The Greening of Oregon's **WORKFORCE:**

Jobs, Wages, and Training



THOMAS



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Executive Summary

Oregon had an estimated 51,402 green jobs in 2008, spread across 5,025 employers. Green jobs accounted for 3 percent of Oregon's private, state government, and local government employment.

Green jobs are not limited to a small number of industries or occupations; they are spread across the whole economy. Hence our report's reference to "the greening" of Oregon's workforce, not to a separate green economy.

Green jobs were reported in all broad industry groups. The three industries with the most green jobs were construction, wholesale and retail trade, and administrative and waste services. Combined, these industries account for 47 percent of Oregon's green jobs.

Oregon's green jobs were spread across 226 different occupations. The five occupations with the most green jobs were carpenters, farmworkers, truck drivers, hazardous materials removal workers, and landscaping and groundskeeping workers. Together these workers represent 27 percent of Oregon's green jobs.

The average wage for green jobs in 2008 was \$22.61 per hour. Two-thirds paid \$15.00 per hour or more. On average, green jobs tended toward slightly higher wages than jobs across the entire economy. But green

wages varied significantly depending on the occupation. Occupations with higher minimum education requirements generally paid higher wages than occupations with little or no required education.

Minimum education requirements for green jobs closely mirrored requirements for all jobs statewide. Thirty-two percent of green jobs do not have a minimum education requirement, 33 percent require a high school diploma, 7 percent require some college, 7 percent require an associate or vocational technology degree, 18 percent require a bachelor's or graduate degree, and 4 percent require other education. Two-thirds of all green jobs require no more than a high school education. Of these jobs, more than half pay more than \$15 per hour. But as is true in the rest of the economy, high-wage green jobs are more likely to require post-secondary education.

Nearly one-third of green jobs required a special license or certificate. The most common special requirements were specific to occupations, such as an electrician's license. Other common requirements were environmental cleanup or abatement certifications, equipment operator licenses and commercial driver's licenses, and prior on-the-job experience.

Employers project the number of green jobs will grow 14 percent between 2008 and 2010. Most growth will likely be in the farming, fishing, and forestry occupations, transportation and material moving occupations, and production occupations.

We define a green job as one that provides a service or produces a product in:

- 1. Increasing energy efficiency
- 2. Producing renewable energy
- 3. Preventing, reducing, or mitigating environmental degradation
- 4. Cleaning up and restoring the natural environment
- 5. Providing education, consulting, policy promotion, accreditation, trading and offsets, or similar services supporting categories 1-4



Purpose: Baseline Information for Workforce Policy-Makers

The Oregon Employment Department has completed a survey of green jobs in Oregon. The purpose of our survey was to estimate the number of green jobs in Oregon and to gather key information for workforce and training policy-makers, as they seek to ensure Oregon has a workforce ready for the opportunities provided by a greening economy. We also attempted to identify future growth trends in green jobs.

Defining a Green Job

There are many competing views on what constitutes a "green" job, business, or industry. Some of these views include factors such as wage levels, job benefits, and other characteristics. While we agree with the desire to improve job quality, we felt the purpose of this survey was to:

- count the number of jobs involved in green activities
- · determine what wages they were paid
- understand what education and training was required to obtain them
- project the demand for these jobs in coming years

Had we limited our count of green jobs to those above certain wage rates, those which had certain job benefits, or those with easily accessible job training and advancement opportunities, we would have lost the ability to determine if advancements in job quality in green jobs are made as the economy expands.

Therefore, we defined a green job as one that provides a service or produces a product in any of these categories:

- 1. Increasing energy efficiency
- 2. Producing renewable energy
- 3. Preventing, reducing, or mitigating environmental degradation
- 4. Cleaning up and restoring the natural environment
- 5. Providing education, consulting, policy promotion, accreditation, trading and offsets, or similar services supporting categories 1-4

We realize our definition is broad, leaving room for interpretation from each respondent. However, we felt that part of measuring what is green is capturing public sentiment and counting jobs which the public view as green. Our survey asked respondents to provide information about those jobs within their organization for which work in any of these categories was an essential part of the job.

A Survey of All Industries and Occupations

Our survey encompassed every industry and geography throughout the state. We asked employers to identify green jobs within their organization and to provide information about those positions. We believed allowing each organization to self-report their green jobs would be more effective than conducting an analysis of pre-selected industries and occupations which we might have considered green. We recognized that while many jobs within an industry may be green, others would not be. The same holds true for occupations; while many engineers may have green jobs, it is probable that most do not.

We conducted our survey between February and May of 2009, asking employers to provide information only from the year 2008. It is possible that the significant downturn in employment in late 2008 and early 2009 skewed some employer responses as respondents may have understated the number of green jobs they had in 2008 due to a focus on those jobs which had been lost during the year. This pessimistic focus may have also led employers to understate their projected number of green jobs in 2010. However, current events such as unprecedented federal spending for green jobs training, weatherization, and other green activities may have led employers to be overly optimistic in projecting their future employment. There is no way to know how the economic events of late 2008 and early 2009 affected the results of our survey.

Oregon has Roughly 50,000 Green Jobs

We estimate there were 51,402 green jobs in Oregon in 2008, spread across 5,025 different employers. Oregon's green workforce made up roughly 3 percent of the state's 1,686,524 private, state, and local government jobs during the year. To add perspective to the size of Oregon's green workforce, it is roughly the same as the number of employees working in Oregon's private hospitals.

Oregon's green jobs were distributed across every industry and occupation, but tended to be more concentrated in industries and occupations related to construction, production, natural resources, and transportation.

Construction has the Most Green Jobs of Any Industry

Table 1

Share of Total Green Jobs by Industry

	Green	Portion of All
Industry	Jobs	Green Jobs
Construction	8,676	17%
Wholesale and Retail Trade	8,315	16%
Administrative and Waste Services	7,074	14%
Natural Resources and Mining	5,762	11%
Professional and Technical Services	5,411	11%
State & Local Government	5,063	10%
Manufacturing	4,228	8%
Leisure and Hospitality	2,260	4%
Other Services	1,555	3%
Educational and Health Services	1,353	3%
Transportation and Warehousing	573	1%
Utilities	403	less than 1%
Information	354	less than 1%
Management of Companies and Enterprises	252	less than 1%
Financial Activities	123	less than 1%
Total	51,402	100%

Table 1 shows the number of green jobs by industry. The construction industry employed the greatest percentage of the state's green jobs. The wholesale and retail trade, administrative and waste services, natural resources and mining, professional and technical services, and state and local government industries each employed 10 percent or more of the state's total green jobs.

All other industries combined employed roughly 20 percent of the green jobs.

Eleven percent of all green jobs were in the natural resources

and mining industry. In addition eleven percent of the natural resources and mining industry's total employment was in green jobs, the most of any industry (Table 2). Other industries with a relatively large percentage of their workforce in green jobs were construction, utilities, administrative and waste services, and professional and technical services.

Green Jobs as a Percent of Total Industry Employment								
	Green Jobs	Total Jobs	Green Jobs as a Percent					
Industry	IN 2008	IN 2008	OF LOCAL					
Natural Resources and Mining	5,762	50,629	11%					
Construction	8,676	92,928	9%					
Utilities	403	4,757	8%					
Administrative and Waste Services	7,074	91,408	8%					
Professional and Technical Services	5,411	72,229	7%					
Wholesale and Retail Trade	8,315	276,618	3%					
Other Services	1,555	64,121	2%					
Manufacturing	4,228	194,859	2%					
State & Local Government	5,063	248,049	2%					
Leisure and Hospitality	2,260	172,798	1%					
Transportation and Warehousing	573	51,203	1%					
Information	354	36,040	1%					
Management of Companies and Enterprises	252	31,959	1%					
Educational and Health Services	1,353	212,942	1%					
Financial Activities	123	85,984	less than 1%					
Total	51,402	1,686,524	3%					

Table 2

"Blue Collar" Occupations Have the Most Green Jobs

Construction and extraction occupations accounted for 20 percent of all green jobs, the greatest concentration of any occupational group (Table 3). Production; farming, fishing, and forestry; and transportation and material moving occupations each employed at least 10 percent of all green jobs. These four "blue collar" occupational groups account for more than half of Oregon's green jobs, a statistic that

has significant implications for the education requirements of green jobs, discussed later.

The remaining occupational groups accounted for 46 percent of all green jobs, but no other single group employed more than 10 percent of the total.

Eleven individual occupations reported more than 1,000 green jobs. Table 4 lists the Top 11 occupations by the number of green jobs and provides a few illustrative examples of the green work being done as given by employers during the survey.

Table 3

Share of Green Jobs by Occupation Group

	Green	Portion of All
Occupation Group	Jobs	Green Jobs
Construction and Extraction	10,381	20%
Production	6,512	13%
Farming, Fishing, and Forestry	5,838	11%
Transportation and Material Moving	5,255	10%
Architecture and Engineering	4,360	8%
Life, Physical, and Social Science	4,135	8%
Building and Grounds Cleaning and Maintenance	2,877	6%
Sales and Related	2,437	5%
Installation, Maintenance, and Repair	2,233	4%
Management	1,639	3%
Office and Administrative Support	1,570	3%
Protective Service	1,032	2%
Education, Training, and Library	790	2%
Business and Financial Operations	683	1%
Food Preparation and Serving Related	513	1%
Arts, Design, Entertainment, Sports, and Media	480	1%
Computer and Mathematical	244	less than 1%
Healthcare Practitioners and Technical	165	less than 1%
Community and Social Services	157	less than 1%
Legal	81	less than 1%
Personal Care and Service	20	less than 1%
Total	51,402	100%

Table 4

Top 11 Occupations with More Than 1,000 Green Jobs Examples of Green Work From the Oregon Green Jobs Survey

Occupation	Selected Green Job Description and Employer
Carpenters	"home weatherization" - local community action center
(4,025 green jobs)	"energy efficiency construction" - temp agency
Farmworkers and Laborers	"herbsman" - 100% organic dairy
(3,189 green jobs)	"assistant grower" - organic nursery
Truck Drivers	"compost truck driver" - waste management company
(2,337 green jobs)	"truck drivers" - biomass company
Hazardous Materials Removal Workers	"asbestos abatement worker" - remediation business
(2,123 green jobs)	"special waste technician" - at county waste center
Landscaping and Groundskeeping Workers	"riparian crew leader" - local watershed restoration
(2,044 green jobs)	"restoration of native plants" - forestry consulting firm
Civil Engineers	"civil inspector" - wind energy firm
(1,889 green jobs)	"LEED AP Project Engineer" - construction company
Production Workers	"paper machine tender" - mill making 100% recycled paper
(1,728 green jobs)	"processing recycling" - oil recycler
Freight, Stock, and Material Movers	"sorter" - recycling company
(1,628 green jobs)	"auto parts dismantler" - auto salvage yard
Retail Salespersons	"sells systems, customer care" - solar panel retailer
(1,149 green jobs)	"retail manager" - organic nursery
Biological Technicians	"Coho life cycle monitoring" - local watershed
(1,115 green jobs)	"fisheries technician" - tribal government
Fire Fighters	"rehab after fires, forest hazard fuel reduction" - environmental
(1,021 green jobs)	consulting firm

Even though 226 occupations were identified as having at least one green job, the Top 11 occupations accounted for 41 percent of all green jobs.

Once again, we see a strong leaning toward "blue collar" jobs in this list.

Solar Panel Installers and Wind Turbine Technicians

In examining employers' descriptions of the activities and functions their green jobs were required to perform, we found that almost all green jobs fit into the current Standard Occupational Classification (SOC) system. While green jobs may be focused on producing a product or providing a service that has environmental benefits, it doesn't appear their job descriptions are much different from their non-green counterparts within the same occupation. However, there are a few cases where new occupation titles would help to clarify the differences between popularly recognized green jobs and other non-green jobs performing similar activities.

Solar panel installers and wind turbine technicians are two green jobs that have generated a lot of interest lately, because of an increase in the use of solar technologies by households and businesses and the recent growth of Oregon's wind farms. Unfortunately, the current SOC system does not have separate occupational titles for either of these green jobs. Information about these occupations

was collected in the survey and reported in a manner consistent with current occupational data, so it is important to know where in the classification system to look for these jobs.

Solar panel installers are generally considered electricians if they are licensed electricians or apprentices installing photovoltaic panels. If they are installing solar thermal units and are licensed plumbers or apprentices, they are generally considered plumbers. Installers without electrician or plumber licenses are generally considered construction laborers or related workers.

Wind turbine technicians are considered installation, maintenance, and repair workers, which includes other related occupations. Depending on the training needed for the position, some wind turbine workers could be considered engineers or electricians.

The SOC system will be revised in 2010, at which time separate occupations for solar photovoltaic technicians and wind turbine service technicians will be introduced. It will likely be a few years before data about the "new" occupations are available.

Table 5

Occupations That Include Solar Panel Installers and Wind Turbine Technicians

Occupation	Green Jobs	Average Hourly Wage	Requires Education Beyond High School	Some Jobs Have Special Requirements
Electricians	658	\$24.58	79%	\checkmark
Installation, Maintenance, and Repair Workers, All Other	539	\$21.60	93%	\checkmark
Plumbers, Pipefitters, and Steamfitters	368	\$25.83	85%	\checkmark
Engineers, All Other	271	\$30.87	99%	\checkmark

Many Green Jobs Require No Education Beyond High School

Of those green jobs where an education requirement was reported, 32 percent had no minimum education required to obtain the position and 33 percent reported that a high school or equivalent education was necessary (Graph 1). That's significant. Two-thirds of Oregon's green jobs require no education beyond high school.

Perhaps of more interest to workforce and training policy makers, 7 percent of green jobs required "some college" and the same number required an associate or vocational two-year degree. Fifteen percent of green jobs required a bachelor's degree while 3 percent required a graduate degree.

The minimum education level required for a green job is highly dependent on the occupation the green job falls under. For example, 87 percent of green jobs in farming, fishing, and forestry occupations had no minimum education requirement while 77 percent of green jobs in architecture and engineering occupations were required to have a bachelor's or higher degree. All four of the occupational groups that each accounted for more than 10 percent of green jobs were heavily



weighted toward either having no minimum education requirement or requiring a high school diploma. Occupational groups that had a smaller number of green jobs, such as computer and mathematical occupations and legal occupations, generally reported a higher minimum education requirement.

The Top 11 occupations that had more than 1,000 green jobs each were also heavily weighted against requiring post-secondary education. Of the Top 11 occupations only two required education beyond high school for more than 20 percent of their green jobs: civil engineers and biological

technicians. Meanwhile, five of the Top 11 reported that none of their green jobs required education beyond secondary school.



Table 6

Top 25 High Education Green Occupations

Occupations Where At Least Half of the Green Jobs Require Education Beyond High School

			Average	Some College,	Bachelor's	Some Jobs
SOC	SOC Title	Green Jobs	Hourly Wage	or Other	Higher	Requirements
17-2051	Civil Engineers	1,889	\$32.70	3%	97%	✓
19-4021	Biological Technicians	1,115	\$16.59	59%	2%	
11-1021	General and Operations Managers	913	\$40.85	48%	32%	✓
17-1011	Architects, Except Landscape and Naval	882	\$33.85	0%	100%	✓
47-2111	Electricians	658	\$30.04	60%	18%	✓
19-1023	Zoologists and Wildlife Biologists	639	\$30.05	0%	100%	✓
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	601	\$35.50	86%	0%	
43-6011	Executive Secretaries and Administrative Assistants	542	\$16.38	61%	7%	
49-9099	Installation, Maintenance, and Repair Workers, All Other	539	\$25.13	93%	0%	✓
51-4121	Welders, Cutters, Solderers, and Brazers	382	\$15.82	86%	0%	✓
47-2152	Plumbers, Pipefitters, and Steamfitters	368	\$29.90	85%	0%	<
13-1199	Business Operations Specialists, All Other	352	\$28.81	21%	62%	✓
19-4093	Forest and Conservation Technicians	330	\$12.72	99%	1%	✓
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	328	\$16.22	100%	0%	✓
25-1199	Postsecondary Teachers, All Other	272	\$33.16	58%	42%	✓
17-2199	Engineers, All Other	271	\$35.93	1%	99%	✓
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	269	\$23.07	47%	24%	1
17-1022	Surveyors	241	\$22.50	100%	0%	
47-4011	Construction and Building Inspectors	225	\$21.97	54%	16%	✓
19-3051	Urban and Regional Planners	204	\$46.38	0%	100%	- ✓
17-3022	Civil Engineering Technicians	200	\$27.71	59%	42%	✓
19-2041	Environmental Scientists and Specialists, Including Health	195	\$28.43	0%	100%	- ✓
25-2021	Elementary School Teachers, Except Special Education	185	\$27.50	0%	100%	- ✓
19-1031	Conservation Scientists	178	\$19.21	0%	100%	✓
19-1099	Life Scientists, All Other	177	\$31.07	2%	98%	1
	All High Education Green Occupations	16,852	\$28.22	41%	50%	✓

In contrast, employers reported that in 128 occupations at least half of the green jobs required some education beyond high school. Of these occupations, the 25 that have the most green jobs are shown in Table 6. In addition to more education, nearly all of these occupations had some green jobs that also required a license, certificate, or other requirements.

Some Green Jobs Require Special Licenses and Certifications

Employers were asked to identify special requirements (other than education) for their green jobs. In most cases, employers identified licenses and certificates that were required for a job candidate to be hired. Others indicated flexibility in allowing a successful job candidate to complete any requirements within a short time from the hiring date.

Eight percent of all green jobs required an occupation-specific certification or registration, such as enrollment in an apprenticeship program, while 7 percent required an occupation-specific license, such as an electrician's license. Only 6 percent of green jobs required some sort of environmental cleanup or abatement certification, such as a hazardous materials certificate or a chemical pesticide applicator's license. Five percent of green jobs required an equipment operator's license or a commercial driver's license. Additionally, 4 percent of green jobs were required to have prior experience or significant on the job training, 2 percent required LEED (Leadership in Energy and Environmental Design) accreditation, and 1 percent required computer proficiency or specific computer program training such as Computer Assisted Drafting.



Certain occupational groups and individual occupations were more likely to require special requirements from job candidates. For example, 21 percent of green jobs in construction and extraction occupations required an environmental cleanup or abatement certification such as hazardous materials certification or chemical applicator's license. Nearly all green jobs working in hazardous material remover, pesticide sprayer, hydrologist, and community and social service specialist occupations were required to have such a certification. Similarly, 35 percent of green jobs within the transportation and material moving occupations required an operator's or commercial driver's license. Engineers, architects, and construction managers were required to have LEED accreditation much more often than other occupations. And, as expected, green jobs within occupations such as database and network administrators usually required computer proficiency or specific computer program training.

Green Wage Levels Slightly Higher than All Jobs

The estimated average wage paid for a green job in 2008 was \$22.61 per hour. Although not strictly comparable, the average (mean) wage for all jobs in Oregon in 2008 was \$19.92 according to the Bureau of Labor Statistics.

Roughly two-thirds of Oregon's green jobs paid \$15.00 per hour or more. As Oregon's median wage was \$15.22 in 2008, this means that green jobs were slightly more likely to fall into Oregon's defined "high wage" category than non-green jobs. Graph 4 shows the percent of green jobs by wage group.

Wages earned in green jobs are highly dependent on the green worker's occupation. Management, architecture and engineering, and business and financial occupations tended to have the highest paid green jobs. Of the green jobs in the management occupation group, 56 percent earned \$50.00 per hour or more. Similarly, 99 percent of green jobs in architecture and engineering had a wage of at least \$15.00 per hour. Green jobs in food preparation and serving occupations were the lowest paid among all green jobs. Fifty-six percent of these jobs earned less than \$10.00 per hour and 89 percent reported wages of less than \$15.00 per hour.





As is true with jobs across the entire economy, more education generally led to higher wages for Oregon's green jobs. Graph 6 shows how the distribution of wages for green jobs varies depending on the education requirement. Although 32 percent of green jobs do not have an educational requirement, of these, only 42 percent pay \$15.00 per hour or more. Fewer green jobs require a bachelor's or graduate degree, but 95 percent of these jobs pay \$15.00 per hour or more.



Graph 6

Higher Wage Green Jobs

There were 32,746 higher wage green jobs – those jobs earning \$15.00 per hour or more – in Oregon in 2008. At least 64 percent of all green jobs were higher wage jobs.

Of the 226 occupations that had at least one green job, 190 reported that at least half of their green workers earned at least \$15.00 per hour. These higher wage green occupations require more education than other green occupations: they employ 94 percent of all the green jobs which require education beyond high school. Among these higher wage green occupations, 23 percent of the green jobs are required to have a bachelor's or graduate degree compared to 2 percent for all other occupations. Similarly, 21 percent are required to have some college, a two-year degree, or other education beyond high school compared to 7 percent of the jobs in other green occupations.

Higher wage green occupations were also slightly more likely to have a special license requirement.

Table 7

Top 25 Higher Wage Green Occupations Occupations Where At Least Half of the Green Jobs Earned \$15.00 per Hour or More

Occupation		Green	Average Hourly	Some College,	Bachelor's	Some Jobs Have Special
Code	Occupation Title	Jobs	Wage	or Other	Higher	Requirements
47-2031	Carpenters	4,025	\$22.64	1%	4%	. 🗸
53-3032	Truck Drivers, Heavy and Tractor-Trailer	2,338	\$34.08	16%	0%	\checkmark
47-4041	Hazardous Materials Removal Workers	2,123	\$15.50	0%	0%	✓
17-2051	Civil Engineers	1,889	\$32.70	3%	97%	✓
51-9199	Production Workers, All Other	1,728	\$38.46	0%	0%	
19-4021	Biological Technicians	1,115	\$16.59	59%	2%	
11-1021	General and Operations Managers	913	\$40.85	48%	32%	✓
17-1011	Architects, Except Landscape and Naval	882	\$33.85	0%	100%	✓
51-8031	Water and Liquid Waste Treatment Plant and System Operators	712	\$25.61	2%	0%	✓
41-4011	Wholesale and Manufacturing Sales Representatives; Technical and Scientific	690	\$23.34	0%	0%	
47-2073	Operating Engineers and Other Construction Equipment Operators	671	\$27.35	6%	0%	\checkmark
47-2111	Electricians	658	\$30.04	60%	18%	✓
19-1023	Zoologists and Wildlife Biologists	638	\$30.05	0%	100%	✓
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	607	\$37.27	2%	41%	\checkmark
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	601	\$35.50	86%	0%	
45-4029	Logging Workers, All Other	585	\$17.83	29%	0%	✓
43-6011	Executive Secretaries and Administrative Assistants	542	\$16.38	61%	7%	
49-9099	Installation, Maintenance, and Repair Workers, All Other	540	\$25.13	93%	0%	✓
47-4099	Construction and Related Workers, All Other	539	\$16.60	13%	0%	✓
53-3021	Bus Drivers, Transit and Intercity	523	\$20.96	1%	0%	\checkmark
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	511	\$19.69	39%	1%	\checkmark
51-2099	Assemblers and Fabricators, All Other	505	\$16.17	9%	0%	✓
51-7011	Cabinetmakers and Bench Carpenters	434	\$17.30	0%	4%	
45-4022	Logging Equipment Operators	429	\$31.68	0%	0%	✓
51-4121	Welders, Cutters, Solderers, and Brazers	382	\$15.82	86%	0%	✓
	All Higher Wage Green Occupations	37,142	\$26.47	21%	23%	√

More Green Jobs Coming Our Way

Employers seem confident they will continue to add green jobs through the next year. Employers' perceptions of future employment may have been affected by the economic events of late 2008 and early 2009, and the expectation of substantial government outlays devoted to promoting green activities. Even though they were being asked during tough economic times, employers still expected their number of green jobs to grow nearly 14 percent between 2008 and 2010, a gain of 7,409 jobs.

Employers in each industry expect to add green jobs. "Other services", an industry that includes a variety of service firms from auto repair shops to political organizations, has projected green jobs growth of 2,652, the most of any industry. State and local governments plan to add 1,157 green jobs, and leisure and hospitality firms are expected to add 1,031. Together, these three industries are likely to add almost two-thirds of Oregon's green jobs through 2010.

Five occupational groups account for 89 percent of the expected green job gains: farming, fishing, and forestry (2,122); transportation and material moving (1,770); production (1,113); architecture and engineering (883); and construction and extraction (696). Three occupational groups are likely victims of the economic

Table 8

	Total	Projected		Doroont
Occupational Group	2008	2010	Change	Change
Farming, Fishing, and Forestry	5,838	7,960	2,122	36%
Transportation and Material Moving	5,255	7,025	1,770	34%
Production	6,512	7,625	1,113	17%
Architecture and Engineering	4,360	5,243	883	20%
Construction and Extraction	10,381	11,077	696	7%
Protective Service	1,032	1,543	511	50%
Life, Physical, and Social Science	4,135	4,338	203	5%
Installation, Maintenance, and Repair	2,233	2,402	169	8%
Education, Training, and Library	790	952	162	21%
Management	1,639	1,791	152	9%
Building and Grounds Cleaning and Maintenance	2,877	3,026	149	5%
Business and Financial Operations	683	797	114	17%
Community and Social Services	157	263	106	68%
Computer and Mathematical	244	301	57	23%
Healthcare Practitioners and Technical	165	178	13	8%
Personal Care and Service	20	27	7	35%
Food Preparation and Serving Related	513	514	1	0%
Legal	81	81	0	0%
Arts, Design, Entertainment, Sports, and Media	480	465	-15	-3%
Office and Administrative Support	1,570	1,376	-194	-12%
Sales and Related	2,437	1,827	-610	-25%
Total	51,402	58,811	7,409	14%

climate – employers expect to need fewer workers in sales and related occupations (-610); office and administrative support (-194); and arts, design, entertainment, sports, and media (-15) through 2010.

The construction and extraction occupation group, which includes electricians who may be thought of as solar panel installers, is expected to add 696 jobs by 2010, a gain of 7 percent. Wind turbine technicians may also fare well in the coming years as installation, maintenance, and repair occupations are expected to add 169 jobs, an 8-percent gain from 2008 employment levels.

If employer expectations come true, the pace of growth for green jobs in Oregon will be much faster than what is expected for overall employment.

Appendix 1: Methodology

The Oregon Employment Department conducted the Oregon Green Jobs Survey between February and April 2009. We asked a sample of private firms and state and local government agencies to provide information about their employees who worked in any of the five green activity categories.

The survey universe contained 68,564 employers with at least two employees who were covered by Oregon's unemployment insurance program during the second quarter of 2008. The universe was stratified into 15 broad industry groups and two sample groups were created, a certainty sample and a random sample.

The certainty sample was created using a list of employers thought to have green jobs based on media reports and employers in broad industry groups with few employers. Firm weights in the certainty sample were calculated as a function of the number of firms in the specific certainty sample relative to the number of responses.

The random sample was drawn proportional to firm size in the remaining broad industry groups. For this group, firm weights were calculated as a function of the number of respondents in the industry, the total number of workers in the industry universe, and the size of the firm.

A green jobs survey form was mailed to each employer in the sample. The survey form can be found in Appendix 2. Employers had the option of returning the survey by mail, entering their response online, or calling a toll-free

number to respond. Employers who did not respond to the first mailing were sent the survey a second time. Phone calls were made by Employment Department staff to a random selection of non-responding employers in industries with low response rates after the second mailing in order to increase the number of responses.

The overall response rate for the survey was 45 percent. Eight of the industry groups had response rates at or above 45 percent. Employers that did not respond included those

Green Jobs Survey Response Rates							
Number of Employers in Universe	68,564						
Sample Size	10,436						
Responses	4,708						
Response Rate	45%						
Industry Utilities Professional and Technical Services Natural Resources and Mining Construction Educational and Health Services Other Services State and Local Government	Response Rate 63% 51% 51% 48% 48% 47% 47%						
Management of Companies and Enterprises	45%						
Transportation and Warehousing	44%						
Manufacturing	43%						
Financial Activities	42%						
Leisure and Hospitality	42%						
Wholesale and Retail Trade	42%						
Information	41%						
Administrative and Waste Services	37%						

Table A1

that elected not to respond to the survey, were no longer in business, did not have a valid address for mail delivery, or responded after the survey collection period had ended.



Oregon Green Jobs Survey



Oregon Employment Department Workforce & Economic Research 875 Union Street NE Salem, Oregon 97311 www.QualityInfo.org

If you have already responded to this survey – please disregard this form and recycle these materials.

ABOUT THE SURVEY

The Oregon Employment Department is measuring the number of green jobs which existed in Oregon in 2008. We define a green job as one that provides a service or produces a product in any of the following categories:

- 1. Increasing energy efficiency
- 2. Producing renewable energy
- 3. Preventing, reducing, or mitigating environmental degradation
- 4. Cleaning up and restoring the natural environment
- 5. Providing education, consulting, policy promotion, accreditation, trading and offsets, or similar services supporting categories 1-4

If working in one or more of these green categories was *essential* to any job in your organization in 2008, please complete the entire survey. If not, please fill out only the information below and return.

- Your responses will be kept strictly confidential
- Include information for all locations in Oregon
- Please respond to the survey no later than April 6,th 2009

OPTIONS FOR RESPONDING TO THE SURVEY

- Respond online at www.qualityinfo.org/greenjobs, or
- Return the survey in the enclosed postage-paid envelope

We will follow up with businesses that do not return their surveys to ensure the accuracy of our results.

If you have any questions, please contact the Green Survey Team toll-free at 1-888-550-7880.

Don't know if your employees count? The back of this survey has detailed guidelines and examples!

CONTACT INFORMATION (please print)

Name:_

Telephone:

Would you like a free copy of the report summarizing these survey results? Yes \Box No \Box

Thank You for Participating!

PLEASE REPORT FOR ALL OF YOUR FIRM'S LOCATIONS IN OREGON

- 1. Approximately how many jobs did you have in Oregon in 2008?_____
- 2. Was working in one or more green categories essential to any of those jobs in 2008?

Yes 🗆 🛛 No 🗅

If Yes – for how many jobs? _____ If No – stop, and please return the survey

The Greening of Oregon's Workforce

Oregon Green Jobs Survey

Save Time. Save Energy. Respond Online at www.qualityinfo.org/greenjobs

Job Title and Brief Description	Ed	Minin ucation R	Special Requirements	
List the job title and briefly describe any major job duties related to green activities Only list jobs where work in green categories was essential to the job in 2008 (Please Print)	Enter c A B C D E F G	 Proceeding No requirer HS diploma Some colle Assoc. or V Bachelor's Graduate d Other (plear) 	following codes: ment a / GED ge, no degree /oc. degree degree legree legree lase specify)	List any required special licenses, certificates, or other training (Please Print)
	\geq			
EXAMPLE: Wind Turbine Technician - Installs and repairs wind turbines		D	Renev technicia	vable energy an certification

If more space is needed, please contact us for another copy or make a copy of this page.

Oregon Employment Department, Workforce and Economic Research 875 Union St NE, Salem, OR 97311-0024 Phone: (888) 550-7880 | Fax: (503) 947-1210 | E-mail: Charlie.B.Johnson@state.or.us

Please respond by no later than April 6th.

We will contact businesses that don't return their surveys to ensure the accuracy of our results.

	Number of Green Workers in Selected Wage Ranges (Report all Workers According to an Hourly Rate)						Total Green Employment	Projected Green Employment	
	Α	В	С	D	Е	F	G		Ectimato tho
	under \$10.00	\$10.00- 14.99	\$15.00- 19.99	\$20.00- 24.99	\$25.00- 29.99	\$30.00- 49.99	\$50.00 and over	Total number of jobs that worked in green areas in 2008	number of jobs you expect to have working in green areas in 2010
								2008 Total	2010 Total
	A	В	С	D	E	F	G		
				2	1			3	5
	A	В	С	D	E	F	G		
	A	В	С	D	E	F	G		
	A	В	С	D	E	F	G		
	A	В	С	D	E	F	G		
	A	В	С	D	E	F	G		
	A	В	С	D	E	F	G		
	Α	В	С	D	E	F	G		
	Α	В	С	D	E	F	G		
	A	В	С	D	E	F	G		
	A	В	С	D	E	F	G		
								2008 Sum	2010 Sum
The	Ple 2008 sum s	ase sum you hould equal	ir total greer	entered for a	nt for both 2 question two	oon page on	u. e.		

This survey is funded, in part, with Employer Workforce Training funds administered by the Oregon Department of Community Colleges and Workforce Development

What We Mean by Green

Did your organization have any jobs in 2008 where work in green categories was essential to the job?

If so, please look through the following examples to determine which jobs should be counted in our survey. <u>These examples are not comprehensive</u> and many jobs which are green are not included here.

If not, please stop and respond online, or fill out the information on page one and return this survey form in the pre-paid envelope.

We are attempting to count jobs where environmental protection or preservation is central to the employee's work, and where employees use specific job-related skills that result in environmental benefits. Although it is important, we are not including jobs at companies that have adopted environmentally-friendly practices such as recycling office paper, promoting car pools or using energy-efficient lights or solar panels – <u>unless</u> the firm had specific employees whose job was to further these practices. If you are an employer that has become more ecologically friendly in your business practices, we congratulate and thank you, but ask that you include only those jobs where work in green activities was *essential* to the function of the job.

1. Increasing energy efficiency

Examples include: LEED certified design and construction, energy efficiency engineering, residential window retrofitting, insulation installation, etc.

Examples do not include: workers at firms where the *firm* has become "greener" by replacing light bulbs, reducing office thermostat temperatures, purchasing fuel efficient fleet vehicles, carpooling, etc.

2. Producing renewable energy

Examples include: solar PV cell manufacturing, wind turbine maintenance, wave energy research, hydro-electric generator repair, biodiesel production, geothermal drilling, design of renewable energy plants, etc.

Examples do not include: electrical power distribution, producing high-voltage electric lines, etc.

3. Preventing, reducing, or mitigating environmental degradation

Examples include: carbon emissions monitoring, organic farming, biomass or biodiversity preservation, recycling center operation, mass transit administration, wastewater treatment, etc. *Examples do not include*: workers who telecommute or carpool, cleaning services using "eco-friendly" chemicals, workplaces using recycled paper, etc.

- 4. Cleaning up and restoring the natural environment Examples include: heavy equipment operation at superfund sites, hazardous waste cleanup, wetlands restoration, etc. Examples do not include: volunteers, workers that "adopt-a-street", garbage disposal services, etc.
- 5. Providing education, consulting, policy promotion, accreditation, trading and offsets, or similar services supporting categories 1-4

Examples include: policy analysis, energy auditing, environmental sciences research, carbon credit brokering, certifying environmental practices, etc.

Examples do not include: educational administrative staff, secretarial services at law firms, etc.

If you need further assistance please contact our Green Survey Team at 1-888-550-7880.



Requires Average Education Hourly Beyond F Wage High School F \$13.17 \$2.64 5% \$13.17 \$2% 5% \$13.17 \$2% 5% \$14.13 10% 5% \$14.13 0% 5% \$14.13 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.40 0% 0% \$11.43 0% 0% \$11.43 0% 0% \$11.43 0% 0%	522 \$20.96 1% 510 \$19.69 40% 504 \$16.17 9% 475 \$13.45 20% 434 \$17.30 4% 429 \$31.68 0% 382 \$15.82 86% 368 \$29.90 85%	2 \$28.81 0% 2 \$28.81 84%
Average Hourly Wage H \$13.17 \$13.17 \$13.17 \$14.13 \$15.50 \$14.13 \$14.13 \$14.13 \$14.13 \$15.50 \$14.13 \$15.50 \$14.13 \$15.50 \$14.13 \$15.50 \$14.13 \$15.50 \$15.50 \$15.50 \$15.50 \$17.13 \$15.50 \$17.13 \$16.50 \$17.13 \$	522 \$20.96 510 \$19.69 504 \$16.17 475 \$13.45 434 \$17.30 429 \$31.68 382 \$15.82 368 \$29.90	2 \$28.81 2 \$28.81
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Occupations With 50 or More Green Jobs upation Cocupation Title all Standard Occupation Title all Standard Occupation Title all Carponents all Carponent all Carponent all Carponent all Carponent all Carponent all Carponent all	 Bus Drivers, Transit and Intercity Heating, Air Conditioning, and Refrigeration Mechanics and Installers Assemblers and Fabricators, All Other Secretaries, Except Legal, Medical, and Executive Cabinetmakers and Bench Carpenters Logging Equipment Operators Welders, Cutters, Solderers, and Brazers Plumbers, Pipefitters, and Steamfitters 	9091 Coin, Vending, and Amusement Machine Servicers and Hepairers 1199 Business Operations Specialists, All Other

Γ

sdoL r
Greer
More
50 or
With 5
Occupations

				Requires	
			Average	Education	Some Jobs
Occupation		Green	Hourly	Beyond	Have Special
Code	Standard Occupation Title	Jobs	Wage H	igh School	Requirement
19-4093	Forest and Conservation Technicians	330	\$12.72	100%	>
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	328	\$16.22	100%	>
37-2019	Building Cleaning Workers, All Other	316	\$15.00	%0	
47-2121	Glaziers	288	\$22.50	21%	
19-4091	Environmental Science and Protection Technicians, Including Health	287	\$12.90	32%	>
35-3031	Waiters and Waitresses	285	\$9.45	%0	
25-1199	Postsecondary Teachers, Except Graduate Teaching Assistants	272	\$33.16	100%	>
17-2199	Engineers, All Other	271	\$35.93	%66	>
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific	760	¢00 07	740/	
	Products	807	10.07¢	0/1/	>
53-7063	Machine Feeders and Offbearers	267	\$11.40	%0	>
47-2051	Cement Masons and Concrete Finishers	244	\$22.00	44%	>
51-2031	Engine and Other Machine Assemblers	241	\$15.82	%0	
17-1022	Surveyors	241	\$22.50	100%	
35-2014	Cooks, Restaurant	228	\$13.75	%0	
47-4011	Construction and Building Inspectors	225	\$21.97	%02	>
25-9021	Farm and Home Management Advisors	219	\$18.14	27%	>
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and	217	\$12 57	~~U	
	Tenders	117	10.21¢	0/0	
37-2012	Maids and Housekeeping Cleaners	216	\$12.50	%0	>
45-1011	First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers	210	\$23.15	37%	>
41-2011	Cashiers	210	\$10.87	%0	
47-2061	Construction Laborers	207	\$18.03	%0	
19-3051	Urban and Regional Planners	204	\$46.38	100%	>
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	201	\$13.37	%0	
17-3022	Civil Engineering Technicians	200	\$27.71	100%	>
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	198	\$21.99	40%	>
19-2041	Environmental Scientists and Specialists, Including Health	195	\$28.43	100%	>
51-2023	Electromechanical Equipment Assemblers	195	\$12.50	%0	
51-8021	Stationary Engineers and Boiler Operators	193	\$30.47	35%	>
25-2021	Elementary School Teachers, Except Special Education	185	\$27.50	100%	>
19-1031	Conservation Scientists	178	\$19.21	100%	>
19-1099	Life Scientists, All Other	177	\$31.07	100%	>
51-2022	Electrical and Electronic Equipment Assemblers	171	\$17.12	%0	>
11-9021	Construction Managers	171	\$46.77	66%	>
49-9041	Industrial Machinery Mechanics	170	\$21.75	56%	>
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	165	\$19.17	%0	>

	Occupations With 50 or More Green Jobs				
				Requires	
Occupation		Green	Average Hourly	Education Bevond	Some Jobs Have Special
Code	Standard Occupation Title	Jobs	Wage F	ligh School	Requirement
17-3013	Mechanical Drafters	165	\$21.89	100%	
17-3011	Architectural and Civil Drafters	163	\$24.13	%06	>
29-9011	Occupational Health and Safety Specialists	150	\$26.68	100%	>
19-2042	Geoscientists, Except Hydrologists and Geographers	145	\$31.04	100%	>
51-8013	Power Plant Operators	144	\$30.40	100%	>
11-9199	Managers, All Other	142	\$38.10	86%	>
19-1029	Biological Scientists, All Other	140	\$23.56	100%	
19-2099	Physical Scientists, All Other	136	\$35.88	100%	>
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	135	\$18.26	27%	>
27-3031	Public Relations Specialists	134	\$27.33	100%	>
19-3091	Anthropologists and Archeologists	134	\$29.07	100%	
15-1031	Computer Software Engineers, Applications	130	\$26.82	100%	>
19-1013	Soil and Plant Scientists	126	\$27.26	100%	>
17-3031	Surveying and Mapping Technicians	115	\$25.00	18%	>
51-9198	Helpers, Production Workers	112	\$15.67	%0	
43-1011	First-Line Supervisors/Managers of Office and Administrative Support Workers	104	\$14.47	66%	>
49-9098	Helpers, Installation, Maintenance, and Repair Workers	103	\$14.66	%0	>
17-3029	Engineering Technicians, Except Drafters, All Other	101	\$23.15	6%	
11-2022	Sales Managers	100	\$24.15	3%	
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	66	\$29.22	%0	>
15-1021	Computer Programmers	96	\$26.90	100%	>
47-4051	Highway Maintenance Workers	94	\$21.54	13%	>
53-1021	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	92	\$17.50	98%	>
27-1025	Interior Designers	92	\$32.88	100%	>
43-5081	Stock Clerks and Order Fillers	92	\$14.24	%0	
47-2081	Drywall and Ceiling Tile Installers	91	\$31.25	%0	>
27-3041	Editors	91	\$20.91	100%	
21-1093	Social and Human Service Assistants	87	\$21.06	100%	
51-2041	Structural Metal Fabricators and Fitters	86	\$22.33	%0	
53-7061	Cleaners of Vehicles and Equipment	84	\$22.20	%0	
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	84	\$17.20	71%	
23-1011	Lawyers	81	\$23.73	100%	
13-1061	Emergency Mangement Specialists	79	\$50.00	100%	
19-1032	Foresters	79	\$24.97	100%	
27-3042	Technical Writers	79	\$40.00	100%	
27-1021	Commercial and Industrial Designers	27	\$28.21	39%	>
53-7051	Industrial Truck and Tractor Operators	77	\$15.52	%0	

		Average	Requires	Some Johe
	Green	Hourly	Beyond	Have Special
Standard Occupation Title	SdoL	Wage	High School	Requirement
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	74	\$15.34	%0	
Self-Enrichment Education Teachers	68	\$14.74	94%	
Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transcortation	67	\$30.74	67%	
Insulation Workers. Floor, Ceiling, and Wall	67	\$28.03	100%	
Farm, Ranch, and Other Agricultural Managers	65	\$27.27	100%	
Warket Research Analysts	65	\$29.88	100%	
painters, Construction and Maintenance	65	\$9.45	100%	
Customer Service Representatives	62	\$18.79	5%	>
bookkeeping, Accounting, and Auditing Clerks	61	\$16.68	37%	
Environmental Engineers	59	\$38.94	100%	>
irst-Line Supervisors/Managers of Landscaping, Lawn Service, and Grounds	eping 50	\$26.40	100%	
Vorkers	5	04.020	% 001	>
Engineering Managers	59	\$47.63	100%	>
Aaintenance and Repair Workers, General	59	\$17.58	25%	>
Electrical Power-Line Installers and Repairers	54	\$38.02	100%	
Machinists	54	\$18.73	%0	
Electronics Engineers, Except Computer	53	\$32.50	100%	
dechanical Engineers	52	\$39.55	100%	>
Refuse and Recyclable Material Collectors	51	\$14.64	49%	>
Cost Estimators	50	\$23.90	100%	>
First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	50	\$33.78	46%	>
Purchasing Agents, Except Wholesale, Retail, and Farm Products	50	\$32.55	91%	
All Others	1,571	\$25.49	68%	~
Total	51.402	\$22,61	36%	>

	Green	No	High School		Associate or Vocational	Bachelor's or	
Occupation Group	Jobs*	Requirement	Graduate	Some College	Degree	Graduate	Other
Construction and Extraction	10,210	40%	41%	2%	5%	6%	%9
Production	6,348	23%	55%	2%	13%	1%	9%9
Farming, Fishing, and Forestry	4,183	87%	6%	2%	less than 1%	less than 1%	3%
Transportation and Material Moving	5,237	34%	56%	6%	1%	%0	2%
Architecture and Engineering	4,290	less than 1%	5%	4%	14%	77%	%0
Life, Physical, and Social Science	4,070	%0	16%	25%	3%	57%	less than 1%
Building and Grounds Cleaning and							
Maintenance	2,842	53%	37%	4%	4%	less than 1%	less than 1%
Sales and Related	1,557	25%	58%	10%	less than 1%	7%	less than 1%
Installation, Maintenance, and Repair	1,928	8%	49%	12%	16%	less than 1%	15%
Management	1,514	8%	11%	4%	29%	40%	8%
Office and Administrative Support	1,523	6%	51%	29%	4%	5%	2%
Protective Service	1,033	%66	less than 1%	less than 1%	%0	%0	%0
Education, Training, and Library	789	21%	1%	7%	4%	47%	20%
Business and Financial Operations	590	6%	3%	8%	7%	62%	14%
Food Preparation and Serving Related	513	100%	%0	%0	%0	%0	%0
Arts, Design, Entertainment, Sports, and							
Media	438	11%	%0	%0	22%	67%	less than 1%
Computer and Mathematical	243	%0	%0	25%	%0	74%	less than 1%
Healthcare Practitioners and Technical	162	%0	2%	5%	7%	85%	less than 1%
Community and Social Services	157	%0	4%	1%	55%	39%	%0
Legal	81	%0	%0	%0	%0	100%	%0
Personal Care and Service	20	%02	%0	%0	%0	30%	%0
Total	47.728	32%	33%	2% ⁰	7%	18%	4%

Appendix 4: Green Jobs Minimum Educational Requirements

Prior Experience of Significant of CentrationComputer of Significant of Significant <b< th=""><th></th><th></th><th>Special</th><th>l Requirement</th><th>_S</th><th></th><th></th><th></th></b<>			Special	l Requirement	_S			
Green of constructionor Significant 1 miningProficiency or 1 miningAblatement 2 miningOut 2 miningCurrent miningCur			Prior Experience	Computer	Cleanup or	Equipment		Occupation
		Green	or Significant	Proficiency or	Abatement	Operator	LEED	Specific
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Occupation Group	Jobs ¹	OUT ²	Training	Certification ³	License or CDL	Accreditation	License/Cert.
Architecture and Engineering2.2662.262.261%less than 1%27%66%Frankpotten2.186less than 1%0%6%0%53%0%53%Production2.186less than 1%0%0%6%0%53%0%53%Production2.0681,070less than 1%0%0%53%0%53%0%Family, Fishing, and Foresty7.023less than 1%0%0%0%0%4%Family, and Foresty7.331%less than 1%0%0%0%4%Minitenance, and Repair1,023less than 1%0%0%0%0%4%Family, and Social Science57331%less than 1%0%0%0%4%Mandparent55511%less than 1%0%0%0%0%0%4%Mandparent55331%less than 1%0%0%0%0%0%0%Mandparent55311%less than 1%0%0%0%0%0%0%Mandparent55311%less than 1%0%0%0%0%0%0%Mandparent56511%less than 1%0%0%0%0%0%Mandparent506%11%less than 1%0%0%0%0%Mandparent506%11%less than 1%0%0%0%0%Mand	Construction and Extraction	4,476	8%	less than 1%	49%	4%	4%	36%
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Architecture and Engineering	2,296	2%	2%	1%	less than 1%	27%	68%
Production2,06840%less than 1%0%6%0%6%0%6% <td>Transportation and Material Moving</td> <td>2,186</td> <td>less than 1%</td> <td>2%</td> <td>%0</td> <td>83%</td> <td>%0</td> <td>13%</td>	Transportation and Material Moving	2,186	less than 1%	2%	%0	83%	%0	13%
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Production	2,068	40%	less than 1%	%0	6%	%0	53%
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Installation, Maintenance, and Repair	1,070	less than 1%	less than 1%	%0	31%	less than 1%	68%
Farming, Fishing, and Forestry7299%0%62%25%0%4%Life, Physical, and Social Science67363%0%19%0%3%15%Life, Physical, and Social Science57331%0%9%2%0%58%Maintenance56511%less than 1%less than 1%2%0%58%Maintenance56511%19%0%0%0%2%0%Management56511%19%0%0%0%0%0%Aris, Design, Entertainment, Sports, and17219%27%0%0%0%0%Aris, Design, Entertainment, Sports, and17219%27%0%0%0%0%0%Mainspress11220%0%0%0%0%0%0%0%0%Misterative Support11220%0%0%0%0%0%0%0%Misterative Support11220%0%0%0%0%0%0%0%Misterative Practitioners and Financial Operations11220%0%0%0%0%0%0%Business and Financial Operations210%0%0%0%0%0%0%0%Computer and Maintistrative Support210%0%0%0%0%0%0%Computer and Fachtical210%0%0%0%0%0%0%<	Protective Service	1,023	less than 1%	%0	%0	%0	%0	100%
Life, Physical, and Social Science 673 63% 0% 19% 0% 3% 15% 14% Publicing and Grounds Cleaning and Management 573 31% 0% 9% 9% 2% 86% Management 565 11% less than 1% 0% 0% 0% 0% 33% 11% less than 1% 0% 0% 0% 0% 0% 33% 11% less than 1% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Farming, Fishing, and Forestry	729	6%	%0	62%	25%	%0	4%
Building and Grounds Clearing and Maintenance 573 31% 0% 2% 0% 58% Maintenance 555 11% less than 1% 0% 2% 0% 58% Maintenance 555 11% less than 1% 0% 2% 0% 0% 33% Ats. Design, Emetrating and Library 233 7% 0	Life, Physical, and Social Science	673	63%	%0	19%	%0	3%	15%
Maintenance 573 31% 0% 9% 2% 0% 58% Management 565 11% less than 1% 0% 2% 0% 58% Education, Training, and Library 565 11% less than 1% 0% 0% 2% 0% 39% Aris, Design, Entertainment, Sports, and 172 19% 27% 0%	Building and Grounds Cleaning and							
Management56511%less than 1%less than 1%0%2%86%Education, Training, and Library2337%0%0%0%0%0%0%MeriaTraining, and Library23317219%27%0%0%0%0%0%MeriaTraining, and Library17219%27%0%0%0%0%0%0%MeriaTraining, and Library17219%27%0%0%0%0%0%MeriaTraining and Administrative Support11220%0%%0%0%0%0%Mealthcare Practitioners and Financial Operations919%52%0%0%0%0%0%0%Business and Financial Operations910%0%0%0%0%0%0%0%Sales and Related210%0%0%0%0%0%0%0%0%Computer and Mathematical210%0%0%0%0%0%0%0%Sales and Related00%0%0%0%0%0%0%0%0%Computer and Mathematical1120%0%0%0%0%0%0%Sales and Related00%0%0%0%0%0%0%Legal000%0%0%0%0%0%Legal000% <td>Maintenance</td> <td>573</td> <td>31%</td> <td>%0</td> <td>6%</td> <td>2%</td> <td>%0</td> <td>58%</td>	Maintenance	573	31%	%0	6%	2%	%0	58%
Education, Training, and Library2337%0%	Management	565	11%	less than 1%	less than 1%	%0	2%	86%
Arts, Design, Entertainment, Sports, and Media T72 19% 27% 0% 0% 53% 0% Office and Administrative Support 172 19% 27% 0% 0% 0% 0% Healthcare Practitioners and Technical 112 20% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0	Education, Training, and Library	233	7%	%0	%0	%0	%0	93%
Media 172 19% 27% 0% 53% 0% Office and Administrative Support 133 61% 39% 0%	Arts, Design, Entertainment, Sports, and							
Office and Administrative Support 133 61% 39% 0%	Media	172	19%	27%	%0	%0	53%	%0
Healthcare Practitioners and Technical 112 20% 0% 0% 0% 66% Business and Financial Operations 91 9% 52% 0% 0% 66% Business and Financial Operations 91 9% 52% 0% 0% 6% 3% Computer and Mathematical 43 0% 100% 0%	Office and Administrative Support	133	61%	39%	%0	%0	%0	%0
Business and Financial Operations 91 9% 52% 0% 0% 36%	Healthcare Practitioners and Technical	112	20%	%0	%	%0	%0	66%
Computer and Mathematical 43 0% 100% <	Business and Financial Operations	91	6%	52%	%0	%0	36%	3%
Sales and Related 21 0% 92% 0% 0% 0% 8% Community and Social Services 6 0%	Computer and Mathematical	43	%0	100%	%0	%0	%0	%0
Community and Social Services 6 0% 100% 0%	Sales and Related	21	%0	92%	%0	%0	%0	8%
Food Preparation and Serving Related 0 0% 0	Community and Social Services	9	%0	%0	100%	%0	%0	%0
Legal 0 0% 0	Food Preparation and Serving Related	0	%0	%0	%0	%0	%0	%0
Personal Care and Service 0 0% 0	Legal	0	%0	%0	%0	%0	%0	%0
Total 16,468 13% 2% 17% 16% 6% 46% ¹ Where a special requirement was specified 2 0.17: On-the-job training 3 Hazmat. pesticide, asbestos, etc. 46%	Personal Care and Service	0	%0	%0	%0	%0	%0	%0
 Where a special requirement was specified OJT: On-the-job training ³ Hazmat, pesticide, asbestos, etc. 	Total	16,468	13%	2%	17%	16%	%9	46%
 2 OJT: On-the-job training ³ Hazmat, pesticide, asbestos, etc. 	¹ Where a special requirement was spec	ified						
³ Hazmat, pesticide, asbestos, etc.	² OJT: On-the-job training							
	³ Hazmat, pesticide, asbestos, etc.							

Appendix 5: Green Jobs Special Requirements

Employer Projections of Green Jobs by Industry

		Forecasted		
	Total	Total		
	Workers	Workers		Percent
Broad Industry	2008	2010	Change	Change
Other Services	1,555	4,207	2,652	171%
State & Local Government	5,063	6,220	1,157	23%
Leisure and Hospitality	2,260	3,291	1,031	46%
Natural Resources and Mining	5,762	6,604	842	15%
Wholesale and Retail Trade	8,315	8,909	594	7%
Manufacturing	4,228	4,555	327	8%
Transportation and Warehousing	573	791	218	38%
Professional and Technical Services	5,411	5,564	153	3%
Management of Companies and Enterprises	252	375	123	49%
Educational and Health Services	1,353	1,467	114	8%
Administrative and Waste Services	7,074	7,149	75	1%
Information	354	414	60	17%
Construction	8,676	8,719	43	0%
Utilities	403	419	16	4%
Financial Activities	123	127	4	3%
Total	51,402	58,811	7,409	14%

WorkSource Oregon Employment Department www.WorkingInOregon.org

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