

FOREST PRODUCTS CERTIFICATION: THE BUSINESS CUSTOMER PERSPECTIVE

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ABSTRACT

While only a handful of wood products suppliers and business customers are currently involved in manufacturing or purchasing certified wood products, the potential exists for increased industry participation. Previous empirical work on environmental certification has examined the perceptions and attitudes of consumers, with few studies examining the perceptions of corporate customers. This research examines perceptions and activities associated with environmentally certified wood products for architects, building contractors, and home center retailers. Study results indicate that industrial forest product customers are not supportive of wood products certification efforts. Even when management environmental concern exists, there is a breakdown in elevating this concern to a corporate commitment or philosophy. Additionally, the federal government was consistently found to be the organization least trusted to certify forest management practices, while independent third-party certifiers were most trusted. A willingness to pay for certification was mixed, and few respondents felt that their customers would pay a premium for certified products.

Keywords: Environmental certification, United States, business customers, wood products.

INTRODUCTION

Environmental certification of forest products and forestry practices, part of the more encompassing green movement, is proliferating globally. In response to environmental concerns, environmental organizations, wood products retailers, and manufacturers are developing standards to encourage consumers to purchase wood originating from certified sustainable forests. The basis for certification is the need for consumers to be assured by neutral third-party certifiers that forest products companies are employing sound practices that will ensure a sustainable forest. These efforts are intended to counter the common percep-

tion by the general public that most forest practices involving the harvesting of wood do irreversible damage to the environment (Peterson 1994). In addition to addressing negative perceptions, companies that prove themselves to be environmentally responsible may benefit by differentiating their products so as to increase market share.

While only a handful of wood products suppliers and business-to-business customers are currently involved in manufacturing or purchasing certified wood products, the potential exists for increased industry participation. Most previous empirical work on environmental certification has examined the perceptions

and attitudes of consumers (Read 1991; Winterhalter and Cassens 1993; Ozanne and Smith in 1996) with few studies examining the perceptions of business-to-business customers.

Thus, to better understand wood products certification issues and implications for business-to-business customers, this research study has the following three objectives:

1. To discern environmental perceptions and levels of awareness for key corporate (as opposed to consumer) forest product purchasers (building contractors and home center retailers) or demand influencers (architects);
2. To identify which entities business-to-business customers would trust to certify wood products and;
3. To assess "willingness to pay" a premium for environmentally certified wood products by these corporate forest products purchasing groups.

BACKGROUND

Environmental certification

Environmental certification programs exist to allow credible, third-party organizations to pass judgment on the environmental performance of products and packaging, rather than leave such assertions to product manufacturers themselves (Coddington 1993). These programs have been developed to overcome inherent conflicts of interest that may give rise to consumer confusion and distrust by providing consumers with unbiased environmental information provided by independent certifying organizations. In general, third-party certification provides information to consumers on six distinct environmental areas: raw materials consumption; energy consumption; air emissions; water emissions; solid-waste generation; and indirect resource consumption or impact (e.g. destruction of wildlife habitat, species preservation) (Coddington 1993).

Certification labels can be issued by first-, second-, or third-party certification organizations (Cabarle et al. 1995). First-party claims are those made by producers about the envi-

ronmental attributes of their own products. Second-party claims are endorsements by trade associations or similar affiliates with a financial interest in the producer's competitiveness. Third-party claims are backed by independent entities not affiliated with a company or trade association and are generally perceived to be least biased.

Wood products environmental certification

Wood products environmental certification has been identified by an American Forest & Paper Association (AFPA) task force as an important issue facing the industry (Anonymous 1994). The Society of American Foresters (SAF) also sees this as an important issue and has conducted a study to explore certification both on a national and international level. Currently, there are two independent organizations that maintain wood products certification programs in the United States: the Smart Wood Program of the Rainforest Alliance and the Green Cross Program of Scientific Certification Systems. These two programs are the only ones in the United States that have been accredited by the Forest Stewardship Council (FSC), a diverse coalition that sets international standards for forest management and accredits certifiers.

In North America, the Rainforest Alliance and eight nonprofit environmental organizations in Canada and the United States formally launched the Canada United States Association (CUSA). Through CUSA, Smart Wood certification will be available in the Pacific Northwest of Canada and the United States, as well as the Southwest, the Lake States, and New England. Collaborators in CUSA are convinced that region-specific efforts represent the strongest approach to certification because regional guidelines are developed through a consensus process involving regional stakeholders (Anonymous, undated). It is hoped that by having CUSA working under the Smart Wood Program, a confusing number of labels and standards can be avoided, which

might dilute the impact of certification and ultimately confuse consumers.

Another program, the Scientific Certification Systems' (SCS) Forest Conservation Program, involves in-depth evaluation of specific timber harvesting operations on three program elements including timber resource sustainability, forest ecosystem health and maintenance, and financial and socioeconomic sustainability.

Many companies in the wood products industry are cynical regarding the future of environmental wood products certification, while others suggest that this is an issue that will continue to impact the industry (Anonymous 1995; Mater 1995). This issue will continue to be driven by environmental nongovernmental organizations, consumers demanding green products, and perhaps by some in the industry itself. "Perhaps a move toward certification will come from forest managers themselves, in the clarity with which they define sustainable forests and the sincerity they display about managing for sustainability" (Mater 1995).

RESEARCH METHODOLOGY

Investigating corporate customer perceptions about environmental certification of wood products was accomplished through mail survey market research. Survey development and implementation for the study were based on the Total Design Method (TDM) (Dillman 1978). In adherence to TDM survey guidelines, presurvey notification, initial survey mailing, postsurvey reminder, and a second mailing were conducted in order to maximize response rates. Key informants and titles were identified for each recipient company through the use of purchased industry directories (Best Lists, Inc. and National Home Center News).

Sample

Sample frames from U.S. populations of architects, building contractors, and home center retailers were developed for primary data col-

lection. Five hundred companies from each of the three populations were surveyed for a total of 1,500 firms. All industry survey respondents were surveyed at the corporate headquarters level. These three corporate sectors were selected based on discussions with wood products suppliers and general knowledge of the importance of these sectors in purchasing or influencing purchases of wood products. Experimental design procedures appropriate to market research where representative random samples are necessary were adhered to for architects and building contractors. Specifically, a random sample of five hundred companies was taken from the entire United States populations of building contractors and architects. Best Lists, Inc., a commercial "list" provider, generated these samples. For the home center retailer population, the sample was the largest five hundred companies by sales in 1994. These companies, which represented 74% of total home center industry sales in 1994 (National Home Center News), were selected because large home center retailers are typically lead adopters of environmentally oriented policies.

After adjusting the sample size for non-deliverable surveys (e.g. company closure, non-forwardable change of address, or deceased respondent), adjusted response rates were: architects (102 respondents or 21%), building contractors (73 respondents or 15%), and home center retailers (121 respondents or 24%) for an overall study response rate of 20% (296/1,469). Obtaining acceptable business-to-business survey response rates is often more challenging due to the added difficulties in locating appropriate key respondents a priori (Hansen et al. 1983). Previous studies have shown that response rates of 15% to 35% from general U.S. populations may be expected (Adams 1986; Boyd et al. 1981; Donald 1960; Hochstim 1967).

Questionnaire

Primary data collection consisted of a structured seven-page mailed survey for each of the

three sample groups. A number of survey questions were adapted from a study conducted by Ozanne and Smith (1996) that examined segmenting markets for environmentally certified wood products. In addition, a set of questions adapted from the work of Banerjee (1992) were posed regarding corporate policies, behaviors, and general inclinations toward environmental sensitivity. The surveys were pretested with representatives from each respondent group by the corporate sponsor of this study. An iterative process resulted in the finalized survey instrument. Sampling, survey procedures, follow-up efforts, and data analysis were conducted in accordance with well-documented and verified techniques (i.e., TDM).

Nonresponse bias was tested by applying a two-tailed *t*-test to the percent of companies by state, comparing respondents and nonrespondents. Differences were found to be statistically insignificant ($P < 0.001$) for architects, building contractors, and home center retailers.

DATA ANALYSIS

Statistical analyses were conducted using two-tailed *t*-tests to test for nonresponse bias; Sheffe treatment of analysis of variance (ANOVA) to examine differences between architects, building contractors, and home center retailers across a number of variables; and factor analysis to investigate commitment to environmental stewardship.

STUDY RESULTS

Demographic information

Where possible, study findings for the three populations were presented in one figure or table allowing each group to be evaluated individually and to be compared with other groups. Differences between groups were statistically analyzed using a Sheffe one-way analysis of variance (ANOVA). Differences at an alpha level of 0.05 are noted in each accompanying table.

Figure 1 shows that all regions of the Unit-

ed States are well represented for the three respondent populations, with no statistically significant differences. As seen in Table 1, there is a wide range in average size of companies between the three business sectors. Architects are represented by the smallest companies with an average of five employees and \$1.9 million in sales in 1994, followed by building contractors (102 employees and \$36.6 million), and home center retailers (1,608 employees and \$277.8 million). With an overall average age of 49 years, there is no significant difference in the average ages of respondents between groups, and with regard to gender mix, respondents in all groups are heavily skewed to males (unweighted average of 92.3%). Education levels of each respondent group were analyzed. Approximately 95% of architect respondents had a college degree or higher, while fewer than two-thirds of building contractors and home center respondents had college degrees.

Trust and certification programs

An important objective of the study was to learn which organizations wood products purchasers would trust to certify forest management and harvesting practices. Respondents were asked to report their level of trust in the federal government, self-regulation by the forest products industry, nongovernment environmental organizations (NGOs), and third-party certifiers. To avoid confusion, NGOs are environmental organizations such as the Sierra Club or Green Peace that are not involved in certification of forest management or sustainability. Third-party certifiers, however, are typically for-profit organizations that certify forest management and harvesting practices. Rankings are based on a four-point scale ranging from 1 or "trust most" to 4 or "trust least." As seen in Table 2, on average, the federal government is consistently the organization least trusted to certify forest management practices across all groups. This may be part of a general distrust for government and a desire for less government regulation and

Respondent Geographic Distributions

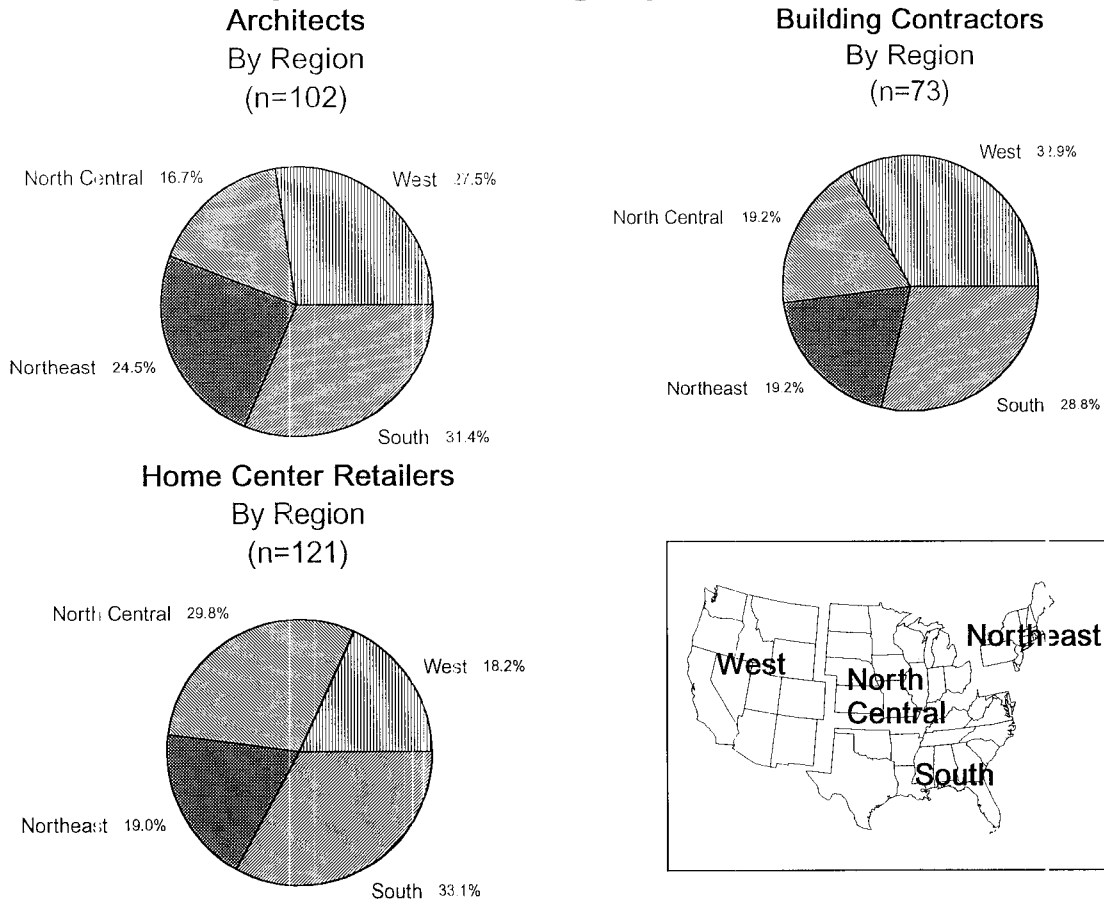


FIG. 1. Respondent geographic distributions.

bureaucracy. On the other hand, independent third-party certification entities were seen as the most trusted across all groups, followed by the forest products industry. Third-party certifiers are likely viewed as independent and objective. Using a Sheffe analysis of variance

(ANOVA), a statistical difference at $\alpha = 0.05$ was found between home center retailers (significantly higher) and each of the other two groups with regard to level of trust in the forest products industry to certify.

The fact that overall the forest products in-

TABLE 1. Respondent demographics.

	Architects n = 102	Building contractors n = 73	Home center retailers n = 121	Significantly different at alpha = 0.05
Average 1994 sales (\$million)	\$1.9	\$36.6	\$277.8	Yes
Average no. of employees	5	102	1,608	Yes
Average age of respondents	51.7	49.2	46.0	No
Respondent gender (percent male)	89.6%	88.1%	99.1%	No

TABLE 2. *Level of trust to certify forest management and harvesting (1 = trust most to 4 = trust least).*

	Architects n = 102	Building contractors n = 73	Home center retailers n = 121	Weighted average	Significantly different at alpha = 0.05 ¹
Third-party certification entity	2.0	1.6	1.7	1.7	No
Forest products industry	2.6	2.4	1.9	2.2	Yes ²
Federal government	2.8	3.1	3.0	3.0	No
Non-governmental environmental group	2.5	3.0	3.6	3.1	Yes ³

¹ A Sheffe one-way analysis of variance (ANOVA) technique with $\alpha = 0.05$ was used to test the hypothesis of no difference between the group means.

² Architects differ from home centers; building contractors differ from home centers.

³ Architects differ from home centers; building contractors differ from home centers.

industry is the second most trusted entity to certify is probably due to the makeup of the respondent groups. In a parallel study that examines environmental certification perceptions of consumers, the forest products industry was seen as the least trustworthy certification entity (Ozanne and Vlosky 1996). Home center retailers have a statistically significantly lower level of trust in NGOs than either architects or building contractors using Sheffe one-way ANOVA at $\alpha = 0.05$. Overall, the trust and support of potential certifiers by wood products business-to-business customers may influence which entities or agencies ultimately are recognized and approved as certifiers.

Corporate support for environmental policies

As seen in Table 3, there are minor differences in the existence or belief in environmental policies across respondent companies. While all groups generally believe that their

companies should have environmental policies, few indicated that such policies actually exist. This is further supported by the fact that very few respondent companies have formal written environmental guidelines. Another indicator of corporate support for environmental policies is the level of top management support. Architects feel that their management has the highest level of support for environmental improvement, followed by home center retailers and building contractors. Using a Sheffe analysis of variance (ANOVA), statistical difference in management support was found between architects and building contractors at $\alpha = 0.05$. Formalization of procedures (i.e., training) is another indicator of environmental commitment. None of the respondent groups had any significant environmental training for employees, perhaps indicating a breakdown in the communication of top management's claimed commitment to the rank and file. The

TABLE 3. *Corporate environmental policies (scale: 1 = strongly disagree to 3 = neither disagree nor agree to 5 = strongly agree).*

My company. . .	Architects n = 102	Building contractors n = 73	Home center retailers n = 121	Weighted average	Significantly different at alpha = 0.05 ¹
has a strong environmental policy.	3.3	2.9	3.0	3.0	No
should have an environmental policy.	3.6	3.3	3.3	3.4	No
has written environmental guidelines.	2.3	2.3	2.5	2.4	No
has top management that supports environmental improvement.	3.5	3.0	3.2	3.2	Yes ²
has environmental training for employees.	2.3	2.4	2.3	2.3	No
rewards employees for outstanding environmental contributions.	2.3	2.2	2.1	2.2	No
uses audits to measure environmental improvement.	2.0	2.1	1.9	2.0	No

¹ A Sheffe one-way analysis of variance (ANOVA) technique with $\alpha = 0.05$ was used to test the hypothesis of no difference between the group means.

² Architects differ from building contractors.

TABLE 4. *Commitment to environmental improvement (scale: 1 = strongly disagree to 3 = neither disagree nor agree to 5 = strongly agree).*

My company has made a commitment to environmental improvement because of:	Architects n = 102	Building contractors n = 73	Home center retailers n = 121	Weighted average	Significantly different at alpha = 0.05
the commitment from top management	3.9	3.5	3.6	3.6	No
customer concerns about the environment	3.3	3.1	3.1	3.1	No
desire to protect my company's image	2.8	3.0	3.2	3.0	No
desire to sustain a competitive advantage in the marketplace	3.0	2.8	3.0	2.9	No
customer demands for "green" products	3.1	2.8	2.7	2.8	No
increased legislation	2.7	2.6	2.9	2.7	No
possible cost savings	2.9	2.6	2.6	2.7	No
public pressure	2.5	2.4	2.4	2.4	No
negative publicity	2.4	2.2	2.6	2.4	No
pressure from environmental organizations	2.6	2.1	2.2	2.3	No

possible breakdown in translating management's environmental concerns or commitment to a corporate philosophy is further indicated in that very few respondent companies reward employees for environmental contributions. Also, companies seem to take a nonchalant approach to tracking environmental improvements that their companies might undertake through the use of environmental audits.

Corporate commitment to environmental improvement

Respondents were also asked to indicate whether their companies had a commitment to environmental improvement. Fifty-eight percent of both architects and home center retailers answered affirmatively, while only 47% of building contractors did so. An unweighted average of 46% of all corporate respondents *do not* believe that their companies are committed to environmental improvement.

The respondents who said that their companies are committed to environmental improvement were asked to rank a number of possible reasons for this commitment. On average, across all corporate groups, a commitment from top management was the highest ranked contributor to environmental commitment (Table 4). The second highest reason for corporate environmental commitment, and the only additional factor ranked above 3.0 (neu-

tral), in terms of a weighted average, for all respondent groups, is customer concern for the environment.

Only architects indicated marginal agreement that customer demands for "green" products had an influence on corporate environmental commitment. So, while customer concern for the environment is perceived to exist, customers appear not to be demanding green or certified wood products from these three supplier groups. Threats of legislation, public pressure, fear of significant negative publicity, and protection of company image do not appear to be motivations to be environmentally sensitive. Three additional factors were found to have minimal influence in corporate environmental commitment across respondent groups: pressure from environmental organizations, the possibility of cost savings, and the motivation to sustain a competitive advantage in the marketplace.

In order to further understand environmental commitment, factor analysis (maximum likelihood with varimax rotation) was conducted on ten variables from Table 4. This resulted in a reduction to three underlying factors (Table 5). These three factors represent 58% of the variance in the ten criteria items. Communality indices (summed square factor loadings) reflect the amount of variance in a particular variable that is accounted for by the factor solution (Hair et al. 1992). All com-

TABLE 5. *Commitment to environmental improvement.*

Variable	Factor analysis (maximum likelihood with Varimax rotation) rotated factor loadings and communalities				
	Mean*	External influences	Internal strategic influences	Management commitment	Communality
Increased legislation	2.7	0.545	0.043	0.189	0.34
Public pressure	2.4	0.835	0.315	0.038	0.80
Negative publicity	2.4	0.806	0.243	0.188	0.74
Pressure from environmental organizations	2.3	0.698	0.249	0.005	0.55
Customer demands for "green" products	2.8	0.425	0.631	0.268	0.65
Protecting company's image	3.0	0.281	0.621	0.170	0.50
Possible cost savings	2.7	0.021	0.714	0.151	0.53
Sustaining a competitive advantage in the marketplace	2.9	0.146	0.680	0.115	0.50
The commitment from top management	3.6	0.015	0.102	0.766	0.60
Variance		2.414	1.987	0.796	5.197
% Var		0.268	0.221	0.088	0.577

* Questions were posed on a five-point scale from 1 = strongly disagree to 5 = strongly agree.

munalities are in the 0.50 to 1.00 range except for increased legislation (0.34), indicating a reliable factor structure. In an eleven variable-three factor solution, customer concerns about the environment did not factor well and had a low degree of communality. Accordingly, it was omitted from the factor analysis. Following is an interpretation and discussion of the three underlying factors.

1) *External influences (Factor 1).*—Influences from stakeholders from outside companies play a role in developing environmental commitment. Threats of increased legislation, public pressure to develop certified management practices, the potential for negative publicity, and pressure from environmental organizations are examples of such external influences identified by respondents.

2) *Internal strategic influences (Factor 2).*—Commitment to certification is often influenced by corporate strategic expediency. Customer demand for "green" products and protecting a company's image are potentially strong influences on corporate strategy. The possibility of sustaining a competitive advantage in the marketplace and generating cost savings can contribute to corporate profitability and market position.

3) *Management commitment (Factor 3).*—Commitment to certification can not exist

without commitment from top management. Certification impacts many functions in an organization and is often viewed as a philosophy. Without top management commitment, this philosophy can not permeate the organization.

Perceptions of environmental certification

In addition to environmental attitudes and corporate activities, it is important to understand corporate perceptions of environmental certification. The first obvious question is to gauge the level of understanding of what certification actually means to these respondent groups. Table 6 indicates that all business sector respondent groups believe that they have a passable understanding of the environmental certification concept.

The question of whom respondents trust to certify forest management and harvesting practices was discussed earlier. In addition, respondents were asked to indicate their trust specifically in forest products manufacturers' environmental claims. As seen in Table 6, there was a significant difference between respondent groups. Architects were least trustful, building contractors were also less than neutral. Home center retailers were alone in their belief that forest products industry en-

TABLE 6. Respondent perceptions of environmental certification (scale: 1 = strongly disagree to 3 = neither disagree nor agree to 5 = strongly agree).

My company...	Architects n = 102	Building contractors n = 73	Home center retailers n = 121	Weighted average	Significantly different at alpha = 0.05 ¹
understands the concept of environmental certification.	3.6	3.4	3.4	3.4	No
trusts environmental claims made by wood products suppliers.	2.6	2.9	3.2	2.9	Yes ²
has purchased environmentally certified wood products or raw materials in the past year.	2.6	2.4	2.6	2.5	No
seeks out suppliers of environmentally certified wood products or raw materials.	2.5	2.1	2.1	2.2	Yes ²

¹ A Scheffe one-way analysis of variance (ANOVA) technique with $\alpha = 0.05$ was used to test the hypothesis of no difference between the group means.
² Architects differ from home centers.
³ Architects differ from building contractors; architects differ from home centers.

environmental claims were trustworthy. However, although home center retailers were ranked the highest, a score of 3.2 is not a resounding endorsement of industry environmental claims. More important, beyond just an understanding of environmental certification, are corporate business practices with regard to certified wood products. Table 6 indicates a low average degree of purchases or specifications of environmentally certified wood products and an even lower propensity to seek out certified products due possibly to the current lack of available certified wood products.

Certification and environmental health

In addition to corporate certification behavior, a number of questions were asked to dis-

cern corporate beliefs regarding the importance of certification on forest health and sustainability. Because certification is intended to impact both temperate and tropical forest resources, questions addressed both forest types (Table 7). When asked if there is even a need for environmental certification of the harvesting of temperate forests, architect respondents strongly agreed, while home center respondents disagreed. Building contractors were, on average, indifferent. Almost an identical pattern of responses occurred for a question regarding whether certification can help sustain the health of temperate forests in the United States.

When asked whether there is a need for environmental certification of the harvesting of

TABLE 7. Certification and environmental health (scale: 1 = strongly disagree to 3 = neither disagree nor agree to 5 = strongly agree).

My company believes...	Architects n = 102	Building contractors n = 73	Home center retailers n = 121	Weighted average	Significantly different at alpha = 0.05 ¹
there is a need for environmental certification of harvesting U.S. temperate forests.	3.7	3.1	2.7	3.1	Yes ²
that environmental certification can help sustain the health of U.S. forests.	3.7	3.2	2.7	3.1	Yes ³
there is a need for environmental certification of harvesting tropical forests.	3.8	3.7	3.3	3.6	Yes ⁴
that environmental certification can reduce tropical deforestation.	3.6	3.4	3.0	3.3	Yes ⁵

¹ A Scheffe one-way analysis of variance (ANOVA) technique with $\alpha = 0.05$ was used to test the hypothesis of no difference between the group means.
² Architects differ from home centers; architects differ from building contractors.
³ Architects differ from home centers; building contractors differ from home centers.
⁴ Architect differ from home centers.
⁵ Architect differ from home centers.

TABLE 8. *Willingness to pay for environmentally certified wood products (scale: 1 = strongly disagree to 3 = neither disagree nor agree to 5 = strongly agree).*

My company...	Architects n = 102	Building contractors n = 73	Home center retailers n = 121	Weighted average	Significantly different at alpha = 0.05 ¹
would pay a premium for environmentally certified wood products or raw materials.	3.3	2.6	2.0	2.5	Yes ²
believes our customers will pay a premium for environmentally certified wood products.	3.0	2.6	2.0	2.5	Yes ³

¹ A Scheffe one-way analysis of variance (ANOVA) technique with $\alpha = 0.05$ was used to test the hypothesis of no difference between the group means

² Architects differ from home centers; architects differ from building contractors; building contractors differ from home centers.

³ Architects differ from home centers; building contractors differ from home centers.

tropical forests, statistical differences between respondent groups were also evident. Although all groups felt that certification for tropical forests was important, architects strongly agreed, while home center retailers barely agreed. The pattern remains consistent when groups are asked if certification can reduce tropical deforestation, with home center retailers responding neutrally, while architects and building contractors agreed with this statement.

One interpretation is that overall, respondents believe that the need for certification is a tropical issue and not something that is relevant to temperate forests. Given that all of the respondent groups have a vested business interest in the forest products industry as customers, it is not surprising that they would not encourage wood products certification and its associated costs.

Willingness to pay for certified wood products

A critical part of developing a corporate certification strategy is to determine customer willingness to pay a premium for environmentally certified wood products. For instance, the key driver for suppliers to produce or distribute environmentally certified wood products is the willingness of customers to pay a premium to offset implementation costs. Similarly, the ability to receive an upcharge from downstream customers, primarily consumers, is another driver of corporate certification involvement. This section addresses willingness to

pay responses for architects, building contractors, and home center retailer groups.

There was a significant difference between respondent groups in the willingness to pay a premium for certified wood products (Table 8). Home center retailers are by far the least willing to pay extra for certified products, while architects show a moderate willingness to pay and building contractors fall somewhere in between. Home center retailers have the greatest exposure in this situation relative to architects and building contractors because they purchase vast volumes of wood products for retail sale which helps to explain their position.

When asked their opinion on whether their customers would pay a premium for certified products, respondents also showed significant differences. None of the groups felt that customers would pay a premium for certified products with means at or below 3.0. Once again, home center retailers felt most strongly that their customers would not pay such a premium. If additional costs of certification can not be directly passed on to the consumer, respondents will not likely volunteer to absorb these costs.

Respondents were asked to evaluate their willingness to pay a premium for specifying environmentally certified wood products across three products at different price points. Two a priori conjectures were that the willingness to pay a premium for environmentally certified wood products is inversely related to the product price and inversely related to the premium percentage.

Architects

Architects were asked to evaluate their willingness to pay a premium for specifying the following environmentally certified wood products: 2 × 4-8' studgrade studs at a base uncertified price of \$350/thousand board feet; hardwood flooring at a base uncertified price of \$20/square foot; and building materials for a new home at a base uncertified price of \$100,000 (Table 9).

On average, architect respondents are willing to pay 16.4% (\$3.28/square foot) for certified hardwood flooring; 11.3% more (\$39.55/thousand board feet) for certified studs and; 5.1% (\$5,100) for specifying certified wood products for a new house. Respondents were also asked if they would not be willing to pay a premium for certified versions of these products. On average, for the three product choices, 31% of architects indicated an unwillingness to pay at all for certified products.

As conjectured, in general, as the product base price and certification price premium percentage increase, the propensity to pay extra for certification decreases. For example, the average premium architects are willing to pay declines from 16.4% for hardwood flooring to 5.1% for a new home. Similarly, as the suggested premium rises from 10% to 50% or greater, there is a precipitous decline in the percentage of respondents willing to pay for certified products. An anomaly to this logic is in the case of architects specifying certified materials for a new home. The percentage of respondents that would specify certified products actually increases as the premium increases from 2% to 10% or more.

Building contractors

Similarly, building contractors were also asked to evaluate their willingness to pay a certification premium for the same three products and price points as architects (Table 9). On average, building contractor respondents are willing to pay 10.7% more (\$37.45/thousand board feet) for studs; 12.3% (\$2.46/square foot) for hardwood flooring; and 3.7%

(\$3,700) for specifying wood products for building a new house. Respondents were also asked if they would *not* be willing to pay a premium for certified versions of these products and, on average, 42% of respondents indicated an unwillingness to pay at all for certified products.

As the product base price and certification price premium percentage increase, the propensity to pay extra for specifying environmentally certified wood products decreases. For example, the average premium building contractors are willing to pay declines from 12.3% for hardwood flooring to 3.7% for a new home. As the suggested premium rises from 10% to 50% or greater for flooring or studs, there is significant decline in the percentage of respondents willing to pay for certified products. In specifying certified materials for a new home, the percentage of respondents rises from 23% willing to pay a 2% premium to 27% willing to pay a 5% premium and then does decline to 15% that would pay 10% or more.

Home center retailers

Due to the retail nature of home centers, respondents in this group were asked to evaluate their willingness to pay a premium for consumer-oriented products: 2 × 4-8' studgrade studs at a base uncertified price of \$350/thousand board feet, a ready-to-assemble chair at a base uncertified price of \$100, and a wood dining room set at a base uncertified price of \$1,000 (Table 9).

On average, for certified products, home center retailer respondents are willing to pay 5.1% more (\$17.85/thousand board feet) for certified studs; 2.8% (\$2.80) for the certified chair; and 4.4% (\$44.00) for a certified dining room set. These responses, on a percentage basis, are the lowest of the three business customer segments. Respondents were also asked if they would *not* be willing to pay a premium for certified versions of these products, and on average, fully 75% of home center respondents indicated an unwillingness to pay at all

TABLE 9. *Willingness to pay a premium for environmentally certified wood products.*

	Uncertified base price	Average premium willing to pay (percent)	Average premium willing to pay \$ increase	Percent of respondents not willing to pay a premium	Percent of respondents willing to pay a: 10% premium	Percent of respondents willing to pay a: 25% premium	Percent of respondents willing to pay a: 50% or more premium
Architects							
Hardwood flooring	\$20/sq. ft.	16.4%	\$3.28/sq. ft.	33%	28%	26%	13%
2" × 4" × 8' Studgrade stud	\$350/MBF	11.3%	\$39.55/MBF	33%	48%	13%	6%
					2% pre- mium	5% pre- mium	10% or more pre- mium
New home	\$100,000	5.1%	\$5,100	27%	20%	20%	33%
Building contractors							
Hardwood flooring	\$20/sq. ft.	12.3%	\$2.46/sq. ft.	47%	26%	16%	12%
2" × 4" × 8' Studgrade stud	\$350/MBF	10.7%	\$37.45/MBF	46%	31%	17%	5%
					2% pre- mium	5% pre- mium	10% or more pre- mium
New home	\$100,000	3.7%	\$3,700	34%	23%	27%	15%
Home center retailers							
Ready-to-assemble chair	\$100	2.8%	\$2.80	71%	24%	5%	0%
2" × 4" × 8' Studgrade stud	\$350/MBF	5.1%	\$17.87/MBF	82%	14%	3%	1%
Dining room set	\$1,000	4.4%	\$44.00	71%	21%	7%	1%

for certified products. This is the highest level of nonwillingness to pay across the three business customer sectors.

And finally, although there is no clear pattern in the average willingness to pay a premium as the product price increases, the percentage of home center respondents willing to pay a certification premium declines dramatically as the percent premium increases.

Chain-of-custody

An argument against wood product environmental certification is the difficulty in maintaining an audit trail of certified material through all levels in the distribution chain (Anonymous 1992; Buckley 1994; Waffle 1994; Ozanne and Vlosky 1995). In this study, home center retailers were asked to evaluate their willingness to incur costs to administer

chain-of-custody procedures as part of the certification process.

Home center retailers overwhelmingly indicate that they are not willing to incur costs for chain-of-custody audits and procedures. Only 13% of home center respondents indicated a willingness to contribute to this cost. Ten percent of respondents would pay between \$5,000 and \$10,000 to support chain-of-custody requirements, while only 3% said they would pay more than \$10,000. This finding indicates that wood products suppliers may be asked to absorb chain-of-custody costs if they participate in certification with home center customers.

SUMMARY

Most empirical research on environmental forest products certification has concentrated

on consumers. In this study, we examine a myriad of issues from the corporate wood product customer perspective. Study results indicate that architects, building contractors, and home center retailers do not have a particularly strong affinity to wood products environmental certification.

While the main thrust of this study was to determine corporate organizations' perceptions and willingness to pay for environmentally certified wood products, an understanding of corporate commitment to environmental responsibility was also investigated. Fifty-four percent of respondent companies indicated a commitment to environmental improvement or stewardship. Overall, there seems to be a breakdown in translating management environmental concerns or commitment into corporate philosophy and practice. Of those companies that indicated that they pursue environmental responsibility, the commitment from top management was the highest ranked reason for pursuing this strategy, followed by their customer's concerns for the environment.

On average, independent third-party certification entities were seen as the most trusted and the federal government the least trusted organization to certify forest management practices. Overall, the trust issue can have implications on which entities or agencies ultimately are recognized and approved as certifiers.

When asked to evaluate whether their customers would pay a premium for certified products, respondents showed significant differences. None of the groups felt that customers would pay a premium for certified products, and home center retailers felt most strongly that their customers would not pay such a premium. This finding is important because for certification to succeed, there must be financial incentives for participants. Overall, the results of this research may provide companies and policy makers with information that can aid in making decisions in developing certification strategies.

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