

Green technologies and practices: a visual essay

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Three-quarters of business establishments during August 2011 used at least one green technology or practice to make their production processes more environmentally friendly. More than half took steps to reduce or eliminate the creation of waste materials as a result of their operations, and approximately 1 in 5 used technologies or practices to conserve natural resources such as soil, water, or wildlife. Information and educational services were among the industries with the highest incidence of green technologies and practices, with more than 4 in 5 such establishments reporting the use of at least one green technology or practice.

Green technologies and practices accounted for more than half of the time workers spent at more than 850,000 jobs; this represents about 0.7 percent of total U.S. jobs and included, for example, 56,700 janitors, 22,000 landscaping and groundskeeping workers, and 13,300 automotive service technicians and mechanics.

These are some of the results from the first Bureau of Labor Statistics (BLS) Green Technologies and Practices (GTP) survey, released in June 2012. The GTP survey is a sample survey of 35,000 business establishments that collects information on the use of green technologies and practices, along with information about employment and wages for workers who spend more than half their time involved in these technologies and practices. The GTP survey uses the BLS process approach to measuring green jobs. (A separate BLS survey, the Green Goods and Services (GGS) survey, uses the output approach to measuring green jobs by collecting data on jobs that are associated with producing goods or providing services that benefit the environment or conserve natural resources. Data on GGS jobs are available at www.bls.gov/ggs.)

For the purposes of the GTP survey, green technologies and practices are defined as those which make an establishment's production processes more environmentally friendly. GTP survey respondents were asked

whether they had used each of the following types of green technologies and practices during the survey reference period, the pay period that included August 12, 2011:

- Generation of electricity, heat, or fuel from renewable sources primarily for use within the establishment
- Use of technologies or practices to improve energy efficiency within the establishment
- Use of technologies or practices in operations to reduce greenhouse gas emissions through methods other than renewable energy generation and energy efficiency
- Use of technologies or practices either to reduce the creation or release of pollutants or toxic compounds as a result of operations or to remove pollutants or hazardous waste from the environment
- Use of technologies or practices to reduce or eliminate the creation of waste materials as a result of operations
- Use of technologies or practices in operations to conserve natural resources, excluding the use of recycled inputs in production processes

Respondents also were asked to provide employment and wage information, by occupation, for workers who spent more than half their time involved in green technologies and practices during the survey reference period. Workers were considered to be involved in green technologies and practices if they were researching, developing, maintaining, using, or installing green technologies and practices or were training the establishment's workers in these technologies and practices.

This visual essay presents highlights from the GTP survey. The first 7 charts focus on business establish-

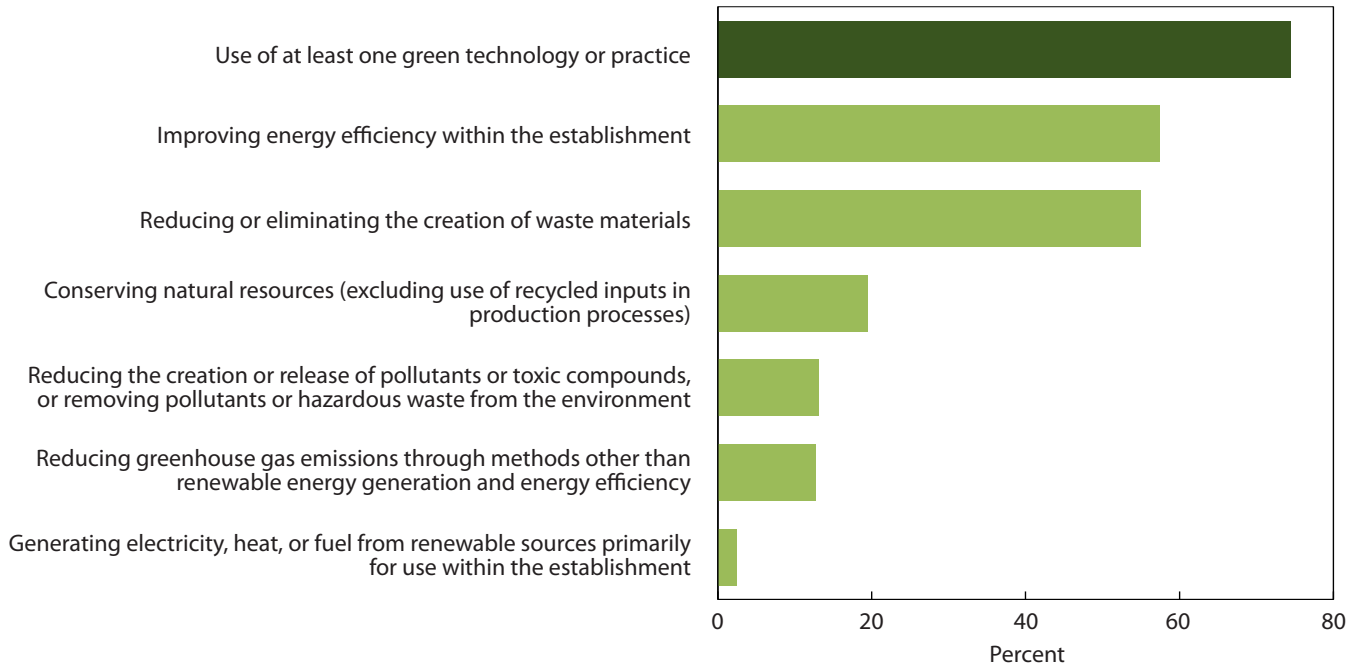
ments' use of green technologies and practices. Charts 1 and 2 show the percentage of establishments, nationally and by census region, that used at least one green technology or practice and that used specific types of technologies or practices during the survey reference period. Charts 3 through 7 present data on green technologies and practices use by industry.

The second part of the visual essay presents data on "GTP employment," or employment of workers who spent more than half their time involved in green technologies and practices during the survey reference period. Chart 8 presents GTP employment as a percentage of total employment

by industry. Charts 9 through 11 contain national data on GTP employment and wages by occupation.

Complete GTP survey data are available from the GTP homepage at www.bls.gov/gtp. Detailed information on the GTP survey methodology, including examples of the types of technologies and practices included in each green technologies and practices category, is available in the survey methods and reliability statement at www.bls.gov/gtp/survey_methods.htm. This visual essay was prepared by Audrey Watson, an economist in the Occupational Employment Statistics program. For more information, contact the GTP staff at gtpinfo@bls.gov or (202) 691-6599.

1. Percentage of establishments using green technologies and practices, by type of technology or practice, August 2011

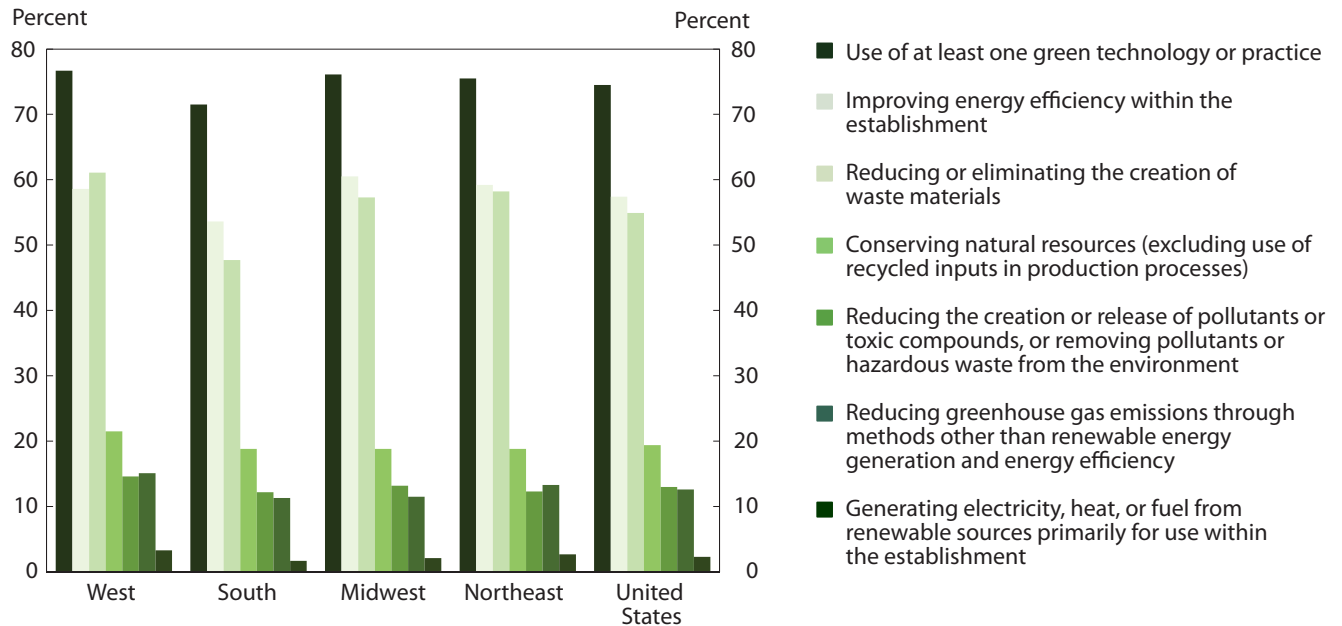


NOTES: Specific types of green technologies and practices are shown by lighter bars. Because establishments could report more than one green technology or practice, the percentage of establishments using specific green technologies and practices will not sum to the percentage of establishments using at least one green technology or practice.

SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- About three-quarters of business establishments used at least one green technology or practice during the pay period that included August 12, 2011.
- The most common green technologies or practices were the improvement of energy efficiency within the establishment, used by 57 percent of establishments, and the reduction or elimination of the creation of waste materials, used by 55 percent.
- The least common green technology or practice was the generation of electricity, heat, or fuel from renewable sources primarily for use within the establishment, used by about 2 percent of establishments.

2. Percentage of establishments using green technologies and practices, by type of technology or practice, United States and census regions, August 2011

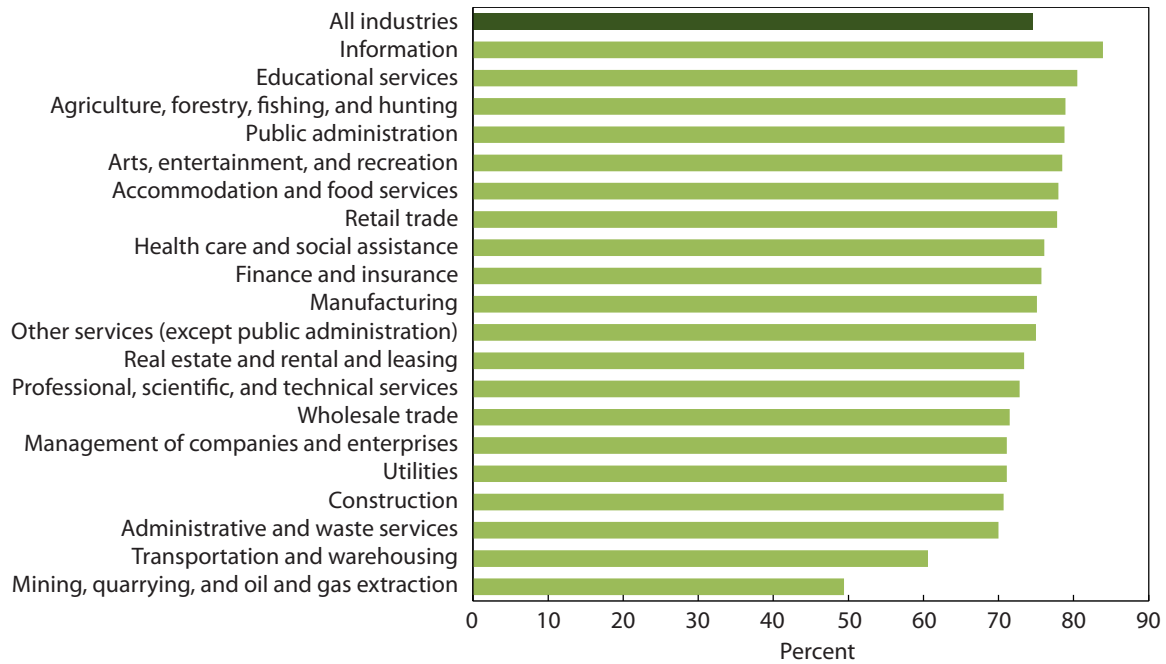


NOTE: Because establishments could report more than one green technology or practice, the percentage of establishments using specific green technologies and practices will not sum to the percentage of establishments using at least one green technology or practice.

SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- Although there was some variation by region in the percentage of establishments using at least one green technology or practice (from 72 percent in the South to 77 percent in the West), the general pattern of green technologies and practices usage was similar across all four census regions. Improvement of energy efficiency and reduction of the creation of waste materials were the most common practices; generation of electricity, heat, or fuel from renewable sources was the least common practice.
- The West had incidence rates above the U.S. average for several types of green technologies and practices. For example, 61 percent of establishments in the West used technologies and practices to reduce or eliminate the creation of waste materials, compared with 55 percent of establishments in the U.S. as a whole. More than 3 percent of establishments in the West generated electricity, heat, or fuel from renewable sources, compared with about 2 percent in the U.S. as a whole.
- Forty-eight percent of establishments in the South used technologies and practices to reduce or eliminate the creation of waste materials, a figure below the U.S. average of 55 percent. Nearly 54 percent of establishments in the South used technologies and practices to improve energy efficiency within the establishment, compared with 57 percent in the U.S. as a whole.
- In the Northeast and Midwest, both the overall incidence rates for green technologies and practices usage and the rates for most individual technologies and practices were not significantly different from the U.S. averages.

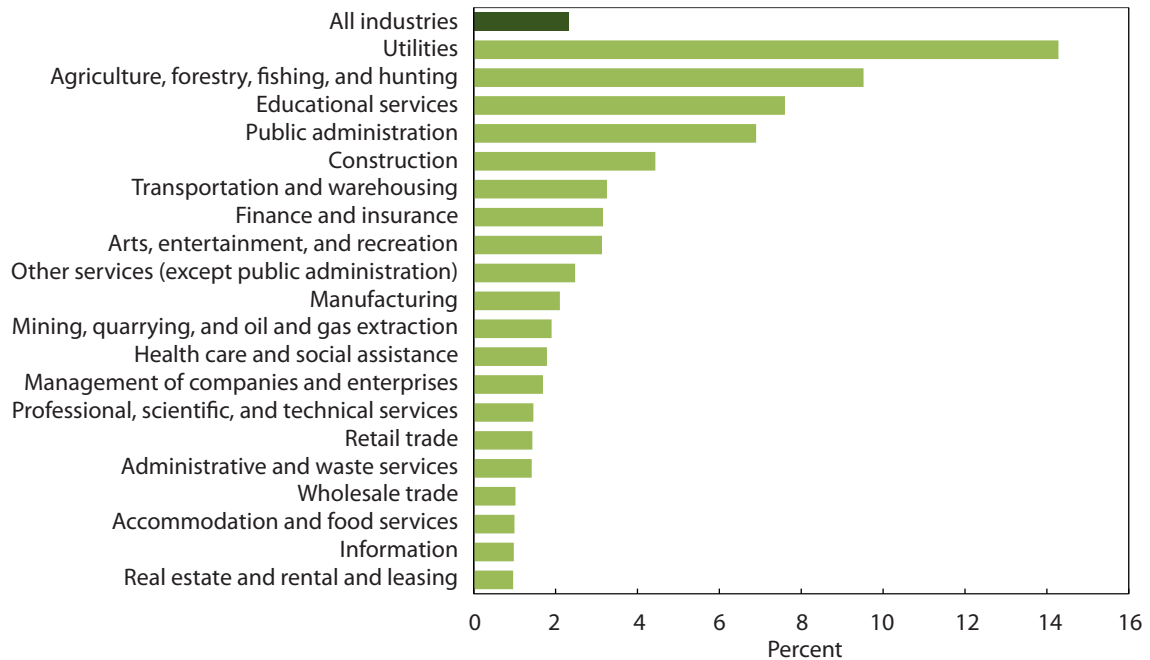
3. Percentage of establishments using at least one green technology or practice, by industry, August 2011



SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- Information and educational services were among the industries with the highest overall incidence of green technologies and practices. Eighty-four percent of establishments in the information industry and 81 percent of establishments in educational services used at least one green technology or practice in August 2011, compared with a 75-percent average across all industries. The industries with the highest overall incidence of green technologies and practices also included agriculture, forestry, fishing, and hunting; public administration; and arts, entertainment, and recreation.
- Mining, quarrying, and oil and gas extraction had the lowest overall incidence of green technologies and practices, with 49 percent of establishments using at least one green technology or practice.
- Other industries with below-average rates of green technologies and practices usage included transportation and warehousing (61 percent), administrative and waste services (70 percent), and construction (71 percent).

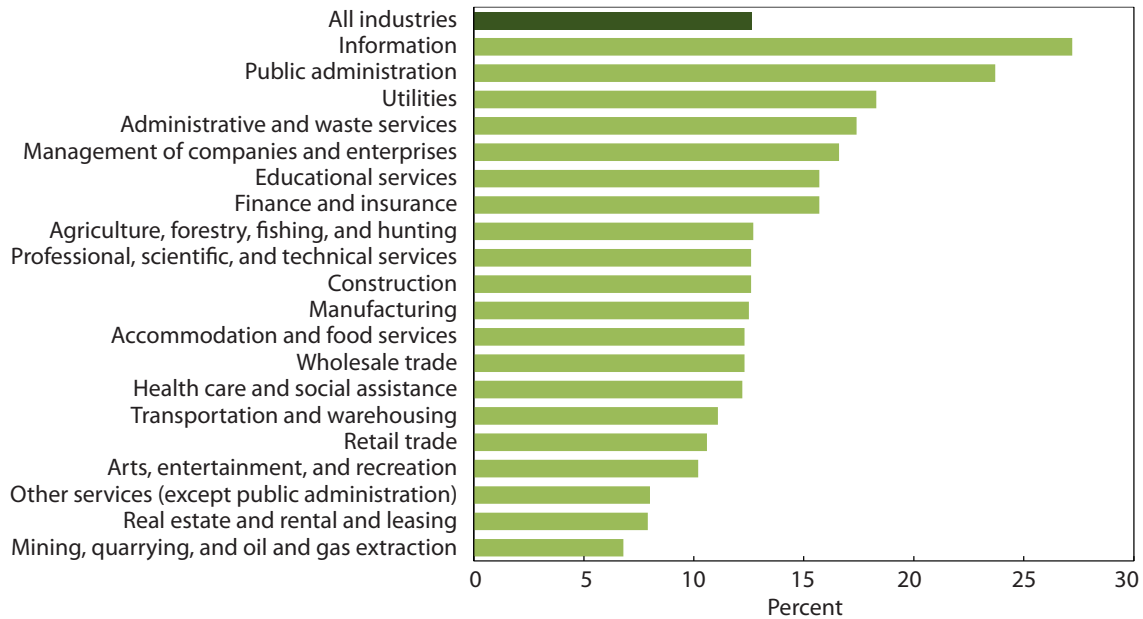
4. Percentage of establishments generating electricity, heat, or fuel from renewable sources primarily for use within the establishment, by industry, August 2011



SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- Incidence rates for specific green technologies and practices tended to vary more by industry than did overall rates of green technologies and practices usage. For example, more than 14 percent of establishments in the utilities industry generated electricity, heat, or fuel from renewable sources primarily for use within the establishment, compared with about 2 percent of establishments across all industries.
- Other industries with above-average rates of generating electricity, heat, or fuel from renewable sources included agriculture, forestry, fishing, and hunting (10 percent); educational services (8 percent); and public administration (7 percent).
- At the other end of the spectrum, 1 percent of establishments in wholesale trade, accommodation and food services, information, and real estate and rental and leasing generated electricity, heat, or fuel from renewable sources, less than half of the all-industries incidence rate for this practice.

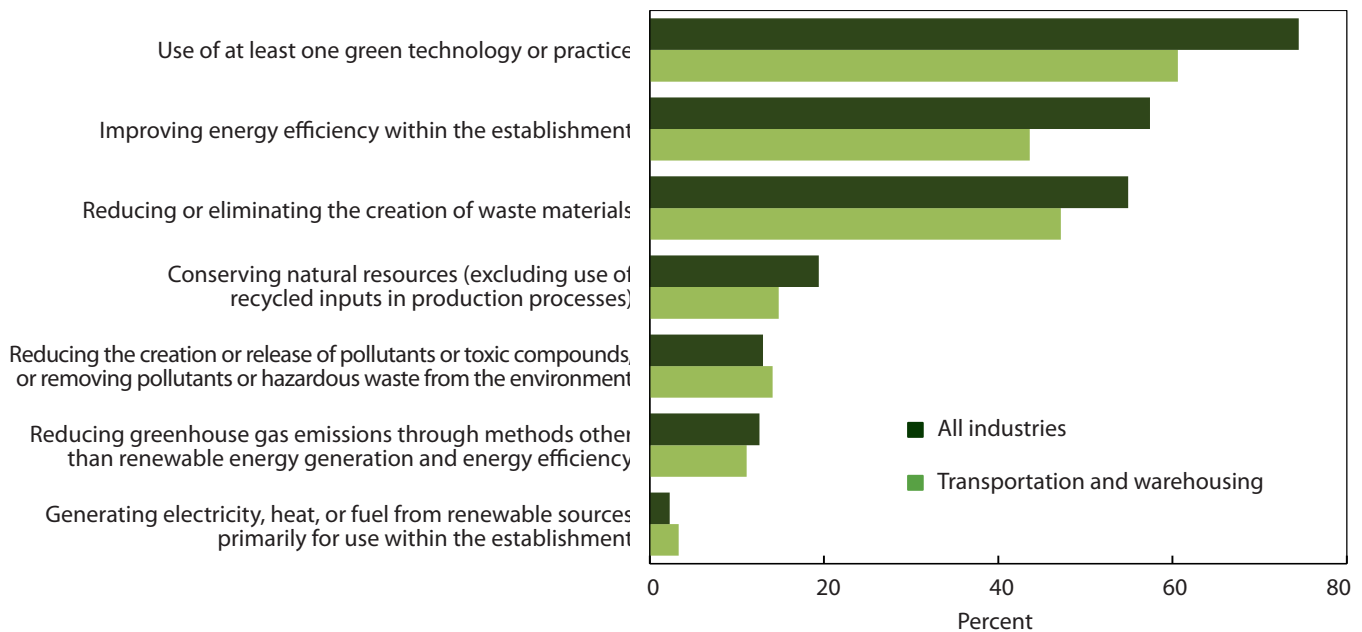
5. Percentage of establishments using technologies or practices to reduce greenhouse gas emissions through methods other than renewable energy generation and energy efficiency, by industry, August 2011



SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- Technologies and practices in this category included purchasing and using carbon offsets; promoting and/or subsidizing alternative forms of transportation for employees, such as carpools, fuel-efficient vehicles, cycling, or mass transit; and implementing employee telework programs.
- Although the information industry had one of the lowest rates of generating energy from renewable sources (see chart 4), it had among the highest incidence rates for several other green technologies and practices, including reducing greenhouse gas emissions through methods other than renewable energy generation and energy efficiency. Twenty-seven percent of establishments in the information industry reduced greenhouse gas emissions through these alternative methods, compared with about 13 percent of establishments across all industries.
- Public administration and utilities also had among the highest incidence rates—24 percent and 18 percent, respectively—for using technologies and practices to reduce greenhouse gas emissions, as well as for implementing several other green technologies and practices.
- Mining, quarrying, and oil and gas extraction (7 percent) and real estate and rental and leasing (8 percent) were among the industries with the lowest rates of using technologies and practices to reduce greenhouse gas emissions through methods other than renewable energy generation and energy efficiency. Both of these industries, along with transportation and warehousing, had below-average incidence rates for several green technologies and practices.

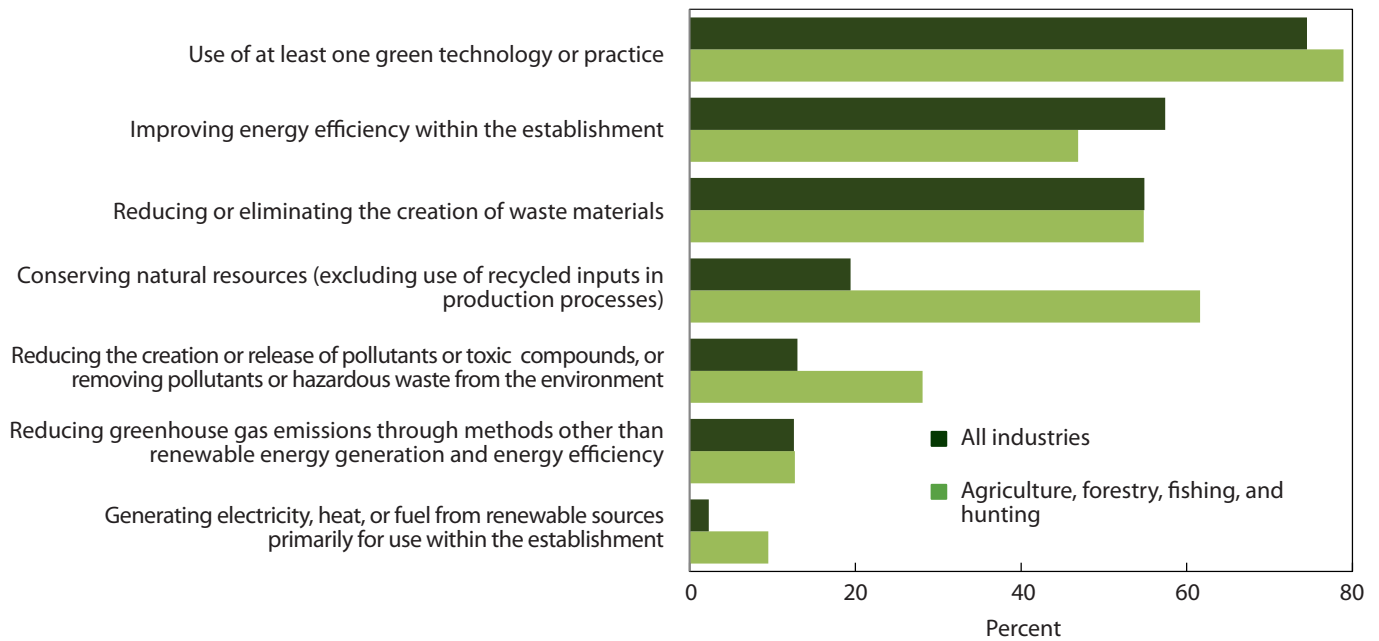
6. Percentage of establishments using green technologies and practices, by type of technology or practice, all industries and transportation and warehousing, August 2011



SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- Establishments in the transportation and warehousing industry were less likely than average to use any green technologies or practices, and also had below-average usage rates for several specific technologies and practices.
- Sixty-one percent of transportation and warehousing establishments used at least one green technology or practice during the survey reference period, below the U.S. all-industries average of 75 percent.
- Transportation and warehousing had below-average usage rates for the two most common types of green technologies and practices: 44 percent of transportation and warehousing establishments used technologies or practices to improve energy efficiency within the establishment, compared with an average of 57 percent across all industries, and 47 percent of transportation and warehousing establishments used technologies or practices to reduce or eliminate the creation of waste materials, compared with the 55-percent all-industries average. This industry was also less likely than average to use technologies and practices to conserve natural resources.
- Although transportation and warehousing had a below-average rate of green technologies and practices usage, its share of GTP employment matched the national average (as shown on chart 8). About 35,100 jobs in this industry were held by workers who spent more than half of their time involved in green technologies and practices, 0.7 percent of total industry employment.

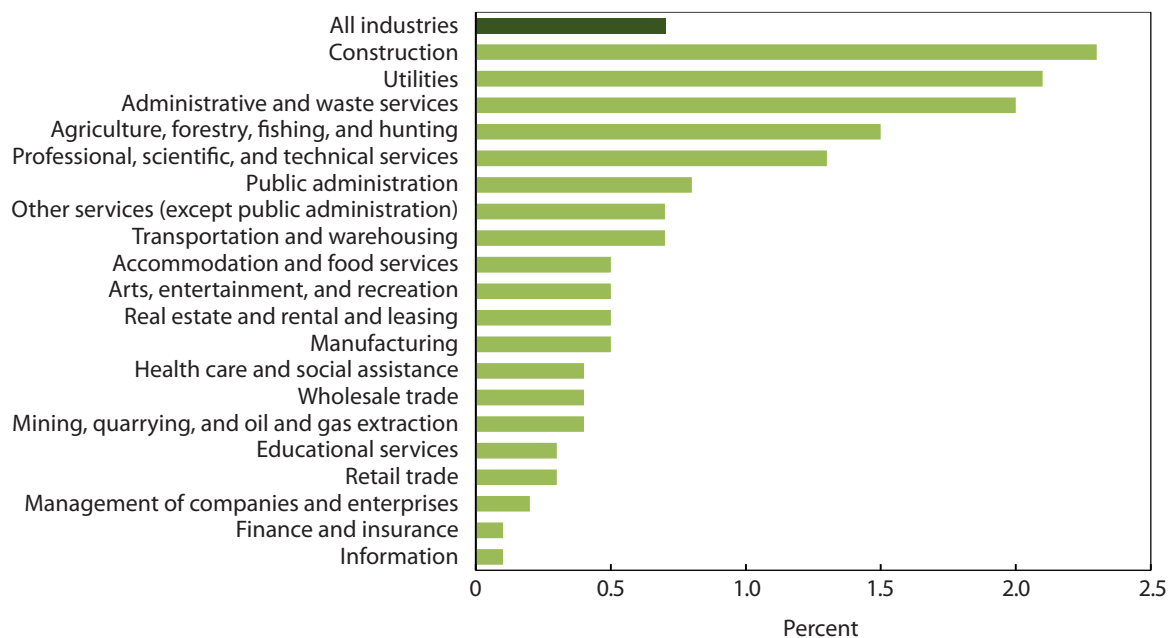
7. Percentage of establishments using green technologies and practices, by type of technology or practice, all industries and agriculture, forestry, fishing, and hunting, August 2011



SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- The agriculture, forestry, fishing, and hunting industry had above-average usage rates for three of the six types of green technologies and practices.
- Sixty-two percent of this industry’s establishments used technologies or practices to conserve natural resources, the highest incidence rate of any industry and more than triple the national all-industries average of 19 percent.
- Twenty-eight percent of this industry’s establishments used technologies or practices to reduce the creation or release of pollutants or toxic compounds or to remove these substances from the environment, compared with 13 percent of establishments across all industries.
- Nearly 10 percent of establishments in this industry generated electricity, heat, or fuel from renewable sources primarily for use within the establishment, compared with 2 percent for all industries combined.
- Although the agriculture, forestry, fishing, and hunting industry had above-average incidence rates for each of these specific green technologies and practices, the percentage of agricultural establishments using at least one green technology or practice was not significantly different from the U.S. average. In part, this may reflect the industry’s average or below-average usage rates for the two most common types of green technologies or practices, the improvement of energy efficiency within the establishment and the reduction or elimination of the creation of waste materials.

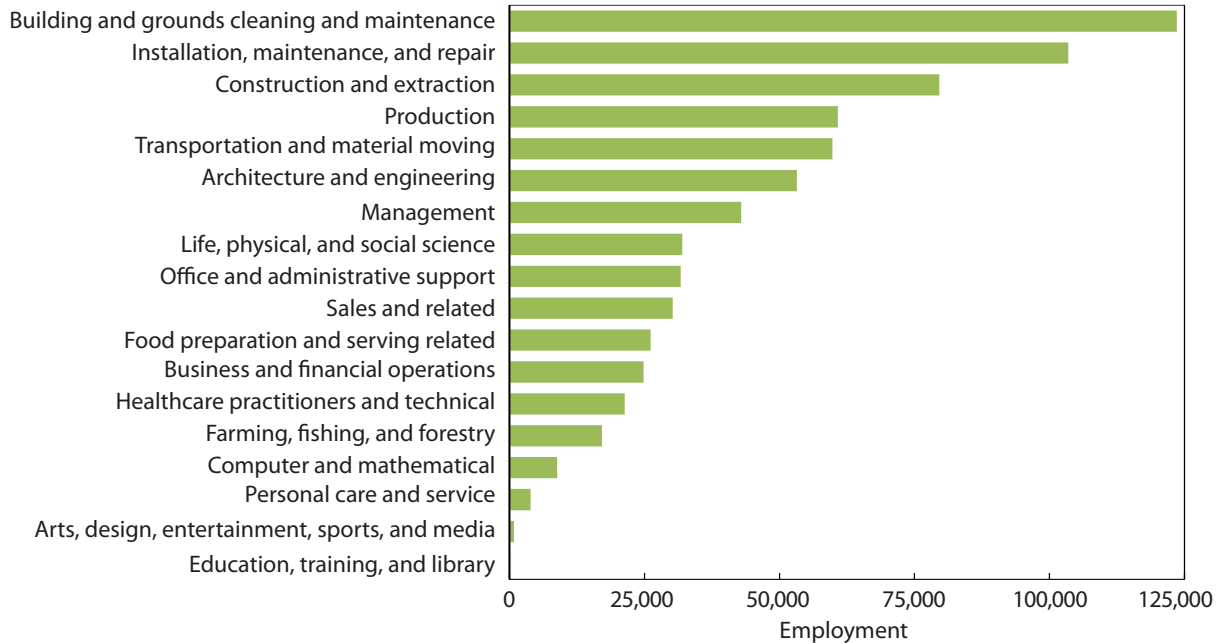
8. Employment of workers spending more than half their time involved in green technologies and practices, as a percentage of industry employment, August 2011



SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- About 854,700 jobs, representing 0.7 percent of total U.S. employment, were held by workers who spent more than half their time involved in green technologies and practices during the survey reference period.
- GTP jobs made up about 2.3 percent of total employment in the construction industry, 2.1 percent of employment in utilities, and 2.0 percent of employment in administrative and waste services. Although these industries were among those with the highest percentages of GTP employment, they did not necessarily have high rates of green technologies and practices usage: the percent of establishments using at least one green technology or practice was below average in both construction and administrative and waste services, and was similar to the U.S. average in utilities (as shown on chart 3). Hence, the proportion of GTP employment and the rate of use of green technologies and practices aren't necessarily related to each other.
- GTP employment made up 0.2 percent or less of total employment in management of companies and enterprises, finance and insurance, and information. Nonetheless, the percent of establishments in these industries that used at least one green technology or practice was similar to or higher than the U.S. average.
- Industries with the largest numbers of GTP jobs included administrative and waste services, with 151,900 GTP jobs; construction (134,100); and professional, scientific, and technical services (99,800). These three industries combined represented about 45 percent of total GTP employment. Mining, quarrying, and oil and gas extraction; information; and management of companies and enterprises each had fewer than 4,000 GTP jobs.
- About 267,600 GTP jobs were in the South, 220,300 in the West, 198,200 in the Midwest, and 168,500 in the Northeast.

9. Employment of workers spending more than half their time involved in green technologies or practices, by occupational group, August 2011



SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- About 123,600 green technologies and practices (GTP) jobs were in building and grounds cleaning and maintenance occupations, and an additional 103,500 were in installation, maintenance, and repair occupations. Together, these two occupational groups made up over one-quarter of GTP employment.
- Construction and extraction, with 79,600 GTP jobs; production, with 60,800; and transportation and material moving, with 59,800, also were among the occupational groups with the highest levels of GTP employment.
- Occupational groups with the lowest GTP employment levels included personal care and service (3,900), as well as the arts, design, entertainment, sports, and media group and the education, training, and library group, which each had fewer than 1,000 GTP jobs.

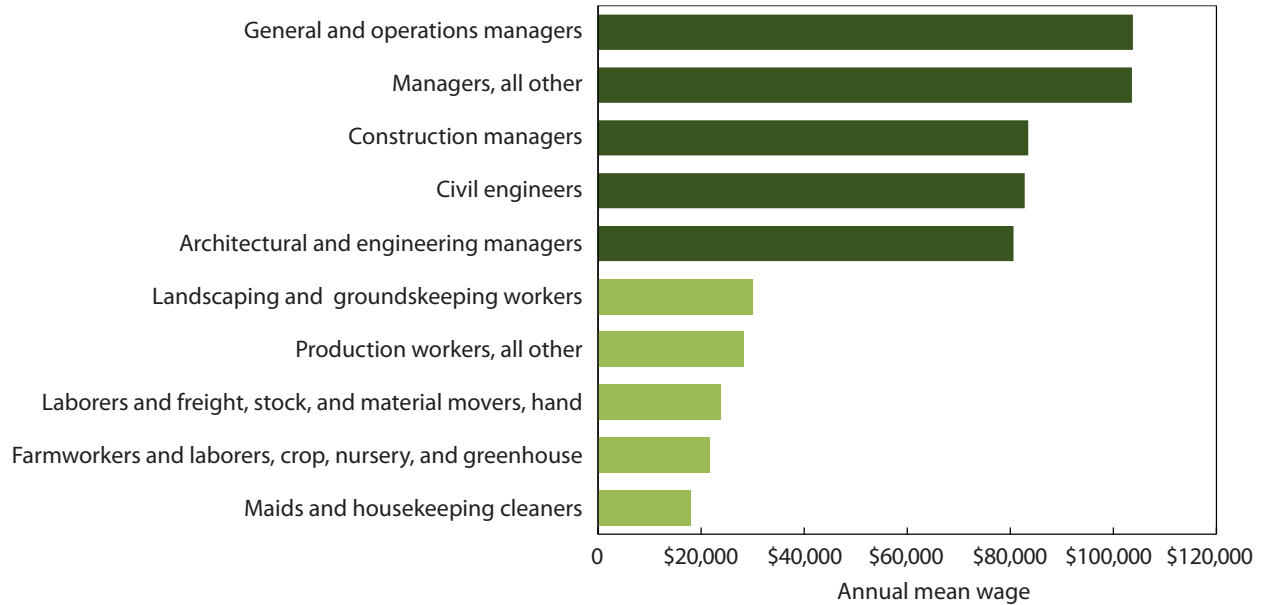
10. Detailed occupations with the largest number of jobs in which workers spent more than half their time involved in green technologies and practices, August 2011



SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- Detailed occupations with the highest green technologies and practices (GTP) employment included janitors and cleaners, except maids and housekeeping cleaners, with 56,700 GTP jobs, and heating, air conditioning, and refrigeration mechanics and installers, with 37,300 GTP jobs.
- General maintenance and repair workers (26,000 GTP jobs); laborers and hand freight, stock, and material movers (23,000); and landscaping and groundskeeping workers (22,000) also were among the occupations with the largest number of GTP jobs.
- Of the 10 occupations shown in the chart, 7 were in the building and grounds cleaning and maintenance or installation, maintenance, and repair occupational groups.

11. Annual mean wages for the highest and lowest paying occupations with GTP employment greater than 1,500, August 2011



NOTE: Lighter bars indicate the five highest paying occupations, and darker bars indicate the five lowest paying occupations. GTP employment is defined as employment of workers spending more than half their time involved in green technologies or practices.

SOURCE: Green Technologies and Practices survey, U.S. Bureau of Labor Statistics.

- Most of the occupations with the highest mean wages for GTP jobs were in the management or architecture and engineering occupational groups.
- Among occupations with at least 1,500 GTP jobs, the most highly paid included general and operations managers, with an annual mean wage of \$103,780 for GTP jobs; construction managers, with \$83,480; and civil engineers, with \$82,810.
- Maids and housekeeping cleaners was the lowest paying GTP occupation, with an annual mean wage of \$17,950 for GTP jobs.
- The lowest paying GTP occupations also included farmworkers and laborers, crop, nursery, and greenhouse (\$21,630); laborers and hand freight, stock, and material movers (\$23,800); and production workers, all other (\$28,180).