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## OCCUPATIONAL EMPLOYMENT AND WAGES IN GREEN GOODS AND SERVICES — NOVEMBER 2011

In November 2011, transportation and material moving occupations accounted for 539,470 jobs, or approximately 28 percent of total employment, in establishments that received all of their revenue from green goods and services, the U.S. Bureau of Labor Statistics reported today. The production (208,180) and office and administrative support (194,440) occupational groups were the second- and third-largest in all-green establishments, representing about 11 and 10 percent of employment, respectively. (See chart 1 and table 1.)

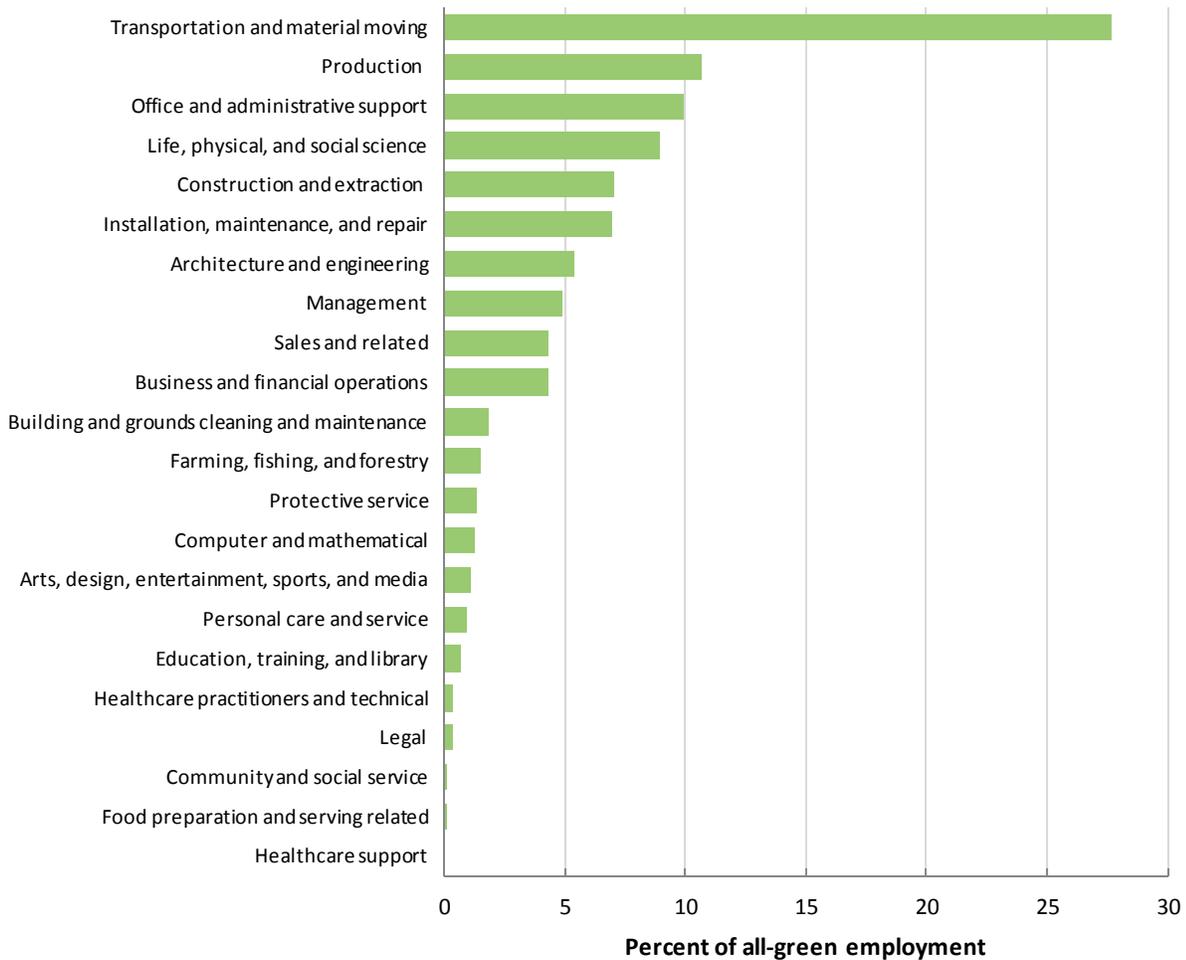
According to 2010 annual average data published by the Green Goods and Services (GGS) survey, about three-fifths of the 3.1 million jobs associated with green goods and services production were in establishments that received all of their revenue from green goods and services. This Occupational Employment and Wages in Green Goods and Services (GGS-OCC) release presents November 2011 occupational employment and wage information for 1.9 million jobs in these all-green establishments. (See Technical Note for an explanation of the differences between the GGS and GGS-OCC data.)

The GGS-OCC data are based on a sample of approximately 93,000 business establishments in 333 industries identified as potentially producing green goods or providing green services. The data consist of occupational employment and wage information categorized by the percent of the establishments' revenue received from green goods and services (GGS). The establishments covered in this release received 100 percent of their revenue from green goods and services. Occupational employment and wage data for in-scope establishments with no green revenue and with mixed green and nongreen revenue are available from the GGS-OCC web site at [www.bls.gov/ggsocc/](http://www.bls.gov/ggsocc/). More information about the GGS-OCC data is provided in the Technical Note.

### Occupations

- Five of the 6 largest detailed occupations in all-green establishments were in the transportation and material moving occupational group. These 5 occupations were school or special client bus drivers (174,450); transit and intercity bus drivers (111,760); refuse and recyclable materials collectors (56,930); hand laborers and freight, stock, and material movers (54,890); and heavy and tractor-trailer truck drivers (39,060). (See chart 2 and table 2.)

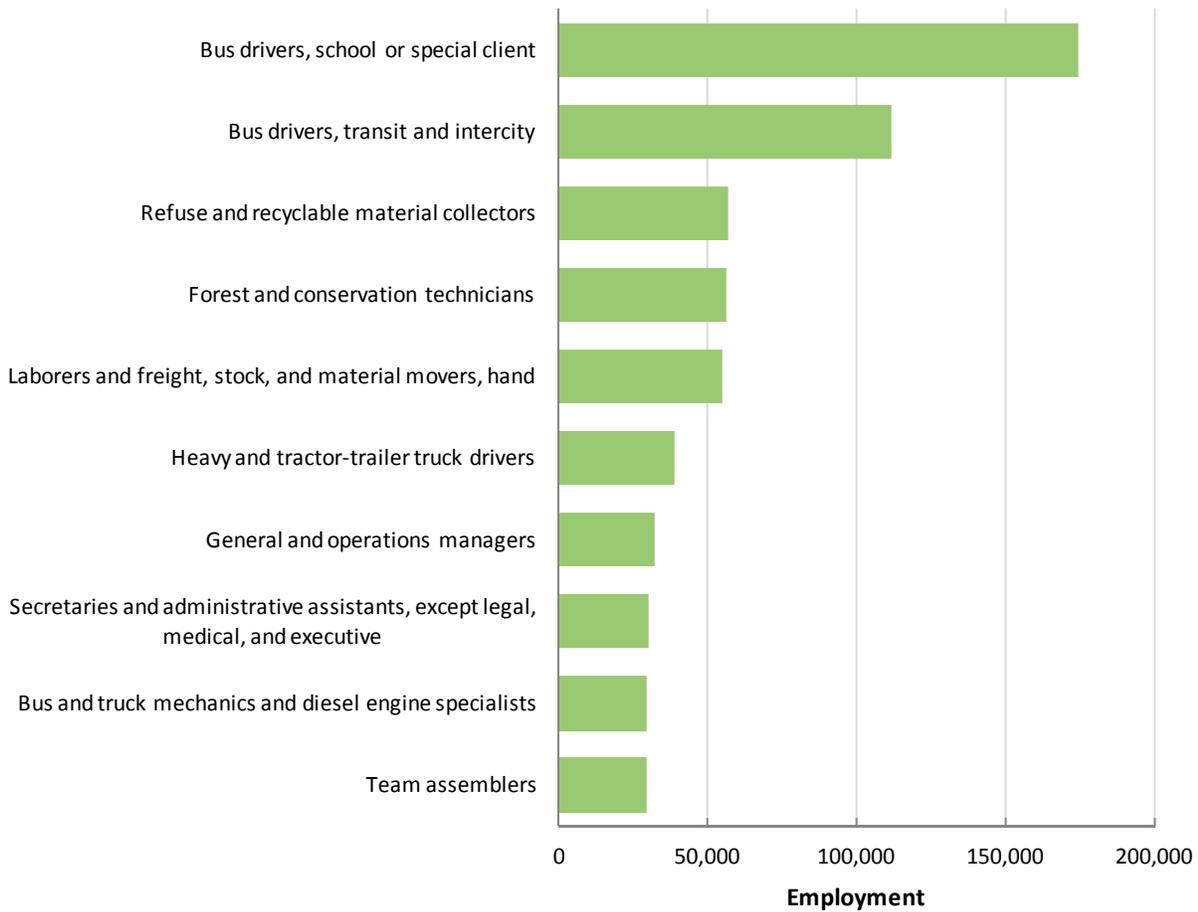
**Chart 1. Occupational groups as a percent of employment in all-green establishments, November 2011**



NOTE: Data represent occupational group employment as a percent of total employment in establishments that are classified in industries covered by the Green Goods and Services (GGS) survey and receive all of their revenue from the production of green goods or provision of green services.

- The largest occupations in all-green establishments outside of the transportation and material moving group included forest and conservation technicians, with employment of 56,620; general and operations managers (32,030); secretaries and administrative assistants, except legal, medical, and executive (30,470); and bus and truck mechanics and diesel engine specialists (29,570). (See chart 2 and table 2.)
- Annual mean wages for the largest occupations in all-green establishments ranged from \$26,270 for hand laborers and freight, stock, and material movers to \$115,520 for general and operations managers. (See chart 3 and table 2.)

**Chart 2. Employment for the largest occupations in all-green establishments, November 2011**

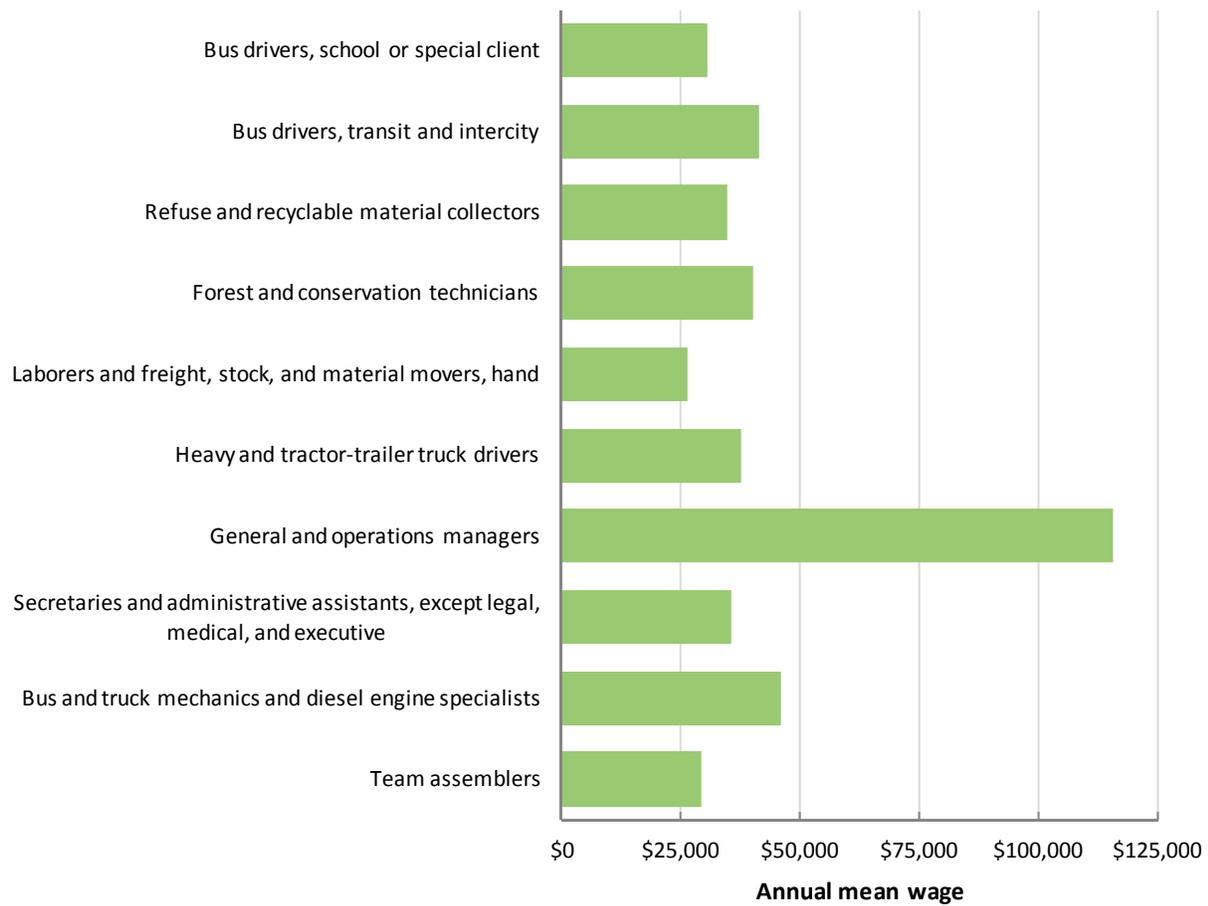


NOTE: Data represent employment in establishments that are classified in industries covered by the Green Goods and Services (GGS) survey and receive all of their revenue from the production of green goods or provision of green services.

### Occupational groups by industries

- The transportation and warehousing industry had 454,710 jobs in all-green establishments, more than any other industry. About 73 percent of these jobs were in transportation and material moving occupations. (See table 3.)
- Other industries with large numbers of jobs in all-green establishments included public administration (276,020), administrative and waste services (274,700), and manufacturing (266,510). (See table 3.)

**Chart 3. Annual mean wages for the largest occupations in all-green establishments, November 2011**



NOTE: Data represent annual mean wages in establishments that are classified in industries covered by the Green Goods and Services (GGS) survey and receive all of their revenue from the production of green goods or provision of green services.

- Nearly 41 percent of jobs in all-green public administration establishments were in life, physical, and social science occupations. Transportation and material moving occupations made up about 42 percent of the jobs in all-green administrative and waste services establishments. Over half of the jobs in all-green manufacturing establishments were in production occupations. (See table 3.)

**Detailed occupations in selected industries**

Utilities, construction, and professional, scientific, and technical services were among the industries with the highest percentage of revenue from green goods and services in 2010, based on results from the GGS survey. Selected data for these industries are shown in tables 4, 5, and 6 and highlighted below:

- The utilities industry had 142,030 jobs in all-green establishments. About a quarter of these jobs were in production occupations, including water and wastewater treatment plant and system operators (20,200), power plant operators (4,530), and nuclear power reactor operators (4,380).

Outside of the production group, the largest occupations in all-green utilities establishments included nuclear engineers (8,170), security guards (5,270), and industrial machinery mechanics (5,100). (See table 4.)

- With an annual mean wage of \$96,270, nuclear engineers was among the highest paying of the largest occupations in all-green utilities establishments. The lowest paying of these occupations included security guards (\$43,580) and water and wastewater treatment plant and system operators (\$44,560). (See table 4.)
- The construction industry had 92,130 jobs in all-green establishments. Fifty-eight percent of these jobs were in construction and extraction occupations, including floor, ceiling, and wall insulation workers (8,210); carpenters (7,860); and construction laborers (7,680). These three occupations made up over one-quarter of employment in all-green construction establishments. Heating, air conditioning, and refrigeration mechanics and installers (5,190) was one of the largest occupations outside of the construction and extraction occupational group. (See table 5.)
- Floor, ceiling, and wall insulation workers was one of the lowest paying occupations in all-green construction establishments, with an annual mean wage of \$30,390. The highest paying of the largest occupations in all-green construction establishments included construction managers (\$86,130) and first-line supervisors of construction trades and extraction workers (\$62,870). (See table 5.)
- Professional, scientific, and technical services had 138,360 jobs in all-green establishments. More than half of these jobs were in life, physical, and social science occupations or in architecture and engineering occupations. The largest occupation in all-green professional, scientific, and technical services establishments was environmental scientists and specialists, including health, with employment of 12,130. (See table 6.)
- Several of the largest occupations in all-green professional, scientific, and technical services establishments had relatively high annual mean wages, including general and operations managers (\$132,580), mechanical engineers (\$88,750), and architects, except landscape and naval (\$83,560). (See table 6.)

# Technical Note

## Overview

The Occupational Employment and Wages in Green Goods and Services (GGG-OCC) program provides occupational employment and wage information for businesses that produce green goods or provide green services. The GGG-OCC data are based on a sample of approximately 93,000 business establishments classified in 333 industries in which establishments potentially produce green goods or provide green services as their primary activity.

The GGG-OCC estimates are produced by linking data from two different surveys at the establishment level: the percent of the establishment's revenue received from green goods and services, from the Green Goods and Services (GGG) survey; and occupational employment and wage information, from the Occupational Employment Statistics (OES) survey. These data are used to produce occupational employment and wage estimates for three groups of establishments: those that receive none of their revenue from green goods and services, those that receive all of their revenue from green goods and services, and those with revenue from a mix of green and nongreen goods and services. This release covers only those establishments that receive 100 percent of their revenue from green goods and services. Data are available at the national level by industry sector for in-scope industries and for all in-scope industries combined. These data represent all employment at establishments in a given revenue category; not all jobs in establishments with mixed green and nongreen revenue are associated with production of green goods and services.

The GGG-OCC estimates are based on the BLS output approach to measuring green jobs: *jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources*. More information about the BLS green jobs initiative is available from the green jobs homepage at [www.bls.gov/green](http://www.bls.gov/green).

## Concepts

**Green goods and services** are defined as goods and services that benefit the environment or conserve natural resources. These goods and services are sold to customers and include research and development, installation, and maintenance services. Green goods and services fall into one or more of the following five categories:

1. *Energy from renewable sources*. Electricity, heat, or fuel generated from renewable sources. These energy sources include wind, biomass, geothermal, solar, ocean, hydropower, and landfill gas and municipal solid waste.
2. *Energy efficiency*. Products and services that improve energy efficiency. Included in this group are energy-efficient equipment, appliances, buildings, and vehicles, as well as products and services that improve the energy efficiency of buildings and the efficiency of energy storage and distribution, such as Smart Grid technologies.
3. *Pollution reduction and removal, greenhouse gas reduction, and recycling and reuse*. These are products and services that:
  - Reduce or eliminate the creation or release of pollutants or toxic compounds, or remove pollutants or hazardous waste from the environment.
  - Reduce greenhouse gas emissions through methods other than renewable energy generation and energy efficiency, such as electricity generated from nuclear sources.
  - Reduce or eliminate the creation of waste materials; collect, reuse, remanufacture, recycle, or compost waste materials or wastewater.
4. *Natural resources conservation*. Products and services that conserve natural resources. Included in this group are products and services related to organic agriculture and sustainable forestry; land management; soil, water, or wildlife conservation; and storm water management.
5. *Environmental compliance, education and training, and public awareness*. These are products and services that:
  - Enforce environmental regulations.
  - Provide education and training related to green technologies and practices.
  - Increase public awareness of environmental issues.

An **establishment** is generally a single physical location at which economic activity occurs (e.g., store, factory, restaurant, etc.). When a single physical location encompasses two or more distinct economic activities, it is treated as two or more separate establishments if separate payroll records are available and certain other criteria are met.

An **industry** is a group of establishments that produce similar products or provide similar services. For example, all establishments that manufacture automobiles are in the same industry. A given industry, or even a particular establishment in that industry, might have employees in

dozens of occupations. In the GGS-OCC data, similar establishments are grouped into industries based on the 2007 North American Industry Classification System (NAICS). More information about the NAICS is available from [www.bls.gov/bls/naics.htm](http://www.bls.gov/bls/naics.htm).

An *occupation* is a set of activities or tasks that employees are paid to perform. Workers are classified into occupations based on their job duties and, in some cases, on the skills, education, and/or training required. Workers with similar job duties are classified in the same occupation, regardless of the industry in which they are employed.

*Employees* are all part-time and full-time workers who are paid a wage or salary. The estimates do not cover the self-employed, owners and partners in unincorporated firms, household workers, or unpaid family workers.

### Industry coverage

The GGS-OCC estimates are based on data for 333 of the nearly 1,200 detailed (6-digit) 2007 NAICS industries. BLS identified these 333 industries as those in which businesses potentially produced green goods or provided green services as their primary activity, based on the definition of green goods and services above. The GGS-OCC scope contains 20 percent of employment covered by state or federal unemployment insurance, or about 19 percent of total U.S. employment. A list of GGS-OCC in-scope industries is available in PDF format at [www.bls.gov/green/final\\_green\\_def\\_8242010\\_pub.pdf](http://www.bls.gov/green/final_green_def_8242010_pub.pdf) or in Excel format at [www.bls.gov/green/final\\_green\\_def\\_8242010\\_pub.xls](http://www.bls.gov/green/final_green_def_8242010_pub.xls).

### The occupational classification system

The GGS-OCC occupational classifications are based on the Office of Management and Budget's Standard Occupational Classification (SOC) system ([www.bls.gov/soc/](http://www.bls.gov/soc/)). The GGS-OCC estimates are based on data collected under both the 2000 SOC and the revised 2010 SOC systems. Almost all the occupations in this release are 2010 SOC occupations; however, some are not. In some cases an occupation is a combination of data reported for one or more occupations in the 2000 SOC and one or more 2010 SOC occupations. Some of these combination occupations match occupations in the 2000 SOC. In other cases, occupations from the two structures were combined into a hybrid occupation that is not found in either the 2000 or 2010 SOC. Some of these hybrid occupations have the same title as a 2010 SOC occupation, but not the same content. These occupations are marked with an asterisk (\*) and given a temporary code for the GGS-OCC data. For more information on how data collected under the two structures were combined, including a downloadable concordance between the SOC and GGS-OCC structures, see [www.bls.gov/oes/oes\\_ques.htm#Ques41](http://www.bls.gov/oes/oes_ques.htm#Ques41).

### Survey sample

The GGS-OCC estimates are based on a sample of approximately 93,000 private sector and federal, state, and local government establishments in the 50 states and the District of Columbia. The GGS-OCC sample is restricted to the 333 in-scope NAICS industries, and is a subset of units in both the GGS sample and either the regular OES sample or a supplement to the OES sample. Both the GGS and OES samples are drawn primarily from the BLS Quarterly Census of Employment and Wages (QCEW), which consists of businesses reporting to state unemployment insurance (UI) programs.

The full GGS sample of 120,000 establishments was selected by stratifying the sampling frame by industry and state, and sampling larger employers with a higher probability than smaller employers. The GGS sample also includes an "environmental allocation" of approximately 6,500 units, selected from a list of 13,000 establishments that BLS had previously identified as being involved in green activity.

The full OES sample consists of approximately 1.2 million business establishments, collected in 6 semiannual survey panels over a 3-year period. The GGS-OCC estimates are based on OES microdata collected with reference dates of November 2011, May 2011, November 2010, May 2010, November 2009, and May 2009. The OES sample is stratified by metropolitan or nonmetropolitan area, industry, and size. To provide the most occupational coverage, larger employers are more likely to be selected than smaller employers.

Approximately 41,300 establishments in the initial GGS sample overlapped naturally with units in the 2009-2011 OES sample. In order to increase the overlap between the two surveys, a swapping algorithm was used to replace 23,400 nonoverlapping GGS units with similar units that were already part of the OES sample. The GGS-OCC sample also included 3,300 federal government units and a 25,000-unit supplement to the OES survey, designed to cover agricultural industries excluded from OES and to provide additional coverage of certain other industries.

### Data collection

Establishments in the GGS-OCC sample received two mail survey forms, one for the GGS survey and one for the OES survey. Among GGS-OCC sample units, the overall national response rates for the GGS survey were 66.4 percent based on establishments and 59.9 percent based on weighted employment. Response rates for the OES survey were 66.7 percent based on establishments and 65.3 percent based on weighted employment. About 48.6 percent of sampled establishments, representing 42.6 percent of weighted sample employment, responded to both surveys.

The GGS survey asked establishments to report the percent of their previous fiscal year's revenue received from green goods and services. Survey forms listed examples of green goods and services meeting the BLS definition. Establishments that did not generate revenue, such as government establishments, nonprofits, or startups without positive revenue, were asked to provide the percent of employment associated with the production of green goods or provision of green services.

The OES survey form asked respondents to provide total employment for the sampled establishment, as well as the number of workers, by occupation, in each of 12 specific wage intervals. The wage intervals were defined in terms of both hourly rates and the corresponding annual rates, where the annual rate for an occupation is calculated by multiplying the hourly wage rate by a typical work year of 2,080 hours. Full-time workers could be reported by either hourly rates or annual salaries, depending on how the worker was paid.

## **Estimation methodology**

### *Wage updating*

The OES survey is designed to produce estimates at detailed levels of geography, industry, and occupation by combining 6 panels of data collected over a 3-year period. Wages for the most recent panel need no adjustment. Wages for earlier panels are updated to the reference period based on movements in the BLS Employment Cost Index (ECI) for the most closely corresponding occupational category.

### *Nonresponse*

GGG-OCC nonrespondents fell into three categories: (1) units that responded to neither GGS nor OES; (2) units that responded to OES, but not GGS; and (3) units that responded to GGS, but not OES. To compensate for nonrespondents in categories 1 and 2, the weights of responding units were adjusted through the use of nonresponse adjustment factors (NRAFs). For nonrespondents in category 3, a nearest neighbor hot deck procedure was used to impute occupational staffing patterns, and a variant of mean wage imputation was used to impute missing occupational wages.

### *Weighting and benchmarking*

Sampled establishments were weighted to represent all establishments for the GGS-OCC scope and reference period. Each establishment was initially assigned a weight based on the reciprocal of its probability of selection into the GGS sample. For units in the OES supplemental sample, the GGS sampling weight was adjusted to account for its probability of being subsequently subsampled in the supplement. Weights were also modified by NRAFs in order to adjust for units that did not respond to the GGS

survey. Finally, the GGS-OCC data were benchmarked to the average of QCEW employment levels for May and November 2011.

### *Employment and wage estimation*

The share of green revenue from GGS was used to divide establishments into groups of businesses reporting no revenue from green goods and services, all revenue from green goods and services, and a mix of green and nongreen revenue. Occupational employment estimates were calculated by multiplying each establishment's reported employment in an occupation by the establishment's final weight, and summing the resulting weighted employment across all establishments reporting the occupation.

Because GGS-OCC wage data were collected by wage range rather than by wage rate, additional information was required to estimate mean and median wages. Data from the BLS National Compensation Survey (NCS) were used to calculate interval means for employees in each of the 12 wage intervals; these interval means were used in combination with the reported data on occupational employment by wage interval to calculate the GGS-OCC wage estimates.

## **GGG-OCC and GGS estimates**

Although the GGS-OCC data have some similarities to the green jobs estimates from the GGS survey, the two datasets also have important conceptual differences and are not designed to be compared. Both the GGS-OCC and GGS estimates are based on the BLS output approach to measuring green jobs, have the same industry scope, and have overlapping samples. Both datasets also use the percent of each sampled establishment's revenue received from green goods and services, as reported to the GGS survey, to produce their estimates. However, the two sets of estimates use the green revenue percentage differently. The GGS survey multiplies each establishment's employment by its green revenue share in order to produce estimates of the total number of green jobs. For example, if an establishment that produces both green and nongreen products employs 100 people and obtains 40 percent of its revenue from the sale of its green products, the GGS survey would count 40 of that establishment's employees as green.

Unlike the GGS survey, the GGS-OCC program does not provide explicit estimates of the number of green jobs. In particular, the GGS-OCC data do not represent occupational breakdowns of the green employment estimates from the GGS survey. Instead, the GGS-OCC program uses the green revenue shares from GGS to group establishments into categories based on the percent of their revenue received from green goods and services. For each revenue category, the GGS-OCC program provides occupational employment and wage estimates for all employees in establishments in that category. The two datasets also have different reference periods: the GGS data

represent 2010 annual averages, and the GGS-OCC data have a November 2011 reference date. For more information about the GGS survey, see [www.bls.gov/ggs/](http://www.bls.gov/ggs/).

### **Data available**

The GGS-OCC data consist of employment, mean wage, and median wage estimates by occupation, presented for three groups of establishments: those with none, all, or some, but not all, of their revenue from green goods and services. Estimates are available at the national level for 2-digit NAICS industries and for all industries combined.

### **For more information**

Answers to frequently asked questions about the GGS-OCC data are available at [www.bls.gov/ggsocc/faq.htm](http://www.bls.gov/ggsocc/faq.htm). Detailed technical information about the GGS-OCC estimates is available in our Survey Methods and Reliability Statement at [www.bls.gov/ggsocc/survey\\_methods.pdf](http://www.bls.gov/ggsocc/survey_methods.pdf).

Information in this release will be made available to sensory impaired individuals upon request. Voice phone: (202) 691-5200; Federal Relay Service: (800) 877-8339.

**Table 1. Employment, percent of employment, and annual mean wages for all-green establishments, by occupational group, November 2011**

Occupational group	Employment	Percent of employment in all-green establishments	Annual mean wage <sup>1</sup>
<b>All occupations<sup>2</sup></b> .....	<b>1,949,520</b>	<b>100.0</b>	<b>\$48,210</b>
Management .....	95,360	4.9	110,220
Business and financial operations .....	83,740	4.3	71,250
Computer and mathematical.....	25,540	1.3	77,270
Architecture and engineering .....	105,670	5.4	77,130
Life, physical, and social science .....	174,930	9.0	57,660
Community and social service .....	3,030	0.2	47,170
Legal .....	6,670	.3	115,150
Education, training, and library .....	13,090	.7	53,440
Arts, design, entertainment, sports, and media .....	22,200	1.1	50,750
Healthcare practitioners and technical .....	7,900	.4	66,640
Healthcare support .....	70	( <sup>3</sup> )	35,260
Protective service .....	26,320	1.4	44,090
Food preparation and serving related .....	2,160	.1	27,190
Building and grounds cleaning and maintenance .....	35,620	1.8	29,080
Personal care and service .....	18,780	1.0	24,320
Sales and related .....	84,560	4.3	38,020
Office and administrative support .....	194,440	10.0	37,260
Farming, fishing, and forestry .....	29,260	1.5	25,670
Construction and extraction .....	137,060	7.0	44,910
Installation, maintenance, and repair .....	135,470	6.9	49,140
Production .....	208,180	10.7	39,240
Transportation and material moving .....	539,470	27.7	35,390

<sup>1</sup> Annual wages have been calculated by multiplying the hourly mean wage by a "year-round, full-time" hours figure of 2,080 hours; for those occupations where an hourly mean wage is not published, the annual wage has been directly calculated from the reported survey data.

<sup>2</sup>Detail may not add to totals due to rounding.

<sup>3</sup>Less than 0.05 percent.

NOTE: Data represent occupational employment and wages for establishments that received all of their revenue from green goods and services. Establishments that did not generate revenue, such as government establishments, nonprofits, or startups without positive revenue, reported all of their employment associated with the production of green goods or provision of green services.

**Table 2. Employment, percent of employment, and annual mean wages for all-green establishments, by selected occupational groups and detailed occupations, November 2011**

Occupation <sup>1</sup>	Employment	Percent of employment in all-green establishments	Annual mean wage <sup>2</sup>
<b>All occupations</b> .....	<b>1,949,520</b>	<b>100.0</b>	<b>\$48,210</b>
<b>Management occupations</b> .....	<b>95,360</b>	<b>4.9</b>	<b>110,220</b>
General and operations managers .....	32,030	1.6	115,520
Administrative services managers .....	6,050	0.3	79,610
Architectural and engineering managers .....	7,720	.4	128,700
Natural sciences managers .....	7,630	.4	98,820
Managers, all other .....	7,240	.4	104,860
<b>Business and financial operations occupations</b> .....	<b>83,740</b>	<b>4.3</b>	<b>71,250</b>
Purchasing agents, except wholesale, retail, and farm products .....	8,950	.5	63,330
Compliance officers .....	6,580	.3	67,670
Management analysts .....	8,530	.4	87,420
Business operations specialists, all other* .....	22,720	1.2	73,000
Accountants and auditors .....	12,480	.6	71,380
<b>Computer and mathematical occupations</b> .....	<b>25,540</b>	<b>1.3</b>	<b>77,270</b>
Software developers, applications .....	6,260	.3	91,250
<b>Architecture and engineering occupations</b> .....	<b>105,670</b>	<b>5.4</b>	<b>77,130</b>
Architects, except landscape and naval .....	6,050	.3	83,390
Civil engineers .....	9,600	.5	80,550
Electrical engineers .....	7,250	.4	86,290
Environmental engineers .....	16,620	.9	87,030
Mechanical engineers .....	9,030	.5	86,340
Nuclear engineers .....	9,050	.5	97,590
Engineers, all other .....	5,460	.3	87,590
<b>Life, physical, and social science occupations</b> .....	<b>174,930</b>	<b>9.0</b>	<b>57,660</b>
Zoologists and wildlife biologists .....	5,810	.3	64,500
Biological scientists, all other .....	8,840	.5	63,780
Conservation scientists .....	10,860	.6	65,280
Foresters .....	5,090	.3	57,100
Chemists .....	7,990	.4	62,960
Environmental scientists and specialists, including health .....	25,540	1.3	78,070
Geoscientists, except hydrologists and geographers .....	5,740	.3	68,850
Physical scientists, all other .....	7,490	.4	101,550
Biological technicians .....	6,070	.3	35,760
Chemical technicians .....	5,380	.3	41,500
Environmental science and protection technicians, including health .....	11,550	.6	45,860
Forest and conservation technicians .....	56,620	2.9	40,110
<b>Legal occupations</b> .....	<b>6,670</b>	<b>.3</b>	<b>115,150</b>
Lawyers .....	5,600	.3	125,570
<b>Education, training, and library occupations</b> .....	<b>13,090</b>	<b>.7</b>	<b>53,440</b>
<b>Arts, design, entertainment, sports, and media occupations</b> .....	<b>22,200</b>	<b>1.1</b>	<b>50,750</b>
Public relations specialists .....	5,630	.3	65,180
<b>Healthcare practitioners and technical occupations</b> .....	<b>7,900</b>	<b>.4</b>	<b>66,640</b>

See footnotes at end of table.

**Table 2. Employment, percent of employment, and annual mean wages for all-green establishments, by selected occupational groups and detailed occupations, November 2011—Continued**

Occupation <sup>1</sup>	Employment	Percent of employment in all-green establishments	Annual mean wage <sup>2</sup>
<b>Protective service occupations .....</b>	<b>26,320</b>	<b>1.4</b>	<b>\$44,090</b>
Security guards .....	7,810	0.4	42,190
Protective service workers, all other* .....	9,370	.5	33,600
<b>Building and grounds cleaning and maintenance occupations .....</b>	<b>35,620</b>	<b>1.8</b>	<b>29,080</b>
Janitors and cleaners, except maids and housekeeping cleaners .....	7,520	.4	30,260
Landscaping and groundskeeping workers .....	22,560	1.2	26,580
<b>Personal care and service occupations .....</b>	<b>18,780</b>	<b>1.0</b>	<b>24,320</b>
Childcare workers .....	10,620	.5	20,780
<b>Sales and related occupations .....</b>	<b>84,560</b>	<b>4.3</b>	<b>38,020</b>
First-line supervisors of retail sales workers .....	5,660	.3	33,630
Cashiers .....	20,900	1.1	24,530
Retail salespersons .....	27,650	1.4	20,440
Sales representatives, services, all other .....	8,000	.4	53,960
Sales representatives, wholesale and manufacturing, except technical and scientific products .....	10,600	.5	65,200
<b>Office and administrative support occupations .....</b>	<b>194,440</b>	<b>10.0</b>	<b>37,260</b>
First-line supervisors of office and administrative support workers .....	12,210	.6	54,920
Bookkeeping, accounting, and auditing clerks .....	18,040	.9	38,630
Customer service representatives .....	15,310	.8	36,240
Receptionists and information clerks .....	5,250	.3	30,840
Information and record clerks, all other .....	6,210	.3	44,820
Dispatchers, except police, fire, and ambulance .....	9,610	.5	45,730
Shipping, receiving, and traffic clerks .....	7,800	.4	33,440
Stock clerks and order fillers .....	12,990	.7	26,960
Executive secretaries and executive administrative assistants .....	10,980	.6	47,720
Secretaries and administrative assistants, except legal, medical, and executive .....	30,470	1.6	35,610
Office clerks, general .....	29,090	1.5	30,740
<b>Farming, fishing, and forestry occupations .....</b>	<b>29,260</b>	<b>1.5</b>	<b>25,670</b>
Farmworkers and laborers, crop, nursery, and greenhouse .....	14,350	.7	21,580
<b>Construction and extraction occupations .....</b>	<b>137,060</b>	<b>7.0</b>	<b>44,910</b>
First-line supervisors of construction trades and extraction workers .....	14,190	.7	61,960
Carpenters .....	10,340	.5	40,920
Construction laborers .....	15,040	.8	38,030
Operating engineers and other construction equipment operators .....	15,760	.8	46,570
Electricians .....	11,600	.6	56,420
Insulation workers, floor, ceiling, and wall .....	8,210	.4	30,390
Plumbers, pipefitters, and steamfitters .....	8,810	.5	44,850
Hazardous materials removal workers .....	21,980	1.1	42,820
Septic tank servicers and sewer pipe cleaners .....	7,230	.4	35,500
<b>Installation, maintenance, and repair occupations .....</b>	<b>135,470</b>	<b>6.9</b>	<b>49,140</b>
First-line supervisors of mechanics, installers, and repairers .....	13,550	.7	67,090
Automotive service technicians and mechanics .....	6,390	.3	35,610
Bus and truck mechanics and diesel engine specialists .....	29,570	1.5	46,130

See footnotes at end of table.

**Table 2. Employment, percent of employment, and annual mean wages for all-green establishments, by selected occupational groups and detailed occupations, November 2011—Continued**

Occupation <sup>1</sup>	Employment	Percent of employment in all-green establishments	Annual mean wage <sup>2</sup>
Heating, air conditioning, and refrigeration mechanics and installers .....	6,710	0.3	\$45,250
Industrial machinery mechanics .....	13,140	.7	53,820
Maintenance and repair workers, general .....	25,700	1.3	43,800
Helpers—installation, maintenance, and repair workers .....	5,240	.3	32,930
<b>Production occupations .....</b>	<b>208,180</b>	<b>10.7</b>	<b>39,240</b>
First-line supervisors of production and operating workers .....	17,980	.9	60,700
Electrical and electronic equipment assemblers .....	5,220	.3	32,090
Team assemblers .....	29,350	1.5	29,430
Welders, cutters, soldiers, and brazers .....	9,240	.5	36,180
Power plant operators .....	5,500	.3	56,440
Water and wastewater treatment plant and system operators .....	26,260	1.3	44,090
Inspectors, testers, sorters, samplers, and weighers .....	14,130	.7	35,510
Helpers—production workers .....	7,320	.4	28,370
<b>Transportation and material moving occupations .....</b>	<b>539,470</b>	<b>27.7</b>	<b>35,390</b>
First-line supervisors of helpers, laborers, and material movers, hand .....	5,010	.3	50,910
First-line supervisors of transportation and material-moving machine and vehicle operators .....	16,300	.8	57,090
Bus drivers, transit and intercity .....	111,760	5.7	41,580
Bus drivers, school or special client .....	174,450	8.9	30,460
Heavy and tractor-trailer truck drivers .....	39,060	2.0	37,470
Light truck or delivery services drivers .....	7,020	.4	30,910
Taxi drivers and chauffeurs .....	6,640	.3	25,900
Subway and streetcar operators .....	7,720	.4	58,920
Transportation attendants, except flight attendants .....	8,770	.4	21,810
Industrial truck and tractor operators .....	11,780	.6	31,980
Cleaners of vehicles and equipment .....	9,420	.5	36,150
Laborers and freight, stock, and material movers, hand .....	54,890	2.8	26,270
Refuse and recyclable material collectors .....	56,930	2.9	34,670

<sup>1</sup> Includes only occupations and occupational groups with employment of more than 5,000 in establishments receiving all their revenue from green goods and services. Occupational data will not sum to the major group and all-occupations totals because totals include occupations for which data are not shown separately.

<sup>2</sup> Annual wages have been calculated by multiplying the hourly mean wage by a "year-round, full-time" hours figure of 2,080 hours; for those occupations where an hourly mean wage is not published, the annual wage has been directly calculated from the reported survey data.

\* Occupation titles followed by an asterisk (\*) have similar titles, but not necessarily the same content, as 2010 SOC occupations.

NOTE: Data represent occupational employment and wages for establishments that received all of their revenue from green goods and services. Establishments that did not generate revenue, such as government establishments, nonprofits, or startups without positive revenue, reported all of their employment associated with the production of green goods or provision of green services.

**Table 3. Employment in all-green establishments, by occupational group and industry, November 2011**

Occupational group	Industry <sup>1</sup>							
	All in-scope industries <sup>2</sup>	Agriculture, forestry, fishing, and hunting	Utilities	Construction	Manufacturing	Wholesale trade	Retail trade	Transportation and warehousing
<b>All occupations<sup>3</sup></b> .....	<b>1,949,520</b>	<b>41,840</b>	<b>142,030</b>	<b>92,130</b>	<b>266,510</b>	<b>80,640</b>	<b>66,570</b>	<b>454,710</b>
Management .....	95,360	1,200	7,760	5,450	13,470	3,740	780	9,010
Business and financial operations .....	83,740	650	6,980	3,270	8,340	2,350	550	6,740
Computer and mathematical .....	25,540	120	2,150	380	3,810	( <sup>4</sup> )	( <sup>4</sup> )	1,190
Architecture and engineering .....	105,670	260	18,810	2,000	19,110	( <sup>4</sup> )	( <sup>4</sup> )	1,970
Life, physical, and social science .....	174,930	5,000	7,620	50	1,580	( <sup>4</sup> )	( <sup>4</sup> )	210
Community and social service .....	3,030	100	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	80	40
Legal .....	6,670	( <sup>4</sup> )	160	30	40	( <sup>4</sup> )	( <sup>4</sup> )	240
Education, training, and library .....	13,090	( <sup>4</sup> )	40	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	120	290
Arts, design, entertainment, sports, and media .....	22,200	100	610	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	230
Healthcare practitioners and technical .....	7,900	50	1,140	140	470	( <sup>4</sup> )	( <sup>4</sup> )	290
Healthcare support .....	70	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )
Protective service .....	26,320	990	6,300	( <sup>4</sup> )	460	180	550	5,260
Food preparation and serving related .....	2,160	40	( <sup>4</sup> )	1,070				
Building and grounds cleaning and maintenance .....	35,620	180	1,180	40	920	360	400	2,740
Personal care and service .....	18,780	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	12,250
Sales and related .....	84,560	450	440	2,770	7,440	5,550	47,040	4,840
Office and administrative support .....	194,440	2,340	17,530	8,650	23,500	11,060	10,350	28,310
Farming, fishing, and forestry .....	29,260	26,770	( <sup>4</sup> )	( <sup>4</sup> )	110	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )
Construction and extraction .....	137,060	70	12,260	53,100	5,990	960	( <sup>4</sup> )	8,150
Installation, maintenance, and repair .....	135,470	800	20,930	10,650	23,190	4,140	( <sup>4</sup> )	38,260
Production .....	208,180	300	35,890	1,510	135,510	12,110	1,600	1,380
Transportation and material moving .....	539,470	2,360	2,120	3,830	21,340	39,360	4,820	332,250

See footnotes at end of table.

**Table 3. Employment in all-green establishments, by occupational group and industry, November 2011—Continued**

Occupational group	Industry <sup>1</sup>							
	Information	Professional and technical services	Management of companies and enterprises	Administrative and waste services	Educational services	Arts, entertainment, and recreation	Other services, except public administration	Public administration
<b>All occupations<sup>3</sup></b> .....	<b>25,460</b>	<b>138,360</b>	<b>7,870</b>	<b>274,700</b>	<b>18,010</b>	<b>28,260</b>	<b>36,190</b>	<b>276,020</b>
Management .....	1,320	11,610	1,240	12,800	1,300	1,580	3,880	20,200
Business and financial operations .....	330	10,630	1,560	5,340	770	1,360	3,040	31,840
Computer and mathematical .....	930	7,930	( <sup>4</sup> )	1,260	720	310	420	6,140
Architecture and engineering .....	( <sup>4</sup> )	34,400	730	4,820	( <sup>4</sup> )	200	160	23,110
Life, physical, and social science .....	( <sup>4</sup> )	38,790	( <sup>4</sup> )	2,920	( <sup>4</sup> )	2,790	3,070	112,530
Community and social service .....	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	610	( <sup>4</sup> )	1,590	500
Legal .....	( <sup>4</sup> )	510	( <sup>4</sup> )	70	( <sup>4</sup> )	( <sup>4</sup> )	330	5,270
Education, training, and library .....	1,790	160	( <sup>4</sup> )	( <sup>4</sup> )	7,810	1,240	760	860
Arts, design, entertainment, sports, and media .....	8,970	3,670	( <sup>4</sup> )	210	130	740	2,350	3,560
Healthcare practitioners and technical .....	( <sup>4</sup> )	420	( <sup>4</sup> )	1,760	1,120	440	( <sup>4</sup> )	1,840
Healthcare support .....	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )
Protective service .....	( <sup>4</sup> )	200	( <sup>4</sup> )	180	320	3,570	( <sup>4</sup> )	8,280
Food preparation and serving related .....	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	160	250	310	( <sup>4</sup> )
Building and grounds cleaning and maintenance .....	210	820	( <sup>4</sup> )	21,390	730	2,500	620	3,510
Personal care and service .....	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	40	170	4,320	870	( <sup>4</sup> )
Sales and related .....	3,120	3,010	70	6,480	( <sup>4</sup> )	1,110	1,230	830
Office and administrative support .....	4,750	15,980	2,270	32,670	3,190	3,130	5,350	25,320
Farming, fishing, and forestry .....	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	30	50	260	120	1,890
Construction and extraction .....	( <sup>4</sup> )	3,060	( <sup>4</sup> )	43,910	70	470	800	8,200
Installation, maintenance, and repair .....	250	1,800	810	15,340	360	2,480	9,480	6,910
Production .....	1,260	4,440	( <sup>4</sup> )	10,950	( <sup>4</sup> )	130	670	2,400
Transportation and material moving .....	2,460	930	( <sup>4</sup> )	114,540	90	1,340	980	12,140

<sup>1</sup> Includes only industries that are in scope for GGS within each sector. For more information on the industry scope for the GGS-OCC estimates, see the Technical Note.

<sup>2</sup> Data represent occupational employment and wages for establishments that received all of their revenue from green goods and services. Establishments that did not generate revenue, such as government establishments, nonprofits, or startups without positive revenue, reported all of their employment associated with the production of green goods or provision of green services.

<sup>3</sup> Occupations listed will not sum to all-occupations totals because the totals include occupational groups for which data are not shown.

<sup>4</sup> Estimate not released.

**Table 4. All-green utilities establishments: employment, percent of total employment, and annual mean wages for the largest occupations, November 2011**

Occupation	Employment <sup>1</sup>	Percent of total employment	Annual mean wage <sup>2</sup>
<b>All occupations</b> <sup>3</sup> .....	<b>142,030</b>	<b>100.0</b>	<b>\$62,500</b>
Water and wastewater treatment plant and system operators .....	20,200	14.2	44,560
Nuclear engineers .....	8,170	5.8	96,270
Security guards .....	5,270	3.7	43,580
Industrial machinery mechanics .....	5,100	3.6	61,830
Power plant operators .....	4,530	3.2	57,620
Nuclear power reactor operators .....	4,380	3.1	77,660
First-line supervisors of production and operating workers .....	4,020	2.8	69,930
Maintenance and repair workers, general .....	3,880	2.7	47,180
Nuclear technicians .....	3,630	2.6	75,370
Office clerks, general .....	3,520	2.5	37,640

<sup>1</sup> GGS-OCC data for utilities include the following North American Industry Classification System (NAICS) industries: Hydroelectric power generation (NAICS 221111), Nuclear electric power generation (NAICS 221113), Other electric power generation (NAICS 221119), Water supply and irrigation systems (NAICS 221310), Sewage treatment facilities (NAICS 221320), and Steam and air-conditioning supply (NAICS 221330). For more information on the industry scope for the GGS-OCC estimates, see the Technical Note.

<sup>2</sup> Annual wages have been calculated by multiplying the hourly mean wage by a "year-round, full-time" hours figure of 2,080 hours; for those occupations where an hourly mean wage is not published, the annual wage has been directly calculated from the reported survey data.

<sup>3</sup> Occupations listed will not sum to all-occupations total because the total includes occupations for which data are not shown.

NOTE: Data represent occupational employment and wages for establishments that received all of their revenue from green goods and services. Establishments that did not generate revenue, such as government establishments, nonprofits, or startups without positive revenue, reported all of their employment associated with the production of green goods or provision of green services.

**Table 5. All-green construction establishments: employment, percent of total employment, and annual mean wages for the largest occupations, November 2011**

Occupation	Employment <sup>1</sup>	Percent of total employment	Annual mean wage <sup>2</sup>
<b>All occupations<sup>3</sup></b> .....	<b>92,130</b>	<b>100.0</b>	<b>\$47,850</b>
Insulation workers, floor, ceiling, and wall .....	8,210	8.9	30,390
Carpenters .....	7,860	8.5	39,900
Construction laborers .....	7,680	8.3	38,020
First-line supervisors of construction trades and extraction workers .....	5,830	6.3	62,870
Electricians .....	5,390	5.9	54,230
Heating, air conditioning, and refrigeration mechanics and installers .....	5,190	5.6	43,010
Plumbers, pipefitters, and steamfitters .....	4,730	5.1	41,330
Secretaries and administrative assistants, except legal, medical, and executive ....	2,810	3.1	35,200
Construction managers .....	2,610	2.8	86,130
Operating engineers and other construction equipment operators .....	2,440	2.6	53,510

<sup>1</sup> GGS-OCC data for construction include the following North American Industry Classification System (NAICS) industries: Construction of buildings (NAICS 236); Water and sewer line and related structures construction (NAICS 237110); Power and communication line and related structures construction (NAICS 237130); Land subdivision (NAICS 237210); Other heavy and civil engineering construction (NAICS 237990); and Specialty trade contractors (NAICS 238). For more information on the industry scope for the GGS-OCC estimates, see the Technical Note.

<sup>2</sup> Annual wages have been calculated by multiplying the hourly mean wage by a "year-round, full-time" hours figure of 2,080 hours; for those occupations where an hourly mean wage is not published, the annual wage has been directly calculated from the reported survey data.

<sup>3</sup> Occupations listed will not sum to all-occupations total because the total includes occupations for which data are not shown.

NOTE: Data represent occupational employment and wages for establishments that received all of their revenue from green goods and services. Establishments that did not generate revenue, such as government establishments, nonprofits, or startups without positive revenue, reported all of their employment associated with the production of green goods or provision of green services.

**Table 6. All-green professional, scientific, and technical services establishments: employment, percent of total employment, and annual mean wages for the largest occupations, November 2011**

Occupation	Employment <sup>1</sup>	Percent of total employment	Annual mean wage <sup>2</sup>
<b>All occupations<sup>3</sup></b> .....	<b>138,360</b>	<b>100.0</b>	<b>\$68,350</b>
Environmental scientists and specialists, including health .....	12,130	8.8	67,700
Environmental engineers .....	7,990	5.8	82,060
Environmental science and protection technicians, including health .....	7,250	5.2	43,150
Architects, except landscape and naval .....	5,770	4.2	83,560
Chemists .....	4,710	3.4	55,660
General and operations managers .....	4,650	3.4	132,580
Geoscientists, except hydrologists and geographers .....	4,280	3.1	66,700
Secretaries and administrative assistants, except legal, medical, and executive ....	3,980	2.9	36,210
Mechanical engineers .....	3,970	2.9	88,750
Chemical technicians .....	3,310	2.4	38,600

<sup>1</sup> GGS-OCC data for professional, scientific, and technical services include the following North American Industry Classification System (NAICS) industries: Offices of lawyers (NAICS 541110); Architectural services (NAICS 541310); Landscape architectural services (NAICS 541320); Engineering services (NAICS 541330); Building inspection services (NAICS 541350); Geophysical surveying and mapping services (NAICS 541360); Other surveying and mapping services (NAICS 541370); Testing laboratories (NAICS 541380); Interior design services (NAICS 541410); Industrial design services (NAICS 541420); Graphic design services (NAICS 541430); Custom computer programming services (NAICS 541511); Computer systems design services (NAICS 541512); Process and logistics consulting services (NAICS 541614); Environmental consulting services (NAICS 541620); Other technical consulting services (NAICS 541690); Research and development in biotechnology (NAICS 541711); Research and development in the physical, engineering, and life sciences (except biotechnology) (NAICS 541712); Advertising agencies (NAICS 541810); Public relations agencies (NAICS 541820); and Commercial photography (NAICS 541922). For more information on the industry scope for the GGS-OCC estimates, see the Technical Note.

<sup>2</sup> Annual wages have been calculated by multiplying the hourly mean wage by a "year-round, full-time" hours figure of 2,080 hours; for those occupations where an hourly mean wage is not published, the annual wage has been directly calculated from the reported survey data.

<sup>3</sup> Occupations listed will not sum to all-occupations total because the total includes occupations for which data are not shown.

NOTE: Data represent occupational employment and wages for establishments that received all of their revenue from green goods and services. Establishments that did not generate revenue, such as government establishments, nonprofits, or startups without positive revenue, reported all of their employment associated with the production of green goods or provision of green services.