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Green Construction Update

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Green construction is a growing sector in the current global economy, particularly in the U.S. market. You may have read a sentence like that many times and wondered … just how large is this market? Is it continuing to expand? What trades and businesses in the construction sector are seeing the most work? Are employers conducting safety training for workers on the use of green products and technologies? And just where are all those green jobs happening? You will find answers within this Data Brief.

The Data Brief is based on information from the U.S. Bureau of Labor Statistics (BLS), the U.S. Green Building Council (USGBC) and McGraw-Hill Construction, and includes the following topics: 1) the rise of LEED (Leadership in Energy and Environmental Design) registration and certification by types of projects, U.S. regions, and states, 2) green job growth in construction and other industries, and 3) safety training on green technologies required by employers. Some topics were previously covered by *The Construction Chart Book: The U.S. Construction Industry and Its Workers*, produced in April of 2013. The Data Brief updates and expands on that LEED program and green jobs information.

KEY FINDINGS

- The annual number of LEED certifications has increased exponentially – from two (2) projects in 2000 to 5,577 projects in 2013.
- The Construction industry had nearly half-a-million green jobs in 2011, accounting for almost 9% of the industry overall.
- Jobs in green construction grew by 27.1% between 2010 and 2011, more than six times the growth rate for all industries combined (4.5%).
- Among construction subsectors, Residential Building experienced significant growth (83.6%) between 2010 and 2011.
- In 2012, about one in four large employers required safety training on green technologies, higher than the average of about one in six for all employers combined.

Above: LEED Credit Categories. LEED certification is one way to quantify green construction. More information available at http://www.usgbc.org/leed/rating-systems

Image Source: RadioWorld. Sustainable Facilities and LEED Certification: A Broadcaster's Guide. April 12, 2010. http://www.rwonline.com/article/sustainable-facilities-and-leed-certification--a-broadcaster%E2%80%99s-guide/3079

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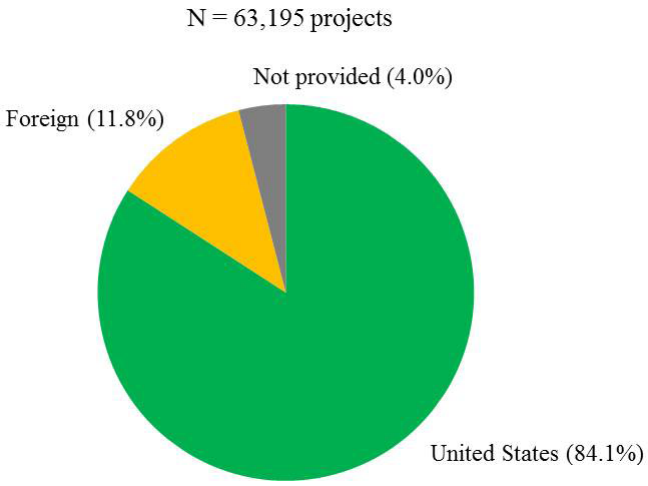
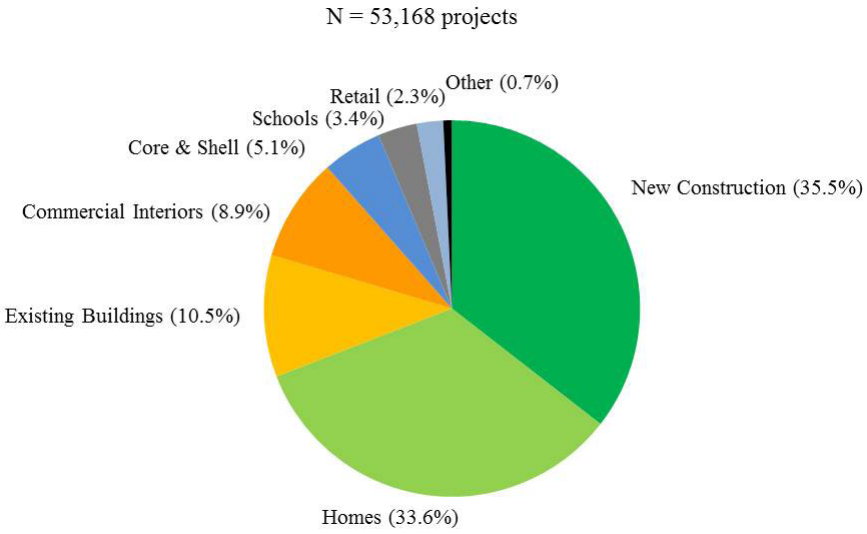
SECTION 1: LEED Registration and Certification

Developed by the USGBC in 1998, LEED certification is an international standard for measuring the level of environmental sustainability of new construction and renovation projects. By the end of 2013, more than 63,000 projects seeking LEED certification were registered worldwide in the LEED Building Projects Directory (Chart 1). Of those projects, 84% or more than 53,000, were based in the U.S. Nearly 36% of the LEED-registered projects in the U.S. were new construction projects, followed by homes (34%; Chart2). Other projects typically were smaller in scope (e.g. existing building renovations and commercial interiors).

1. LEED-Registered Projects, 2013



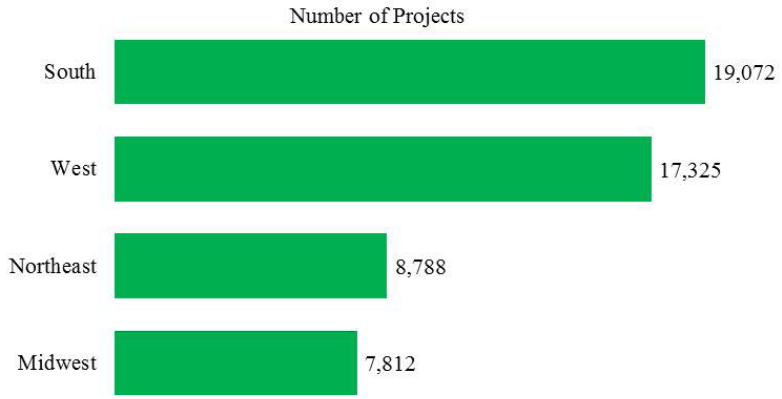
2. Types of LEED-Registered Projects in the U.S., 2013



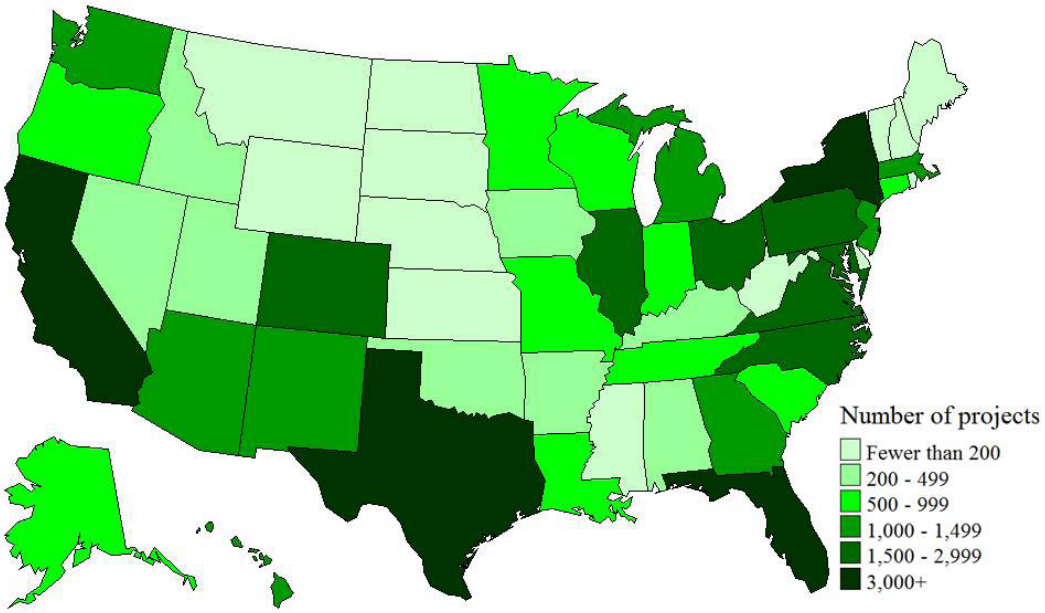
Source: Charts 1, 2 - U.S. Green Building Council. LEED Building Project Directory (as of 12/31/2013). Calculations by CPWR Data Center.

The majority of LEED-registered projects were located in the South and West of the country, with fewer projects in the Northeast and Midwest (Chart 3). At the state level, California had the most LEED-registered projects (7,551), followed by Texas (4,228), New York (3,260) and Florida (3,019; Chart 4). West Virginia had the fewest, with 67 registered projects.

3. LEED-Registered Projects by Region in the U.S., 2013



4. Number of LEED-Registered Projects by State, 2013



Source: Charts 3, 4 - U.S. Green Building Council. LEED Building Project Directory (as of 12/31/2013). Calculations by CPWR Data Center.

The registered projects must meet LEED criteria in order to receive LEED certification. There are four levels of certification – Certified, Silver, Gold, and Platinum (Chart 5). Each level requires earning a certain number of credits in the core categories. Based on the levels of LEED certification, 21% of U.S. projects received the stamp of Certified, earning between 40 and 49 points (Chart 6). More than 35% of projects in the U.S. earned Silver status, followed closely by 33% receiving Gold, and 11% with Platinum status — the highest available rating, receiving at least 80 points.

5. LEED Certification Levels

6. LEED-Certifications by Level in the U.S., 2000-2013

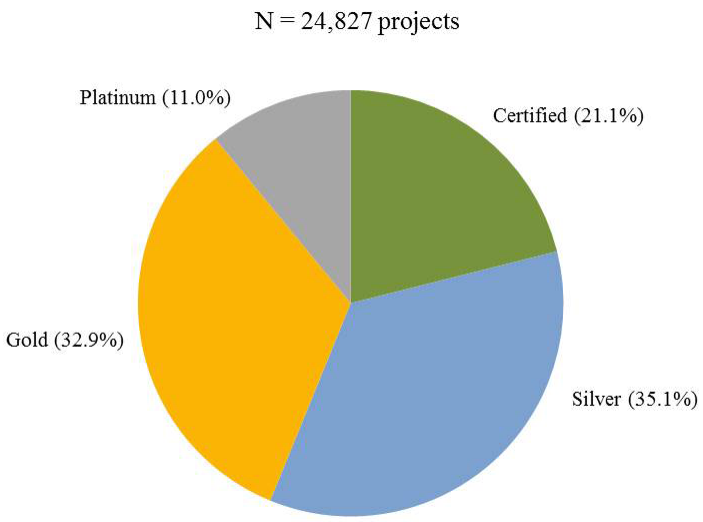
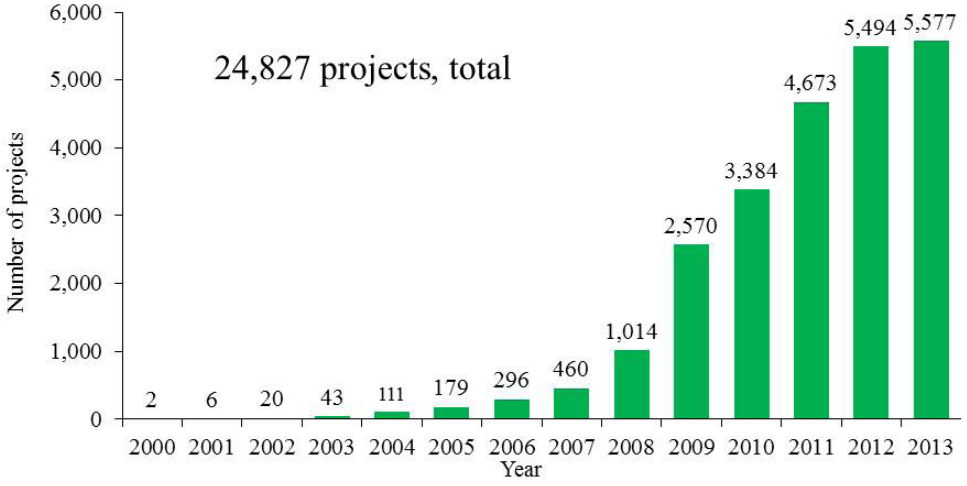


Image Source: Chart 5 - Green Building Alliance. LEED Certification. http://www.go-gba.org/resources/leed/

Source: Chart 6 - U.S. Green Building Council. LEED Building Project Directory (as of 12/31/2013). Calculations by CPWR Data Center.

The LEED certification program has expanded exponentially in a short period of time. In 2000, just two (2) projects earned LEED certification; in 2013 alone, 5,577 projects received LEED certification (Chart 7). The annual number of certifications grew even during the years of the economic downturn — from 460 certifications in 2007 to 2,570 just two years later. By the close of 2013, about half of the projects registered in the U.S. LEED program had received certification, totaling close to 25,000 projects.

7. LEED-Certified Projects in the U.S., 2000-2013



Note: Year not provided for 998 certified projects.

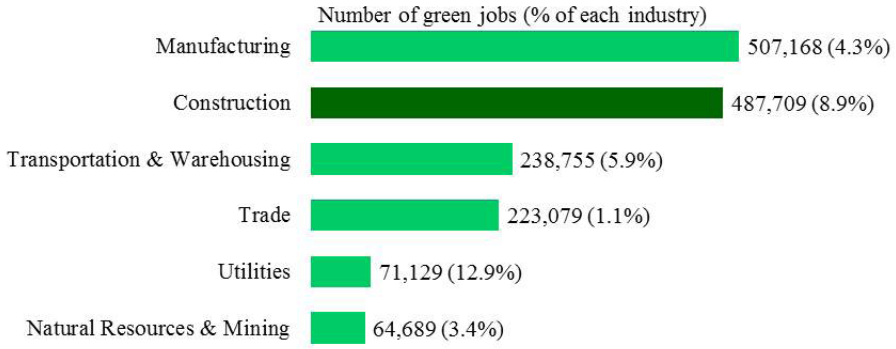
Source: U.S. Green Building Council. LEED Building Project Directory (as of 12/31/2013). Calculations by CPWR Data Center.

SECTION 2: Green Jobs in Construction and Other Industries

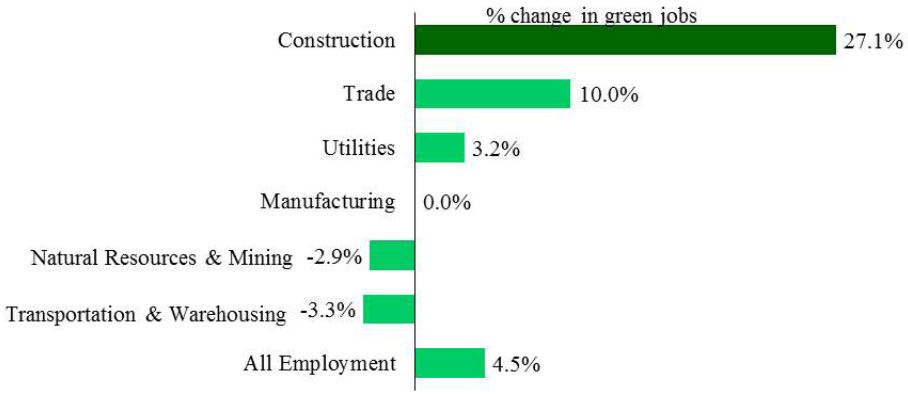
Along with the increasing number of green construction projects, more and more construction workers perform "green-related activities," or more specifically, *green jobs*. According to the BLS, *green jobs* are in "businesses that produce goods and provide services that benefit the environment and conserve natural resources." Based on this definition, many industry sectors are involved in green jobs, including most subsectors in the Construction industry.

In 2011, there were 2.5 million green jobs in the U.S., accounting for 2.3% of the total wage-and-salary workers in the nation (BLS, 2013). Nearly 488,000, or 19.4% of all green jobs, were in the Construction industry; those green jobs represented 8.9% of all jobs in Construction (Chart 8). The number and proportion of green jobs varied greatly among industries. For example, although the Utilities industry had just 71,000 jobs, that industry had the highest proportion of green jobs (12.9%). However, the annual change in the proportion of green jobs was highest in Construction, growing 27.1% between 2010 and 2011, compared to the all-industry average of 4.5% during the same period (Chart 9).

8. Number of green jobs, selected industries, 2011



9. Annual change in the rate of green jobs, selected industries, 2011

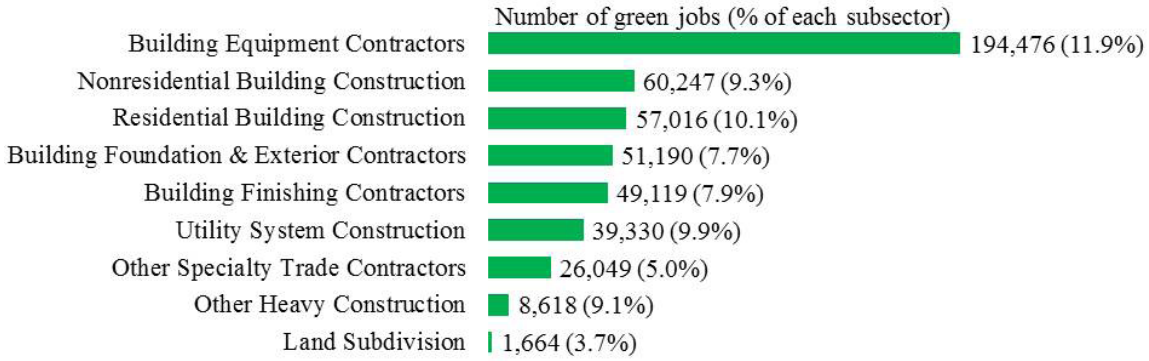


Note: Chart 8 - The proportion of green jobs in all industries was 2.3%.

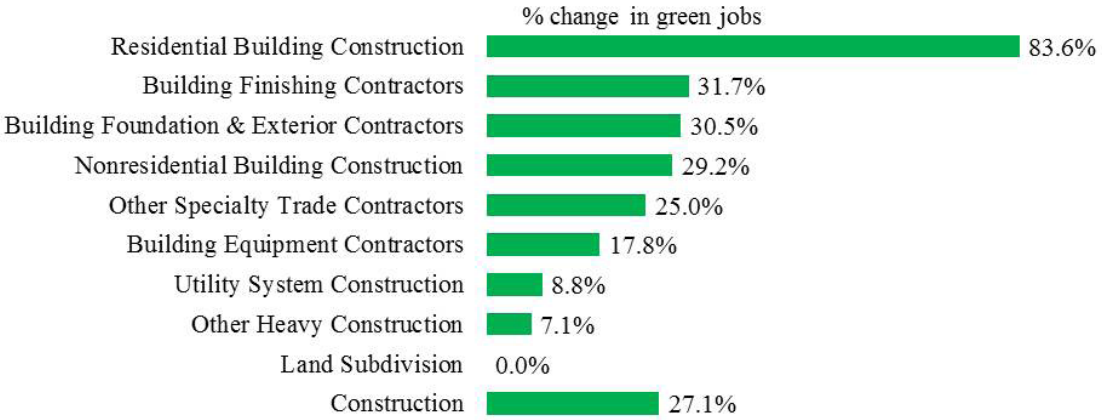
Source: Charts 8, 9 - U.S. Bureau of Labor Statistics. Green Goods and Services Survey.

Among Construction subsectors, Building Equipment Contractors (e.g. electrical, plumbing, heating, air-conditioning) had the highest number of green jobs — nearly 200,000 in 2011 (Chart 10). The proportion of green jobs in this subsector was also the highest at 11.9%. Yet, the annual change in the proportion of green jobs increased just 17.8% in this subsector between 2010 and 2011, lower than the average for the Construction industry overall (Chart 11). In contrast, the proportion of green jobs in Residential Building Construction increased 83.6% between 2010 and 2011, higher than any other Construction subsector. This indicates a rapidly growing trend of green construction in Residential Buildings.

10. Number of green jobs in construction, by subsector, 2011



11. Annual change in the rate of green jobs in construction, by subsector, 2011



Source: Charts 10, 11 - U.S. Bureau of Labor Statistics. Green Goods and Services Survey.

SECTION 3: Safety Training on Green Technologies

Although green technologies (e.g. solar panels, LED lighting) may be good for the environment and the economy, they may alter tasks, materials, and practices used in the construction industry, which may bring new hazards or exacerbate existing hazards for construction workers. Despite the importance of safety and health in green jobs, according to The Construction Safety Management Survey conducted by McGraw-Hill Construction in 2012, only 18% of the construction firms who participated in the survey required safety training specific to green technologies, products or practices (Chart 12). In that survey, just 14% of General Contractors, including those in both residential and nonresidential buildings, and operative builders, required safety training on green technologies (e.g. fall protection training for solar panel installers), compared to 24% of Specialty Trade companies.

Safety training requirements for green technologies varied by project type. In the last three years, about 28% of firms with Transportation Building projects, such as airports, train stations, and bus depots, required safety training on green technologies compared to only 17% of the firms with Non-Building projects (e.g., roads, dams, water mains; Chart 13).

12. Safety training required by employers on green technologies, by construction subsector, 2012

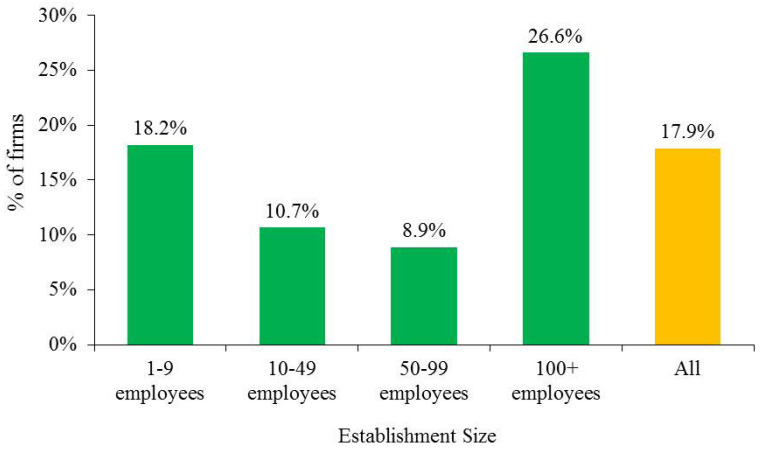
13. Safety training required by employers on green technologies, by project type, 2010-2012

Source: Charts 12, 13 - McGraw-Hill Construction, 2012. The Construction Safety Management Survey. Calculations by CPWR Data Center.

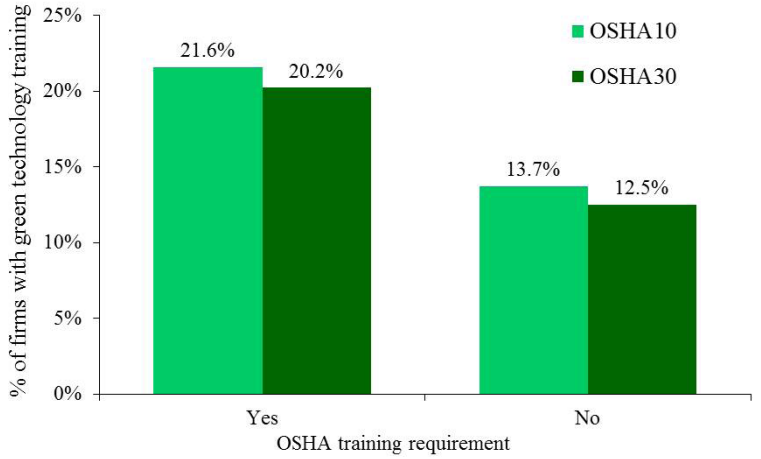
The requirements also differed significantly by establishment size. In general, large establishments (at least 100 employees) were more likely to require safety training on green technologies than smaller ones (Chart 14). However, it is noteworthy that small establishments (fewer than 10 employees) were more likely to have training requirements than medium-sized establishments.

The firms requiring OSHA 10-hour or 30-hour training were much more likely to require safety training on green technologies. Of the firms requiring OSHA 10-hour or 30-hour training, more than 20% reported that they also required all workers to have safety training on green technologies (Chart 15). The proportion of safety training on green technologies dropped to less than 14% for those firms not requiring OSHA training.

14. Safety training required by employers on green technologies, by establishment size, 2012



15. Safety training required by employers on green technologies, by whether OSHA10 or OSHA30 was required, 2012



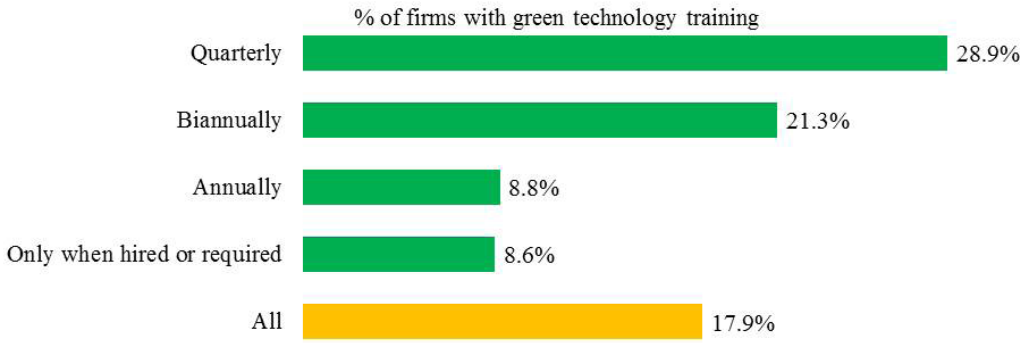
Note: Chart 14 - The results may not be representative and reliable due to the relatively small sample size of the survey.

Source: Charts 14, 15 - McGraw-Hill Construction, 2012. The Construction Safety Management Survey. Calculations by CPWR Data Center.

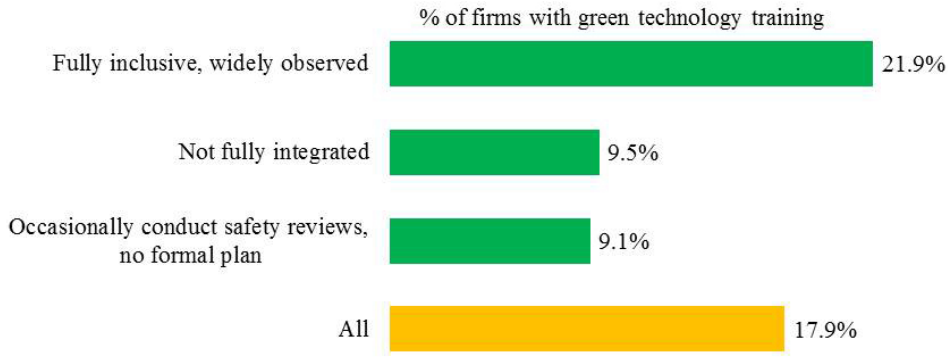
Firms offering general safety training are also more likely to require green-related safety training. Among the firms who offered general training to their workers at least once a quarter, nearly 30% required safety training on green technologies (Chart 16). The proportion was less than 9% among firms only offering general training when workers are hired or when required by specific demands on the jobsite.

The strength of a firm's safety program is associated with green safety training requirements. Among firms who had a fully inclusive and widely observed safety program, 22% required safety training on green technologies compared to 10% among those who did not have a fully integrated safety program and 9% among those who occasionally conducted safety reviews but had no formal plan (Chart 17).

16. Safety training required by employers on green technologies, by frequency of general safety training, 2012



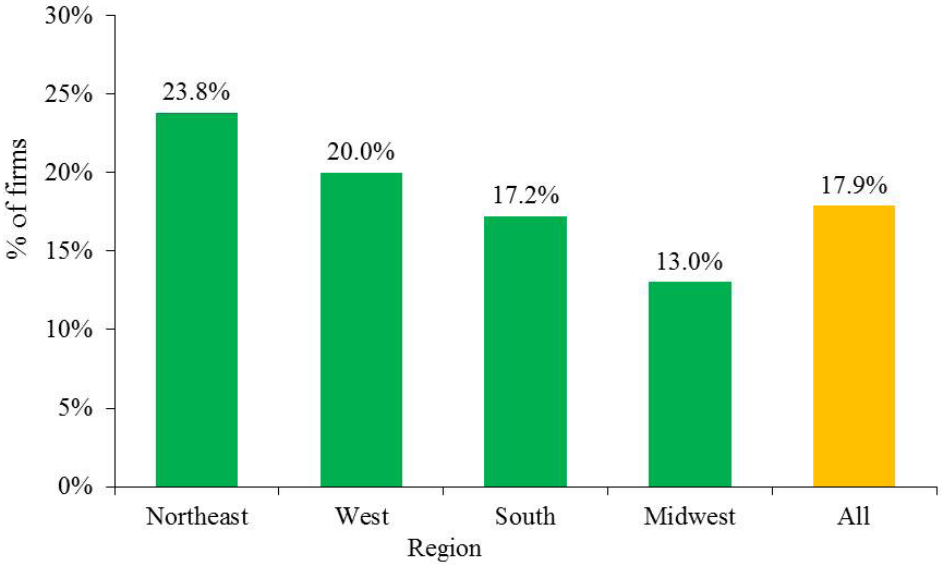
17. Safety training required by employers on green technologies, by strength of employer safety program, 2012



Source: Charts 16, 17 - McGraw-Hill Construction, 2012. The Construction Safety Management Survey. Calculations by CPWR Data Center.

In terms of region, the Northeast had the highest proportion of companies requiring safety training for green technologies (24%; Chart 18). In contrast, just 13% of companies in the Midwest required such training.

18. Safety training required by employers on green technologies, by region, 2012



Source: McGraw-Hill Construction, 2012. The Construction Safety Management Survey. Calculations by CPWR Data Center.

Conclusion

These findings show that green construction is growing at a rapid rate, both in projects and jobs. Although this is good news for the green economy, new technologies, materials, and work procedures used in green construction may increase existing risks or bring new hazards to construction workers who perform green jobs. In addition, safety and health training on green technologies is far behind the growth of green construction. Employers moving into green construction should consider the potential risks to construction workers, and address them through safety and health training and workplace interventions.

Reference

Bureau of Labor Statistics. 2013. Green Goods and Services (GGS). Retrieved from http://www.bls.gov/ggs/ggsoverview.htm#definition.

More Resources

To better understand the risks to construction worker safety and health and the need for worker training when using green technologies, please see several CPWR research publications:

- *Green and Healthy Jobs*, a report covering specific hazards to workers, by type of green construction equipment, and case studies of fatalities from these hazards.
- Green Jobs: A Safety and Health Outlook for Workers, a PowerPoint based on the above report, examines the definition of green jobs and focuses on hazards to worker safety and health.
- Improving Worker Safety on 'Green' Construction Projects, a *CPWR Key Findings from Research* document based on peer-reviewed journal articles, with links to abstracts.
- "Green" Construction Workers May Face Additional Safety Risks, an article appearing in *EHS Today*.
- Green Construction: what it is and its impact on the construction labor force, a meeting of the Construction Economics Research Network (CERN) in October 2010. Link includes PowerPoints from presenters.

Additional information on green construction from the CPWR Data Center:

- Measuring the Effects of Green Jobs on Construction Worker Safety & Health, a webpage describing the Data Center's work on analyzing statistics on green jobs and construction worker safety and health.
- Green Construction in the United States, and related charts in PowerPoint, from *The Construction Chart Book*, fifth edition; see also Green Jobs in Construction and Other Industries, and related charts in PowerPoint.

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About the CPWR Data Center

The CPWR Data Center is part of CPWR – The Center for Construction Research and Training. CPWR is a 501(c)(3) nonprofit research and training institution created by the Building and Construction Trades Department, AFL-CIO, and serves as the research arm of the BCTD. CPWR has focused on construction safety and health research since 1990. This study on green construction is part of our ongoing surveillance activities on current and changing workplace practices on jobsites that can affect the safety and health of construction workers. This data analysis updates and expands on information found in CPWR's *The Construction Chart Book*.

This Data Brief is the fourth in a series of publications analyzing construction-related data. The three previous data briefs focused on Hispanic construction workers in the U.S. workforce. The first, Hispanic Employment in Construction, second, Health Insurance Coverage and Health Care Utilization among Hispanic Construction Workers, and third data brief, Fatal and Nonfatal Injuries among Hispanic Construction Workers, 1992-2008, are all available on the CPWR website by following the links. Each link will provide you with a downloadable PDF version of the data brief and PowerPoint files of all the charts. Click on a chart in PowerPoint to access the data behind the graphic.

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