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Forest Certification and Wood Use in Australia

Perceptions and Intentions in the Value Chain

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Prepared for the

Forest & Wood Products Research & Development Corporation

by

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Contents

Executive Summary

In recent years, the wider social and economic framework that the forest sector operates within has undergone significant change. In particular, public perceptions about the relative environmental merits of using wood are being challenged. This challenge comes from both alternative building materials (e.g. concrete, plastic and steel), and from alternative supplies of wood (e.g. natural or plantation forests, and imported or domestic timbers). Accompanying this challenge is a growing trend to market environmental merits of products, particularly through environmental endorsements or certification.

These challenges have lead to three research questions addressed in this study.

- What are the attitudes of forest growers and primary wood processors towards forest certification and what factors would facilitate adoption of forest certification?

- What motivates intermediate consumers, such as architects, and builders, to use alternative building materials to wood and what determines their choices?

- How do final consumers view the use of wood relative to alternative building materials and what factors influence their decisions about the materials they purchase?

The research questions are reflected in seven surveys carried out in the first half of 2002, covering the spectrum from forest growers to final consumers. Each survey addressed one of the research questions and was directed at a particular group.

Forest Industry	Forest growers Primary wood processors
Intermediate Customers	Architects Builders Building material retailers Furniture manufacturers
Final Consumers	

The questions and results of the study lead to two major areas of conclusions – forest certification and building material selection.

Forest Certification

Each survey posed some type of question related to forest certification. Those involved forest growing and primary processing had the greatest number of questions, since they are closely linked to the forest certification debate. Fewer questions about forest certification were asked of other groups, and generally these were in the context of wider decisions about selection of building materials. The conclusions in this section bring together information from all the surveys.

Environmental perceptions of building materials

Intermediate and final consumers generally believe that wood is more environmentally friendly than other building materials, including steel, concrete, masonry and plastic. When asked about general environmental aspects of building material use throughout

the extraction, production and installation process, architects and consumers perceive wood to be the material that is least harmful to the environment, while builders and furniture manufacturers generally perceive wood to be harmless to the environment.

The general perception of intermediate and final consumers that wood is relatively more environmentally friendly than other building materials. However, about 30 percent of architects, and 20 percent of builders and retailers have avoided using some building materials, including wood, for environmental reasons. Builders are also more likely to have negative perceptions about the environmental impact of wood extraction. In addition, consumers are more likely to consider the environmental impact or credentials of wood than the other building materials, making the wood products industry susceptible to consumers' environmental concerns.

In addition, the conjoint analysis of consumer preferences for outdoor wooden furniture attributes shows that over all, forest type is rated as most important, followed by forest certification, and Australian timber sources. A cluster analysis of the conjoint analysis results provides four clusters, or market segments for outdoor wooden furniture.

- The *"quality environmentalist"* cluster rates forest certification as the most important attribute, prefers a long warranty provided, and is the least price-sensitive cluster.
- The *"value environmentalist"* cluster rates a long warranty as the most important attribute, prefers timber with forest certification, and is the most sensitive to price.
- The *"implicit-certification consumer"* cluster rates forest type as the most important attribute, preferring plantation sources, and also prefers wood sourced from Australia, and forest certification.
- The *"buy-local consumer"* cluster rates the region where the wood was sourced as the most important attribute, preferring wood sourced from Australia over imported wood, followed by plantation sources.

These conjoint analysis results show that environmental attributes are important for some final consumers when purchasing products manufactured from wood. Given all of these factors, the environment may then be a dimension that the wood products industry can use to promote wood to intermediate and final consumers. Forest certification would work in favour of wood in this aspect.

Knowledge about and attitudes towards forest certification

Intermediate consumers are generally aware of, and have a preference for, certified wood products. About 75 percent of respondents in all intermediate consumer categories are aware of certified wood products. In addition, there is a strong preference for using or stocking certified wood products, particularly for architects and building products retailers.

Intermediate consumers also believe that certified wood products are important to their ultimate customers. At least 50 percent of respondents in each category think that some of their customers would buy certified wood products if they were available. This rises to 90 percent for building products retailers, where the greatest proportion of respondents also report that customers have already requested certified wood products. A number of respondents in all categories of intermediate consumers believe that their customers would pay a premium for certified wood products.

The price premium suggested by some intermediate consumers corresponds with the results of the consumer survey, which show that for some consumer segments, certification is more important than price and consumers would pay a higher price for a

product with the certification attribute. However, there are also a number of consumer market segments that are price sensitive and it is not clear that the market will sustain a price premium in all product areas. Consumers themselves are generally familiar with the concept of environmental purchases as well, with 61 percent of respondents having seen some type of environmental labelling on packaging, and 53 percent actually purchasing a product with environmental labelling.

The results overall indicate that the forest industry is likely to find that forest certification will provide a role in positioning wood in the marketplace as many of their customers would purchase certified wood products in preference to non-certified products.

For the forest industry itself, the interest in forest certification is higher among forest growers than primary processors, with 60 percent of forest grower respondents indicating they will become involved compared to only 44 percent of primary processors. Within two years, about 30 percent of forest growers and 18 percent of primary processors expect to be undertaking or have forest certification.

At a State level, the level of uptake of certification is generally higher for forest growers involved in native forests than for plantations, while for processors it is the reverse and those involved in processing plantation resources are more likely to be involved in forest certification. Both growers and processors in New South Wales and Queensland are less inclined to become involved in forest certification, and the certification impetus is strongest in the southern States. Individually, intentions to certify are much higher in Tasmania.

Those who have made the decision to undertake forest certification are more likely to see certification as important in their markets and to see some benefits in certification. However, many primary processors and forest growers view forest certification as defensive reaction to protect markets rather than as a market opportunity. For many respondents, the most important reason for undertaking forest certification would be peer pressure, as there is widespread belief that their customers are not demanding certified products. To some extent, this reflects the fact that market growth is expected to be in countries or regions that are not closely linked to a need for certification. The net effect is a perception that forest certification is being driven by industry itself. However, it may also reflect a breakdown in communication between the forest industry and their customers.

Barriers to forest certification

There are three main barriers to forest certification. First, there is a general lack of knowledge or clarity about what is going on in forest certification, and uncertainty about what might happen in the future. This is linked to the observation that for most businesses, there is no direct perception of demand for certified forest products. The net effect is that many businesses have decided to hold off and wait until something clearer emerges.

Secondly, and linked to the lack of a direct perception of demand for certified forest products, there is inadequate communication along the forest products supply chain. Forest growers and primary producers are generally not aware of the potential demand for certified forest products indicated by the survey results for intermediate and final consumers. At present, most businesses considering forest certification will feel they run the risk of being caught without links to other parts of the supply chain. The breakdown in communication in the forest industry itself is shown by the intended level of uptake of certification potentially being much higher for forest growers involved in

native forests than for plantation growers, while the opposite occurs for processors of those resources.

Thirdly, while there is a belief that forest certification will go some way to promoting the industry's environmental stewardship, the forest industry does not believe that it will satisfy Australian environmental groups to the same extent that it might satisfy foreign environmental groups. As such, the perception is that there will be resistance to forest certification by Australian environmental groups and it will not have the desired effect in the market place for wood products.

Most acceptable certification approach

Only forest growers and primary producers were asked explicit questions about specific approaches to forest certification. The one exception to this was the consumer survey where respondents were asked about the organisation most trusted to carry out forest certification. The results show that an independent, private certification organisation is the most trusted organisation to carry out forest certification, and that the wood products industry is least trusted. Whatever system(s) are developed, they will need to meet this criterion for acceptance in the marketplace.

Among those forest growers and primary processors who have already selected forest certification schemes, only three schemes are currently being considered. These are the ISO 14001 Environmental Management System, the Australian Forestry Standard, and the Forest Stewardship Council scheme. ISO 14401 is effectively a transitional or complementary management system for full forest certification. For the other two systems, there is currently an even split between the Australian Forestry Standard and the Forest Stewardship Council scheme for plantation growers and softwood processors. Native forest managers and processors are focusing predominantly on the Australian Forestry Standard.

Most forest industry respondents are concerned that whatever certification they undertake, it has international credibility and will facilitate sales in both the Australian and international markets. There is no desire for duplicate or ultimately redundant certification efforts. This points to a need for adoption of an international certification system, or a mechanism for mutual recognition or an easy transition from a domestic certification system like the Australian Forestry Standard to an international system..

Factors that would facilitate forest certification

Factors that would facilitate forest certification follow from the main barriers identified previously. Given the relatively low level of knowledge about forest certification, a useful starting point is communication with the forest industry and along the supply chain about forest certification systems generally, what is happening internationally, and how the Australian forest industry fits into the domestic and international scene. The focus of this communication should be to identify the risks and opportunities of forest certification, and mechanisms for making certification work.

Although the market generally works efficiently in transmitting demands along the supply chain, experience overseas shows that the lag times involved in developing the certified wood products market can create problems for different parts of the supply chain. The same problems seem to be emerging in Australia. As a result, there is a need to facilitate communication between different parts of the forest products supply chain.

Appropriate channels for communicating about forest certification

For both forest growers and primary processors, industry or trade publications will probably be the most effective method of communicating information on forest certification. Professional associations are also possible channels.

Selection Criteria for Building Materials

Intermediate and final consumers were asked a range of questions about selection of building materials and the factors they use in their decisions. In this context, intermediate consumers are those who are in the value chain for forest products, or those who have a role in creating or translating demand from final consumers. This group covers architects and builders (specifiers), building material retailers and furniture manufacturers. The conclusions in this section bring together information from all the consumer surveys.

Current and future use of wood in building applications

When asked about preferences for building materials in a variety of indoor and outdoor applications around the home, final consumers showed that wood is highly preferred. The preference by final consumers for wood in residential buildings is also reflected by architects and builders, with wood being a dominant material for the main structural components in this application. The surveys show that most architects and builders feel very positive about the use of wood.

An important issue for the wood products industry are the large number of builders who intend to decrease their use of wood. This reduction would be a continuation of the trend over the past five years where the use of wood by both architects and builders for residential buildings has decreased for all the applications considered, mostly being replaced by steel or concrete. One area of interest for the wood products industry is wall framing, where steel is close to wood in terms of consumer preference and there has been a rapid adoption by architects and builders. This may indicate the effects of promotion by the steel industry and the development of framing systems that make it easier to use steel.

In commercial buildings, the frequency of wood use by architects and builders is much lower. Wood use is only common in interior partitions, and interior trim and detail in this application. The same downward trend in wood use found in residential buildings is occurring in commercial construction, with survey results showing wood use decreasing over the past five years and steel and concrete use increasing.

For final consumers and the D.I.Y. market, wood is generally the preferred building material in both exterior and interior applications, and wood dominates in the building trade and DIY markets. However in some applications, wood has close competitors. This includes exterior cladding (masonry), fencing (steel), internal wall framing (steel) and windows (steel/metal).

Use of wood in furniture applications

Solid hardwood was the most frequent furniture construction type used by manufacturers. However, for more than half of the manufacturers making solid wood furniture, solid wood was less than 20 percent of their sales. The other common types of construction were hardwood veneer and artificial laminate over wood composites. The most important furniture attribute for consumers was the attractiveness of the

furniture closely followed by quality construction. Style or design, quality, durability and getting good value were also rated as important, although the overall price of the furniture was seen as a less important furniture attribute than 'good value'.

Key selection criteria

For architects and builders, each is more likely to view their own preferences as being most important, while builders also more likely than architects to view the preferences of structural engineers as being important. Architects are more likely to view the appearance of the material and environmental considerations as being important in material selection. They are also concerned about the light, space, sound and function of the material or what can be termed architectural considerations. Builders are most concerned with more practical considerations, or those that impact on their ability to carry out the building job. Builders are more likely than architects to consider ease of installation as being important in material selection.

Both architects and builders consider consistency and quality of the material important and that the material is proven to perform in the intended application. They also consider it important that the material will be available when needed, that the supply will be consistent and that it will have a reasonable installation cost.

For building material suppliers, demand from trade customers was the most important selection criteria for determining which building materials were carried in their stores. They also identified logistical factors, including product availability and supply consistency, and product-specific factors, including consistency, quality and price, as very important factors in the selection of building materials.

For furniture manufacturers, consumer preference was very important in the selection of furniture materials, along with the appearance of the material. They also identified material consistency and quality, supply consistency, and material availability as being very important in determining the selection of furniture materials. These again are largely logistical and supply management factors.

Perceived advantages of wood

Architects rated functionality as an important building selection criteria, while builders saw ease of installation as being important in material selection. Not surprisingly, one of the key attributes where wood performs well for these groups is in ease of being incorporating into design or use. Furniture manufacturers as well indicated that when compared to other furniture materials, wood rated highest in ease of incorporation into design, and ease of use in manufacturing.

For architects and builders, a key competitive advantage for wood is that it performs well in the cost area, including total building cost, installation cost and material costs. Wood is also seen to provide 'value for money' for building material retailers and consumers.

The specific nature of wood also provides some of its competitive advantages, for both furniture and building applications where appearance was important. This includes factors such as warmth, texture, and grain of wood.

Perceived disadvantages of wood

For both architects and builders, wood does not rate as well as other materials in terms of durability. When asked to identify the three greatest drawbacks to using wood in commercial design, the most commonly cited reasons for both architects and builders identified were, “it is prone to insect damage”, and “it deteriorates or rots”. These perceptions of drawbacks point to physical characteristics of wood as playing a part in the decline in wood use.

Wood also does not rate as well in terms of consistent quality for architects, builders and building material retailers.

Promoting wood products

The key areas to address in promoting wood products build on the perceived strengths of wood, while at the same time, addressing the perceived weaknesses of wood. The wood products industry needs to build on the positive opinion held by consumers, architects and builders about wood in residential construction, and to take advantage of the opportunity to increase wood use. In a range of applications, the survey results show that manufacturers can focus on the attractiveness and ease of use of wood.

To reverse the trend in commercial construction, the wood products industry will have to overcome the negative attitudes of a large number of architects who do not think that wood is a good material for structural applications in light commercial buildings and the large number of builders who indicate that they will use less wood in the future. The main opportunity for wood may be the difference between the number of builders who use wood in light commercial construction and the number who think it is suitable.

A potentially key factor in addressing wood use in both residential and commercial building is to address problems in the adoption of new technology in wooden structural systems. The results of the surveys suggest that transfer of information about wooden structural systems is not occurring as fast or as well for wood as for other building materials and that different distribution systems are developing for wood and non-wood materials. However fast technological transfer is occurring, it is also occurring faster among builders than among architects.

Taken together, the slow transfer of information on new wood-based building systems and differences in distribution systems for building materials indicates that the wood products industry needs to develop different approaches to promoting wood use.

1. Distribution Channels

It appears that the wood products industry is relying too much on traditional distribution through building material suppliers to place their products, while other building material suppliers are using more specialised and direct distribution and promotion channels. The wood products industry needs to evaluate whether this is still an effective distribution system with the development of engineered wood products and the apparent breakdown in technology transfer to the building industry.

2. Training and Promotion

There is a need to evaluate the effectiveness of current methods used to provide training on wood products and systems for architects and builders and the effectiveness of promotional material.

One area that appears to be important is the development of material for formal education programmes (architects and builders), as well as sales presentations, trade shows, and exhibits to demonstrate both new and existing wood products to all parts of the building chain. The advice of store personnel and the availability of information on product installation and use were considered to be important in influencing DIY customer purchasing decisions. As such, it is important to extend information and physical examples provided for architects and builders to both DIY customers and store staff of building material suppliers.

Introduction

The last major study of perceptions and attitudes towards forests and wood products in Australia was undertaken in 1996[1]. This study examined a range of issues, including awareness, knowledge, and support for certification/accreditation systems among various stakeholder groups. The study found that only one conservation group unreservedly supports any system of forest certification, that there is a high level of awareness of certification among forest growers, industry representatives, forest regulators and conservationists, but not among final timber users, and that consumers and timber users attach some degree of importance to assurances that the production of timber products does not result in over-exploitation of forests.

Since this last study, the wider social and economic framework that the forest sector operates within has continued to change. In particular, public perceptions about the relative environmental merits of using wood are being challenged. This challenge comes from both alternative building materials (e.g. concrete, plastic and steel), and from alternative supplies of wood (e.g. natural or plantation forests, and imported or domestic timbers). Accompanying this challenge is a growing trend to market environmental merits of products, particularly through environmental endorsements or certification.

Numerous questions are being raised about how these changes are affecting users of wood products and the industry that produces them. Particular questions that have been raised are:

- How does the forest industry perceive the trend towards providing consumers with certification of forest management, and what are their intentions in terms of adopting forest certification?

- How do consumers, including final users and intermediate users who specify building materials, view the use of alternative building materials, what motivates them to use particular materials and do environmental issues influence their choices?

With these questions in mind, there are three research questions that could be addressed.

- What are the attitudes of forest growers towards forest certification and what factors would facilitate adoption of forest certification?

- What motivates specifiers, such as architects, and builders, to use alternative building materials to wood and what determines their choices?

- How do final consumers view the use of wood relative to alternative building materials and what factors influence their decisions about the materials they purchase?

To address the questions raised here, three types of surveys were carried out. Each survey addressed one of the research questions and was directed at a particular group. The three groups are as follows:

[1] The Consultancy Bureau, 1996.

Introduction

Forest Industry

Part 1 of the study covers the forest industry. This group includes both private and public, and plantation and native forest growers, as well as primary processor like sawmills and panel manufacturers.

The research objectives for the forest industry group are as follows:

- To determine attitudes towards forest certification.
- To determine factors that would facilitate adoption of forest certification.
- To identify barriers which impede the adoption of certification.
- To determine the appropriate channels for communicating about certification.
- To determine which certification approach is most acceptable.

Two surveys, one for forest growers and managers, and one for primary processors, were developed for this part of the study.

Intermediate Customers

Part 2 of the study covers intermediate consumers. This group includes those who are in the value chain for forest products, and who have a role in creating or translating demand from final consumers. This group covers specifiers such as architects and builders, those in the retail-wholesale chain for timber and secondary processors such as furniture manufacturers.

The research objectives for this group are as follows:

- To determine the influence of cost (material, installed, lifetime) in the selection of building materials (wood, steel, concrete, plastic).
- To determine whether factors such as ease of use, or compatibility with other building systems has an influence on the selection of building materials.
- To determine whether knowledge/training, prevalent tools or common building styles (built on site, pre-fabrication) have an influence on the selection of building materials.
- To determine the relative importance of environmental considerations compared to other product attributes when specifying/purchasing materials.
- To determine knowledge about and attitudes towards forest certification.

Four surveys covering architects, builders, building products retailers and furniture manufacturers were developed for this part of the study.

Final Consumers

Part 3 of the study covers final consumers. This group includes the wider population who are the final users of wood products, such as home or furniture buyers, or D.I.Y. customers.

The research objectives for this group are as follows:

- To determine the influence of cost (material, installed, lifetime) in the selection of building materials (wood, steel, concrete, plastic).
- To determine whether factors such as ease of use, or compatibility with other building systems has an influence on the selection of building materials.

- To determine whether knowledge/training, or prevalent tools has an influence on the selection of building materials.
- To determine the relative importance of environmental considerations compared to other product attributes when purchasing materials.
- To determine the attitudes of final consumers toward forest certification of forests (Australian and other countries).

In total, seven surveys covering the spectrum of forest products production and consumption were undertaken. This remainder of this report covers the results of the surveys of these groups.

Part 1

Forest Industry

This section of the report covers the results of a survey of forest growers and primary wood processors in Australia. The research objectives for this group are as follows:

- To determine attitudes towards forest certification
- To determine factors that would facilitate adoption of forest certification
- To identify barriers which impede the adoption of certification
- To determine the appropriate channels for communicating about certification
- To determine which certification approach is most acceptable

Data on the Australian forest industry's attitudes towards and awareness of forest certification to address these objectives was collected using two different mail surveys. The remaining parts of this section present the methodology and results of these surveys.

Methodology

Two different surveys were developed for the forest industry, one for forest growers and one for primary wood processors. This split was done to reflect the fact that these activities are at different locations in the value chain for wood products, and that they are not always integrated activities where a forest grower will also be a wood processor. As a result, while there were many common questions in both surveys, there were also some differences.

The survey instruments (Appendix 1) for both surveys contained five parts. The first part contained questions to help determine respondents' knowledge of forest certification. This included knowledge about specific forest certification schemes and their expectations of specific practices or requirements that might be contained in forest certification. Before answering this section, respondents were provided with a specific definition of forest certification.

> *Forest certification means that a formal, documented audit has been completed to ensure that forests are well-managed according to a defined set of criteria*.

Secondly, respondents were asked to indicate what they believed to be the effects of forest certification on the Australian forest products industry. In addition to the effects on the industry, respondents were also asked to indicate what they believed to be the effects of forest certification for their organisation.

Thirdly, respondents were asked to indicate their organisation's intentions toward forest certification. Respondents were asked to specify whether their organisation was already considering certification, and if so, when they expected to begin this process (within the next 12 months, 24 months, after 24 months or whether their organisation was in the process of becoming certified, or already had certification). Those organisations that were considering certification or possessed certification were then asked to indicate which scheme they were involved with. Next, those with some involvement with certification were asked to indicate what factors were important in their choice of this scheme and what factors made it difficult to implement the forest certification scheme. Those organisations who had not intention of pursuing forest

certification were then asked to indicate what factors influenced their decision not to adopt forest certification.

Fourthly, respondents were queried on their ability to undertake a forest certification scheme by determining their current involvement in similar schemes. Respondents were asked to indicate their involvement in a range of generic management systems (e.g. ISO 9001), which may be adopted by organisations to ensure that internal processes will meet the organisation's objectives. In addition, forest growers were asked to indicate their involvement in a range of codes that guide forest management practices (e.g. self-administered industry code). All respondents were also asked to assess their use of a variety of communication channels in obtaining information on various topics. For instance, respondents were asked to indicate whether they obtained information on forest certification through industry trade publications, conferences, professional associations, or government publications.

Finally, a series of demographic questions were asked that can be used to categorise organisations. For instance, forest growers were asked to record the ownership status of their organisation, the size of the forests owned or managed by their organisation, the markets served by their customers, and the forest types and States where their forests are located. Primary processors were asked to record the ownership status of their organisation, the type of products produced by their organisation, the markets served by their customers, and the forest types and States where their logs are sourced. Finally, respondents were also given space to provide additional comments about forest certification.

Survey development and implementation was based on methods recommended by Dillman[2] and described as the Total Design Method (TDM). In adherence to the TDM survey guidelines, an initial survey mailing, and a second mailing were conducted in order to maximize response rates. Before being implemented, the research instrument was pretested to check for biased, misleading or confusing questions, to verify the quality and comprehensiveness of information received, and to test the overall effectiveness of the research instrument. The pretests were implemented in two steps. First, research colleagues were asked to evaluate the research instruments for clarity of instruction. Next, a small sample was posted and the replies evaluated. After the pretests, it was determined that a number of questions needed to be reworded to increase their clarity and a number of additional options needed to be added to certain questions.

For the forest grower survey, the sample population came from two sources. Firstly, 13 grower members from the Plantation Timber Association of Australia were selected. Secondly, Australian Forest Growers (AFG) selected and sent surveys to 100 growers who were members of that organisation. To protect the identity of AFG members, their mailing was handled entirely by AFG. In total, 113 surveys were mailed. After adjusting the sample size for non-deliverable surveys and incomplete or otherwise unusable surveys, the adjusted response rate was 47 surveys or 42 percent. Data were collected in March and April of 2002.

For the primary wood processor survey, the sample population came from members of the Forest and Wood Products Research and Development Council. A total of 331 surveys were mailed. After adjusting the sample size for non-deliverable surveys and incomplete or otherwise unusable surveys, the adjusted response rate was 32 percent. Data were collected in May and June of 2002.

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[2] Dillman, D. 1978. Mail and Telephone Surveys: The Total Design Method. New York, NY: John Wiley & Sons.

Results of the Forest Grower Survey

The results of the forest grower survey are presented under a number of headings that reflect particular areas of interest.

- Demographics
- Awareness about forest certification
- Attitudes towards forest certification
- Intentions for forest certification
- Choice of forest certification scheme
- Forest certification and size
- Certification and forest type
- Communication channels
- Additional comments

Demographics

Table 1.1 has the 47 respondents to the survey producing 4,509,405 m^3 of output from plantation forests and 5,867,900 m^3 of output from native forests. The respondents also own or manage 1,139,428 hectares of plantation forest and 6,737,074 hectares of native forest. This represents 77 percent of the plantation forest estate[3] and 61 percent of the native forest estate[4]. As such, the results of the study should be a good reflection of what is occurring in the industry.

Table 1.1 Average Size of Forest Holdings and Annual Log Production

Forest Type	Area Owned or Managed (ha)		Total annual production (m^3/yr)	
	Total	Average	Total	Average
Plantation	1,139,428	25,320	4,509,405	109,985
Native	6,737,074	160,406	5,867,900	136,462

As well as identifying area and production, the survey asked for information on the States or Territory where forests were under ownership or management (Table 1.2). For the purposes of this question, plantations were split into softwood and hardwood to allow for different management objectives and species being used in a plantation setting. Respondents could also select more than one location. Table 1.2 includes respondents from all parts of Australia and covers owners or managers of all forest types.

[3] Total plantation forest area is based on an estimate of 1,484,743 hectares by the Bureau of Rural Sciences (BRS (2001), Plantations of Australia, Canberra).

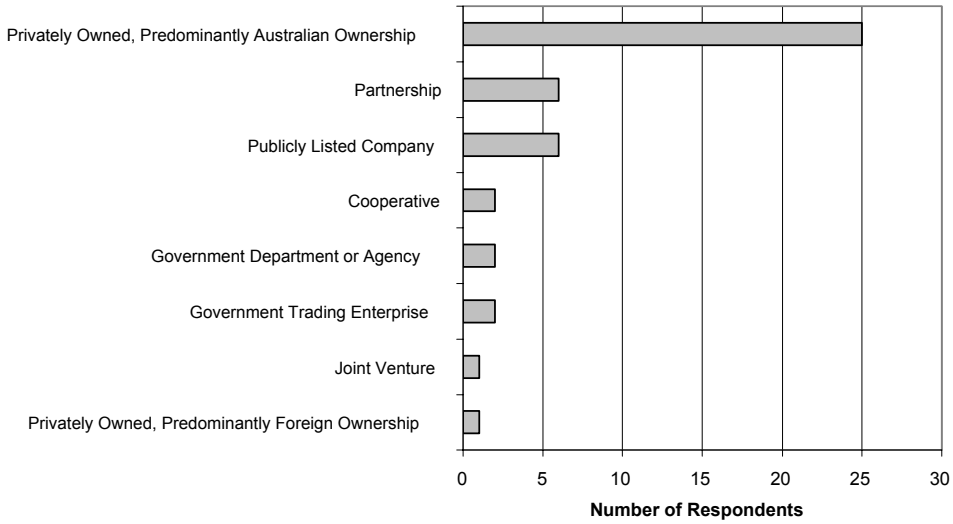
[4] Total native forest area is 11 million hectares (www.nafi.com.au).

Table 1.2 Location and Types of Forests Under Ownership or Management
(Number of respondents with forest type in that State or Territory)

	Softwood Plantations	Hardwood Plantations	Native Forest
WA	7	9	1
SA	5	4	1
TAS	4	4	4
VIC	14	14	3
NSW	7	2	5
QLD	2	4	1
ACT	1	0	0
NT	0	1	0

One other demographic question was ownership structure. As can be seen in Figure 1.1, there is a wide range of ownership types across the forest growers surveyed. However, most forest growers are privately owned Australian organisations (53 percent).

Figure 1.1 Forest Grower Ownership



Forest growers were also asked about current markets for their customers, and expected markets in five years. An interesting feature of Table 1.3 is that 11 forest growers are not yet producing logs or do not know what their customers are doing, and 12 will be in the same position in five years time.

Table 1.3 Markets for Log Buyers

	Softwood Plantation		Hardwood Plantation		Native Forest	
	Current Markets (N = 33)	Future Markets (N = 33)	Current Markets (N = 27)	Future Markets (N = 27)	Current Markets (N = 15)	Future Markets (N = 15)
Australia	25	20	16	15	13	11
New Zealand	0	1	0	1	1	2
Japan	9	10	11	13	6	7
Korea	3	6	2	7	2	4
USA	0	3	0	2	0	2
China	2	8	2	9	3	7
Other Southeast Asia	5	8	4	8	3	6
India	3	4	3	4	2	3
European Union	1	3	1	2	1	3
Other, not specified	0	1	0	1	0	1

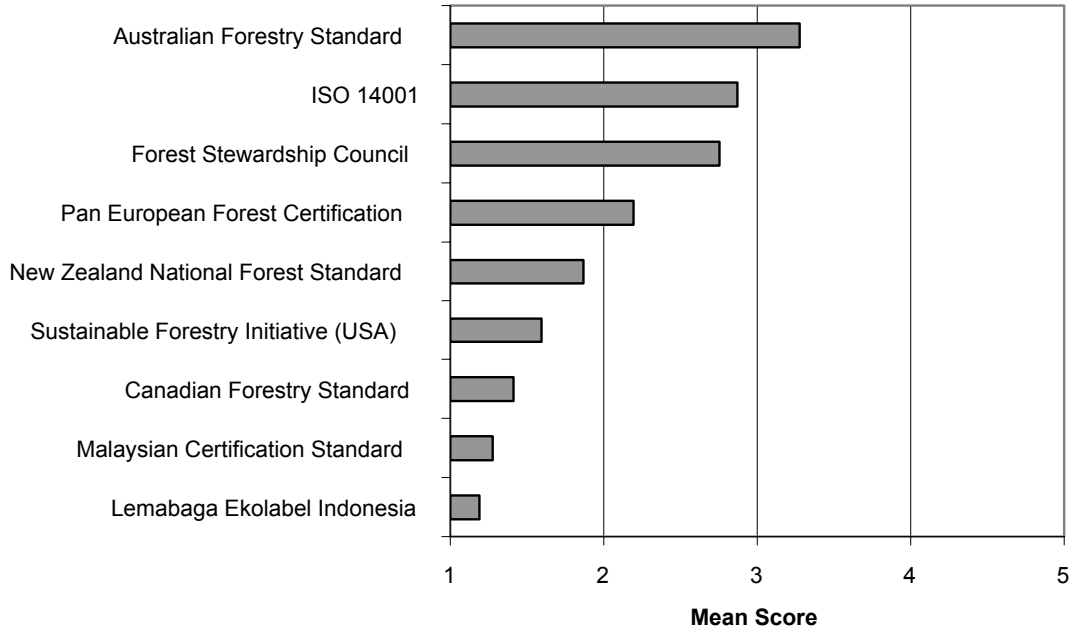
For the respondents who answered the question, Australia and Japan are the main markets for their customers (Table 1.3). The Australian market is a main market for the customers of 83 percent of forest grower organisations. This is expected to decline to 71 percent in five years. The 17 percent of growers whose customers do not sell to the Australian market at all have customers that are largely in the Japanese market. These growers are predominantly producing plantation hardwoods. The second main market is Japan, with 39 percent of respondents. Japan is expected to be a main market for the customers of 49 percent of growers in five years.

Respondents anticipate growth in Asian markets. The major change in markets is growth in China (11 percent to 40 percent), South Korea (11 percent to 29 percent) and other Southeast Asia (14 percent to 29 percent). India is also an area where respondents anticipate growth. Importantly from the perspective of forest certification, market growth is expected to be in countries or regions that are not closely linked to a need for or market pressure for certification, other than in products for re-export. Countries or regions currently linked to markets for certified forest products, Europe and the U.S., are identified as likely markets for the customers of only 14 and 9 percent of respondents respectively.

Awareness about Forest Certification

An important objective of the study was to assess respondents' levels of awareness and knowledge of forest certification schemes. To do this, respondents were asked to rate their level of knowledge about a number of forest certification schemes. Respondents' assessments are based on a five-point scale ranging from 1 which means, 'I know nothing about', through 3 which means, 'I have read about', to 5 which means, 'I know a lot about'.

Figure 1.2 Knowledge of Forest Certification Schemes



Respondents' level of knowledge of forest certification schemes can only be described as superficial (Figure 1.2). Only for one scheme, the Australian Forestry Standard, do the majority of respondents indicate having at least read something about the scheme. The ISO 14001 and Forest Stewardship Council schemes have the next highest level of knowledge reported by respondents. However, given the press and industry coverage these schemes have received, one might expect a higher level of knowledge.

In general, respondents' knowledge of the various certification schemes is low. The greatest level of awareness is for schemes for which there is some degree of activity in Australia (Australian Forestry Standard, ISO 14001) or which has wide international coverage (Forest Stewardship Council). There is little or no awareness of other certification activities internationally.

Given the low level of awareness, some uncertainty or confusion about what might be included in a forest certification scheme is likely. This confusion emerges in Table 1.4 where respondents were asked to indicate what features or practices they would expect forest certification schemes to include. Respondents could indicate, 'Yes' they believed the practice would be part of the scheme, 'No' it would not, or they could indicate 'Don't Know'.

Table 1.4 has a number of questions that would be expected to be mirror opposites in terms of the response.

- Third party versus self-assessment.
- Prescriptive management requirements versus prescribed environmental outcomes.
- Prescribed versus company-defined management systems.

Table 1.4 Expectations of Forest Certification Schemes

I believe forest certification schemes will have …		Yes	No	Don't Know
Third party assessment	(N = 47)	40	2	5
Self assessment	(N = 44)	27	13	4
Prescriptive forest management requirements	(N = 46)	24	19	3
Prescribed environmental outcomes	(N = 47)	27	10	10
Prescribed management system(s)	(N = 46)	32	9	5
Company-defined management system(s)	(N = 46)	33	4	9
Environmental requirements	(N = 47)	42	2	3
Economic requirements	(N = 46)	21	11	14
Social requirements	(N = 47)	27	9	11
Product tracking through the value chain	(N = 45)	29	7	9
A label that can be used for marketing	(N = 47)	35	5	7

The type of assessment required relates to whether respondents thought that they would be required to have an external agency audit what they were doing to maintain certification, or whether they could do this themselves. Based on Table 1.4, a number of respondents thought that they would be able to do both, with 40 respondents saying they thought there would be external audits and 27 respondents saying they would be able to self-audit.

A similar pattern emerges when respondents were asked whether they thought there would be prescriptive management requirements or more general prescribed outcomes. In the survey, prescriptive forest management requirements were defined as “Detailed specifications such as maximum coupe size, or operating distance from streams. Operator has no discretion over what to do” and prescribed environmental outcomes were defined as “Specific outcomes such as sediment loads rather than the specific means to achieve this. Operator has discretion over specific action to meet outcomes.” In Table 1.4, roughly the same number of respondents answered “Yes” to both questions, however the “No” and “Don’t know” responses were quite different. The pattern of responses to these two questions suggests that there was either confusion over what the question was asking, or similar to the previous questions, confusion over what might be involved in forest certification.

The third set of questions that were expected to have mirrored responses related to whether there would be prescribed or company defined management systems used for forest certification. The management system refers to the process put in place to ensure that forest activities are monitored and managed to ensure compliance with certification requirements. Prescribed management systems were defined as “Specific management system (documentation and reporting) must be used for the certification scheme”, and company-defined management systems were defined as “Any management system can be selected that meets the needs of the certification scheme.” In Table 1.4, a majority of respondents thought that they would be able to do both, with 32 respondents saying they thought there would be a prescribed management system and 33 respondents saying they would be able to define their own management system.

Respondents were also asked whether a forest certification system would have environmental, economic or social requirements to it. The purpose of these questions was to determine whether respondents were familiar with or had expectations for a forest certification system that was similar to the Forest Stewardship Council system. Table 1.4 shows that respondents mostly associated forest certification with

environmental requirements. Only about half of respondents have any expectation that there might be economic or social requirements to having forest certification. These latter two questions also had the highest number of respondents indicating that they did not know whether there would be these requirements.

Respondents were finally asked whether they thought that there would be product tracking through a value chain and a logo for marketing purposes with forest certification. The responses in Table 1.4 indicate that only two thirds were aware that product tracking was required by forest certification, and that 75 percent thought that a certification scheme would come with a marketing logo. This indicates that many respondents do no associate a marketing label with a requirement to maintain product tracking or a chain of custody.

Taken together, the questions in Table 1.4 reveal that respondents have a relatively low level of knowledge of forest certification schemes or important gaps in understanding. Both of these factors point to a need for education in what can happen in or constitutes the basis for forest certification.

Attitudes Towards Certification

In order to understand respondents' attitudes toward forest certification schemes, respondents were asked to indicate their beliefs about the effects of forest certification on the Australian forest products industry. Their beliefs were measured on a five-point scale where 1 means 'disagree' with the statement provided, 3 means 'partly agree', and 5 means 'agree'. There is no statistical difference in the responses of softwood and hardwood growers so the results will be discussed together. Mean responses to these questions are shown in Figure 1.3.

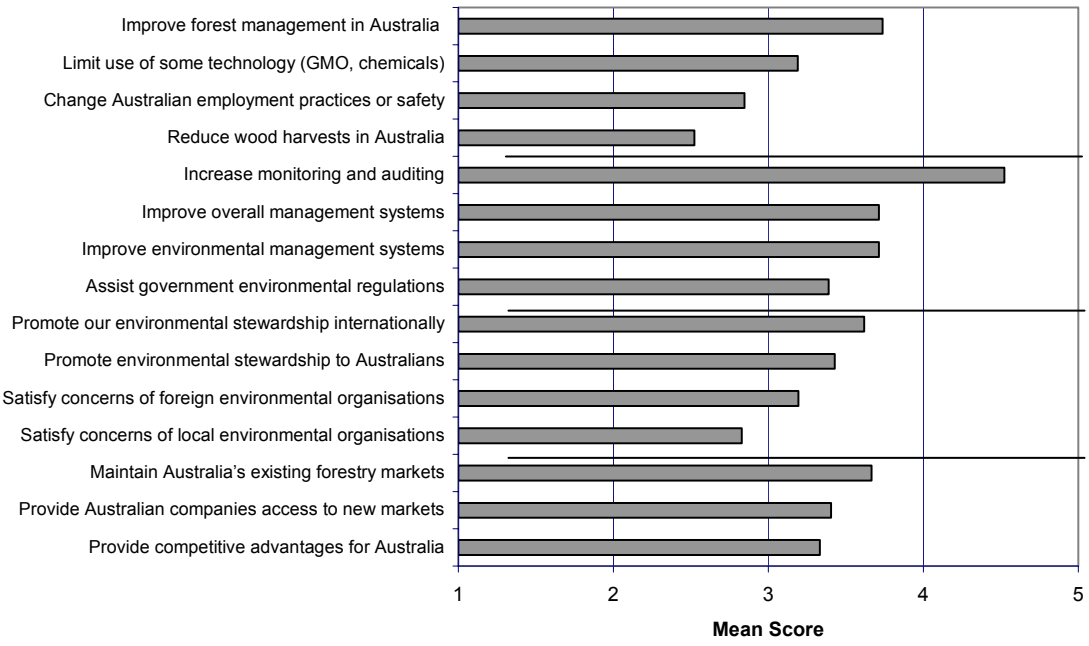
The responses in Figure 1.3 and the following discussion are grouped under general topics.

- Impact on forestry activity
- Impact on management
- Impact on perceptions of environmental stewardship
- Impact on markets

Impact on Forestry Activity

The first three questions in Figure 1.3 cover expected effects on forest management. Generally, forest growing organisations do not perceive certification as likely to have any negative effect on the Australian forest industry as most disagree that it will lower harvests or change employment and safety practices. They may even perhaps see it have a positive effect in terms of its ability to improve forest management. The only negative is the belief that there could be some limits on the use of technology.

Figure 1.3 Effects of Forest Certification on the Australian Forest Products Industry



Impact on Management

Respondents strongly believe that forest certification will increase auditing and monitoring compared to what they currently do, but they also believe that it will improve overall and environmental management systems. Respondents also believe that forest certification will have some effect on assisting Government environmental regulation. The general sense from these responses is that forest growing organizations see some positive effects from improved management systems.

Impact on Perceptions of Environmental Stewardship

Respondents believe that forest certification will go some way to promoting the industry's environmental stewardship, both offshore and in the domestic market. However, they do not believe that it will satisfy Australian environmental groups to the same extent that it might satisfy foreign environmental groups.

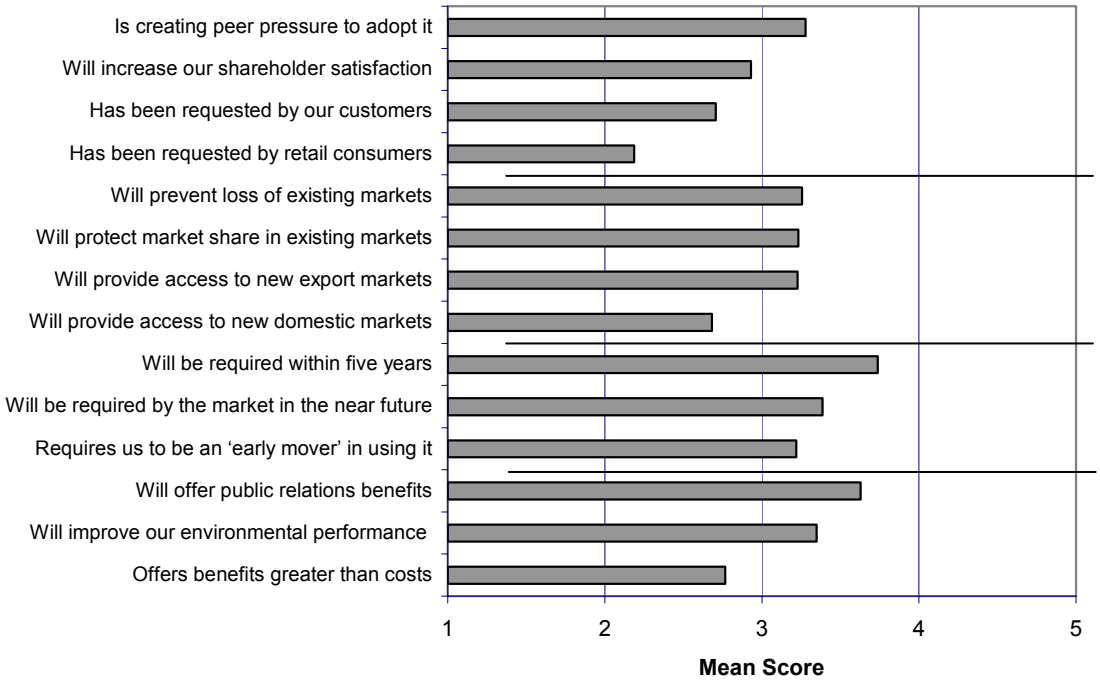
Impact on Markets

Respondents believe that forest certification will have some effect on maintaining existing markets, but they are not positive about its ability to provide access to new markets, or to provide a competitive advantage. Taken together, forest growers mainly perceive forest certification as a defensive measure in existing markets.

In addition to asking growers their opinions on macro-level changes to the forest products industry, respondents were also asked their beliefs about the importance or impacts of forest certification for their own organisation. Their beliefs were measured on a five-point scale where 1 means 'disagree' with the statement provided, 3 means 'partly agree', and 5 means 'agree'. Again there is not statistical difference across forest types so the mean responses to these questions are presented together in Figure 1.4. Generally, respondents did not feel strongly about any of the statements

provided, with mean score of all responses only 3.4 (partly agree with the statement) and the highest score only 3.74 (for “will be required within five years”).

Figure 1.4 Importance of Forest Certification to the Organisation



The responses in Figure 1.4 and the following discussion can again be grouped under general topics.

- Market need
- Market access
- Timing of forest certification
- Impact on the organisation

Market Need

The first four questions in Figure 1.4 show that for individual forest growers, the most important reason for responding to forest certification would be peer pressure. There is no belief that their customers or retail customers of forest products are demanding certified products. They also do not believe that forest certification will increase the satisfaction of shareholders. The latter two points lend weight to the notion that forest certification is being driven by industry itself rather than markets or owners.

Market Access

The next three questions show that respondents believe that certification will have a greater effect on new export markets than on new domestic markets. The most important factors in market access are that forest certification will help prevent loss of existing markets and market share. Again, this points to defensive rather than market opportunity reasons for undertaking forest certification.

Timing of Forest Certification

The next three questions in Figure 1.4 show that there is a firm belief that forest certification will be required in the near future, and certainly within five years. There is also some agreement that it may pay to be an early mover in the adoption of forest certification rather than waiting to see what happens. Most respondents expect to act soon, and under the right circumstances, at least some companies will move quickly. However, as was discussed previously, the quick movement would appear to be defensive rather than exploiting new market opportunities.

Impact on the Organisation

The last three questions in Figure 1.4 show that while overall benefits are not believed to outweigh costs of undertaking forest certification, there is a strong belief that there will be public relations benefits, and a positive impact on organization environmental performance.

The overall results from Figure 1.4 show that most respondents believe that forest certification is being driven by the industry rather than the market, and that when implemented will largely be a defensive measure in their existing (largely domestic) markets.

Intentions for Forest Certification

As was indicated in Figure 1.4, many forest growers believe certification is inevitable and expect to be involved in forest certification in the next five years. In order to get a more precise idea of intentions for forest certification, forest growers were asked to indicate their organisation's current intentions toward undertaking forest certification (Table 1.5).

Table 1.5 Organisational Intentions toward Forest Certification
(Number of Respondents)

No intention to pursue forest certification at this time		18
Plan some involvement or have some involvement with forest certification		
• Considering in 12 months	9	
• Considering in 24 months	9	
• Considering after 24 months	4	
• In the process of obtaining forest certification	1	
• Already have forest certification	4	
		27
Total Respondents		45

Not unexpectedly, as is shown in Table 1.5, 60 percent of respondents indicate they currently are involved or are planning some involvement with forest certification. However, a substantial number indicate that they do not plan to have any involvement with certification at the present time.

For those indicating some type of intention for involvement, 66 percent of forest growers indicate that they are considering forest certification within the next two years,

and about half of those are considering forest certification in the next year. One organization is in the process of becoming certified, and four organisations already have some type of forest certification. In addition, three of the organisations that already have forest certification have ISO 14001 certification and are considering pursuing additional types of certification.

The intention of about 50 percent of respondents to be undertaking or have forest certification within two years is a positive outlook for the industry given the lack of knowledge and understanding shown or demonstrated previously. It also shows the potential for a relatively high uptake of forest certification in the near future.

Choice of Certification Scheme

Of the 27 organisations in Table 1.5 that are considering forest certification, 18 have selected a specific scheme to pursue. Among those who have selected a forest certification scheme, only three schemes are currently being considered. At this time, the ISO 14001 Environmental Management System is the most common approach, followed by the Australian Forestry Standard and the Forest Stewardship Council scheme. Based on Table 1.6, some companies are considering more than one scheme, typically ISO 14401 and some other scheme.

Table 1.6 Choice of Forest Certification Scheme
(Number of Respondents)

No forest certification scheme at this time		9
Have selected forest certification scheme		18
Scheme selected		
• Australian Forestry Standard	8	
• Forest Stewardship Council	6	
• ISO 14001	9	

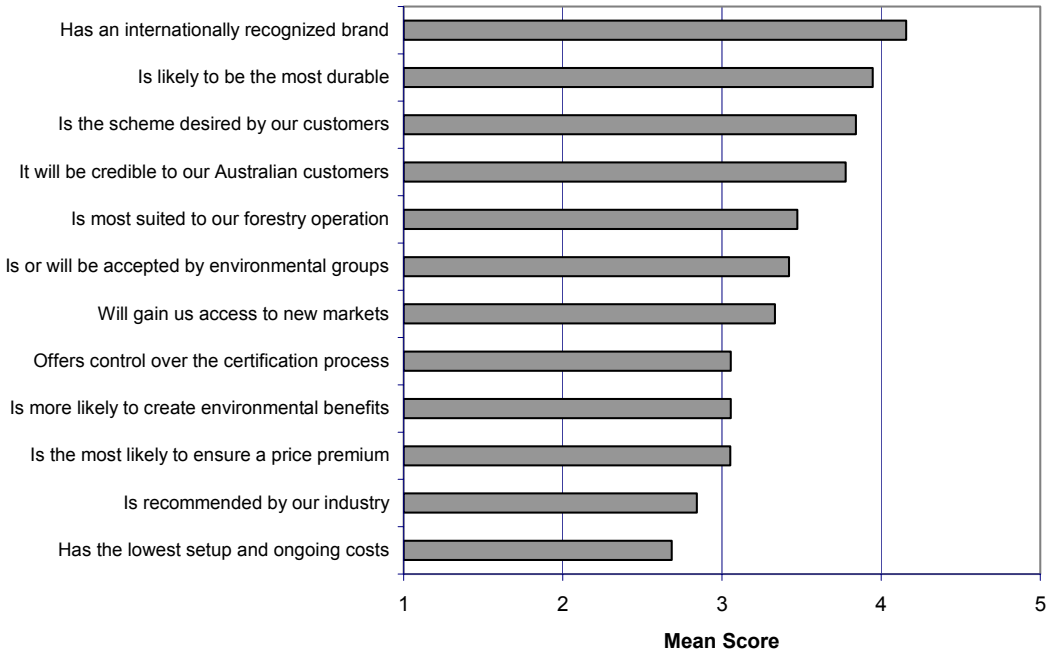
One interesting feature of Table 1.6 is that growers appear to dividing evenly between the Australian Forest Standard and Forest Stewardship Council schemes. Table 1.7 illustrates that the split between the Australian Forestry Standard and the Forest Stewardship Council scheme is roughly equal for plantation growers, but native forest managers are focusing predominantly on the Australian Forestry Standard. ISO 14001 Environmental Management System appears to have appeal across all forest types. These results raise questions for the implementation of the Australian Forestry Standard and the potential for requiring mutual recognition between the Australian Forestry Standard and the Forest Stewardship Council scheme.

Table 1.7 Forest Certification and Forest Type
(Number of Respondents)

	Australian Forestry Standard	Forest Stewardship Council	ISO 14001
Softwood Plantation	6	5	6
Hardwood Plantation	3	3	6
Native Forest	4	1	3

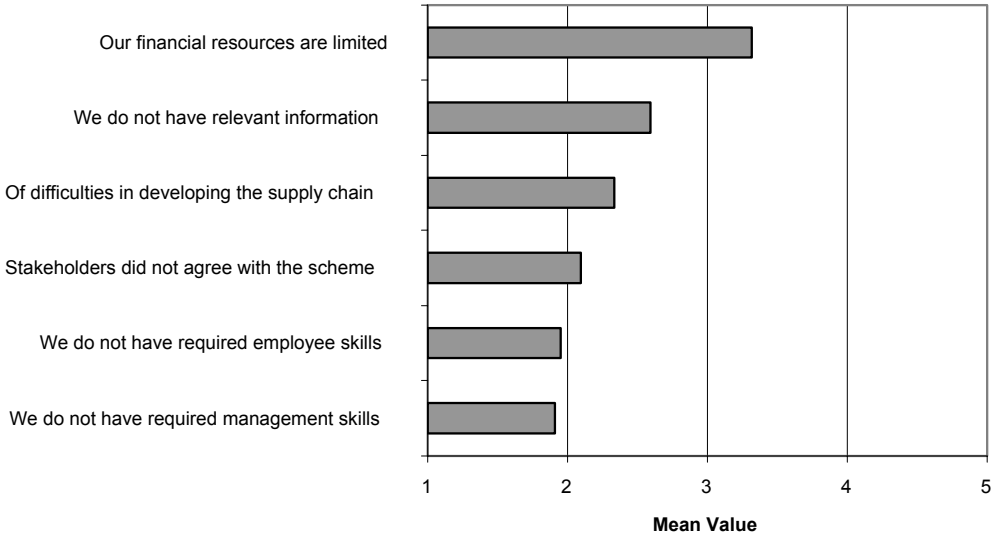
Those growers who had selected or were considering a particular forest certification scheme were also asked to indicate what factors were important to them in their choice of that scheme. Respondents were asked to indicate importance on a 5-point scale between 1 meaning 'not important' and 5 meaning 'very important'. The first two factors in Figure 1.5 suggest a 'quality' issue, with the importance of a recognised international brand and a system that is going to last being ranked most highly as important factors. The next most important factors are credibility to domestic customers or a certification scheme desired by customers. Taken together, this suggests that the key considerations in scheme selection are related to commercial or market issues, rather than strict profitability (access to new markets, price premium) or wider political issues (acceptance by environmental groups, recommended by the industry).

Figure 1.5 Selection Criteria for Forest Certification Schemes



Those forest growers who indicated they had selected or were considering a particular scheme were also asked to rate factors that could make it difficult to implement the scheme. Respondents were asked to evaluate factors on a five-point scale ranging from 1 meaning 'no impediment' to 5 meaning a 'major impediment'. The results of this question are shown in Figure 1.6.

Figure 1.6 Impediments to Forest Certification Scheme Implementation



Only limitations on financial resources emerge as being somewhat of an impediment to undertaking forest certification. Generally, the factors that were anticipated to create obstacles for certification did not feature highly. A lack of information and difficulties in developing a chain-of-custody for certified products could be seen as minor impediments.

Respondents were also able to note additional impediments to the options provided. The impediments that were indicated by respondents include:

- There is no scheme yet in Australia
- There is no final agreement on schemes
- Our organisation does not have required systems
- Environmental group resistance to certification
- Time and resources in company cycle

A number of these relate to a similar theme of there not yet being a scheme that meets their needs. Presumably these organisations have selected something that meets their needs for now but will modify what they are doing as things become clearer.

The 18 growers, or 40 percent of respondents, who are not currently interested in forest certification were asked to answer questions that looked at reasons why this was the case. They were asked to respond to questions by indicating their agreement with statements on a 5-point scale ranging between 1 meaning ‘disagree’, 3 meaning ‘partly agree’ and 5 meaning ‘agree’. The results are shown in Figure 1.7. The first two questions indicate that financial considerations are most important to these respondents. Benefits relative to costs of certification not being clear, and limitations on financial resources had the highest levels of agreement. The next four questions, all of which had a mean score above three, or that respondents had some agreement with, show that forest certification itself was part of the problem for these respondents. These include information, clarity about what was happening and complexity.

Figure 1.7 Reasons for Not Pursuing Forest Certification

Taken together, these show that uncertainty or confusion about what forest certification is or what is happening with it were linked to their decision to hold off from forest certification at this time. Interestingly, a lack of relevant management and employee skills was not considered to be an impediment by respondents. This had been identified as a potential problem area by the researchers based on discussions with companies that had undergone certification.

If the responses in Figure 1.4, dealing with the importance of forest certification to the respondent's organisation, are analysed according to whether the respondent was or was not considering or undertaking certification, they show some significant differences between the two groups (Table 1.7).

As can be seen in Table 1.7, those who are already becoming involved in forest certification are more likely to see certification as important for markets (protection of markets or meeting demand) and to see some benefits in certification (environmental performance, shareholders or benefits higher than costs).

Forest growers were also given an opportunity to list other problems that they felt were constraints on pursuing certification. The other reasons include:

- Performance standard difficult to obtain
- Policies between Forest Stewardship Council and Government forestry growers make a common approach difficult
- Greens' opposition to native logging, prevents certification
- Awaiting advice from organization we have a marketing agreement with
- Irregular entry to markets means benefits to small forest owners are uncertain
- Certification will discriminate against native forests
- Too impractical and costly
- Uneducated on topic/know nothing about

These other reasons basically revolve around policy or political factors that relate to finding a forest certification system that will work for everyone including development of performance standards and balancing desires of certifiers, growers, and environmentalists.

Table 1.7 Involvement in Forest Certification and Perceived Impact on Their Organisation

	Not Involved (N = 18)	Involved (N = 27)	P - value
Offers benefits greater than costs	2.13	3.15	8.43**
Will offer public relations benefits	3.31	3.81	2.19
Will improve our environmental performance	2.76	3.73	6.76**
Will be required by the market in the near future	3.12	3.56	1.39
Requires us to be an 'early mover' in using it	2.93	3.38	1.32
Will be required within five years	3.56	3.85	0.67
Will protect market share in existing markets	2.63	3.59	8.34**
Will prevent loss of existing markets	2.56	3.67	9.31**
Will provide access to new domestic markets	2.88	2.56	0.70
Will provide access to new export markets	2.88	3.44	2.45
Has been requested by our customers	2.00	3.21	6.91**
Has been requested by retail consumers	2.12	2.23	0.07
Is creating peer pressure to adopt it	3.17	3.35	0.20
Will increase our shareholder satisfaction	2.47	3.23	4.00*

Forest Certification and Size

In order to determine whether involvement in certification, either current or planned, is related to the size of the organisation, cross tabs were run for involvement in forest certification, and forest area owned or managed and annual production (Table 1.8). For the purposes of this analysis, small forest growers are those owning or managing up to 550 hectares, or producing 4,000 m^3 per year or less. Large growers are those owning or managing areas larger than 550 hectares, or producing more than 4,000 m^3 per year.

Table 1.8 indicates that there is a positive relationship between forest certification involvement and size. Growers with large forest areas (chi-square statistic significant at α = .001) or total annual production (chi-square statistic significant at α = .01) are more likely to be involved in certification than smaller growers.

Table 1.8 Forest Certification Involvement and Grower Size

Involvement With Certification	Size of Forest Owned or Managed	
	Small (0-550 ha)	Large (> 550 ha)
No	18 (64 %)	2 (11 %)
Yes	10 (36 %)	17 (89 %)
Total	28	19
	Total Annual Log Production	
	Small (0 - 4,000 m^3/yr)	Large (> 4,000)
No	18 (58 %)	2 (13 %)
Yes	13 (42 %)	14 (87 %)
Total	31	16

Certification and Forest Type

Respondents were asked to indicate which States or Territories they owned forests or had forests under management, and their intentions for certification. As can be seen in Table 1.9, intentions to certify are roughly equal across forest types. The survey shows that about 50 percent of softwood plantations, 54 percent of hardwood plantations and 44 percent of native forests are expected to be certified.

Table 1.9 Location and Types of Forests Certified or Intend to Certify

	Softwood Plantations		Hardwood Plantations		Native Forest	
	Have Forests	Intend to Certify	Have Forests	Intend to Certify	Have Forests	Intend to Certify
WA	7	4	9	5	1	1
SA	5	2	4	3	1	0
TAS	4	2	4	2	4	3
VIC	14	7	14	8	3	2
NSW	7	3	2	1	5	1
QLD	2	1	5	1	2	2
ACT	1	1	0	0	0	0
NT	0	0	1	1	0	0

When looking at a State level, the level of uptake of certification could be seen to be much higher in native forests generally than for plantations. Individually, intentions to certify native forests are much higher in Queensland (100%), Western Australia (100%), Tasmania (75%) and Victoria (67%).

In general terms, New South Wales and Queensland growers appear to be somewhat less inclined to intend to certify their forests. Only 36 percent of ownerships across forest types in New South Wales and 44 percent in Queensland intend to certify their forests. It appears as though the certification impetus is somewhat stronger in southern States.

Management Systems Experience

As was alluded to earlier, experience with management systems was believed to potentially be a significant hurdle for forest growers in pursuing forest certification, particularly because most forest certification systems have a significant requirement for audit and monitoring. In order to find out what kind of experience or existing skill mix growers already had, two sets of questions were asked about experience with management systems. One asked forest growers to indicate whether they are involved with a code that defines acceptable forest practices or a code of management practices in order to determine their capability to implement a forest certification scheme. The other questions looked at general management systems not specifically tied to forestry.
Table 1.10 has 78 percent of respondents involved with some type of management system, whether it is only in the context of a forest practices code or in the context of a different management system. About one third of respondents are involved in both types of management systems.

Table 1.10 Management Systems Expertise
(Number of Respondents)

Not involved in any forest practice or management system		10
Involved in either a forest practice or management system		36
Involved in both forest practice and management systems		17
Not involved in any Forest Practices Code		15
Involved in some type of Forest Practices Code		31
• Self-administered industry code	16	
• Self-administered internal or company code	7	
• Self-administered government code	12	
• External audited industry code	6	
• External audited internal or company code	4	
• External audited government code	10	
Not involved in any Management System		24
Involved in some type of Management System		22
• ISO 9001 – Quality Management System	6	
• ISO 14001 – Environmental Management System	9	
• QAS Certified Environmental Management System	2	
• QAS Occupational Health and Safety Management System	9	
• Other Management System (Safety Map)	1	

Involvement with forest practices codes was based on a selection of self-administered and externally audited types of schemes, with the differences relating to whether the code was internally generated, an industry code or a Government code. Respondents classified the forest practices codes they were involved with using their own judgement of what kind of definition most closely described the code. Table 1.10 shows that two thirds of forest growers are already involved in some type of management code or guideline that defines acceptable forest practices. Perhaps more importantly, almost one third of respondents have no experience with working to some type of forest code of practice.

Of those who identified that they were involved with a forest practices code, the most common type of code was a self-administered industry code. Respondents include the Code of Plantation Management and the Forest Practices Code in this category. A number of respondents also use a self-administered Government code, such as the Victorian Code of Forest Practices. There is a much lower involvement in externally audited codes, with the most common one being a Government code (Harvesting Code of Practice for Native Forests, Tasmanian Forest Practices Code, Best Operating Standard NSW). Of the 31 respondents involved in a forest code of practice, just over half (17) were involved only in a self-administered system.

The relationship between current or planned involvement in forest certification and participation in a forest practices code is shown in Table 1.11. There is a positive relationship between involvement in forest certification and participation in a forest code (chi square significant at α = 0.05).

Table 1.11 Involvement in Forest Practices Codes and Forest Certification

Involvement with Certification	Involvement in Forest Practices Code	
	No	Yes
No	10 (66 %)	10 (32 %)
Yes	5 (34 %)	21 (68 %)
Total	15	31

Fewer forest growers are participating in a generic management system, with less than half of respondents showing involvement in any type of general management system. Again, the importance of these types of systems is that they may help an organisation ensure that internal processes will meet the organisation's objectives, and may also provide evidence of an organisation's ability to implement a forest certification scheme.

Participation is greatest in the International Standard Organisation's Environmental Management Systems (ISO 14001) and Occupational Health and Safety Management systems. A few are also involved in the ISO Quality Management System (ISO 9001). Generally, these results indicate that there is a lack of experience with formal management systems by a large number of forest growers. This is important in the context of a formal, audited forest certification system.

Forest certification could be a major transition for a forest grower. While these results indicate that the many of forest growers already follow some type of code of forest management practice (30 percent of respondents), some type of management system (11 percent of respondents) or both types of systems (37 of respondents), not many have experience with an externally audited system. In addition, 21 percent of respondents are not involved in any type of management system. Taken together, this could be an area of concern in developing certification, although as was indicated earlier, growers themselves do not believe that they lack skills or that this will be an impediment to pursuing certification.

Communication Channels

In order to determine the most appropriate channels for communicating with forest growers about forest certification, respondents were asked to indicate which channels they would most likely use for a variety of types of information. Table 1.12 indicates

that industry or trade publications will probably be the most effective method of communicating information on forest certification, since this channel is used by more than 50 percent of respondents to get information on four out of five of the information types, including certification.

Table 1.12 Communication Channels

Communication Channel	Information Type				
	New Technology	Market Information	Forest Certification	Government Regulations	Sector Initiatives
Industry Trade Publication	11	36	24	26	32
Conference or workshop	29	22	30	23	19
Professional Association	18	18	27	20	21
Government Publication	13	20	18	36	10
Internet/Web Page	26	24	26	20	18
Other Business or Consultant	15	19	13	12	11
Research Organisation	31	11	8	5	8
Promotional Material/Fliers	21	10	15	7	16
Word of Mouth or Colleagues	20	26	21	17	20

The next most common are the Internet, and conferences or workshops and are used by more than 50 percent of respondents in three out of the five information types, again including certification. Conferences and workshops was the channel selected by the most respondents for certification specifically. While a professional association did not feature highly generally, the one area where this channel did feature was for certification. This leaves the potential for the other channels to provide information on forest certification.

Respondents' Comments

Respondents were encouraged to provide any additional comments about forest certification that they thought were important but had not been addressed in the survey. A full list of comments is in Appendix 2. In general the comments related to three specific areas.

First, forest growers commented on forest certification in general. Some growers indicated that certification is intrusive and unnecessary because Australian forests are already well managed. Another grower questioned the need for certification and indicated it was just a mechanism to keep environmentalists happy. Several respondents felt that forest certification was an instrument to deny market access, especially for small forest growers. Another respondent believes that there needs to be more discussion of the requirements and analysis of associated costs and benefits for forest growers. Finally, some growers believed certification was necessary for the future and others indicated it was essential and inevitable.

Other respondents commented specifically on particular certification schemes. One respondent felt the Forest Stewardship Council approach was unbalanced, but another felt it was now more suited to plantations. Several respondents felt that the AFS approach was "dead" due to lack of support by environmental groups, and thus it is an ineffectual scheme compared with the FSC. One respondent questioned whether the AFS would provide a chain of custody procedure.

The most vocal with their comments were the small forest growers. Although small forest growers are interested in forest certification, the majority provided very negative comments regarding it. For instance, many small growers felt that certification is being developed by and for the large grower, and thus is excluding the small grower and may devalue small private forests. They feel that benefits, costs and procedures must be developed for small growers. Also, small growers felt that self-assessment with group auditing must be allowed to include the small grower.

The most consistent criticism by the small grower is that certification will be too expensive for small growers and they will be unable to pay the costs to certify. Also, unless compliance costs are kept to a minimum, the costs of forest certification will outweigh the benefits. Finally, if certification becomes necessary for market access, because small growers are unable to justify costs, their forests will cease to have value and degrade out of existence with the lack of management.

Results of the Primary Wood Processor Survey

The results of the primary wood processor survey are again presented under a number of headings that reflect particular areas of interest.

- Demographics
- Awareness about forest certification
- Attitudes towards forest certification
- Intentions for forest certification
- Choice of forest certification scheme
- Forest certification and log source
- Communication channels
- Additional comments

Demographics

The 91 respondents to the survey are involved in range of primary wood products (Table 1.13). Most of the respondents were involved in sawmilling with 46 (50 percent) producing hardwood sawn timber, and 37 (41 percent) producing softwood sawn timber.

As well as identifying production, the survey asked for information on the States or Territory where log supply originated. For the purposes of this question, plantations were split into softwood and hardwood to allow for different products and markets. More than one location could be selected by each respondent. Table 1.14 includes respondents from all parts of Australia except the Northern Territory, and covers producers using timber from all forest types.

Table 1.13 Types of Primary Producers and Annual Output

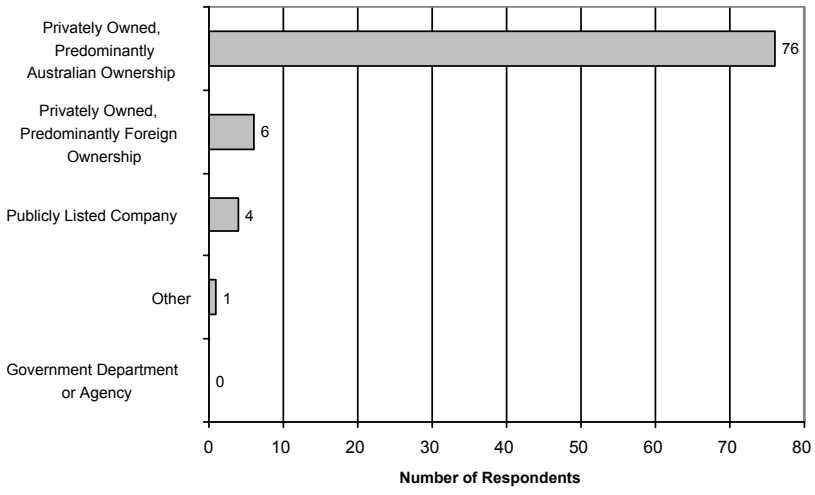
Product Type	Number of Respondents	Total Production	Median Production
Hardwood Sawn Timber	46	684,083 m^3	5,000 m^3
Softwood Sawn Timber	37	2,074,975 m^3	9,500 m^3
Hardwood Plywood	4	214,200 m^3	28,600 m^3
Softwood Plywood	3	14,800 m^3	2,000 m^3
MDF/Hardboard	4	770,000 m^3	125,000 m^3
Particleboard	4	1,160,000 m^3	225,000 m^3
Hardwood Chips	4	4,780,000 mt	375,000 mt
Softwood Chips	3	1,605,000 mt	550,000 mt
Post and Poles	4	31,000 m^3	9,000 m^3

Table 1.14 Location and Source of Log Supplies
(Number of respondents with log supply from forest type in that state)

	Softwood Plantations	Hardwood Plantations	Native Forest
WA	5	1	5
SA	9	0	0
TAS	5	2	6
VIC	13	1	12
NSW	11	7	19
QLD	10	1	18
ACT	3	0	0
NT	0	0	0

One other demographic question is ownership structure. Figure 1.8 indicates the range of ownership types across the primary processors surveyed. However, the majority of primary processors are privately owned organisations that are predominantly under Australian ownership (87 percent).

Figure 1.8 Ownership of Primary Wood Processors



Respondents were also asked about the markets currently being served by their customers, and the markets that they expect to be serving in five years (Table 1.15). Of the respondents who answered this question, Australia is the primary market, with 98 percent of all primary processors or their customers in this market. This is expected to decline in five years although with 88 percent still serving the Australian market. The secondary market for primary wood processors or their customers is Japan, currently at 23 percent of respondents and expected to grow to 29 percent in five years.

The other markets are New Zealand (16 percent), the U.S.A. (12 percent), China (10 percent) and other South East Asia (11 percent). Taken together, respondents anticipate a growth in Asian markets. The main market changes in the next five years are expected to be increases in Japan (29 percent), China (24 percent, and the U.S.A. (18 percent).

Table 1.15 Primary Wood Processor Markets

	All Primary Processors (n=89)		**Hardwood Sawn Timber (n=46)**		**Softwood Sawn Timber (n=37)**		**Poles (n=11)**	
	Current	5 Years	Current	5 Years	Current	5 Years	Current	5 Years
Australia	87	79	43	40	37	34	11	11
New Zealand	14	14	8	10	1	2	3	3
Japan	20	26	12	13	8	12	3	2
Korea	5	8	2	3	1	5	0	0
USA	11	16	7	10	5	8	2	2
China	9	21	7	11	2	12	1	2
Other Southeast Asia	10	15	7	10	3	6	1	0
India	2	2	0	1	0	0	1	1
European Union	8	11	6	8	1	3	3	4

	Hardwood Plywood (n=4)		**Softwood Plywood (n=3)**		**Reconstituted Panels (n=8)**		**Hardwood Chips (n=3)**		**Softwood Chips (n=3)**	
	Current	5 Years	Current	5 Years	Current	5 Years	Current	5 Years	Current	5 Years
Australia	4	4	3	3	7	5	3	3	3	3
New Zealand	1	1	1	1	5	2	1	1	1	1
Japan	3	2	1	1	6	4	3	2	1	1
Korea	0	1	0	0	5	3	0	1	0	0
USA	1	1	1	0	2	4	1	1	0	0
China	2	2	0	1	5	4	2	3	0	1
Other Southeast Asia	1	1	0	0	4	3	1	1	0	0
India	0	0	1	1	2	0	0	0	0	0
European Union	1	1	1	1	2	0	1	1	0	0

*** The number of respondents in each category does not sum up to the total number of respondents as they could select more than one product category.**

The major change in markets for hardwood sawn timber is a growth in U.S. and other Southeast Asia (15 percent of respondents producing this product to 22 percent), and China (11 percent of respondents producing this product to 24 percent). For softwood sawn timber, the major change in markets that will be served by is a growth in China (5 percent of respondents producing this product to 32 percent), Japan (21 percent of respondents producing this product to 32 percent), and the U.S. (13 percent of respondents producing this product to 21 percent).

Importantly, from the perspective of forest certification, market growth is generally expected to be in countries or regions that are not closely linked to a need for certification, other than in products for re-export. Countries or regions currently linked to markets for certified forest products, Europe and the U.S., are identified as likely markets for the customers of only 17 and 22 percent of hardwood sawn timber respondents respectively and only 8 and 21 percent of softwood sawn timber respondents respectively.

Awareness About Forest Certification

An important objective of the study was to assess respondents' levels of awareness and knowledge of forest certification schemes. Respondents were asked to rate their level of knowledge about a number of forest certification schemes. Respondents' assessments are based on a five-point scale ranging from 1 which means 'I know nothing about', through 3 'I have read about', to 5 meaning 'I know a lot about'. Respondents' level of knowledge of forest certification schemes can only be described as superficial (Figure 1.9).

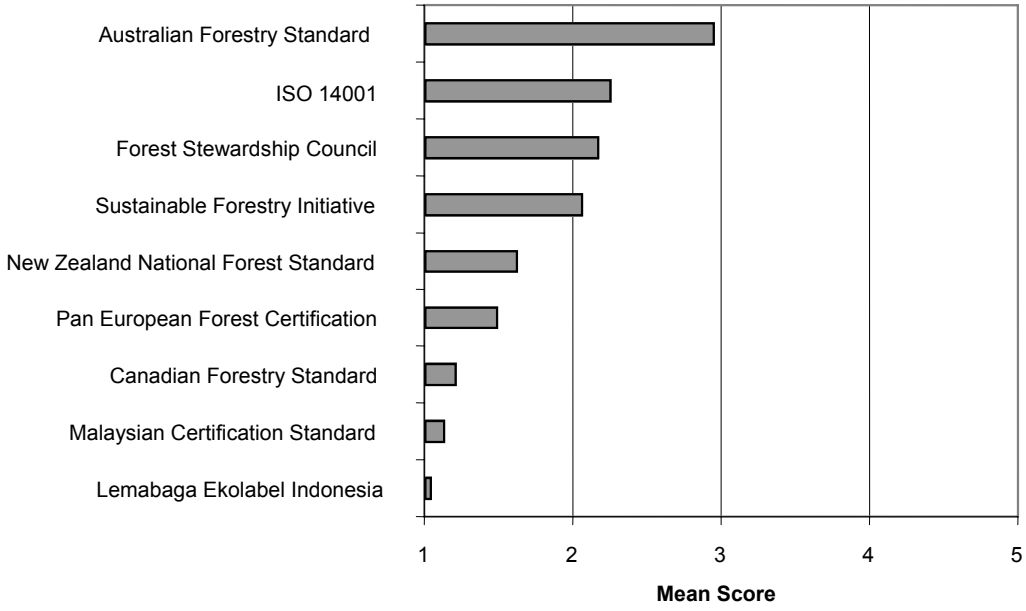


Figure 1.9 Knowledge of Forest Certification Schemes

Only for one scheme, the Australian Forestry Standard, do almost a majority of respondents indicate having read something about the scheme. The ISO 14001, Sustainable Forestry Initiative and Forest Stewardship Council schemes have the next highest level of knowledge. Given the press and industry coverage of the ISO 14001 and Forest Stewardship Council schemes have had, one might expect a higher level of knowledge. The level of awareness of the Sustainable Forestry Initiative is interesting

given it only operates in and affects forests in the U.S., but perhaps reflects readership of U.S. forestry publications.

In general, respondents' knowledge of the various certification schemes is low. Similar to forest growers, the greatest level of awareness is for schemes for which there is some degree of activity in Australia (Australian Forestry Standard, ISO 14001) or which has wide international coverage (Forest Stewardship Council). Even so, this level of awareness is low. Sixteen percent of respondents had not heard of the Australian Forest Standard and another 14 percent indicated a level of knowledge less than 'I have read about'. For both the ISO 14001 and Forest Stewardship Council schemes, more than 40 percent of respondents had not heard about these schemes. There is generally little or no awareness of other certification activities internationally.

The low level of awareness demonstrated in Figure 1.9 should translate into some uncertainty or confusion about what might be expected to be included in a forest certification scheme. In order to find out what respondents knew about forest certification, they were asked to indicate what features or practices they would expect forest certification schemes to include. Respondents were asked to answer a number of questions where they could indicate, "Yes" they believed a practice would be part of the scheme, "No" it would not, or they could indicate "Don't Know." Responses are shown in Table 1.16.

Table 1.16 Expectations of Forest Certification Schemes

I believe environmental certification schemes will have …		Yes	No	Don't Know
Third party assessment	(N = 87)	55	11	21
Self assessment	(N = 87)	48	13	26
Prescribed management system(s)	(N = 87)	51	15	21
Company-defined management system(s)	(N = 87)	46	7	34
Prescriptive wood handling requirements	(N = 87)	35	18	34
Prescriptive wood processing requirements	(N = 87)	31	25	32
Product tracking through the value chain	(N = 87)	48	8	31
A label that can be used for marketing	(N = 87)	72	1	14

This question has a number of questions that would be expected to be mirror opposites in terms of the response. These questions dealt with the following issues.

- Third party versus self-assessment
- Prescribed versus company-defined management systems

The type of assessment required relates to whether respondents thought that they would be required to have an external agency audit what they were doing to maintain certification, or whether they could do this themselves. A number of respondents thought that they would be able to do both, with 32 out of the 55 respondents saying they thought there would be external audits and the 48 respondents saying they would be able to self-audit.

A similar pattern emerges when respondents were asked whether they thought that there would be prescribed or company defined management systems used for forest certification. The management system refers to the process put in place to ensure that forest and wood processing activities are monitored and managed to ensure compliance with certification requirements. Again, 30 out of the 51 respondents thought there would be a prescribed management system and 46 respondents said they would be able to define their own management system.

Respondents were also asked whether a forest certification system would have prescriptive requirements related to wood handling and processing. The purpose of these questions was to determine whether respondents were familiar with or had expectations for segregation of certified and non-certified wood products or for changes to their processing practices that are sometimes associated with a forest certification system. Table 1.16 shows that 35 to 40 percent of respondents expect some type of prescriptive requirement, and that an equal number did not know.

Respondents were finally asked whether they thought that there would be product tracking through a value chain and a logo for marketing purposes with forest certification. The responses in Table 1.16 indicate that 55 percent of respondents were aware that product tracking was required by forest certification, and that 83 percent thought that a certification scheme would come with a marketing logo. The 45 percent of respondents who either did not believe or did not know that product tracking was a component of forest certification indicates that many respondents do no associate a marketing label with a requirement to maintain a chain of custody.

Although about 35 percent of respondents answered ‘Don’t Know’ for each question in Table 1.16, very few gave this answer for all or most questions. About 61 percent of respondents answered ‘Yes’ or ‘No’ to at least six of the eight questions. Generally, Table 1.16 shows that many primary processors do not know what is expected in forest certification schemes and that they have a relatively low level of knowledge of forest certification schemes or important gaps in understanding. Both of these factors point to a need or opportunity for education about forest certification.

Attitudes Towards Certification

In order to understand respondents’ attitudes toward forest certification schemes, respondents were asked to indicate their beliefs about the effects of forest certification on the Australian forest products industry. Their beliefs were measured on a five-point scale where 1 means ‘disagree’ with the statement provided, 3 means ‘partly agree’, and 5 means ‘agree’. There is no statistical difference in the responses of the different type of primary processors so the results will be discussed collectively.

Mean responses to these questions are shown in Figure 1.10. The results show that primary wood processors generally do not have strong feelings about the potential effects that were provided. The only effect they felt strongly about was that forest certification would increase monitoring and auditing.

Figure 1.10 Effects of Forest Certification on the Australian Forest Products Industry

The responses and the following discussion can otherwise be grouped under general topics.

- Impact on forestry activity
- Impact on management
- Impact on perceptions of environmental stewardship
- Impact on markets

Impact on Forestry Activity

The first four questions in Figure 1.10 cover expected impacts on forest management. Generally, primary producers do not perceive forest certification is likely to have any negative effect as most disagree that it will lower harvests, change employment and safety practices, or limit the use of technology. They may even perhaps see a positive effect in terms of its ability to improve forest management.

Impact on Management

Respondents agree that forest certification will increase auditing and monitoring, but they also believe that to some extent it will improve overall and environmental management systems. Respondents also believe that forest certification will have some effect on assisting Government environmental regulation. The general sense from these responses is that primary wood processors see some positive effects from improved management systems.

Impact on Perceptions of Environmental Stewardship

Respondents believe that forest certification will go some way to promoting the industry's environmental stewardship, both offshore and domestically. However, similar to forest growers, they do not believe that it will satisfy environmental groups. The low score was partially due to a split response, with 30 percent disagreeing that

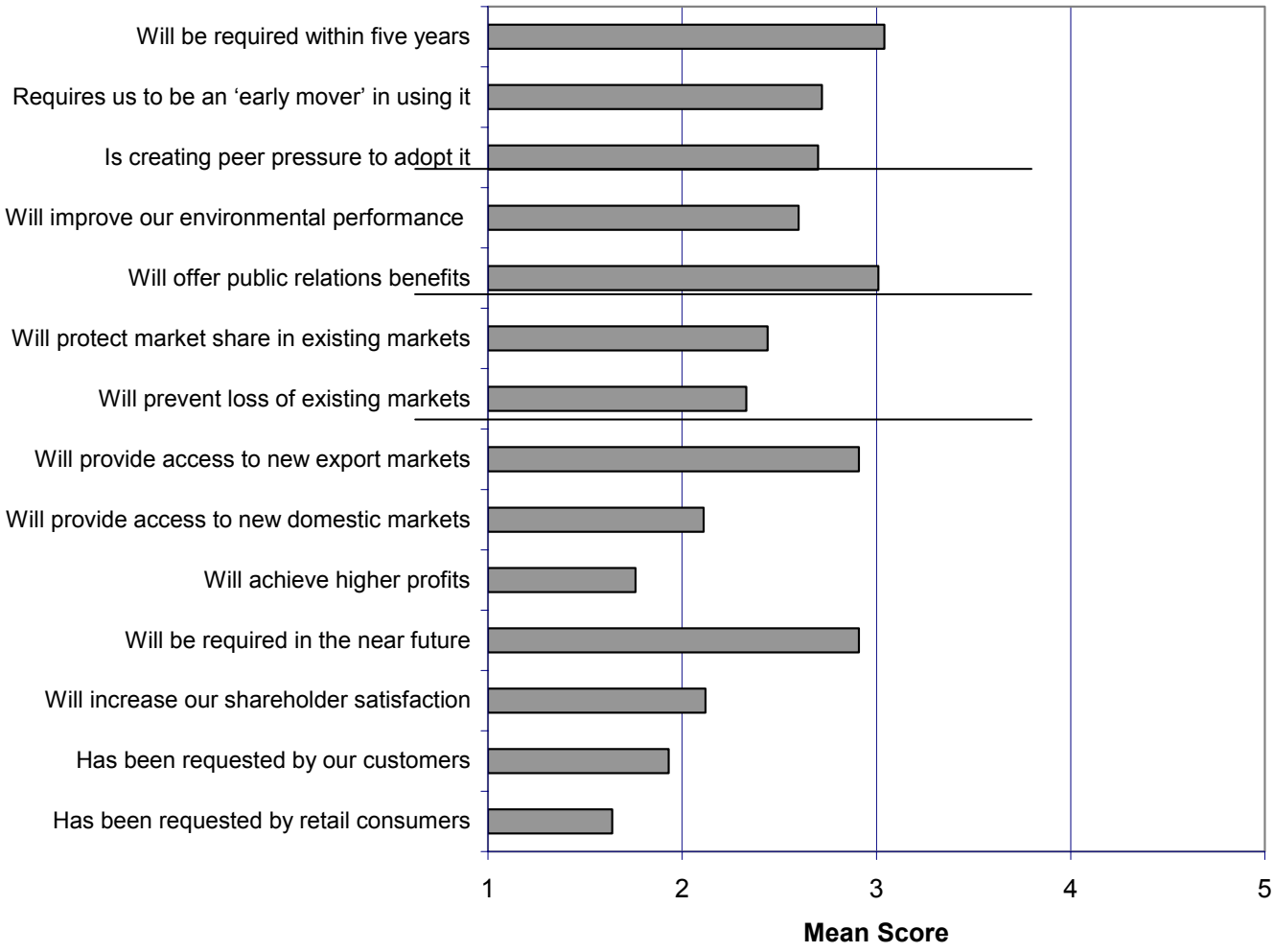
forest certification would satisfy environmental groups (score of 1), 30 percent partly agreeing (score of 3), and another 30 percent in greater agreement (score of 4 or 5). This split response is not statistically significant.

Impact on Markets

Respondents believe that forest certification will have some effect on maintaining existing markets, providing access to new markets, and providing a competitive advantage. Taken together, primary producers perceive that forest certification may provide competitive benefits for the industry.

In addition to asking growers their opinions on macro-level changes to the forest products industry, respondents were also asked their beliefs about the importance or impacts of forest certification for their own organisation. Their beliefs were measured on a five-point scale where 1 means 'disagree' with the statement provided, 3 means 'partly agree', and 5 means 'agree'. Again there is no statistical difference across the type of products produced so the mean responses to these questions are presented together. In Figure 1.11, generally, none of the factors listed ranked very highly for primary wood processors, indicating that there are no pressing reasons for this group to want to become involved in forest certification.

Figure 1.11 Importance of Forest Certification to the Organisation



The responses in Figure 1.11 can again be grouped under general topics:

- Market need
- Market access
- Timing of forest certification
- Impact on the organisation

Market Need

The first four questions in Figure 1.11 show that for individual primary processor organisations, the most important reason for responding to forest certification would be peer pressure. There is no belief that their customers or retail customers of forest products are demanding certified products. They also do not believe that forest certification will increase the satisfaction of shareholders. The latter two points lend weight to the notion that forest certification is being driven by industry itself rather than markets or owners.

Market Access

The next three questions show that respondents believe that certification will have little effect on their markets. If forest certification has any effect at all, the impact will be in new export markets rather than new domestic markets. In addition, forest certification is not believed to be important in preventing the loss of existing markets and market share. The low scores here generally indicate that primary processors do not view forest certification as a market opportunity.

Timing of Forest Certification

The next three questions in Figure 1.11 show that primary producers are not sure that that forest certification will be required in the near future, or within five years. They are also not sure that there is an advantage to being an early mover in the adoption of forest certification and would perhaps rather wait to see what happens. This is reflected in later results where it can be seen that most respondents have no interest in undertaking forest certification.
Impact on the Organisation

The last three questions in Figure 1.11 show that while primary processors believe that there will be some public relations benefits from forest certification, it will not have any impact on the organisation's environmental performance or profitability.

The overall results from Figure 1.11 show that most respondents believe that forest certification will not have any positive impact on their organisation, and that if anything, it is being driven by the industry rather than the market.

Intentions for Forest Certification

As was indicated in Figure 1.11, many primary processors believe forest certification is inevitable and expect to be involved eventually. In order to get a more precise idea of their intentions for forest certification, primary processors were asked to indicate their organisation's current intentions toward undertaking forest certification.

In Table 1.17, 44 percent of respondents indicate they currently have some involvement or are planning for some involvement with forest certification. However,

the majority of respondents indicate that they do not plan to be involved with certification at the present time.

Table 1.17 Organisational Intentions toward Forest Certification
(Number of Respondents)

No intention to pursue forest certification at this time		50
Plan some involvement or have some involvement with forest certification		
• Considering in 12 months	7	
• Considering in 24 months	9	
• Considering after 24 months	17	
• In the process of obtaining forest certification	6	
• Already have forest certification	0	
		39
Total Respondents		89

For those primary processors indicating some type of intention for involvement, 44 percent indicate that they are considering forest certification within the next two years, and just under half of those are considering forest certification in the next year. Six organisations are in the process of becoming certified. There are no primary processors that already have some type of forest certification. Table 1.17 shows that within two years, only about 18 percent of respondents expect to be undertaking or have forest certification. This is not a very positive outlook given the potential for a relatively high uptake of forest certification by forest growers in the near future.

Choice of Certification Scheme

Of the 39 organisations that are considering forest certification, 14 have selected a specific scheme to pursue (Table 1.18). Of those who have selected a forest certification scheme, four schemes are currently being considered. At this time, the Australian Forestry Standard is the most common approach, followed by the ISO 14001 Environmental Management System. Since ISO 14401 typically leads to other certification, it could be expected that there will be follow on uptake of other schemes. One interesting feature of Table 1.18 is that processors appear to leaning toward the Australian Forestry Standard as a forest certification standard.

Table 1.18 Choice of Forest Certification Scheme
(Number of Respondents)

No forest certification scheme at this time		25
Have selected forest certification scheme		14
Scheme selected		
• Australian Forestry Standard	6	
• Forest Stewardship Council	3	
• ISO 14001	5	
• Pan European Forest Certification	1	

In order to see whether the log resource had any influence on certification systems, respondents were divided by log source. As can be seen in Table 1.19, the split between the Australian Forestry Standard and the Forest Stewardship Council scheme is roughly equal for processors using softwood plantation logs, but processors using

native forest logs are focusing predominantly on the Australian Forestry Standard. ISO 14001 Environmental Management System appears to also be preferred by processors using softwood plantation.

Table 1.19 Forest Certification and Forest Type*
(Number of Respondents)

Log Source	Australian Forestry Standard	Forest Stewardship Council	ISO 14001	Pan-European Forest Certification
Softwood Plantation	4	3	5	0
Hardwood Plantation	1	0	0	0
Native Forest	5	0	1	1

* Some respondents use more than one type of log resource.

Those primary processors who had selected or were considering a particular forest certification scheme were also asked to indicate what factors were important in their choice of that scheme. Respondents were asked to indicate their considerations on a 5-point scale where 1 means 'not important' and 5 means 'very important'. Mean responses are shown in Figure 1.12.

Figure 1.12 Factors Considered Important When Selecting Scheme

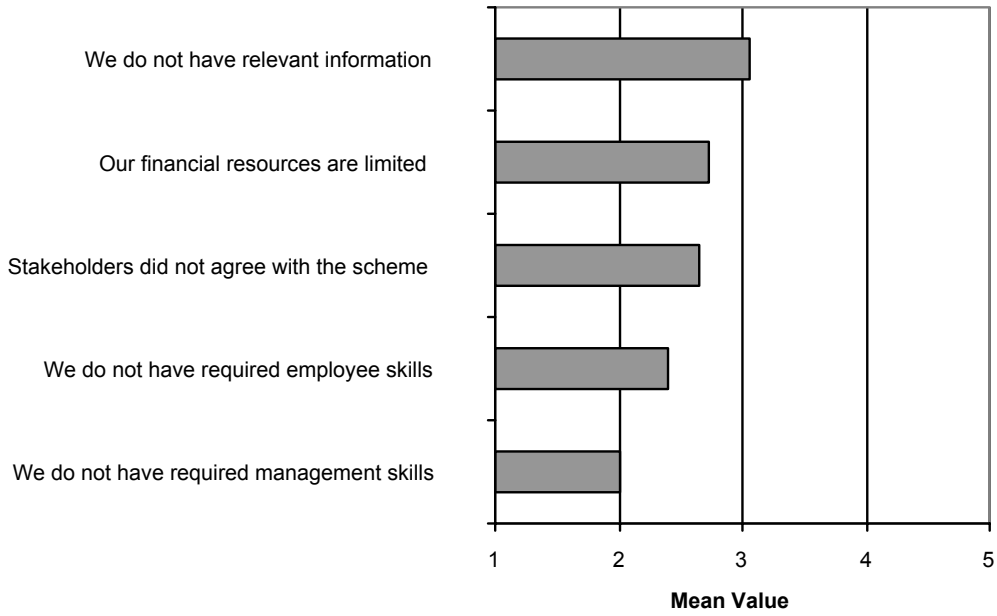
The top ranking factors in Figure 1.12 suggest that international market criteria are most important in the selection of a forest certification system. A recognised international brand, a system that is required by the organisation's customers (as opposed to Australian customers which had a lower ranking), and gaining access to new markets ranked in the top four factors. Control over the certification process, suitability to manufacturing processes and a system recommended by the industry also

rank highly. These latter factors point to the importance of systems that are matched to and managed by primary processors.

Taken together, these results suggest that the key considerations in forest certification scheme selection are related to commercial or market issues, rather than strict profitability (price premium) or wider environmental issues (acceptance by environmental groups, creation of environmental benefits). Unlike forest growers, primary processors are more likely to view what the industry is recommending as being important to their decision.

Those primary processors who indicated they had selected or were considering a particular scheme were also asked to rate factors that could make it difficult to implement the scheme. Respondents were asked to evaluate factors on a five-point scale ranging from 1 meaning 'no impediment' to 5 meaning a 'major impediment'. The results of this question are shown in Figure 1.13. Generally, the factors that were anticipated to create obstacles for certification did not feature highly. Only a lack of information emerges as being somewhat of an impediment to undertaking forest certification. Limitations on financial resources and stakeholder disagreement could also be seen as impediments.

Figure 1.13 Impediments to Forest Certification Scheme Implementation



Respondents were also able to indicate additional impediments to the options provided which included:

- Needs to be a market-led process. No point in gaining certification unless there is financial benefit.
- Australian Forestry Standard is still being developed.
- Our forest owner is not certified.

The common theme in these comments is that system is still evolving, either in terms of what is required in the market or the backwards linkages to log suppliers. Presumably these organisations have selected something that they expect will meet

their needs for now but will modify what they are doing as things become clearer for them.

The 50 primary processors, or 56 percent of respondents, who are not currently interested in forest certification were asked to answer a question that looked at reasons why this was the case. They were asked to respond to questions by indicating their agreement with statements on a 5-point scale ranging from 1 meaning 'disagree', 3 meaning 'partly agree', and 5 meaning 'agree'. The results are shown in Figure 1.14.

The first five questions indicate that lack of knowledge and uncertainty about what is happening or might happen, coupled with financial considerations are most important to these respondents. Taken together, these show that uncertainty or confusion about what forest certification is or how it might affect an organisation was linked to their decision to hold off from making a decision.

Of the next four questions, all of which had a mean score above 3 or that respondents had some agreement with, show that a lack of relevant management and employee skills was considered an impediment to respondents pursuing forest certification. This had been identified as a potential problem area by the researchers based on discussions with companies that had undergone certification.

Figure 1.14 Reasons for Not Pursuing Forest Certification

If the responses in Figure 1.14, dealing with the importance of forest certification to the respondent's organisation, are analysed according to whether the respondent was or was not considering or undertaking certification, they show some significant differences between the two groups. As can be seen in Table 1.20, those who are already becoming involved in forest certification are more likely to see certification as important for markets (protection of markets or meeting demand) and to see some benefits in certification (environmental performance, shareholders or benefits higher than costs).

Table 1.20 Involvement in Forest Certification and Impact on an Organisation

	Not Involved (N = 50)	Involved (N = 39)	F - value
Will achieve higher profits	1.52	2.07	5.9*
Will offer public relations benefits	2.60	3.48	12.6**
Will improve our environmental performance	2.17	3.12	14.9**
Will be required in the near future	2.23	3.69	50.9**
Requires us to be an 'early mover' in using it	2.35	3.15	8.7**
Will be required within five years	2.45	3.71	26.0**
Will protect market share in existing markets	2.19	2.82	5.8*
Will prevent loss of existing markets	2.06	2.69	6.6*
Will provide access to new domestic markets	1.84	2.38	5.6*
Will provide access to new export markets	2.36	3.53	21.6**
Has been requested by our customers	1.23	2.69	39.1**
Has been requested by retail consumers	1.15	2.15	24.0**
Is creating peer pressure to adopt it	2.51	2.94	3.0
Will increase our shareholder satisfaction	1.67	2.71	16.3**

** 99 percent confidence, * 95 percent confidence

Primary processors were also given an opportunity to list other problems that they felt were constraints on pursuing certification including:

- Awaiting a decision from our major log supplier.
- We have no guaranteed log supply.
- We do not own the forest and need to consult with forest growers.
- It is the forest that must be accredited. Forests must be accredited first.
- Leaving the industry due to government policy.
- Exiting industry.
- It is not required.
- Our market does not require it.
- FSC versus ISO14001 problem.
- Q.A. means increased costs and lower productivity.

A number of the 'other' reasons basically revolve around the need to develop supply linkages with log producers before the rest of the process can take place. For some of these processors, they will not proceed until they have certified log supplies, and for others, they have decided to leave the industry.

For two of the respondents, it is the forward linkage that is important, and they do not currently perceive a demand for certified wood products. Together, these comments illustrate the necessity of developing the supply chain in a coordinated way so that individual businesses are not caught out of synchronisation with other parts of the supply chain.

Certification and Forest Type of Log Source

Respondents were asked to indicate which States they processed wood in, and their intentions for certification of mills or products from these sources. Table 1.21 shows that intentions to certify are roughly equal across log sources.

Table 1.21 Location and Types of Log Source and Certification of Wood Products

	Softwood Plantations		Hardwood Plantations		Native Forest	
	Use This Forest	Intend to Certify	Use This Forest	Intend to Certify	Use This Forest	Intend to Certify
WA	5	2	1	0	5	2
SA	9	4	0	0	0	0
TAS	5	4	2	2	6	5
VIC	13	7	1	0	12	5
NSW	11	6	7	3	19	5
QLD	10	5	1	1	18	4
ACT	3	1	0	0	0	0
NT	0	0	0	0	0	0

The survey shows that about 51 percent of primary processors using softwood plantations, 49 percent using hardwood plantations and 43 percent using native forests expect to be producing certified wood products. When looking at a State level, the level of uptake of certification could generally be seen to be higher for processors using logs from plantations than for processors using logs from native forests. Individually, intentions to certify native forests are much higher in Tasmania (85%) than for other States, most of which have between 35 and 45 percent of processors intending to certify.

In the context of the certification debate, the low expected uptake by processors of logs from native forests in New South Wales (26%) and Queensland (22%) is somewhat interesting. A somewhat higher proportion of processors of native logs intend to certify in Victoria (42%) and Western Australia (40%). The lower rate of intentions of processors in New South Wales and Queensland to some extent matches the lower rate of certification intentions of forest growers in those States. Again, it appears as though the certification impetus is somewhat stronger in southern States.

Management Systems Experience

As was alluded to earlier, experience with management systems was believed to potentially be a significant hurdle for primary processors in pursuing forest certification, particularly because most forest and wood products certification systems have a significant requirement for audit and monitoring for chain of custody. In order to find out what kind of experience or existing skill mix primary processors already utilised, they were asked about experience with management systems.

In Table 1.22 about half of respondents have involvement in some type of general management system. The importance of these types of systems is that they may help an organisation ensure that internal processes will meet the organisation's objectives, and may also provide evidence of an organisation's ability to move towards the implementation of a forest certification scheme. Participation is greatest in Occupational Health and Safety Management systems, and a number are also involved in the ISO Quality Management System (ISO 9002).

Table 1.22 Management Systems Expertise
(Number of Respondents)

Not involved in any Management System		40
Involved in some type of Management System		41
• ISO 9002 – Quality Management System	12	
• ISO 14001 – Environmental Management System	5	
• QAS Certified Environmental Management System	3	
• QAS Occupational Health and Safety Management System	22	
• Other Management System	15	

The other management systems mentioned by primary processors include the following:

- Australian Timber Industry Certification (4 respondents)
- Australian Hardwood Quality Control
- Industry quality system
- Timber Trade Industrial Association Management Systems for Small Business
- Atlas SHE system
- Codes of Forest Practice (2 respondents)
- Forest Harvesting Industry Code of Practice WPHS (Qld)
- Australian Standards/TRADAC specifications for quality
- Safety Map
- MRP II Class A certification (2 respondents)
- NSCA Safety Audit/Monitor
- JAZ (JAS) ANZ AWPA Product certification (Need to check)
- Customer requirements
- Internal quality assurance system
- Internal quality assurance system and internal OHS system
- Internally developed quality control system

Generally, these results indicate that there is a spread of experience with formal management systems by a number of primary processors. This experience correlates with the low importance placed on a lack of management or employee skills in undertaking certification schemes.

The relationship between current or planned involvement in forest certification and participation in a management system is shown in Table 1.23. There is a positive relationship between involvement in forest certification and participation in a management system.

Table 1.23 Involvement in Certification by Involvement in Management System

Involvement with Certification	**Involvement in a Management System**	
	No	Yes
No	28 (72 %)	16 (39%)
Yes	11 (28%)	25 (61 %)
Number of Cases	39	41

Forest certification could be a major transition for a primary processor. These results indicate that many primary processors already follow some type of management system (50 percent), and have experience with an externally audited system. However, half of the respondents are not involved in any type of a management system. This could be an area of concern in developing certification, although as was indicated earlier, primary processors themselves do not believe that they lack skills or that this will be an impediment to pursuing certification.

Communication Channels

In order to determine the most appropriate channels for communicating with primary processors about forest certification, respondents were asked to indicate which channels they would most likely use for a variety of types of information (Table 1.24).

Table 1.24 Communication Channels
(Percent of Respondents)

Communication Channel	Information Type				
	New Technology	Market Information	Forest Certification	Government Regulations	Sector Initiatives
Industry Trade Publication	70	59	49	45	52
Conference or workshop	37	23	37	29	30
Professional Association	29	41	45	42	40
Government Publication	15	28	32	65	21
Internet/Web Page	36	34	25	32	29
Other Business or Consultant	18	30	18	37	19
Research Organisation	37	23	25	9	20
Promotional Material/Fliers	43	24	11	17	38
Word of Mouth or Colleagues	58	58	31	25	39

Based on Table 1.24, industry or trade publications will probably be the most effective method of communicating information on forest certification, since this channel is used by more than 50 percent of respondents to get information on four out of five of the information types, including forest certification. The next most common channel is a professional association, used by about 40 percent of respondents in four out of five of the information types, including forest certification. This points towards 2 potential channels to provide information on forest certification.

Respondents' Comments

Respondents were encouraged to provide any additional comments about forest certification that they thought were important but had not been addressed in the survey. A full listing of the comments can be seen in Appendix 2. In general, the comments related to four specific areas.

First, primary processors commented on the demand for forest certification. Some processors indicated that domestic clients do not care where their wood comes from as long as it is cheap. Other primary processors pointed out that the real demand was overseas and that certification would be important to compete in offshore markets. In this context, at least one respondent identified the need for international certification and recognition of systems across markets.

Secondly, another common area of concern was that forest certification was something that was being driven by the "greens". Some respondents pointed out that Australian forests were already well-managed and that certification would not improve the status of Australian forests. Linked to this concern was that the forest certification was yet another step in stopping the forest industry.

The third area of comments was on the cost of forest certification. This was raised in the context of small producers being able to absorb costs, and in the context that it would be likely that producers would absorb the costs of certification due to the lack of demand for these products.

The final area of comment was on the need to develop links to forest growers before primary processors could proceed. Respondents identified two areas of concern. One was the commitment by Government forestry agencies to provide secure supplies as well as certified ones. The other was a more general problem of linking with certified sources of plantation wood.

Summary

For both forest growers and primary processors, Australia and Japan are the main markets, however growth is expected to be in other markets. Forest growers anticipate a growth in Asian markets, particularly China and South Korea. Hardwood sawn timber processors expect growth in the U.S. and Southeast Asia, particularly China. Softwood sawn timber processors expect growth in China, Japan and the U.S. Importantly from the perspective of forest certification, market growth is expected to be broadly in countries or regions that are not closely linked to a need for certification, other than in products for re-export. Countries or regions currently linked to markets for certified forest products, Europe and the U.S., are identified as likely ultimate markets for only a small number of respondents.

In general, respondents' knowledge of different forest certification schemes is low. The greatest level of awareness is for schemes for which there is some degree of activity in Australia (Australian Forestry Standard, ISO 14001) or which has wide international coverage (Forest Stewardship Council). Even then this level of awareness is low. When asked about forest certification schemes, the Australian Forestry Standard was the only scheme where a majority of respondents indicated some familiarity, however even this was only at the level of having read something about the scheme. There is generally little or no awareness of other certification activities internationally.

The low level of awareness of forest certification schemes translates into uncertainty or confusion about what might be expected to be included in a forest certification scheme. Respondents were asked about whether there would be external or internal auditing, whether there would be prescriptive management requirements or more general prescribed outcomes, and whether there would be externally prescribed or company defined management systems. These three sets of mirrored responses (either one or the other), were answered in a way that more than 50 percent of both forest growers and primary processors thought that they would be able to do both.

When forest growers were asked whether a forest certification system would have environmental, economic or social aspects to it, most respondents associate forest certification only with environmental outcomes. With only about half of respondents having any expectation of economic or social components to forest certification, and otherwise respondents indicating that they did not know whether there would be these requirements, it appears that respondents are generally unaware of forest certification systems similar to the.
Primary processors were asked whether they were familiar with or had expectations for segregation of certified and non-certified wood products or for changes to their processing practices that are often associated with forest certification systems. Less than half of respondents expect some type of prescriptive requirement, and an equal number did not know. This again indicates that respondents are generally unaware of forest certification systems.

Both groups of respondents were asked whether they thought that there would be product tracking through a value chain and a logo for marketing purposes with forest certification. Awareness of a marketing logo was generally high, however awareness of product tracking through the value chain was not as high (two thirds of forest growers and 55 percent of primary processors being aware that product tracking was required by forest certification). This indicates that many respondents do no associate a marketing label with a requirement to maintain a chain of custody.

Generally, the questions about forest certification show that these two groups do not know what is expected in forest certification schemes and that they have a relatively low level of knowledge of forest certification schemes or important gaps in understanding. Both of these factors point to a need for education about forest certification.

When asked about the macro effects of forest certification on the forest industry, both groups generally do not perceive certification as a likely to have any negative effect on their operation. There may even be a perception that forest certification could have a positive effect in terms of improving forest management. The only negative is a belief by forest growers that there could be some limits on the use of technology. Both groups of respondents believe that forest certification will go some way to promoting the industry's environmental stewardship, both offshore and domestically. However, they do not believe that it will satisfy Australian environmental groups to the same extent that it might satisfy foreign environmental groups. Both groups of respondents believe that forest certification will have some effect on maintaining existing markets, but their opinions diverge at this point. Forest growers are not positive about the ability of forest certification to provide access to new markets, or to provide a competitive advantage. Primary processors on the other hand see forest certification as providing access to new markets, and providing a competitive advantage. Taken together, forest growers mainly perceive forest certification as a defensive measure in existing markets, while primary producers perceive that forest certification may provide competitive benefits for the industry.

Both groups were also asked about the micro effects of forest certification on their own business. For both groups, the most important reason for responding to forest certification would be peer pressure, as there is no belief that their customers or retail customers of forest products are demanding certified products. With primary processors not viewing forest certification as a market opportunity and forest growers viewing forest certification as defensive reaction rather than a market opportunity, it appears that the perception is that forest certification is being driven by industry itself rather than the market opportunities of individual businesses or owners' objectives.

Forest Industry

There is a divergence of opinion between forest growers and primary processors over the timing of forest certification, with forest growers more strongly believing that forest certification will be required in the near future, and certainly within five years. Forest growers are also more likely to see an advantage for their organisation in being an early mover in the adoption of forest certification rather than waiting to see what happens. Most forest growers expect to act soon, and under the right circumstances, at least some companies will move quickly. Both groups believe that there will be public relations benefits from forest certification, although it is not believed to have any impact on profitability. The net results show that at an individual organisation level, most respondents believe that forest certification is being driven by the industry rather than the market, and that it will not have any positive impact on their organization.

The interest in forest certification is higher among forest growers than primary processors. When asked about intentions for forest certification, 60 percent of forest growers and only 44 percent of primary processors currently have or are planning some involvement with forest certification. Within two years, about 30 percent of forest growers and 18 percent of primary processors expect to be undertaking or have forest certification. With a significant number from a current status of little or no involvement in certification, this leaves a substantial number in the forest industry who do not have any current plans to be involved with certification.

When responses are aggregated by State, size or forest type, there is a positive relationship between involvement of forest growers in forest certification, and either the size of forest owned or managed, or total annual production, with large growers being more likely to be involved in certification. At a State level, the level of uptake of certification could be seen to be generally much higher for forest growers involved in native forests than for plantations, while for processors it is the opposite. Unless addressed, this has the potential to create a situation where either upstream or downstream links in the forest products chain create problems in developing forest certification. Both growers and processors in New South Wales and Queensland appear to be somewhat less inclined to become involved in forest certification (25 percent or less of respondents), and the certification impetus is strongest in the southern States. Individually, intentions to certify are much higher in Tasmania.

Among those who have selected a forest certification scheme, only three schemes are currently being considered, the Australian Forestry Standard, the ISO 14001 Environmental Management System and the Forest Stewardship Council scheme. ISO 14401 is sometimes chosen along with some other scheme. There is an even split between the Australian Forestry Standard and the Forest Stewardship Council scheme for plantation growers and softwood processors, but native forest managers and processors are focusing predominantly on the Australian Forestry Standard. This raises questions for the implementation of the Australian Forestry Standard and the potential for requiring mutual recognition between the Australian Forestry Standard and other internationally recognised schemes.

The key considerations in forest certification scheme selection are related to commercial or market issues, rather than strict profitability (access to new markets, price premium) or wider political issues (acceptance by environmental groups, recommended by the industry). Both groups consider international market criteria to be important, however, forest growers also have a greater focus on domestic consumers. Primary processors are more likely to view what the industry is recommending and systems that are matched to and managed by primary processors as being important to their decision. There were only minor management or logistical impediments to undertaking forest certification.

For those who have decided not to undertake forest certification at this time, a lack of knowledge, a lack of clarity about what was happening, and uncertainty about what is happening or might happen, coupled with financial considerations are most important in their decision. Primary processors also pointed out the necessity of developing the supply chain in a coordinated way so that individual businesses are not caught out of synchronisation with other parts of the supply chain. When compared to those who have made the decision to undertake forest certification, it is clear that those who are already becoming involved are more likely to see certification as important for markets (protection of markets or meeting demand) and to see some benefits in certification (environmental performance, shareholders or benefits higher than costs).

The process of undertaking and managing a forest certification system could be a major transition for a forest grower and prior experience with management systems could be an advantage for either forest growers or primary processors. The results show that less than one third of forest growers already follow some type of code of forestry management practice and/or management system, and few have experience with an externally audited system. A greater number of primary processors already follow some type of management system and have experience with externally audited systems, even with this group, half of the respondents are not involved in any type of a management system. Although respondents themselves did not believe that they lack management skills or that this will be an impediment to pursuing certification, there is a positive correlation between experience with management systems and involvement in forest certification.

For both forest growers and primary processors, industry or trade publications will probably be the most effective method of communicating information on forest certification. Professional associations were also found to be a potential channel to provide information on forest certification.

Part 2

Intermediate Consumers

This section of the report covers the results of surveys of intermediate consumers of wood products in Australia. This group includes those who are in the value chain for forest products, and who have a role in creating or translating demand from final consumers. This group covers specifiers, architects and builders, those in the retail-wholesale chain for timber, and a secondary processor, furniture manufacturers. The research objectives for this group are as follows:

- To determine the influence of cost (material, installed, lifetime) in the selection of building materials (wood, steel, concrete, plastic).
- To determine whether factors such as ease of use, or compatibility with other building systems has an influence on the selection of building materials.
- To determine whether knowledge/training, prevalent tools or common building styles (built on site, pre-fabrication) have an influence on the selection of building materials.
- To determine the relative importance of environmental considerations compared to other product attributes when specifying/purchasing materials.
- To determine knowledge about and attitudes towards forest certification.

Data on intermediate consumers' perceptions about material selection was collected using different mail surveys for architects, builders, retailers and furniture manufacturers. The remaining parts of this section present the methodology and results of these surveys.

Methodology

Four different surveys were developed for this group. The architect and builder surveys were very similar, differing largely in the phrases used to change questions from a design to a building activity. Consequently, the methodology for the architect and builder surveys will be presented at the same time. The methodology for the other two surveys will be presented separately.

Architects and Builders

The survey instrument (Appendix 1) contained five parts. The first part contained questions to help determine what criteria architects and builders use when selecting materials for the buildings they design or build. This question included an extensive list of relevant product attributes that might apply to all building materials. In addition, this section asked respondents to compare four building materials, steel, wood, concrete, and masonry, on a reduced list of material attributes. This section also asked respondents to evaluate buildings made of wood and the process of designing or building with wood. Finally, respondents were asked to evaluate their level of knowledge and experience for a number of wooden structural materials, wooden non-structural materials, and non-wood materials.

The second section of the survey asked respondents to rate building materials in terms of how harmful they believe them to be to the environment across a number of environmental parameters, including extracting the raw resource and manufacturing the building material. Architects and builders were also asked to indicate their level of awareness of certified wood products, as well as their attitude toward such products.

Intermediate Consumers

Before answering this section, respondents were provided with a specific definition of forest certification.

> *Forest certification means that a formal, documented audit has been completed to ensure that forests are well-managed according to a defined set of criteria, which include environmental, social and economic aspects. Wood products that can be verified to originate from certified forests can bear a certification label.*

The third section of the survey related to residential and light commercial buildings. Respondents were first asked to indicate whether they specified wood as the main structural component in either residential or light commercial buildings. Next, respondents were asked to indicate the material used most frequently across a number of building applications for both residential and light commercial buildings. In order to determine how material use may have changed, they were asked to indicate what material was most likely to be used five years ago and what was most likely to be used today. Respondents were also asked to indicate across a range of attributes, how wood compares to other materials that might be used in residential and light commercial construction.

In the fourth section of the survey, architects and builders were asked to assess their use of a variety of communication channels in obtaining information about new products, systems or services. The final questions in the survey contained a series of demographic questions that could be used to categorise architects or builders. For instance, respondents were asked to record how long they have been a practicing architect, whether they are self-employed, the number of employees at their place of work, and the billing level of their firm. Builders were asked to record how long they have been a practicing builder, whether they are self-employed, the number of employees at their place of work, and the billing level of their firm.

Retailers

The survey instrument (Appendix 1) contained four parts. The first part of the survey contained questions about a range of factors that might be important in determining which building materials are carried in a building supply store.

The second part of the survey asked respondents about the relative performance attributes of different building materials and about the use of different building materials in various building applications over time.

The third part of the survey asked questions about different environmental considerations related to building materials. These questions contained specific references to forest certification. Before answering this section, respondents were again provided with the specific definition of forest certification used in this survey (see forest industry section).

The final part of the survey contained a series of demographic questions that can be used to categorise organisations. Respondents were asked to record the ownership status of their organisation, the type of products produced by their organisation, the markets served by their customers, and the forest types and states where their logs are sourced. Finally, respondents were also given space to provide additional comments about forest certification.

Furniture Manufacturers

The survey instrument (Appendix 1) contained four parts. The first part of the survey contained questions about a range of factors that might be important in determining what materials are used in their furniture.

The second part of the survey asked questions about different environmental considerations related to furniture materials. These questions contained specific references to forest certification. Before answering this section, respondents were again provided with a specific definition of forest certification used in this survey (see forest industry section).

The third part of the survey asked respondents about the relative performance attributes of different building materials and about the use of different materials in various applications.

The final part of the survey contained a series of demographic questions that will be used to categorise organisations. For instance, respondents were asked to record the ownership status of their organisation, the markets served by their customers, and the states where they manufacture furniture.

Survey Development and Implementation

As described in the forest industry section of this report, survey development and implementation for this portion of the study was based on methods recommended by Dillman[5] and described as the Total Design Method (TDM). After the architect and builder pretest, it was determined that both the questionnaires were too long, and the majority of respondents were omitting one section of the survey. This section was dropped from both surveys. The building products retailer and furniture manufacturer pretests showed that a number of questions in both questionnaires needed to be reworded to increase their clarity and a number of additional options needed to be added to certain questions.

A mailing list company in Australia provided randomly selected mailing lists of 350 architects, 350 builders, 208 retailers and 314 furniture manufacturers. A total of 300 architect and builder surveys were mailed, and 208 retailers and 314 furniture manufacturers were mailed surveys. After adjusting the sample sizes for non-deliverable surveys and incomplete or otherwise unusable surveys, the adjusted response rate for the architect survey was 21.4 percent, the builder survey 19.4 percent, the retailer survey 18.5 percent and the furniture manufacturer survey 15.1 percent. Data were collected in May and June of 2002.

[5] Dillman, D. 1978. Mail and Telephone Surveys: The Total Design Method. New York, NY: John Wiley & Sons.

Results of the Architect Survey

The results of the survey are presented under a number of headings that reflect particular areas of interest.

- Demographics
- Building material selection criteria
- Comparison of building material attributes
- Residential and light commercial buildings material use
- Knowledge and experience with building materials
- Perceived impact of building material use on the environment
- Perceptions of environmentally certified wood products
- Learning about building materials and design

Demographics

In terms of the size of the companies represented, architects are spread fairly evenly across four groups, ranging from $100,000 in annual billings to over $5,000,000 (Table 2.1). However, the most common size of architectural firms responding to the survey were those with annual billings between $1,000,001 and $5,000,000. In addition, architectural organisations range in size, in terms of number of employees, from 1 to 120 employees, with an average size of 24 employees.

Most respondents design buildings in Queensland, New South Wales, or Victoria (Table 2.2). Unfortunately, Tasmania and the Northern Territory are not well represented in the sample.

The architects who responded to the survey were almost all male (98 percent), ranging in age from 32 to 71 years old, with an average age of 52 years. Respondents have been practicing architects for an average of 27 years, with a range of six to 45 years in practice. In addition, the majority of architects in the sample are self-employed (65 percent).

Table 2.1 Size of Organisation by Billings Per Year
(Number of Respondents, N=55)

Under $100,000	0
$100,000 to $500,000	10
$500,001 to $1,000,000	11
$1,000,001 to $5,000,000	21
Over $5,000,000	11
Do not know	2

Table 2.2 Geographic Distribution of Design Work
(Number of Respondents, N=57)

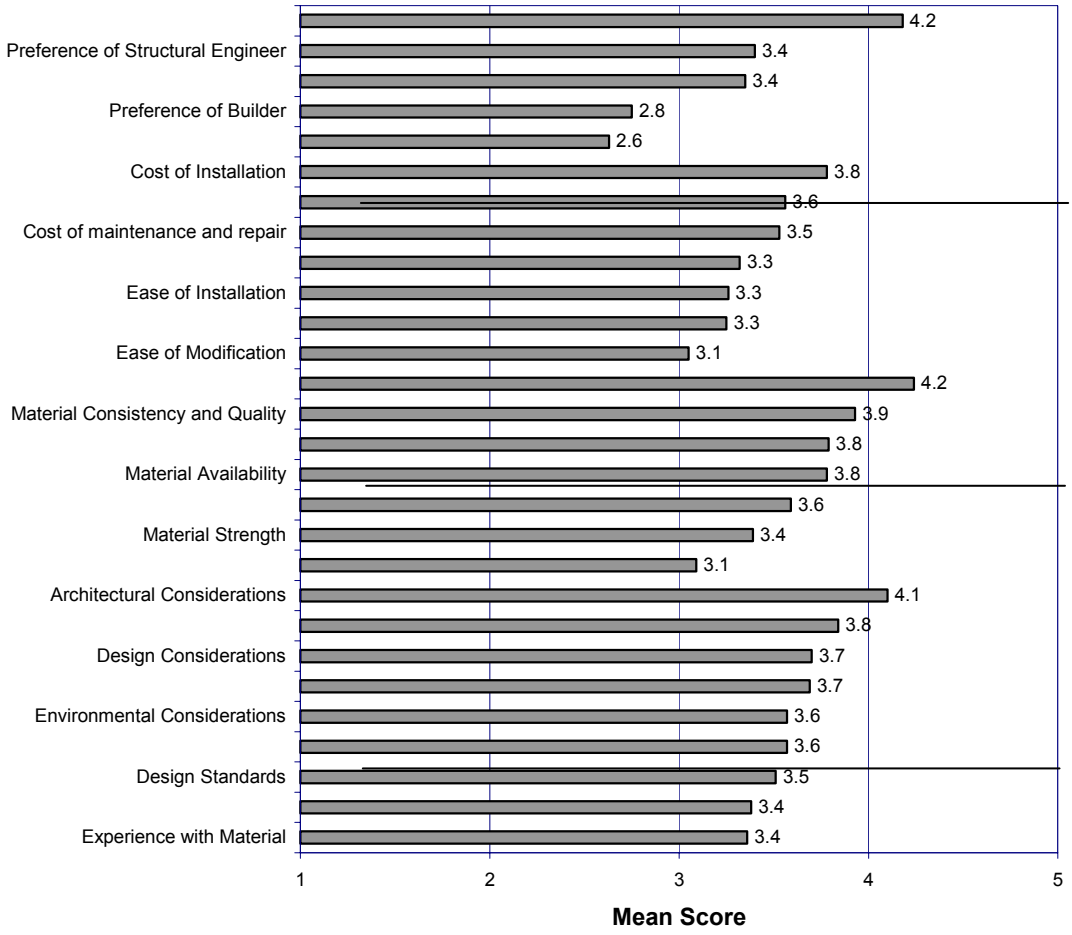
Queensland	12
New South Wales	19
Victoria	15
Tasmania	2
South Australia	5
Western Australia	5
Northern Territory	0

Building Material Selection Criteria

An important objective of the study was to determine what criteria architects use when selecting materials for the buildings they design. Respondents were asked to indicate the importance of a number of building selection criteria. Respondents' assessments

are based on a five-point scale ranging from 1 meaning 'Not At All Important', through 3 'Important', to 5 'Extremely Important'. The results are shown in Figure 2.1.

Figure 2.1 Architect Building Material Selection Criteria



In Figure 2.1, the preferences of architects, architectural considerations and appearance of the material were considered by architects to be the most important decision criteria (mean scores over 4.0). The criteria included in this question can also be grouped into the following four areas:

- Importance of decision makers on material selection
- Importance of installation, maintenance and repair attributes
- Specific building material characteristics
- General building material characteristics

Importance of Decision Makers

Architects were asked to indicate the importance of the preferences of a number of individuals involved in the design and building process, in terms of their influence on the selection of building materials. In Figure 2.1, architects rate their own preference as being the most important influence on the selection of building materials (mean score of 4.18).

The preferences of structural engineers and the owner/developer are the next most important influences on the selection of building materials. Figure 2.1 shows that in order to influence architects in their selection of building materials, it is important that promotion be focused directly to them, and that manufacturers of building materials stress the importance of the architect's role in the selection of building materials.

Installation, Maintenance and Repair

Architects were also asked to rate the importance of a number of considerations related to the installation, maintenance and repair of building materials. In Figure 2.1, the factors included in this area were all rated fairly important, although none had a mean score over 4.0. Of these factors, the cost of installing the material was rated as most important by architects. The consistency of supply, and the cost of maintenance and repair, were also rated as important considerations by architects in their selection of building materials.

Specific Building Material Characteristics

The next set of questions relate to the importance of specific building material characteristics when selecting materials. The appearance of the material was rated by architects as the most important consideration in selecting building materials (mean score of 4.24). Material consistency and quality, safety and availability were rated highly. Many of these are factors that manufacturers can control.

General Building Material Characteristics

The next group of questions relates to a number of general characteristics of building materials and how they fit into broader considerations. Definitions were provided for environmental, architectural and design considerations. Environmental considerations refer to global impact due to material use. Architectural considerations refer to light, space, sound, and function. Design considerations refer to simplicity of design, application of codes, and time required. All questions on this list rated highly for architects (mean score on the list of 3.69). From this list, architectural considerations were rated as most important to architects when selecting materials for the buildings they design.

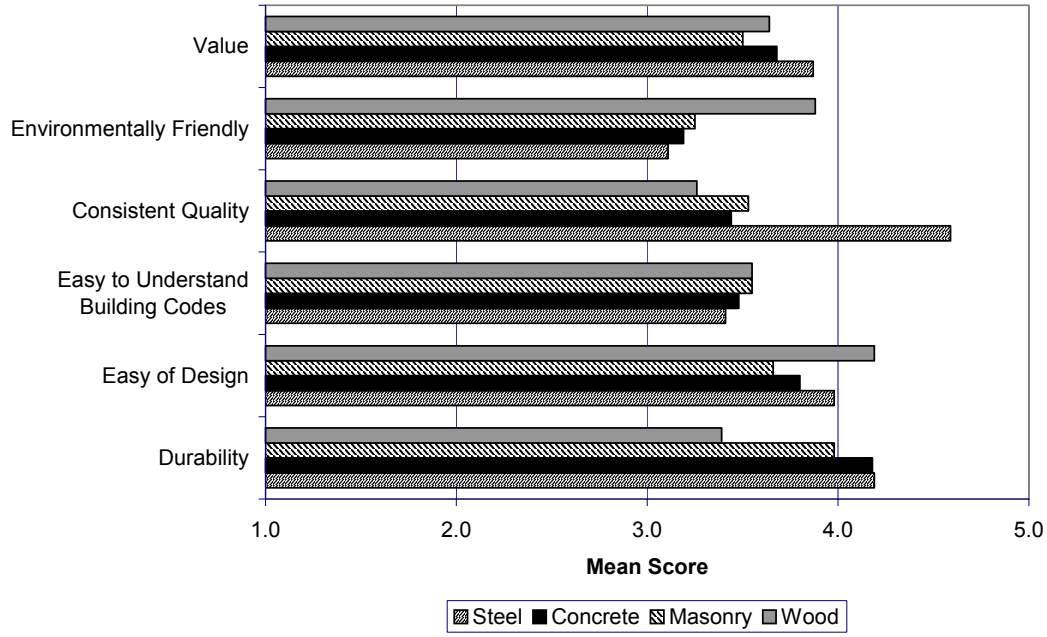
Overall, these results suggest that architects consider their own role in the design process and in particular the selection of building materials, to be critical. Their most important consideration in the selection of building materials is the appearance of the material. They are also concerned about the light, space, sound, and function of the material or what has been referred to as architectural considerations.

They need to be reassured of the consistency level and quality of the material and that the material has a proven track record. From a more practical standpoint, architects need to be assured that the material will be available when needed, it will have a reasonable installation cost, and the material will be safe it its application.

Comparison of Building Materials Attributes

In order to determine how wood compares to steel, concrete and masonry, respondents were asked to rate these different building materials on six key parameters or attributes. Respondents were asked to indicate whether they believe the material possessed an attribute on a scale of 1 to 5, where 1 means the material possesses the attribute 'not at all', and 5 means the material possesses the attribute 'to a high degree'.

Figure 2.2 Building Material Attributes



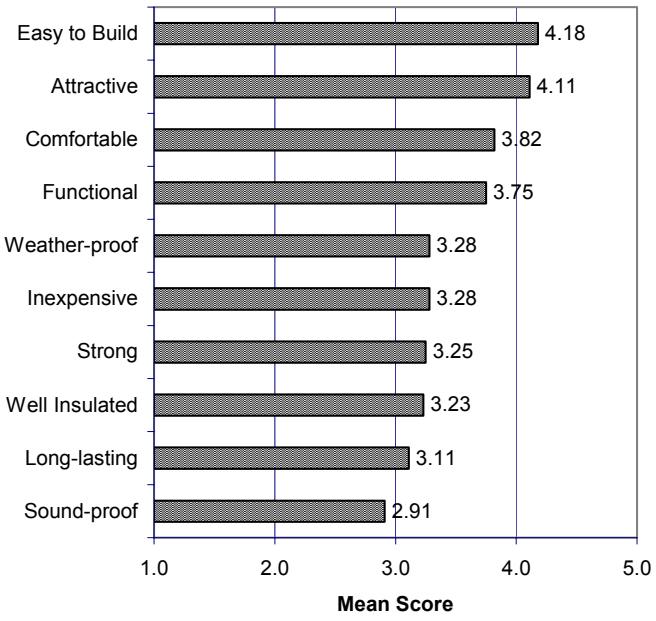
In Figure 2.2, all of the materials were generally rated by architects as being similar for each of the attributes. The main differences emerge in durability, where wood is rated as being somewhat less durable than other materials; consistent quality, where steel is perceived to more consistent than all other materials, and environmentally friendly, where wood is perceived as being more environmentally friendly than other materials.

In terms of how wood may be positioned by architects on these key attributes, wood performs well in terms of perceptions of environmental friendliness and ease of incorporating into design. However, wood does not perform well in terms of durability or consistent quality. Thus, the wood products industry should stress the perceived strength of wood as environmentally friendly, but needs to ensure that durability and consistency perceptions are addressed.

Evaluation of Wood as a Building Material

Architects were asked a series of questions specifically related to wood as a building material. They were first asked to indicate their agreement with a series of statements related to buildings made primarily of wood, with a rating of 1 indicating they 'strongly disagreed' with the statement and a rating of 5 meaning they 'strongly agreed' with the statement. In Figure 2.3, architects agree that buildings made of wood are easy to build, attractive, comfortable and functional.

Figure 2.3 Buildings Made of Wood are…



Respondents were also asked their perceptions about designing with wood with evaluation on a 5-point scale from one indicating “not at all” to five indicating “to a high degree”. Architectural respondents provided a positive indication that designing buildings with wood is gratifying, fast and simple (Figure 2.4).

The next group of questions in this section queried respondents on the ease of designing with wood. Again respondents were asked to indicate their beliefs from 1 meaning ‘not at all’ to 5 meaning to ‘a high degree’. Figure 2.5 indicates that respondents do not feel overly positive regarding the ease of designing with wood on these parameters. Although the majority of respondents indicate that they can join structural components and understand building codes, they are neutral about their design abilities on these parameters. In addition, architects do not feel it is easy to design in fire protection, or to control for rot or pest damage when using wood as a building material.

Figure 2.4 Designing with wood is…

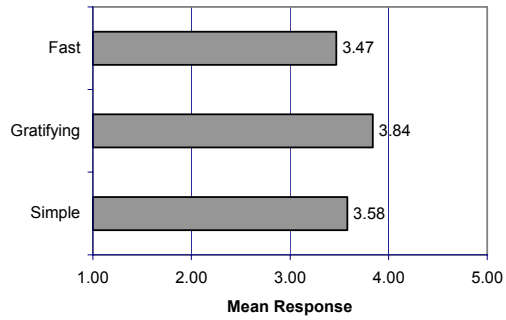
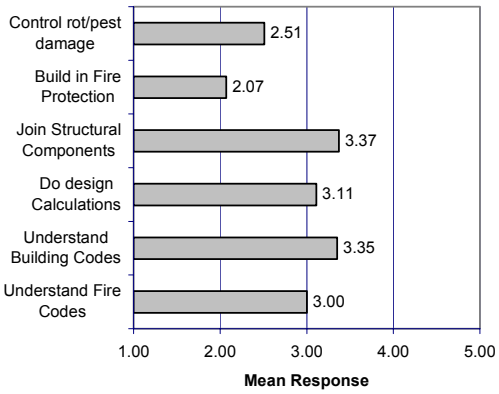


Figure 2.5 When Designing with Wood it is Easy to…



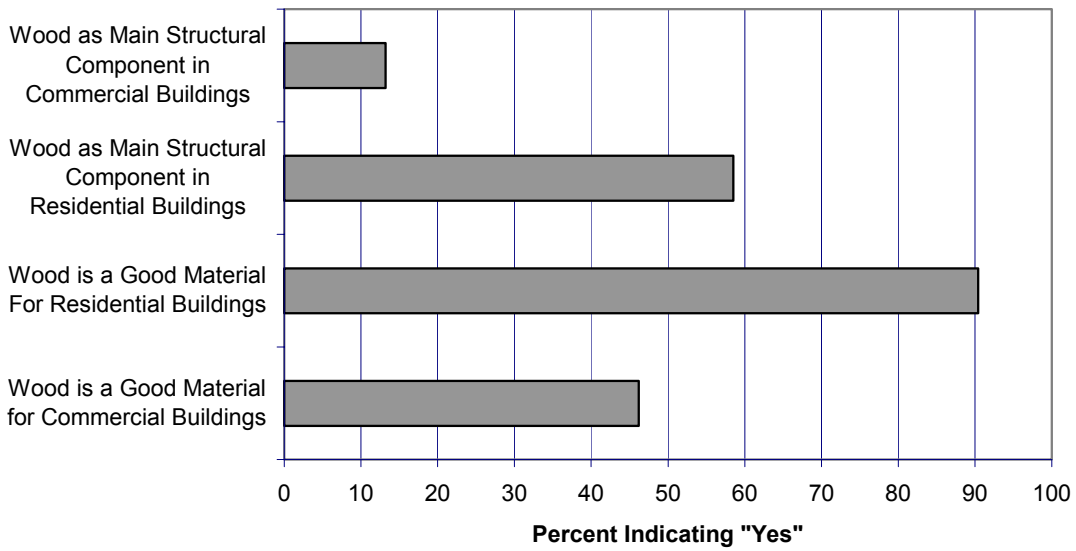
These results suggest that architects perceive that wood has a number of attributes that make it an attractive building material, but also a number of areas that they perceive as limitations to the use of wood. Overall, the majority of architects reported that they find it gratifying to design buildings using wood, and in particular, they find wood easy to build with, and an attractive and functional material. The belief that wood is an attractive material is very important because architects rated material attractiveness as their most important building selection criteria. In addition, architects rated functionality, one of the architectural considerations, very highly. Thus, it is critical that the industry stresses both the appearance of wood and its functional nature in product promotion.

In addition, these results suggest that architects do not feel overly confident in their ability to design with wood. In particular, their ability to build in fire protection, or control for rot and pest damage. Again these results suggest the need for product education, perhaps incorporated into formal educational programmes, on how to design with wood.

Residential and Light Commercial Buildings

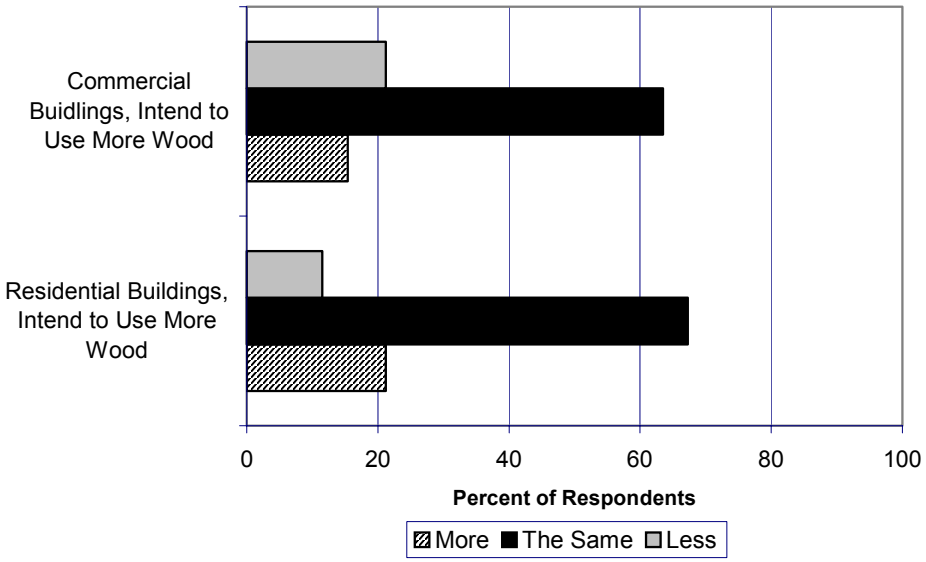
The next series of questions in the survey related to residential and light commercial buildings that are two stories or less, or less than 1000 m^2 in area. If the respondents' design work was devoted entirely to other types of structures, they were asked to skip this section of the survey. First, respondents were asked to describe their use of wood in residential and light commercial buildings by answering 'yes' or 'no' to a number of questions. Figure 2.6 shows that almost 60 percent of architects presently build residential buildings using wood as the main structural component. However, when asked the same question related to light commercial buildings, only 13 percent of respondents indicated they used wood as the main structural component. Respondents were asked to indicate whether they believe wood is a good material for use in these applications. Over 90 percent of architects felt wood was a good structural material for residential buildings, but only 46 percent felt it was appropriate as a structural material in light commercial buildings.

Figure 2.6. Use of Wood in Residential and Light Commercial Buildings



The next two questions asked respondents to indicate their future use of wood in residential and light commercial applications (Figure 2.7). Respondents were asked to indicate whether they planned to use more, less or the same amount of wood in the future. For residential buildings, the majority of respondents (67 percent) intend to use the same amount of wood in the future and a small number (11 percent) indicating that they may decrease their use of wood in the future. However, 21 percent of respondents indicated that they intend to increase their use of wood in residential applications. In terms of light commercial buildings, again the majority of respondents (63 percent) do not intend on changing their use of wood in the future, and a number (21 percent) believe they will use less wood in light commercial buildings. Only 15 percent believe they will use more wood in the future in commercial buildings.

Figure 2.7 Future Use of Wood in Residential and Light Commercial Buildings



The results in Figures 2.6 and 2.7 indicate that although wood is heavily used as the main structural component in residential buildings, and the majority of respondents feel very positive about the use of wood in this application, there is still an opportunity to increase the use of wood. In particular, the wood products industry can focus its efforts on the 21 percent of architects who indicate they plan to use more wood in the future for residential buildings. In the light commercial sector, an opportunity exists for increasing the use of wood, but the industry will have to overcome the negative attitudes of a large number of architects who do not think that wood is a good material for structural applications in light commercial buildings. However, the industry may focus on the 15 percent of architects who indicate that they plan to use more wood in this application.

In order to determine the specific uses of wood in residential and light commercial buildings, architects were asked to indicate what material they most frequently used across a number of building applications (e.g. roof systems, floor systems, wall systems). In order to determine how material use may have changed, respondents were also asked to indicate material use five years ago and the material most likely to be used today. Table 2.3 shows the number of architects using each material, today and five years ago, for residential buildings.

Table 2.3 Building Material Use in Residential Buildings
(Number of Respondents)

	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof system	25	32	3	3	31	26	3	3	1	1
Floor system	7	12	28	31	29	26	1	1	0	0
Exterior wall system	9	18	4	12	23	23	32	30	0	2
Interior partition	12	22	0	1	41	34	10	11	0	0
Exterior Cladding	10	22	6	11	20	18	29	26	0	0
Interior trim/detail	3	6	1	1	47	48	1	1	1	2

In roof systems, steel and wood are the materials most likely to be chosen, with very small numbers of respondents choosing any of the other materials. Steel has shown an increase in market share with an increase in the number of architects choosing it for roof systems, and a corresponding reduction in the use of wood. In floor systems, concrete and wood are the materials most likely to be used. Again, the use of wood has decreased from five years ago, and the use of concrete and steel in floor systems has increased. Masonry, wood and steel were most common in exterior wall systems, however, the number of architects using steel and concrete has increased, and wood has remained stable. Wood is most likely to chosen by architects for interior partitions, however the number of architects choosing wood has declined and the number of architects choosing steel has increased. A number of different materials are used for exterior cladding, including steel, wood, and most importantly, masonry. Architects have increasingly selected steel and concrete in the past five years. Finally, wood continues to be the most commonly selected material for use in interior trim.

Table 2.4 provides information on material use in commercial buildings. Steel is the predominant material used for roof systems in commercial buildings, and concrete is the predominant material for floor systems. Masonry, steel and concrete were most likely to be selected for exterior wall systems, and steel and concrete are also growing in use for exterior wall systems. In terms of interior partitions, steel and wood are most likely to be selected by architects, with fewer architects now selecting wood. Use of materials in exterior cladding mirrors that of exterior wall systems, with most of these materials forming both the structure and cladding (e.g. tilt slab or concrete block walls). The number of architects using steel in exterior cladding applications has doubled in the past 5 years. Finally, wood is chosen by the largest number of architects for interior trim applications.

Table 2.4 Material Use in Commercial Buildings

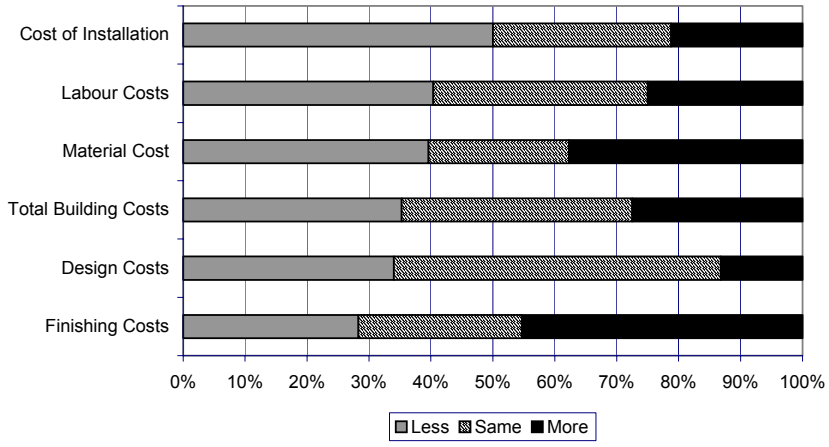
	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof system	46	50	8	6	7	6	0	0	0	0
Floor system	8	10	44	47	8	10	1	0	0	0
Exterior wall system	20	23	13	17	2	6	28	19	1	1
Interior partition	34	35	1	2	22	16	7	6	1	3
Exterior Cladding	22	32	19	20	3	4	25	20	1	2
Interior trim/detail	11	12	0	0	38	38	0	0	4	4

The results in Tables 2.3 and 2.4 suggest that wood is likely to be extensively used in residential buildings for interior trim and partitions, exterior cladding and wall systems, and in roof floor systems. However, in all of these applications, except exterior wall systems, the specification of wood by architects has decreased in the last 5 years. Moreover, across all applications the specification of steel has increased from five years ago. In addition, the specification of concrete has increased for floor systems, exterior wall systems, and exterior cladding.

In commercial buildings, there is a similar but less pronounced trend. Steel has gained ground across all applications, and wood has lost ground for roof systems and interior partitions. These results again suggest that wood products manufacturers need to rethink their positioning strategy, particularly against steel, if they want to regain ground.

In order to determine some of the reasons why wood may or may not be selected in residential and light commercial buildings, respondents were asked to evaluate wood relative to steel, concrete, masonry and plastic. For a number of different factors, respondents were asked to indicate the relative position of wood as being either 'more', 'less,' or 'the same' when compared to other materials in residential and light commercial buildings. The questions are grouped into cost (Figure 2.8) and labour (Figure 2.9) considerations.

Figure 2.8 Wood Cost Compared to Other Materials
(Percent of Respondents)



In Figure 2.8, most respondents believe that wood is either less costly (40 percent) or the same cost (23 percent) as other materials. Wood's key competitive advantage is in cost of installation, where 50 percent of respondents say it costs less to use wood and another 29 percent say it is the same as other building materials. Other areas where wood is competitive are in labour costs. One area where architects perceive wood to have a competitive disadvantage is in finishing costs. Differences in building design are reflected in the large number of architects who consider wood to be either a more expensive building material, or to be less costly.

Figure 2.9 Labour Inputs for Wood Relative to Other Materials

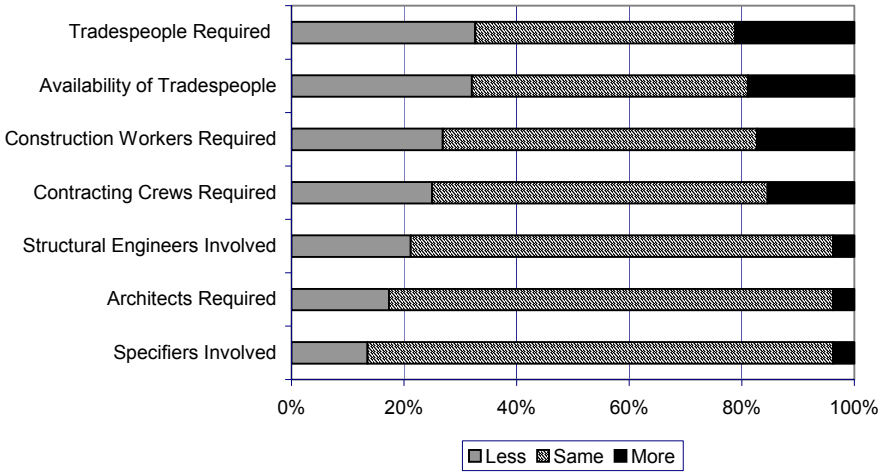
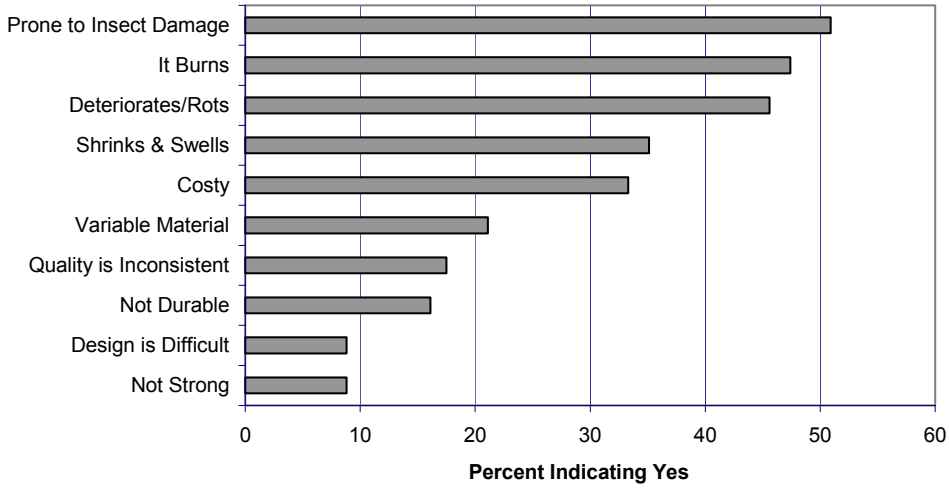


Figure 2.9 shows architect's opinions about labour inputs when using wood compared to other materials. Generally, architects feel that using wood has similar or somewhat lower requirements for different types of labour. The one area that might be perceived to be a problem is in the availability of trades people, where 32 percent of respondents feel that availability in wood construction is less than for other materials. This is to some extent offset by the 19 percent of architects who think that trades people for wood are more available than for other materials. These results indicate that relative costs or labour requirements are not the cause of wood losing market share to other building materials in residential construction, or the reasons why it has such a small market share in commercial construction.

Architects were also asked specific questions about why wood is not regularly used in commercial design and were asked to indicate what they believe to be the three greatest drawbacks to using wood in commercial applications. In Figure 2.10, the belief that wood is prone to insect damage was selected as an impediment by more than 50 percent of respondents. In addition, a large number of respondents felt that drawbacks to using wood include the fact that it burns (47 percent) and it deteriorates or rots (46 percent). Shrinking and swelling (35 percent) and the cost of wood (33 percent) were also indicated as drawbacks to using wood in commercial applications.

Figure 2.10 Reasons Why Wood is not Used Regularly in Commercial Design



These results again suggest the need to educate architects on how the performance of wood can be improved on these parameters. For example, wood may be treated to reduce insect damage or protected to reduce deterioration or rotting.

Knowledge and Experience with Building Materials

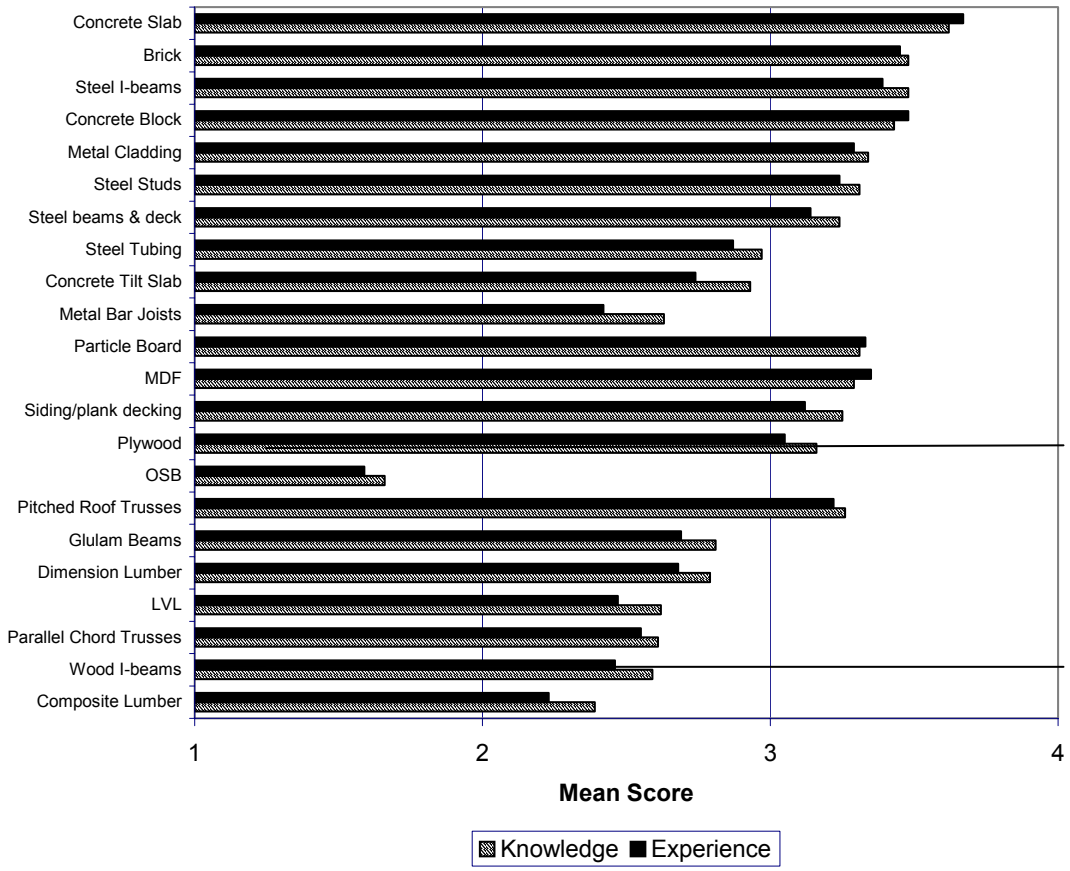
An understanding of how different materials can be used and experience with their use is a common theme in research into building material use. In order to gain an understanding of architects' knowledge of and experience with different building materials, respondents were asked to rate their level of knowledge and experience. Ratings were based on a 4-point scale where 1 means 'not at all knowledgeable about or experienced with this product', 2 means 'not very knowledgeable about or experienced with this product', 3 means 'somewhat knowledgeable about or experienced with this product', and 4 means 'very knowledgeable about or experienced with this product' (Figure 2.11).

The building materials in this question were separated into three groups.

- Non-wood materials
- Wooden non-structural materials
- Wooden structural materials

The first group in Figure 2.11, covering non-wood materials, shows that the level of knowledge and experience with these materials is fairly high overall. For the second group, wooden non-structural materials, respondents again report high levels of knowledge and experience for all materials except for oriented strand board (OSB). In the third group, wooden structural materials, other than for pitched roof trusses, respondents' knowledge and experience is generally lower than for the other groups of materials. What this shows is that architects are much less familiar with emerging engineered wood products that have greatest potential to maintain or expand the use of wood products in the building industry.

Figure 2.11 Knowledge and Experience With Building Materials



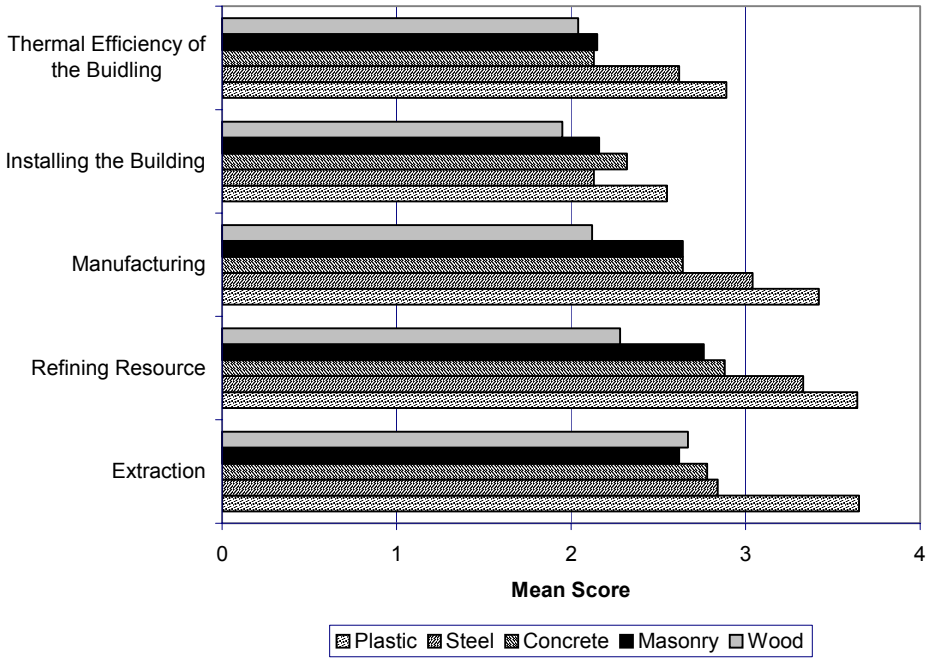
These results suggest that transfer of information about wooden structural systems is not occurring as fast or as well as for other building materials. This indicates the need to incorporate training on wood products and systems, especially engineered wood products, for architects into promotional material. This could be as part of formal education programmes, as well as sales presentations, trade shows, and exhibits which could be used to expose architects to both new and existing wood products. This would increase architect knowledge and in turn experience of structural and non-structural uses of wood.

Perceived Impact of Building Materials Use on the Environment

Architects were asked to different building materials on a number of parameters according to how harmful they felt the materials were to the environment (Figure 2.12).

Each environmental parameter had five choices, with 0 meaning ‘never thought about it, 1 meaning ‘completely harmless’, 2 meaning ‘harmless’, 3 meaning ‘harmful’, and 4 meaning ‘very harmful’. In Figure 2.12, wood performs well on all environmental parameters, generally being considered to be harmless to the environment. More importantly, in all categories except extraction, wood is considered to have the lowest environmental impact of any of the building materials.

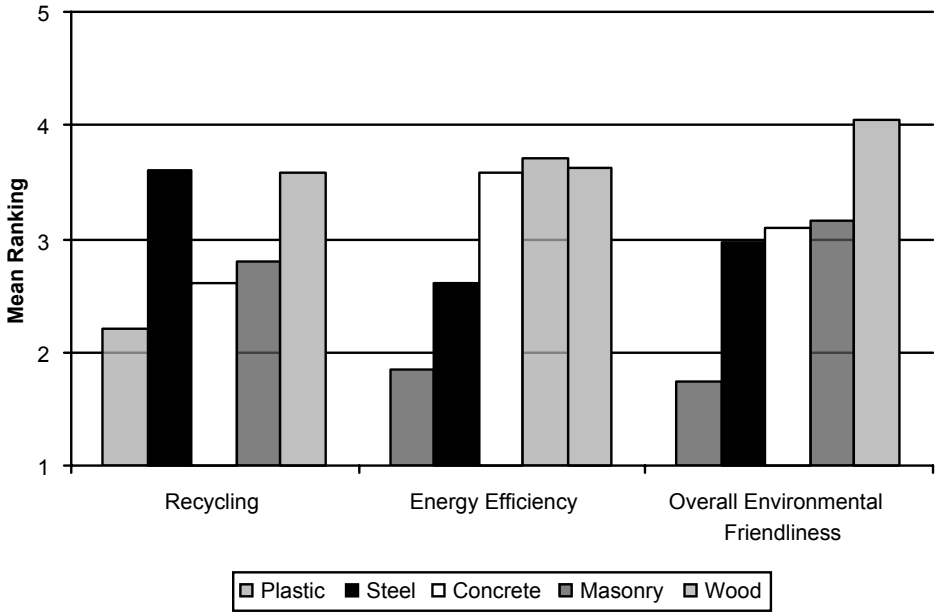
Figure 2.12 Environmental Effects of Building Materials



In addition to the relative scores in Figure 2.12, respondents were also asked to rank the same five building materials on their ability to be recycled, the energy efficiency of buildings made from the material, and the overall environmental friendliness of the material. In this question, a score of one means that the material was ranked lowest in that particular environmental parameter and a score of five meant the material was ranked highest. Figure 2.13 shows that wood is seen as being highly recyclable by architects, similar to steel. Buildings constructed of masonry are believed to be slightly more energy efficient, but wood and concrete have very similar mean scores on this parameter. Finally, in terms of overall environmental friendliness, wood is perceived by architects to be the friendliest building material.

It has been suggested earlier that wood may need to reposition itself in the minds of architects, and particularly relative to steel. The parameter of environmental friendliness may be one attribute on which the industry repositions itself. These results indicate that architects perceive wood to be the least harmful material for the environment. Plastic is perceived as being the most harmful and steel is perceived as being the next most harmful. Thus, the wood products industry may choose to use both wood's environmental credentials to differentiate it from steel.

Figure 2.13 Environmental Comparison of Building Materials

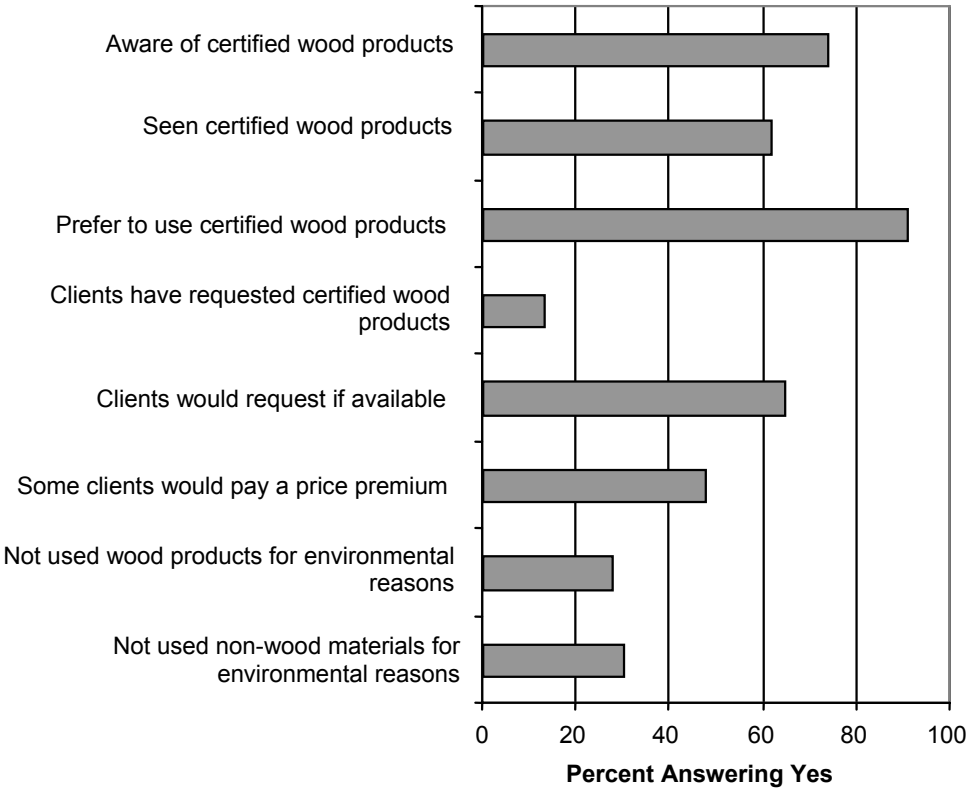


Perceptions of Environmentally Certified Wood Products

Related to the perceived environmental friendliness of wood are architects' knowledge about and attitudes towards environmentally certified wood products. Architects were asked to indicate their agreement with a number of statements about environmentally certified wood products by answering either 'yes ' or 'no' to each statement. The percentage of respondents answering yes to these statements is presented in Figure 2.14. A large number of the architects responding to this survey indicate that they are aware of certified wood products (74 percent), and that they have seen certified wood products in the marketplace (62 percent). Given the lack of certified wood products in the Australian market, it is not clear what products or type of certification they were referring to.

In terms of the potential for a market for certified wood products, 91 percent of respondents indicated that they personally would prefer to use certified wood products if available. The results also show that 65 percent of architects believe that their clients would request certified wood products if they were available, and 48 percent believe their clients would pay a price premium for certified wood products. However, only a small number (14 percent) indicate that clients have actually requested certified wood products. Architects were also asked if they have avoided wood or other materials for environmental reasons. Almost a third (30 percent) of architects has avoided non-wood building materials for environmental reasons, and 28 percent of architects indicate that they have not used wood products for environmental reasons.

Figure 2.14 Awareness and Attitudes toward Certified Wood Products



Although previous results indicate that architects perceive wood to be an environmentally friendly material, the responses to this question show that architects would still like some reassurance of the authenticity of any environmental claims made by wood products manufacturers. In addition, they believe their clients would request such products if they were readily available and some would pay a price premium for certified products. Thus, the forest industry is likely to find that forest certification will provide an important role in reassuring architects and their customers, and help to reposition wood in the marketplace.

Learning about Building Materials and Design

One objective of this study is to determine the most appropriate mechanisms for educating members of the building material supply chain about wood. As part of this objective, architects were asked where they received their training. From Table 2.6, the majority of respondents received their design education through some form of formal degree, particularly undergraduate (64 percent) and post-graduate (36 percent) qualifications.

Architects were also asked to indicate which of a number of information channels they use to learn about a new product, system or service. Along with indicating which of the channels they use, they were also asked to indicate which of the channels is most influential in getting them to try a new product (Table 2.7).

Table 2.6 Education Level of Respondents
(Number of Respondents, N=58)

University undergraduate degree	37
University post-graduate degree	21
College/TAFE diploma	7
Technical/trade qualification	0
Formal on-the-job or apprenticeship training	0
Continuing education	3
No formal training	1

Table 2.7 Communication Channels to Learn about Building Materials
(Number of Respondents, N=58)

Information Source	Number Using	Most Influential
Reading materials (trade magazines, textbooks, technical research, etc.)	47	33
Manual/Data Files (design manuals, code manuals, service manuals, construction data files, etc.)	46	14
Company-specific promotion (product manuals, information packages/updates, advertisements, etc.)	45	13
Word of Mouth (friends, peers, co-workers, clients, contactors, trades people, etc.)	39	21
Personal Promotion (personal sales calls and visits, customer service reps, company consultations, etc.)	34	12
Association (Industry-wide) promotion (newsletters, updates, mail-outs, etc.)	33	12
Continuing Education (information seminars, product seminars, short courses, guest speakers, etc.)	33	9
Physical Examples (demonstration buildings, new buildings, exhibits, trade shows, etc.)	33	20
Computerised Information (on-line databases, design software)	30	10

In Table 2.7, the most common ways that architects learn about new products is by using reading materials such as trade magazines, textbooks or technical research (81 percent), using design or service manuals (79 percent), and using company-specific promotion like product manuals or information packages (78 percent). Out of the different information channels, trade magazines, textbooks and technical research (57 percent), word of mouth (36 percent) and use of physical examples (34 percent) are the most influential ways of communicating with architects.

These results indicate that the most important channel for communicating with architects is through trade magazines, textbooks and technical research. This type of approach would have the advantage of insuring that architects are educated about the use of wood early in their design training through textbooks. It would also influence their perceptions, knowledge and experience of wood later in their design careers by

using other communication channels, particularly technical research materials that provide information on the use of wood in particular applications, and trade magazines with articles on new wood products or applications. Physical examples, such as demonstration buildings provided at exhibits or trade shows, could also be used to increase architects' experience with wood products.

Results of the Builder Survey

The results of the survey are presented under a number of headings that reflect particular areas of interest.

- Demographics
- Building Material Selection Criteria
- Comparison of Building Materials on Select Attributes
- Residential and Light Commercial Buildings
- Knowledge and Experience of Building Materials
- Perceived Impact of Building Materials Use on the Environment
- Perceptions of Environmentally Certified Wood Products
- Learning about Building Materials

Demographics

The individuals who responded to the survey were all male, ranging in age from 24 to 71 years old, with an average age of 49 years. Builders have been practicing on average 27 years, with a range of two to 48 years in practice. In addition, the majority of builders in the sample are self-employed (58 percent).

In terms of the size of the companies represented, builders fall mainly into two groupings, ranging from a billing level of $1,000,001 to over $5,000,000 (Table 2.8). In addition, builders range in size, in terms of number of employees, from 1 to 75 employees, with an average size of 21 employees.

Most respondents work on buildings in one of three states, Queensland, New South Wales, and Victoria (Table 2.9). Unfortunately, Tasmania, Northern Territory, and ACT are not well represented in the sample.

Table 2.8 Size of Organisation by Billings per year
(Number of Respondents, N=51)

Under $100,000	0
$100,000 to $500,000	1
$500,001 to $1,000,000	2
$1,000,001 to $5,000,000	16
Over $5,000,000	29
Do not know	0

Table 2.9 Geographic Distribution of Design Work
(Number of Respondents, N=51)

Queensland	14
New South Wales	21
Victoria	7
Tasmania	0
South Australia	3
Western Australia	6
Northern Territory	0
ACT	1

The majority of respondents received their building education through some form of diploma or trade qualification (Table 2.10), including a TAFE diploma (49 percent), technical or trade qualification (51 percent), or a formal on-the-job or apprenticeship programme (39 percent).

Table 2.10 Education Level of Respondents

(Number of Respondents, N=51)

University undergraduate degree	8
University post-graduate degree	8
College/TAFE diploma	25
Technical/trade qualification	26
Formal on-the-job or apprenticeship training	20
Continuing education	7
No formal training	0

Building Material Selection Criteria

An important objective of the study was to determine what criteria builders use when selecting building materials. Respondents were asked to indicate the importance of a number of building material selection criteria. Respondents' assessments are based on a five-point scale ranging from one, which means 'not at all important,' to five, which means 'extremely important'. As can be seen in Figure 2.14, overall, cost of installation, material availability, and material consistency and quality were ranked very important (mean score over 4.0).

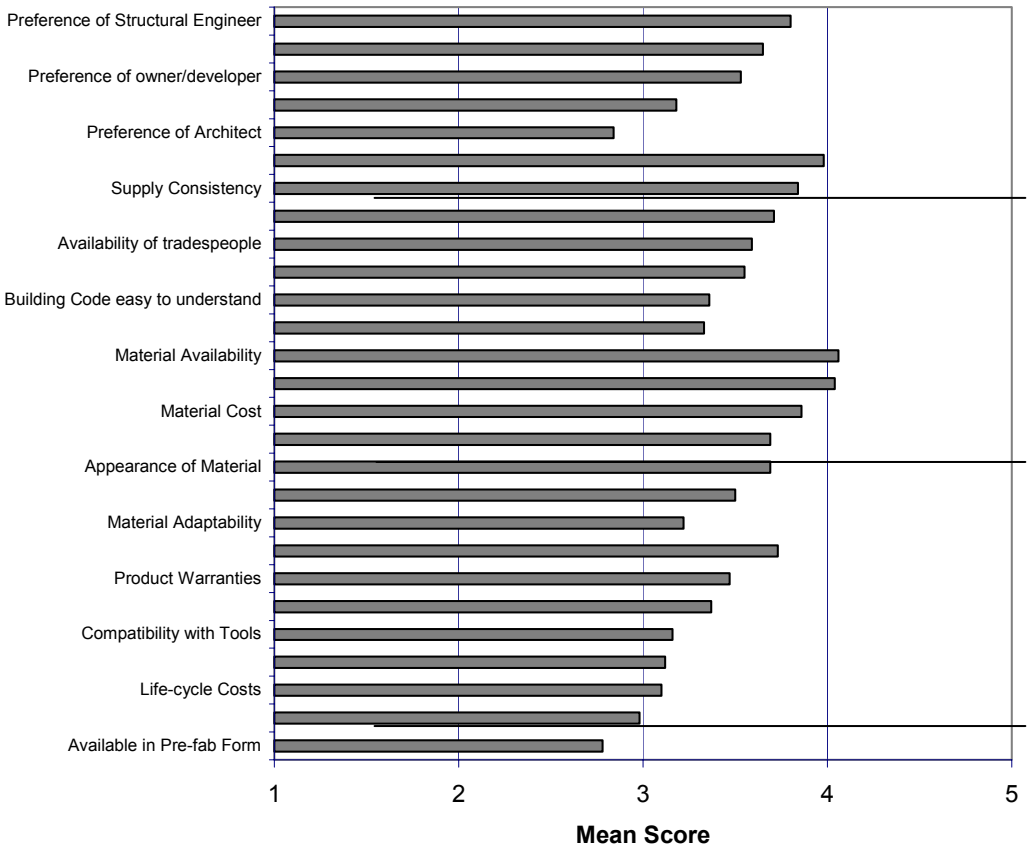
The criteria in Figure 2.14 can also be divided into four areas.

- Importance of decision makers on material selection
- Importance of installation, maintenance and repair attributes
- Specific building material characteristics
- General building material characteristics

Importance of Decision Makers

Builders were asked to indicate the importance of the preferences of a number of individuals involved in the design and building process, in terms of their influence on the selection of building materials. Builders rate the preference of the structural engineer as being the most important influence on the selection of building materials. Their own preference and the preference of the owner are felt to be the next most important influence on the selection of building materials.

Figure 2.14 Builder Building Material Selection Criteria



Installation, Maintenance and Repair

Builders were asked to rate the importance of a number of considerations related to the installation, maintenance and repair of building materials. Of these considerations, the cost to install the material was rated as the most important consideration by builders. The consistency of supply and the ease of installation were also rated as important considerations to builders in their selection of building materials.

Specific Building Material Characteristics

The next set of questions relate to the importance of specific building material characteristics when selecting materials. The availability of the material, and consistency and quality of the material were rated as the most important considerations in selecting building materials by builders, and these criteria were rated the most important issues of all those provided. The next most important consideration was the cost of the material.

General Building Material Characteristics

The next group of questions relate to a number of general characteristics of building materials and how they would fit into broader considerations. Overall, these considerations are evaluated as being less important to builders. From this list, the record of the material was rated as the most important to builders. Product warranty and the builder's experience with the material were the next most important factors

The results in Figure 2.14 indicate that builders are most concerned with more practical considerations, or those that impact on their ability to carry out the building job. For instance, they want to be assured that the material will be available when it is needed and that the supply will be consistent. Thus, builders want to be assured that the building material has a well-developed supply chain before they are likely to adopt and use a material. Builders are also concerned about the quality and consistency of the material and that the material is proven to perform in the intended application. Thus, builders may be hesitant to try new materials or change what they are using until they are sure the material is not going to fail. As might be expected, cost considerations are also crucial to builders.

In order to determine whether builders and architects differ in terms of the importance of these selection criteria, a one-way analysis of variance (ANOVA) was used to examine the differences in the mean responses to the questions in Figures 2.1 and 2.14. Table 2.11 provides the mean value for both architects and builders on the selection criteria used in both surveys, and statistical significance.

Table 2.11 shows that architects and builders differ on a few important considerations when selecting materials for the buildings they design or build. First, architects and builders have different points of view on whose preference should be considered relevant to the selection process. Architects see their own preference as being a key consideration, whereas builders believe their own preference and the preference of the structural engineer are important when selecting building materials.

As might be anticipated, builders are more concerned about the ease of installation of the material than architects. Architects consider the appearance of the material to be a critical issue; however it is a less important consideration to builders. In addition, architects perceive the life-cycle costs of using the material to be more relevant than do builders. Finally, architects evaluate environmental considerations to be a more important consideration when selecting building materials than do builders.

These results indicate that the communication approach used for architects and builders should differ. For architects, the wood products industry should appeal to their role and importance in the design process and stress such factors as the appearance of the material, the overall life-cycle costs, and the impact of the material on the environment. However, for builders they want to be assured that the material has the acceptance of the structural engineer, and that the material will be easy to install, along with the other attributes that have been discussed earlier. Thus, if new materials are being introduced to the marketplace, the wood products industry needs to provide information and training for builders on how a material is used and installed.

Table 2.11 Builders and Architects Building Material Selection Criteria

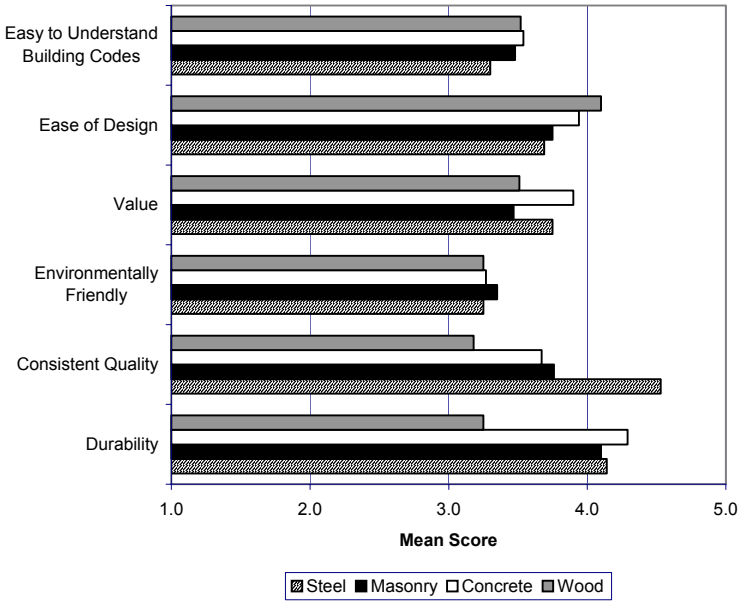
Consideration	Mean Response Architects (N=58)	Builders (N=51)	F-statistic
Preference of architect	4.18	2.84	40.04***
Preference of structural engineer	3.40	3.80	5.09*
Preference of owner/developer	3.35	3.53	.78
Preference of contractor	2.63	3.18	10.50
Preference of builder	2.75	3.65	24.66***
Availability of Tradespeople	3.32	3.59	1.85
Cost of installation	3.78	3.98	1.81
Ease of modification	3.05	3.33	2.55
Ease of installation	3.26	3.71	8.79**
Supply consistency	3.56	3.84	2.74
Cost of maintenance and repair	3.53	3.55	.015
Building codes easy to understand	3.25	3.37	.41
Material availability	3.76	4.06	3.58
Material adaptability	3.09	3.22	.48
Material cost	3.59	3.86	2.64
Appearance of material	4.24	3.69	11.84***
Safety of material	3.79	3.69	.35
Material consistency & quality	3.93	4.04	.52
Material strength	3.39	3.50	.52
Life-cycle costs	3.57	3.09	5.16*
Fire performance rating	3.38	3.12	2.25
Product Warranties	3.69	3.47	1.64
Proven record of material	3.84	3.73	.69
Experience with material	3.36	3.37	.01
Environmental considerations	3.57	2.98	8.73**

* Significant at α = .05; ** Significant at α = .01, Significant at α = .001.

Comparison of Building Materials Attributes

In order to determine how wood compares to other potential or competitive building materials, respondents were asked to rate different building materials on six key parameters or attributes. Respondents were asked to indicate whether they believe the material possessed an attribute on a scale of 1 to 5 where 1 means the material possesses the attribute 'not at all', and 5 means the material possesses the attribute 'to a high degree'.

Figure 2.15 Building Material Attributes



In Figure 2.15, wood is rated as the least durable of the four building materials, with concrete being perceived as the most durable. However, wood is perceived by builders to be slightly easier to incorporate into design than the other materials. In terms of ability to understand building codes, there are no real differences between materials. Steel is perceived by builders to provide the most consistent quality of the four materials, and wood is perceived as providing the least consistency in terms of quality. In terms of environmental impact, builders do not believe there is a difference between the four materials. Finally, in terms of value, defined as performance relative to cost, all materials are considered to be similar.

To position wood relative to these three building materials, these results suggest that the industry needs to focus on builders' perceptions of the durability and quality of wood. Builders need to be educated regarding the building applications that wood is most appropriately used in order that it is considered as durable as concrete or steel. In addition, the industry may need to focus on increasing the consistency of quality of wood in order to change builders' perceptions of this attribute, especially since this was shown to be an important attribute to builders.

In order to determine whether builders and architects differ in terms of their evaluation of these materials, a one-way analysis of variance (ANOVA) was used to examine the differences in the mean responses to these questions. As shown in Table 2.12, very few statistically significant differences were found. The one parameter where relevant differences were found was environmental friendliness, where architects believe wood is more environmentally friendly than other building materials, while builders see wood as being the same.

Table 2.12 Architect and Builder Environmental Friendliness Perceptions

	Mean Response		F-statistic
	Architects (N=58)	Builders (N=51)	
Steel	3.11	3.25	.57
Wood	3.88	3.25	8.26**
Concrete	3.19	3.27	.23
Masonry	3.25	3.35	.44

* Significant at α = .05; ** Significant at α = .01, Significant at α = .001.

Evaluation of Wood as a Building Material

Builders were asked a series of questions specifically related to wood as a building material. They were first asked to indicate their agreement with a series of statements related to buildings made primarily of wood, with a rating of 1 indicating they 'strongly disagreed' through to 5 meaning they 'strongly agreed' with the statement (Figure 2.16).

Figure 2.16 Buildings Made of Wood are …

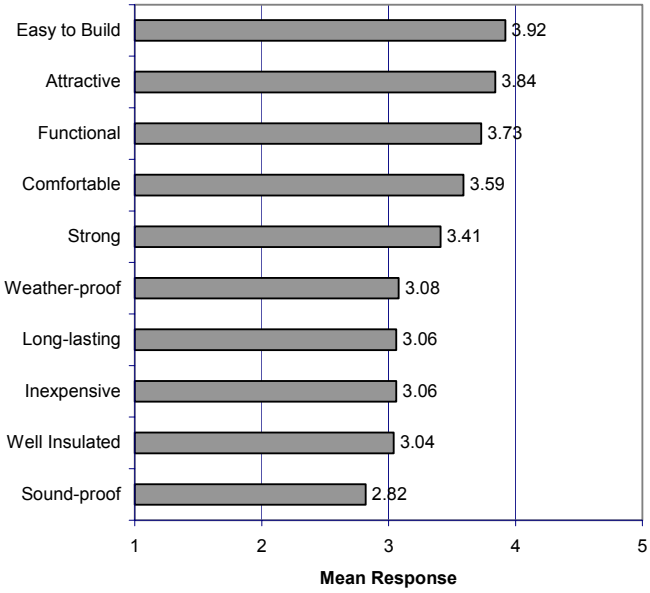


Figure 2.16 shows that builders agree that buildings constructed of wood are easy to build, attractive, functional and comfortable. Builders are neutral about the remaining statements. Next, builders were asked their perceptions about building with wood. Respondents were asked to evaluate their beliefs on a 5-point scale from 1 meaning 'not at all' to 5 meaning 'to a high degree'. In Figure 2.17, respondents indicate a positive perception that building with wood is simple, gratifying and fast.

The next group of questions in this section queried respondents on the ease of building with wood. Again respondents were asked to indicate their beliefs from 1 meaning 'not at all' to 5 meaning 'a high degree.' Figure 2.18 indicates that builders feel it is easy to join wooden structural components. In addition, they feel at ease in their understanding of building codes related to wood and undertaking design calculations

when using wood. However, they do not believe it is easy to control rotting and pest damage when using wood.

Figure 2.17 Building with wood is …

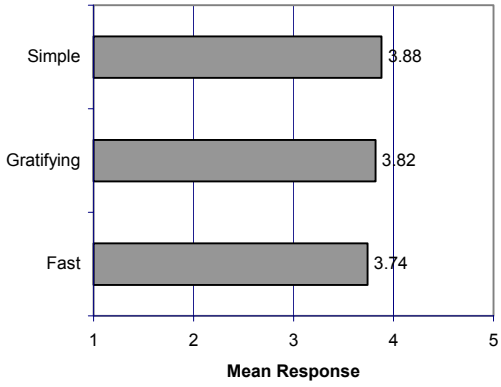
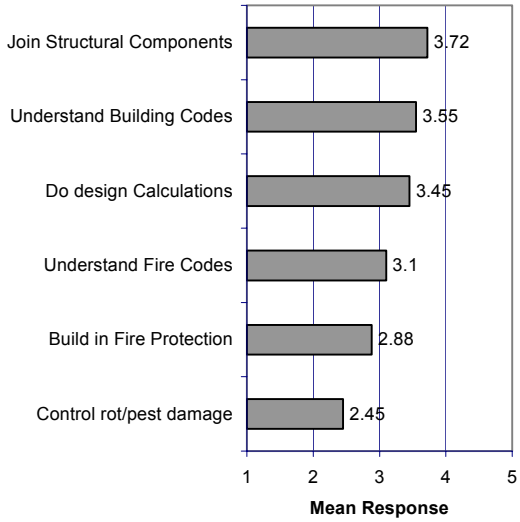


Figure 2.18 When Building with Wood it is Easy to …



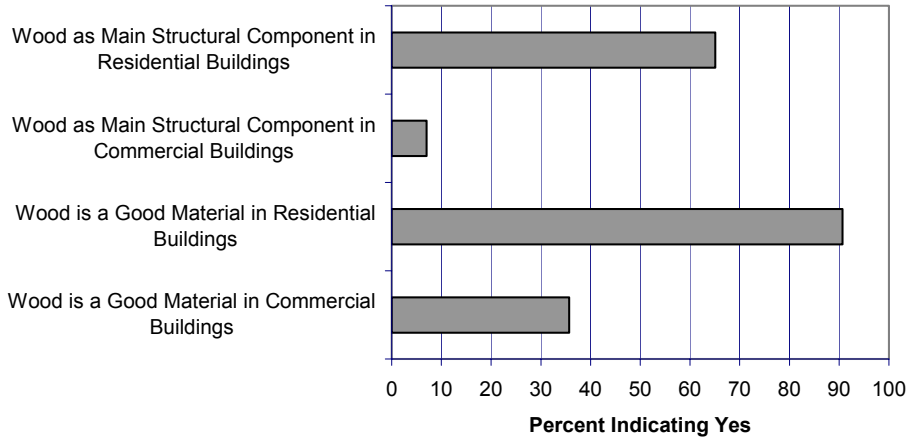
In order to position wood and improve its acceptability by builders, the results in Figures 2.16, 2.17 and 2.18 suggest a number of marketing implications. In order to capitalise on builders' positive perceptions of wood, the wood products industry may want to stress the feeling that wood is easy to use – in terms of a building material that is simple to use, fast and gratifying to work with. However, in order to increase the acceptability of wood it may be important to change the neutral feeling builders have about buildings constructed of wood – soundproof, well insulated, long lasting, understanding of fire codes, building in fire protection or controlling rot and pests when using wood. Thus, it may be necessary to develop educational promotion in order to increase builders' knowledge in these areas, which exhibited neutral feeling or perceptions

Residential and Light Commercial Buildings

The next series of questions in the survey related to residential and light commercial buildings that are two stories or less, or less than 1000 m^2 in area. If the respondents' building work was devoted entirely to other types of structures, they were asked to skip this section of the survey.

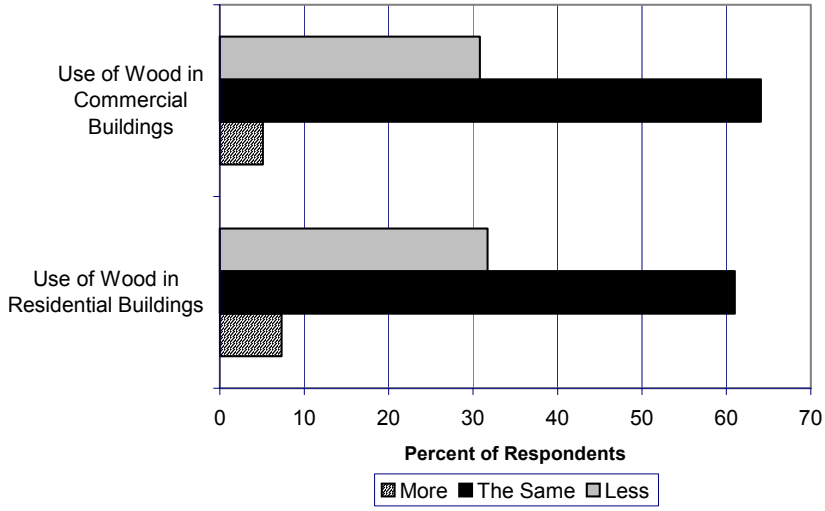
Firstly, respondents were asked to describe their use of wood in residential and light commercial buildings by answering 'yes' or 'no' to a number of questions. Figure 2.19 shows that over 65 percent respondents presently build residential buildings using wood as the main structural component. However, only 7 percent of respondents use wood as the main structural component in light commercial buildings. Respondents were also asked to indicate whether they believe wood is a good material for use in these applications. As is shown in Figure 2.19, over 90 percent of builders felt wood was a good structural material for residential buildings, but only 36 percent felt it was appropriate as a structural material in light commercial buildings.

Figure 2.19 Use of Wood in Residential and Light Commercial Buildings



Secondly, respondents were asked to indicate their future use of wood in these two applications (Figure 2.20) by indicating whether they planned to use more, less or the same amount of wood in the future.

Figure 2.20 Future Use of Wood in Residential and Light Commercial Buildings



For residential buildings, the majority of respondents (61 percent) intend to use the same amount of wood in the future (Figure 2.20). Significantly, a substantial number of builders (32 percent) intend to use less wood for residential construction in the future. For light commercial buildings, a majority of respondents (64 percent) do not intend on changing their use of wood in the future. However, as with residential, a large number of builders (31 percent) intend to use less wood in light commercial buildings in the future.

These results contrast with the expected increase in use of wood by architects and reveal an important issue for the wood products industry. Although wood is heavily used as the main structural component in residential buildings, and the vast majority of respondents feel very positive about the use of wood in this application, a large number of builders intend to decrease their use of wood. The wood products industry needs to build on the positive opinion about wood in residential construction and ensure that the

intended reduction in wood use does not eventuate. In the light commercial sector, an opportunity exists for increasing the use of wood, given the difference between the number of builders who use wood in light commercial construction and the number who think it is suitable for use, but the wood products industry will have to understand the perceptions of and overcome the intention of builders to reduce the use of wood.

In order to determine the specific uses of wood in residential and light commercial buildings, builders were asked to indicate what material they most frequently used across a number of building applications (e.g. roof systems, floor systems, wall systems). To provide a perspective on how material use may have changed, respondents were asked to indicate material most likely to be used five years ago and the material most likely to be used today. Table 2.13 shows the number of builders using each material, today and five years ago, for residential buildings.

Table 2.13 Building Material Use in Residential Buildings
(Number of Respondents)

	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof system	12	23	7	7	33	24	5	2	0	3
Floor system	2	5	22	25	24	21	3	0	0	3
Exterior wall system	6	10	1	6	15	11	34	30	0	3
Interior partition	4	13	1	4	36	28	7	6	0	3
Exterior Cladding	8	11	1	5	14	7	27	28	1	3
Interior trim/detail	1	4	0	2	41	35	3	1	2	7

Based on Table 2.13, for roof systems, wood and steel are most likely to be chosen. However, steel has shown a substantial increase in the number of builders choosing it for roof systems, while wood has decreased. For floor systems, concrete and wood are most likely to be used. There is a continued slow shift from wood to concrete floor systems.

Masonry was the most common building material for exterior wall systems. However, the number of builders using masonry in exterior wall systems has slightly decreased, while the use of steel and concrete has increased. Wood is most likely to be chosen by builders for interior partitions, however wood is being less frequently used over the last five years and the frequency of steel use has increased. A number of different materials are used for exterior cladding, including steel, wood, and most importantly, masonry. Builders are increasingly selecting steel and concrete, whereas wood has lost ground in the past five years. Finally, wood is the most frequently used material for interior trim, both five years ago and today, but its use has decreased over the past five years and the use of plastic has increased.

Table 2.14 provides information on building material use in commercial buildings. Steel is the most frequently used material for roof systems. Concrete is the predominant material for floor systems. Masonry was the most likely material to be selected for exterior wall systems, but a large number of builders are also selecting concrete in this application. For interior partitions, there has been a rapid increase in the use of steel over the past 5 years and a corresponding decrease in the use of wood. Steel is now the material most likely to be selected by builders for interior wall partitions. Steel and

masonry are the materials most frequently used for exterior cladding, with growth in the use of steel and concrete. Wood is the material most frequently chosen for interior trim applications, however the use of plastic is increasing.

Table 2.14 Building Material Use in Commercial Buildings
(Number of Respondents)

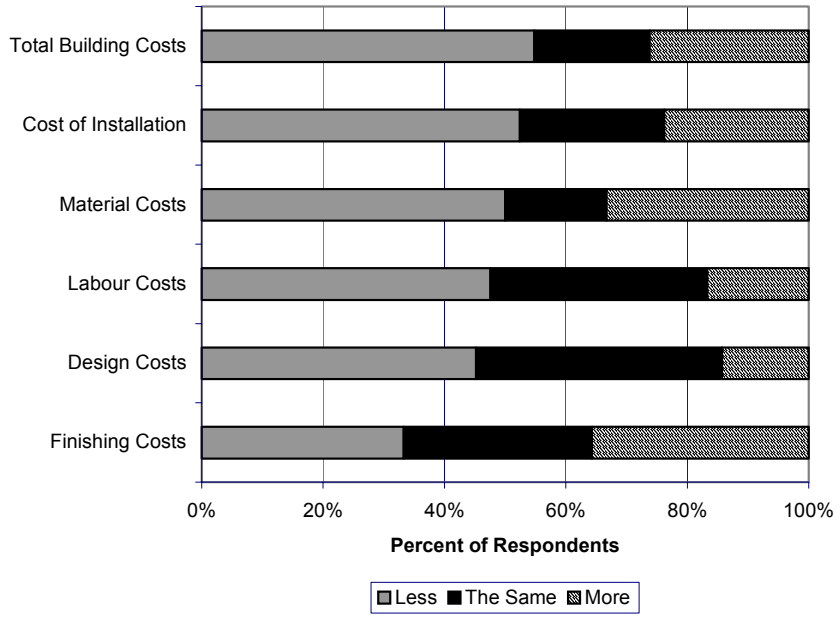
	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof system	31	33	3	6	5	3	2	1	0	3
Floor system	4	6	27	31	7	4	4	1	0	3
Exterior wall system	8	10	6	12	6	1	22	21	0	4
Interior partition	11	22	0	3	19	10	11	6	0	3
Exterior Cladding	14	18	6	11	8	5	20	18	0	4
Interior trim/detail	1	5	0	3	31	28	2	1	2	7

These results indicate that over the past five years the use of wood by builders for residential buildings has decreased for all the applications considered. At the same time, the use of steel has increased for all applications and the use of concrete has increased for five of the six applications. In addition, many builders (32 percent) indicate that their future use of wood (Figure 2.20) will decrease, with only 6 percent indicating they will use more wood. Thus, unless the wood products industry focuses on repositioning wood relative to these materials, it is likely that it will lose market share in the residential building market.

For commercial buildings, the same trend is occurring as for residential buildings, with wood use decreasing over the past five years and steel and concrete use increasing. In addition, only 5 percent of builders indicate that they are likely to use more wood in commercial applications in the future and 31 percent indicate that they will use less wood (Figure 2.20). Thus, unless the industry takes action, it is likely that wood will continue to lose ground against steel and concrete in commercial construction.

In order to determine some of the reasons why the use of wood in residential and light commercial buildings is changing, respondents were asked to evaluate wood relative to other materials, such as steel, concrete, masonry, and plastic, across a range of factors. For a number of different factors, respondents were asked to indicate the relative position of wood as being either ‘more’, ‘less,’ or ‘the same’ when compared to other materials in residential and light commercial buildings. The questions are grouped into cost (Figure 2.21) and labour (Figure 2.22) considerations.

Figure 2.21 Wood Cost Compared to Other Materials



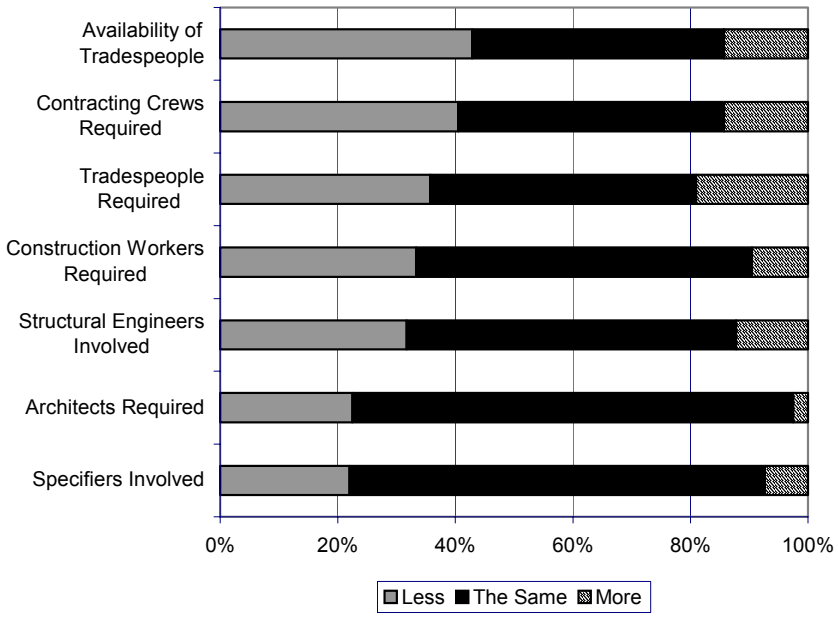
In Figure 2.21, wood ranks very well on cost parameters. The greatest advantages for wood are in terms of total building cost, installation cost and material cost. For total building costs, 55 percent of respondents believe costs are less with wood and 20 percent believe costs are the same as for other materials. For installation costs, 52 percent of respondents believe the costs are less with wood, and 25 percent believe costs are the same as for other materials. For material cost, 50 percent of respondents believe wood is less costly than other materials and 17 percent believe it has the same cost.

The main area where wood's advantage declines in cost terms is in finishing costs where 36 percent of builders feel the costs are greater for finishing wood than other materials. However, the majority of builders feel finishing costs are either less than (33 percent) or the same (31 percent) as other materials. Generally, these results suggest that cost considerations are not influencing builders to turn their attention to other building materials.

Figure 2.22 shows respondents' rankings for about labour inputs when using wood compared to other materials. Generally, labour requirements are similar to other materials or less. However, 43 percent of respondents believe the availability of skilled trades people will be less for wood when compared to other materials.

Again, these results suggest that labour considerations do not appear to be a major disadvantage of using wood compared to other materials. However, the one area of concern for builders is that there may not be available the skilled trades people in the use of wood. This was shown to be an important decision criterion in earlier results. Thus, along with educating builders on the use of wood, it may also be necessary for the wood products industry to focus their educational efforts on developing skilled trades people.

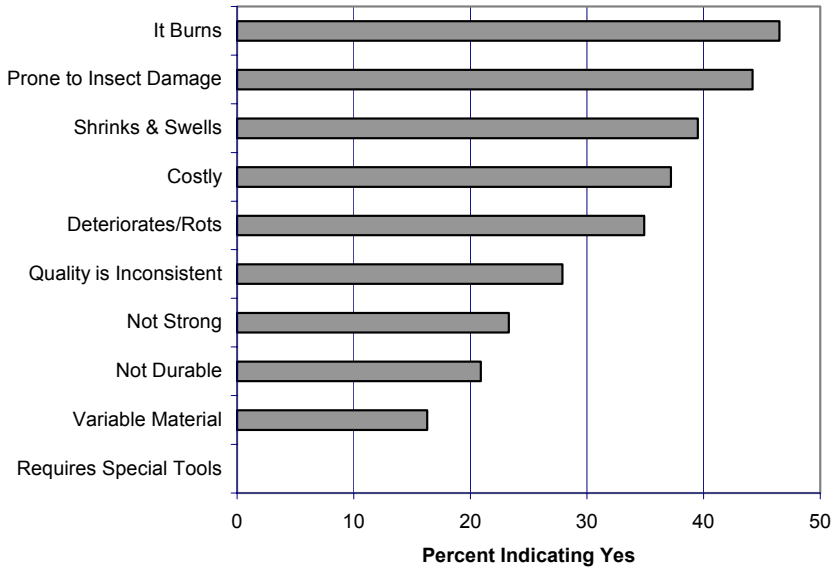
Figure 2.22 Labour Inputs of Wood Relative to Other Materials



Builders were also asked specific questions about why wood is not regularly used in commercial design and were asked to indicate what they believe to be the three greatest drawbacks to using wood in commercial applications. As can be seen in Figure 2.23, the fact that wood burns was indicated by the greatest number of builders (47 percent) as a drawback to its use in commercial applications. In addition, being prone to insect damage (44 percent), shrinking and swelling (40 percent), and deterioration or rot (35 percent) were indicated as drawbacks to using wood in commercial applications. Although somewhat inconsistent with earlier results, a number of builders (37 percent) perceived cost to be a drawback to using wood. None of the respondents believed the need for specialised tools was a drawback to the use of wood.

These results are consistent with earlier findings that indicate that builders do not believe it is easy to protect wood against fire damage, protect against fungal and insect damage, or control its dimensions for shrinkage and swelling. These could be impediments to wood being used by builders in commercial applications. These could be important areas for the wood products industry to focus on in order to stop the potential decline in use of wood. The industry needs to focus on improving wood's performance on these parameters, but also improving builders' perceptions of wood's performance on these parameters through education and promotion.

Figure 2.23 Reasons Why Wood is not Used Regularly in Commercial Applications



Knowledge and Experience of Building Materials

The next group of questions asked respondents to rate their level of knowledge and experience with a number of building materials. Ratings were based on a 4-point scale where 1 means 'not at all knowledgeable about or experienced with this product,' 2 means 'not very knowledgeable about or experienced with this product', 3 means 'somewhat knowledgeable about or experienced with this product', and 4 means 'very knowledgeable about or experienced with this product' (Figure 2.24).

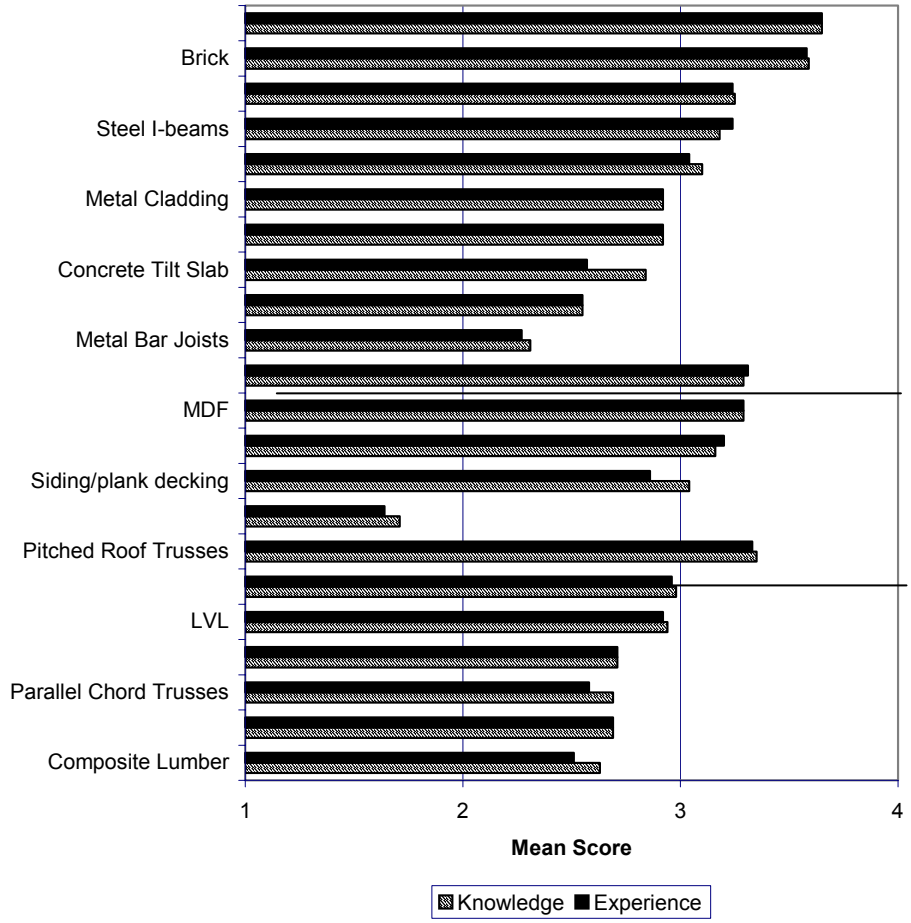
The building materials in Figure 2.24 can be separated into three groups.

- Non-wood materials
- Wooden non-structural materials
- Wooden structural materials

The first group in Figure 2.24, covering non-wood materials, shows that the level of knowledge and experience with some materials, such as concrete slab, brick, concrete block, steel I-beams and steel studs, is fairly high. However, builders are less familiar with many of these materials than architects (Figure 2.11).

For the second group of materials, wooden non-structural materials, respondents again report high levels of knowledge and experience for all materials except for oriented strand board (OSB). In the third group, wooden structural materials, other than for pitched roof trusses, respondents' knowledge and experience is generally lower than for the other groups of materials. What this shows is that builders are less familiar with emerging engineered wood products that have greatest potential to maintain or expand the use of wood products in the building industry. However, builders are generally more aware of or experienced with wooden structural materials than architects.

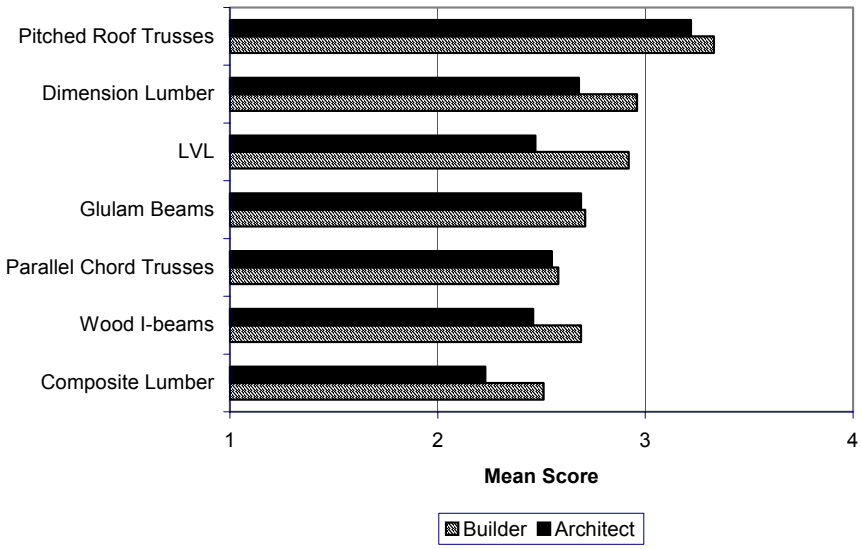
Figure 2.24 Knowledge and Experience of Wooden Structural Materials



As can be seen Figure 2.25, builders have generally had more experience across a range of wood-based structural materials, although for both groups, the level of experience is not high. These results reinforce the observation that the transfer of information about wooden structural systems is not occurring as fast or as well as for other building materials. However fast the transfer is occurring, it is also occurring faster among builders than among architects.

This indicates the need to incorporate training on wood products and systems for both builders and architects into promotional material. As was mentioned earlier, this could be as part of formal education programmes, as well as sales presentations, trade shows, and exhibits which could be used to expose builders to both new and existing wood products. This would increase builder knowledge and in turn experience of structural uses of wood.

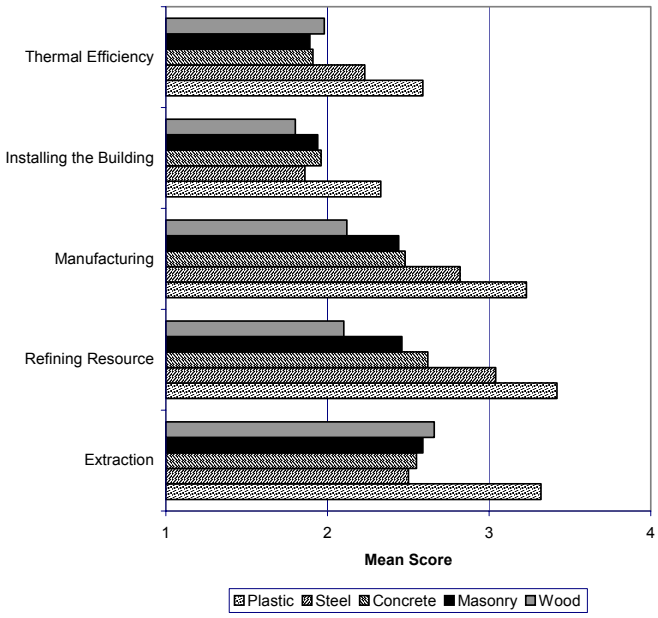
Figure 2.25 Architect and Builder Experience with Wooden Structural Materials



Perceived Impact of Building Materials Use on the Environment

Builders were asked to rate steel, concrete, wood, masonry and plastic on a number of parameters according to how harmful they felt the materials were to the environment. Each environmental parameter had five choices; ranging from having never thought about the issue, to it being very harmful. The means responses of those who had thought about the issue are shown in Figure 2.26, with 1 meaning 'completely harmless', 2 meaning 'harmless', 3 meaning harmful, and 4 meaning 'very harmful'.

Figure 2.26 Environmental Effects of Building Materials



Wood rates well relative to other building materials on the environmental parameters used in the question. Wood is generally perceived to be harmless and as being the

least environmentally harmful in three of the five environmental parameters (thermal efficiency, installing the building and manufacturing). However, wood does not rate as well in builders' perceptions of the environmental impact of the extraction process for wood.

In addition to the relative scores in Figure 2.26, respondents were also asked to rank the same five building materials on their ability to be recycled, the energy efficiency of buildings made from the material, and the overall environmental friendliness of the material. In this question, a score of one means that the material was ranked lowest in that particular environmental parameter and five meant the material was ranked highest. Figure 2.27 provides the mean response for these three environmental parameters for each material.

Figure 2.27 Environmental Comparison of Building Materials

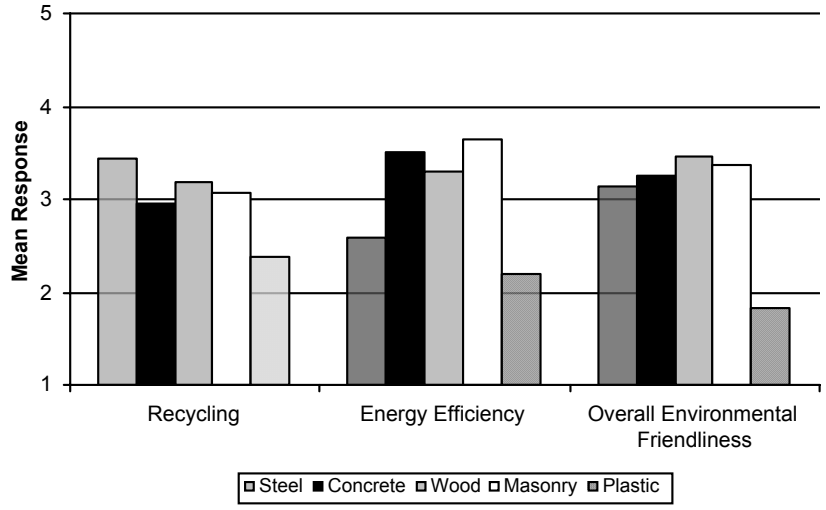


Figure 2.27 shows that builders see wood as similar to other materials in terms of being recyclable by builders, with steel being seen as more environmentally friendly on this parameter. Buildings constructed of masonry and concrete are believed by builders to have similar energy efficiency to those constructed of wood. Finally, in terms of overall environmental friendliness, wood is ranked highest, although very similar to a number of other materials.

Although wood ranks well in terms of builders' perceptions of the relative environmental friendliness of wood, this may not be an area where the wood products industry seeks to differentiate wood for builders. Earlier results showed that builders rated environmental considerations (Figure 2.14) to be one of the least important selection criteria for building materials. Thus, although wood ranks well here, it is an area of low significance to builders when they are deciding on which materials to use.

The results show that architects and builders differ on their perceptions of the environmental friendliness of wood, with architects indicating they believe wood is more environmentally friendly than builders. In order to determine where each group might perceive a difference in environmental performance, a one-way analysis of variance was done for the mean responses in Figures 2.12, 2.13, 2.26 and 2.27. The results of this analysis are shown in Table 2.15.

Table 2.15 Architect and Builder Perceptions of Environmental Performance of Building Materials

		Mean Response					Mean Response		
		Architects (N=58)	Builders (N=51)	F-statistic			Architects (N=58)	Builders (N=51)	F-statistic
Extracting the Raw Resource	steel	2.84	2.50	5.64*	Thermal Efficiency of the Building	steel	2.62	2.23	5.20*
	concrete	3.65	2.55	81.25***		concrete	2.13	1.91	4.46*
	wood	2.78	2.66	0.52		wood	2.04	1.98	0.19
	masonry	2.67	2.59	0.29		masonry	2.15	1.89	5.50*
	plastic	2.62	3.32	29.74***		plastic	2.89	2.59	3.28
Refining the Raw Resource	steel	3.33	3.04	4.24*	Recycling of Material	steel	3.61	3.39	0.73
	concrete	2.88	2.62	3.73		concrete	2.61	2.96	1.9
	wood	2.28	2.10	1.99		wood	3.58	3.18	1.95
	masonry	2.76	2.46	4.87*		masonry	2.79	3.06	1.51
	plastic	3.64	3.42	3.12		plastic	2.21	2.38	0.36
Building Material Production	steel	3.04	2.82	2.52	Energy Efficiency of Building Made from Materials	steel	2.61	2.58	0.01
	concrete	2.64	2.48	1.85		concrete	3.59	3.50	0.19
	wood	2.12	2.12	0.01		wood	3.63	3.29	2.17
	masonry	2.64	2.44	3.04		masonry	3.71	3.64	0.14
	plastic	3.42	3.23	2.32		plastic	1.85	2.19	1.61
Installing the Building	steel	2.13	1.86	6.84**	Overall Environ-mental Friendliness	steel	2.96	3.14	0.72
	concrete	2.32	1.96	10.68***		concrete	3.09	3.26	0.92
	wood	1.95	1.80	1.97		wood	4.04	3.45	5.58*
	masonry	2.16	1.94	4.17*		masonry	3.16	3.36	1.48
	plastic	2.55	2.33	2.74		plastic	1.74	1.82	0.11

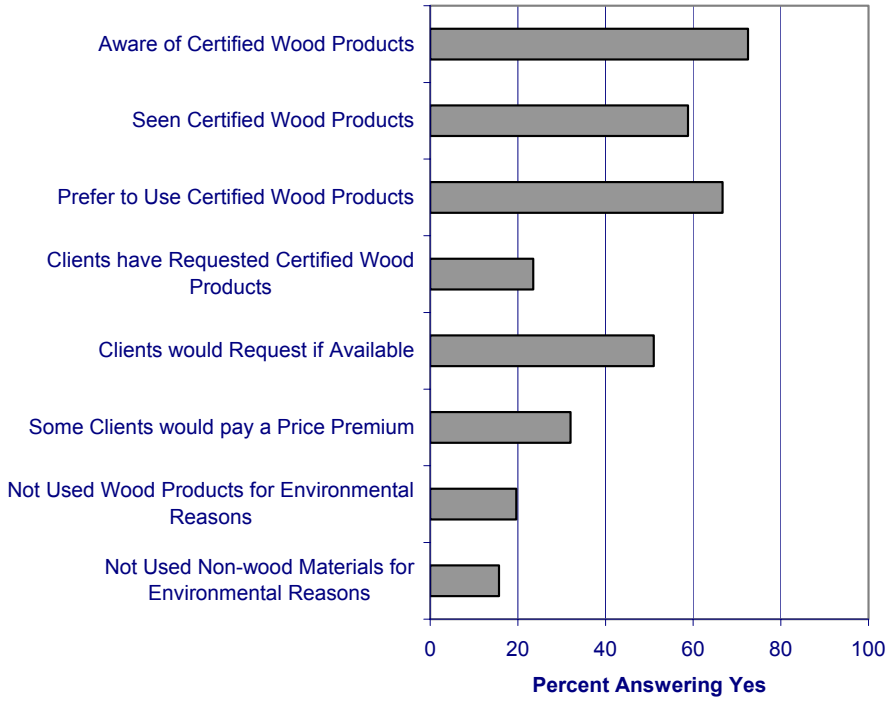
Table 2.15 shows that there are a number of areas where architects and builders differ. Architects perceive that when extracting the raw resource, steel and concrete are more harmful to the environment, and builders perceive that plastic is more harmful to the environment. Architects perceive that steel and masonry are more harmful to the environment when refining the raw resource than builders. Architects also believe that steel, concrete, and masonry are more harmful to the environment when installing a building. Architects perceive steel, concrete, and masonry as more harmful to the environment than builders when considering thermal efficiency of a building made from those materials.

Finally, in terms of overall environmental friendliness, architects feel that wood is more environmentally friendly than do builders. This analysis, however, has found that there are no statistically significant differences between architects' and builders' perceptions of wood on these environmental parameters.

Perceptions of Environmentally Certified Wood Products

Related to the perceived environmental friendliness of wood are builders' knowledge and attitudes towards environmentally certified wood products. Builders were asked to indicate their agreement with a number of statements about environmentally certified wood products by answering either a 'yes' or 'no' to each statement. The percentages of respondents answering yes to these statements are presented in Figure 2.28.

Figure 2.28 Awareness of and Attitudes toward Certified Wood Products



A large number of builders (73 percent) indicate that they are aware of certified wood products, and that they have seen certified wood products in the marketplace (59 percent). Similar to the response of architects, given the lack of certified wood products in the Australian market, it is not clear what products or type of certification they were referring to. In terms of a potential for a market for certified wood products, 67 percent of respondents indicate that they personally would prefer to use certified wood products if available.

The results also show that 51 percent of builders believe that their clients would request certified wood products if they were available, and 32 percent believe their clients would pay a price premium for certified wood products. However, only a small number (24 percent) indicate that clients have actually requested certified wood products. Builders were also asked if they have avoided wood or other materials for environmental reasons. Only 20 percent of builders have avoided wood for environmental reasons and a similar number (16 percent) have avoided non-wood building materials for environmental reasons.

Given that environmental considerations are relatively unimportant to builders, it is unlikely that providing them with environmentally certified wood products would increase their use of wood. Even though they indicate here that they would feel more comfortable using certified wood products, it is not a determinant attribute for them and other considerations are more relevant, as discussed earlier. However, if certification has been undertaken to meet the needs of other market segments, the results here show that builders would pick up these products in preference to non-certified products.

Learning about Building Materials

An important objective of this study is to determine the most appropriate mechanisms for educating members of the building material supply chain about wood. As part of this objective, builders were asked to indicate which information sources or channels

they use to gain information about a new product, system or service. Along with indicating which of the channels they use, they were also asked to indicate which of the channels is most influential in getting them to try a new product (Table 2.16).

Table 2.16 Communication Channels to Learn about Building Materials
(Number of Respondents, N=)

	You Use	Most Influential
Reading materials (trade magazines, textbooks, technical research, etc.)	40	24
Manual/Data Files (design manuals, code manuals, service manuals, construction data files, etc.)	33	13
Company-specific promotion (product manuals, information packages/updates, advertisements, etc.)	29	16
Association (Industry-wide) promotion (newsletters, updates, mail-outs, etc.)	30	14
Personal Promotion (personal sales calls and visits, customer service reps, company consultations, etc.)	27	13
Continuing Education (information seminars, product seminars, short courses, guest speakers, etc.)	23	9
Word of Mouth (friends, peers, co-workers, clients, contactors, trades people, etc.)	32	16
Physical Examples (demonstration buildings, new buildings, exhibits, trade shows, etc.)	26	21
Computerised Information (on-line databases, design software)	18	11

In Table 2.16, builder's sources of information are similar to those of architects. The most common source of information about new products or services for builders is reading trade magazines, textbooks and technical research. In addition, manuals or data files, word of mouth from friends, peers, or co-workers, promotion by an industry association, and company specific promotion are common sources of information. In terms of the communication channel that is the most influential in terms of getting builders to try a new product or service, reading materials are the most influential source of information. In addition, builders consider physical examples of products, such as demonstration buildings, exhibits or trade shows to be influential in getting them to try new products.

It has been suggested earlier that there is a need to educate builders in a number of areas, such as the appropriate use of wood, fire codes, or how to increase the durability of wood in certain applications. It may be possible to influence builders' perceptions, knowledge and experience of wood by using a number of communication channels. Given the results here, they could be provided with technical research materials that have information and instructions on the use of wood in particular applications. The wood products industry could also use articles in trade magazines to educate builders on new wood products. It is also important to use physical examples, such as demonstration buildings, to increase builders' experience with wood products. Builders also indicate they are influenced by company specific promotion, and this should also be used to communicate with builders.

Results of the Building Products Retailer Survey

The results of the building products retailer survey are presented under a number of headings that reflect particular areas of interest.

- Demographics
- Choice of building materials to stock
- Relative performance of building materials
- Use of building materials
- Environmental attributes of building materials

Demographics

The 36 respondents to the survey covered a range of retail systems. In Table 2.17, the most common form of retail system for respondents was an independent store (83 percent). The mean annual sales of building material suppliers were $66 million.

Table 2.17 Retail System
(Number of Respondents)

Independent Store	30
Corporate Chain	2
Franchise	4

Table 2.18 Size by Annual Sales

Mean	$66,000,000
25 percentile	<$1,000,000
50 percentile	<$3,600,000
75 percentile	<$12,500,000

However, from Table 2.18, 25 percent of respondents had annual sales of $1,000,000 or less, 50 percent with $3,6000,000 or less, and 75 percent with $12,500,000 or less. The reason for the high mean sales was the very high annual sales of some respondents. The lowest annual turnover by a franchise or corporate chain was $5 million. Respondents cover all parts of Australia (Table 2.19).

Table 2.19 Location of Retailers
(Number of respondents)

Queensland	10
New South Wales/ACT	15
Victoria	9
Tasmania	1
South Australia	3
Western Australia	4
Northern Territory	1

Respondents were also asked about the markets currently being served by their stores. The particular areas of interest were the split between trade and do-it-yourself (DIY) customers, and the population covered by a store. In Table 2.20, on average 28 percent of sales were to DIY customers and 72 percent to trade customers.

Table 2.20 also shows that 25 percent of respondents had less than 7 percent of their sales to DIY customers. Sales to trade customers however were 50 percent or less for the 25 percent of the sample with the lowest sales to trade customers. These results

show that trade sales should be a significant factor in determining what is stocked by building products suppliers.

Table 2.20 Customer Split
(n=36)

	DIY	Trade
Mean %	28%	72%
25 percentile	7%	50%
50 percentile	20%	75%
75 percentile	40%	90%

Table 2.21 Market Size
(Number of Respondents)

Under 10,000	4
10,000 to 50,000	10
50,001 to 100,000	4
100,001 to 500,000	9
Over 500,000	7
Do not know	2

Market size, as measured by population served by building materials suppliers, is shown in Table 2.21. For independent stores and franchises, population is determined by the area served by the particular store. For building supply chains, population is the minimum target population for a store. Table 2.21 shows that respondents cover a range of market sizes.

Choice of Building Materials to Stock

An important objective of this study was to determine respondents' opinions about factors that could be important in determining which building materials they chose. Figure 2.30 shows the mean responses for the importance of a range of factors. Importance was measured on a five-point scale where 1 means 'not at all important', 3 means 'important', and 5 means 'extremely important'.

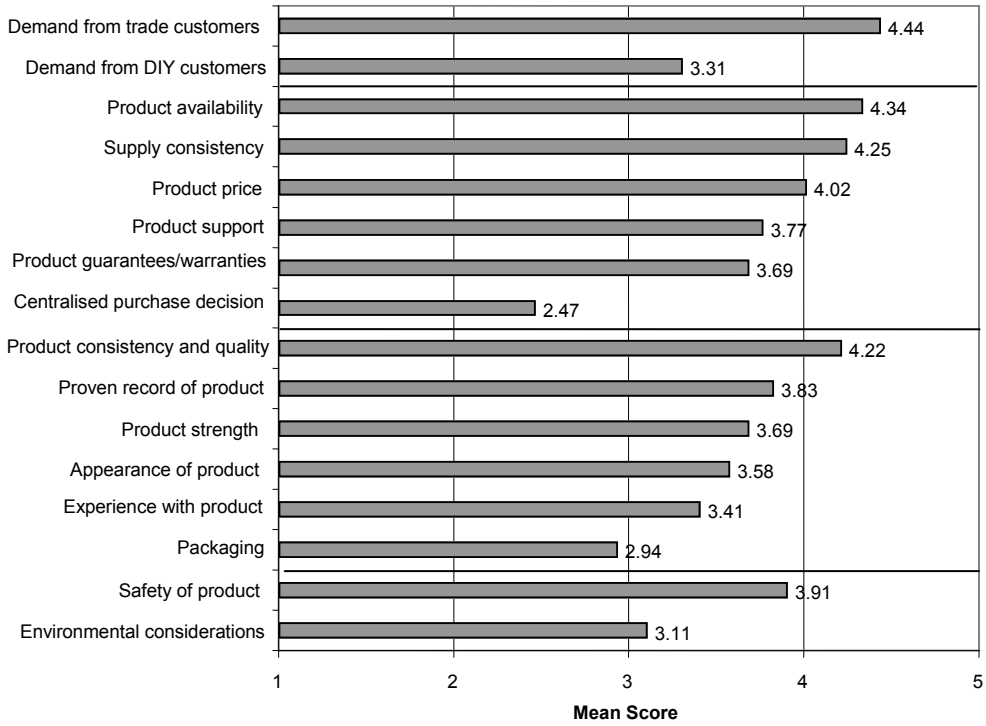
Overall, demand from trade customers, product availability, supply consistency, product consistency and quality, and product price were rated as very important factors in the selection of building materials. The majority of these factors are related to management of supply and logistics, or factors that under the control of individual businesses. The responses in Figure 2.30 can also be grouped under general topics.

- Customer demand
- Product market factors
- Product physical factors
- Environmental and safety factors

Customer Demand

Figure 2.30 shows that demand from trade customers is the most important factor overall, and rated as much more important than demand from DIY customers. Given the importance of trade customers in sales, this result is not surprising. While DIY customer demand is rated as important, it does emphasise the importance of trade demand (builders) in determining sales of various building materials.

Figure 2.30 Building Material Selection Criteria



Product Market Factors

The next eight factors could be categorized as market-related characteristics of a product. Respondents were given a definition for centralised purchase decision as,

> *Stores are part of a corporate chain, retail cooperative or franchises where purchase decisions for all stores are centralised rather than being made by individual stores.*

Of these factors, product availability and price, and supply consistency were rated as very important factors (mean score greater than 4.0). Product support and guarantees were rated as the next most important factors. All of these factors are related to management and logistics rather than a specific building material and would apply to any material.

Product Physical Factors

Product consistency and quality was ranked as very important by building products suppliers. They also rated a proven record and experience with a product as being important in their choice of materials. While the appearance of the product also rated highly, the packaging was considered to be less important. Collectively, these results show that past experience with a building material is an important factor in the selection of products by building material suppliers.

Environmental and Safety Factors

A definition was provided for environmental considerations to assist in answering this question being:

> *Environmental considerations refer to global impact due to material use.*

Environmental and safety factors were both rated as important by building material suppliers, with safety being the more important factor. One observation is that the mean score for environmental considerations by corporate retail systems is higher than for other store types (4.50).

Building material retailers were also asked about the factors they thought influenced the building material purchasing decisions of their DIY customers. Importance of various factors was measured on a five-point scale where 1 means 'not at all important', 3 means 'important', and 5 means 'extremely important' (Figure 2.31).

Figure 2.31 DIY Customer Building Material Purchasing Influences

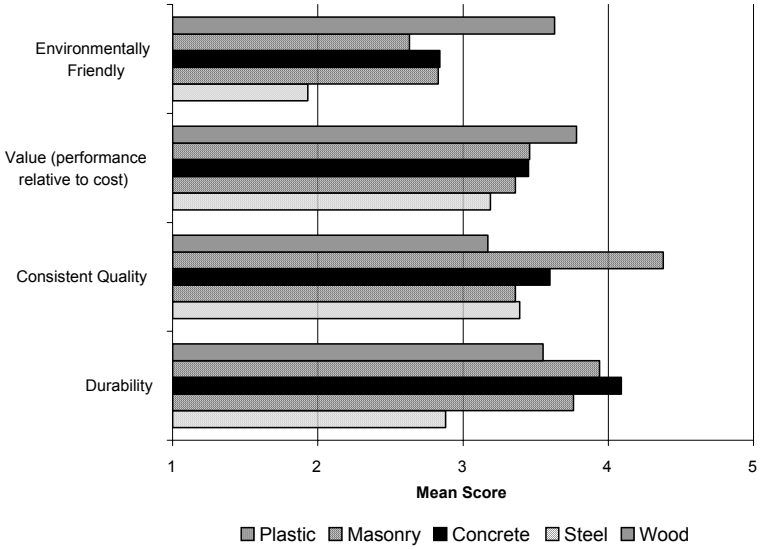
In Figure 2.31, the advice of store personnel was considered to be very important and the availability of information on product installation and use was considered to be important. In-store displays were considered to have some importance, but other factors were not considered to be important in influencing DIY customer purchasing decisions. These results show the importance of providing information on installation and use of building materials, both for DIY customers and for the store staff who advise them.

Relative Performance of Building Materials

In order to understand building material suppliers' opinions about the relative performance of different building materials, they were asked to rate a number of different materials for a particular product attribute. The attributes provided were durability, consistent quality, value (performance relative to cost) and environmentally friendly. Their opinions were measured on a five-point scale where 1 means 'material possesses attribute not at all' to 5 means 'material possesses attribute to a high degree'.

In Figure 2.32, wood has the highest score in terms of being environmentally friendly and having value. Plastic is the lowest in both of these categories, while masonry, concrete and steel are roughly similar. For consistent quality, steel far out ranks other building materials. Wood is ranked lowest in this category, but not dissimilar to masonry and plastic. In terms of durability, concrete is ranked highest but is not much different than wood, masonry and steel.

Figure 2.32 Relative Performance of Building Materials



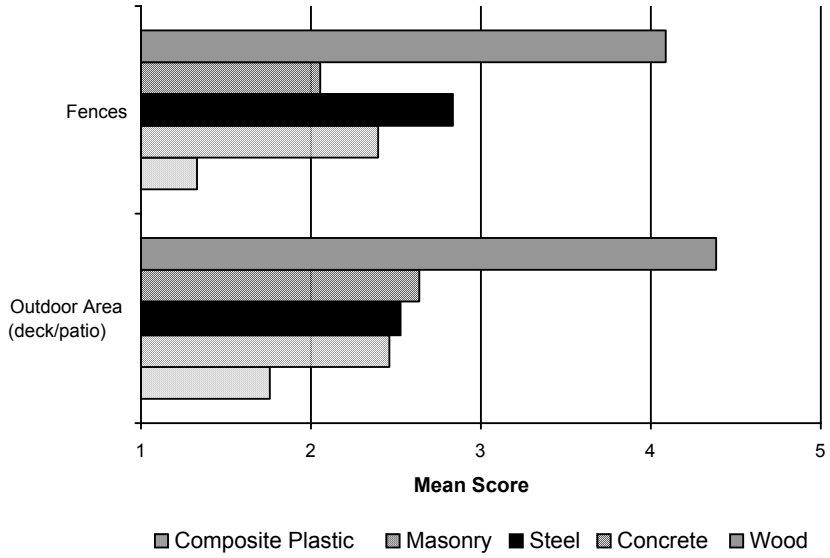
In the opinion of building material retailers, wood overall is generally regarded relatively higher in performance attributes compared to other building materials. The main area where it and other materials lag is in consistent quality compared to steel. To the extent that this issue can be addressed by management practices rather than being an inherent characteristic of the material, then wood should be a well positioned in this building materials market.

Use of Building Materials

Building material retailers were asked about the purchasing patterns of their customers. One question was directed at DIY customers and the other at changes in materials being used for residential construction. Respondents were asked to indicate the frequency with which particular building materials were being used in two common DIY outdoor building application, outdoor areas and fences, and two indoor building applications load-bearing walls and joinery. Frequency of use was measured on a five-point scale where 1 means 'never use' to 5 meaning 'always use'. Mean scores for outdoor areas and fences are shown in Figure 2.33.

In Figure 2.33, fencing in the DIY market is dominated by wood, with steel and masonry being used much less frequently. The use of steel may be an indication of the availability of steel fencing systems as well as durability issues. Wood again dominates in the DIY materials for outdoor areas, defined as decks or patios. Concrete, steel, and masonry are used much less frequently. This suggests that wood has a strong comparative advantage or appeal when it comes to these outdoor applications.

Figure 2.33 DIY Material Use in Outdoor Applications



Mean scores for different materials in load-bearing wall applications in the DIY market are shown in Figure 2.34. They show that wood dominates in this indoor application. Softwood is used most frequently, followed by hardwood. Steel and masonry are used much less frequently. Since wood has been separated by type in this question, the use of wood in total may be more frequent than indicated by the separate mean scores.

The other indoor application was joinery. Mean scores for this application are shown in Figure 2.35. Joinery applications are dominated by wood-based materials. Solid wood is most common, but use of MDF or veneer over MDF is also common. Use of emerging substitute materials such as metal or plastic is still minor in DIY applications.

Figure 2.34 DIY Load-Bearing Wall Material Use

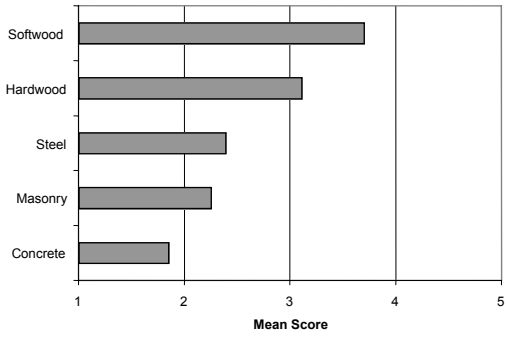
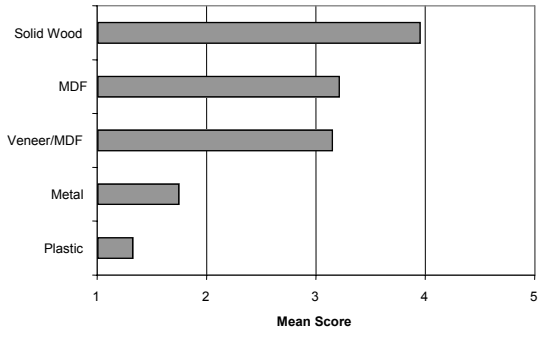


Figure 2.35 DIY Joinery Material Use



Building material suppliers were also asked about their perception of building material use in residential buildings and changes in use over the past five years. Respondents were asked to identify which building material out of steel, concrete, wood, masonry and plastic was most likely to be used in a particular application today and five years ago. Table 2.22 shows that in roof systems, wood is the most common material (67 percent).

Table 2.22 Building Material Use in Residential Buildings
(Number of Respondents)

	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof system	7	11	3	1	23	21	1	0	0	0
Floor system	1	3	16	21	19	16	2	1	0	0
Exterior wall system	1	3	1	3	12	12	18	19	0	0
Interior partition	1	4	1	1	28	27	6	4	0	0
Interior trim/detail	0	1	0	0	31	31	1	0	0	1

In flooring systems, two materials, concrete (62 percent) and wood (47 percent) are common. In external wall systems, two materials again dominate – masonry (55 percent) and wood (35 percent). For interior partitions and trim, wood again dominates with 79 percent saying it is the dominant material used in partitions, and 91 percent saying it is the dominant material in trim. In terms of changes, in roof systems steel use has increased from 20 percent saying is was the most common material used 5 years ago to 32 percent today.

In flooring systems, wood has declined from being the dominant material 5 years ago (down to 47 percent) and has been replaced by concrete (47 percent 5 years ago to 62 percent today). Steel use in floor systems has increased from only 3 percent of respondents saying it was the most common material 5 years ago to 9 percent today. In exterior wall systems there has been a growth in the use of steel and concrete (both increasing from 3 percent to 12 percent). The major changes in the indoor wall partition market are the growth of steel (3 percent to 12 percent) and a decrease in masonry (18 percent down to 12 percent).

Taken together, the results of this section show the dominance of wood in the markets served by building material retailers. Given the results of the previous section, much of this dominance can be linked to the demands of trade and DIY customers. There may also be an influence of the familiarity of retailers with wood products and systems based on wood products that contributes to their popularity.

Environmental Attributes of Building Materials

Building materials retailers were asked a number of questions about the environmental attributes of building materials. The first set of questions dealt specifically with certified wood products. Based on Table 2.23, retailers have a high awareness of certified wood products, with 83 percent saying they are aware of certified wood products and 86 percent saying that they have seen certified wood products in the marketplace. More importantly, retailers also believe that some of their trade and DIY customers

would prefer to buy certified wood products (91 and 88 percent of respondents respectively).

Table 2.23 Certified Wood Products
(Number of Respondents)

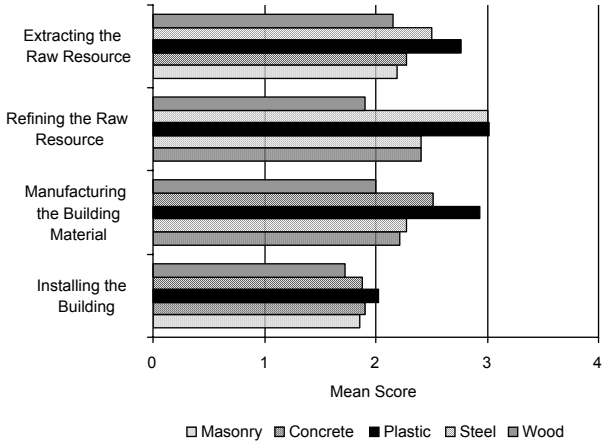
	Yes	No	Total	% Yes
Some Trade customers would buy certified wood products if available	30	3	33	91%
Some D.I.Y. customers would buy certified wood products if available	29	4	33	88%
I would prefer to stock certified wood products if available	28	4	32	88%
I have seen certified wood products in the marketplace	30	5	35	86%
I am aware of certified wood products	29	6	35	83%
Some suppliers have discussed providing certified wood products	22	13	35	63%
Some Trade customers have requested certified wood products	18	17	35	51%
Some customers would pay a price premium for certified wood products	15	18	33	45%
Some D.I.Y. customers have requested certified wood products	10	24	34	29%
I have **not** stocked some wood products for environmental reasons	7	26	33	21%
I have **not** stocked some non-wood building materials (steel, concrete, plastic) for environmental reasons	5	29	34	15%

Some of this perception is being driven by current demand, as 51 percent have had trade customers request certified wood products and 29 percent have had DIY customers request certified wood products. Also important for forest growers and primary wood producers, 45 percent believe that some of their customers would pay a price premium for certified wood products.

While 88 percent would prefer to stock certified wood products, only a small number have chosen not to stock some types of building materials for environmental reasons. Of the respondents, 21 percent have not stocked some wood products for environmental reasons, and 15 percent have not stocked other building materials for the same reason. Generally, this provides a picture of a building products retailing sector that is ready to stock and have information available about certified wood products.

Respondents were also asked to indicate their opinion on the environmental effects of various building materials at different points in their production process. Respondents were asked to indicate how harmful on the environmental they thought different materials were on a 5-point scale where 0 means ‘never thought about it’, 1 means ‘completely harmless’ and 4 means ‘very harmful’. Mean responses are shown in Figure 2.36.

Figure 2.36 Environmental Effects of Building Material Use



The responses in Figure 2.36 show that generally, most building materials are considered to be harmless to the environment throughout the extraction, production and installation process. Only steel and plastic have mean scores that show that they are considered to be harmful especially in refining for both and in manufacturing for plastic. Wood is consistently considered to be the least harmful and in all cases, has a mean score that shows that it is considered to be harmless to the environment.

Results of the Furniture Manufacturer Survey

The results of the furniture manufacturer survey are presented under a number of headings that reflect particular areas of interest:

- Demographics
- Choice of materials to use in furniture
- Environmental attributes of materials
- Relative performance of materials used in furniture
- Use of materials in furniture manufacturing

Demographics

Respondents were asked about the ownership status of their organization. As can be see in Table 2.24, most of the 42 respondents to the survey were privately owned, Australian organisations (95 percent).

Table 2.24 Ownership Status
(Number of Respondents)

Privately Owned, Predominantly Australian Ownership	40
Privately Owned, Predominantly Foreign Ownership	0
Publicly Listed Company	1
Government Trading Enterprise	1

Table 2.25 Annual Sales ($)
(n=35)

Mean	43,000,000
Median	3,000,000
25 percentile	1,200,000
50 percentile	3,000,000
75 percentile	10,000,000

Respondents were also asked about the annual sales of their organisation. In Table 2.25, mean annual sales are $43 million, however this is high due to a few very large manufacturers. Table 2.25 shows 25 percent had annual sales of $1,200,000 or less, 50 percent $3,6000,000 or less, and 75 percent $10,00,000 or less.

Respondents were also asked about the States in which they manufacture furniture. Table 2.26 showing respondents covered all parts of Australia. The numbers in Table 2.26 do not add up to the total number of respondents because some respondents manufactured furniture in more than one State.

Respondents were also asked about the markets they or their customers currently sell to, and the markets that they expect to be selling into in five years. As can be seen in Table 2.27, Australia is currently the main market, with 95 percent of all furniture manufacturers or their customers in this market. This is expected to decline in the next five years, as only 74 percent still expect to be in the Australian market.

The second main market is New Zealand, currently with 19 percent but expected to fall to 14 percent in five years. The other markets are Japan (12 percent), the U.S.A. (10 percent), E.U. (12 percent) and other South East Asia (14 percent). Taken together, respondents anticipate some growth in Asian, U.S. and European markets. The main changes in the next five years are expected to be increases to Europe (14 percent), other South East Asia (17 percent), and the U.S.A. (12 percent).

Table 2.26 Location of Furniture Manufacturing
(Respondents indicating that state)

Queensland	9
New South Wales	15
Victoria	15
Tasmania	1
South Australia	8
Western Australia	8
Northern Territory	1
ACT	1

Table 2.27 Furniture Markets
(Number of respondents, n=42)

	Current	5 Years
Australia	40	31
New Zealand	8	6
Japan	5	5
Korea	1	1
USA	4	5
China	1	2
Other SE Asia	6	7
India	0	0
European Union	5	6

Choice of Materials to Use in Furniture

An important objective of this study was to determine respondents' opinions about factors that could be important in determining which materials they chose for manufacturing furniture. Figure 2.37 shows the mean responses indicating the importance of a range of factors. Importance was measured on a five-point scale where 1 means 'not at all important', 3 means 'important', and 5 means 'extremely important'.

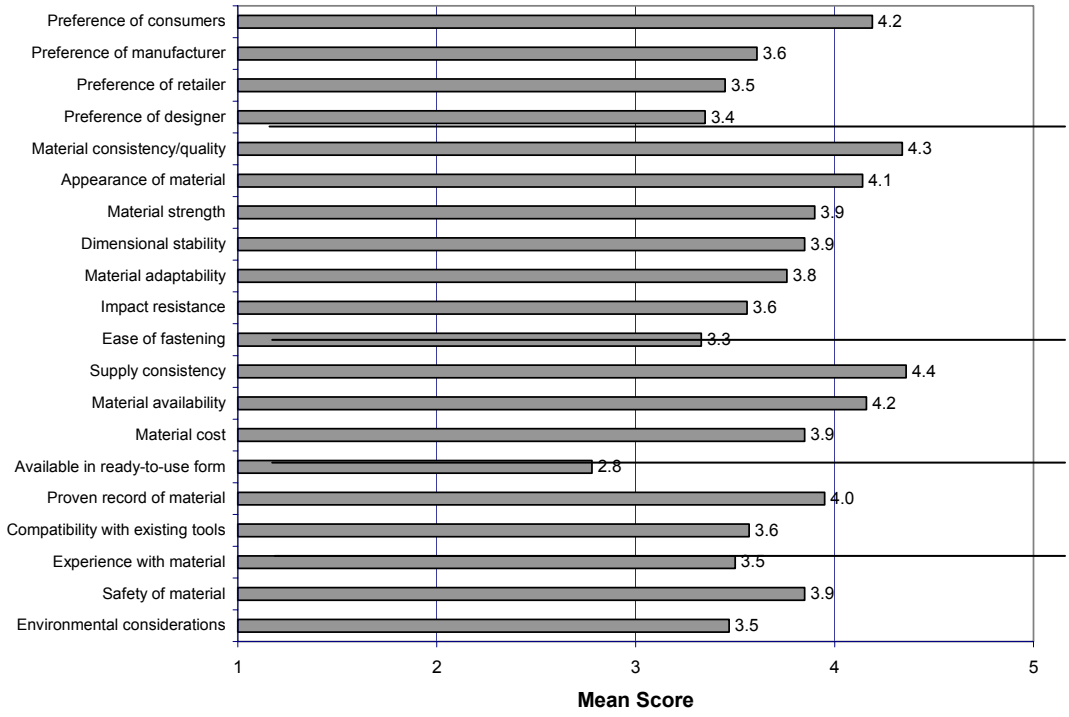
Five factors were considered to be very important when selecting materials:

- Supply consistency (mean score 4.4)
- Material consistency/quality (mean score 4.3)
- Preference of consumers (mean score 4.2)
- Material availability (mean score 4.2)
- Appearance of material (mean score 4.1)

Two of theses factors, supply consistency and material availability, show the importance of managing sales and supply to meet manufacturer requirements. Another two, material consistency/quality and appearance of material, show the importance of the physical attributes of the material, both from a processing performance perspective, and from the perspective of visual appeal. The responses in Figure 2.37 can otherwise be grouped under general topics.

- Preferences of different decision makers
- Material physical characteristics
- Market related factors
- Experience in using a material
- Environmental and safety factors

Figure 2.37 Furniture Material Selection Criteria



Preferences of Decision Makers

The first four factors in Figure 2.37 show the importance of various decision makers in the selection of furniture materials. The preferences of consumers were considered to

be most important, although the preferences of the manufacturer, retailer and designer were also considered to be important.

Material Physical Characteristics

The next seven factors cover a range of physical characteristics of furniture materials. Generally, all of the factors listed were rated as being important to material selection. Material consistency and quality, both important for manufacturing processes, and material appearance were considered to be very important.

Market Related Factors

The next three factors covered aspects that are related to the market for a particular material. Of these, material availability and supply consistency were considered to be very important. Material cost, with a mean score of 3.9, was also considered to be very important in material selection. Having material in ready to use form, such as cut-to-size, was not considered to be important.

Experience in Using a Material

The next three factors covered aspects of a manufacturer's experience with materials, including compatibility with existing tools. While all of these factors were considered to be important, none were considered to be very important. This suggests that some of the other aspects weigh more heavily in decision-making than experience and availability of tools.

Environmental and safety factors

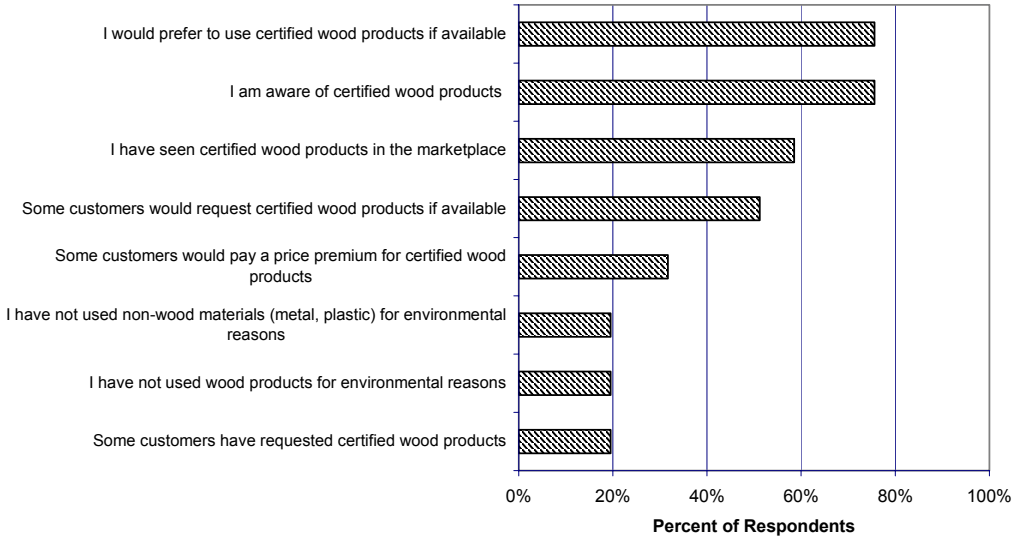
The earlier definition was provided for environmental considerations to assist in answering this question. Environmental and safety factors were both rated as important by building material suppliers, with safety being the more important factor. Generally, these results show that the physical attributes of the material, including consistency, quality, and appearance, are important in material selection. These factors influence visual appeal, as well as processing performance. Respondents also identified supply issues as being important, highlighting the importance of distribution systems.

Environmental Attributes of Materials

Furniture manufacturers were asked a number of questions about the environmental attributes of building materials. The first set of questions dealt specifically with certified wood products (Figure 2.38).

Figure 2.38 shows that 75 percent of furniture manufacturers said that they were aware of certified wood products, and that they would prefer to use certified wood products if they were available. While only 20 percent of furniture manufacturers indicated that customers had requested certified wood products, 50 percent indicated that some customers would request certified wood products if they were available. Taken together, this indicates that furniture manufacturers should be a ready market for certified wood products. An important consideration for wood products manufacturers is that only 30 percent of furniture manufacturers believe that their customers would pay a premium for certified wood products. However, environmental considerations are not yet influencing the use of materials in furniture manufacturing.

Figure 2.38 Certified Wood Products



Respondents were also asked about the origins of the wood used in their furniture manufacturing and whether they used any wood from certified sources. Certified sources were defined as wood that came from forests that had forest certification. As can be seen in Table 2.28, the most common source of furniture timber was Australia, with 75 of the species and country combinations from this source. The 75 responses for Australian timber sources account for 32 out of the 37 respondents to this question.

Table 2.28 Timber Sources and Forest Certification*

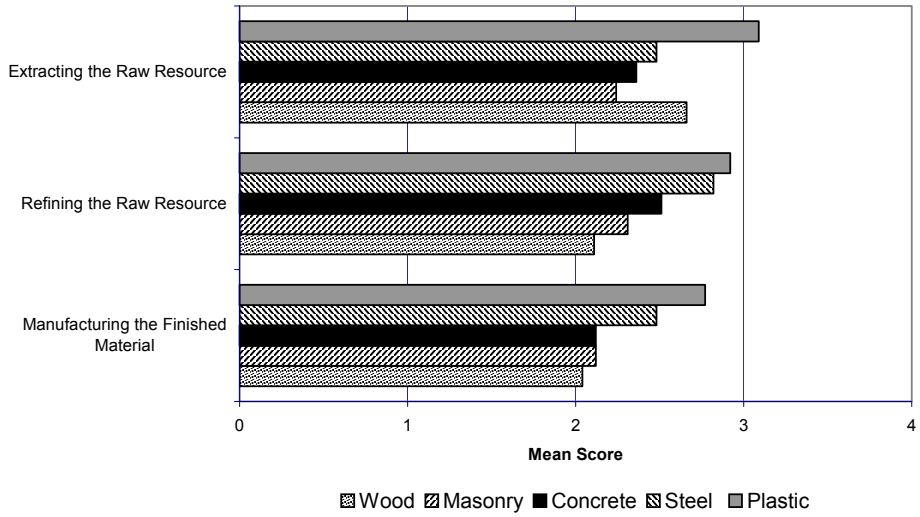
Source	Certified	Not Certified	Not Indicated	Total
Australia	31	21	23	75
NZ	3	4	5	12
US	1	2	2	5
Sweden	1	1	0	2
Brazil	0	0	1	1
Italy	0	1	0	1
China	0	1	0	1
Malaysia	0	1	0	1
Belgium	1	0	0	1

* Total number of respondents is 37. Each respondent could list as many species/country combinations as required.

The surprising result is the number of respondents who indicated that they used certified sources from Australia (15 out of the 32 respondents using Australian supplies), since there are currently no certified forest resources in Australia. It is possible that these respondents are using timber from a company that has ISO 14001 accreditation. It may also be that these respondents are confusing the Australian Timber Industry Certification, a quality control certification system used by the hardwood sawmilling industry, with forest certification. This could be an area of concern for the wood products industry as it will want to be sure that forest certification is correctly recognized and represented by customers of wood products.

Respondents were also asked their opinion about the environmental effects of various building materials at different points in their production process (Figure 2.39).

Figure 2.39 Environmental Effects of Building Material Use

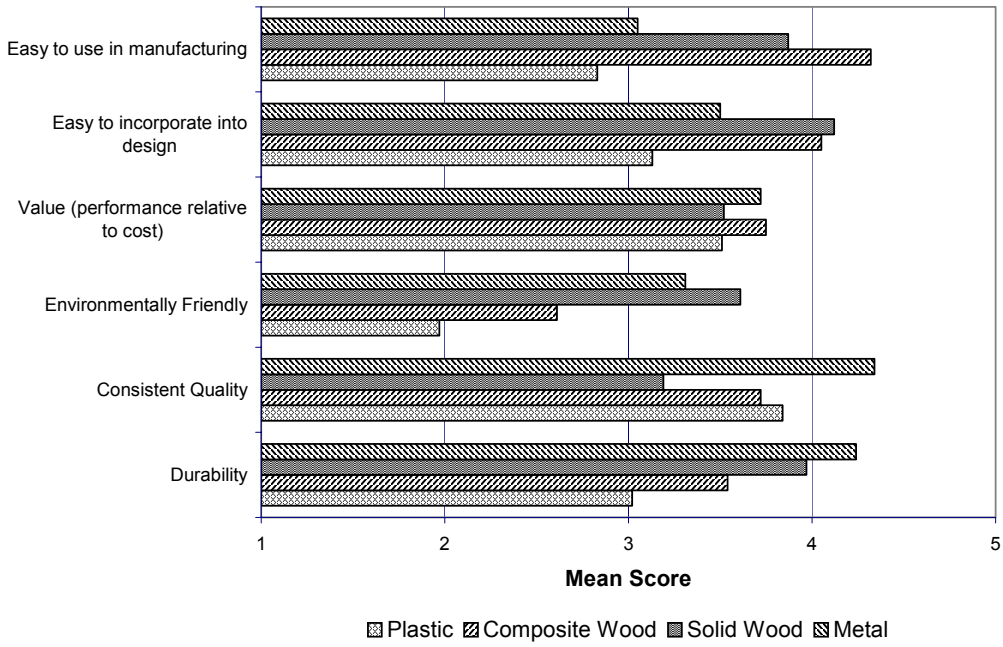


In Figure 2.39, respondents were asked to indicate how harmful to the environment they thought different materials were on a 5-point scale where 0 means 'never thought about it', 1 means 'completely harmless' and 4 means 'very harmful'. The responses show that generally, most building materials are considered to be harmless to the environment throughout the extraction, production and installation process. Only plastic has a mean score that shows that it is considered to be harmful in extracting the raw resource, although it also has the highest scores in every category. Wood is considered to be the least harmful material in refining and manufacturing, but rates second behind plastic in extracting the raw resource, although with a mean score below that indicating it is believed to be harmful to the environment.

Relative Performance of Materials Used in Furniture

In order to understand furniture manufacturer's opinions about the relative performance of different furniture materials, they were asked to rate a number of different materials for particular product attributes. The attributes provided were durability, consistent quality, value (performance relative to cost), easy to incorporate into design, easy to use in manufacturing, and environmentally friendly. Their opinions were measured on a five-point scale where 1 means 'material possesses attribute not at all' to 5 meaning 'material possesses attribute to a high degree' (Figure 2.40).

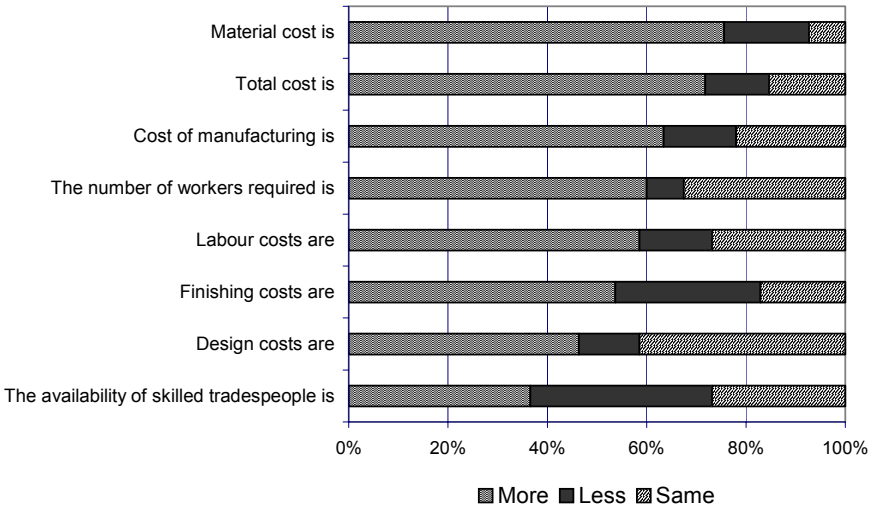
Figure 2.40 Relative Performance of Building Materials



In Figure 2.40, solid wood was ranked very high in ease of use in manufacturing, ease of incorporation into a design, and durability (although in a furniture context). Solid wood was also rated the highest in ease of incorporation into design and environmentally friendly. Composite wood products also rate highly in ease of use in manufacturing, and ease of incorporation into a design. The area where wood was rated the lowest was in consistent quality, although its mean score was still 3.19 placing it on the positive side. Plastic is the lowest ranked material in most categories. All materials were roughly equal with respect to value (performance relative to cost). Based on an average of mean scores across the different categories in Figure 2.40, furniture manufacturers regard solid and composite wood as being similar to metal and higher than plastic. The only area where solid wood lags behind other materials is in consistent quality. To the extent that this issue can be addressed by management practices rather than being an inherent characteristic of the material, then wood should be well-positioned in this building material market.

Respondents were also asked about the relative performance of solid wood when compared to other materials, such as composite wood (particleboard, plywood, medium density fibreboard, or any other type of composite wood material), metal, and plastic. In Figure 2.41, most furniture manufacturers believe that using solid wood is more expensive than using other materials. Material, manufacturing and labour costs are higher for solid wood and result in higher total costs. Finishing and design costs, and availability of skilled trades people are similar to other materials. Generally, very few manufacturers thought that solid wood was less expensive. The higher cost of solid wood shows up in the relative use of solid wood in furniture manufacturing in the next section.

Figure 2.41 Relative Attributes of Solid Wood
(Percent of Respondents)



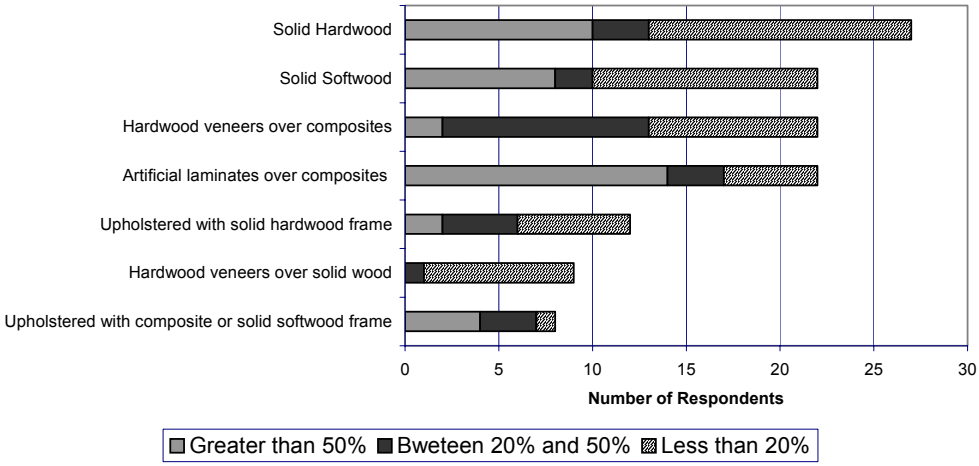
Use of Materials in Furniture Manufacturing

In order to understand respondents' use of various wood products in furniture manufacturing, they were asked to provide information on the percentage of furniture sales that were comprised of a range of furniture construction types. The furniture types covered the following categories.

- Upholstered with composite or solid softwood frame
- Hardwood veneers over solid wood
- Upholstered with solid hardwood frame
- Artificial laminates over composites
- Hardwood veneers over composites
- Solid softwood
- Solid hardwood

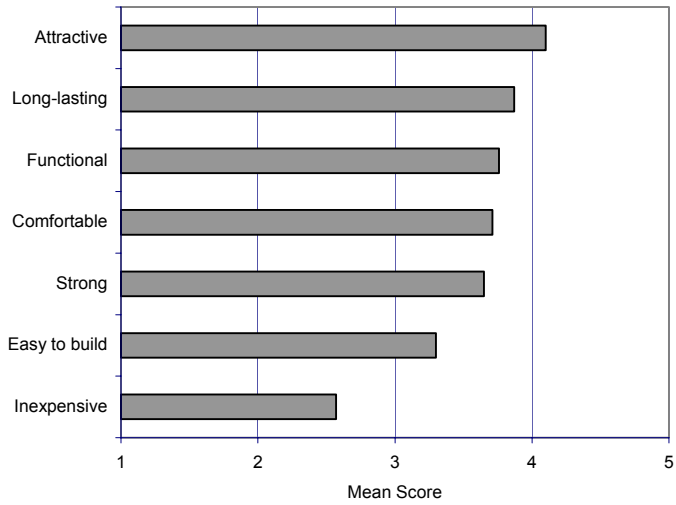
For this question, respondents were provided with definitions and diagrams for solid wood furniture, hardwood veneer over composites, hardwood veneer over solid wood and artificial laminates over composites (Appendix 1). As can be seen in Figure 2.42, solid hardwood was the most frequent construction type used by furniture manufacturers (64 percent). However, for more than half of these manufacturers, solid wood furniture was less than 20 percent of their sales. The other common types of construction were hardwood veneer or artificial laminate over wood composites.

Figure 2.42 Furniture Construction Types (n=42)



In order to get a sense of what underpins the pattern of wood use in Figure 2.42, furniture manufacturers were asked about the use of wood in furniture manufacture and design. Their opinions were measured on a five-point scale where 1 means 'strongly disagree with the statement' and 5 means 'strongly agree with the statement'. Mean responses to the statement, "Furniture made primarily of wood is…" are shown in Figure 2.43.

Figure 2.43 Furniture made primarily of wood is…



Mean responses to the statement, to the statement, "Designing furniture with wood is" are shown in Figure 2.44 and to the statement, "When designing furniture with wood it is easy to…" are shown in Figure 2.45.

Figure 2.44 Designing furniture with wood is…

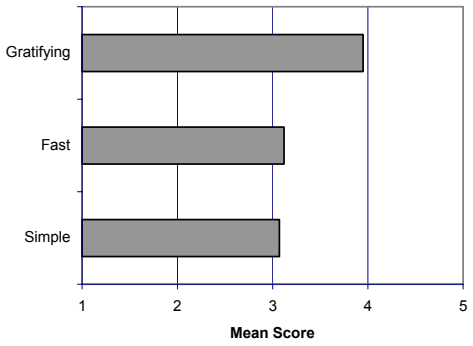
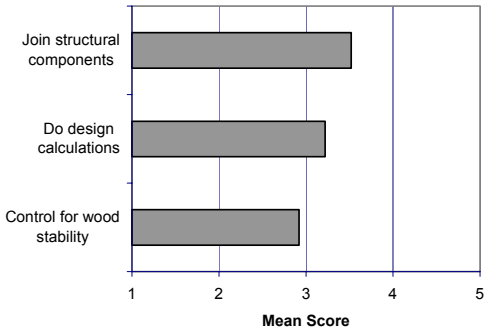


Figure 2.45 When designing furniture with wood it is easy to…



The results in Figures 2.43, 2.44 and 2.45 show that furniture manufacturers generally agree with the statements about furniture made primarily of wood, and find it a particularly gratifying material to use. In most other respects, furniture manufacturers are neutral about the use of wood. The only real disagreement with any statement is with furniture from solid wood being inexpensive. This generally positive opinion about wooden furniture should help to underpin its sustained presence in the market and preference by manufacturers.

Summary of Intermediate Consumer Results

The surveys of intermediate consumers lead to a number of observations about how these groups select building materials and position of wood as a desired building material.

Architects and Builders

In terms of general criteria for selection of building materials, the results suggest that architects and builders perceive that wood has a number of attributes that make it an attractive building material. However, each group is different in terms of which criteria are important for selecting building materials. Each is more likely to view their own preferences as being most important, while builders also more likely than architects to also view the preferences of structural engineers as also being important. Architects also rated material attractiveness as their most important building selection criteria, along with functionality. Builders are more likely to see ease of installation as being more important in material selection than architects. Architects believe wood is more environmentally friendly than other building materials, while builders see wood as having the same environmental friendliness. As such, architects are more likely to view environmental considerations as being important in material selection.

Given the differences in building material selection criteria, the communication approach used for architects and builders should differ. For architects, the wood products industry should appeal to their role and importance in the design process and stress such factors as the appearance of the material, the overall life-cycle costs, and the impact of the material on the environment. However, for builders the wood products industry needs to provide information and training on how a material is used and installed to ensure that they understand that the material will be easy to install. This is particularly the case with new wood-based materials that are being introduced to the marketplace.

When comparing wood with other building materials, both architects and builders identified areas where wood was considered to possess attributes much more than other materials. In particular, the key attributes where wood performs well were in terms of perceptions of relative environmental friendliness and ease of incorporating into design or use. Wood does not rate as well in terms of durability or consistent quality for either group. The wood products industry needs to ensure that durability and consistency perceptions are addressed. This could include education about building applications where wood is most appropriately used and will be as durable as concrete or steel. In addition, the industry may need to focus on increasing the consistency of quality of wood in order to change perceptions of this attribute.

When asked about building materials used in residential applications, the results indicate that wood is heavily used as the main structural component in residential buildings, and most respondents feel very positive about the use of wood. The main difference between architects and builders, and potentially an important issue for the wood products industry, are the large number of builders who intend to decrease their use of wood. This reduction would be a continuation of the trend over the past five years where the use of wood by both architects and builders for residential buildings has decreased for all the applications considered, mostly being replaced by steel or concrete. The wood products industry needs to build on the positive opinion about wood in residential construction, and to take advantage of the opportunity to increase wood use by focusing on the 21 percent of architects who indicate they plan to use more wood in the future for residential buildings.

For commercial buildings, the same trend is occurring as for residential buildings, with wood use decreasing over the past five years and steel and concrete use increasing. The wood products industry will have to overcome the negative attitudes of a large number of architects who do not think that wood is a good material for structural applications in light commercial buildings and the large number of builders who indicate that they will use less wood in the future. The main opportunity for wood may be the difference between the number of builders who use wood in light commercial construction and the number who thinks it is suitable.

The anticipated reduction in wood use cannot be associated with any of a range of cost and labour factors covered in the two surveys. Generally, both architects and builders believed that wood had similar costs or labour requirements as other materials. When asked to identify the three greatest drawbacks to using wood in commercial design, the most commonly cited reasons for both architects and builders identified were “it is prone to insect damage” and “it deteriorates or rots”. Architects selected “it burns” as their third most common drawback, while builders selected “it shrinks and swells”. These perceptions of drawbacks point to physical and inherent characteristics of wood as playing an important part in the decline in wood use. All of these could be important areas for the wood products industry to focus on in order to stop the potential decline in use of wood. The industry needs to focus on improving wood’s performance on these parameters, but also improving perceptions of wood’s performance on these parameters through education and promotion.

An additional area that points to problems in using wood is the adoption of new technology in wooden structural systems. The results of the surveys suggest that transfer of information about wooden structural systems is not occurring as fast or as well as for other building materials. However fast the transfer is occurring, it is also occurring faster among builders than among architects. This indicates the need to incorporate training on wood products and systems for architects and builders into promotional material. This could be as part of formal education programmes, as well

as sales presentations, trade shows, and exhibits to demonstrate both new and existing wood products and increase knowledge of structural systems that use wood.

When asked about general environmental aspects of building material use, architects perceive wood to be the material that is least harmful to the environment, while builders generally perceive wood to be harmless. The only area of concern was in builders' perceptions of the environmental impact of wood extraction. However builders rated environmental considerations to be one of the least important selection criteria for building materials and this factor is not likely to be significant for builders when they are deciding on which materials to use.

Environmental friendliness may be one attribute that the industry uses to reposition itself, particularly relative to steel. This will be more important for architects, as they have indicated that they would like some certification of environmental claims made by wood products manufacturers and that their clients would request certified wood products if they were readily available. Builders on the other hand have shown that environmental considerations are relatively unimportant and it is unlikely that environmentally certified wood products would increase their use of wood. As such, the forest industry is likely to find that forest certification will provide a role in positioning wood in the marketplace for architects and their customers and that builders would pick up these certified wood products in preference to non-certified products.

If the wood products industry wants to communicate with architects and builders, there are a two important ways of doing this. The most important channel for communicating with both architects and builders is through reading materials such as trade magazines, textbooks and technical research. The importance of textbooks is that this would insure that architects and builders are educated about the use of wood early in their careers. Technical research materials on the use of wood, and trade magazines with articles on new wood products or applications would provide on-going information to those in the industry. The other important channel is the use of physical examples, such as demonstration buildings provided at exhibits or trade shows.

Retailers

Overall, demand from trade customers, product availability, supply consistency, product consistency and quality, and product price were rated as very important factors in the selection of building materials by building material retailers. The majority of these factors are related to management of supply and logistics, factors that are under the control of individual businesses and that would apply to any material. The results emphasise three points:

- The importance of influencing trade demand (builders) in determining sales of various building materials from retailers
- The importance of managing sales and distribution of products from mills to retailers
- The importance of providing information on installation and use of building materials, both for DIY customers and for the store staff who advise them

When compared to other building materials, wood is well regarded by building material retailers, and dominates in the markets they serve (building trade and DIY customers). The main attributes where wood performs well are in being environmentally friendly and providing value for money. The familiarity of retailers with wood products and with wood-based building systems also contributes to their popularity. The main area where wood lags behind other materials is consistent quality. Again, this is a management

issue rather than an inherent characteristic of wood, and dealing with this issue should position wood well in this market.

There are also differences in what building materials architects and builders say they are using and what building material retailers say is being used. While the perception of retailers about building material use in residential construction is that wood has maintained its dominance, architects and builders have a different perception. Table 2.29 combines information from Tables 2.3, 2.13, and 2.22 and shows the relative frequency of use of either steel or concrete compared to wood by architects and builders in various residential building applications, compared to sales by retailers for that application. For example, architects and builders are roughly twice as likely (2.3 and 1.8) to indicate that they most frequently use steel rather than wood in residential roof systems. Table 2.29 indicates that while building products retailers are important for some segments of the building trade, other channels for distributing non-wood building materials into residential building sector are also important, particularly the distribution of steel products and systems.

Table 2.29 Relative Frequency of Steel and Concrete Use Compared to Wood Sales by Building Products Retailers

	Steel		Concrete	
	Architect	Builder	Architect	Builder
Roof systems	2.3	1.8	2.4	6.1
Floor systems	2.5	1.3	0.9	0.9
Exterior wall systems	3.1	3.6	2.1	2.2
Interior partitions	4.4	3.1	0.8	3.9
Interior trim/detail	3.9	3.5	-	-

When asked about forest certification, most retailers would prefer to stock certified wood products, however this has not yet translated to purchasing decisions, and only a few have not stocked a building material for environmental reasons. Wood is consistently considered to be the least harmful to the environment of any building material. Generally, this indicates that promotion of wood on environmental attributes through certification would work in favour of wood.

Furniture

Furniture manufacturers identified supply consistency, material consistency/quality, consumer preference, material availability, and appearance of material as being very important in determining the selection of furniture materials. Two of theses factors, supply consistency and material availability, show the importance of managing sales and supply to meet manufacturer requirements. Two of the others, material consistency/quality and appearance of material, show the importance of the physical attributes of the material, both from a processing performance perspective, and from the perspective of visual appeal.

Solid hardwood was the most frequent furniture construction type used by manufacturers, however, for more than half of the manufacturers making solid wood furniture, it was less than 20 percent of their sales. The other common types of construction were hardwood veneer or artificial laminate over wood composites.

Attitudes towards wood that underpinned this pattern of use show that when compared to other furniture materials, solid wood rated highest in ease of incorporation into design and in being environmentally friendly. Composite wood products also rate highly in ease of use in manufacturing, and ease of incorporation into a design. The area where wood was rated the lowest was in consistent quality.

In terms of relative performance of solid wood when compared to other materials, most furniture manufacturers believe that material, manufacturing and labour costs are higher for solid wood, while finishing and design costs and availability of skilled trades people is similar to other materials, resulting in higher total costs for solid wood. Otherwise, solid and composite wood materials are regarded similar to metal and higher than plastic. The generally positive opinion about wooden furniture should help to underpin its sustained presence in the market and preference by manufacturers.

When asked about environmental aspects of furniture material use, furniture manufacturers generally consider most building materials to be harmless to the environment throughout the extraction, production and installation process, and environmental considerations are not yet influencing the use of materials in furniture manufacturing. Most furniture manufacturers said that they were aware of certified wood products, and that they would prefer to use certified wood products if they were available. Importantly, more than 50 percent furniture manufacturers indicated that some customers would request certified wood products if they were available, however, only 30 percent believe that their customers would pay a premium for certified wood products. Taken together, this indicates that furniture manufacturers should be a ready market for certified wood products, but at this point, without a price premium.

There may also be some confusion about certification that the wood products industry would have to address, as 15 out of 32 respondents indicated that the used certified sources from Australia where there are currently none available. This could be an area of concern for the wood products industry as it will want to ensure that forest certification is correctly recognized and represented to customers of wood products rather than being confused with another system of certification which relates to quality or management system.

Part 3

Final Consumers

This section of the report covers the results of a survey of final consumers. This group includes the wider population who are the final users of wood products, such as home or furniture buyers, or D.I.Y. customers. The research objectives for this group are as follows:

- To determine the influence of cost (material, installed, lifetime) in the selection of building materials (wood, steel, concrete, plastic)
- To determine whether factors such as ease of use, or compatibility with other building systems has an influence on the selection of building materials
- To determine whether knowledge/training, or prevalent tools has an influence on the selection of building materials
- To determine the relative importance of environmental considerations compared to other product attributes when purchasing materials
- To determine the attitudes of final consumers toward forest certification of forests (Australian and other countries)

The remaining parts of this section present the methodology and results of the final consumer survey.

Methodology

One of the objectives of this study is to determine whether environmental considerations influence the way that consumers select building materials. A particular aspect of this is to determine whether forest certification is a relevant attribute for wood products, and if it is, the relative importance of forest certification compared to other important wood product attributes.

The particular context used for studying the relative importance of forest certification is the decision-making process for outdoor furniture purchases. Wooden outdoor furniture was chosen because it covers a range of attributes which were considered relevant to wood products purchasing decisions, including price, warranty, timber source, forest type and forest certification. Furniture is also a product category that most consumers would have shopped for at some point in the past. The outdoor wooden furniture analysis will provide information on the relative importance of these attributes and in particular, the relative importance of forest certification compared to other furniture attributes.

A common approach used to evaluate the relative importance of product attributes is to treat combinations of product attributes as a bundle that a consumer must compare to alternative bundles of attributes. The technique used to evaluate preferences for attribute bundles is conjoint analysis (CJA).[6] In the area of market analysis, CJA relates the buyer's preferences to a set of pre-specified brand attributes. In addition, CJA determines the contribution of each attribute level to a buyer's preferences.

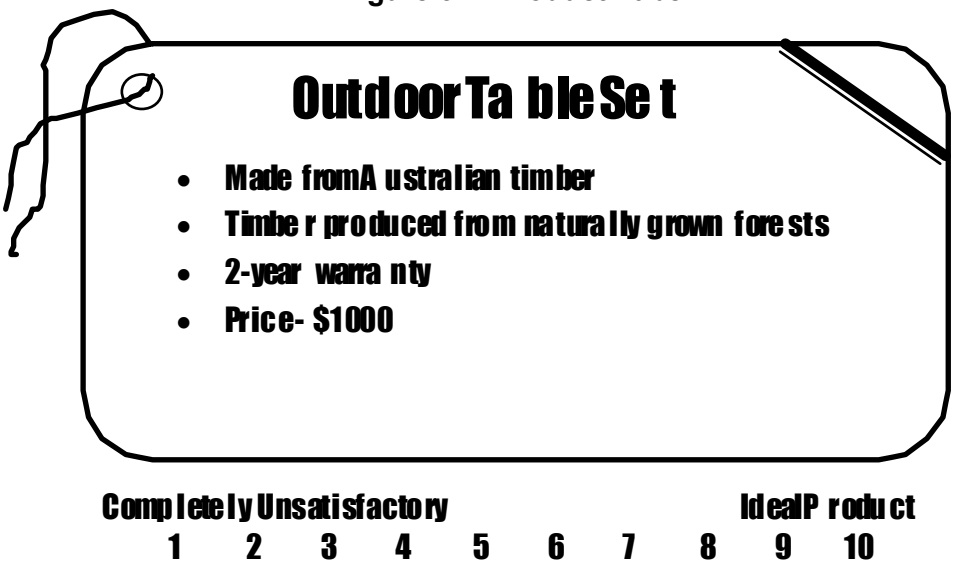
[6] The basic idea in CJA is that by providing consumers with a range of stimuli from among which to choose, inferences can be made about the value systems upon which their behaviour is based. The word 'conjoint' refers to the process of measuring relative values of things considered jointly which might be poorly measured when taken one at a time. CJA is therefore concerned with measuring the joint effect of two or more independent variables on the ordering of a dependent variable.

Another common objective in this type of research is to segment the results of CJA into groups of people that have similar preferences for bundles of attributes. This is typically done using cluster analysis.[7] In this study, cluster analysis was used to group respondents based on the importance they assigned to the different product attributes. In other words, cluster analysis indicates whether all respondents value furniture attributes in a similar fashion or whether there are segments of respondents with different preferences. Cluster analysis will also show how large the segments are and, when combined with ANOVA, may be able to provide a demographic profile of each segment.

Data on the importance of wood product attributes was collected using a mail survey of Australian consumers (Appendix 1). The survey instrument contained a number of sections. The first section contained questions to help determine the relevance of the outdoor wooden furniture purchase scenario to the respondents. First, respondents were asked to indicate whether they had shopped for or purchased household furniture within the past 12 months, and whether they intended to purchase household furniture in the next 12 months. Respondents were next asked to rate the importance of a number of furniture characteristics.

The second section contained questions for the conjoint analysis. Respondents were asked to approach this section as if they were intending to buy a wooden outdoor table and four chairs. Respondents were provided with a drawing of the furniture, along with 12 different product labels (Figure 3.1).

Figure 3.1 Product Label



Each label contained a combination of five product attributes, with two levels or values for each attribute (Table 3.1).

[7] Cluster analysis attempts to identify and classify objects or variables so that each object is very similar to others in the cluster and very different from those outside the cluster.

Table 3.1 Product Attributes and Levels

Attributes	**Level 1**	**Level 2**
Price	$1000	$1250
Warranty	2-year	5-year
Timber Source	Imported	Australia
Forest Type	Native	Plantation
Certification	No Certification	Certification

Price and warranty were selected as attributes as a result of a review of retailer advertisements and point of purchase information relating to outdoor furniture. This review showed that these attributes were commonly included in promotional material. Timber source (imported or domestic), forest type (natural or plantation) and forest certification were selected because they are attributes that may be of particular relevance to Australian consumers and product manufacturers. These attributes were also commonly found in promotional materials for furniture.

A standardized orthogonal design was used to construct different product label conditions. With five attributes and two levels, 12 different labels were required. Respondents were asked to treat the 12 labels as if they were the labels they would find attached to the furniture in a retail outlet.

Respondents were asked to rate each of the twelve labels on the information provided by circling the most appropriate number, where one equals a 'completely unsatisfactory product' and ten equals an 'ideal product'. They were asked to read all the labels before starting to rate them. They were also advised that they could assign the same rating to more than one label. To help clarify the labels, respondents were given definitions for the following terms:

- *Native forests* are naturally occurring forests that are managed for wood products as well as other uses such as recreation and wildlife habitat.
- *Plantation forests* are planted commercial tree crops managed only for wood production.
- *Forest certification* means that an audit has been completed to ensure that the forests are managed in a sustainable manner and that the trees are harvested in an environmentally sound manner.

The third section contained questions that attempted to determine how respondents evaluate wood compared to other building materials, such as steel, concrete, masonry and plastic. First, respondents were asked to evaluate the building materials across six attributes, such as durability and attractiveness. Next, respondents were asked about their preferences for different building materials across a range of applications, such as flooring, windows, or decking.

The fourth section contained questions about environmental aspects of purchasing. They were asked to indicate whether they had seen products displaying environmental information on packaging or products that had been environmentally certified and whether they had purchased either type of product. They were also asked to rate their level of trust in different organisations that might undertake and verify the certification of forests and wood products (e.g. Commonwealth Government or an environmental non-government organisations). In addition, respondents were asked to rank a number of different building materials on how harmful they perceive the extraction,

refining, and manufacture of the material is to the environment. The final section contained a series of demographic and socio-economic questions.

Survey development and implementation for this study was based on methods recommend by Dillman[8] and described as the Total Design Method (TDM). The population of interest was Australian adults who may be in the market for outdoor furniture and/or building materials. To sample this population, a mailing list of homeowners was purchased from an Australian database provider, who randomly selected 750 names from their database of homeowners, which included residents from all over Australia

The research instrument was pretested on the population of interest to check for biased, misleading or confusing questions, to verify the quality and comprehensiveness of information received, and to test the effectiveness of the conjoint procedure. Data were collected in May and June of 2002. In adherence to the TDM survey guidelines, an initial survey mailing, post-survey reminder and a second mailing were conducted in order to maximize response rates. After adjusting the sample size for non-deliverable surveys and incomplete or otherwise unusable surveys, the adjusted response rate was 183 or 26.3 percent.

Results

The results of the survey are presented under a number of headings that reflect particular areas of interest.

- Demographics
- Outdoor wooden furniture
- Environmental purchases
- Building material selection

Demographics

Generally, the respondents to the questionnaire represented a broad cross-section of Australian society. There were higher numbers of male respondents (58 percent) than female respondents, with the majority of respondents aged between 36 and 65 years (83 percent). In terms of annual income, 47 percent of respondents had an annual income between $40,000 and $79,999.

For education, 19 percent of respondents had attained a secondary education level, 16 percent had a vocational qualification, 20 percent had a bachelor's degree, and 18 percent had completed or worked towards a graduate degree. The majority of respondents (80 percent) lived in cities of larger than 250,000 people. Finally, only 7 percent of respondents indicated they were a member of an organization whose primary mission was to protect the environment.

Outdoor Wooden Furniture

Respondents were asked a number of questions related to the CJA analysis and the purchase of outdoor wooden furniture. This includes asking questions related more generally to purchases of furniture.

[8] Ibid.

The results included in this section cover the following areas:

- The relevance of the furniture purchase scenario
- Past experiences with environmental purchases
- Important furniture attributes
- CJA results
- Cluster analysis

Relevance of the Furniture Purchase Scenario

In order to determine how relevant the purchase scenario in the survey was to respondents, they were asked to indicate whether they had been or would be in the market for furniture. The results show that 57 percent of respondents had shopped for household furniture in the last 12 months, 50 percent had bought household furniture in the last 12 months, and 48 percent intend to purchase household furniture in the next 12 months. These results indicate that the questionnaire was posing questions about a purchasing decision that most respondents should be familiar with.

Important Furniture Attributes

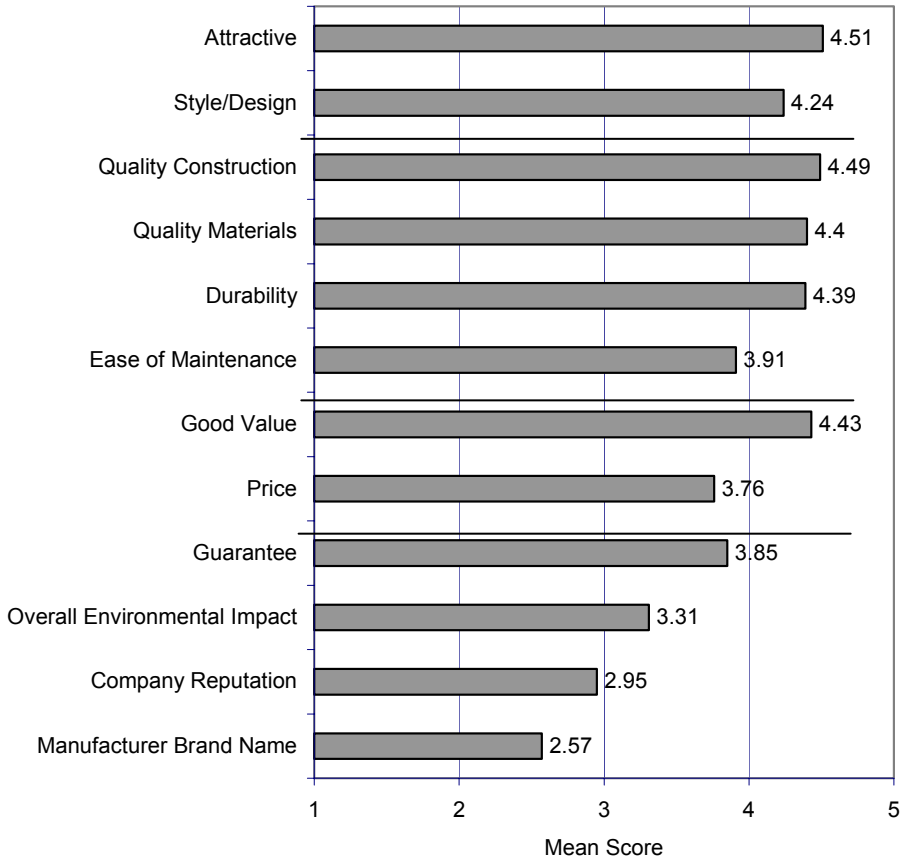
Respondents were next asked to rate the importance of a number of furniture attributes. A response of a 1 means the attribute is 'not at all important' and 5 means 'extremely important' to the respondent. In Figure 3.2, the most important furniture attribute from this list was the attractiveness of the furniture. A related characteristic, overall style or design, was still an important consideration to respondents but not as important as the overall attractiveness of the furniture.

The next group of attributes relate to the quality and durability of the furniture. Respondents rate quality construction as the second most important furniture attribute of the total list of attributes. In addition, the quality of the material, durability of the furniture, and ease of maintenance are rated as important by respondents. Two questions related to the cost of buying furniture. Getting good value was also rated an important consideration, although the overall price of the furniture was seen as a less important furniture attribute than good value.

The last group of attributes relate to less tangible aspects of furniture. The most important attribute in this group is the guarantee or warranty offered by the furniture manufacturer. The next most important attribute is the overall environmental impact of the furniture. The reputation of the company who produces the furniture and the brand of the furniture were not seen as important attributes to respondents. Although not primary considerations, these results indicate that furniture manufacturers should consider the type of warranty they offer and the impact of their operations on the natural environment.

More attributes are included in Figure 3.2 than the conjoint procedure allows. Although Figure 3.2 covers a more thorough list of furniture attributes, it does not reveal the relative importance of specific furniture attributes. As discussed earlier, CJA reveals the importance of attributes considered conjointly or relative to one another. This is considered to be a more realistic approach because it more closely mimics a consumer purchase decision. As such, the CJA questions draw on only a few of the attributes in Figure 3.2 and in effect hold many of the rest constant by considering the same furniture style (e.g. attractiveness and design).

Figure 3.2 Importance of Furniture Attributes

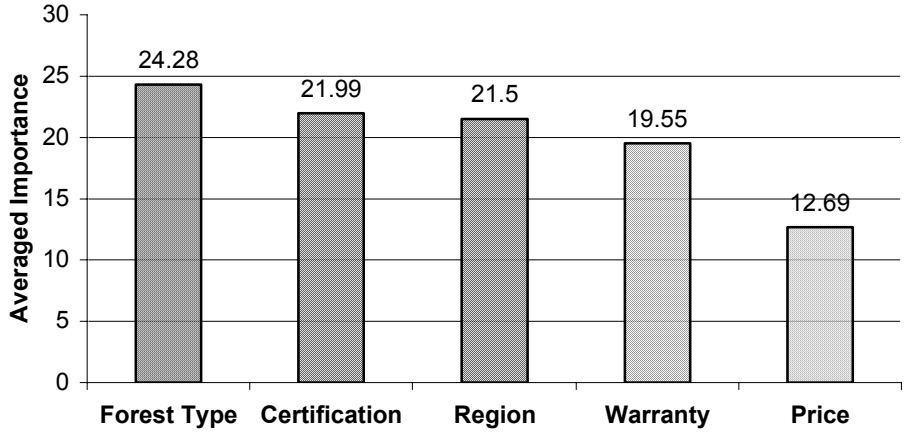


Conjoint Analysis

Figure 3.3 shows the averaged importance of the various furniture attributes provided by the conjoint analysis. Overall, forest type is rated as the most important furniture attribute, with plantation sources being preferred to native forest sources. Forest certification, with certified preferred over non-certified sources, and region, with Australian sources preferred over imported timber, were the next most important attributes. Warranty, with five years preferred over a two-year warranty was rated a little lower. Price is rated as the least important furniture attribute, with a lower price preferred to a higher price, as would be expected.

There are number of important results here. First, price is not found to be an overly important consideration to consumers. It should be recalled that the survey was drawn from home owners and average income in the sample is higher than the wider population, so these results reflect the preferences of a more affluent segment of the population represented by the sample frame. In wooden outdoor furniture, Australian consumers prefer that wood is sourced from a plantation forest rather than a native forest. In addition, consumers prefer that the forests are managed sustainably and that the trees are harvested in an environmentally sound manner. Finally, they would like the wood to be sourced from within Australia rather than from imported sources.

Figure 3.3 Importance of Outdoor Wooden Furniture Attributes



Cluster Analysis

Although useful, the aggregate results provided by the conjoint analysis do not provide all the potential information about furniture purchasing decisions. CJA used in conjunction with cluster analysis can tell us whether all respondents value the product attributes in a similar fashion. Unlike other statistical methods, cluster analysis does not provide precise rules for choosing a cluster solution. The usual approach is to compute solutions for several different clusters, and then to decide among the alternative solutions based upon predetermined criteria, practical judgment, common sense or theoretical foundations.

A 4-cluster solution was chosen because this number of clusters was the smallest that adequately differentiated the utility values. A Scheffe one-way analysis of variance technique was used to test the hypothesis of no difference between the utility values across the four clusters. All of the attributes proved to be statistically different (α = .05) across the four clusters.

Table 3.2 provides the results for the four-cluster solution and includes the relative utility values for each of the four clusters on each attribute, the most valued level of that attribute and the sample size for each cluster. The relative utility value of an attribute is computed by taking the attribute utility value divided by the sum of the utility values for all the attributes.

Table 3.2 Relative Utility Values for the Four Clusters

Attribute	Cluster 1 n=38	Cluster 2 n=65	Cluster 3 n=32	Cluster 4 n=37
Warranty	**24.4% 5-year**	**36.9% 5-year**	5.0%	6.9%
Forest Type	15.9%	9.6%	**60.7% Plantation**	**22.7% Plantation**
Region	18.1%	10.6%	14.2%	**51.7% Australia**
Forest Certification	**40.3% Certified**	**21.7% Certified**	13.4%	10.9%
Price	1.2%	**21.2% $1,000**	6.7%	7.8%

Cluster 1, comprising 22.1 percent of the sample, rates certification as the most important furniture attribute, preferring outdoor furniture that has been made from timber with forest certification. This cluster is also sensitive to the product warranty provided, preferring the 5-year warranty and it is the least price-sensitive of all the clusters. Given these characteristics, this cluster represents the "quality environmentalist".

Cluster 2, comprising 37.8 percent of the sample, rates a long warranty as the most important furniture attribute. This cluster also prefers outdoor furniture that has been made from timber with forest certification, and is also the most sensitive to price, preferring lower prices. Given these characteristics, this cluster represents the "value environmentalist".

Cluster 3, comprising 18.6 percent of the sample, rates forest type as the most important furniture attribute, preferring the wood in their outdoor furniture to come from a plantation forest. Given this, and that the next two most important attributes are region and certification, this cluster represents the "implicit-certification consumer".

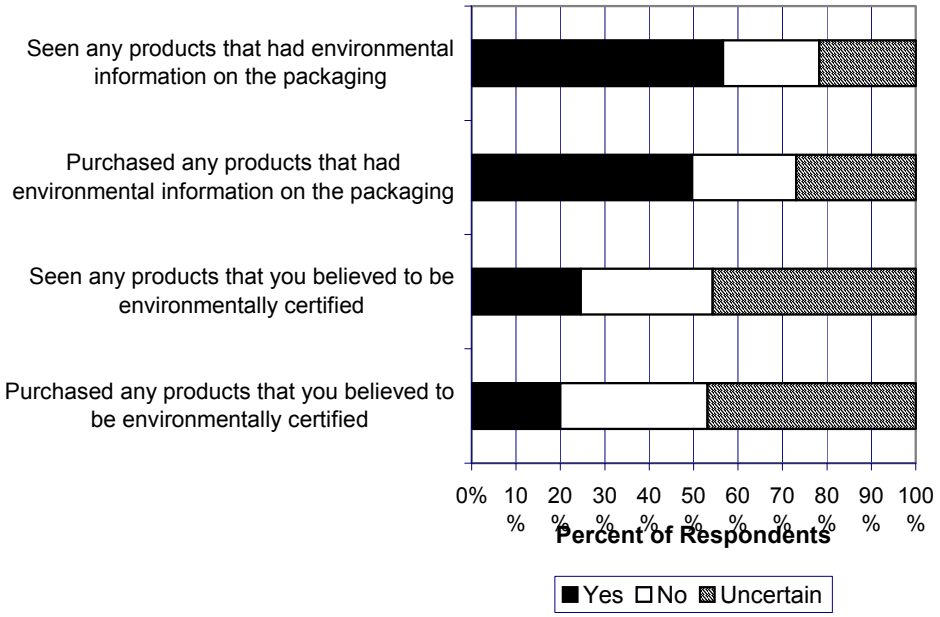
Cluster 4, comprising 21.5 percent of the sample, rates the region where the wood was sourced as the most important furniture attribute, preferring wood sourced from Australia over imported wood. The next most important attribute for this cluster was forest type, with plantation sources preferred. Given these attributes, this cluster represents the "buy-local consumer".

Demographic information, such as age, occupation or income, can be used to develop a profile of an average individual in each of the clusters. To do this, the clusters were compared on the basis of a range of demographic variables using a Scheffe one-way analysis of variance. Unfortunately, the statistical test did not find any differences in the mean values on these demographic variables, thus it was not possible to draw an adequate profile of these clusters using these demographic variables.

Environmental Purchases

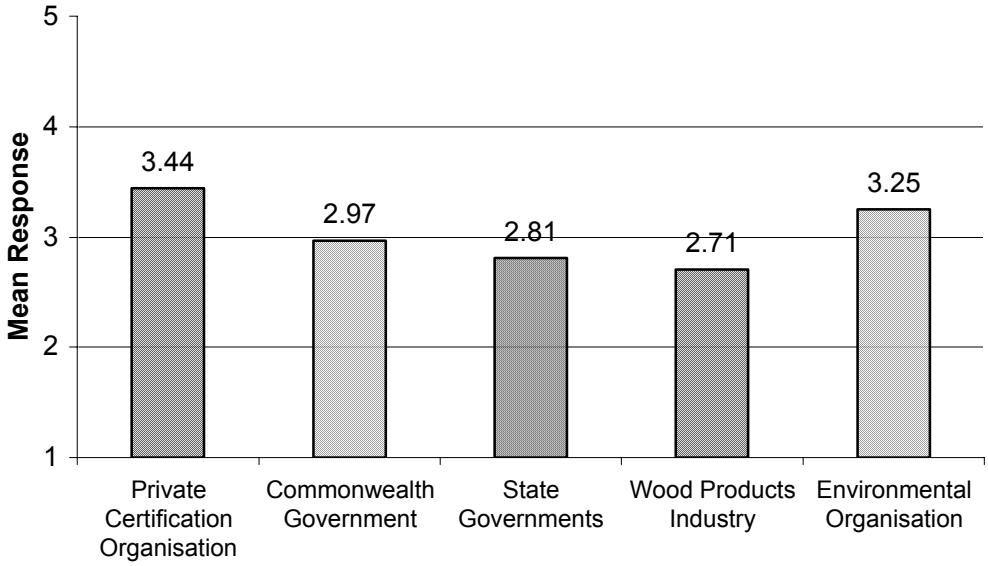
Respondents were asked about their exposure to environmental information on packaging for any product. In Figure 3.4, 57 percent of respondents indicated that they had seen products that had environmental information on the packaging, and 50 percent indicated that they had purchased such products in the last 12 months. A smaller number of respondents indicated that they had seen any type of product they believed to be environmentally certified (25 percent) or had actually purchased a product they believed was environmentally certified (20 percent).

Figure 3.4 Purchases of Environmentally Marketed Products



Combining both responses, 61 percent of respondents had seen some type of environmental labelling on packaging, including both certified and uncertified products, and 53 percent had actually purchased a product with environmental labelling. The results in Figure 3.4 also indicate that the outdoor wooden furniture analysis was posing questions about the environmental aspect of a purchasing decision that many respondents should be familiar with. The degree of 'uncertain' regarding purchases of certified products also indicates the need to accompany certification with a publicity campaign.

Figure 3.5 Trust in Certifying Organisations

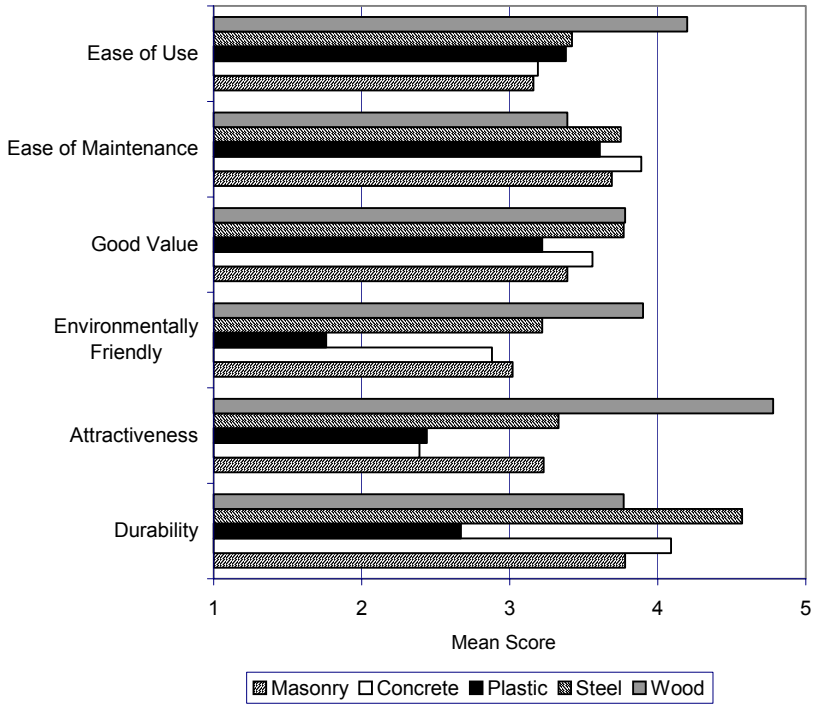


Respondents were also asked to rank five different organisations that might undertake and verify the certification of forests and wood products according to the relative level of trust they had in that organisation. Organisations that were rated 1 were the least trusted and 5 the most trusted. Figure 3.5 provides the mean response for the level of trust in each organisation. Overall, an independent private certification organisation is the most trusted organisation to carry out forest certification. An environmental organisation, the Commonwealth Government, and the State Governments are the next most trusted bodies to provide certification. The wood products industry is the least trusted by consumers to provide certification.

Building Material Selection

In order to determine how wood compares to other building materials, respondents were asked to rate a number of building materials on six key parameters or attributes (Figure 3.6). Respondents were asked to indicate whether they believe each material possessed an attribute on a five-point scale where 1 means 'not at all', and 5 means the material possesses the attribute 'to a high degree'. Respondents could allocate the same rating to more than one material for each attribute.

Figure 3.6 Relative Attributes of Wood



In general terms, Figure 3.6 shows that consumers view wood very favourably, wood having the highest ratings in four out of the six categories. Particular strengths of wood are its attractiveness and ease of use where wood is rated much higher than all other building materials. The results also indicate that wood is perceived as being the most environmentally friendly of the five materials considered. This contrasts to a fear among many in the wood products industry is that wood is perceived as being environmentally unfriendly compared to competitive building materials.

Steel is perceived as being the next most environmentally friendly material, which indicates that promotion by the steel industry may be having some impact. Although not rated the highest, wood is still viewed by respondents as being durable (mean

score of 3.77). The only attribute where wood has the lowest rating is in ease maintenance, but here it still has a mean score of 3.39, or a neutral status.

Overall, these results indicate that as a building material, wood is perceived as having a number of positive characteristics, and these need to be promoted by the industry. The warmth, texture, and grain of wood can be emphasised in terms of the attractiveness of wood compared to competitive materials. In addition, consumers perceive that wood is the most environmentally friendly of the materials, and given assurance of sustainable management, perhaps through certification, consumers may be willing to accept wood's environmental credentials.

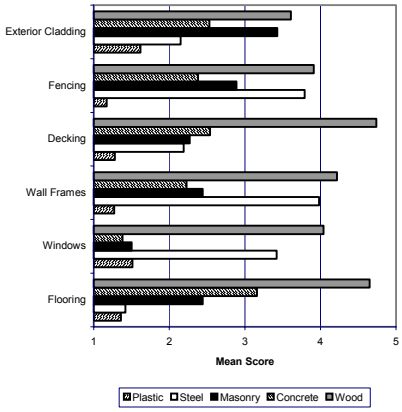
Wood should also be promoted in terms of being easy to use. The industry may want to continue to promote wood's versatility and educate consumers on appropriate uses for wood. In particular, consumer education may be useful to explain under what conditions wood would be as durable as alternative building materials, and the industry needs to promote to consumers the easiest methods of maintaining wood for appearance, durability, etc.

This analysis also indicates that, in the minds of Australian consumers, wood is most closely positioned against steel in terms of environmental friendliness, overall value, and ease of use. Thus, promotional work may need to be undertaken in order to create a unique position for wood and move it away from steel in consumers' minds.

Respondents were next asked to indicate which of five building materials they would prefer to use in a variety of applications around the home. Respondents were asked to indicate their preference on a scale of 1 to 5, where 1 means 'not preferred' and 5 means 'highly preferred'. Figure 3.7 shows that wood is highly preferred by consumers. It is the only building material that is highly preferred for any application, and in all applications, it is the most preferred building material.

In exterior applications wood has some close competitors. In exterior cladding, wood and masonry have similar preferences. This may relate to the perception that wood is not as easy to maintain as masonry, and is perceived as being equally durable, as discussed earlier. For decking, wood is the preferred material. This may be due to the lack of competing systems in this application in the Australian market. Wood and plastic composites and plastic deck systems are now being marketed in North America. In interior applications, wood is again the most preferred material but faces challenges by steel for wall framing and windows.

Figure 3.7 Preferences for Building Materials



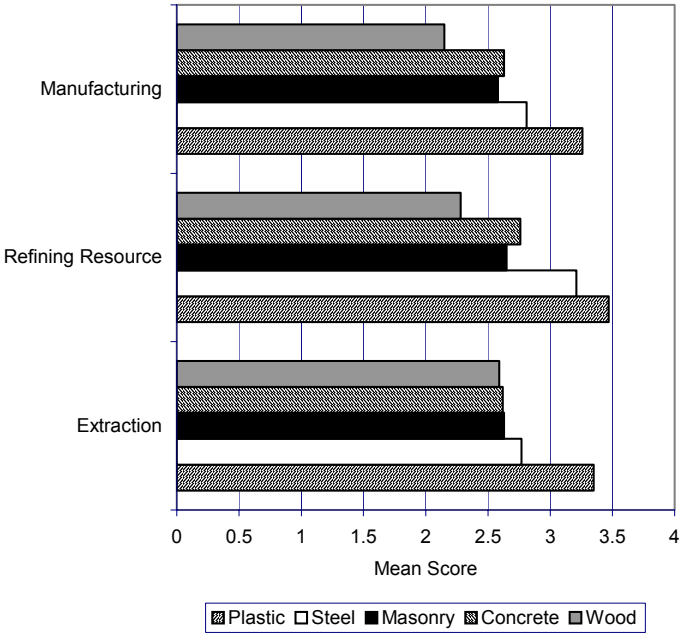
These results suggest that although wood is well positioned in many building applications, there are some areas where promotion of the use of wood may be valuable. For example, although wood is preferred for windows, steel or metal windows are seen as the next best option. The particular attributes of wood that need to be promoted to maintain this preference include its appearance, along with ways of dealing with maintenance.

Another area of interest for the wood products industry is wall framing, where steel is close to wood in terms of consumer preference. This may indicate the effects of promotion by the steel industry and the development of framing systems that favour steel. This again suggests the need for the development and promotion of wooden framing systems.

Cladding manufacturers may want to focus on the perceived attractiveness of wood over masonry as a method of differentiating the two materials. In fencing, wood and steel have similar preferences. Manufacturers may want to focus on the attractiveness of wood or its ease of use, as discussed earlier, as a means of differentiating wood from steel.

In order to find out whether opinions about the relative environmental effects of different building materials might have on consumer purchases, respondents were also asked to rate the environmental effect of a number of materials through their production process. The means scores for responses are shown in Figure 3.8. There were five choices for each question, with 0 meaning ‘never thought about’, 1 meaning ‘completely harmless’, 2 meaning ‘harmless’, 3 meaning ‘harmful’, and 4 meaning ‘very harmful’.

Figure 3.8 Perceived Impact of Building Material Use on the Environment



Overall, wood rates well in terms of respondents' perceptions of environmental effects through their production process for these parameters. Wood is perceived as being the least harmful of the five materials in all cases, and its mean score was close to 2.0, or harmless, in every case. Its highest mean score was for extraction of the raw resources. Plastic was perceived as being the most harmful across the three environmental parameters, and steel was perceived as being the next most harmful across all three parameters.

A substantial number of consumers had never thought about these issues (Table 3.3). It is interesting to note that wood had the smallest proportion of consumers who had never thought about these issues. That is, wood and its relation to the environment is thought about more than any of the other building materials.

Table 3.3 Consumers Who Never Think of Materials Impacting the Environment

	Steel	Wood	Concrete	Masonry	Plastic
			%		
Extracting the Raw Resource	7.8	2.8	15.2	13.9	9.4
Refining the Raw Resource	7.8	6.2	19.5	18.5	9.5
Manufacturing the Finished Product	9.4	5.6	15.1	16.3	7.8

These results substantiate results discussed above where wood is perceived as being the most environmentally friendly of the five building materials considered. If these perceptions are accurate, then these may be parameters that the industry uses to promote wood away from these alternative materials. However, these results indicate that consumers are more likely to consider the environmental impact or credentials of wood than the other materials, making the industry susceptible to consumers' environmental concerns and possibly susceptible to more restrictive environmental

policy. These results suggest that the industry may want to consider using forest certification as a way to minimise the environmental concerns of consumers.

Summary of Final Consumer Results

The most important furniture attribute was the attractiveness of the furniture closely followed by quality construction. Style or design, quality, durability and getting good value were also rated as important, although the overall price of the furniture was seen as a less important furniture attribute than good value. Taken together, these results suggest that furniture materials and manufacturing methods must combine durability and quality construction with value, as consumers appear to be willing to pay for quality.

The CJA analysis shows that over all, forest type is rated as the most important furniture attribute, with plantation sources being preferred to native forest sources. Forest certification, with certified preferred over non-certified sources, and region, with Australian sources preferred over imported timber, were the next most important attributes. Warranty, with five years preferred over a two-year warranty was rated a little lower. Price is rated as the least important furniture attribute, with a lower price preferred to a higher price. However, it should be recalled that the survey is drawn from home owners and average income in the sample is higher than the wider population, so these results reflect the preferences of a more affluent segment of the population represented by the sample frame.

A cluster analysis of the CJA results provides four clusters, or market segments:

- The *"quality environmentalist"* cluster rates forest certification as the most important attribute, prefers a long warranty provided, and is the least price-sensitive cluster
- The *"value environmentalist"* cluster rates a long warranty as the most important attribute, prefers timber with forest certification, and is the most sensitive to price
- The *"implicit-certification consumer"* cluster rates forest type as the most important attribute, preferring plantation sources, and also prefers wood sourced from Australia, and forest certification
- The *"buy-local consumer"* cluster rates the region where the wood was sourced as the most important attribute, preferring wood sourced from Australia over imported wood, followed by plantation sources

It was not possible to draw an adequate profile of these clusters using the demographic variables that were collected in the questionnaire.

When asked about relative attributes of wood compared to other building materials, the results indicate that wood is perceived as having a number of positive characteristics that could be promoted by the wood products industry. The warmth, texture, and grain of wood can be emphasised in terms of the attractiveness of wood compared to competing materials. In addition, consumers perceive that wood is the most environmentally friendly of the materials, and given assurance of sustainable management, perhaps through certification, consumers may be willing to accept wood's environmental credentials. Wood should also be promoted in terms of being easy to use. The industry may want to continue to promote wood's versatility and educate consumers on appropriate uses for wood. In particular, consumer education may be useful to explain under what conditions wood would be as durable as

alternative building materials, and the industry needs to promote to consumers the easiest methods of maintaining wood. In particular, promotional work may need to be undertaken in order to create a unique position for wood and move it away from steel in consumers' minds.

When asked about which of five building materials they would prefer to use in a variety of applications around the home, respondents showed that wood is highly preferred by consumers. Although wood is well positioned in many building applications, there are some areas where promotion of the use of wood may be valuable. An example is windows, where wood is preferred, but steel or metal windows are seen as the next best option. The particular attributes of wood that need to be promoted to maintain this preference include its appearance, along with ways of dealing with maintenance. Another area of interest for the wood products industry is wall framing, where steel is close to wood in terms of consumer preference. This may indicate the effects of promotion by the steel industry and the development of framing systems that make it easier to use steel. This again suggests the need for the development and promotion of wooden framing systems. In other applications, manufacturers may want to focus on the attractiveness or ease of use of wood.

Consumers also perceive wood to be the most environmentally friendly of the five building materials considered. If these perceptions are accurate, then these may be parameters that the industry also uses to promote wood away from these alternative materials. However, consumers are more likely to consider the environmental impact or credentials of wood than the other materials, making the industry susceptible to consumers' environmental concerns. This suggests that the industry may want to consider using forest certification as a way to minimise the environmental concerns of consumers.

When asked about environmental purchases, 61 percent of respondents had seen some type of environmental labelling on packaging, including both certified and uncertified products, and 53 percent had actually purchased a product with environmental labelling. The degree of "uncertain" regarding purchases of certified products indicates the need to accompany any certification programme with a publicity campaign. Overall, an independent private certification organisation is the most trusted organisation to carry out forest certification. The wood products industry is the organisation least trusted by consumers to provide certification.

Part 4

Conclusions

In recent years, the wider social and economic framework that the forest sector operates within has undergone significant change. In particular, public perceptions about the relative environmental merits of using wood are being challenged. This challenge comes from both alternative building materials (e.g. concrete, plastic and steel), and from alternative supplies of wood (e.g. natural or plantation forests, and imported or domestic timbers). Accompanying this challenge is a growing trend to market environmental merits of products, particularly through environmental endorsements or certification.

These challenges have lead to the three research questions addressed in this study.

- What are the attitudes of forest growers towards forest certification and what factors would facilitate adoption of forest certification?
- What motivates specifiers, such as architects, and builders, to use alternative building materials to wood and what determines their choices?
- How do final consumers view the use of wood relative to alternative building materials and what factors influence their decisions about the materials they purchase?

Seven surveys were carried out to address these questions, each survey addressing one of these research questions and being directed at particular groups. The questions and results of the study lead to two major areas of conclusions – forest certification and building material selection.

Forest Certification

Each survey posed some type of question related to forest certification. Those involved in forest growing and primary processing had the greatest number of questions, since they are closely linked to the forest certification debate. Fewer questions about forest certification were asked of other groups, and generally these were in the context of wider decisions about selection of building materials. The conclusions in this section bring together information from all the surveys.

Environmental perceptions of building materials

Intermediate and final consumers generally believe that wood is more environmentally friendly than other building materials, including steel, concrete, masonry and plastic. When asked about general environmental aspects of building material use throughout the extraction, production and installation process, architects and consumers perceive wood to be the material that is least harmful to the environment, while builders and furniture manufacturers generally perceive wood to be harmless to the environment.

The general perception of intermediate and final consumers is that wood is relatively more environmentally friendly than other building materials. However, about 30 percent of architects, and 20 percent of builders and retailers have avoided using some building materials, including wood, for environmental reasons. Builders are also more likely to have negative perceptions about the environmental impact of wood extraction.

In addition, consumers are more likely to consider the environmental impact or credentials of wood than those of other building materials, making the wood products industry susceptible to consumers' environmental concerns.

In addition, the conjoint analysis of consumer preferences for outdoor wooden furniture attributes shows that over all, forest type is rated as most important, followed by forest certification, and Australian timber sources. A cluster analysis of the conjoint analysis results provides four clusters, or market segments of outdoor wooden furniture purchasers.

- The *"quality environmentalist"* cluster rates forest certification as the most important attribute, prefers a long warranty provided, and is the least price-sensitive cluster.
- The *"value environmentalist"* cluster rates a long warranty as the most important attribute, prefers timber with forest certification, and is the most sensitive to price.
- The *"implicit-certification consumer"* cluster rates forest type as the most important attribute, preferring plantation sources, and also prefers wood sourced from Australia, and forest certification.
- The *"buy-local consumer"* cluster rates the region where the wood was sourced as the most important attribute, preferring wood sourced from Australia over imported wood, followed by plantation sources.

These conjoint analysis results show that environmental attributes are important for some final consumers when purchasing products manufactured from wood. Given all of these factors, the environment may then be a dimension that the wood products industry can use to promote wood to intermediate and final consumers. Forest certification would work in favour of wood in this aspect.

Knowledge about and attitudes towards forest certification

Intermediate consumers are generally aware of, and have a preference for, certified wood products. As can be seen in Table 4.1, about 75 percent of respondents in all intermediate consumer categories are aware of certified wood products. In addition, there is a strong preference for using or stocking certified wood products, particularly for architects and building products retailers.

Intermediate consumers also believe that certified wood products are important to their ultimate customers. At least 50 percent of respondents in each category think that some of their customers would buy certified wood products if they were available. This rises to 90 percent for building products retailers, where the greatest proportion of respondents also report that customers have already requested certified wood products. A number of respondents in all categories of intermediate consumers believe that their customers would pay a premium for certified wood products.

The price premium response shown in Table 4.1 corresponds with the results of the consumer survey, which show that for some consumer segments, forest certification is more important than price and consumers would pay a higher price for a product with the certification attribute. However, there are also a number of consumer market segments that are price sensitive and it is not clear that the market will sustain a price premium in all product areas. Consumers themselves are generally familiar with the concept of environmental purchases as well, with 61 percent of respondents having

seen some type of environmental labelling on packaging, and 53 percent actually purchasing a product with environmental labelling.

Table 4.1 Opinions About Certified Wood Products
(% of respondents)

	Architects	Builders	Retailers*	Furniture
Aware of	74	73	83	75
Prefer to use or stock	91	67	88	75
Customers would buy if available	65	51	91/88	50
Customers have requested	14	24	51/29	20
Customers would pay a premium	48	32	45	30

* Trade/DIY customers

The results overall indicate that the forest industry is likely to find that forest certification will provide a role in positioning wood in the marketplace as many of their customers would purchase certified wood products in preference to non-certified products.

One area that the wood products industry may have to address is confusion about what constitutes forest certification. Half of the furniture manufacturers said they used certified sources from Australia where there are currently none available, and many of the consumer respondents were uncertain about whether they were actually making environmental purchases. The wood products industry will want to be sure that forest certification is correctly recognised and represented to customers of wood products rather than being confused with another system.

For the forest industry itself, the interest in forest certification is higher among forest growers than primary processors, with 60 percent of forest grower respondents indicating they will become involved compared to only 44 percent of primary processors. Within two years, about 30 percent of forest growers and 18 percent of primary processors expect to be undertaking or have forest certification.

Larger growers and processors are more likely to be involved in or considering forest certification. At a State level, the level of uptake of certification is generally higher for forest growers involved in native forests than for plantations, while for processors it is the reverse and those involved in processing plantation resources are more likely to be involved in forest certification. Both growers and processors in New South Wales and Queensland are less inclined to become involved in forest certification, and the certification impetus is strongest in the southern States. Individually, intentions to certify are much higher in Tasmania. Nationally though, there are a substantial number in the forest industry who do not have any current plans to be involved with forest certification.

Those who have made the decision to undertake forest certification are more likely to see certification as important in their markets and to see some benefits in certification. However, many primary processors and forest growers view forest certification as defensive reaction to protect markets rather than as a market opportunity. For many respondents, the most important reason for undertaking forest certification would be peer pressure, as there is widespread belief that their customers are not demanding certified products. To some extent, this reflects the fact that market growth is expected to be in countries or regions that are not closely linked to a need for certification. The

net effect is a perception that forest certification is being driven by industry itself. However, given the information in Table 4.1, it may also reflect a breakdown in communication between the forest industry and their customers.

Barriers to forest certification

Based on the survey findings, there are three main barriers to forest certification. First, there is a general lack of knowledge or clarity about what is going on in forest certification, and uncertainty about what might happen in the future. This is linked to an earlier observation that for most businesses, there is no direct perception of demand for certified forest products. The net effect is that many businesses have decided to hold off and wait until something clearer emerges.

Secondly, and linked to the lack of a direct perception of demand for certified forest products, there is inadequate communication along the forest products supply chain. Forest growers and primary producers are generally not aware of the potential demand for certified forest products indicated by the survey results for intermediate and final consumers. At present, most businesses considering forest certification feel they run the risk of being caught without links to other parts of the supply chain. The breakdown in communication in the forest industry itself is shown by the intended level of uptake of certification potentially being much higher for forest growers involved in native forests than for plantation growers, while the opposite occurs for processors of those resources.

Finally, while there is a belief that forest certification will go some way to promoting the industry's environmental stewardship, the forest industry does not believe that it will satisfy Australian environmental groups to the same extent that it might satisfy foreign environmental groups. As such, the perception is that there will be resistance to forest certification by Australian environmental groups and it will not have the desired effect in the market place for wood products.

Most acceptable certification approach

Only forest growers and primary processors were asked explicit questions about specific approaches to forest certification. The one exception to this was the consumer survey where respondents were asked about the organisation most trusted to carry out forest certification. The results on carrying out forest certification show that an independent, private certification organisation is the most trusted organisation to carry out forest certification, and that the wood products industry is least trusted. Whatever system(s) are developed, they will need to meet this criterion for acceptance in the marketplace.

Among those forest growers and primary processors who have already selected forest certification schemes, only three schemes are currently being considered. These are the ISO 14001 Environmental Management System, the Australian Forestry Standard, and the Forest Stewardship Council scheme. ISO 14401 is effectively a transitional or complementary management system to full forest certification. For the other two systems, there is currently an even split between the Australian Forestry Standard and the Forest Stewardship Council scheme for plantation growers and softwood processors. Native forest managers and processors are focusing predominantly on the Australian Forestry Standard.

Most forest industry respondents are concerned that whatever certification they undertake, it has international credibility and will facilitate sales in both the Australian and domestic markets. There is no desire for duplicate or ultimately redundant

certification efforts. This points to a need for adoption of an international certification system, or a mechanism for mutual recognition or an easy transition from a domestic certification system like the Australian Forestry Standard and international systems, such as Forest Stewardship Council.

Factors that would facilitate forest certification

Factors that would facilitate forest certification provide appropriate avenues to pursue the breakdown of the main barriers identified previously. Given the relatively low level of knowledge about forest certification, a useful starting point is communication with the forest industry and along the supply chain about forest certification systems generally, what is happening internationally, and how the Australian forest industry fits into the domestic and international scene. The focus of this communication should be to identify the risks and opportunities of forest certification, and mechanisms for making certification work.

Although the market generally works efficiently in transmitting demands along the supply chain, experience overseas shows that the lag times involved in developing the certified wood products market can create problems for different parts of the supply chain. The same problems seem to be emerging in Australia. As a result, there is a need to facilitate communication between different parts of the forest products supply chain.

Appropriate channels for communicating about forest certification

For both forest growers and primary processors, industry or trade publications will probably be the most effective method of communicating information on forest certification. Professional associations are also possible channels (e.g., meetings, seminars, workshops, field days, newsletters).

Selection Criteria for Building Materials

Intermediate and final consumers were asked a range of questions about selection of building materials and the factors they use in their decisions. In this context, intermediate consumers are those who are in the value chain for forest products, or those who have a role in creating or translating demand from final consumers. This group covers architects and builders (specifiers), building material retailers and furniture manufacturers. The conclusions in this section bring together the relevant results from all the consumer surveys.

Current and future use of wood in building applications

When asked about preferences for building materials in a variety of indoor and outdoor applications around the home, final consumers indicated that wood is highly preferred. The preference for wood in residential buildings is also reflected by architects and builders, with wood being a dominant material for the main structural components in this application. The surveys show that most architects and builders feel very positive about the use of wood.

An important issue for the wood products industry are the large number of builders who intend to decrease their use of wood. This reduction would be a continuation of the trend over the past five years where the use of wood by both architects and builders for residential buildings has decreased for all the applications considered, mostly being replaced by steel or concrete.

One area of interest for the wood products industry is wall framing, where steel is close to wood in terms of consumer preference and there has been a rapid adoption by architects and builders. This may indicate the effects of promotion by the steel industry and the development of framing systems that make it easier to use steel.

In commercial buildings, the frequency of wood use by architects and builders is much lower. Wood use is only common in interior partitions, and interior trim and detail in this application. The same downward trend in wood use found in residential buildings is occurring in commercial construction, with survey results showing wood use decreasing over the past five years and steel and concrete use increasing.

For final consumers and the D.I.Y. market, wood is generally the preferred building material in both exterior and interior applications, and wood dominates in the building trade and DIY markets. However, in some applications, wood has close competitors including exterior cladding (masonry), fencing (steel), internal wall framing (steel) and windows (steel/metal).

Use of wood in furniture applications

Solid hardwood was the most frequent furniture construction type used by manufacturers. However, for more than half of the manufacturers making solid wood furniture, solid wood was less than 20 percent of their sales. The other common types of construction were hardwood veneer and artificial laminate over wood composites. The most important furniture attribute for consumers was the attractiveness of the furniture closely followed by quality construction. Style or design, quality, durability and getting good value were also rated as important, although the overall price of the furniture was seen as a less important furniture attribute than ‘good value’.

Key selection criteria

For architects and builders, each is more likely to view their own preferences as being most important, while builders are more likely than architects to view the preferences of structural engineers as being important. Architects are more likely to view the appearance of the material and environmental considerations as being important in material selection. They are also concerned about the light, space, sound, and function of the material, or what can be termed architectural considerations. Builders are most concerned with more practical considerations, or those that impact on their ability to carry out the building job. Builders are more likely than architects to consider ease of installation as being important in material selection.

Both architects and builders consider consistency and quality of the material important and that the material is proven to perform in the intended application. They also consider it important that the material will be available when needed, that the supply will be consistent, and that it will have a reasonable installation cost.

For building material suppliers, demand from trade customers was the most important selection criteria for determining which building materials were carried in their stores. They also identified logistical factors, including product availability and supply consistency, and product-specific factors, including consistency, quality and price, as very important factors in the selection of building materials.

For furniture manufacturers, consumer preference was very important in the selection of furniture materials, along with the appearance of the material. They also identified material consistency and quality, supply consistency, and material availability as being

very important in determining the selection of furniture materials. These again are largely logistical and supply management factors.

Perceived advantages of wood

Architects rated functionality as an important building selection criterion, while builders saw ease of installation as being important in material selection. Not surprisingly, one of the key attributes where wood performs well for these groups is in its ease of being incorporated into design or use. As well, furniture manufacturers indicated that when compared to other furniture materials, wood rated highest in ease of incorporation into design, and ease of use in manufacturing.

For architects and builders, a key competitive advantage for wood performs well is in cost, including total building cost, installation cost and material costs. Wood is also seen to provide 'value for money' for building material retailers and consumers.

The specific nature of wood also provides some of its competitive advantages, for both furniture and building applications where appearance was important. This includes factors such as warmth, texture, and grain of wood.

Perceived disadvantages of wood

For both architects and builders, wood does not rate as well as other materials in terms of durability. When asked to identify the three greatest drawbacks to using wood in commercial design, the most commonly cited reasons for both architects and builders identified were "it is prone to insect damage" and "it deteriorates or rots". These perceptions of drawbacks point to physical and inherent characteristics of wood as playing a part in the decline in wood use.

Wood also does not rate as well in terms of consistent quality for architects, builders and building material retailers.

Promoting wood products

The key areas to address in promoting wood products build on the perceived strengths of wood, while at the same time, addressing the perceived weaknesses of wood. The wood products industry needs to build on the positive opinion held by consumers, architects and builders about wood in residential construction, and to take advantage of the opportunity to increase wood use. In a range of applications, the survey results show that manufacturers can focus on the attractiveness and ease of use of wood.

To reverse the trend in commercial construction, the wood products industry will have to overcome the negative attitudes of a large number of architects who do not think that wood is a good material for structural applications in light commercial buildings and the large number of builders who indicate that they will use less wood in the future. The main opportunity for wood may be the difference between the number of builders who use wood in light commercial construction and the number who thinks it is suitable.

A potentially key factor in addressing wood use in both residential and commercial building is to address problems in the adoption of new technology in wooden structural systems. The results of the surveys suggest that transfer of information about wooden structural systems is not occurring as fast or as well for wood as for other building materials and that different distribution systems are developing for wood and non-wood

materials. However fast technological transfer is occurring, it is also occurring faster among builders than among architects.
Taken together, the slow transfer of information on new wood-based building systems and differences in distribution systems for building materials indicates that the wood products industry needs to develop different approaches to promoting wood use through the following:

1. Distribution Channels

It appears that the wood products industry is relying too much on traditional distribution through building material suppliers to place their products, while other building material suppliers are using more specialised and direct distribution and promotion channels. The wood products industry needs to evaluate whether this is still an effective distribution system with the development of engineered wood products and the apparent breakdown in technology transfer to the building industry.

2. Training and Promotion

There is a need to evaluate the effectiveness of current methods used to provide training on wood products and systems for architects and builders and the effectiveness of promotional material.

One area that appears to be important is the development of material for formal education programmes (architects and builders), as well as sales presentations, trade shows, and exhibits to demonstrate both new and existing wood products to all parts of the building chain. The advice of store personnel and the availability of information on product installation and use were considered to be important in influencing DIY customer purchasing decisions. As such, it is important to extend information and physical examples provided for architects and builders to both DIY customers and store staff of building material suppliers.

If the wood products industry wants to communicate with architects and builders, there are two main methods. The most important communication means is through reading material such as trade magazines, textbooks and technical research. The importance of having information about wood use in textbooks is that this would ensure that architects and builders are educated about the use of wood early in their careers. Technical research material on the use of wood, and trade magazines with articles on new wood products or applications provides on-going information to those in the industry. The other important channel for builders and architects is the use of physical examples, such as demonstration buildings provided at exhibits or trade shows.

Appendices

Contents

In this survey, please use the following definition for forest certification:

Forest certification means that a formal, documented audit has been completed to ensure that forests are well-managed according to a defined set of criteria.

1. **Please indicate your level of knowledge with the following forest certification schemes.** (Circle the appropriate number for each). "I know a lot about" (5) means that you have detailed knowledge such as who administers the programme, whether it has a marketing logo, whether it is prescriptive, or whether it requires chain of custody.

	I know nothing about				I know a lot about
International Standards Organisation 14001	1	2	3	4	5
Pan European Forest Certification	1	2	3	4	5
Forest Stewardship Council	1	2	3	4	5
New Zealand National Forest Standards	1	2	3	4	5
Australian Forestry Standard	1	2	3	4	5
Sustainable Forestry Initiative	1	2	3	4	5
Canadian Forestry Standard	1	2	3	4	5
Lembaga Ekolabel Indonesia	1	2	3	4	5
Malaysian Certification Standard	1	2	3	4	5

2. **Given your knowledge of forest certification, please indicate which of the following practices you would expect to be included in a forest certification scheme.**

I believe forest certification schemes will have …	Yes	No	Don't Know
Third party assessment	□	□	□
Self assessment	□	□	□
Product tracking through the value chain	□	□	□
Environmental requirements	□	□	□
Economic requirements	□	□	□
Social requirements	□	□	□
Prescriptive forest management requirements[1]	□	□	□
Prescribed environmental outcomes[2]	□	□	□
Prescribed management system(s)[3]	□	□	□
Company-defined management system(s)[4]	□	□	□
A label that can be used for marketing	□	□	□

1. Detailed specifications such as maximum coupe size, or operating distance from streams. Operator has no discretion over what to do.

2. Specific outcomes such as sediment loads rather than the specific means to achieve this. Operator has discretion over specific action to meet outcomes.

3. Specific management system (documentation and reporting) must be used for the certification scheme.

4. Any management system can be selected that meets the needs of the certification scheme.

3. What do you believe will be the effects of forest certification on the AUSTRALIAN FOREST PRODUCTS INDUSTRY? Please circle the number that best corresponds to your belief about each of the following statements.

Forest certification will…	Disagree		Partly Agree		Agree
Maintain Australia's existing forestry markets	1	2	3	4	5
Provide Australian companies access to new markets	1	2	3	4	5
Promote environmental stewardship to Australians	1	2	3	4	5
Promote our environmental stewardship internationally	1	2	3	4	5
Satisfy concerns of foreign environmental organisations	1	2	3	4	5
Satisfy concerns of local environmental organisations	1	2	3	4	5
Assist government environmental regulations	1	2	3	4	5
Provide competitive advantages for Australia	1	2	3	4	5
Limit use of some technology (GMO, chemicals)	1	2	3	4	5
Reduce wood harvests in Australia	1	2	3	4	5
Change Australian employment practices or safety	1	2	3	4	5
Increase monitoring and auditing	1	2	3	4	5
Improve forest management in Australia	1	2	3	4	5
Improve environmental management systems	1	2	3	4	5
Improve overall management systems	1	2	3	4	5

4. What do you believe about the importance of forest certification for you or your organisation? Please circle the number that best corresponds to your belief about each of the following statements.

Forest certification ….	Disagree		Partly Agree		Agree
Has been requested by our customers	1	2	3	4	5
Has been requested by retail consumers	1	2	3	4	5
Will be required by the market in the near future	1	2	3	4	5
Will increase our shareholder satisfaction	1	2	3	4	5
Will provide access to new domestic markets	1	2	3	4	5
Will provide access to new export markets	1	2	3	4	5
Offers benefits greater than costs	1	2	3	4	5
Will offer public relations benefits	1	2	3	4	5
Will prevent loss of existing markets	1	2	3	4	5
Will protect market share in existing markets	1	2	3	4	5
Requires us to be an 'early mover' in using it	1	2	3	4	5
Will be required within five years	1	2	3	4	5
Is creating peer pressure to adopt it	1	2	3	4	5
Will improve our environmental performance	1	2	3	4	5

5. Please indicate your or your organisation's intentions toward forest certification. Please tick (□) the box that most adequately reflects your organisation's intentions.

No intention to pursue forest certification at this time (Proceed directly to Question 9) □

We are considering forest certification in

- The next 12 months □
- The next 24 months □
- After the next 24 months □

We are in the process of obtaining forest certification □

We already have forest certification □

If you indicated that you have or are considering forest certification in Question 5, please go to Question 6. Otherwise proceed directly to Question 9.

6. Which forest certification scheme(s) are you or your organization involved with or considering? (□)

No particular scheme at this time (Go to Question 9) □

We have selected a scheme □
(Name of Scheme) _____

(Name of Scheme) _____

7. If you have selected or are considering a particular scheme in Question 6, what factors were important in your choice of this particular scheme(s)? Please circle the number that best corresponds to your belief about the following statements.

This certification scheme ….	Not important				Very important
Is the scheme desired by our customers	1	2	3	4	5
Is most suited to our forestry operation	1	2	3	4	5
Is more likely to create environmental benefits	1	2	3	4	5
It will be credible to our Australian customers	1	2	3	4	5
Has an internationally recognized brand	1	2	3	4	5
Is the most likely to ensure a price premium	1	2	3	4	5
Is recommended by our industry	1	2	3	4	5
Offers control over the certification process	1	2	3	4	5
Will gain us access to new markets	1	2	3	4	5
Is likely to be the most durable	1	2	3	4	5
Has the lowest setup and ongoing costs	1	2	3	4	5
Is or will be accepted by environmental groups	1	2	3	4	5

8. If you have selected or are considering a particular forest certification scheme in Question 6, are there any factors that have made it difficult for your organisation to undertake this certification scheme? Please circle the number that best corresponds to your belief about the following statements.

Implementing forest certification is difficult because….	No Impediment				Major Impediment
We do not have relevant information	1	2	3	4	5
Stakeholders did not agree with the scheme	1	2	3	4	5
We do not have required management skills	1	2	3	4	5
We do not have required employee skills	1	2	3	4	5
Our financial resources are limited	1	2	3	4	5
Of difficulties in developing the supply chain	1	2	3	4	5
Other _____	1	2	3	4	5

Please go to Question 10

9. If you have no intention to pursue forest certification at this time, please indicate what factors have influenced your decision. Please circle the number that best corresponds to your belief about the following statements.

We have not adopted forest certification because	Disagree Agree		Partly Agree		
There are too many schemes to consider	1	2	3	4	5
The benefits relative to costs are not clear	1	2	3	4	5
The issue is too complex	1	2	3	4	5
We do not have relevant information	1	2	3	4	5
Our financial resources are limited	1	2	3	4	5
We do not have required management skills	1	2	3	4	5
We do not have required employee skills	1	2	3	4	5
It is too early to make a decision	1	2	3	4	5
It is not relevant to our business	1	2	3	4	5
It is not clear which way the industry will go	1	2	3	4	5
It is not available in Australia					
Other _____	1	2	3	4	5

10. There are a range of codes or guidelines that define acceptable forest practices. These codes can be either specified by legislation or be developed by companies and organizations for self-management. They may be specific to forestry or more widely applied to natural resources. Please indicate whether your organisation is currently following a code that guides your forest practice. Please indicate (□) all codes your organisation is using (you may select more than one option and enter multiple codes for any option).

Our company is not involved in any forest code	□
Self-administered industry code Name(s) _____	□
Self-administered internal or company code Name(s) _____	□
Self-administered government code Name(s) _____	□
External audited industry code Name(s) _____	□
External audited internal or company code Name(s) _____	□
External audited government code Name(s) _____	□

11. There are a range of generic management systems that can be adopted by organisations to ensure that internal processes will meet the organisation's objectives. Please indicate whether you are currently using any quality management systems (□)?

Our company is not involved in any management system	□
ISO 9001 Quality Management System	□
ISO 14001 Environmental Management System	□
QAS Certified Environmental Management System (CEM)	□
QAS Occupational Health and Safety Management System (OSH)	□
Other _____	□
Other _____	□
Other _____	□
Other _____	□

12. For each of the different types of information, which of the following communication channels would you most likely use? Select as many communication channels as you need for each type of information (□).

Communication Channel	Information Type				
	New Technology (Chemicals, equipment)	Market Information (Prices, economics)	Forest Certification	Government Regulations (taxation, planning)	Sector Initiatives (promotion standards)
Industry Trade Publication	□	□	□	□	□
Conference or workshop	□	□	□	□	□
Professional Association	□	□	□	□	□
Government Publication	□	□	□	□	□
Internet/ Web Page	□	□	□	□	□
Other Business or Consultant	□	□	□	□	□
Research Organisation	□	□	□	□	□
Promotional Material/Fliers	□	□	□	□	□
Word of Mouth or Colleagues	□	□	□	□	□

The remaining questions refer to your organisation. Remember all information is confidential. If you choose not to answer some of these questions, we would still like your survey returned.

13. What is the ownership status of your organisation (□)?

Privately Owned, Predominantly Australian Ownership	□
Privately Owned, Predominantly Foreign Ownership	□
Publicly Listed Company	□
Government Trading Enterprise	□
Government Department or Agency	□
Joint Venture	□
Partnership	□
Other (please specify) _____	□

14. What types of forests does your organisation manage or own, and what is the size of the holdings, and annual log production? (Please complete the table.)

Forest Type	Area owned or managed (ha)	Total annual production (m^3/yr)
Plantation		
Native Forest		

15. Into which of the following markets do your customers currently sell the majority of their products and what do you expect this to be in five years? Please tick (□) all that apply.

	Current	In 5 years		Current	In 5 years
Australia	□	□	Other SE Asia	□	□
New Zealand	□	□	India	□	□
Japan	□	□	European Union	□	□
Korea	□	□	Other - Please Specify	□	□
USA	□	□			
China	□	□			

16. Is your forestry operation integrated with a wood processing operation?

Yes □ **No** □

17. Which forest types and states do you have forests under ownership or management, and are you considering certification for these forests? Please tick (□) all that apply.

State	Softwood Plantations		Hardwood Plantations		Native Forest	
	Under Management	Intend to or have certified	Under Management	Intend to or have certified	Under Management	Intend to or have certified
WA	□	□	□	□	□	□
SA	□	□	□	□	□	□
Tas	□	□	□	□	□	□
Vic	□	□	□	□	□	□
NSW	□	□	□	□	□	□
Qld	□	□	□	□	□	□
ACT	□	□	□	□	□	□
NT	□	□	□	□	□	□

18. Please add any other comments about forest certification that you think are important and have not been addressed in this survey.

Thanks for your help!
Please return this survey by placing it in the envelope provided and dropping it in the nearest postbox. No stamp is needed.

Section 1 – Forest Certification and Certified Wood Products

For this section, use the following definition for forest certification and certified wood products:

Forest certification means that a formal, documented audit has been completed to ensure that forests are well-managed according to a defined set of criteria, which include environmental, social and economic aspects. Wood products that can be verified to originate from certified forests can bear a certification label.

1. **Please indicate your level of knowledge with the following forest certification schemes.** (Circle the appropriate number for each). "I know a lot about" (5) means that you have detailed knowledge such as who administers the programme, whether it has a marketing logo, whether it is prescriptive, or whether it requires chain of custody.

	I know nothing about		I have read about		I know a lot about
International Standards Organisation 14001	1	2	3	4	5
Pan European Forest Certification	1	2	3	4	5
Forest Stewardship Council	1	2	3	4	5
New Zealand National Forest Standards	1	2	3	4	5
Australian Forestry Standard	1	2	3	4	5
Sustainable Forestry Initiative	1	2	3	4	5
Canadian Forestry Standard	1	2	3	4	5
Lembaga Ekolabel Indonesia	1	2	3	4	5
Malaysian Certification Standard	1	2	3	4	5

2. **Please indicate whether you believe the following practices will be included in an forest certification scheme.**

I believe forest certification schemes will have …	Yes	No	Don't Know
Third party assessment	□	□	□
Self assessment	□	□	□
Product tracking through the value chain	□	□	□
Prescriptive wood handling requirements	□	□	□
Prescriptive wood processing requirements	□	□	□
Prescribed management system(s)	□	□	□
Company-defined management system(s)	□	□	□
A label that can be used for marketing	□	□	□

3. What do you believe will be the effects of forest certification on the AUSTRALIAN FOREST PRODUCTS INDUSTRY? Please circle the number that best corresponds to your belief about the following statements.

Certification will…	Disagree		Partly		Agree
Maintain Australia's existing forestry markets	1	2	3	4	5
Provide Australian companies access to new markets	1	2	3	4	5
Promote environmental stewardship to Australians	1	2	3	4	5
Promote our environmental stewardship internationally	1	2	3	4	5
Satisfy concerns of environmental organisations	1	2	3	4	5
Assist government environmental regulations	1	2	3	4	5
Provide competitive advantages for Australia	1	2	3	4	5
Limit use of some technology (GMO, chemicals)	1	2	3	4	5
Reduce wood harvests in Australia	1	2	3	4	5
Change Australian employment practices	1	2	3	4	5
Increase monitoring and auditing	1	2	3	4	5
Improve forest management in Australia	1	2	3	4	5
Improve environmental management systems	1	2	3	4	5
Improve overall management systems	1	2	3	4	5

4. What do you believe about the importance of forest certification for YOUR ORGANISATION? Please circle the number that best corresponds to your belief about the following statements.

Forest certification ….	Disagree		Partly		Agree
Has been requested by our customers	1	2	3	4	5
Has been requested by retail consumers	1	2	3	4	5
Will be required in the near future	1	2	3	4	5
Will increase our shareholder satisfaction	1	2	3	4	5
Will provide access to new domestic markets	1	2	3	4	5
Will provide access to new export markets	1	2	3	4	5
Will achieve higher profits	1	2	3	4	5
Will offer public relations benefits	1	2	3	4	5
Will prevent loss of existing markets	1	2	3	4	5
Will protect market share in existing markets	1	2	3	4	5
Requires us to be an 'early mover' in using it	1	2	3	4	5
Will be required within five years	1	2	3	4	5
Is creating peer pressure to adopt it	1	2	3	4	5
Will improve our environmental performance	1	2	3	4	5

5. Please indicate your organisation's intentions towards becoming accredited to produce certified wood products. Please tick (□) the box that most adequately reflects your organisation's intentions.

No intention of becoming accredited to produce certified wood products at this time (Proceed directly to Question 9) □

We are considering becoming accredited to produce certified wood products

- The next 12 months □
- The next 24 months □
- After the next 24 months □

We are in the process of becoming accredited to produce certified wood products □

We are already accredited to produce certified forest products □

If you indicated that you have or are considering accreditation to produce certified wood products in Question 5, please go to Question 6. Otherwise proceed directly to Question 9.

6. Which certification scheme(s) you are involved with or are you considering?

No particular scheme at this time (Go to Question 9) □

We have selected a scheme □
(Name of Scheme) _____

(Name of Scheme) _____

7. If you have selected or are considering a particular scheme in Question 6, what factors were important in your choice of this particular scheme(s)? Please circle the number that best corresponds to your belief about the following statements.

This certification scheme ….	Not Important				Very Important
Is the scheme required by our customers	1	2	3	4	5
Is most suited to our manufacturing operation	1	2	3	4	5
Is more likely to create environmental benefits	1	2	3	4	5
It will be credible to our Australian customers	1	2	3	4	5
Has an internationally recognized brand	1	2	3	4	5
Is the most likely to ensure a price premium	1	2	3	4	5
Is recommended by our industry	1	2	3	4	5
Offers control over the certification process	1	2	3	4	5
Will gain us access to new markets	1	2	3	4	5
Is or will be accepted by environmental groups	1	2	3	4	5

8. If you have selected or are considering a particular scheme in Question 6, are there any factors that have made it difficult for your organisation to undertake this certification scheme? Please circle the number that best corresponds to your belief about the following statements.

Implementing forest certification is difficult because….	No Impediment				Major Impediment
We do not have relevant information	1	2	3	4	5
Stakeholders did not agree with the scheme	1	2	3	4	5
We do not have required management skills	1	2	3	4	5
We do not have required employee skills	1	2	3	4	5
Our financial resources are limited	1	2	3	4	5
Other _____	1	2	3	4	5

Please go to Question 10

9. If you have no intention to pursue accreditation to produce certified wood products at this time or have not selected a certification scheme yet, please indicate what factors have influenced your decision. Please circle the number that best corresponds to your belief about the following statements.

We have not pursued accreditation to produce certified wood products because	Disagree		Partly Agree		Agree
There are too many schemes to consider	1	2	3	4	5
The benefits are not clear	1	2	3	4	5
The issue is too complex	1	2	3	4	5
We do not have relevant information	1	2	3	4	5
Our financial resources are limited	1	2	3	4	5
We do not have required management skills	1	2	3	4	5
We do not have required employee skills	1	2	3	4	5
It is too early to make a decision	1	2	3	4	5
It is not relevant to our business	1	2	3	4	5
It is not clear which way the industry will go	1	2	3	4	5
Other _____	1	2	3	4	5

10 There are a range of generic management systems that can be adopted by organisations to ensure that internal processes will meet the organisation's objectives. Please indicate whether you are currently using any quality management systems (□)?

Our company is not involved in any management system	□
ISO 9002 Quality Management System	□
ISO 14001 Environmental Management System	□
QAS Certified Environmental Management System (CEM)	□
QAS Occupational Health and Safety Management System (OSH)	□
Other _____	□
Other _____	□
Other _____	□
Other _____	□

11. For each of the different types of information, which of the following communication channels would you most likely use? Select as many communication channels as you need for each type of information (□).

Communication Channel	**Information Type**				
	New Technology (Chemicals, equipment)	Market Information (Prices, economics)	Forest Certification	Government Regulations (taxation, planning)	Sector Initiatives (promotion standards)
Industry Trade Publication	□	□	□	□	□
Conference or workshop	□	□	□	□	□
Professional Association	□	□	□	□	□
Government Publication	□	□	□	□	□
Internet/ Web Page	□	□	□	□	□
Other Business or Consultant	□	□	□	□	□
Research Organisation	□	□	□	□	□
Promotional Material/Fliers	□	□	□	□	□
Word of Mouth or Colleagues	□	□	□	□	□

The remaining questions refer to your organisation. Remember all information is confidential. If you choose not to answer some of these questions, we would still like your survey returned.

12. What is the ownership status of your organisation (□)?

Privately Owned, Predominantly Australian Ownership □
Privately Owned, Predominantly Foreign Ownership □
Publicly Listed Company □
Government Trading Enterprise □
Other (please specify) _____ □

13. What types of products does your organisation produce, and what is the approximate volume of output? (Please complete the table.)

Product Type	Total annual production	Units (e.g. m^3)
Hardwood Sawn Timber		
Softwood Sawn Timber		
Hardwood Plywood/Veneer		
Softwood Plywood/Veneer		
MDF		
Particleboard		
Strandboard		
Pulp and Paper		

14. In to which of the following markets do you or your customers currently sell the majority of their products and what do you expect this to be in five years? Please tick (□) all that apply.

	Current	In 5 years		Current	In 5 years
Australia	□	□	Other SE Asia	□	□
New Zealand	□	□	India	□	□
Japan	□	□	European Union	□	□
Korea	□	□	Other - Please Specify	□	□
USA	□	□			
China	□	□			

15. Indicate which states you process wood in, what log sources you use in those states, and whether you are considering certification for products from these forests? Please tick (□) all that apply.

State	Log Supply from Softwood Plantations		Log Supply from Hardwood Plantations		Log Supply from Natural Forest	
	Manufacture products from this source	Intend to or have certified mills or products	Manufacture products from this source	Intend to or have certified mills or products	Manufacture products from this source	Intend to or have certified mills or products
WA	□	□	□	□	□	□
SA	□	□	□	□	□	□
Tas	□	□	□	□	□	□
Vic	□	□	□	□	□	□
NSW	□	□	□	□	□	□
Qld	□	□	□	□	□	□
ACT	□	□	□	□	□	□
NT	□	□	□	□	□	□

16. Please add any other comments about forest certification that you think are important and have not been addressed in this survey.

Thanks for your help!
Please return this survey by placing it in the envelope provided and dropping it in the nearest postbox. No stamp is needed.

Section 1 – Building Material Selection

1. How important are the following considerations when selecting materials for the buildings you design. Please check (✓) one box for each consideration.

Consideration	Not At All Important	Slightly Important	Important	Very Important	Extremely Important
Preference of architect	□	□	□	□	□
Preference of structural engineer	□	□	□	□	□
Preference of owner/developer	□	□	□	□	□
Preference of contractor	□	□	□	□	□
Preference of builder	□	□	□	□	□
Availability of tradespeople	□	□	□	□	□
Cost of installation	□	□	□	□	□
Ease of modification	□	□	□	□	□
Ease of installation	□	□	□	□	□
Material availability	□	□	□	□	□
Material adaptability	□	□	□	□	□
Material cost	□	□	□	□	□
Supply consistency	□	□	□	□	□
Material consistency and quality	□	□	□	□	□
Cost of maintenance and repair	□	□	□	□	□
Life-cycle costs	□	□	□	□	□
Fire performance rating	□	□	□	□	□
Material strength	□	□	□	□	□
Product guarantees/warranties	□	□	□	□	□
Proven record of material	□	□	□	□	□
Experience with material	□	□	□	□	□
Design standards	□	□	□	□	□
Design considerations[1]	□	□	□	□	□
Architectural considerations[2]	□	□	□	□	□
Building code easy to understand	□	□	□	□	□
Appearance of material	□	□	□	□	□
Safety of material	□	□	□	□	□
Environmental considerations[3]	□	□	□	□	□

1. Design considerations refer to simplicity of design, application of codes, time required, etc.
2. Architectural considerations refer to light, space, sound, function, etc.
3. Environmental considerations refer to global impact due to material use.

2. Please indicate the extent to which you believe the following attributes are possessed by each of the following materials. Please circle the number that best corresponds to your belief about each material for a particular attribute.

	Material possesses attribute… Not at all				To a high degree		Material possesses attribute… Not at all				To a high degree
Durability						**Value (performance relative to cost)**					
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Concrete	1	2	3	4	5	Concrete	1	2	3	4	5
Masonry	1	2	3	4	5	Masonry	1	2	3	4	5
Consistent Quality						**Easy to incorporate into design**					
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Concrete	1	2	3	4	5	Concrete	1	2	3	4	5
Masonry	1	2	3	4	5	Masonry	1	2	3	4	5
Environmentally Friendly						**Building codes are easy to understand**					
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Concrete	1	2	3	4	5	Concrete	1	2	3	4	5
Masonry	1	2	3	4	5	Masonry	1	2	3	4	5

3. Please indicate your level of agreement or disagreement with the following statements by circling the appropriate number.

	Strongly Disagree				Strongly Agree		Not at all				To a high degree
Buildings made primarily of wood are….						**Designing with wood is…**					
Easy to build	1	2	3	4	5	Simple	1	2	3	4	5
Inexpensive	1	2	3	4	5	Gratifying	1	2	3	4	5
Long-lasting	1	2	3	4	5	Fast	1	2	3	4	5
Attractive	1	2	3	4	5	**When designing with wood it is easy to…**					
Comfortable	1	2	3	4	5	Understand fire codes	1	2	3	4	5
Functional	1	2	3	4	5	Understand building codes	1	2	3	4	5
Sound-proof	1	2	3	4	5	Do design calculations	1	2	3	4	5
Strong	1	2	3	4	5	Join structural components	1	2	3	4	5
Well insulated	1	2	3	4	5	Build in fire protection	1	2	3	4	5
Weather-proof	1	2	3	4	5	Control rot/pest damage	1	2	3	4	5

4. Please tell us about your knowledge of and experience with the following structural and nonstructural products and systems. Circle one number for Knowledge and one number for Experience for each product listed using the following key:

1 – Not at all Knowledgeable about or Experienced with this product
2 – Not very Knowledgeable about or Experienced with this product
3 – Somewhat Knowledgeable about or Experienced with this product
4 – Very Knowledgeable about or Experienced with this product

Wooden Structural Materials	**Knowledge**				**Experience**			
Dimension lumber	1	2	3	4	1	2	3	4
Composite lumber	1	2	3	4	1	2	3	4
Glulam beams	1	2	3	4	1	2	3	4
Wood I-beams (I-joists)	1	2	3	4	1	2	3	4
Laminated veneer lumber (LVL)	1	2	3	4	1	2	3	4
Parallel chord trusses	1	2	3	4	1	2	3	4
Pitched roof trusses	1	2	3	4	1	2	3	4
Wooden Non-structural Materials								
Siding/plank decking	1	2	3	4	1	2	3	4
Plywood	1	2	3	4	1	2	3	4
Oriented strand board (OSB)	1	2	3	4	1	2	3	4
Medium density fibreboard (MDF)	1	2	3	4	1	2	3	4
Particle board	1	2	3	4	1	2	3	4
Non-Wood Materials								
Metal bar joists	1	2	3	4	1	2	3	4
Steel I-beams	1	2	3	4	1	2	3	4
Steel beams and deck	1	2	3	4	1	2	3	4
Steel studs	1	2	3	4	1	2	3	4
Metal cladding	1	2	3	4	1	2	3	4
Steel tubing	1	2	3	4	1	2	3	4
Concrete tilt slab	1	2	3	4	1	2	3	4
Concrete slab	1	2	3	4	1	2	3	4
Concrete block	1	2	3	4	1	2	3	4
Brick	1	2	3	4	1	2	3	4

Section 2 - Environmental Considerations

5. Please rate the materials on each of the following environmental dimensions according to how harmful you feel they are to the environment. For each environmental dimension, please check (✓) one box for each material.

	Completely Harmless	Harmless	Harmful	Very Harmful	Never Thought About It
Extracting the Raw Resource					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Refining the Raw Resource					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Manufacturing the Building Material					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Installing the Building					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Thermal Efficiency of the Building					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐

6. **Please rank the building materials listed below according to their ability to meet environmental considerations.**

In each case, rank the materials from 1 to 5, with 1 being the LEAST able to meet the environmental consideration and 5 being the MOST able to meet the environmental consideration.

	Steel	Concrete	Wood	Masonry	Plastic
Recycling of Material	☐	☐	☐	☐	☐
Energy Efficiency of Buildings Made from Material	☐	☐	☐	☐	☐
Overall Environmental Friendliness	☐	☐	☐	☐	☐

7. **This question deals with certified wood products. For this question, please indicate your agreement (✓) with the following statements using this definition for forest certification and certified wood products:**

Forest certification means that a formal, documented audit has been completed to ensure that forests are well-managed according to a defined set of criteria, which include environmental, social and economic criteria. Wood products that originate from certified forests can bear a certification label.

	YES	NO
I am aware of certified wood products	☐	☐
I have seen certified wood products in the marketplace	☐	☐
Some clients have requested certified wood products	☐	☐
Some clients would request certified wood products if available	☐	☐
I would prefer to use certified wood products if available	☐	☐
Some clients would pay a price premium for certified wood products	☐	☐
I have **not** used wood products for environmental reasons	☐	☐
I have **not** used non-wood building materials (steel, concrete, plastic) for environmental reasons	☐	☐

8. **Do you have any additional comments with regards to building material use and the environment?**

Section 3 - Residential and Light Commercial Buildings

This section of the survey concerns residential and light commercial buildings that are 2 storeys or less, or less than 1000 m^2 in area. If your business is devoted ENTIRELY to any of the following building categories, please skip this section and proceed to Section 4.

- **Buildings 3 stories or more**
- **Buildings larger than 1000 m^2**
- **Non-building structures (dams, tunnels, bridges, etc.)**

9. Please answer the following questions (✓) on wood use.

	Yes	No
Do you presently build residential buildings using wood as the main structural component?	□	□
Do you presently build light commercial buildings using wood as the main structural component?	□	□
In general, do you think that wood is a good material for structural applications in residential buildings?	□	□
In general, do you think that wood is a good material for structural applications in light commercial buildings?	□	□

	More	Less	Same
Do you intend on using more or less wood in the future for residential buildings?	□	□	□
Do you intend on using more or less wood in the future for commercial buildings?	□	□	□

10. For RESIDENTIAL buildings, what material did you most frequently use in the following applications 5 years ago and what is most likely to be used today?

For each application (roof system etc.), check (✓) the one material most frequently used 5 years ago and the one material most likely to be used today. For a product that combines more than one material, check as many materials as are applicable for the combined product.

	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof systems	□	□	□	□	□	□	□	□	□	□
Floor systems	□	□	□	□	□	□	□	□	□	□
Exterior wall systems	□	□	□	□	□	□	□	□	□	□
Interior partitions	□	□	□	□	□	□	□	□	□	□
Exterior Cladding	□	□	□	□	□	□	□	□	□	□
Interior trim/detail	□	□	□	□	□	□	□	□	□	□

11. For COMMERCIAL buildings, what material did you most frequently use in the following applications 5 years ago and what is most likely to be used today?

For each application (roof system etc.), check (✓) the one material most frequently used 5 years ago and the one material most likely to be used today. If you use a product that combines more than one material, check as many materials as are applicable for the combined product.

	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof systems	□	□	□	□	□	□	□	□	□	□
Floor systems	□	□	□	□	□	□	□	□	□	□
Exterior wall systems	□	□	□	□	□	□	□	□	□	□
Interior partitions	□	□	□	□	□	□	□	□	□	□
Exterior Cladding	□	□	□	□	□	□	□	□	□	□
Interior trim/detail	□	□	□	□	□	□	□	□	□	□

12. On average, when comparing WOOD to other materials, such as steel, concrete, masonry, and plastic, used in residential and light commercial buildings…(✓)

	More	Less	The Same
Material cost is	□	□	□
Design costs are	□	□	□
Cost of installation is	□	□	□
Labour costs are	□	□	□
Finishing costs are	□	□	□
Total building cost is	□	□	□
The number of architects required is	□	□	□
The number of specifiers involved is	□	□	□
The number of contracting crews required is	□	□	□
The number of tradespeople required is	□	□	□
The number of construction workers required is	□	□	□
The number of structural engineers is	□	□	□
The availability of skilled tradespeople is	□	□	□

13. For each of building area and height, circle the number that best corresponds to how often you use the materials listed as the major structural component.

Building Area:	Never Use				Always Use
Less than 50 m^2					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5
50 to 250 m^2					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5
More than 250 m^2					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5

Building Height:	Never Use				Always Use
One Storey					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5
Two Storeys					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5

14. The following is a list of common reasons why wood is not regularly used in commercial design. Please check (✓) what you believe to be the THREE GREATEST DRAWBACKS to using wood in commercial applications.

- ☐ It is costly
- ☐ It burns
- ☐ It is not strong
- ☐ It is not durable
- ☐ It shrinks and swells
- ☐ It deteriorate/rots
- ☐ Its quality is inconsistent
- ☐ It is a variable material
- ☐ It is prone to insect damage
- ☐ It is difficult to design with
- ☐ Other (please specify) _____

Section 4 – Learning about Building Materials and Design

15. Which of the following best describes your educational background? Please check (✓) all that apply.

University undergraduate degree	☐
University post-graduate degree	☐
College/TAFE diploma	☐
Technical/trade qualification	☐
Formal on-the-job or apprenticeship training	☐
Continuing education	☐
No formal training	☐
Other (please specify) _____	☐

16. The following list presents some of the many ways in which information about new products/systems/services can be obtained. Please check (✓) all applicable ways that you use to learn about new materials/products. Please also check all applicable ways that are most influential in getting you to try a new product.

	You Use	Most Influential
Reading materials (trade magazines, textbooks, technical research, etc.)	☐	☐
Manual/Data Files (design manuals, code manuals, service manuals, construction data files, etc.)	☐	☐
Company-specific promotion (product manuals, information packages/updates, advertisements, etc.)	☐	☐
Association (Industry-wide) promotion (newsletters, updates, mail-outs, etc.)	☐	☐
Personal Promotion (personal sales calls and visits, customer service reps, company consultations, etc.)	☐	☐
Continuing Education (information seminars, product seminars, short courses, guest speakers, etc.)	☐	☐
Word of Mouth (friends, peers, co-workers, clients, contactors, tradespeople, etc.)	☐	☐
Physical Examples (demonstration buildings, new buildings, exhibits, trade shows, etc.)	☐	☐
Computerised Information (on-line databases, design software)	☐	☐
Other (please specify) _____	☐	☐

Section 5

Please tell us a little about yourself and the place in which you work. Remember, all information is strictly confidential. If you choose not to answer some of these questions, we would still like your questionnaire returned.

17. What is your gender (✓)? □ **Male** □ **Female**

18. What is your age? _____ years

19. How many years have you been a practicing architect? _____ years

20. Are you self-employed (✓)? □ **Yes** □ **No**

21. How many employees are there at your place of work? _____

22. Which state do you mostly design buildings for (Check only one (✓))

Queensland	□
New South Wales	□
Victoria	□
Tasmania	□
South Australia	□
Western Australia	□
Northern Territory	□

23. Approximately how much business does your place of work do in terms of billings per year?

Under $100,000	□
$100,000 to $500,000	□
$500,001 to $1,000,000	□
$1,000,001 to $5,000,000	□
Over $5,000,000	□
Do not know	□

Thanks for your help!
Please return this survey by using the return envelope provided. No stamp is needed.

Section 1 – Building Material Selection

1. **How important are the following considerations when selecting materials for the structures you build. Please check (✓) one box for each consideration.**

Consideration	Not At All Important	Slightly Important	Important	Very Important	Extremely Important
Preference of architect	☐	☐	☐	☐	☐
Preference of structural engineer	☐	☐	☐	☐	☐
Preference of owner/developer	☐	☐	☐	☐	☐
Preference of contractor	☐	☐	☐	☐	☐
Preference of builder	☐	☐	☐	☐	☐
Availability of tradespeople	☐	☐	☐	☐	☐
Cost of installation	☐	☐	☐	☐	☐
Ease of modification	☐	☐	☐	☐	☐
Ease of installation	☐	☐	☐	☐	☐
Material availability	☐	☐	☐	☐	☐
Material adaptability	☐	☐	☐	☐	☐
Material cost	☐	☐	☐	☐	☐
Supply consistency	☐	☐	☐	☐	☐
Material consistency/quality	☐	☐	☐	☐	☐
Cost of maintenance and repair	☐	☐	☐	☐	☐
Life-cycle costs	☐	☐	☐	☐	☐
Fire performance rating	☐	☐	☐	☐	☐
Material strength	☐	☐	☐	☐	☐
Product guarantees/warranties	☐	☐	☐	☐	☐
Proven record of material	☐	☐	☐	☐	☐
Experience with material	☐	☐	☐	☐	☐
Compatibility with existing tools	☐	☐	☐	☐	☐
Available in pre-fabricated form[1]	☐	☐	☐	☐	☐
Building code easy to understand	☐	☐	☐	☐	☐
Appearance of material	☐	☐	☐	☐	☐
Safety of material	☐	☐	☐	☐	☐
Environmental considerations[2]	☐	☐	☐	☐	☐

[1] Factory-built wall frames, wall panels or roof trusses.
[2] Environmental considerations refer to global impact due to material use.

2. Please indicate the extent to which you believe the following attributes are possessed by each of the following materials. Please circle the number that best corresponds to your belief about each material for a particular attribute.

	Material possesses attribute… Not at all				To a high degree		Material possesses attribute… Not at all				To a high degree
Durability							**Value (performance relative to cost)**					
Steel	1	2	3	4	5		Steel	1	2	3	4	5
Wood	1	2	3	4	5		Wood	1	2	3	4	5
Concrete	1	2	3	4	5		Concrete	1	2	3	4	5
Masonry	1	2	3	4	5		Masonry	1	2	3	4	5
Consistent Quality							**Easy to incorporate into design**					
Steel	1	2	3	4	5		Steel	1	2	3	4	5
Wood	1	2	3	4	5		Wood	1	2	3	4	5
Concrete	1	2	3	4	5		Concrete	1	2	3	4	5
Masonry	1	2	3	4	5		Masonry	1	2	3	4	5
Environmentally Friendly							**Building codes are easy to understand**					
Steel	1	2	3	4	5		Steel	1	2	3	4	5
Wood	1	2	3	4	5		Wood	1	2	3	4	5
Concrete	1	2	3	4	5		Concrete	1	2	3	4	5
Masonry	1	2	3	4	5		Masonry	1	2	3	4	5

3. Please indicate your level of agreement or disagreement with the following statements by circling the appropriate number.

	Strongly Disagree				Strongly Agree		Not at all				To a high degree
Buildings made primarily of wood are….							**Building with wood is…**					
Easy to build	1	2	3	4	5		Simple	1	2	3	4	5
Inexpensive	1	2	3	4	5		Gratifying	1	2	3	4	5
Long-lasting	1	2	3	4	5		Fast	1	2	3	4	5
Attractive	1	2	3	4	5		*When building with wood it is easy to…*					
Comfortable	1	2	3	4	5		Understand fire codes	1	2	3	4	5
Functional	1	2	3	4	5		Understand building codes	1	2	3	4	5
Sound-proof	1	2	3	4	5		Do design calculations	1	2	3	4	5
Strong	1	2	3	4	5		Join structural components	1	2	3	4	5
Well insulated	1	2	3	4	5		Build in fire protection	1	2	3	4	5
Weather-proof	1	2	3	4	5		Control rot/pest damage	1	2	3	4	5

4. Please tell us about your knowledge of and experience with the following structural and nonstructural products and systems. Circle one number for Knowledge and one number for Experience for each product listed using the following key:

1 – Not at all Knowledgeable about or Experienced with this product
2 – Not very Knowledgeable about or Experienced with this product
3 – Somewhat Knowledgeable about or Experienced with this product
4 – Very Knowledgeable about or Experienced with this product

Wooden Structural Materials	**Knowledge**				**Experience**			
Dimension lumber	1	2	3	4	1	2	3	4
Composite lumber	1	2	3	4	1	2	3	4
Glulam beams	1	2	3	4	1	2	3	4
Wood I-beams (I-joists)	1	2	3	4	1	2	3	4
Laminated veneer lumber (LVL)	1	2	3	4	1	2	3	4
Parallel chord trusses	1	2	3	4	1	2	3	4
Pitched roof trusses	1	2	3	4	1	2	3	4
Wooden Non-structural Materials								
Siding/plank decking	1	2	3	4	1	2	3	4
Plywood	1	2	3	4	1	2	3	4
Oriented strand board (OSB)	1	2	3	4	1	2	3	4
Medium density fibreboard (MDF)	1	2	3	4	1	2	3	4
Particle board	1	2	3	4	1	2	3	4
Non-Wood Materials								
Metal bar joists	1	2	3	4	1	2	3	4
Steel I-beams	1	2	3	4	1	2	3	4
Steel beams and deck	1	2	3	4	1	2	3	4
Steel studs	1	2	3	4	1	2	3	4
Metal cladding	1	2	3	4	1	2	3	4
Steel tubing	1	2	3	4	1	2	3	4
Concrete tilt slab	1	2	3	4	1	2	3	4
Concrete slab	1	2	3	4	1	2	3	4
Concrete block	1	2	3	4	1	2	3	4
Brick	1	2	3	4	1	2	3	4

Section 2 - Environmental Considerations

5. Please rate the materials on each of the following environmental dimensions according to how harmful you feel they are to the environment. For each environmental dimension, please check (✓) one box for each material.

	Completely Harmless	Harmless	Harmful	Very Harmful	Never Thought About It
Extracting the Raw Resource					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Refining the Raw Resource					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Manufacturing the Building Material					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Installing the Building					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Thermal Efficiency of the Building					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐

6. **Please rank the building materials listed below according to their ability to meet environmental considerations.**

In each case, rank the materials from 1 to 5, with 1 being the LEAST able to meet the environmental consideration and 5 being the MOST able to meet the environmental consideration.

	Steel	Concrete	Wood	Masonry	Plastic
Recycling of Material	□	□	□	□	□
Energy Efficiency of Buildings Made from Material	□	□	□	□	□
Overall Environmental Friendliness	□	□	□	□	□

7. **This question deals with certified wood products. For this question, please indicate your agreement (✓) with the following statements using this definition for forest certification and certified wood products:**

Forest certification means that a formal, documented audit has been completed to ensure that forests are well-managed according to a defined set of criteria, which include environmental, social and economic aspects. Wood products that originate from certified forests can bear a certification label.

	YES	NO
I am aware of certified wood products	☐	☐
I have seen certified wood products in the marketplace	☐	☐
Some clients have requested certified wood products	☐	☐
Some clients would request certified wood products if available	☐	☐
I would prefer to use certified wood products if available	☐	☐
Some clients would pay a price premium for certified wood products	☐	☐
I have **not** used wood products for environmental reasons	☐	☐
I have **not** used non-wood building materials (steel, concrete, plastic) for environmental reasons	☐	☐

8. **Do you have any additional comments with regards to building material use and the environment?**

Section 3 - Residential and Light Commercial Buildings

This section of the survey concerns residential and light commercial buildings that are 2 storeys or less, or less than 1000 m^2 in area. If your business is devoted ENTIRELY to any of the following building categories, please skip this section and proceed to Section 4.

a. **Buildings 3 stories or more**
b. **Buildings larger than 1000 m^2**
c. **Non-building structures (dams, tunnels, bridges, etc.)**

9. Please answer the following questions on wood use. (✓)

	Yes	No
Do you presently build residential buildings using wood as the main structural component?	□	□
Do you presently build light commercial buildings using wood as the main structural component?	□	□
In general, do you think that wood is a good material for structural applications in residential buildings?	□	□
In general, do you think that wood is a good material for structural applications in light commercial buildings?	□	□

	More	Less	Same
Do you intend on using more or less wood in the future for residential buildings?	□	□	□
Do you intend on using more or less wood in the future for commercial buildings?	□	□	□

10. For RESIDENTIAL buildings, what material did you most frequently use in the following applications 5 years ago and what is most likely to be used today?

For each application (roof system etc.), check (✓) the one material most frequently used 5 years ago and the one material most likely to be used today. For a product that combines more than one material, check as many materials as are applicable for the combined product.

	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof systems	□	□	□	□	□	□	□	□	□	□
Floor systems	□	□	□	□	□	□	□	□	□	□
Exterior wall systems	□	□	□	□	□	□	□	□	□	□
Interior partitions	□	□	□	□	□	□	□	□	□	□
Exterior Cladding	□	□	□	□	□	□	□	□	□	□
Interior trim/detail	□	□	□	□	□	□	□	□	□	□

11. For COMMERCIAL buildings, what material did you most frequently use in the following applications 5 years ago and what is most likely to be used today?

For each application (roof system etc.), check (✓) the one material most frequently used 5 years ago and the one material most likely to be used today. If you use a product that combines more than one material, check as many materials as are applicable for the combined product.

	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof systems	□	□	□	□	□	□	□	□	□	□
Floor systems	□	□	□	□	□	□	□	□	□	□
Exterior wall systems	□	□	□	□	□	□	□	□	□	□
Interior partitions	□	□	□	□	□	□	□	□	□	□
Exterior Cladding	□	□	□	□	□	□	□	□	□	□
Interior trim/detail	□	□	□	□	□	□	□	□	□	□

12. On average, when comparing WOOD to other materials, such as steel, concrete, masonry, and plastic, used in residential and light commercial buildings…

	More	Less	The Same
Material cost is	□	□	□
Design costs are	□	□	□
Cost of installation is	□	□	□
Labour costs are	□	□	□
Finishing costs are	□	□	□
Total building cost is	□	□	□
The number of architects required is	□	□	□
The number of specifiers involved is	□	□	□
The number of contracting crews required is	□	□	□
The number of tradespeople required is	□	□	□
The number of construction workers required is	□	□	□
The number of structural engineers is	□	□	□
The availability of skilled tradespeople is	□	□	□

13. For each of building area and height, circle the number that best indicates how often you use the materials listed as the major structural component.

Building Area:	**Never Use**				**Always Use**
Less than 50 m^2					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5
50 to 250 m^2					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5
More than 250 m^2					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5

Building Height:	**Never Use**				**Always Use**
One Storey					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5
Two Storeys					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Combination	1	2	3	4	5

14. The following is a list of common reasons why wood is not regularly used in commercial design. Please check (✓) what you believe to be the THREE GREATEST DRAWBACKS to using wood in commercial applications.

- ☐ It is costly
- ☐ It burns
- ☐ It is not strong
- ☐ It is not durable
- ☐ It shrinks and swells
- ☐ It deteriorates/rots
- ☐ Its quality is inconsistent
- ☐ It is a variable material
- ☐ It is prone to insect damage
- ☐ Requires specialized tools
- ☐ Other (please specify)

_____

Section 4 – Learning about Building Materials and Design

15. Which of the following best describes your educational background? Please check (✓) all that apply.

University undergraduate degree	□
University post-graduate degree	□
College/TAFE diploma	□
Technical/trade qualification	□
Formal on-the-job or apprenticeship training	□
Continuing education	□
No formal training	□
Other (please specify) _____	□

16. The following list presents some of the many ways in which information about new products/systems/services can be obtained. Please check (✓) all applicable ways that you use to learn about new materials/products. Please also check all applicable ways that are most influential in getting you to try a new product.

	You Use	Most Influential
Reading materials (trade magazines, textbooks, technical research, etc.)	□	□
Manual/Data Files (design manuals, code manuals, service manuals, construction data files, etc.)	□	□
Company-specific promotion (product manuals, information packages/updates, advertisements, etc.)	□	□
Association (Industry-wide) promotion (newsletters, updates, mail-outs, etc.)	□	□
Personal Promotion (personal sales calls and visits, customer service reps, company consultations, etc.)	□	□
Continuing Education (information seminars, product seminars, short courses, guest speakers, etc.)	□	□
Word of Mouth (friends, peers, co-workers, clients, contactors, tradespeople, etc.)	□	□
Physical Examples (demonstration buildings, new buildings, exhibits, trade shows, etc.)	□	□
Computerised Information (on-line databases, design software)	□	□
Other (please specify) _____	□	□

Section 5

Please tell us a little about yourself and the place in which you work. Remember, all information is strictly confidential. If you choose not to answer some of these questions, we would still like your questionnaire returned.

17. What is your gender (✓)? □ **Male** □ **Female**

18. What is your age? _____ years

19. How many years have you been a practicing builder? _____ years

20. Are you self-employed (✓)? □ **Yes** □ **No**

21. How many employees are there at your place of work? _____

22. Which state do you mostly construct buildings (Check only one (✓))

Queensland	□
New South Wales	□
Victoria	□
Tasmania	□
South Australia	□
Western Australia	□
Northern Territory	□

23. Approximately how much business does your place of work do in terms of billings per year?

Under $100,000	□
$100,000 to $500,000	□
$500,001 to $1,000,000	□
$1,000,001 to $5,000,000	□
Over $5,000,000	□
Do not know	□

Thanks for your help!
Please return this survey by using the return envelope provided. No stamp is needed.

1. How important are the following considerations when selecting materials for the furniture you manufacture. Please check (✓) one box for each consideration.

Consideration	Not At All Important	Slightly Important	Important	Very Important	Extremely Important
Preference of designer	☐	☐	☐	☐	☐
Preference of consumers	☐	☐	☐	☐	☐
Preference of retailer	☐	☐	☐	☐	☐
Preference of manufacturer	☐	☐	☐	☐	☐
Material availability	☐	☐	☐	☐	☐
Material adaptability	☐	☐	☐	☐	☐
Material cost	☐	☐	☐	☐	☐
Supply consistency	☐	☐	☐	☐	☐
Material consistency/quality	☐	☐	☐	☐	☐
Material strength	☐	☐	☐	☐	☐
Impact resistance	☐	☐	☐	☐	☐
Ease of fastening	☐	☐	☐	☐	☐
Available in ready-to-use form	☐	☐	☐	☐	☐
Dimensional stability	☐	☐	☐	☐	☐
Proven record of material	☐	☐	☐	☐	☐
Experience with material	☐	☐	☐	☐	☐
Compatibility with existing tools	☐	☐	☐	☐	☐
Appearance of material	☐	☐	☐	☐	☐
Safety of material	☐	☐	☐	☐	☐
Environmental considerations[1]	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐

[1] Environmental considerations refer to global impact due to material use.

2. This question deals with certified wood products. For this question, please indicate your agreement (✓) with the following statements using the following definition for forest certification and certified wood products:

Forest certification means that a formal, documented audit has been completed to ensure that forests are well-managed according to a defined set of criteria, which include environmental, social and economic aspects. Wood products that originate from certified forests can bear a certification label.

	YES	NO
I am aware of certified wood products	☐	☐
I have seen certified wood products in the marketplace	☐	☐
Some customers have requested certified wood products	☐	☐
Some customers would request certified wood products if available	☐	☐
I would prefer to use certified wood products if available	☐	☐
Some customers would pay a price premium for certified wood products	☐	☐
I have **not** used wood products for environmental reasons	☐	☐
I have **not** used non-wood materials (metal, plastic) for environmental reasons	☐	☐

3. What types of wood does your organisation use for manufacturing furniture and what is the source of the wood? Certified sources means wood that has come from certified forests. (Please complete the table.)

Wood Type	Annual Volume (m3)	Country of Origin	Use Some Certified Sources	
			Yes	No
			Yes	No
			Yes	No
			Yes	No
			Yes	No
			Yes	No
			Yes	No
			Yes	No
			Yes	No

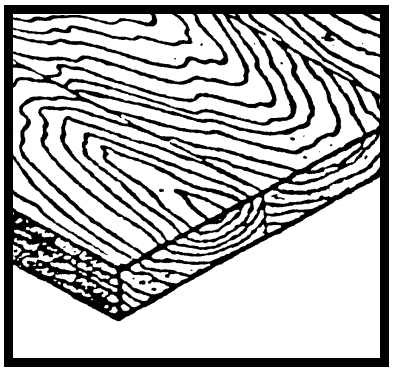
4. Please indicate the extent to which you believe the following attributes are possessed by each of the following materials for furniture manufacturing. Please circle the number that best corresponds to your belief about each material for a particular attribute. Composite wood refers to materials like Medium Density Fibreboard (MDF), Particleboard and Laminated Wood.

	Material possesses attribute… Not at all				To a high degree		Material possesses attribute… Not at all				To a high degree
Durability						**Value (performance relative to cost)**					
Metal	1	2	3	4	5	Metal	1	2	3	4	5
Solid Wood	1	2	3	4	5	Solid Wood	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5
Composite Wood	1	2	3	4	5	Composite Wood	1	2	3	4	5
Consistent Quality						**Easy to incorporate into design**					
Metal	1	2	3	4	5	Metal	1	2	3	4	5
Solid Wood	1	2	3	4	5	Solid Wood	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5
Composite Wood	1	2	3	4	5	Composite Wood	1	2	3	4	5
Environmentally Friendly						**Easy to use in manufacturing**					
Metal	1	2	3	4	5	Metal	1	2	3	4	5
Solid Wood	1	2	3	4	5	Solid Wood	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5
Composite Wood	1	2	3	4	5	Composite Wood	1	2	3	4	5

5. On average, when comparing SOLID WOOD to other materials, such as composite wood (particleboard, plywood, medium density fibreboard, or any other type of composite wood material), metal, and plastic, used in furniture manufacturing how does wood compare on the following dimensions? (Please check (✓) one box for each statement)

	More	Less	The Same
Material cost is	☐	☐	☐
Design costs are	☐	☐	☐
Cost of manufacturing is	☐	☐	☐
Labour costs are	☐	☐	☐
Finishing costs are	☐	☐	☐
Total cost is	☐	☐	☐
The number of workers required is	☐	☐	☐
The availability of skilled tradespeople is	☐	☐	☐

6. Please indicate the approximate percentages of your total furniture sales represented by each of the following construction types. Use the following definitions to answer this question.

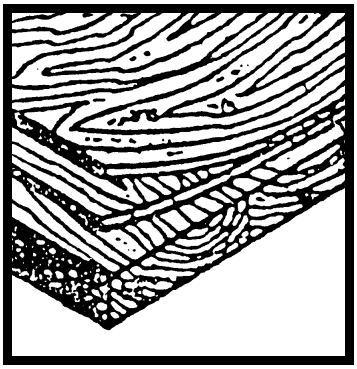


Solid Wood

Each exposed furniture part is made of solid wood.

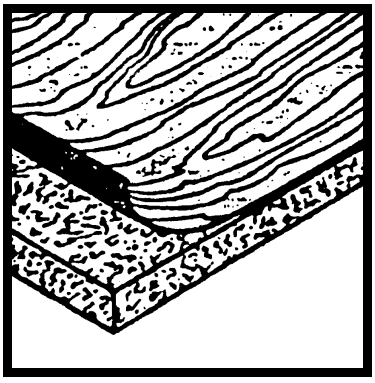
Hardwood Veneer over Composites

Thin slices of hardwoods bonded to particleboard, plywood, medium density fibreboard, or any other type of composite wood material.



Hardwood Veneer over Solid Wood

Thin slices of hardwoods bonded to solid wood.



Artificial Laminates over Composites

A layer of paper, plastic or foil similar in appearance to natural wood is bonded to the surface of particleboard, plywood, medium density fibreboard, or any other type of composite wood material.

Type of Furniture Construction	Percentage of Total Furniture Sales
Solid Wood (hardwood)	**_____%**
Solid Wood (softwood)	**_____%**
Hardwood veneers over solid wood	**_____%**
Hardwood veneers over composites	**_____%**
Artificial laminates over composites	**_____%**
Upholstered with solid hardwood frame	**_____%**
Upholstered with composite or solid softwood frame	**_____%**
Other _____	**_____%**
	100%

7. Please indicate your level of agreement or disagreement with the following statements by circling the appropriate number.

	Strongly Disagree				Strongly Agree		Not at all				To a high degree
Furniture made primarily of wood is….						**Designing furniture with wood is…**					
Easy to build	1	2	3	4	5	Simple	1	2	3	4	5
Inexpensive	1	2	3	4	5	Gratifying	1	2	3	4	5
Long-lasting	1	2	3	4	5	Fast	1	2	3	4	5
Attractive	1	2	3	4	5	**When designing furniture with wood it is easy to..**					
Comfortable	1	2	3	4	5	Do design calculations	1	2	3	4	5
Functional	1	2	3	4	5	Join structural components	1	2	3	4	5
Strong	1	2	3	4	5	Control for wood stability	1	2	3	4	5

8. In to which of the following markets do you or your customers currently sell their products and what do you expect this to be in five years? Please indicate (□) all markets that apply.

	Current	In 5 years		Current	In 5 years
Australia	□	□	Other SE Asia	□	□
New Zealand	□	□	India	□	□
Japan	□	□	European Union	□	□
Korea	□	□	Other - Please Specify	□	□
USA	□	□			
China	□	□			

9. In which states do you manufacture furniture (Check as many as applicable (✓))

Queensland	□
New South Wales	□
Victoria	□
Tasmania	□
South Australia	□
Western Australia	□
Northern Territory	□

10. Please rate the materials on each of the following environmental dimensions according to how harmful you feel they are to the environment. For each environmental dimension, please check (✓) one box for each material.

	Completely Harmless	Harmless	Harmful	Very Harmful	Never Thought About It
Extracting the Raw Resource					
Steel	□	□	□	□	□
Concrete	□	□	□	□	□
Wood	□	□	□	□	□
Masonry	□	□	□	□	□
Plastic	□	□	□	□	□
Refining the Raw Resource					
Steel	□	□	□	□	□
Concrete	□	□	□	□	□
Wood	□	□	□	□	□
Masonry	□	□	□	□	□
Plastic	□	□	□	□	□
Manufacturing the Finished Material					
Steel	□	□	□	□	□
Concrete	□	□	□	□	□
Wood	□	□	□	□	□
Masonry	□	□	□	□	□
Plastic	□	□	□	□	□

The remaining questions refer to your organisation. Remember all information is confidential. If you choose not to answer some of these questions, we would still like your survey returned.

11. What is the ownership status of your organisation (□)?

Privately Owned, Predominantly Australian Ownership □
Privately Owned, Predominantly Foreign Ownership □
Publicly Listed Company □
Government Trading Enterprise □
Other (please specify) _____ □

12. What is the approximate value of your organisation's annual sales?

$ _____

Thanks for your help!
Please return this survey by placing it in the envelope provided and dropping it in the nearest postbox. No stamp is needed.

1. **How important are the following considerations when selecting building materials to carry in your store(s)? Please check (✓) one box for each consideration.**

Consideration	Not At All Important	Slightly Important	Important	Very Important	Extremely Important
Demand from trade customers	☐	☐	☐	☐	☐
Demand from DIY customers	☐	☐	☐	☐	☐
Packaging	☐	☐	☐	☐	☐
Product availability	☐	☐	☐	☐	☐
Product price	☐	☐	☐	☐	☐
Supply consistency	☐	☐	☐	☐	☐
Product consistency and quality	☐	☐	☐	☐	☐
Product strength	☐	☐	☐	☐	☐
Product guarantees/warranties	☐	☐	☐	☐	☐
Proven record of product	☐	☐	☐	☐	☐
Experience with product	☐	☐	☐	☐	☐
Appearance of product	☐	☐	☐	☐	☐
Safety of product	☐	☐	☐	☐	☐
Environmental considerations[1]	☐	☐	☐	☐	☐
Product support	☐	☐	☐	☐	☐
Centralised purchase decision[2]	☐	☐	☐	☐	☐

a. Environmental considerations refer to global impact due to material use.
b. Stores are part of a corporate chain, retail cooperative or franchises where purchase decisions for all stores are centralised rather than being made by individual stores.

2. **To what extent do the following considerations influence building material purchase decisions of D.I.Y. CUSTOMERS? Please check (✓) one box for each consideration.**

Consideration	Not At All Important	Slightly Important	Important	Very Important	Extremely Important
Availability of information on product installation and use	☐	☐	☐	☐	☐
Advice of store personnel	☐	☐	☐	☐	☐
Instore displays	☐	☐	☐	☐	☐
Ability to rent specialised tools	☐	☐	☐	☐	☐
Instore demonstrations	☐	☐	☐	☐	☐

3. **Please indicate the extent to which you believe the following attributes are possessed by each of the following materials. Please circle the number that best corresponds to your belief about each material for a particular attribute.**

	Material possesses attribute… Not at all				To a high degree		Material possesses attribute… Not at all				To a high degree
Durability						**Value (performance relative to cost)**					
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Concrete	1	2	3	4	5	Concrete	1	2	3	4	5
Masonry	1	2	3	4	5	Masonry	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5
Consistent Quality						**Environmentally Friendly**					
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Concrete	1	2	3	4	5	Concrete	1	2	3	4	5
Masonry	1	2	3	4	5	Masonry	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5

4. **For each of the following building applications, circle the number that best indicates how often your D.I.Y. customers use the materials listed as the main material. Please circle one number for each material in each application.**

Outdoor Applications	Never Use				Always Use
Outdoor Area (deck/patio)					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Composite Plastic	1	2	3	4	5
Fences					
Steel	1	2	3	4	5
Wood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Composite Plastic	1	2	3	4	5

Indoor Renovations	Never Use				Always Use
Load – Bearing Wall					
Softwood	1	2	3	4	5
Hardwood	1	2	3	4	5
Concrete	1	2	3	4	5
Masonry	1	2	3	4	5
Steel	1	2	3	4	5
Joinery					
Solid Wood	1	2	3	4	5
MDF	1	2	3	4	5
Veneer/MDF	1	2	3	4	5
Metal	1	2	3	4	5
Plastic	1	2	3	4	5

5. For RESIDENTIAL buildings, what material did your customers most frequently use in the following applications 5 years ago and what is most likely to be used today?

For each application (windows etc.), check (✓) the one material most frequently used 5 years ago and the one material most likely to be used today.

	Steel		Concrete		Wood		Masonry		Plastic	
	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today	5 years ago	Today
Roof systems	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Floor systems	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Exterior wall systems	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Interior partitions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Interior trim/detail	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

6. This question deals with certified wood products. For this question, please indicate your agreement (✓) with the following statements using this definition for forest certification and certified wood products:

Forest certification means that a formal, documented audit has been completed to ensure that forests are well-managed according to a defined set of criteria, which include environmental, social and economic aspects. Wood products that originate from certified forests can bear a certification label.

	YES	NO
I am aware of certified wood products	☐	☐
I have seen certified wood products in the marketplace	☐	☐
Some D.I.Y. customers have requested certified wood products	☐	☐
Some Trade customers have requested certified wood products	☐	☐
Some suppliers have discussed providing certified wood products	☐	☐
Some D.I.Y. customers would buy certified wood products if available	☐	☐
Some Trade customers would buy certified wood products if available	☐	☐
I would prefer to stock certified wood products if available	☐	☐
Some customers would pay a price premium for certified wood products	☐	☐
I have **not** stocked some wood products for environmental reasons	☐	☐
I have **not** stocked some non-wood building materials (steel, concrete, plastic) for environmental reasons	☐	☐

7. Please rate the following building materials on each of the following environmental dimensions according to how harmful you feel they are to the environment. For each environmental dimension, please check (✓) one box for each material.

	Completely Harmless	Harmless	Harmful	Very Harmful	Never Thought About It
Extracting the Raw Resource					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Refining the Raw Resource					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Manufacturing the Building Material					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Installing the Building					
Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Masonry	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐

Please tell us about your stores. Remember, all information is strictly confidential. If you choose not to answer some of these questions, we would still like your questionnaire returned.

8. **In which states are your stores located? (Check as many as are applicable (✓))**

Queensland	□	South Australia	□
New South Wales/ACT	□	Western Australia	□
Victoria	□	Northern Territory	□
Tasmania	□		

9. **What is the population in the town(s) or city(s) where your store(s) is located? (Check only one (✓). For chains please check your minimum target population.)**

Under 10,000	□	100,001 to 500,000	□
10,000 to 50,000	□	Over 500,000	□
50,001 to 100,000	□	Do not know	□

10. **What is the split between trade and DIY sales in your store(s)?**

	%
D.Y.I.	_____
Trade	_____

11. **What is the total annual value of sales from your store(s)?**

$ _____

12. **What retail system is your store(s) most closely described by? (Check only one (✓)**

Independent Store	□
Corporate Chain	□
Franchise	□
Other (Please specify)	□

_____

Thanks for your help!
Please return this survey by using the return envelope provided. No stamp is needed.

Furniture Selection

1. Please answer the following questions about furniture purchases.

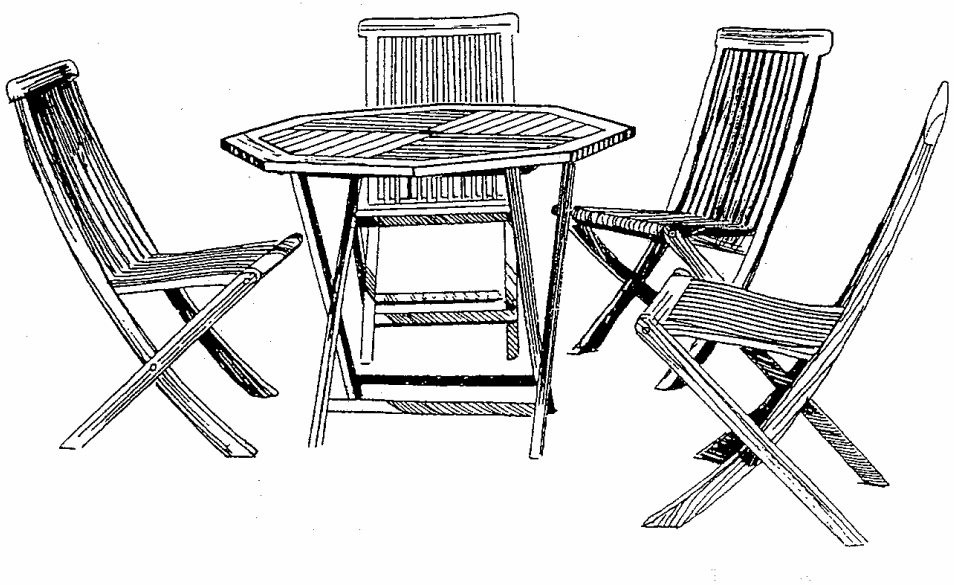
	Yes	No
In the past 12 months have you shopped for household furniture?	☐	☐
In the past 12 months have you bought any household furniture?	☐	☐
If yes, what have you bought?		
_____		
How much did it cost?		
_____		
Are you intending to buy any household furniture in the next 12 months?	☐	☐
If yes, what are you intending to buy?	☐	☐

2. When selecting a piece of furniture to buy, how important are the following furniture characteristics? *(Please circle only one number for each furniture characteristic)*

	NOT AT ALL IMPORTANT				EXTREMELY IMPORTANT
PRICE	1	2	3	4	5
QUALITY MATERIALS	1	2	3	4	5
ATTRACTIVE	1	2	3	4	5
DURABLE	1	2	3	4	5
GOOD VALUE	**1**	**2**	**3**	**4**	**5**
QUALITY CONSTRUCTION	1	2	3	4	5
COMPANY REPUTATION	1	2	3	4	5
OVERALL ENVIRONMENTAL IMPACT	1	2	3	4	5
STYLE/DESIGN	1	2	3	4	5
MANUFACTURER BRAND NAME	1	2	3	4	5
GUARANTEE	1	2	3	4	5
EASE OF MAINTENANCE	1	2	3	4	5
OTHER_____	**1**	**2**	**3**	**4**	**5**

Section 2 - Purchase of Outdoor Wooden Furniture

3. Please approach this section as if you were intending to buy a wooden outdoor table and 4 chairs as pictured below. The labels on the next page are to be treated as if they were the labels you would find attached to the furniture in the shop. There are 12 labels so picture twelve identical looking sets of tables and chairs with one label hanging on each set of furniture.



Each label will have a <u>combination</u> of the following features:

- The timber will be either Imported **<u>or</u>** from Australia.
- The timber will be from either Native Forests **<u>or</u>** Plantation Forests (see definitions below).
- The timber will be either environmentally certified (see definition below) **<u>or</u>** not certified.
- The furniture will have either a 2 Year Warranty **<u>or</u>** a 5 Year Warranty.
- The furniture will have a price of either $1000 **<u>or</u>** $1250.

Please rate each of the 12 labels on the information provided by circling the most appropriate number (where 1 = completely unsatisfactory product and 10 = the ideal product). You may give the same rating to more than one label. We suggest that you read all the labels before answering the section.

<u>Definitions</u>

Native Forests are naturally occurring forests that are managed for wood products as well as other uses such as recreation and wildlife habitat.

Plantation Forests are planted commercial tree crops managed only for wood production.

Environmental Certification means that an audit has been completed to ensure that the forests are managed in a sustainable manner and that the trees are harvested in an environmentally sound manner.

Building Material Selection

4. Please indicate the extent to which you believe the following attributes are possessed by each of the following materials used in building houses. Please circle the number that best corresponds to your belief about each material for a particular attribute.

	Material possesses attribute… Not at all				To a high degree		Material possesses attribute… Not at all				To a high degree
Durability						**Good Value**					
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5
Glass	1	2	3	4	5	Glass	1	2	3	4	5
Attractive						**Ease of Maintenance**					
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5
Glass	1	2	3	4	5	Glass	1	2	3	4	5
Environmentally Friendly						**Easy to use**					
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5
Glass	1	2	3	4	5	Glass	1	2	3	4	5

5. For each of the following house applications, circle the number that best indicates your preference for the materials listed in that application.

	Never Consider				Always Consider			Never Consider				Always Consider
Floor						**Wall Frame**						
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Concrete	1	2	3	4	5	Concrete	1	2	3	4	5
Masonry	1	2	3	4	5	Masonry	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5
Windows						**Fence**						
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Concrete	1	2	3	4	5	Concrete	1	2	3	4	5
Masonry	1	2	3	4	5	Masonry	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5
Deck						**Exterior Siding**						
Steel	1	2	3	4	5	Steel	1	2	3	4	5
Wood	1	2	3	4	5	Wood	1	2	3	4	5
Concrete	1	2	3	4	5	Concrete	1	2	3	4	5
Masonry	1	2	3	4	5	Masonry	1	2	3	4	5
Plastic	1	2	3	4	5	Plastic	1	2	3	4	5

6. When considering wood as a building material, how important are the following factors? ***(Please circle only one number for each factor)***

	NOT AT ALL IMPORTANT				EXTREMELY IMPORTANT
Price	1	2	3	4	5
Availability	1	2	3	4	5
Attractiveness	1	2	3	4	5
Durability	1	2	3	4	5
Familiar with the material	1	2	3	4	5
Have the tools required	1	2	3	4	5
Matches existing materials	1	2	3	4	5
Environmental impact	1	2	3	4	5

Environmental Purchases

7. Please answer the following questions about environmental information on product packaging.

	Yes	No	Unsure
In the last 12 months, have you seen any products that have environmental information on the packaging?	□	□	□
Have you purchased any products that had environmental information on the product packaging?	□	□	□
Have you seen any products that were environmentally certified?	□	□	□
Have you purchased any products that were environmentally certified?	□	□	□

8. The following list contains the different organizations that might undertake and verify the environmental certification of forests and wood products. Please rank each of the five organizations in the list according to your level of trust in that organization to carry out environmental certification

Use 1 for the LEAST trusted organization and 5 for the MOST trusted.

An independent private certification organisation □

The Commonwealth Government □

State Governments □

The forestry and wood products industry □

An environmental organisation □

Section 4 – Environmental Considerations

Please rank the materials on each of the following environmental dimensions according to how harmful you feel they are to the environment. For each environmental dimension, please check (✓) one box for each material.

	Completely Harmless	Harmless	Harmful	Very Harmful	Never Thought About It
Extracting the Raw Resource					
Steel	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Glass	☐	☐	☐	☐	☐
Refining the Raw Resource					
Steel	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Glass	☐	☐	☐	☐	☐
Manufacturing the Finished Product					
Steel	☐	☐	☐	☐	☐
Wood	☐	☐	☐	☐	☐
Plastic	☐	☐	☐	☐	☐
Glass	☐	☐	☐	☐	☐

Section 5.

Please tell us more about yourself by ticking the most appropriate response. Remember all information is confidential. If you choose not to answer any of these questions, we would still like your questionnaire returned. Thank You!

1. Which is your age group?

18 - 25	❑	46 - 55	❑	76 and over	❑
26 - 35	❑	56 – 65	❑		
36 - 45	❑	66 – 75	❑		

2. What is your gender?

Male ❑ Female ❑

3. What is your marital status?

Single/Never Married	❑	Married	❑
De facto relationship	❑	Divorced/Separated	❑
Widowed	❑		

4. What is your occupation? _____

5. What is the highest level of education you have attained?

Primary education	❑	Bursary	❑
Secondary education	❑	Trade Qualification	❑
Fifth Form Certificate	❑	Diploma	❑
Sixth Form Certificate	❑	Degree	❑
Higher School Certificate	❑	Post-graduate studies	❑

Other _____

6. To which of the following ethnic groups do you most closely identify?

NZ European	❑	Asian	❑
NZ Maori	❑	Other _____	
Pacific Islander	❑		

7. Which of the following best describes your area of residence?

In a rural area (population less than 2,500)	❑
Small city, town or village (2,500 to 9,999)	❑
Medium-sized city (10,000 to 250,000)	❑
Large city (250,000 or more)	❑

8. Are you currently a member of any organisation whose primary mission is to protect the environment?

   ❑ Yes (please specify) _____
   ❑ No

9. What is your annual income?

$0 - $19,999	❑
$20,000 - $39,999	❑
$40,000 - $59,999	❑
$60,000 - $79,999	❑
$80,000 - $99,999	❑
$100,000 - $149,999	❑
$150,000 and Over	❑

Thanks for your help!
Please return this survey by using the return envelope provided. No stamp is needed.

Forest Grower Comments

- Although I have a great deal of knowledge about certification, senior management has limited understanding or awareness of international certification issues. The industry, except for a few furniture makers who export, do not know or want to know about certification
- Have ISO, pursuing AFS

- Choose ISO because
  - readily available
  - flow-on effects from Quality Management and Environment Management perspective
  - FSC was considered unbalanced, with too much focus on social aspects; Principle 10 afterthought; Montreal principles all embracing; mixture of system and performance requirements
  - Will consider incorporating certification scheme with specific performance requirements when available
- Have ISO

- Use to think FSC was very anti-plantations and not at all suited to certification of plantations. Changes in criteria have made it much better.
- Believe the AFS is dead due to lack of support by environmental groups. To make the exercise worthwhile, the scheme has to be supported by environmental groups, otherwise counterproductive
- Considering FSC

- Unnecessary and Intrusive on Individual - Big Brother
- All group auditing must be allowed to permit small growers to achieve certification at an affordable cost.
- Considering AFS

- The AFS does not help small scale growers or value adding (e.g. provides no chain of custody)
- As yet, no international certification scheme that meets either forest industry or greens approval. Stand-off, for instance, over FSC – industry suspicious of using it. Greens oppose to native forest logging, even where small scale and selective.

- I have not seen any discussion on requirements for certification or analysis of associated cost/benefit for forest growers. I believe it is a competitive advantage for any industry to supply a consistent quality and quantity of product to satisfy market requirements.

- I am a small landholder and certification appears to be aimed at the professional/large holder rather than the small owner.
- Benefits, costs, procedures, etc. have not been developed for small holders.
- The need for certification is queried, the grower would appear to have to bear the cost – the only benefit I can see is environmental and to keep the “greenies” happy.

- It will probably be too expensive for small private growers.

- There is considerable public concern about conservation of river red gum forests. The red gum forests not on public land are found on a multitude of small holdings. The private owners appear to be very wary of co-operatives or

collectives. As individuals the small areas are unlikely to justify cost of certification. If certification becomes necessary for river red gum products to be marketed, many forest areas will cease to be of value to their owners. If a forest is not of value to its owner it may be conserved by apathy but is more likely to degrade out of existence.

- Considering certification after 24 months.

- Small forest/plantation owners are scared stiff that the costs of certification will outweigh the benefits given.
- Given their infrequent entry into markets and that audit requirements will be difficult to achieve and costly to implement – the potential is there to exclude the small forest grower from the market.

- I have been involved in a number of certification/quality schemes in other industries and every one of them has operated:
    - primarily as a barrier to entry
    - benefiting only the larger corporate sector
    - producing lowest common denominator outcomes
    - often actually lowering standards and quality
    - misrepresenting the actual conditions present “insitu”
    - negating the competitive advantage of smaller players
    - imposing disproportionate costs on smaller players
    - with no evidence of need beyond the whim of bureaucrats
    - with no capacity to benchmark or measure improvements
    - with no capacity to reward “real” superior performance
    - On the evidence to date, forest certification will be even worse than other industry schemes. It was conceived by its’ proponents as an instrument of market denial that could go well beyond that which is lawful, just or equitable. It is a job creation scheme for forestry graduates and a serious impediment to the expansion of native forest into clear land. Environmental custodianship is no place for anal retentives!!

- The AFS is impracticable for small growers unless it addresses that large companies will sign off for a perceived advantage that will kill off private farm forestry. Besides, a rational group system will have to be developed, as it will not be viable for smaller individuals, unless this happens.

- I am an accredited EMS auditor who directly provides management advice to plantation owners. There is nothing about auditing i.e. internal capacity, training and external auditor position

- Certification is important for the future. However, unless compliance cost are keep to a reasonable cost per hectare (taking into account the size of plantations), smaller plantation owners/managers will not participate.
- Considering AFS.

- Certification is both essential and inevitable
- Certification criteria must be rational, practical and achievable

- Potentially crippling to small-scale growers who are unlikely to pay for the cost of certification and risk market exclusion!

- I have reservation about the implementation of certification to get a globally accepted standard. The cost for industry to implement, monitor and audit, to make it compulsory or not
- Quality always sells regardless
- Science technology can measure wood value and tree history from seedling to end product.

- Due to regional climate differences, some plantations rate of growth varies a great deal (between 17 ” to 42 ” PA). Hence, certification should acknowledge these significant inherent differences and stumpage rates should vary accordingly.
- For example: soft wood – soft, soft wood - medium, soft wood - hard

- Forest certification must be available to the small forest owner. If it is designed and driven by the big end of town, it will marginalise and devalue private forests, especially private native forests.
- In the process of obtaining FSC.

- Certification will be very expensive for small forest owners. The motivation for certification is market access.
- My understanding is that if a scheme gets out, there will be series of compromises that will deliver no end benefits but will affect the certifying organizations.
- Considering FSC

Primary Processor Comments

- Most European and U.K. markets now require FSC certification. Inferior products carrying this stamp of approval are selected above quality products from Australia because we do not have this available. ISO 14001 is not considered an alternative.

- Forest certification is necessary to validate the fact that Australian forestry products are more "world best" and as such, certification in an appropriate format will go some way to counter "?" claims to the contrary
- Smaller timber producers need to fall in behind major suppliers such as Forestry (state) departments and rally on them to utilise the most practical certification scheme.

- Some rationale too tight
- Too much Green orientation. Functions ruled by Green purposes

- The concept for forest certification sounds good but in reality, it won't work. There are so called accepted milling operations now that I know of, that in reality do not do sustainable logging as they publish. I also know of both Indonesian and Malaysian owned milling and logging organisations that profess to do Accredited Forest Certification schemes in PNG but in reality, purge and plunder these forests, taking all logs including those undersize. When money is the controlling factor and people in the right places in both the private and government sectors can be bought, then certification is only gimmick to entice people into buying products that in reality may not be produced as stated
- As is the case of "made in Australia" gimmick. The ingredients can come from anywhere, and from countries that do not follow strict standards – hence, people do not always buy what they are.

- As you can see we have little of forest certification – please send more information

- Qld forests are controlled by the government agencies. As they certify their forests, then we can certify the products we harvest from

- There needs to be recognition on a Global-International basis for coordination and practical application of a set of standards. Self interest groups pushing their own agendas presently prevent this. This is holding back progress in these areas of reform

- We will only be involved in forest certification if the market requires certified products. Australian natural forests are well managed and forest certification will not assist in this regard

- To much control of our industry has been given away already.
- Certification programs are a front for Green groups to get more control. Every concession we give is met with more demands in native forest area.

- The company to which this survey refers is not involved with log harvesting but is a log processor (logs are not purchased at mill gate)
- We are maintaining a watching brief and believe that ultimately the certification issue will be decided by market influences.

- I think that certification is relevant for plantations, particularly prior to establishment. There has been some horrendous crime committed in wiping out natural eco-systems simply because someone wanted to establish a plantation
- The government management of public Hardwood forests in Australia is probably the most rigorous of any country in the world, and does not require any other overlay, as it is constantly audited by scientists etc.
- Forest certification was in essence a con by Green groups to make the process more expensive. It has no validity in many countries around the world as they are already receiving "best practice".

- We are a small family sawmill. This certificate looks a bit big for us at the moment but believe it is important for the future

- Hard to even consider being certified until we obtain security from DNRE/Government because the public are now running with these emotions about harvesting trees from natural forest. Government are attempting to edge their bets both ways but it will not work.

- Certification is being used by the Greens to destroy industry as its primary focus, there is no domestic but some mild international interest (e.g. Europe)
- Best strategy is to develop credible systems (e.g. AFS) and ally these credible systems (e.g. PEFS)

- Certification is entirely market led
- Current market drivers are from export customers
- Domestic customers are not retail customers, hence very little domestic demand for certification

- The ongoing costs of this accreditation on the "primary processors" of timber needs to be considered very carefully. In recent times, the added costs from the introduction of the current Environmental and Workplace Health and Safety Regulations in the native logging/timber industry have been and still are, in some cases, very burdensome. The risks of litigation have also blown way out of proportion, partly in response to the introduction of more and more of this type of thing.
- We need to be very careful, that while every intention may be to improve the market for a 'better' or 'more sound' product, we don't loose the very people/businesses who produce it
- When all is said and done, if the user of a product is not prepared to pay more money for an "improved" or "certified" product which is not really any different to the one they have always used (e.g. the Cypress forests have been sustain ably logged for many years and their management continually monitored), then all an accreditation will do is add further costs to the "primary processors" which they would be unable to recoup or pass on

- Cost of certification is a significant issue
- Do not expect environmental groups to support or be satisfied with any certification (including FSC) as ultimately that would mean Australian, ENGO's would need to endorse forestry management. This endorsement is never expected, no matter what management systems are adopted. Contact me – card attached

- Yet another "job creating" scheme by a minority who have no idea on how real businesses operate

- No doubt yet another cost to be passed onto the processor
- Forest certification and compliance costs will be another expense which will send more people out of this industry

- It is difficult for a saw miller, as one customer to a forest grower to dictate certification. This survey seems to be steered towards forest owners who mill their own products
- These opinions are on a local level only and may not be in line with wider company directions

- Forest certification, as a sop to the Greenies, will be a complete failure, as they will never give up their determination to lock up all native forests
- Clients could not care less where their timber comes from as long as it is cheap enough and good enough

- As we manufacture material harvested from Pine plantation into commodity treated products, we do not see forest certification as an issue.
- The stringent environmental controls imposed on NSW forest mangers ensure a high degree of sound environmental management.
- Sustainability is not an issue as we are dealing with a planted tree crop.

- I believe that forest certification would be like quality certification i.e. customers get some comfort from it being in place but are not prepared to pay a premium for it in the majority of cases.
- I think it could be just another diversion of the Green movement. We have been following the progress of the various schemes, but to date there is next to zero demand coming from the market

- Survey asks about forest certification. Yet questions are about processing in part
- Our processing unit are only able to be certified through chain of custody, except for a Green crop certification

- Cost of certification as well as who would regulate. i.e. government or independent body would greatly affect our decision

- Certification is an unnecessary impact which increases costs
- Generally, well managed forests produce expensive timber, poorly managed forests produce poor timber, unsustainable forests essentially fail.
- The issues are sorted out in the market place.

- We are currently considering but no actual intent at this stage
- The cost and administration (time commitment) is likely to alienate many small (<200ha) natural forest owners, who will care even less for their forest if it is worth nothing i.e. it is now a liability when it was previously an asset.

- Certification should be handled by the forest industries federation of Australia

- Central Gippsland has lost 48% of its forests to permanent reserves. Of the remainder, the code of forest practise restricts us to 17%.

- Increased bureaucracy – more non productive jobs

- System creates a need, then requiring satisfaction of that artificial need. From a production viewpoint, the disadvantages outweigh any perceived potential advantages

- Do not agree that there is a need for forest certification due to small saw mill