the-job training requirements such as retail salespersons may be underemployed if they have received training toward another occupation.

Table 2 on page 8 shows the top 30 occupations along with the minimum educational levels required to perform those duties. Of the top 30 occupations, 15 have an education requirement of at least an associate degree. For those occupations, it is possible to count the graduates from related education programs.

Most Idaho postsecondary schools report the number of graduates from their academic programs to the Integrated Postsecondary Educational Data System (IPEDS). Each academic program is assigned a Classification of Instructional Programs, or CIP, code. Each CIP code filters into specific Standard Occupational Classification, or SOC, codes as defined by the U.S. Department of Labor's Occupational Outlook Handbook. Using EMSI's Occupational Analysis reporting tool, the list of academic programs from IPEDS was cross-referenced against the CIP-2000-2010 Crosswalk from the U.S. Department of Education to find CIP to SOC code relationships. The CIP-2000-2010 Crosswalk provides detailed analysis of educational programs. It is only possible to collect prospective supply information for academic programs reported to the IPEDS.

In order to speculate on the supply for an occupation, graduates from related Idaho academic programs were counted according to the level of completion. Only graduates attaining the minimum education level are counted in the human capital supply for that occupation. For example, environmental scientists and specialists, including health has a minimum education level of a master's degree. Idaho colleges and universities graduated 50 students with bachelor's degrees in the same CIP codes identified with that occupation. However, only the 19 graduates with master's degrees from those programs are qualified.

Because of the large numbers of CIP codes associated with these occupations, management occupations were not analyzed because the core competencies for those jobs are addressed in the lower related occupations. Two of the top 30 occupations are within the management group: general and operations managers number 22 and architecture and engineering managers number 25.

Analysts were unsuccessful in obtaining meaningful data on the trade occupations. The department obtained data from a few of the community colleges and some of the trade unions that offer training programs. However, analysts found that there are no records kept for tracking the movement of apprentices to licensure. The 2009 completer information provided for heating, air conditioning and refrigeration mechanics and installers in Table 2 on page 8 is strictly what schools reported to the IPEDS.

The top 30 occupation with the largest supply of eligible graduates from Idaho colleges and universities is mechanical engineer at 11 with 193 mechanical engineering graduates from University of Idaho, Boise State University, Idaho State University and Brigham Young University-Idaho.

Gap Analysis

A gap analysis is intended to compare the demand for an occupation relative to supply. To properly conduct a gap analysis, adequate data must exist to illuminate the actual supply and demand. However, any data source has limitations. The following caveats must be considered in order to properly conduct a supply and demand gap analysis.

- Academic programs may lead to jobs in more than one occupation. The number of potential workers summed across all occupations is greater than the total number of graduates. Each occupation must be evaluated separately, recognizing that the numbers represent only the Idaho “potential” for that occupation.
- Likewise, occupations can be comprised of more than one CIP code. This is especially true for supervisory and management positions. Generally, supervisory positions include all of the CIP codes associated with the occupations they supervise.
- The IPEDS data may be incomplete for certain occupations. Only schools that accept federal funding are required to report to the system.
- An inclusive but measurable geographic area must be defined for including schools. A suitable analysis will include all schools that regularly supply workers for a particular occupation regardless of geographic proximity.
- There are no assurances that graduates of a particular academic program will work in that field or within the defined geographic area.

Table 1: Estimated Demand for Top 30 Occupations with Green Jobs

Rank of Top 30 Green Jobs	SOC	SOC Title	Minimum Education Level*	2008-2018		2010		2010 Green Workers	2010 Annual Green Openings
				Annual Openings	Annualized Growth	Estimated Vacancies	Estimated New Vacancies		
1	47-2061	Construction Laborers	MT	84	0.57%	29	0	1,007	13
2	37-3011	Landscaping and Groundskeeping Workers	ST	205	2.03%	95	8	603	21
3	47-4041	Hazardous Materials Removal Workers	MT	21	3.60%	NA	NA	599	21
4	53-3032	Truck Drivers, Heavy and Tractor-Trailer	ST	519	1.74%	336	181	570	21
5	47-2152	Plumbers, Pipefitters and Steamfitters	LT	50	-0.04%	8	8	536	11
6	19-4091	Environmental Science and Protection Technicians, Including Health	A	18	1.91%	9	0	526	18
7	49-9021	Heating, Air Conditioning and Refrigeration Mechanics and Installers	PVA	45	1.34%	11	0	471	14
8	45-2092	Farmworkers and Laborers, Crop, Nursery and Greenhouse	ST	401	1.45%	193	0	469	20
9	47-2073	Operating Engineers and Other Construction Equipment Operators	MT	50	0.41%	46	14	411	9
10	19-2041	Environmental Scientists and Specialists, Including Health	M	26	2.22%	6	0	391	20
11	17-2141	Mechanical Engineers	B	42	0.40%	22	6	312	9
12	13-1199	Business Operations Specialists, All Other	B	143	1.51%	6	0	310	12
13	19-1023	Zoologists and Wildlife Biologists	B	13	0.37%	6	5	291	10
14	53-7081	Refuse and Recyclable Material Collectors	ST	54	2.17%	NA	NA	282	15
15	51-9199	Production Workers, All Other	MT	48	0.28%	NA	NA	277	11
16	19-4021	Biological Technicians	B	32	0.43%	24	6	257	10
17	11-1021	General and Operations Managers	B+	477	0.58%	71	4	250	9
18	47-2111	Electricians	LT	102	-3.04%	5	0	246	7
19	19-1032	Foresters	B	2	-0.04%	NA	NA	244	2
20	37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	ST	288	0.98%	23	10	244	7
21	41-2031	Retail Salespersons	ST	1,161	1.94%	530	64	237	12
22	47-2181	Roofers	MT	15	-1.38%	NA	NA	235	4
23	19-2031	Chemists	B	15	1.57%	4	0	234	12
24	19-4051	Nuclear Technicians	A	6	2.05%	43	13	229	6
25	11-9041	Architectural and Engineering Managers	B+	28	4.59%	5	0	229	6
26	47-4099	Construction and Related Workers, All Other	MT	22	0.98%	NA	NA	212	9
27	17-2051	Civil Engineers	B	36	2.41%	27	15	206	9
28	17-2081	Environmental Engineers	B	20	3.16%	17	0	203	12
29	17-2199	Engineers, All Other	B	46	1.63%	30	0	202	8
30	17-2071	Electrical Engineers	B	42	-0.98%	44	1	197	5

Top 30 Green Jobs, Source: 2010 Idaho Green Jobs Survey; SOC Code, Source: 2010 Standard Occupational Classification Codes; Minimum Education Level, Source: Bureau of Labor Statistics; 2008-2018 Annual Openings, Source: 2008-2018 Long-Term Occupation Projections, Idaho Department of Labor (includes openings due to both growth and net replacement); Annualized Growth, Source: 2008-2018 Long-Term Occupation Projections, Idaho Department of Labor; 2010 Estimated Vacancies, Source: 2010 Idaho Job Vacancy Survey; 2010 Estimated New Vacancies, Source: 2010 Idaho Job Vacancy Survey (subset of estimated vacancies for newly created positions); 2010 Annual Green Openings, Source: 2010 Idaho Green Jobs Survey (includes openings due to both growth and net replacement; subset of the 2008-2018 annual openings).

Table 2: Estimated Supply for Top 30 Occupations with Green Jobs

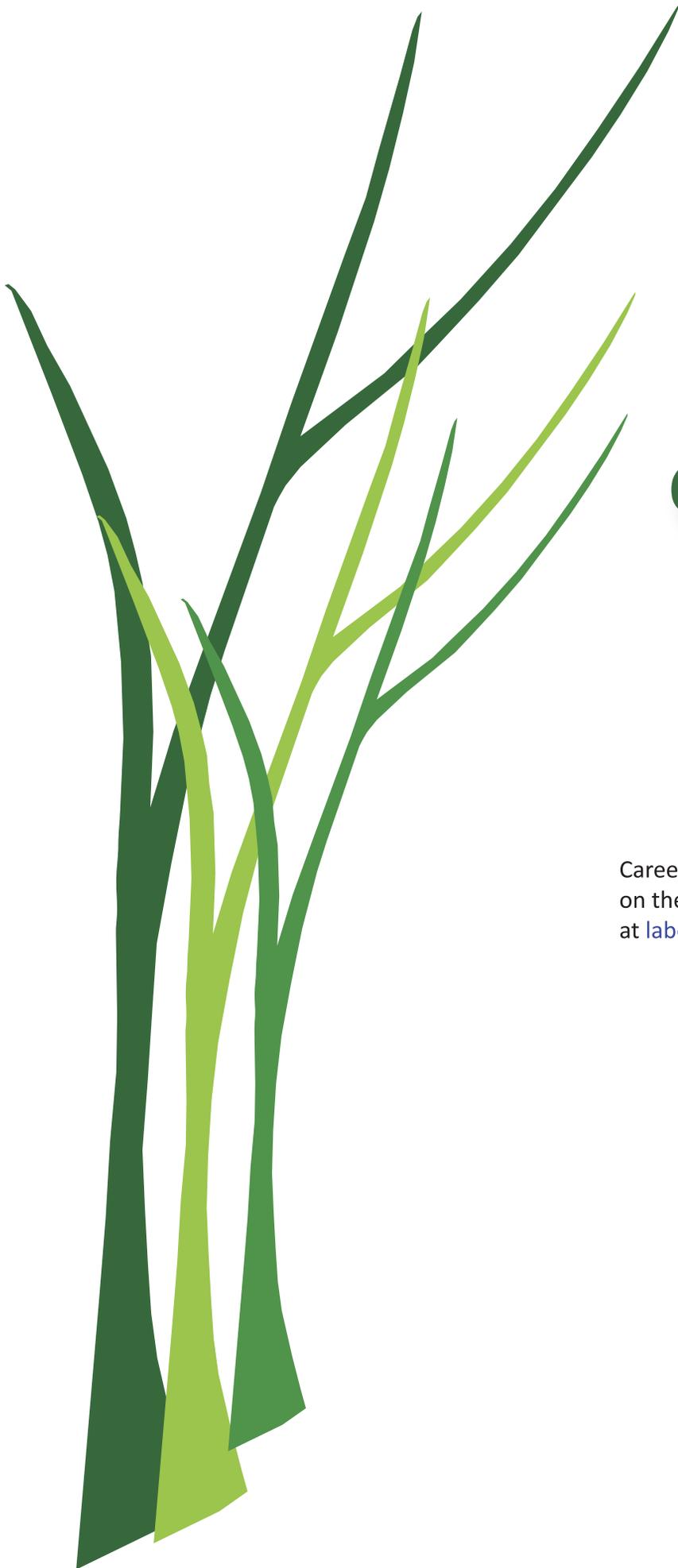
Rank of Top 30 Green Jobs	SOC	SOC Title	WIA Training		CIP	Minimum Education Level*	2009 Idaho Completers
			Y	MT			
1	47-2061	Construction Laborers	Y	46.9999		MT	4
2	37-3011	Landscaping and Groundskeeping Workers	Y	01.0605		ST	57
3	47-4041	Hazardous Materials Removal Workers	Y	46.9999		MT	4
4	53-3032	Truck Drivers, Heavy & Tractor-Trailer	Y	49.0205		ST	41
5	47-2152	Plumbers, Pipefitters and Steamfitters	Y	None reported in Idaho		LT	.
6	19-4091	Environmental Science and Protection Technicians, Including Health	Y	03.0103, 03.0104		A	50
7	49-9021	Heating, Air Conditioning and Refrigeration Mechanics and Installers	Y	47.0201		PVA	20
8	45-2092	Farmworkers and Laborers, Crop, Nursery and Greenhouse	N	None reported in Idaho		ST	.
9	47-2073	Operating Engineers and Other Construction Equipment Operators	Y	None in Idaho		MT	.
10	19-2041	Environmental Scientists and Specialists, Including Health	Y	03.0103, 03.0104		M	19
11	17-2141	Mechanical Engineers	Y	14.1901		B	215
12	13-1199	Business Operations Specialists, All Other	Y	None reported in Idaho		B	.
13	19-1023	Zoologists and Wildlife Biologists	Y	26.0701, 26.0702, 26.0707, 26.1301, 03.0601, 26.0799		B	69
14	53-7081	Refuse and Recyclable Material Collectors	N	NONE		ST	NA
15	51-9199	Production Workers, All Other	Y	NONE		MT	NA
16	19-4021	Biological Technicians	Y	None reported in Idaho		B	.
17	11-1021	General and Operations Managers	Y	46.0302		B+	NA
18	47-2111	Electricians	Y	03.0201, 03.0502, 03.0506, 03.0509,		LT	.
19	19-1032	Foresters	Y	03.0201, 03.0502, 03.0506, 03.0509,		B	94
20	37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	N	NONE		ST	NA
21	41-2031	Retail Salespersons	N	None reported in Idaho		ST	14
22	47-2181	Roofers	N	None reported in Idaho		MT	.
23	19-2031	Chemists	N	40.0501		B	68
24	19-4051	Nuclear Technicians	Y	41.0299		A	17**
25	11-9041	Architectural and Engineering Managers	Y	46.9999		B+	NA
26	47-4099	Construction and Related Workers, All Other	Y	14.0801, 14.0805		MT	4
27	17-2051	Civil Engineers	Y	14.0801, 14.0805		B	97
28	17-2081	Environmental Engineers	Y	14.1401		B	14
29	17-2199	Engineers, All Other	N	14.0101, 14.1301, 14.2701, 14.3901, 14.1201, 14.9999, 14.1101		B	13
30	17-2071	Electrical Engineers	Y	14.1001		B	106

Abbreviations: SOC - Standard Occupational Code; WIA - Workers trained for these occupations through the Workforce Investment Act training programs in Idaho; CIP - Classification of Instructional Programs.
 Notes: NONE = No CIP is correlated with this occupation; None reported in Idaho = No CIP related to this occupation is offered at Idaho postsecondary schools; NA - Not possible to do an analysis of this occupation.

National Center for Education Statistics; 2010 Idaho Green Jobs Survey; Minimum Education Level. Source: U.S. Bureau of Labor Statistics; CIP / SOC crosswalk. Source: U.S. Department of Education's

*M = Master's Degree; B+ = Work Experience, plus a Bachelor's or Higher Degree; B = Bachelor's Degree; A = Associate Degree; PVA = Postsecondary Vocational Training; LT = Long-Term On-the-Job Training;

MT = Moderate-Term On-the-Job Training; ST = Short-Term On-the-Job Training.
 **These graduates are of an academic program of at least one, but less than two academic years.



Section VII

Idaho Green Career Lattices

Career lattices are interactive graphic files available on the Idaho Department of Labor green microsite at labor.idaho.gov/futureready.