

Measurement Criteria:
The Sustainable Development Market 2008

A survey of decision makers' attitudes
and perceptions in the sustainable development
market

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Measurement Criteria: The Sustainable Development Market 2008

In 2008, the Portland Cement Association (PCA) Market Research department surveyed decision makers in the sustainable development market to assess their attitudes and perceptions of concrete and competing materials. This research was conducted as part of the measurement criteria research program, which strives to measure the effectiveness of promotions by tracking market share, promotional successes, and the attitudes and perceptions of decision makers.

Surveys were sent to decision makers from *Environmental Design & Construction* magazine, *Building Design & Construction* magazine, and from a list of decision makers from *Architectural Record* magazine. Filters, such as business or job function and job title, were applied in the selection process to better increase the probability that survey recipients would have background knowledge in sustainable development. Respondents surveyed were architects, designers, engineers, and environmental planners and managers. The survey addressed attitudes and perceptions toward sustainable development materials and their impact on the environment.

Methodology

Overall, 15,000 questionnaires were electronically sent to the various contacts in a blind survey format to avoid influencing the recipient's responses. Five thousand surveys each were emailed to contacts from *Environmental Design & Construction* magazine, *Building Design & Construction* magazine, and from *Architectural Record* magazine.

The questionnaire consisted of 30 questions and was presented in an internet survey form from a third-party Web host. Respondents were instructed to answer the questions based on the projects they had worked on the most during the last year. A sample questionnaire can be found in Appendix A. Returned surveys totaled 503, for an overall response rate of 3.3%. The sample size of 503 decision makers allows for statistical analysis at the 95% confidence level with a $\pm 4.0\%$ margin of error.

Any inferences or comparisons made from this data should consider the sample size, response rates, and resultant margin of error. When comparing data among different contact levels, now and in the future, caution should be used in drawing conclusions when response rates and bases are low.

Executive Summary

The attitudes and perceptions of 503 architects, designers, engineers from architect firms, consultants, and other professionals were collected. When asked how familiar they were with the term sustainable development, 57% said they were very familiar.

Respondents were asked what would be their structural material of choice to achieve sustainability goals on a project. Concrete, wood, and steel were ranked approximately the same, average 33%, with respondents explaining that the appropriate material of choice fully depends on the project context and the framework of the building needs.

When asked how many sustainable projects the respondents have worked on in the past year, the majority of respondents, 31%, indicated they have worked on 4 or more projects.

Green Factor

Survey respondents were asked to rank the level of importance of 22 attributes when selecting building materials. Energy efficiency was perceived as the most important attribute when selecting a building material with a mean rating of 4.5 on a scale of 1(not important) to 5 (very important).

After assessing the mean ratings of the attributes and then evaluating how concrete, wood and steel were ranked against those same attributes, an index was developed and multiplied against the original mean rating to develop a numeric score as to how each material ranked, overall, as a green material. Concrete's green factor was 4.20, wood was 4.03, followed by steel with a green factor of 3.85.

Environmental Impact

Seventy-seven percent of respondents said the sustainable development projects they have worked on in the past year used concrete for their sustainable material. The most common types of sustainable projects reported were residential (66%), followed by offices (64%), and education/school buildings (52%).

Sixty-four percent of respondents said the depletion of natural resources is the environmental consideration their company uses in their marketing approach. The majority of respondents (43%) told us that sustainable development is a part of the way they market their business, but it is not the main way they differentiate themselves.

Industry Leadership

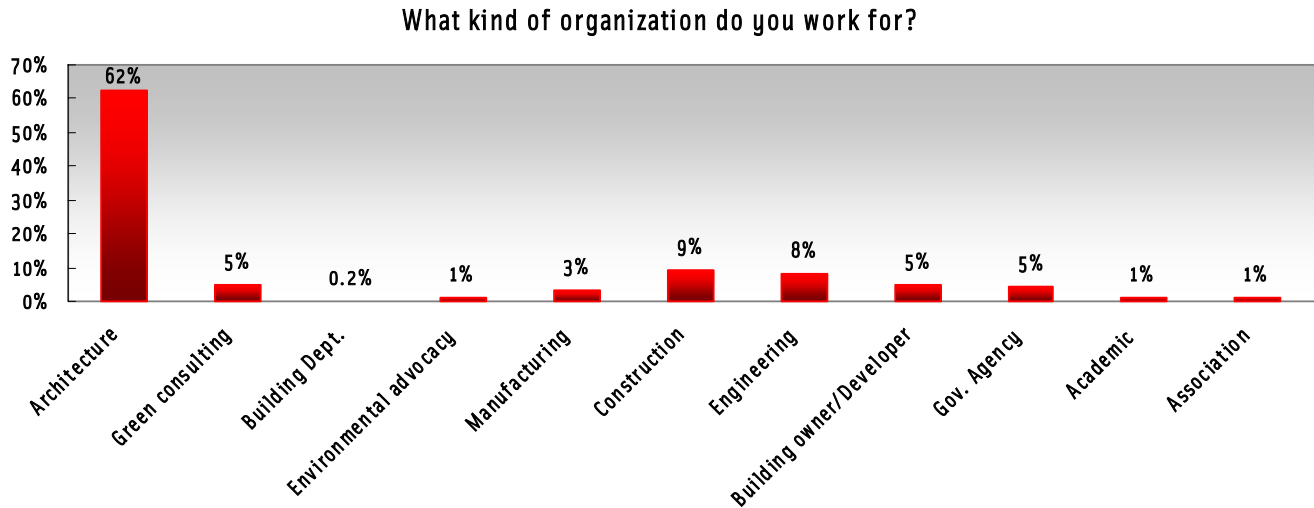
The Portland Cement Association received the highest percentage ratings from survey respondents on their level of contact with the association (53%), the level of attendance at a PCA event (49%), and having received association literature electronically (48%).

The wood industry received the highest mean rating, 3.6, from respondents for their level of leadership in supporting the premise of sustainable development. The concrete industry and the paint industry followed with mean rating of 3.2.

The Respondents

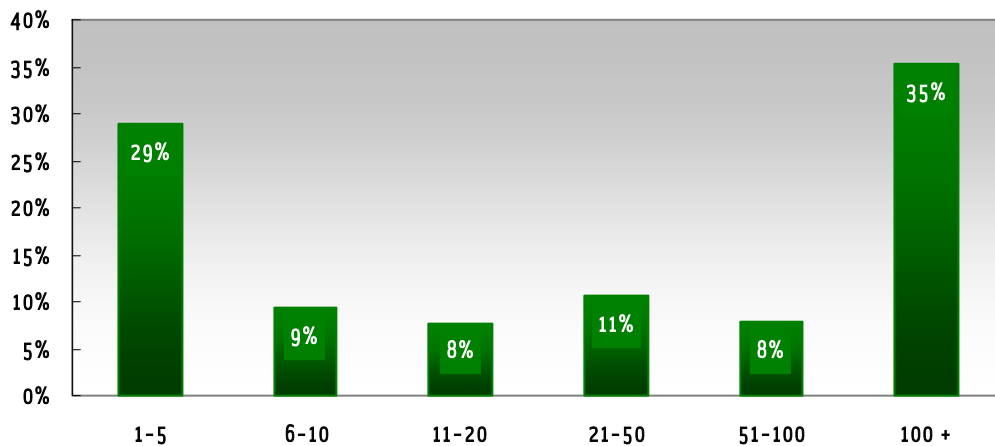
Type of Organization

Respondents were asked to identify what type of organization they were currently working with. Sixty-two percent of the respondents indicated they worked at an architecture organization. Approximately 9% of respondents indicated they worked in construction, followed by 8% that worked at an engineering organization.



When asked how many employees were at their current company, the majority of respondents, 35%, indicated 100 plus employees. Twenty-nine percent indicated a range of 1-5 employees, followed by 11% that had 21-50 employees.

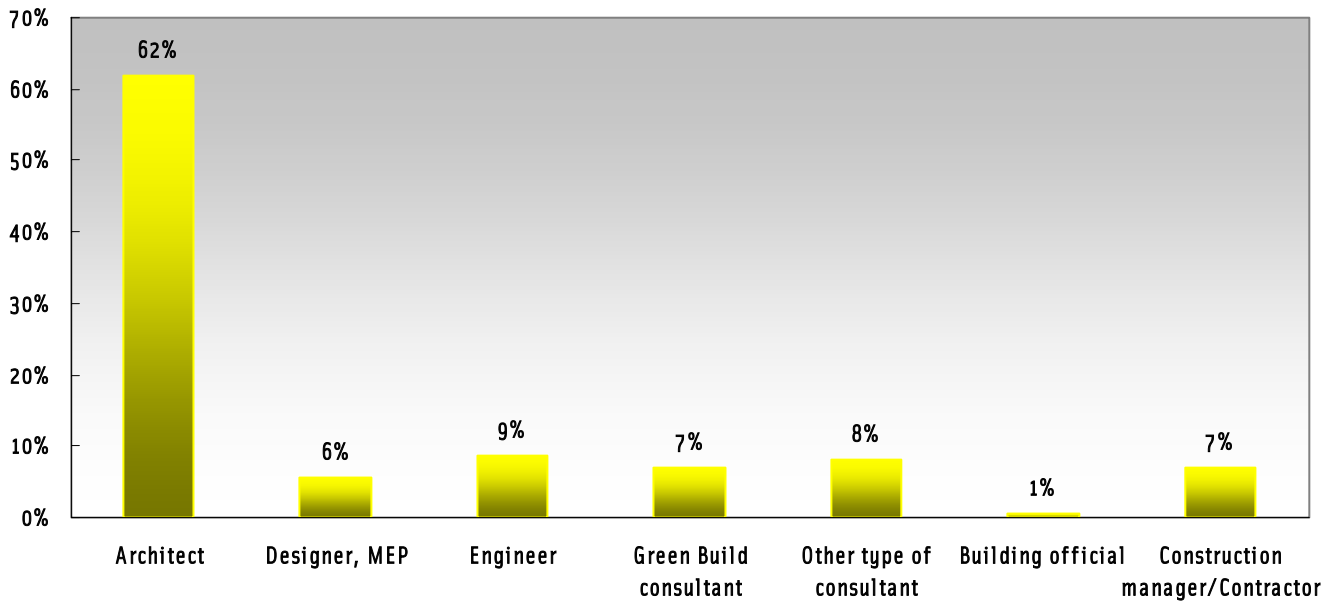
How many employees do you have in your organization?



Position

Survey recipients were requested to identify their current position at the time they were filling out the survey. The largest single category of respondents indicated architect at 62%. Engineers represented the second largest category at 9% of the respondents, and construction manager/contractor and other type of consultants represented 8% of the survey respondents.

What kind of position do you currently hold?

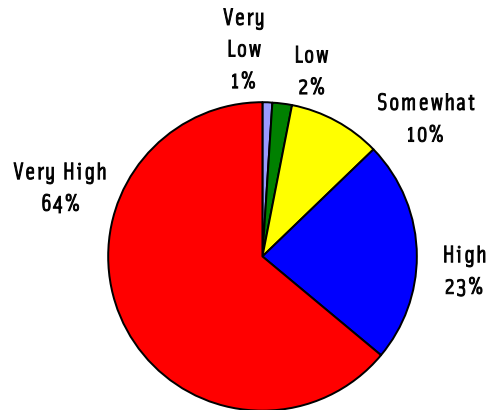


Perceptions and Knowledge of Sustainability

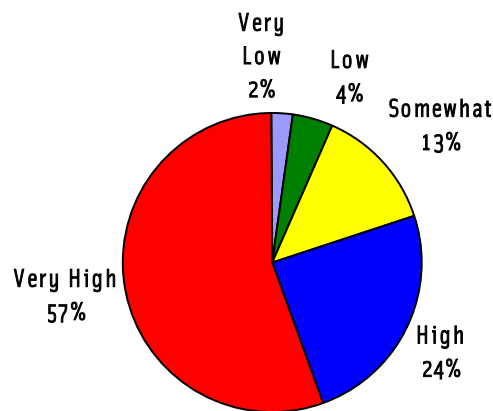
Terminology

When asked how familiar respondents were with the term *green building* versus *sustainable development*, 64% indicated they had a very high level of familiarity with *green building*. Fifty-seven percent of respondents said they had a very high level of familiarity with *sustainable development*.

Green Building - Level of Familiarity



Sustainable Development - Level of Familiarity



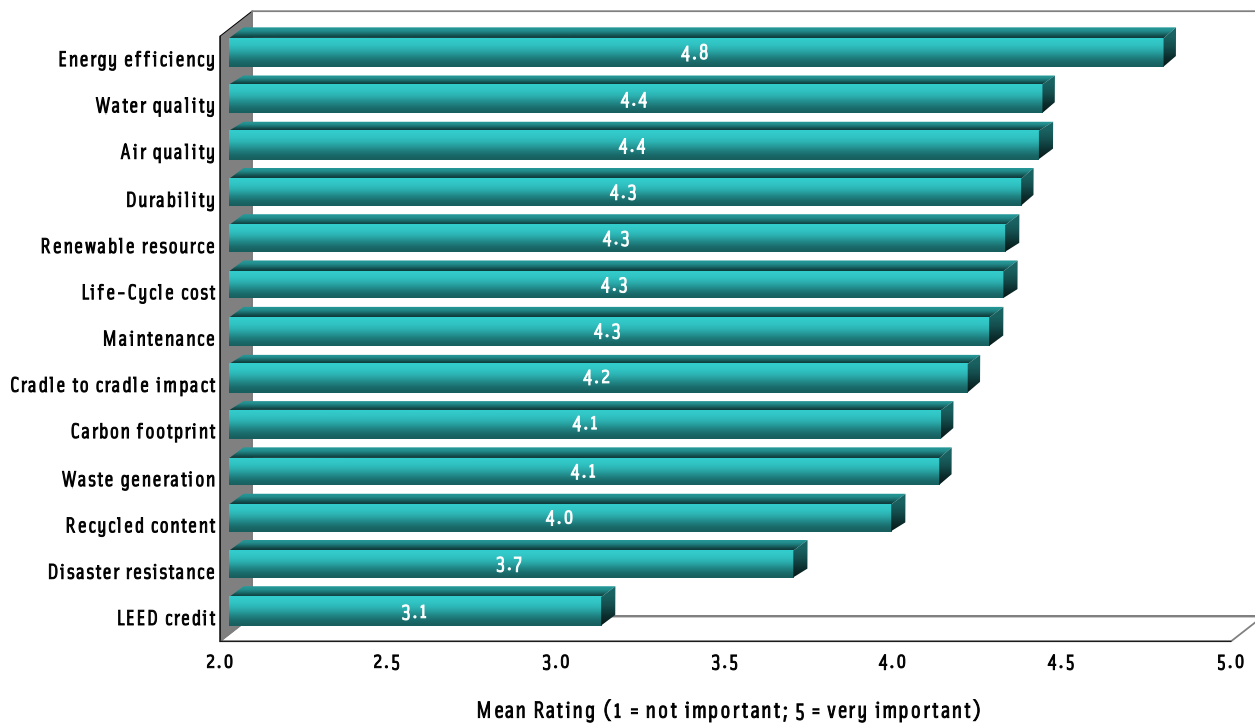
Respondents were then asked if they considered sustainable development to mean the same as green build. The majority of respondents, 75%, indicated they did not consider both terms to mean the same thing. When asked why, respondents indicated that although both terms address the minimization of adverse effects from construction activity on the planet, sustainable development encompasses a larger, more macro perspective that takes into consideration planning factors beyond the immediate building project. Respondents believed that green building was one component of sustainable development.

Sustainable Attributes

Level of Importance

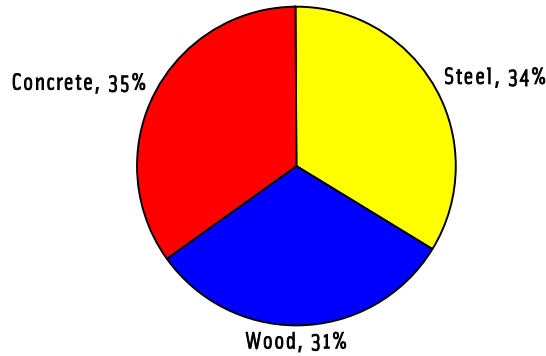
The survey provided thirteen key variables when considering sustainable development and asked respondents to rank them for their importance on a scale of 1 (not important) through 5 (very important). Based on the mean ratings below, respondents indicated that energy efficiency (4.8) was the most important variable, followed by water quality (4.4) and air quality (4.4). Durability (4.3) was ranked as the fourth most important variable.

Ranking of Importance of Sustainable Development Variables



When respondents were asked what their structural material of choice to achieve their sustainability design goals was, concrete (35%), steel (34%), and wood (31%), were closely split.

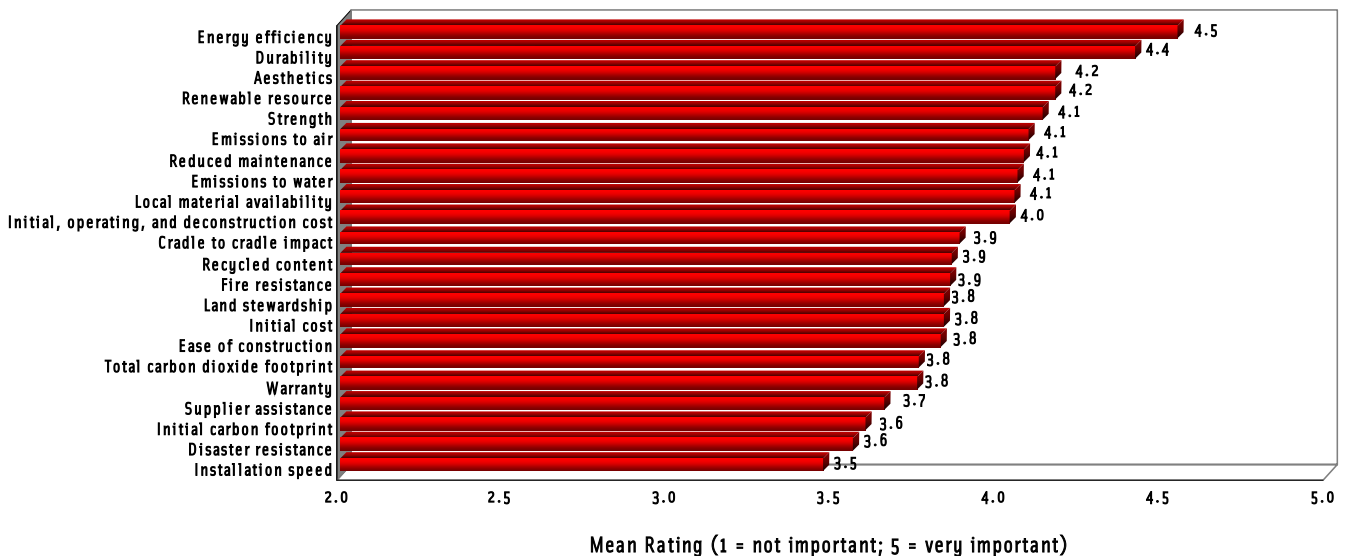
Structural Material of Choice for Sustainability Design Goals



When respondents were asked to expand on their reasoning, the majority indicated that the appropriate material of choice fully depends on the project parameters and the context of the building needs.

The questionnaire asked respondents to rate the level of importance of 22 material attributes when deciding on a building material. Based on the mean response rate from a scale of 1 (not important) through 5 (very important), energy efficiency (4.5), durability (4.4), and aesthetics (4.2) were the top three ranked attributes for importance. The lowest attributes ratings were supplier assistance (3.7), initial carbon footprint (3.6), disaster resistance (3.6), and installation speed (3.5).

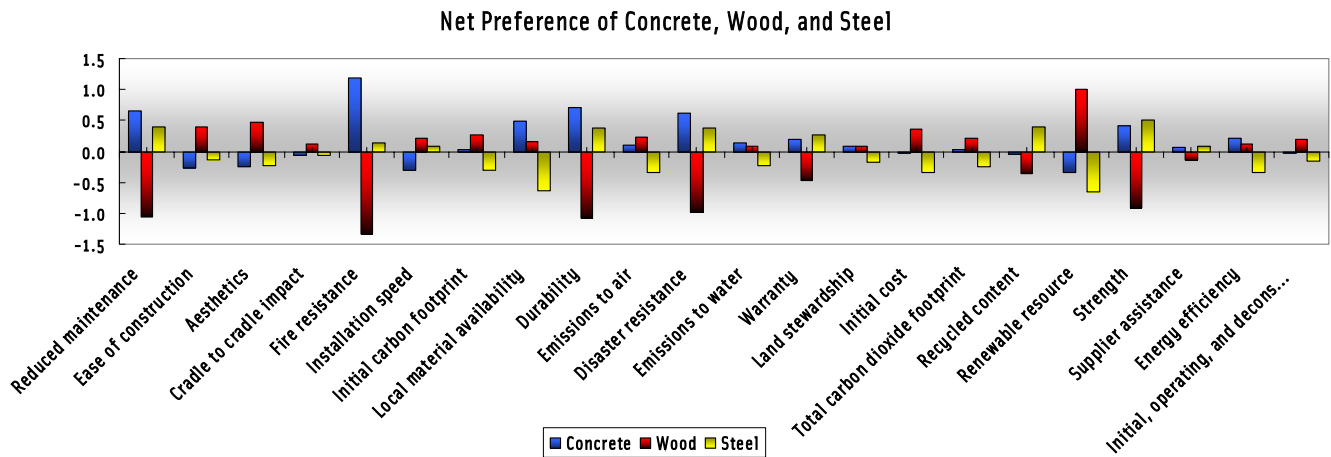
Ranking of Importance of Attributes when Selecting Building Materials



Net Preference

Respondents were given instructions to rank building materials (concrete, steel, and wood) in comparison of one another for performance on a scale from 1 (very poor) to 5 (excellent). The building materials were rated on the same twenty-two material attributes that respondents previously rated for importance in the previous graph.

Net preference is an efficient tool in evaluating comparisons, especially the kind made in the preference section of this survey. To compare concrete, steel and wood, the net preference was calculated by subtracting the average rating of all paving materials in a particular attribute from each individual material in that same attribute category. Higher absolute values indicate stronger preferences. If the net preference ranking for a material was negative (bar below the axis), preferences were weaker. Based on the 22 attributes respondents ranked concrete, steel and wood for each attribute.



The charts shown below detail the net preference rating for all three materials based on each attribute that is shown in the previous graph.

Net preference								
Attributes	Reduced maintenance	Ease of construction	Aesthetics	Cradle to cradle impact	Fire resistance	Installation speed	Initial carbon footprint	Local material availability
Concrete	0.6	-0.3	-0.2	-0.1	1.2	-0.3	0.0	0.5
Wood	-1.0	0.4	0.5	0.1	-1.3	0.2	0.3	0.2
Steel	0.4	-0.1	-0.2	-0.1	0.1	0.1	-0.3	-0.6

Net preference							
Attributes	Durability	Emissions to air	Disaster resistance	Emissions to water	Warranty	Land stewardship	Initial Cost
Concrete	0.6	0.1	0.6	0.1	0.2	0.1	-0.03
Wood	-0.9	0.2	-1.0	0.1	-0.5	0.1	0.4
Steel	0.3	-0.3	0.4	-0.2	0.3	-0.2	-0.3

Net preference							
Attributes	Total carbon dioxide footprint	Recycled content	Renewable resource	Strength	Supplier assistance	Energy efficiency	Initial, Operating, and deconstruction cost
Concrete	0.0	-0.04	-0.3	0.4	0.1	0.2	-0.03
Wood	0.2	-0.4	0.8	-0.8	-0.1	0.1	0.2
Steel	-0.3	0.4	-0.6	0.5	0.1	-0.3	-0.2

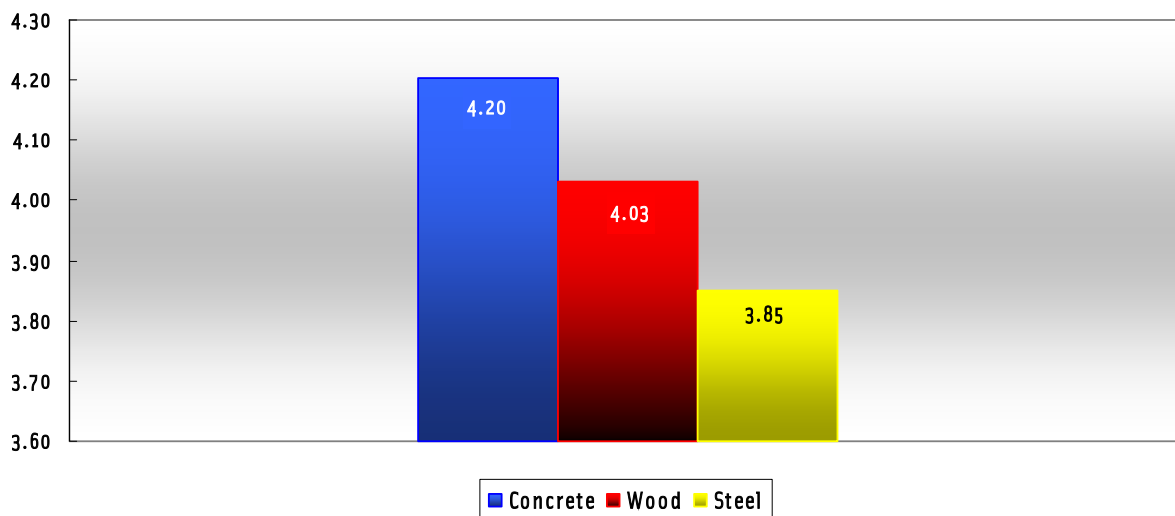
Green Factor

Green Factor Findings

The green factor rating allows us to look at each individual building material (concrete, wood, and steel) and interpret how sustainable (or green) respondents felt about each material.

Based on the graph below, concrete ranked the highest (4.20), followed by wood (4.03), and then steel (3.85) when determining how sustainable or green the building material is perceived by decision makers.

Green Factor of Concrete, Wood, and Steel



To determine the green factor rating, the calculation can be broken down into a 3 step process.

- Step 1, the mean ratings for level of importance for attributes directly related to sustainable development were calculated.
- In step 2, the mean ratings for each material (concrete, wood, and steel) within each attribute directly related to sustainable development were indexed (divided) against the overall average for that particular attribute.
- Step 3, the mean rating of the attribute from step 1 was multiplied against the indexed number of the material for that same attribute in step 2. This new number is summed across all attributes per material, and then weighted by the number of attributes being analyzed.

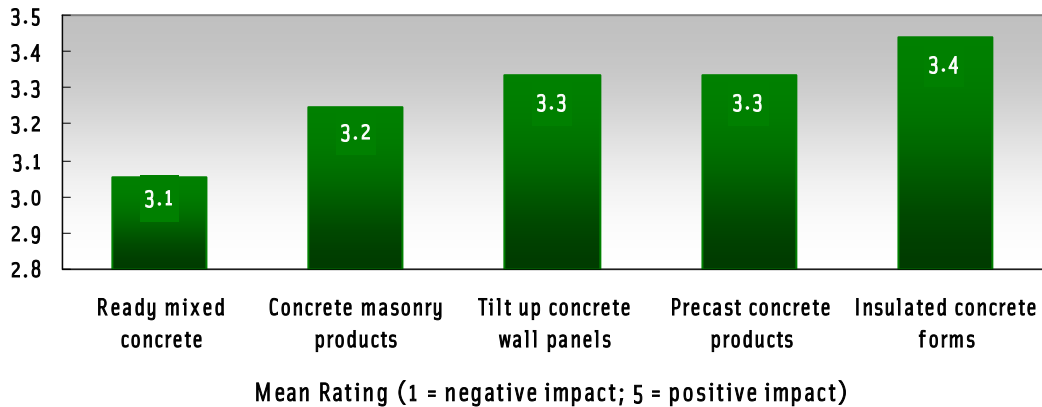
This number allows us to determine how green each material ranks, everything being constant, against one another when compared on the same attributes.

Environmental Impact

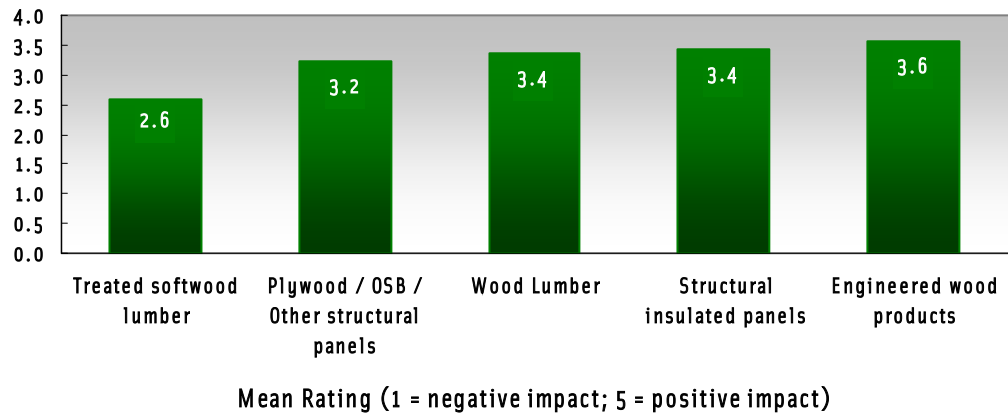
Material Ratings

Respondents were asked to rank various building material products on their environmental impact on a scale that ranged from 1 (negative impact) to 5 (positive impact). The graphs below illustrate the mean rating perceptions of each material.

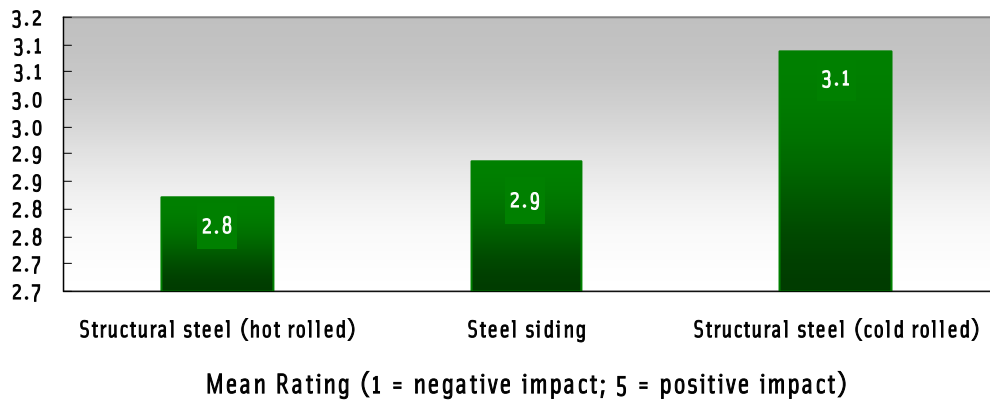
Concrete Product Ratings on their Environmental Impact



Wood Product Ratings on their Environmental Impact

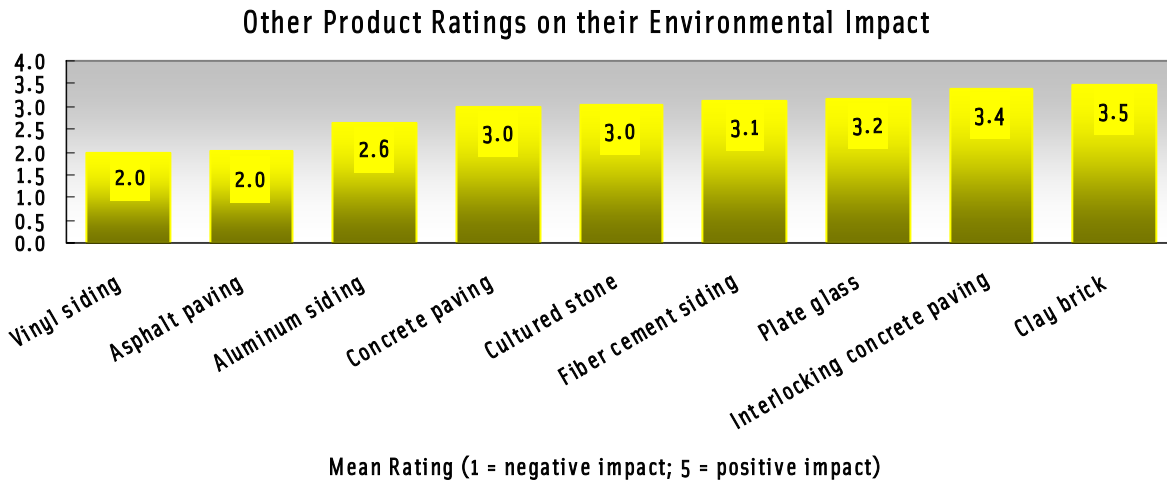


Steel Product Ratings on their Environmental Impact



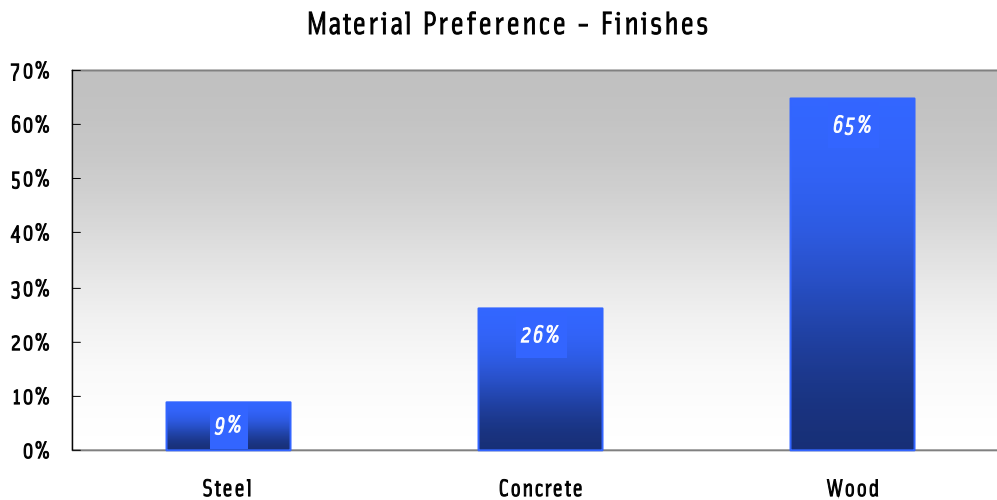
Other Material Ratings

Respondents were asked to further evaluate other products on their environmental impact on the scale 1 (negative impact) to 5 (positive impact). The graph below illustrates the mean ratings for each product.



Structural and Finishes

When asked to indicate which material respondents would prefer to work with when needing the most sustainable material, respondents were able to evaluate concrete, wood, and steel based on structural qualities, and finishes. Forty-three percent of respondents selected concrete as their material preference for structural design, 39% of the respondents selected steel as their structural material preference. Wood garnered 18% of respondent's preference. Sixty-five percent of respondents selected wood as their material of choice for finishes. Followed by 26% of respondents who selected concrete, and 9% of respondents indicated they preferred steel.

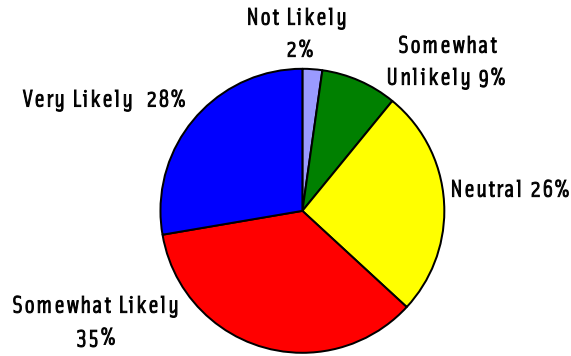


When respondents were asked to expand on their selection choice and explain why they selected the material they did, the majority of responses, 40%, indicated that they felt the most sustainable material is contingent on the context of building needs and project parameters.

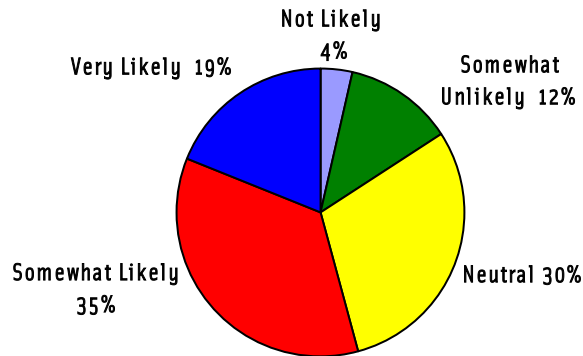
Material Recommendations

Statements regarding the usage of material for a sustainable building design were shown to respondents, and they were asked to identify their level of likelihood towards the statement. The pie charts below illustrate the level of likelihood towards the statements based on survey responses.

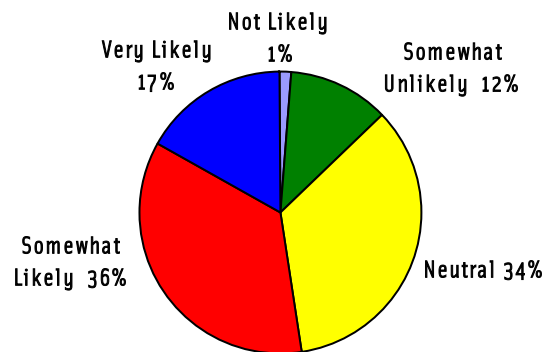
I would likely recommend using concrete for a sustainable building design



I would likely recommend using wood for a sustainable building design

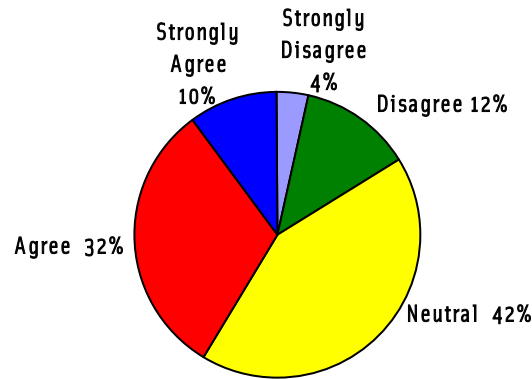


I would likely recommend using steel for a sustainable building design

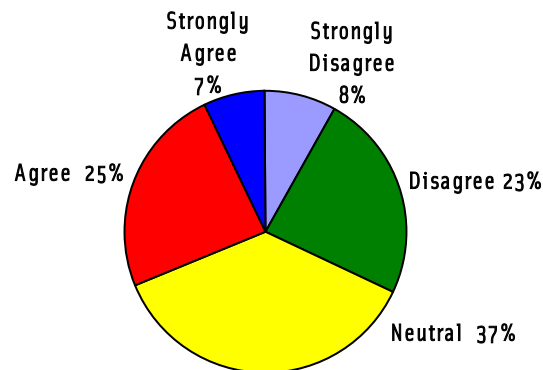


Respondents were then shown statements comparing concrete, wood, and, steel as materials that provide greater sustainability and were asked to indicate their level of agreement; the series of pie charts below depict the level of agreement towards the statements based on survey responses. Cement/concrete structures maintain the largest combined percentage, 42%, of respondents that strongly agreed or agreed with the greater structural sustainability of the material.

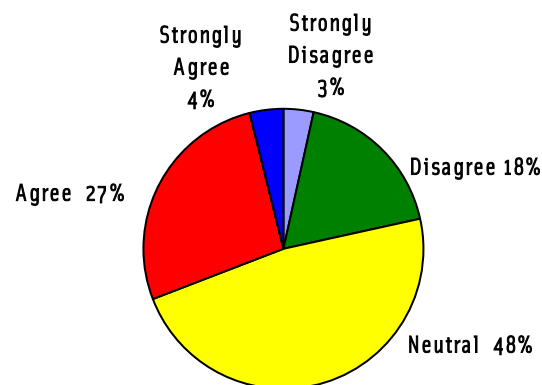
Predominantly cement/concrete structures provide greater sustainability than other materials



Predominantly wood structures provide greater sustainability than other materials

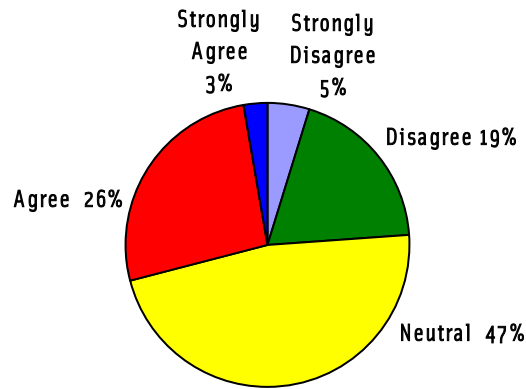


Predominantly steel structures provide greater sustainability than other materials

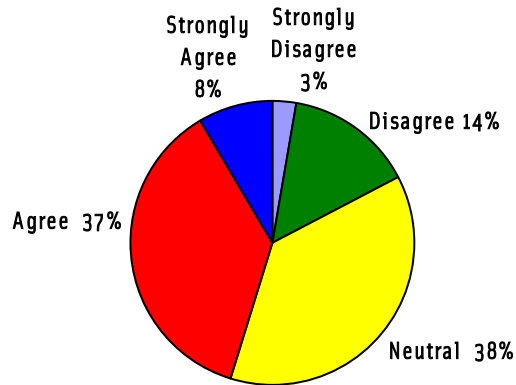


Survey recipients were asked to identify their level of agreement towards statements of environmental leadership in manufacturing. The wood industry maintained the largest combined percentage, 45%, of respondents who strongly agreed or agreed with the environmental leadership in their manufacturing.

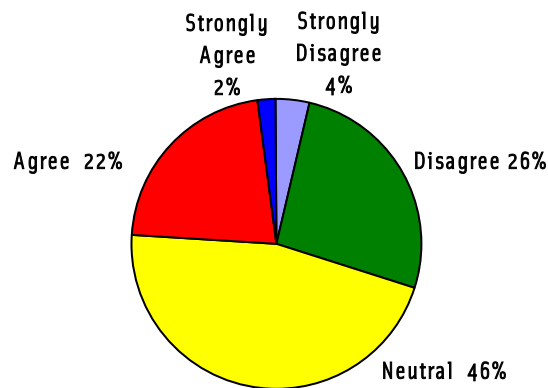
The cement / concrete industry demonstrates environmental leadership in its manufacturing.



The wood industry demonstrates environmental leadership in its manufacturing.

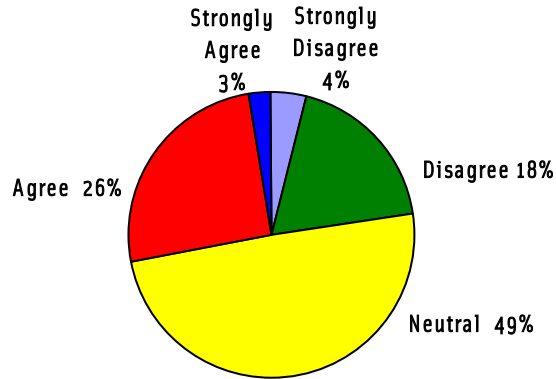


The steel industry demonstrates environmental leadership in its manufacturing.

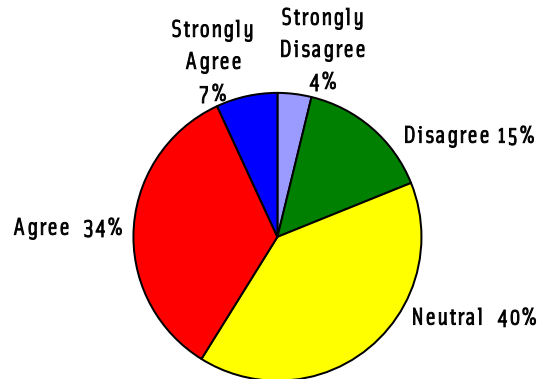


Environmentally responsible manufacturing statements were shown to respondents. The wood industry had the largest combined percentage, 41%, of survey respondents who strongly agreed or agreed with their commitment in environmentally responsible manufacturing.

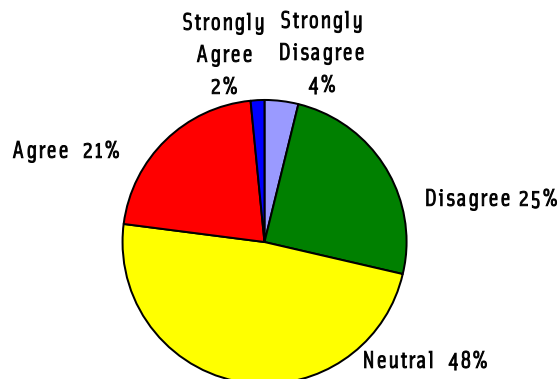
The cement / concrete industry is committed to environmentally responsible manufacturing



The wood industry is committed to environmentally responsible manufacturing

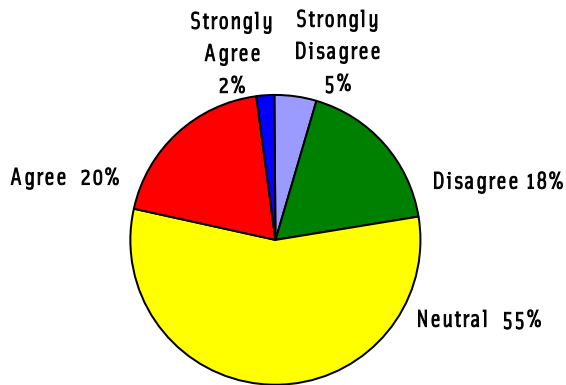


The steel industry is committed to environmentally responsible manufacturing

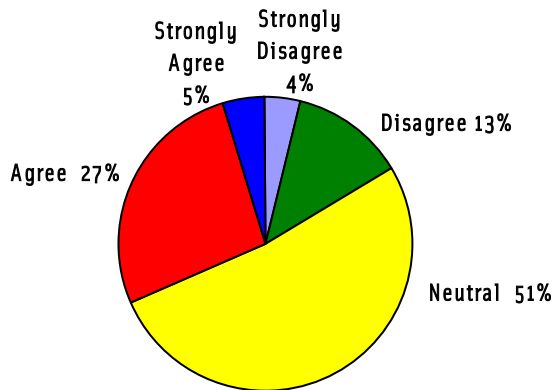


Statements regarding voluntary reduction of emissions were shown to respondents. The wood industry had the largest combined percentage, 33%, of survey respondents who strongly agreed or agreed with the wood industry's effort level in emission reduction.

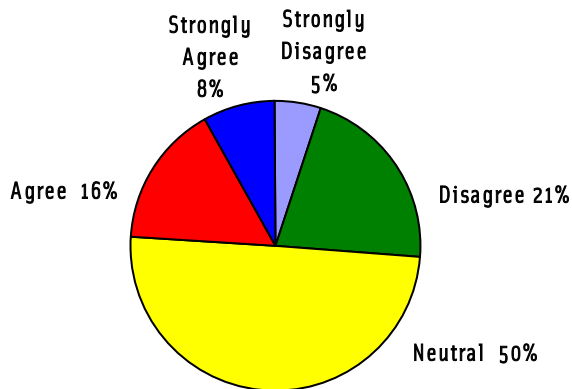
The cement/concrete industry has made a good effort in its voluntary reduction of emissions



The wood industry has made a good effort in its voluntary reduction of emissions



The steel industry has made a good effort in its voluntary reduction of emissions

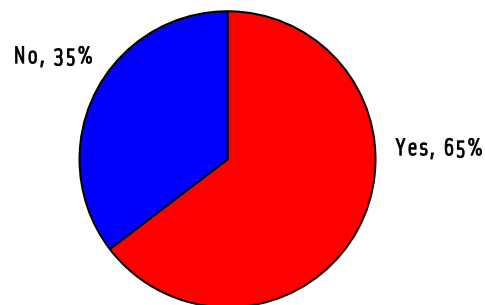


Projects

Sustainable Projects

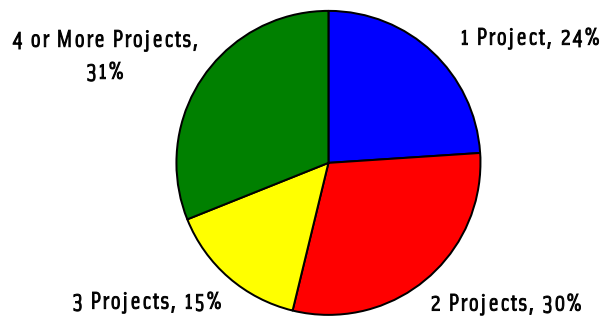
The survey asked recipients if they had worked on a sustainable project within the last year. Sixty-five percent of respondents indicated they had worked on a sustainable project within the past year. In contrast, 35% of respondents had said they did not work on a sustainable project.

Have you worked on any sustainable development projects in the past year?



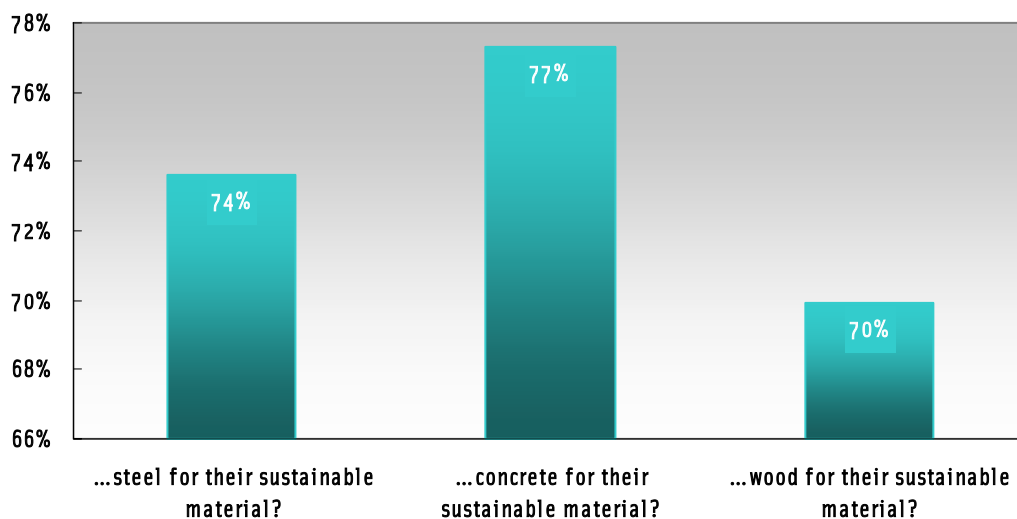
For those respondents that indicated they had worked on a sustainable project within the past year, the survey asked how many projects had they worked on. The majority of respondents, 31%, worked on 4 or more sustainable projects within the past year.

How many sustainable projects have you worked on in the last year?



Based on the graph below, the majority of respondents (77%) said they used concrete as a sustainable material. Seventy-four percent of respondents indicated they used steel, and 70% indicated they used wood as their sustainable material.

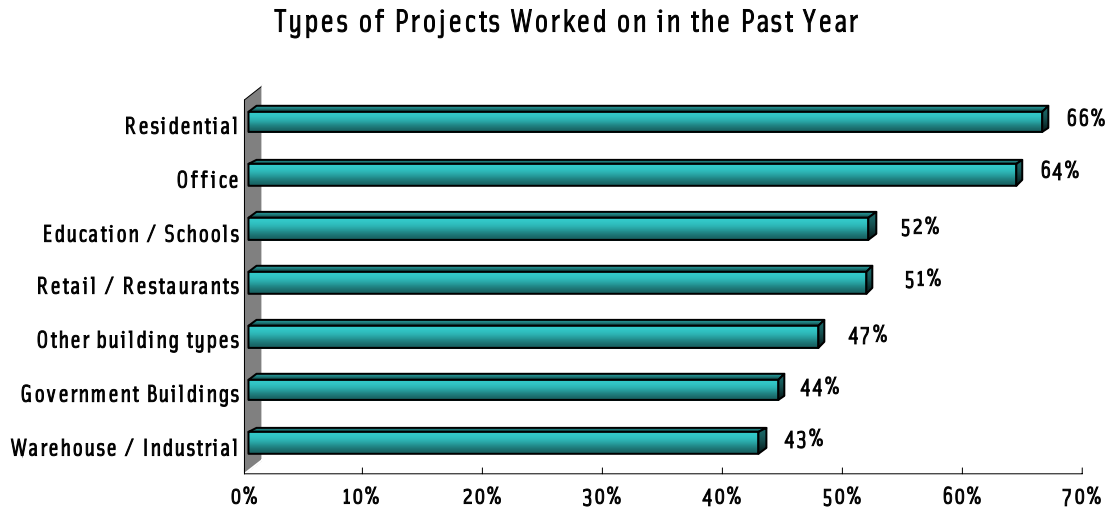
Of those sustainable projects you have worked on in the past year, how many used...



Respondents were allowed to choose multiple selections when answering the sustainable projects material usage question. Each response was given equal weight, resulting in the total percentage to exceed 100%.

Types of Buildings

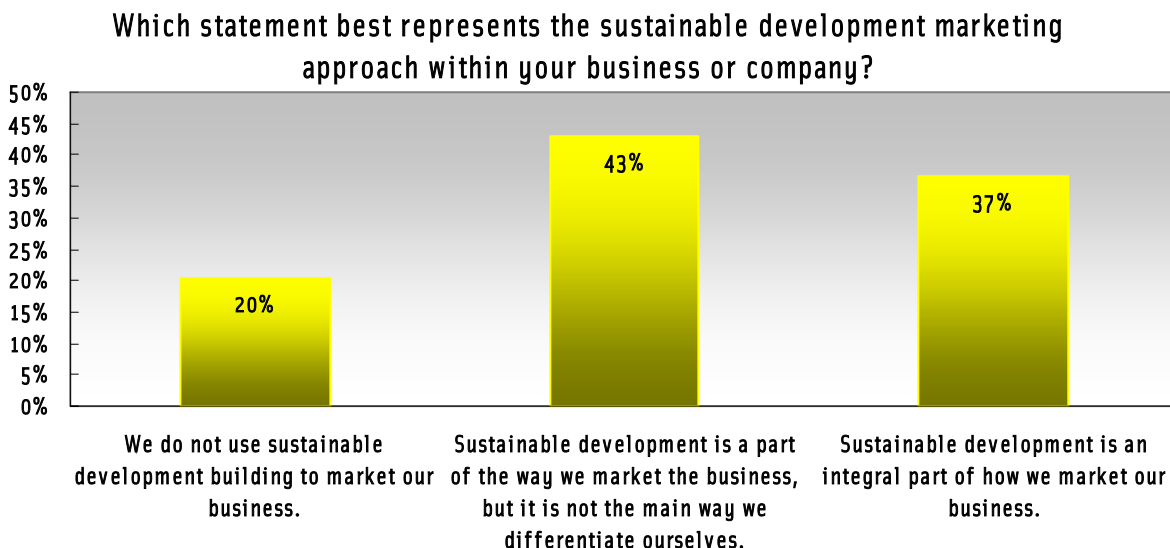
When respondents were asked to share the types of buildings they have worked on in the past year, 66% indicated they worked on residential buildings, followed by 64% that worked on office buildings. Education/school type buildings came in third with 52%.



Respondents were allowed to choose multiple selections when answering the question about types of projects they worked on in the past year. Each response was given equal weight, resulting in the total percentage to exceed 100%.

Marketing Approach

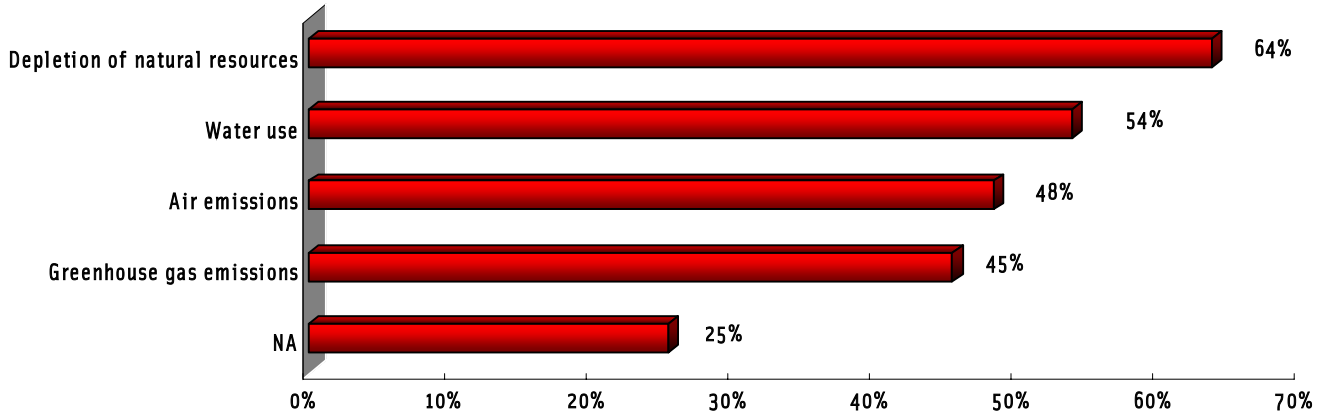
Respondents were asked to indicate which statement best represented the sustainable development marketing approach within their business or company. The chart below illustrates that the majority of respondents, 43%, indicated that sustainable development is a part of the way they market the business, but it is not the main way they differentiate themselves.



Environmental Considerations

Respondents were asked if their business or company had a sustainable development marketing approach, what types of environmental considerations were used. Based on the responses, 64% of the respondents indicated that the depletion of natural resources was considered. Fifty-four percent reported water use was considered. Forty-eight percent indicated their business or company considered air emissions.

If your business or company has a sustainable development marketing approach, what types of environmental considerations are used?

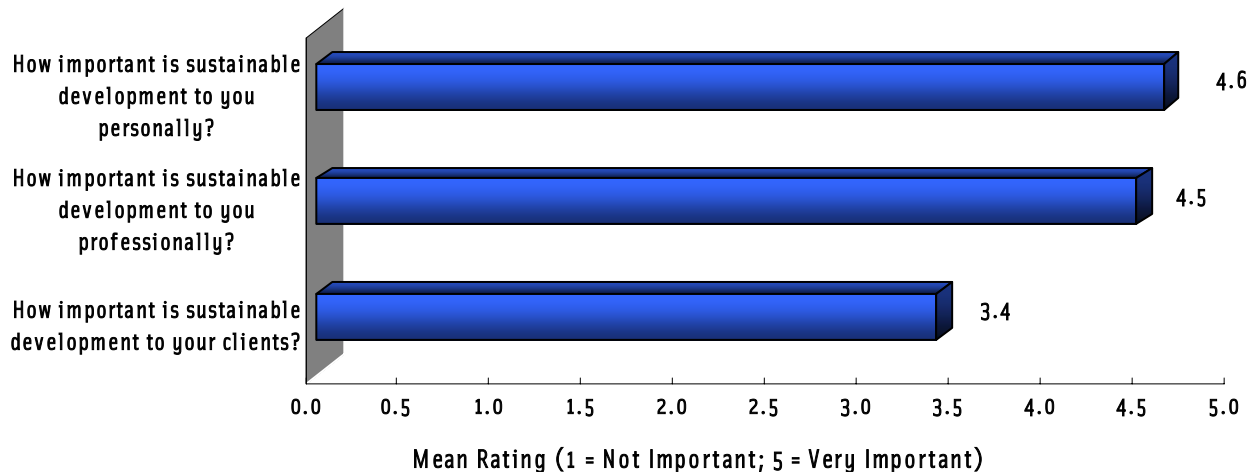


Respondents were allowed to choose multiple selections when answering the question regarding sustainable marketing approach and environmental considerations. Each response was given equal weight, resulting in the total percentage to exceed 100%.

Project Importance

The survey asked respondents to regard the following questions and answer on the level of importance when considering sustainable development on a scale from 1 (not important) to 5 (very important). The highest mean rating, 4.6, was given to the question, 'How important is sustainable development to you personally?' followed closely by 'How important is sustainable development to you professionally?' with a mean rating of 4.5.

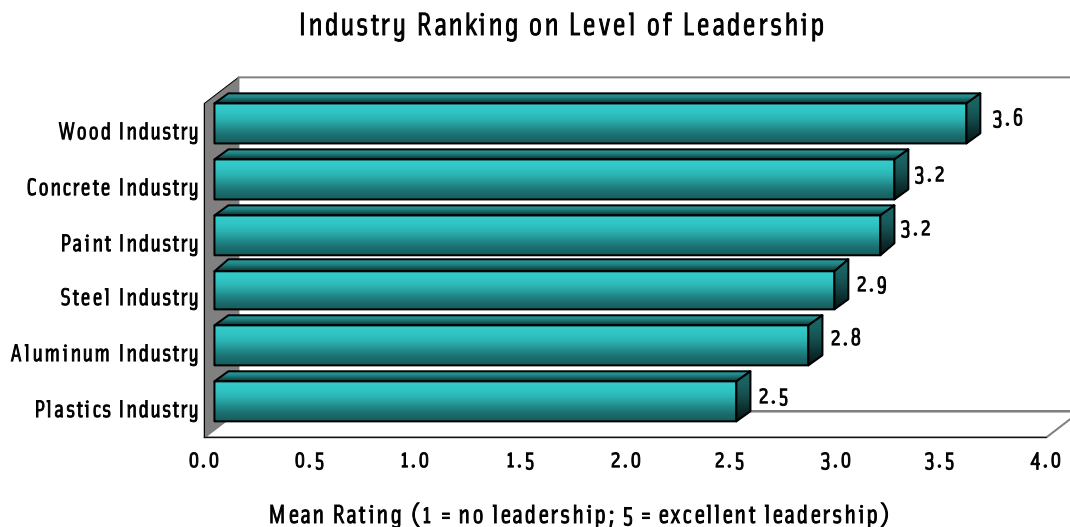
Sustainable Development Importance



Industry Leadership

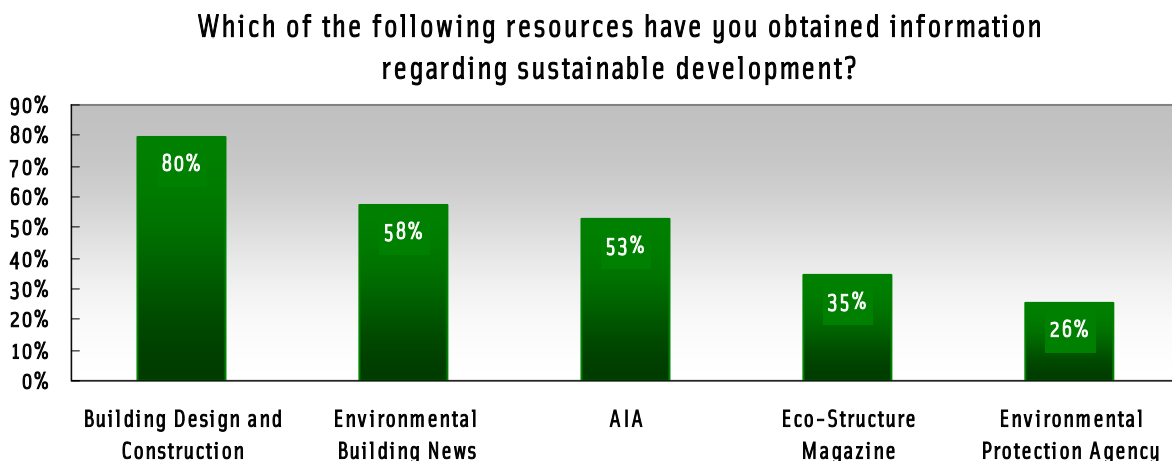
Leadership

Recipients were asked to rank various industries on their level of leadership in supporting the premise of sustainable development. Based on a scale from 1 (no leadership) to 5 (excellent leadership), the wood industry was ranked the highest with a mean rating of 3.6. The concrete industry and the paint industry both followed with a mean rating of 3.2. The steel industry received a mean rating of 2.9. The aluminum industry received a mean rating of 2.8. The plastics industry received a mean rating of 2.5.



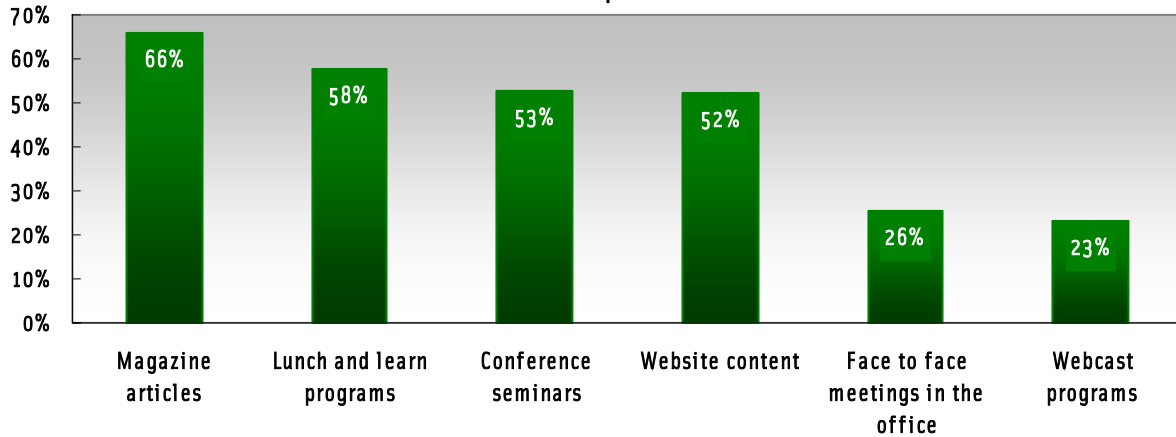
Information Resource

Respondents were requested to share from which resources they have obtained information regarding sustainable development. Eighty percent of the respondents indicated they obtained information from *Building Design and Construction* magazine. This was followed by 58% that received sustainable development information from *Environmental Building News* magazine. Fifty-three percent of respondents indicated the American Institute of Architects (AIA) as a resource for sustainable development information.



Respondents were asked to share their preference towards the best approaches to deliver educational information regarding sustainable development. Sixty-six percent of respondents indicated they preferred magazine articles. Fifty-eight percent of respondents preferred lunch and learn programs, followed by 52% that favored conference seminars.

What are the best methods to deliver educational sustainable development material and stay informed of trends and tech developments?

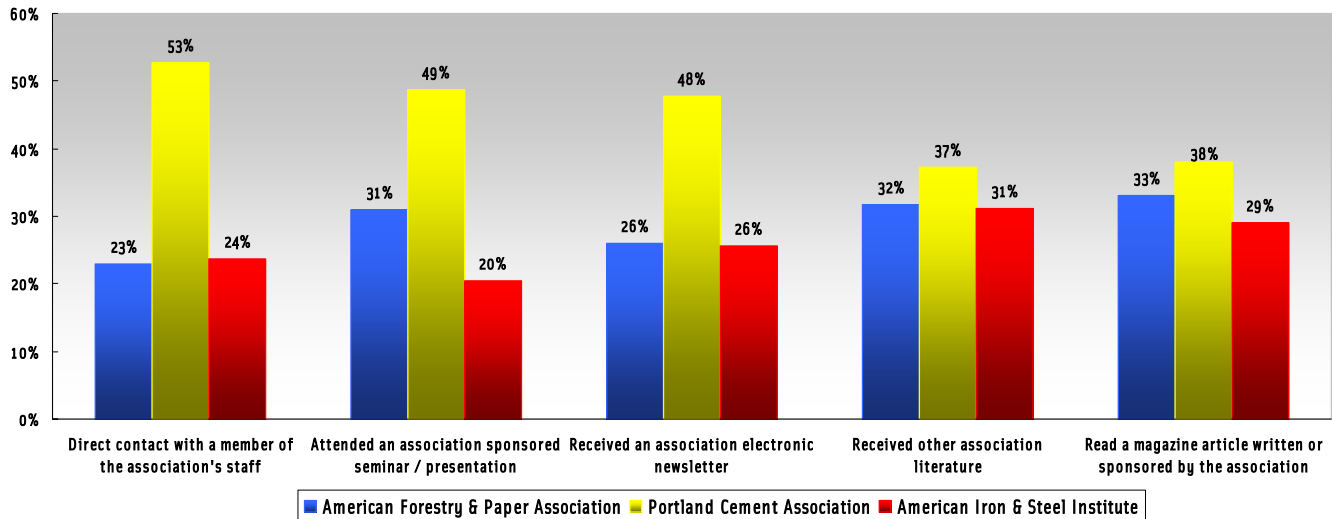


Respondents were allowed to choose multiple selections when answering the two previous questions above. Each response was given equal weight, resulting in the total percentage to exceed 100%.

Level of Contact

The survey requested respondents to indicate what type of contact they had with the following organizations: Portland Cement Association, American Forestry & Paper Association, and the American Iron & Steel Institute. The graph below depicts the responses for the various levels of contact or participation.

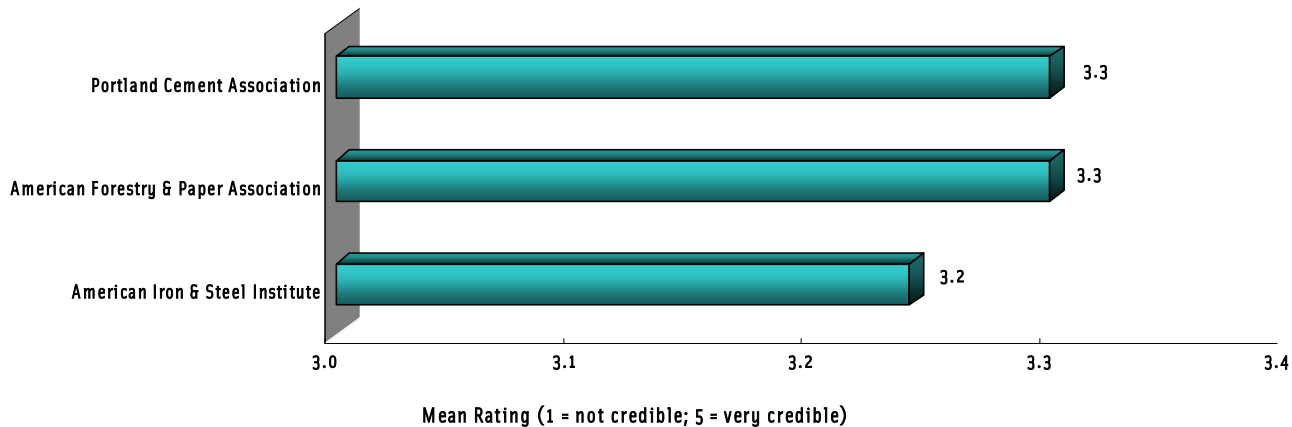
Concrete, Wood, and Steel Attribute Ratings



Level of Credibility

When considering those same organizations, the survey asked respondents to rate how credible they believed the sustainable development information was that they encountered from those same organizations. Respondents were asked to rate them from a scale of 1 (not credible) to 5 (very credible). The graph below illustrates the mean rating from respondents.

Rating of Credibility of Sustainable Development Information from the Following Associations



APPENDIX A: Sustainable Development Decision Maker Survey

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Perceptions & Knowledge of Sustainability

1. How familiar are you with the following terms?

	Low 1	2	3	4	High 5
Green Building	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sustainable Development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Do you consider the phrase "sustainable development" the same as "green building"?

Yes

No

Why?

Sustainability Attributes

3. Please rate these variables on their importance when considering sustainable development.

	Not Important 1	2	Somewhat Important 3	4	Very Important 5
Air quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cradle to cradle impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carbon footprint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Durability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disaster resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LEED credit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Life-Cycle cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recycled content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Renewable resource	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Waste generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. What is your structural material of choice to achieve your sustainability design goals on a project?

Steel

Wood

Concrete

Why?

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5. How important are each of the following attributes in your decision to select a particular building material?

	Not Important 1	2	Somewhat Important 3	4	Very Important 5
Reduced maintenance	jn	jn	jn	jn	jn
Ease of construction	jn	jn	jn	jn	jn
Aesthetics	jn	jn	jn	jn	jn
Cradle to cradle impact	jn	jn	jn	jn	jn
Fire resistance	jn	jn	jn	jn	jn
Installation speed	jn	jn	jn	jn	jn
Initial carbon footprint	jn	jn	jn	jn	jn
Local material availability	jn	jn	jn	jn	jn
Durability	jn	jn	jn	jn	jn
Emissions to air	jn	jn	jn	jn	jn
Disaster resistance	jn	jn	jn	jn	jn
Emissions to water	jn	jn	jn	jn	jn
Warranty	jn	jn	jn	jn	jn
Land stewardship	jn	jn	jn	jn	jn
Initial cost	jn	jn	jn	jn	jn
Total carbon dioxide footprint	jn	jn	jn	jn	jn
Recycled content	jn	jn	jn	jn	jn
Renewable resource	jn	jn	jn	jn	jn
Strength	jn	jn	jn	jn	jn
Supplier assistance	jn	jn	jn	jn	jn
Energy efficiency	jn	jn	jn	jn	jn
Initial, operating, and deconstruction cost	jn	jn	jn	jn	jn

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6. Please rate concrete for the following attributes listed.

	Very Poor 1	2	3	4	Excellent 5
Reduced maintenance	€	€	€	€	€
Ease of construction	€	€	€	€	€
Aesthetics	€	€	€	€	€
Cradle to cradle impact	€	€	€	€	€
Fire resistance	€	€	€	€	€
Installation speed	€	€	€	€	€
Initial carbon footprint	€	€	€	€	€
Local material availability	€	€	€	€	€
Durability	€	€	€	€	€
Emissions to air	€	€	€	€	€
Disaster resistance	€	€	€	€	€
Emissions to water	€	€	€	€	€
Warranty	€	€	€	€	€
Land stewardship	€	€	€	€	€
Initial cost	€	€	€	€	€
Total carbon dioxide footprint	€	€	€	€	€
Recycled content	€	€	€	€	€
Renewable resource	€	€	€	€	€
Strength	€	€	€	€	€
Supplier assistance	€	€	€	€	€
Energy efficiency	€	€	€	€	€
Initial, operating, and deconstruction cost	€	€	€	€	€

Sustainable Development 2008

7. Please rate wood for the following attributes listed.

	Very Poor 1	2	3	4	Excellent 5
Reduced maintenance	jn	jn	jn	jn	jn
Ease of construction	jn	jn	jn	jn	jn
Aesthetics	jn	jn	jn	jn	jn
Cradle to cradle impact	jn	jn	jn	jn	jn
Fire resistance	jn	jn	jn	jn	jn
Installation speed	jn	jn	jn	jn	jn
Initial carbon footprint	jn	jn	jn	jn	jn
Local material availability	jn	jn	jn	jn	jn
Durability	jn	jn	jn	jn	jn
Emissions to air	jn	jn	jn	jn	jn
Disaster resistance	jn	jn	jn	jn	jn
Emissions to water	jn	jn	jn	jn	jn
Warranty	jn	jn	jn	jn	jn
Land stewardship	jn	jn	jn	jn	jn
Initial cost	jn	jn	jn	jn	jn
Total carbon dioxide footprint	jn	jn	jn	jn	jn
Recycled content	jn	jn	jn	jn	jn
Renewable resource	jn	jn	jn	jn	jn
Strength	jn	jn	jn	jn	jn
Supplier assistance	jn	jn	jn	jn	jn
Energy efficiency	jn	jn	jn	jn	jn
Initial, operating, and deconstruction cost	jn	jn	jn	jn	jn

Sustainable Development 2008

8. Please rate steel for the following attributes listed.

	Very Poor 1	2	3	4	Excellent 5
Reduced maintenance	jn	jn	jn	jn	jn
Ease of construction	jn	jn	jn	jn	jn
Aesthetics	jn	jn	jn	jn	jn
Cradle to cradle impact	jn	jn	jn	jn	jn
Fire resistance	jn	jn	jn	jn	jn
Installation speed	jn	jn	jn	jn	jn
Initial carbon footprint	jn	jn	jn	jn	jn
Local material availability	jn	jn	jn	jn	jn
Durability	jn	jn	jn	jn	jn
Emissions to air	jn	jn	jn	jn	jn
Disaster resistance	jn	jn	jn	jn	jn
Emissions to water	jn	jn	jn	jn	jn
Warranty	jn	jn	jn	jn	jn
Land stewardship	jn	jn	jn	jn	jn
Initial cost	jn	jn	jn	jn	jn
Total carbon dioxide footprint	jn	jn	jn	jn	jn
Recycled content	jn	jn	jn	jn	jn
Renewable resource	jn	jn	jn	jn	jn
Strength	jn	jn	jn	jn	jn
Supplier assistance	jn	jn	jn	jn	jn
Energy efficiency	jn	jn	jn	jn	jn
Initial, operating, and deconstruction cost	jn	jn	jn	jn	jn

9. Please rate the following wood products (structural) on their environmental impact. Please consider both the energy consumption and the impact of each material over its complete life-cycle on land stewardship, air emissions, and water emissions (raw materials acquisition, manufacturing of the product, product in service, and disposal/recycling).

	Negative Impact 1	2	Neutral 3	4	Positive Impact 5	NA
Wood lumber	jn	jn	jn	jn	jn	jn
Plywood / OSB / Other structural panels	jn	jn	jn	jn	jn	jn
Engineered wood products	jn	jn	jn	jn	jn	jn
Treated softwood lumber	jn	jn	jn	jn	jn	jn
Structural insulated panels	jn	jn	jn	jn	jn	jn

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10. Please rate the following steel products (structural) on their environmental impact. Please consider both the energy consumption and the impact of each material over its complete life-cycle on land stewardship, air emissions, and water emissions (raw materials acquisition, manufacturing of the product, product in service, and disposal/recycling).

	Negative Impact 1	2	Neutral 3	4	Positive Impact 5	NA
Structural steel (hot rolled)	jn	jn	jn	jn	jn	jn
Steel studs (cold rolled)	jn	jn	jn	jn	jn	jn
Steel siding	jn	jn	jn	jn	jn	jn

11. Please rate the following concrete products (structural) on their environmental impact. Please consider both the energy consumption and the impact of each material over its complete life-cycle on land stewardship, air emissions, and water emissions (raw materials acquisition, manufacturing of the product, product in service, and disposal/recycling).

	Negative Impact 1	2	Neutral 3	4	Positive Impact 5	NA
Ready mixed concrete	jn	jn	jn	jn	jn	jn
Concrete masonry products	jn	jn	jn	jn	jn	jn
Precast concrete products	jn	jn	jn	jn	jn	jn
Insulated concrete forms	jn	jn	jn	jn	jn	jn
Tilt up concrete wall panels	jn	jn	jn	jn	jn	jn

12. Please rate the following products on their environmental impact. Please consider both the energy consumption and the impact of each material over its complete life-cycle on land stewardship, air emissions, and water emissions (raw materials acquisition, manufacturing of the product, product in service, and disposal/recycling).

	Negative Impact 1	2	Neutral 3	4	Positive Impact 5	NA
Concrete paving	jn	jn	jn	jn	jn	jn
Asphalt paving	jn	jn	jn	jn	jn	jn
Aluminum siding	jn	jn	jn	jn	jn	jn
Vinyl siding	jn	jn	jn	jn	jn	jn
Interlocking concrete paving	jn	jn	jn	jn	jn	jn
Plate glass	jn	jn	jn	jn	jn	jn
Clay brick	jn	jn	jn	jn	jn	jn
Cultured stone	jn	jn	jn	jn	jn	jn
Fiber cement siding	jn	jn	jn	jn	jn	jn

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13. Which material would you prefer to design / work with when needing the most sustainable material?

	Structural	Finishes
Steel	€	€
Concrete	€	€
Wood	€	€
Other (please specify)	<input type="text"/>	

14. Please rank the following industries on their level of leadership in supporting the premise of sustainable development.

	No Leadership 1	2	3	4	Excellent Leadership 5
Steel Industry	jñ	jñ	jñ	jñ	jñ
Wood Industry	jñ	jñ	jñ	jñ	jñ
Concrete Industry	jñ	jñ	jñ	jñ	jñ
Plastics Industry	jñ	jñ	jñ	jñ	jñ
Aluminum Industry	jñ	jñ	jñ	jñ	jñ
Paint Industry	jñ	jñ	jñ	jñ	jñ

15. Please indicate your level of likelihood with each of the following statements regarding concrete, steel, and wood.

	Not Likely 1	2	3	4	Very Likely 5
I would likely recommend using concrete for a sustainable building design.	jñ	jñ	jñ	jñ	jñ
I would likely recommend using steel for a sustainable building design.	jñ	jñ	jñ	jñ	jñ
I would likely recommend using wood for a sustainable building design.	jñ	jñ	jñ	jñ	jñ

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16. Please indicate your level of agreement with each of the following statements regarding concrete, steel, and wood sustainability.

	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
Predominantly wood structures provide greater sustainability than other materials.	jn	jn	jn	jn	jn
Predominantly cement and concrete structures provide greater sustainability than other materials.	jn	jn	jn	jn	jn
Predominantly steel structures provide greater sustainability than other materials.	jn	jn	jn	jn	jn
The wood industry demonstrates environmental leadership in its manufacturing process.	jn	jn	jn	jn	jn
The cement and concrete industry demonstrates environmental leadership in its manufacturing process.	jn	jn	jn	jn	jn
The steel industry demonstrates environmental leadership in its manufacturing process.	jn	jn	jn	jn	jn
The wood industry is committed to environmentally responsible manufacturing.	jn	jn	jn	jn	jn
The cement and concrete industry is committed to environmentally responsible manufacturing.	jn	jn	jn	jn	jn
The steel industry is committed to environmentally responsible manufacturing.	jn	jn	jn	jn	jn
The wood industry has made a good effort in its voluntary reduction of emissions.	jn	jn	jn	jn	jn
The cement and concrete industry has made a good effort in its voluntary reduction of emissions.	jn	jn	jn	jn	jn

The steel industry has made a good effort in its voluntary reduction of emissions.

Information About You

17. How many employees do you have in your organization?

1-5

6-10

11-20

21-50

51-100

100+

18. What kind of organization do you work for?

Architecture

Green consulting

Building Dept.

Environmental advocacy

Manufacturing

Construction

Engineering

Building Owner / Developer

Gov. Agency

Academic

Association

Other (please specify)

19. What kind of position do you currently hold?

Architect

Designer, MEP

Engineer

Green Build Consultant

Other type of Consultant

Building Official

Construction Manager / Contractor

Other (please specify)

20. Have you worked on any sustainable development projects in the past year?

Yes

No

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21. If yes, how many sustainable development projects have you worked on in the past year?

22. If yes, of those sustainable development projects you have worked on in the past year, how many used....

...steel for their sustainable material?

...concrete for their sustainable material?

...wood for their sustainable material?

23. Please indicate the number of projects you have worked on in the past year next to the different types of buildings you have worked on.

Office

Retail / Restaurants

Warehouse / Industrial

Education / Schools

Government Buildings

Residential

Other building types

24. Which statement best represents the sustainable development marketing approach within your business or company?

We do not use sustainable development building to market our business.

Sustainable development is a part of the way we market the business, but it is not the main way we differentiate ourselves.

Sustainable development is an integral part of how we market our business.

25. If your business or company has a sustainable development marketing approach, what types of environmental consideration are used?

Air emissions

Water Use

Greenhouse gas emissions

Depletion of natural resources

NA

Other (please specify)

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26. Please answer the questions on the level of importance when considering sustainable development.

	Not Important 1	2	Neutral 3	4	Very Important 5
How important is sustainable development to you personally?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How important is sustainable development to you professionally?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How important is sustainable development to your clients?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Which of the following resources have you obtained information regarding sustainable development?

- Eco-Structure Magazine
- Environmental Building News
- Building Design and Construction
- Environmental Protection Agency
- AIA

Other (please specify)

28. What are the best methods to deliver educational sustainable development material and stay informed of trends and technological developments?

- Face to face meetings in office
- Lunch and learn programs
- Website content
- Webcast programs
- Magazine articles
- Conference seminars

Other (please specify)

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29. Please indicate what type of contact you or your company have had with the following organizations.

	American Forestry & Paper Association	Portland Cement Association	American Iron & Steel Institute
Direct contact with a member of the association's staff	€	€	€
Attended an association sponsored seminar / presentation	€	€	€
Received an association electronic newsletter	€	€	€
Received other association literature	€	€	€
Read a magazine article written or sponsored by the association	€	€	€

30. Please rate how credible you believe sustainable development information you have encountered or received from the following associations.

	Not Credible 1	2	Neutral 3	4	Very Credible 5
American Forestry & Paper Association	jñ	jñ	jñ	jñ	jñ
Portland Cement Association	jñ	jñ	jñ	jñ	jñ
American Iron & Steel Institute	jñ	jñ	jñ	jñ	jñ

Thank you for taking the Sustainable Development Benchmark Survey 2007

All responses and information given in this survey are confidential. Please provide your name and contact information for a chance to win a 8gb IPOD nano. This information will be used for the IPOD nano winner notification purpose ONLY.

31. Please enter your contact information below.

Name:

Company:

Address:

City:

State:

Zip:

Phone:

Email: