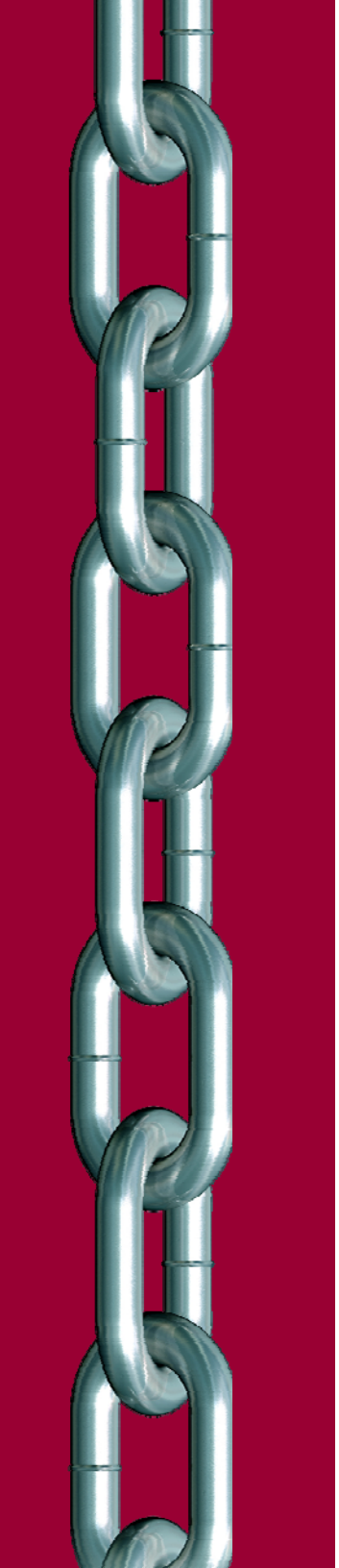

Hot Topic Report

Facility Sustainability

Leading Practices for Green Facilities

Supply Chain Consortium

Benchmarking & Best Practices

January 11, 2010
www.supplychainconsortium.com

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Facility Sustainability

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Facility Sustainability

Introduction

Building environmentally friendly facilities is truly a hot topic across the globe today. At the same time, sustainability and green practices have been a part of our everyday thinking for decades. As noted by the U.S. Environmental Protection Agency (EPA), green building, which is also referred to as green construction or sustainable building, "is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle – from site work to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort."

Innovative technologies are underway to improve green facilities, and many basic practices can jumpstart companies as they begin greening their facilities. The common objective is that "green buildings are designed to reduce the overall impact of the building environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources;
- Protecting occupant health and improving employee productivity; and
- Reducing waste, pollution and environmental degradation."

This report will focus on the key findings from the Supply Chain Consortium's survey on *Building and Facility Sustainability*.

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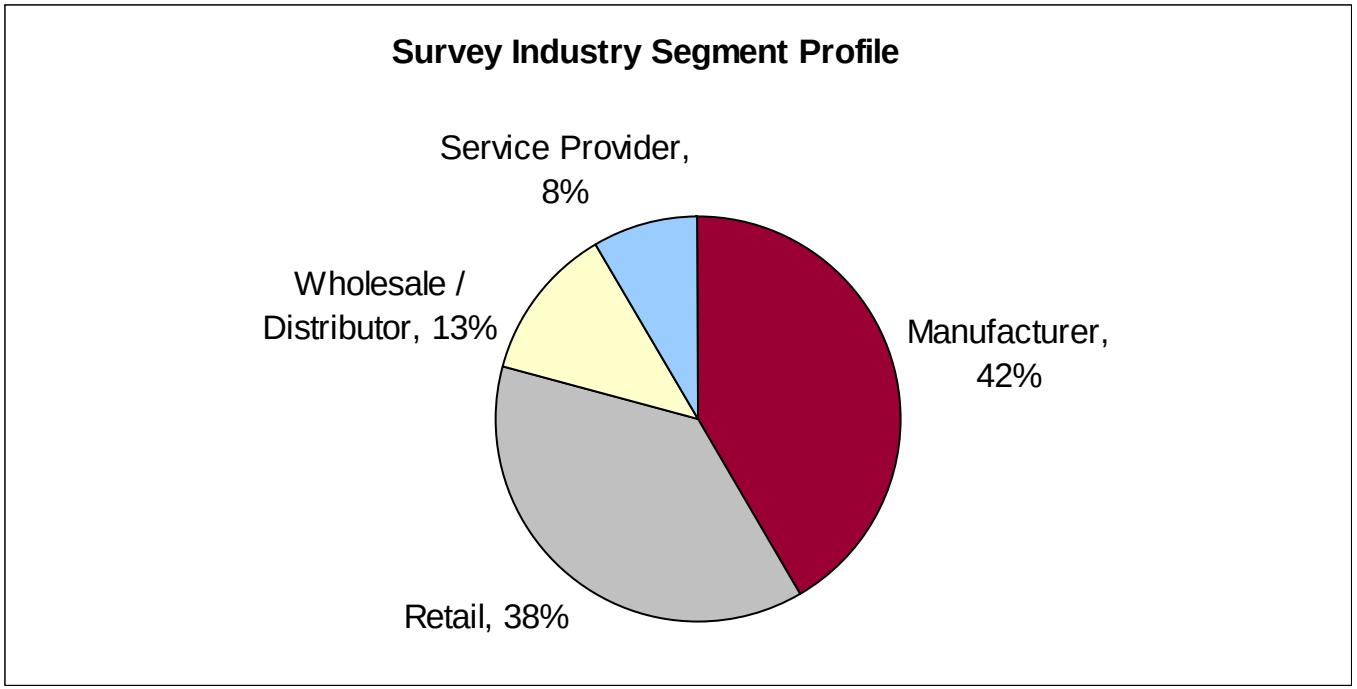
Survey Participant Demographics



- Throughout the report, the number of responses and the percentage of companies answering each question varies depending on the topic and question, but in general, the distribution of responses in the figure above hold true for the results in this report.
- This survey has a fairly equal number of manufacturing and retail participants. A group of logistics service providers also completed the survey.

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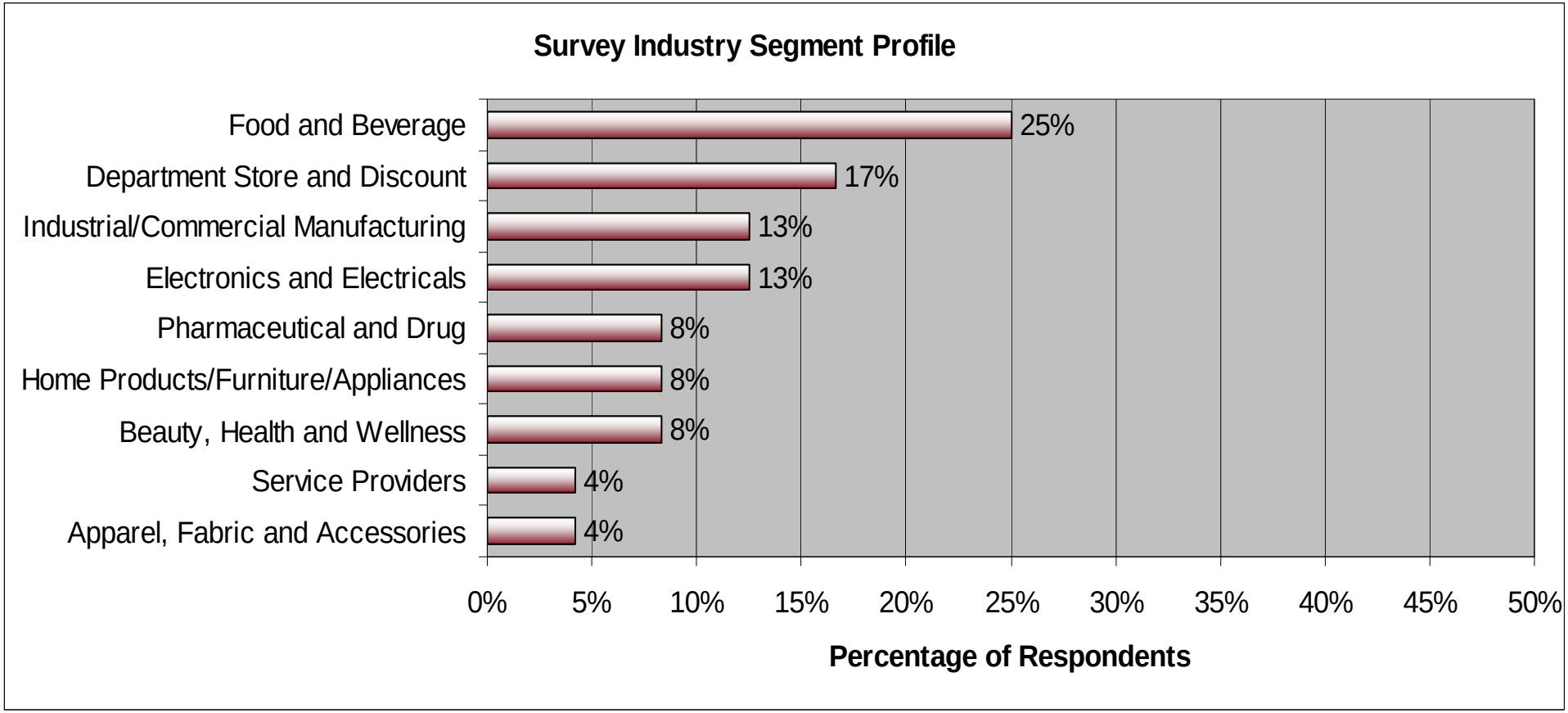
Survey Participant Demographics



- There is a good distribution of survey respondents across nine major industries.
- The largest percentage of responses is from (1) food and beverage companies and (2) department store and discount retailers.

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Green Techniques For Selection of Locations

Green Building Techniques Used to Select Facility Locations	Percentage of Respondents	
	Always	Sometimes
Locate site so that it does not disturb any nearby wetlands, soil, or streams.	65%	21%
Locate sites away from floodplains, prime farmland, habitats for endangered or threatened species, and wetlands.	65%	17%
Eliminate all pollution from the building to control erosion, runoff to storm sewers or local waterways, and dust generation.	57%	39%
Avoid any unnecessary soil compaction during site selection.	39%	39%
Create a construction site protection plan to protect and preserve the natural habitat and biodiversity as much as possible.	26%	52%
Prepare a natural resources inventory of your selected site that catalogs the current status of the area.	17%	39%
Design preferred parking spaces for vanpool, carpool, and alternative energy vehicles.	9%	30%
Install an alternative energy filling station on the site if the facility is large enough.	4%	30%

- Surveyed companies are generally very concerned with flood plains and habitat issues.
- Techniques are also frequently employed to control erosion and runoff, including site development that avoids unnecessary soil compaction.
- The least used building selection techniques are (1) designated parking for more efficient vehicles and (2) an on-site alternative fuel filling station. It is unlikely these options would have been considered at all just a few years ago.

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Building Water Efficiency Techniques

Water Efficiency Techniques Used in Facility Locations	Percentage of Respondents	
	Always	Sometimes
Building is designed to significantly reduce the amount of water necessary for operation.	26%	35%
Landscape vegetation is selected to minimize the use of water.	17%	57%
If any irrigation is necessary, it is highly efficient – such drip irrigation, capturing rain water, or using water that otherwise recycles from the site itself.	9%	30%
Roofing techniques are utilized to maximize the use of rain water, minimize runoff, and provide natural insulation barriers.	0%	39%
Company captures and uses gray water.	0%	22%

- Transitioning facilities to be more water efficient is a challenging task, but it has paid dividends to companies in many industries.
- The most common water efficiency technique is to design the building to minimize the amount of water necessary for operation through internal process improvements such as capturing gray water or unused process water, landscaping selection, and roofing material selection.
- Many progressive companies have greatly reduced their dependence on external water sources with innovative building and process techniques.

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Building Energy Efficiency Techniques

Energy Efficiency Techniques Used in Facility Locations	Percentage of Respondents	
	Always	Sometimes
Use advanced daylight techniques combined with modern low energy lighting systems to minimize lighting energy use.	39%	35%
Design building so that it significantly reduces the amount of energy necessary for operation.	26%	52%
Use Energy Star building material whenever possible.	26%	65%
Use thermal heating systems.	0%	35%
Use passive solar building techniques.	0%	22%
Use active solar panels or solar photovoltaic roofing systems.	0%	22%
Use wind power to supplement the building's energy use.	0%	26%

- Natural daylight has long been used to supplement internal lighting sources. Today's advanced building control systems are capable of moderating internal lighting based on the availability of natural light.
- Also a common technique for energy efficient buildings is the optimum use of materials for insulation, window treatments, as well as other means of reducing the heat and cooling loads of facilities.
- Advanced thermal heating, passive and active solar systems, and wind power are not common but are becoming a factor in new building design.

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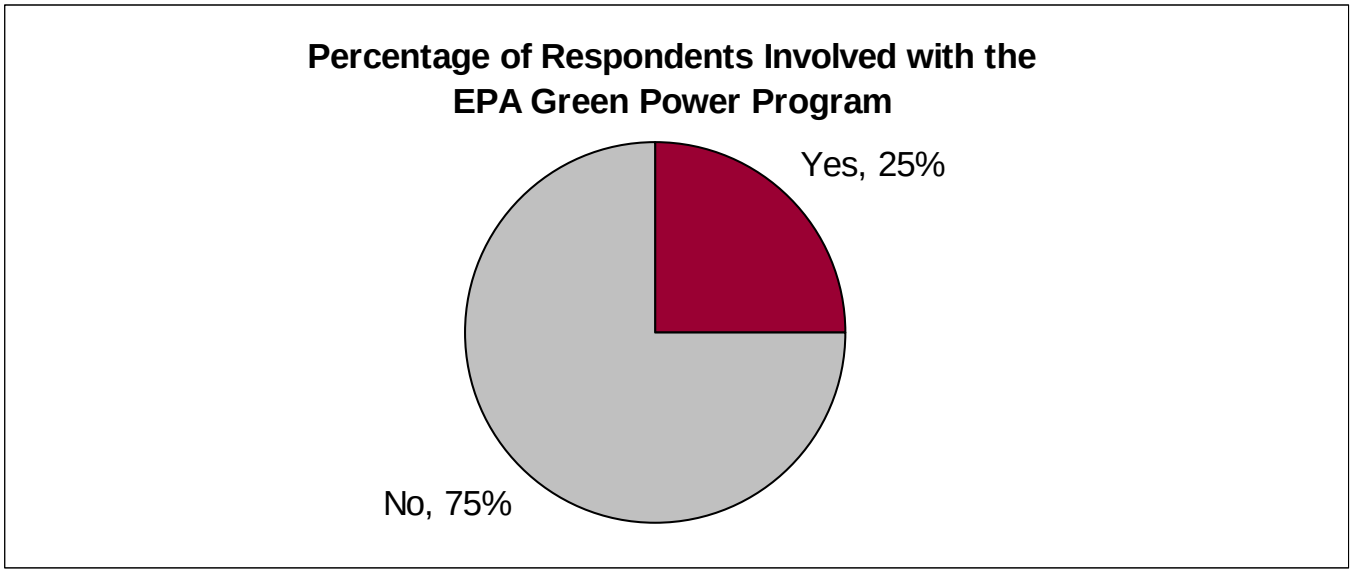
EPA Green Power Program



- The EPA Green Power Program helps companies buy electricity generated from renewable resources such as solar, wind, geothermal, small and low-impact hydropower, and biomass.
- Only 25% of survey respondents are participating in this program, but over time this will increase. To get more information on this program, visit: http://www.epa.gov/grnpower/documents/purchasing_guide_for_web.pdf

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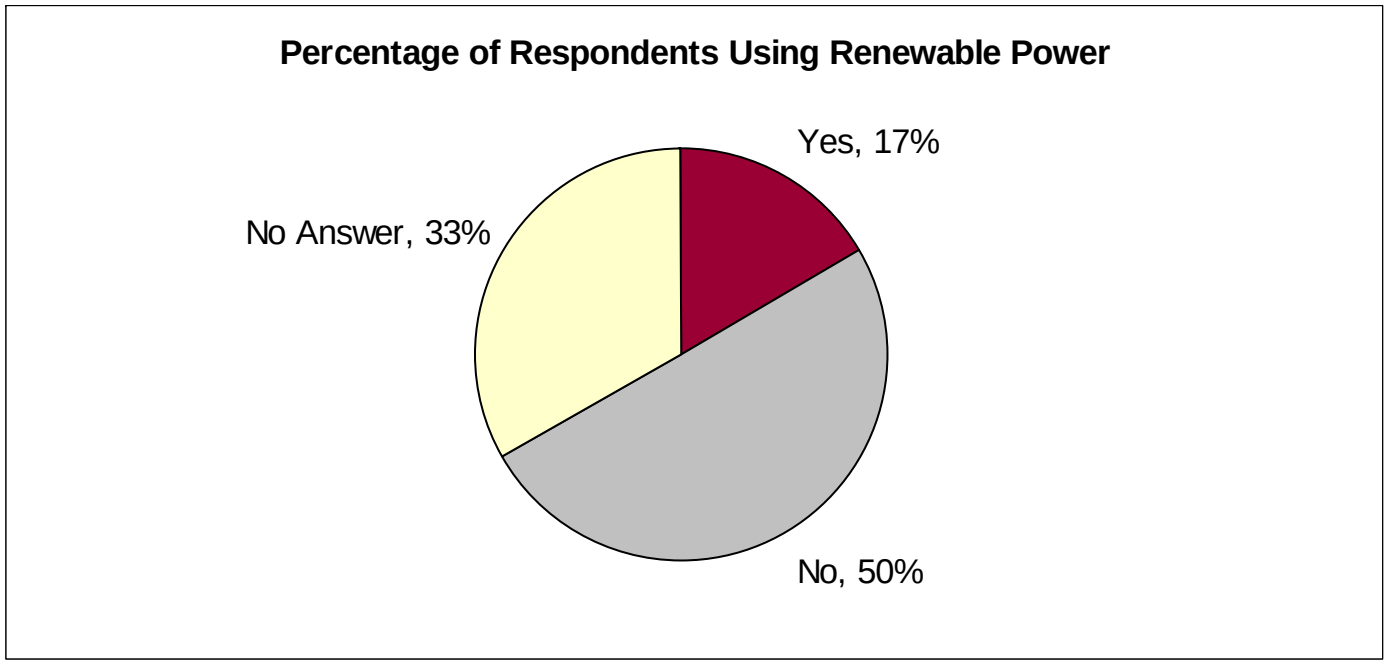
Use of Renewable Power



- A growing number of companies use renewable power sources to run their facilities.
- For companies that use renewable power sources, they are averaging 23% of their total power requirement from renewable sources. The percentage of renewable power that companies are using ranges from 5% to more than 70%.

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Material and Resource Efficiency Techniques

Material and Resource Efficiency Techniques Used in Facilities	Percentage of Respondents	
	Always	Sometimes
Protect the ground from contamination by any hazardous construction materials.	87%	13%
Properly dispose of any paints, varnishes, or other chemical compounds used in the construction.	78%	22%
Separate metals and other recyclable and salvageable materials during remodeling.	35%	52%
Choose only non-VOC (volatile organic compounds) sealants, finishes, adhesives, carpets, and composite wood products.	22%	57%
Use recycled plastics for signs, parking stops, trash receptacles, benches, tables, bike racks, etc.	17%	70%
Obtain building materials from locations near the building site.	17%	61%
Use materials that are durable and reusable at the end of their life cycle.	13%	70%
Use building materials that require minimal or no additional finishing actions to complete.	9%	70%
Reuse materials that have been salvaged from other buildings.	4%	65%
Use recycled content for roofing materials.	0%	65%
Use agricultural byproducts for construction materials, such as soy-based insulation, bamboo, or wood-byproduct materials.	0%	48%

- Companies today are vigilant with respect to protection from hazardous materials and minimizing emissions from their operations.
- To ensure that the most efficient materials are being used, companies are becoming increasingly aware of the materials being used in their buildings. This is providing companies with a wide range of environmentally friendly building material options.

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Building Systems Efficiency Techniques

Building Systems Efficiency Techniques Used in Facilities	Percentage of Respondents	
	Always	Sometimes
Have adequate controls for all HVAC and lighting systems to allow them to be shut down or controlled by occupants.	39%	61%
Design building systems such as HVAC, electrical, mechanical, and plumbing to be complementary when possible, and use efficiencies aimed in one system to assist in another system.	30%	70%
Install electric monitoring devices to allow occupants to understand how their activities impact the building's energy use.	17%	39%
Provide operable windows in sufficient quantities to allow for adequate ventilation, views, and use of outside air for cooling and heating purposes.	4%	57%
Install CO_2 and other monitoring systems to ensure that air quality remains at high levels throughout the building's life.	4%	52%

- HVAC systems and lighting systems are being used to control all aspects of a facility's energy usage.
- Total building systems help optimize the comfort and safety of occupants and minimize the energy, water and emissions from an operation.
- In a related question, just over half of survey participants responded that they develop and implement entire building waste management systems. Over time these building waste management systems will become commonplace due to their ability to save costs and reduce energy dependence.

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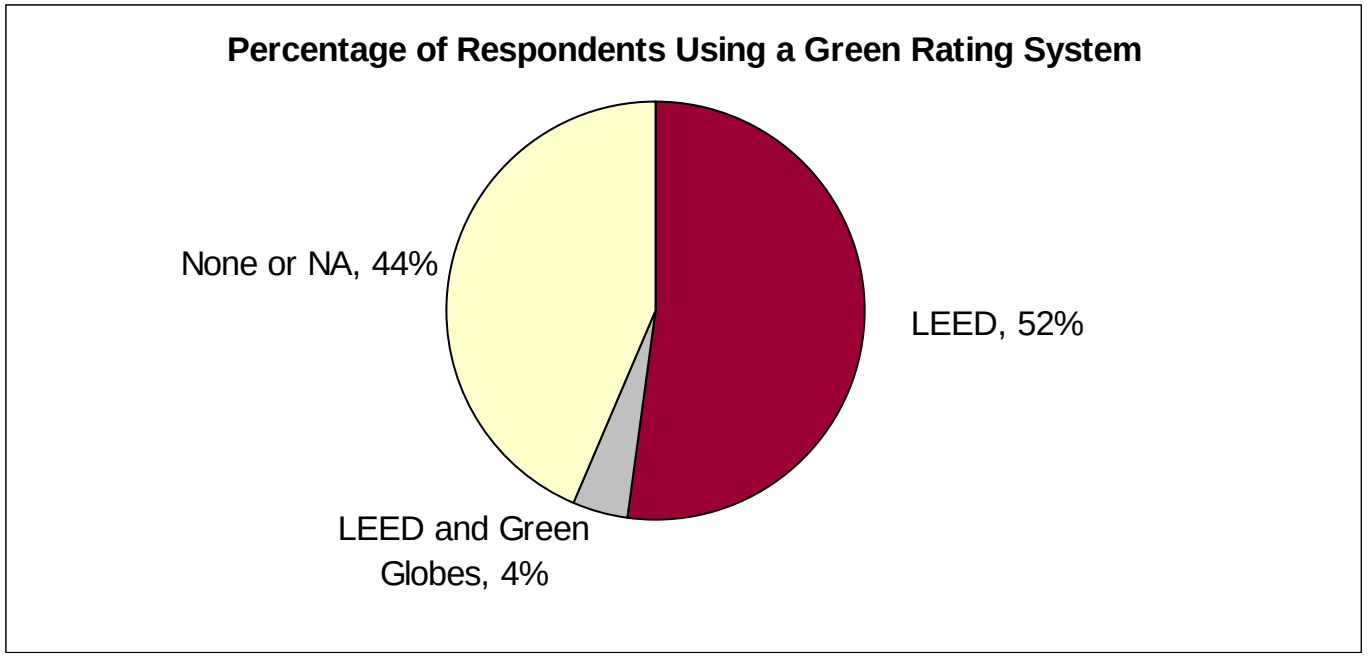
Use of the LEED Rating System



- The Leadership in Energy and Environmental Design (LEED) Green Building Rating System was developed by the U.S. Green Building Council (USGBC) to provide a suite of standards for environmentally sustainable construction. The hallmark of LEED is that it is an open and transparent process in which the technical criteria proposed by the LEED committees are publicly reviewed for approval by the more than 10,000 membership organizations that currently constitute the USGBC.
- LEED has become the leading standards process for green buildings.

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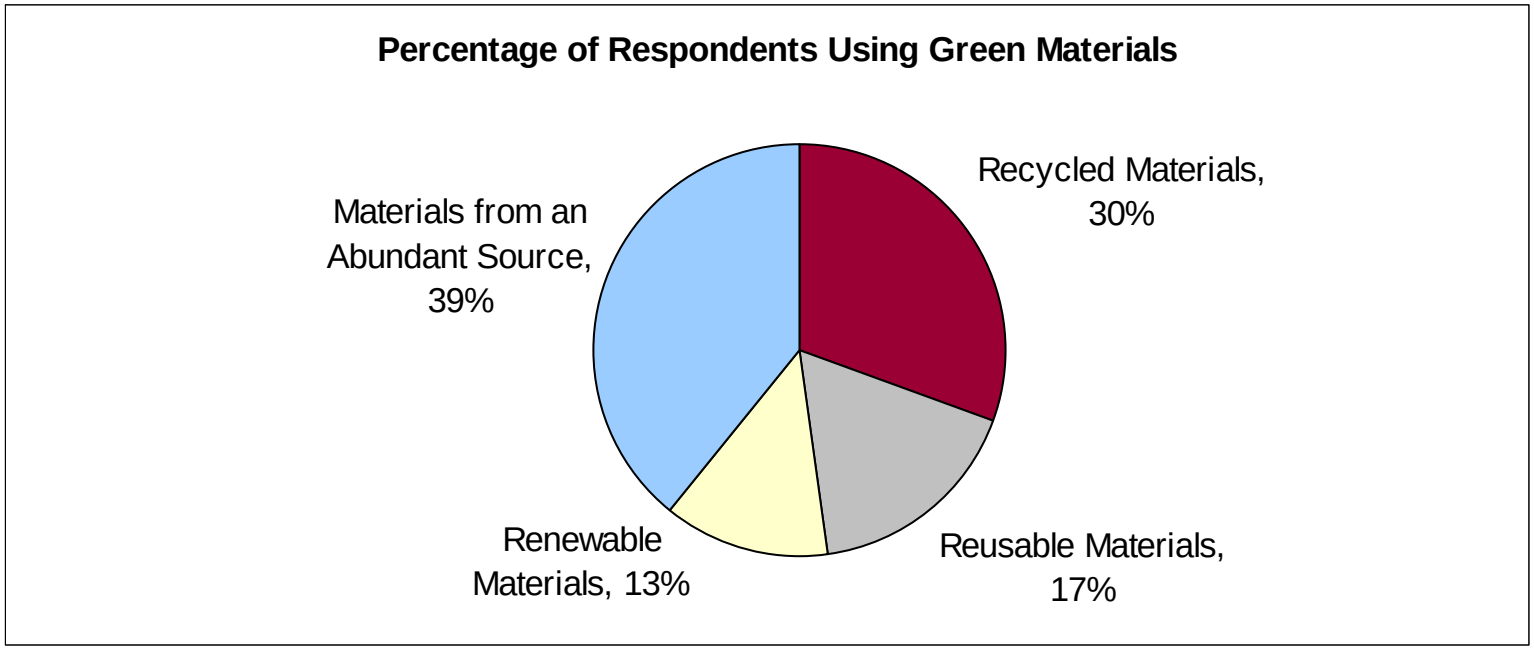
Building Materials Used



- Materials from an abundant source such as iron, glass or aluminum are used for new buildings by 39% of respondents, followed by recycled materials which are used by 30% of respondents.
- For the 39% of companies that use abundant materials, more than half of all materials used by them are abundant materials.
- Recycled materials are nearly 25% of the total materials used by the 30% of companies that use recycled materials.

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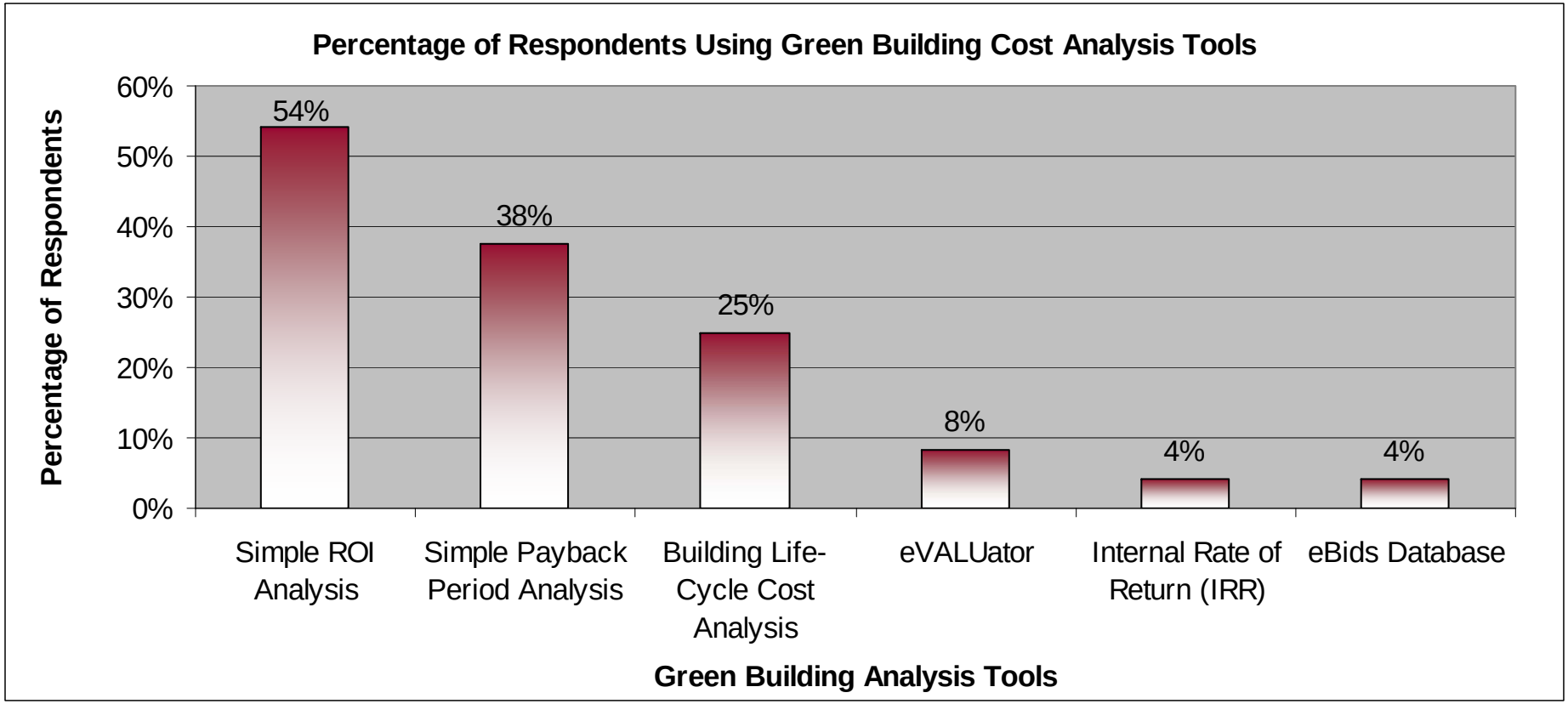
Green Building Cost Analysis Tools



- Most companies use traditional financial analysis tools, such as ROI, payback period and IRR; some use these methods in conjunction with building life-cycle cost analysis.

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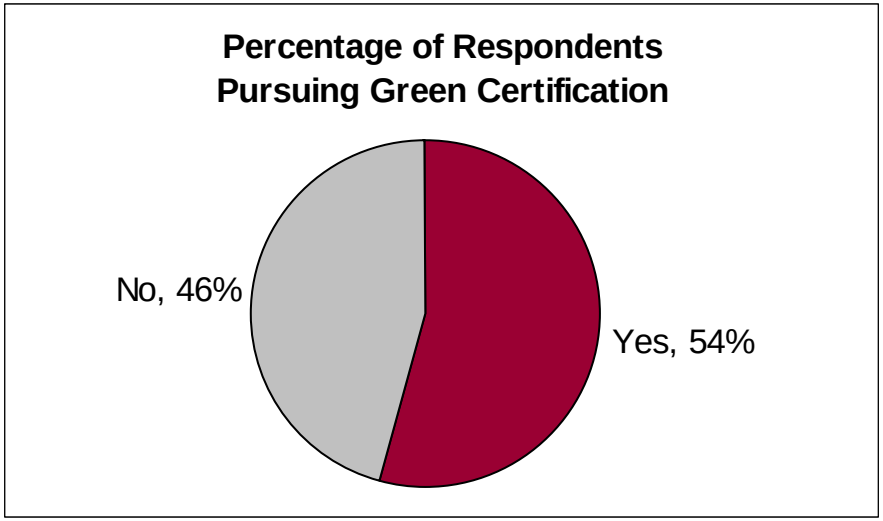
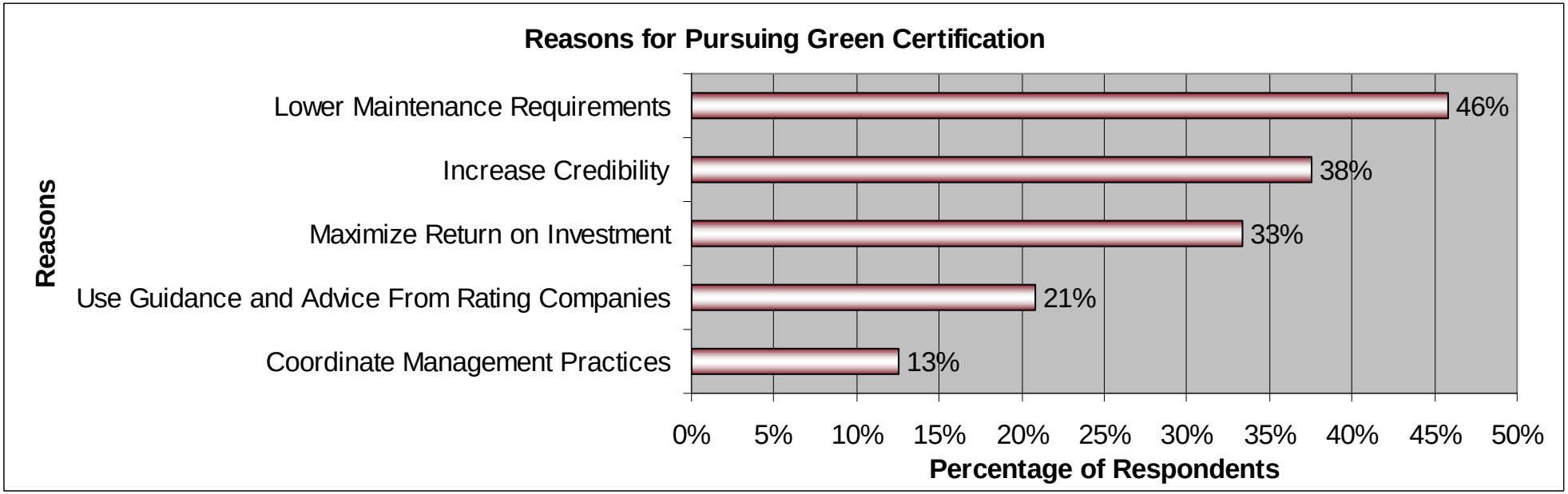
Green Certification



- More than half of the surveyed companies are pursuing or have pursued green certification.
- The reasons for pursuing certification range from decreasing maintenance requirements to increasing credibility and maximizing the return on green investments.



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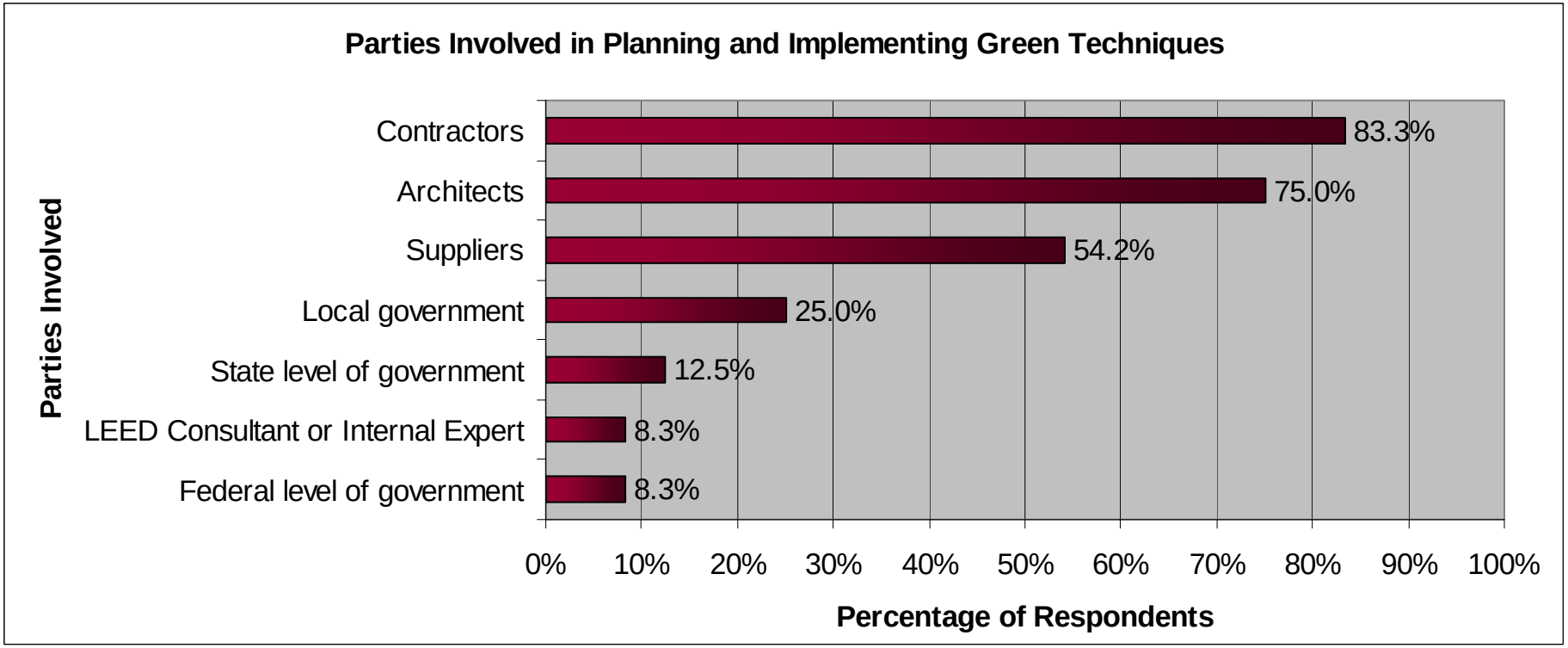
Parties Involved with Green Planning and Implementation



- Not surprisingly, the most common parties involved in planning and implementation of green building techniques are contractors, architects and suppliers.
- Local, state and federal government agencies are also involved in sustainability planning and implementation with companies.

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Closing Thoughts

The greening of facilities is an important part of any company's sustainability efforts. It is a complex situation to minimize the energy, water and other natural resources that are consumed in the operations of facilities while still maintaining the comfort and safety of occupants and employees.

This survey shows that considerable progress has been made and concerted efforts are underway to utilize and design more sustainable facilities. A few key highlights include:

- Companies' concerns for the environment now extend to the protection of land, water and animal habitats.
- Innovative water conservation and energy efficiency improvements are being made.
- Use of renewable power sources is on the rise.
- New facility designs are incorporating more environmentally friendly materials.
- Environmental building certification (LEED) is growing in importance.
- Companies are seeking and achieving an acceptable ROI for green building initiatives.
- The best facility designs involve specialized environmental resources from the building industry and government.

Green facilities will continue to evolve in the foreseeable future and will remain as an area ripe for improvements in cost reduction and the environment.

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To learn more about facility and building sustainability, as well as benchmarking and best practices, additional resources are available to members through the Supply Chain Consortium: www.supplychainconsortium.com.

Join the LinkedIn Supply Chain Consortium Group: www.linkedin.com/groupRegistration?gid=1966314

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