

ARE SECONDARY WOOD PRODUCTS ENVIRONMENTALLY FRIENDLY? A  
STUDY OF PUBLIC PERCEPTIONS

by

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## **Abstract**

The forest and wood products industry in Canada plays a significant role in the Canadian economy. As the market for secondary wood products has increased around the world, it has been noted that British Columbia is falling behind other regions in taking advantage of this growth. Meanwhile, the environment has become a significant topic, both globally and in British Columbia. This research merges these two areas of concern, exploring survey participants' views on environmental sustainability and environmental friendliness, and examining what effect these views have on their purchasing decisions.

The survey examines participants' knowledge of environmental issues and general purchasing habits, and then focuses on knowledge, perceptions, and purchasing habits in connection to secondary wood products. Analyses of the survey results follow a literature review. Preliminary recommendations are provided to the secondary wood products industry on how to maximize the marketing strength of environmental attributes.

Despite reporting high levels of concern and a strong belief that humanity is facing an environmental crisis, participants showed a surprisingly low commitment to purchasing environmentally friendly products, and were more likely to prioritize other purchasing values, such as price and quality. While participants assessed their knowledge of British Columbia's forest practices and related industries as relatively low and did not consider the practices of industry to be very environmentally conscious, they also generally do not avoid purchasing secondary wood products due to environmental concerns.

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## Introduction

The purpose of this study is to examine how people perceive the importance of sustainability as a product attribute in their secondary wood product purchasing decisions. Sustainability is currently a topic of increasing interest on both a global and a local scale, and has become important to company reputations and the assessment of potential market opportunities (Miles and Covin, 2000). This research study explores what, if any, associations Vancouverites make between the concepts of ‘environmental sustainability’ / ‘environmental friendliness’ and secondary wood products. The research also attempts to determine if those associations have a perceived effect on respondents’ purchasing decisions. The association of wood products and perceptions of sustainability are evaluated in comparison with other materials (for example: plastic, steel, and glass). The information gathered in this study could assist in the marketing of wood products.

The thesis begins by discussing the key terminology used in this project, specifically the definitions and classifications of secondary wood products, concepts of ‘sustainability’, and what qualifies as ‘environmentally friendly’.

The second chapter concentrates on secondary wood products, beginning with a survey of the industry globally and narrowing to look specifically at Canada and British Columbia. According to the data, the global market for secondary wood products has been increasing, although the competitive advantage is shifting towards countries with lower costs of production. Many nations and regions, in an effort to maintain or expand



economic activity, have been pursuing stronger secondary wood product industries. British Columbia's exports of secondary wood products may have been increasing year-after-year, however the provinces' proportion of global exports has been in decline (BC Stats 2003, Shrier 2003). In light of this, there is incentive for British Columbia's businesses to consider greater research and development in new technologies, and new methods of marketing current products.

The third chapter explores the relationship between the wood products industry, consumers, and concepts surrounding sustainability and environmental friendliness. Numerous studies have found that wide variation and much confusion exists in public opinions about the relationship between the environment and the economy. This chapter discusses research on consumer purchasing practices, and summarizes studies on public attitudes about the relationship between forestry, sustainability, and the economy. One of the key areas in this discussion is the attitude-behavior gap observed in consumer purchasing; what consumers say they *would* do and what they *actually* do are often quite different.

Leading into the project itself, chapter four presents the methodology followed in the course of this research. This includes the design and implementation of the survey, and the calculation of the required sample size.

Chapter five presents the basic statistical results of the survey on a question-by-question basis, offering comparisons and identification of noticeable trends. The overall results are brought together and discussed in chapter six. Chapter seven reviews the

limitations of the research, and discusses how these could be addressed in further studies.

Chapter eight concludes this report by summarizing the overall findings.

## **Key Terminology**

Terminology remains one of the main challenges in cross-disciplinary work, as the language used to describe core concepts varies across disciplinary lines. This challenge is increased when moving from academia to popular culture. Often what a layperson means by a given term is far more casual, and less specific, than what a researcher would consider the term to mean. Therefore, in order to proceed to discuss these ideas in this project, it is critical to define the terms. Specifically, what is meant by ‘Secondary Wood Products’, ‘Sustainability’ or ‘Sustainable’, and ‘Environmentally Friendly’?

### **Defining Secondary Wood Products**

The secondary wood products industry, often referred to as value-added, plays an increasingly significant role in the economies of several regions, including Canada and British Columbia (DeLong et al., 2007). The United Nations (European Commission for Europe / Food and Agriculture Organization) notes that demand for secondary wood products “is derived from housing construction, home repair and remodeling, and home decoration.” (United Nations, 2008). Though there is no universally accepted definition of the secondary wood products industry (Shrier, 2003, p.2), it is generally considered to include furniture, cabinets, millwork and mouldings, pallets and containers, shakes and shingles, and engineered wood products (Kozak and Maness, 2001; Wilson et al., 2001). These can be loosely categorized as products produced from primary wood materials

such as lumber and wood-based panels. Wilson et al. (1999, 2001, 2008) have been conducting surveys of the secondary wood product industry since 1990. The original seven business types included in these surveys were: remanufactured products; millwork; engineered wood products; cabinets; furniture; pallets and containers; and other miscellaneous wood products (Wilson et al., 2001). Beginning in 1999, Wilson et al. (2001, 2008) added panelboards and shakes and shingles as additional secondary wood product business types, though reporting of findings have since been presented using both the seven and nine business typologies. The original seven business types are similar to those used in analysis by BC Stats (1998, 2000, 2003), and Jaakko Pyory (2001).

The variety of secondary wood products definitions used in research and reporting causes some difficulties when reviewing related literature. Jaakko Pyory defines value added products as “those that were not traded on the open market and were normally sold to users rather than intermediaries” (2001, p3). This definition is very much in the spirit of this research project. Where possible, the review of literature on secondary wood products attempts to report values consistent with Jaako Pyory and the seven business typology used by Wilson et al. (2001) and BC Stats (1998, 2000, 2003).

## **Defining Sustainability**

Sustainability is a complex concept open to numerous interpretations and definitions. The Collins Canadian Dictionary defines sustainability in relation to “economic development, energy sources, etc” as “capable of being maintained at a steady level without exhausting natural resources or causing severe ecological damage.” In his

book, the Ecology of Commerce, Paul Hawkins (1993, p.139) offers a slightly more advanced definition of the term, defining sustainability as “an economic state where the demands placed upon the environment by people and commerce can be met without reducing the capacity of the environment to provide for future generations.” Hawkins adds that sustainability “can also be expressed in the simple terms of an economic golden rule for the restorative economy: leave the world better than you found it, take no more than you need, try not to harm life of the environment, make amends if you do.”

One of the earliest recorded social philosophies that might satisfy Hawkins’ definition of sustainability is the Great Law of the Haudenosaunee (Six Nations Iroquois Confederacy), more commonly referred to as the “Seventh Generation Philosophy”. This principle of justice required that chiefs must anticipate the impact of their decisions as far forward in time as the seventh generation.

While the Iroquois were far advanced in their notion of social and environmental responsibility, the Western world was slower to catch on. According to Geis and Kutzmark (1995), some of the first Western ideas of sustainability did not emerge until the 1950s with the work of Aldo Leopold, who “raised concern for an environment’s carrying capacity, or its ability to absorb human influence and still sustain all of its life forms and processes” (Geis and Kutzmark, 1995 p5). They further observed that it was not until the 1970’s that “Garret Harding placed that concern squarely in the community context with his compelling Tragedy of the Commons, which described the destruction of a village green through individual cases of overgrazing” (Geis and Kutzmark, 1995 p5).

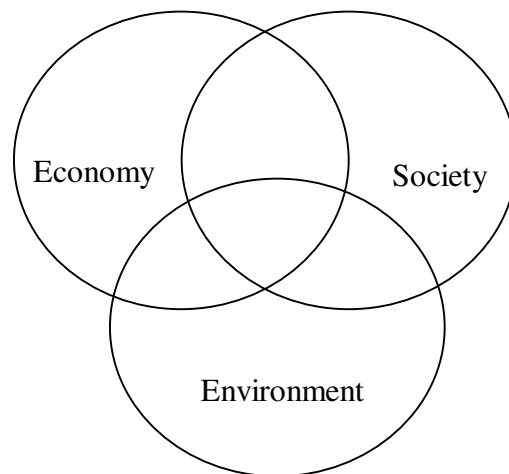
Current notions of sustainability developed throughout the 1970s and 1980s as a result of conferences and reports, such as the 1972 UN Stockholm Conference on the Human Environment and the 1980 World Conservation Strategy. (The Sustainability Report, 2006) The concept of sustainability continued to flourish in western society throughout the 1990's, and early 21<sup>st</sup> century.

Today, there are many definitions of sustainability. The best known and most referenced one was put forth in 1987 by the United Nations World Commission on Environment and Development (UNCED), often referred to as the Bruntland commission as it was chaired by Gro Harlem Bruntland (Thomas Prugh, 1999). The report defined sustainability as that which “meets the needs of the present without compromising the ability of future generations to meet their own needs.” (Bruntland, 1987 p. 54)

The definition of sustainability frequently varies depending on the topic at hand. In the case of renewable resources, such as forestry, it is generally agreed that sustainability means, “The rate of harvest should not exceed the rate of regeneration” (Prugh, 1999, p. 45). While this definition addresses the need for consumption to parallel natural growth, it does not give a clear indication of any further value system informing society how this should be achieved.

It has also been argued that sustainability is a balance of three aspects: the environment, the economy, and society (see Figure 1). This notion of sustainability is widespread. The 2000 Report of the Auditor General of Canada defines sustainability as “a constantly evolving concept based on integrating social, economic and environmental

concerns” (Auditor General of Canada, 2000, Exhibit 35.1). This is also supported in a policy statement of the National Association of State Foresters, who state that “These three aspects of sustainability – the economic, the social, and the ecological – support one another and cannot be separated without discrediting the concept of sustainability” (National Association of State Foresters, 1999). As these three aspects are interrelated, they each need to be considered simultaneously. In sustainable business models, this notion is often referred to as the “triple bottom line”, a term coined by John Elkington (Management Magazine, 2006). The definition given by the World Business Council for Sustainable Development is in keeping with this notion, stating that sustainability “involves the simultaneous pursuit of economic prosperity, environmental quality and social equity” (The World Business Council for Sustainable Development, 2006).



**Figure 1: Three Aspects of Sustainability**

## **Defining Environmentally Friendly**

Although the term “Environmentally Friendly” is used profusely, in publications by environmental non-government organizations (ENGOS) and university academics, in product descriptions and advertisements, as well as by the public at large, there are no clear definitions of what the term encompasses. The general meaning would seem to include anything “good” for the environment. But what is “good”, who decides if it is, and how is it measured?

The difficulty with using a term that is not clearly defined is that it can be flexibly applied by different users. Product advertising often uses the term “Environmentally Friendly” when marketing to the general public without supplying a definition. Rather than dealing with a scientific measurement, they appear to be appealing to the public’s impression of environmental “goodness”. This has become such a trend in advertising that the Government of Canada has seen fit to intervene. The Canadian Standards Association and the Competition Bureau have recently released ‘Environmental Claims: A Guide for Industry and Advertisers’ (Competition Bureau of Canada, 2008). In addition to resources on best practices and existing bylaws, the Guide stresses the need for marketers to substantiate claims regarding supposed “environmentally friendly” products. According to the Guide, “any statement or symbol that refers to, or creates the general impression that it reflects, the environmental aspects of any product or service is considered an environmental claim” (Osler Advertising and Marketing Review, 2008).



Paradoxically, something that is environmentally friendly may not necessarily meet the criteria for something that is sustainable. For example, it could be argued that the most environmentally friendly approach to British Columbia's forests would be a total ban on logging. While this may result in an environmentally sustainable forest, the negative social impacts would be numerous and far reaching. British Columbia's economy would be hit extremely hard, and the quality of life would decrease for many people. While this measure would satisfy the sustainability criteria where demand should not exceed the rate of regeneration of a resource, it would be in violation of a sustainable balance between society, the economy, and the environment.

# Literature Review

## Secondary Wood Products<sup>1</sup>

### The Global Secondary Wood Products Industry

For the past several decades, secondary wood products trade has been growing around the world, both in terms of value and volume (World Forestry Centre, 2005). According to the United Nations Annual Market Review of Forest Products (2001 p123), “world trade of secondary wood products is expanding at a faster rate than primary wood products.” In the 2001 annual review of the forest product industry, the UN found that world trade in furniture had for the first time exceeded that of sawn wood, respectively valued at \$29 billion USD and \$25 billion USD (United Nations, 2001).

Most of the international trade of secondary wood products occurs between a handful of developed nations. Globally, five countries account for 60% of secondary wood product imports: the United States, Germany, France, the United Kingdom, and Japan (United Nations, 2008). It is also important to note that, in addition to the imports by Germany and the United States, these two countries are also major producers in supplying their own markets (United Nations, 2004). Germany and the US Great Lake

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<sup>1</sup> While every attempt was made to obtain the most up to date and accurate data as possible, some caution should be observed in referenced values as they represented aggregated data.

States are two of the biggest secondary wood products producing regions; however, both regions only export a fraction of what they produce. Germany exports 8%, while the US Great Lake States export only 5% of shipments. This demonstrates the large demand within these national markets (Jaakko Pöyry, 2001) and the advantages in being closely situated to end-users.

The United Nations forecast in 2004 that the comparative advantage in the production of secondary wood products would continue to shift in favour of countries with lower production costs. This trend was being led by China, which had by 2004 surpassed both Germany and Canada as a furniture exporter (United Nations, 2004), and in 2007 “has become the world’s largest furniture exporter, overtaking Italy in export value” (United Nations, 2007 p123).

As a means of maintaining or expanding economic activity from the forest industry, many countries have begun to push their value-added sectors (Wilson et al., 1999). In Finland, France, and the Netherlands, for example, these policies for economic development have been achieved by limiting exports of sawn timber and logs, imposing taxes on commodity exports and encouraging value-added investment (United Nations, 2001). Stennes and Wilson (2002 p3) found that a key objective for many wood product regions, in “maximizing the local or domestic socio-economic benefits of resource industries” is to perform additional processing of the commodity products within their jurisdiction.

## **Secondary Wood Products in Canada**

Canada is the world's largest exporter of forest products (Canadian Forest Service, 2008). Although Canada's percentage of world trade in forest products is still significant, in recent years it has been in decline, both in terms of percentage of the trade and in unadjusted value. In 2007, \$33.6 billion in Canadian exports accounted for 14% of world forest products trade (Canadian Forest Service, 2008), down from 18% in 2002 (Canadian Forest Services - Industry and Trade, 2005). This declining trend continues, with the 2007 figures being \$4.7 billion less than in 2006 (Canadian Forest Service, 2008).

Canada's forest products industry is a key part of the Canadian economy and an important source of employment across the country. In 2007, employment in the industry was at nearly 750,000 direct and indirect jobs, although this represented a decline of approximately 150,000 jobs since 1999 (Canadian Forest Service, 2008). In addition to providing significant employment in large urban centres, the industry is the primary source of income for around 300 rural communities (Canadian Forest Service, 2008).

In Canada, the secondary wood products industry tends to be smaller, less capital intensive and less rural than the primary industry (Kozak and Maness, 2001). DeLong et al. (2007) attribute much of the development of Canada's secondary wood products sector to settlement patterns, resource availability, and environmental and taxation policies across the country.

Though the secondary wood products industry in Canada grew throughout the 1990's, growth has slowed since 2000 (Cohen and Kozak, 2006). The global competitive market for these products has changed. This change has been attributed to increasing raw material supplies globally, as well as increased manufacturing in recently emerging economies like China and Vietnam (Cohen and Kozak, 2006). In fact, China has become the major competitor to Canada's secondary wood product industry, both in domestic markets and in its main export market, the United States (Cohen and Kozak, 2006). In order to remain / become more competitive, Canadian firms must "embrace innovation, uniqueness and differentiation" (DeLong et al., 2007 p2212).

## **Secondary Wood Products in British Columbia**

Roughly two-thirds of British Columbia, 60 million hectares, is forested. Productive forests cover 43 million hectares of British Columbia – more than 45% of the provincial land mass. Approximately half of this area, 23 million hectares, is commercially operable with an annual harvest of less than 1% of this area (Delcourt and Wilson, 1998). From this annually harvestable area, British Columbia generates 40% of the total national harvest, making the province the largest, and most important, forestry sector in Canada. In 2001, the total forest sector sales in the province were nearly \$16 billion, with \$2 billion in direct government revenue (Stennes and Wilson, 2002). In British Columbia, the forest industry accounts for 7% of employment, and 15% of economic activity (British Columbia Ministry of Forests and Range, 2006). Since 1987,

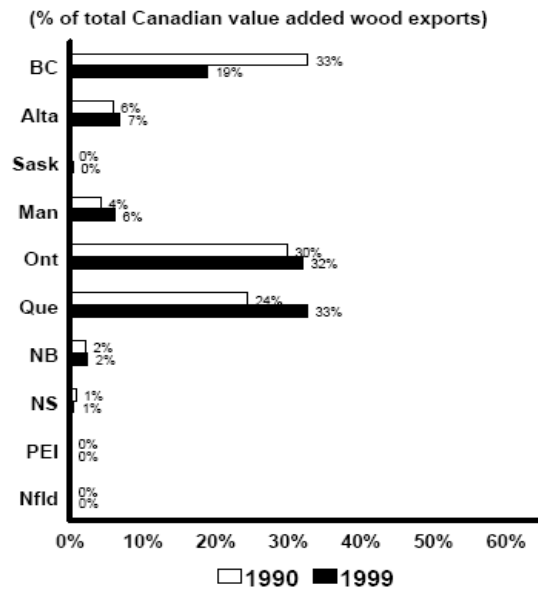
the forest industry in British Columbia has provided direct and indirect employment for 93,000 people, on average (British Columbia Ministry of Forests and Range, 2006).

Throughout the 1960's and 1970's, the forest industry faced a number of changes as demand for forest products increased due to economic / population growth throughout the world, and supplies decreased due to worries about the finite limit of natural resources (DeLong et al., 2004). The 1990's saw an increasing global awareness and concern about environmental impacts, which have become powerful and influential forces on government regulations and consumers, directly impacting the forest industry (DeLong et al., 2004). As a result of these changes, the forest products industry has had to learn to adapt to the changing nature of the industry, both nationally and internationally. Throughout the 1990's, British Columbia's exports of softwood lumber became less diversified. Exports to the US grew from 69% in 1990 to 80% by 1999, while exports to the EU dropped from 11% to 1%. Shipments to Japan rose from 16% to 19% in the mid 1990's, but fell back to 13% by 1999 (Stennes and Wilson, 2002).

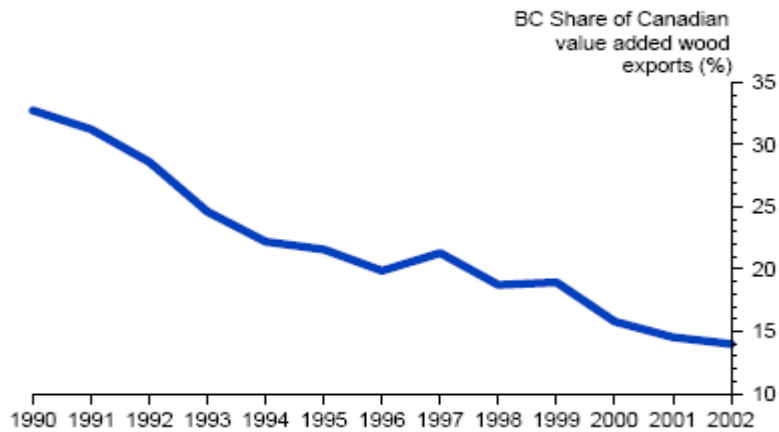
The secondary wood product manufacturing industry in British Columbia is based largely in urban areas, with 59% of companies concentrated in Vancouver, and 22% in Kamloops (Wilson et al. 2001). Due to the importance of the forest industry to the province, Wilson et al. (2001, 2008) have conducted regular surveys of British Columbia's secondary manufacturing industry since 1990. Results of this ongoing research have shown that the total sales value of secondary wood products in British Columbia (based Wilson et al.'s (2001) seven business typology) grew steadily through

the 1990's (Wilson et al. 2001). Secondary wood products sales from BC in 1990 were estimated at about \$1.5 billion; by 1999, total sales had grown to \$2.90 billion, an increase of 70% when accounting for inflation (Wilson et al. 2001). In 1999, sales of secondary wood product accounted for 26% of the province's forest product sales (Wilson et al. 2001).

Despite the steady growth of the industry throughout the 1990s, the province fell behind when compared with the rest of the country (Shrier, 2003). Between 1990 and 1997, B.C. exports in secondary wood products rose by 184%; this is an impressive compound annual growth rate (CAGR) of 16% per year. However, over the same period, exports from the rest of Canada increased by 414% or a CAGR of 23% per year (BC Stats, 1998). While B.C. was the primary exporter of secondary wood products from Canada in 1990, other provinces have been increasing their shares (see Figure 2) (BC Stats, 2003). By 2002, British Columbia was third in exports, following Ontario and Quebec. BC slipped from 33% of Canada's value added exports in 1990 to 14% in 2002 (see Figure 3) (BC Stats, 2003). BC Stats (1998, 2003) attributes the increase in secondary wood product exports from the rest of Canada to "the phenomenal increase" of furniture exports from other provinces, particularly Ontario and Quebec, but also Alberta and Manitoba (BC Stats, 2003 p4).



**Figure 2: Provincial Comparison of Value-Added Exports (BC Stats, 2000)**



**Figure 3: British Columbia’s Share of Canadian Value-Added Exports (BC Stats, 2003)**

Since 1999, the secondary wood product industry in British Columbia has not grown significantly, both in terms of employment and sales figures. Wilson and Stennes (2008 p26) found from their most recent survey of the industry in British Columbia that “most measures of growth are stagnant since 1999, and sector sales although higher than



1999, have not increased as quickly as inflation.” When including all nine business-types, Wilson and Stennes note that, when accounting for inflation, sales have dropped by 12%. Additionally, since the 1999, the market for British Columbia’s secondary wood products has shifted to a greater reliance on the provincial domestic market, away from the United States (Wilson and Stennes, 2008).

The BC Chamber of Commerce feels that British Columbia is not keeping up with the rest of Canada, or the world, citing the following examples:

Finland (pop. 5.2 million) - invested \$90 million in their ‘Value Added Wood Chain’ program which involves marketing, research and new product development, education and enhancing manufacturing capacity.

France - has adopted a ‘build with wood’ strategy to meet Kyoto goals. By increasing the use of wood in construction by 10%, they figure that they will reduce green house gas emissions by 20%.

Alberta - inspired by leaders like Finland, will soon be releasing a Value Added Strategy that will seek to increase their competitiveness and manufacturing capacity in a wide range of value added wood products (BC Chamber of Commerce, 2004 p86).

The BC Chamber of Commerce feels that the “same attention and dedication to competitiveness and advancement” that the provincial government has shown in the primary forest industry, “needs to occur for the wood products/value added sector of the industry” (2004, p86).

## Why Grow the Value-Added Industry?

In referring to secondary manufacturing generally (not specifically the wood products industry), BC Stats said that:

Although the economy of British Columbia is still fairly dependent on resource extraction based industries, emerging sectors like tourism, high technology and value-added (secondary) manufacturing also play a significant role. These industries are often touted as the most likely sources of growth for the future economy of the province. Since they are less reliant on capital-intensive resource extraction, they are a good fit for development by small business. (BC Stats, 2003 p10)

Many nations and regions are working hard to increase the strength of their secondary manufacturing sectors, including Chile, New Zealand, parts of Scandinavia, and the Pacific Northwest of the United States (Wilson et al, 1999). This effort has been driven by an attempt to maintain or expand economic activity in the forest products industries, as maintaining current levels of “activity from ‘primary’ forest products in the future is unlikely” (Stennes and Wilson, 2002 p2). A number of factors are making business tougher in the primary sector; the effects of global competition, environmental pressure, decreasing allowable cut, dropping lumber prices and “cumbersome trade restrictions” (in terms of Canadian exports to the US and Europe) which can have economic and employment rate repercussions (Stennes and Wilson, 2002 p2).

Encouraging the promotion of the value-added industry will help to offset the local effects of a changing global primary industry (Wilson et al., 1999). The more labour intensive processing required of secondary manufacturing maximizes the potential of every unit of timber cut, benefiting employment levels and the economy. The secondary

sector is seen as being able to increase value and maintain employment, with some skill transferability from primary operations (Wilson et al., 1999). Encouragement of companies with medium to high value and job rates (such as millwork, furniture, and cabinets) will help to diversify the industry and increase employment without impacting the annual allowable cut (Kozak et al., 2003) (Figure 4 shows the number of jobs per 1000 m<sup>3</sup> Round Wood Equivalent in various business types in the value-added sector). Growth of value-added production throughout the 1990's increased sector employment by an estimated 2,797 jobs by 1997, an increase of 24% from 1990, while sales increased 75%, or \$1.15 billion in that period.

<b>Business Type</b>	<b>Jobs per 1000m<sup>3</sup> RWE</b>
Engineered Wood Products	1.84
Cabinets	10.33
Furniture	7.66
Millwork	1.75
Other Wood Products	0.70
Pallets & Containers	0.82
Remanufactured Products	0.50
Total Forest Sector	1.10

**Figure 4: BC Forest Product Employment Coefficients (Wilson et al., 1999)**

## **Summary of Secondary Wood Products**

The secondary wood products industry has been growing around the world as timber producing regions have tried to maximize economic benefits. While British

Columbia has managed to expand the local value added industry, sectors in other provinces have grown at much higher rates. This has led some people to feel concerned that British Columbia is falling behind.

With the competitive advantage in producing secondary wood products shifting in favour of countries with lower production costs, British Columbia's companies are facing even more competition. In particular, China has become a major force in the world market for value added wood products, and a significant direct competitor to Canada in the domestic and US markets. This has led experts in the Canadian secondary wood products industry to emphasize the need for innovation and new strategies.

## **Public Attitudes Towards Sustainability and Environmentally Friendly Products**

In recent years, concerns about the health of the environment have been increasing in British Columbia and around the globe. While the world's population continues to grow, sustainable living practices and environmentally friendly products are becoming increasingly important, impacting many industries, including forestry and wood products. Throughout the last 30 years there has been increasing anxiety about the environment. This growing concern has fueled many environmental debates, with the world's forests being one of the major issues (Peck, 2002).

However, what, if any, impact do these concerns have on people's purchasing decisions? Market opportunities may exist for secondary wood products because of this "green" mentality, and the desire of consumers to use renewable resources.

### **Public Attitudes**

Numerous studies have been carried out to assess public attitudes towards the environment and sustainability. The results of many of these studies, however, would seem to be, if not contradictory, at the very least non-complementary. Consumer Reports has found that public opinions about the environment are largely driven by the media (Uhrig, 1999). According to their research, the "issues that receive the most 'amount of publicity' are the ones that stay in the consumers' mind" (Uhrig, 1999 p8). This would seem to indicate that much of the public's education about the environment is generated by the media's preference for particular subjects.

## **The Environment and the Economy**

Many researchers have studied public attitudes towards the environment, and people's willingness to pay for preventing environmental damage. Studies performed in Europe and the United States have found that respondents believe protecting the environment be a top priority. According to the results of Harris Poll #77 (2005), three-quarters of adults in the United States agree that "protecting the environment is so important that requirements and standards cannot be too high, and continuing environmental improvements must be made regardless of cost". Another study surveying European attitudes throughout the European Economic Union found that "European Union citizens give priority to protecting the environment over economic competitiveness" (Organic Consumers, 2005).

Not all studies agree, however. The Yale Strategy Group (2005) determined that if Americans had to choose, 54% would rather "keep the economy growing" than protect the environment. A similar sentiment in the U.S. was found by Yale University's School of Forestry and Environmental Studies (2004a), where respondents were evenly divided between keeping taxes low or protecting the environment. The Yale study found that "while there is broad-based support for the environment, voters have to weigh the economic costs and their concerns about taxes", and that "economic trade-offs dampen enthusiasm for protecting the environment" (Yale Strategy Group, 2004a p9).

The 2005 Yale study also found that consumers were oftentimes confused due to too much information. Respondents indicated that they did not know whom to believe.

53% of those surveyed said that “there is so much information and disagreement in the media that I don’t know who to believe about what is best for the environment” (Yale Strategy Group, 2005 p5).

The assumption that the environment and the economy are at odds is common in environmental debate. The organization, Redefining Progress, says that, “sustainability means resolving the conflict between two competing goals: the sustenance of human life and the integrity of nature” (Redefining Progress, 2006). This definition positions the welfare of the economy and environment as competing interests. Can we have both? According to the key findings of the Yale Strategy Group (2005), the American public believes so. When asked if they agreed with the statement, ‘You don’t have to sacrifice environmental protection to get economic growth. The choice between jobs and the environment is a false one: we can have both’, three-quarters (75%) agreed (Yale Strategy Group 2005).

These surveys show that there is a wide variation and much confusion in public opinions on issues surrounding the environment and the economy. Despite warnings that the “overuse of renewable natural capital can impair or destroy its ability to regenerate itself and sustain the flow of goods and services on which we depend” (Prugh, 1999, p. 50), a significant number of consumers place the economy ahead of the environment. At the same time, however, there is a sizable number of Americans who believe that “protecting the environment should be a top priority, even if that means higher consumer

prices” (Yale Strategy Group, 2005) and are willing to pay extra for goods which they believe are better for the environment.

To further complicate the public response to the environment, there is evidence to suggest that consumer spending does not necessarily correspond to stated consumer attitudes. The real test of consumers comes down to consumer practices when faced with the financial ramifications of making an environmentally friendly choice. It has been widely noted in many studies that there is a significant difference between people’s attitudes and their behaviors (Gupta and Ogden, 2006; Hand and Macheski, 2003; Anderson 2003). This attitude-behavior gap and how it pertains to consumers of wood products will be discussed further in the next section.

### **Attitudes versus Behaviour: Wood Products and Public Perception**

Public perceptions of wood products directly affect the growth of the industry. According to the Wood Promotion Network, until recently, “the wood industry [has been] under attack. Companies marketing alternative materials, along with misguided environmental groups, were having a direct affect on the wood industries bottom line” (Wood Promotion Network, 2006). DeLong et al., writing in reference to the same period, record a similar relationship between consumer perceptions and industry success:

There is a strong interest in encouraging expansion of the secondary manufacturing sector as increasing costs, substitute products driving down demand and public demands for sustainability continue to make it more difficult for parts of BC to compete in the commodity market. (DeLong et al., 2004 p25)



Numerous studies have been conducted to try to gain a greater understanding of the way the public at large views wood products at various stages of manufacture and consumption. “Myths prevail among the general public about wood, forest products and the condition of the environment” (Uhrig, 1999 p ii). Uhrig found that Americans tend not to be aware of the quantity of products they consume on a daily basis that come from wood, and the “environmental friendliness that wood and non-wood substitutes inherently possess” (Uhrig, 1999 p ii).

In researching public perceptions of wood products amongst American college students, Bowyer (1995), found a trend whereby students and younger respondents demonstrated a greater degree of misperception. He found this worrisome, as this demographic group would soon take on leadership roles within society. The survey he conducted found that the worst misconceptions about the forest product industry were:

- 1) People believe that trees live for thousands of years or until they are cut down;
- 2) 73% of students believe most of America’s forests will disappear by 2050;
- 3) 15% of paper mill employees know how much paper is recycled each year;  
and
- 4) 78% of respondents believe the world is rapidly running out of minerals.

The results of a later study by Polzin and Bowyer (1999), on randomly selected Montana residents, supported the findings of the college student survey by determining

that there are “pervasive misconceptions about forests, wood products and natural resource use” (Polzin and Bowyer, 1999 p37). They felt that:

Misunderstanding and misinformation regarding forests and wood products among this group seem to suggest a significant and growing problem for the wood-using industry. Ongoing efforts to educate the public at large about forests and forestry also appear warranted. (Polzin and Bowyer, 1999 p41)

Several organizations have been formed throughout Canada and the United States to combat misconceptions about forests, forest industries, and wood products.

Organizations such as the Wood Promotion Network, the Canadian Wood Council, and the American Wood Council, have worked hard to increase public awareness of the benefits of using wood. As the residential housing market is the largest consumer of North American wood products, this sector has been the main focus of these efforts.

A survey of British Columbians by Mark Trend Research (2000) asked participants to rank various topics as priorities for the province. The survey found that “protection of the environment and encouraging a healthy forest” (Mark Trend Research, 2000 p1) was the most important issue for respondents. “Residents widely agree that the forest industry is important to their local economy and to the province’s economy as a whole” (Mark Trend Research, 2000 p3). However, the same research found that “British Columbians are not willing to sacrifice jobs and economic development for tougher environmental restrictions.” More than three-quarters of B.C. residents “would prefer to see environmental issues resolved carefully over time, rather than see tougher regulations

imposed immediately, if this would result in a loss of jobs” (Mark Trend Research, 2000 p5).

Hand and Macheski found that “public opinion polls have consistently demonstrated the public’s willingness to ‘tradeoff’ economic growth for environmental protection.” (Hand and Macheski, 2003, p1). They note that most of the respondents felt that the environment and the economy were both important, however the willingness to accept extra costs for the health of the environment “drops off fairly quickly when dollar values rise above token amounts” (Hand and Macheski, 2003 p10).

Several studies have been conducted that show consumers are ‘willing’ to pay to protect the environment. These studies examine consumer attitudes by asking people how much extra they would financially commit for the assurance of purchasing an environmentally friendly product. Most of this research has found that the majority of people surveyed would be willing to spend more for the same quality product if it was guaranteed as environmentally friendly or sustainable.

In the case of wood products, consumers are often asked about the price premium they would be willing to pay for an environmentally certified product over another, otherwise equal product. Archer’s (2004 p16) survey of urban Canadians found that “half to two-thirds of respondents... indicated that they would be more likely to purchase a certified over a non-certified product, all else being equal.” Additionally, in a survey performed in store at Home Depot in Oregon State, the majority of consumers were willing to pay extra for certified products. (Anderson, 2003)

Interesting results are noticed, however, when these attitudinal studies are compared with corresponding behavioral studies. Attitudinal studies are hypothetical, and as a result, consumers may be willing to pay more when the question is asked, but they are not faced with actually paying for it. However, behavioral studies on consumers willingness to pay for sustainable / environmentally friendly products have found that, when faced with a purchase decision between an environmentally certified and a non-environmentally certified product, the price differential must be quite small, or non-existent, in order to sway consumers buying habits.

Anderson and Hansen (2002b) performed a comparative attitude-behaviour study of consumers purchasing plywood at two Home Depot stores in Oregon State. This study included a survey of customer willingness to pay for certified plywood, which showed that 61% of respondents would pay at least a 5% premium for certification. The behavioral study was conducted at the same two stores and tracked the actual purchases of certified and non-certified plywood at various price differentials. Purchasing results showed that “most consumers prefer to purchase an ecolabeled product, so long as it doesn’t cost more than a competing non-ecolabeled product” (Anderson and Hansen 2002a p1). They also found that “a lower price is a more compelling product attribute than the presence of an ecolabel” (Anderson and Hansen 2002a p1). In the behavioral experiment, 58% of customers paid a 2% premium.

Anderson et al. (2005 p2) found that “individuals stated willingness-to-pay and his or her demonstrated willingness-to-pay for those same environmental amenities may

not be consistent”. They also note that “when individuals are required to pay real money for environmental amenities claimed to be highly valued, his or her actual consumption of those amenities falls as the cost increases” (Anderson et al. 2005 p2).

Ramensteiner (1999) has also conducted surveys on this topic, focusing on European attitudes towards forests and forest products. Rather than asking consumers to indicate the additional cost they would be willing to pay for environmentally friendly product, they were asked to rank product attributes in order of importance. This methodology showed that, while most consumers surveyed paid the environmental friendliness of a product at least ‘some special attention’, several other factors were more important, including quality, durability, design material, and sale price (see Figure 5). Ramensteiner notes, “For the majority of products, environmental aspects are not regarded as being of key importance to consumers in purchasing decisions.”

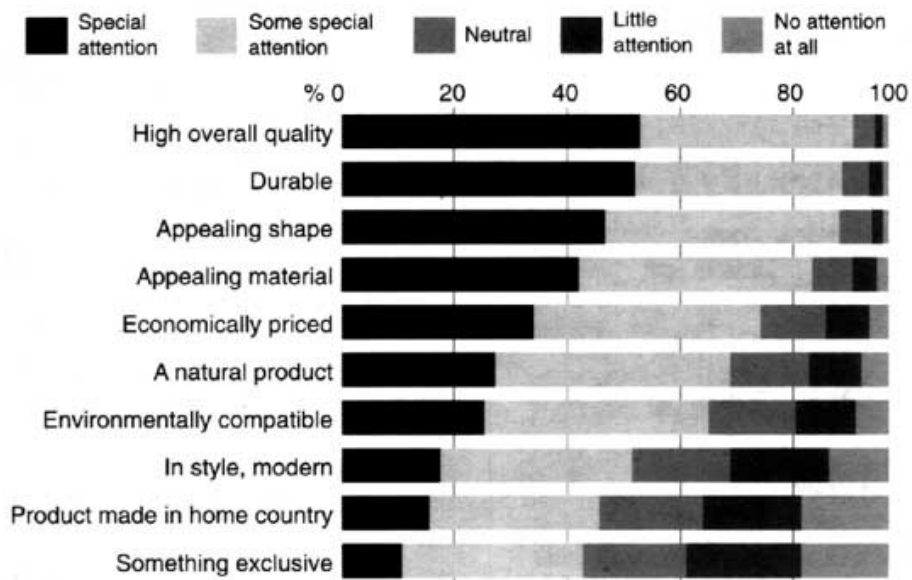


Figure 5: Importance of Product Attributes (Rametsteiner, 1999)

## Wood Frame Construction and the Environment

Being the largest consumer of wood products in North America, the construction industry has been the main focus of the majority of studies on consumer attitudes towards wood products. As such, this research has been included in this section as it may be found to correlate with attitudes on secondary wood products. For the most part, this research tends to compare and contrast wood, concrete, and steel building products.

Beginning with a more general survey of attitudes towards wood use, Rametsteiner's survey of European consumers for the Food and Agriculture Organization of the United Nations (1999) analyzed the attitudes of European consumers towards forests and forest products. This survey found that the majority of respondents considered glass and domestic wood (versus tropical wood) as being environmentally friendly materials. Opinions on tropical woods were evenly split between consumers between being environmentally friendly or harmful (see Figure 6).

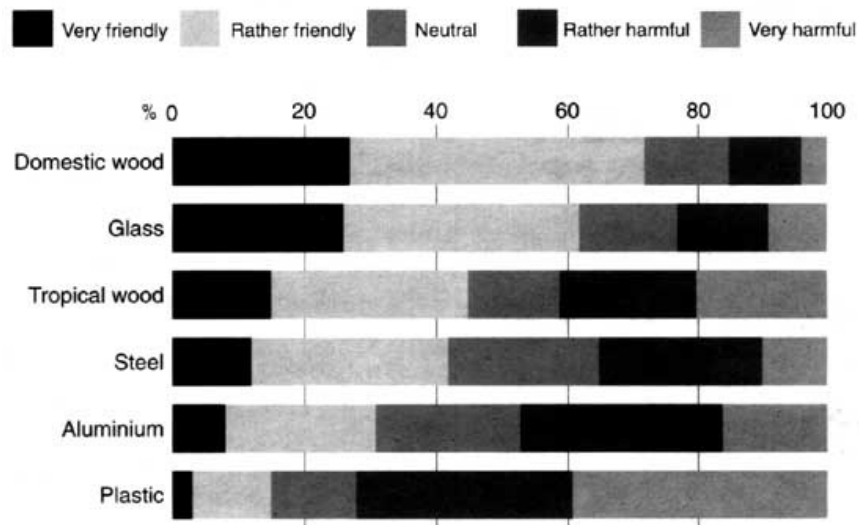


Figure 6: Perceived Environmental Friendliness of Material (Rametsteiner, 1999)

In this survey, wood features as a popular choice compared to other available products. Other more recent surveys have similar findings. The Wood Promotion Network has been tracking consumers' beliefs towards wood building products since 2000. Their surveys have found that between 2000 and 2003, consumers' belief that "wood is an all around better building material than steel or concrete has climbed 22%, to a total of 70%." And additionally, "more builders and consumers than ever before see wood use as being a sound environmental choice" (Wood Promotion Network, 2006).

Life Cycle Analysis studies have been undertaken to compare wood to steel and concrete as structural materials, quantifying the environmental effects of products through their entire life spans. Life Cycle Analysis is an "internationally accepted method for quantifying the total environmental effects associated with products; extraction of raw resources; product manufacture and transportation; product installation; use, and maintenance in a building; and ultimate disposal or reuse" (Forintek, 2003 p1). This analysis method is a "rigorous cradle-to-cradle calculation [that] gives the only true picture of a products environmental profile" (Forintek, 2003 p1).

An analysis by Forintek compared three equivalent Canadian homes using different structural materials: one wood frame, one light steel, one insulated concrete forms. The study addressed the embodied environmental effects of the construction materials, as well as the associated environmental effects of heating and cooling the homes for over 20 years. Results found that the home built with wood frame construction ranked best in all six environmental measures: Primary Energy, Global Warming,

Potential Air Pollution, Water Pollution, Resource Use, and Solid Waste (O'Connor and Dangerfield, 2004). Forintek's results are supported by those of the Consortium for Research on Renewable Industrial Materials (CORRIM), who performed similar analysis comparing wood, steel and concrete construction in the US (Lippke et al., 2004). They also seem to coincide with the attitudinal surveys of Rametsteiner (1999). All of this research indicates that wood products are more environmentally friendly than other options. However, this measure is comparative rather than absolute; it does not guarantee that all forestry is sustainable, only that it is less environmentally harmful than other available options.

### **Summary of Sustainability and Environmentally Friendly Products**

As the above articles have demonstrated, while sustainability is becoming increasingly important to contemporary forestry discourses, significant differences remain regarding what the term means and how it is applied. Public perceptions of the sustainability and environmentally friendliness of products can influence consumers' buying practices, but only when products are priced similarly to the non-environmental options. This demonstrates that, while consumers may not actually pay more for a product that they believe to be more environmentally friendly, this attribute can offer those products a competitive marketing advantage.



## Research Objectives / Questions

Although the secondary wood products industry is facing some challenges in British Columbia due to increasing worldwide competition, growing environmental concerns may present new market opportunities for the secondary wood products sector. However, these marketing opportunities may prove to be contingent upon the purchasing practices of consumers or, more specifically, the degree to which they associate secondary wood products with environmentally friendly or sustainable options.

Three core research questions form the structure around which this project is designed. These are:

- 1) How important do people feel sustainability and environmental concerns are in their daily lives?
- 2) How do people perceive the impact of sustainability on their purchasing decisions? Do people purchase products that they feel are more sustainable than other options?
- 3) How do people feel about wood as a sustainable or environmentally friendly material?
  - a. Are wood products considered more sustainable / environmentally friendly than other products?

- b. Are people more likely to purchase wood products as a sustainable option over other products?

## Methodology

This project was designed to address the research questions set out above at a minimal cost. The target population for the study was defined as individuals living within the Greater Vancouver Regional District (GVRD) in British Columbia who were 18 years of age or older. Limiting the research to those 18 years or older was done to simplify the survey consent process. Additionally, it was felt that individuals under the age of consent play a relatively small role in the secondary wood product consumer base.

## Sample Size

The sample size for this study was determined by using the formula (Bluman, 2001):

$$n = (t_{\alpha/2}^2 S^2) / E^2$$

In order to calculate the sample size, the standard deviation is required. As a standard deviation from previously existing studies could not be found, the value was estimated. The formula  $Std = (range - 1) / 4$  (Rice, 2004) was used to estimate the standard deviation. Likert scale-style questions made up the majority of the survey questions, so with a ten-point range, the estimated standard deviation is calculated as 2.25. This value was consistent with the empirical rule whereby 95% of normally distributed points will fall within 2 standard deviations of the mean.

Using the estimated standard deviation and a desired precision of 0.65, a required sample size,  $n$ , is calculated to be 46. This number was rounded up to 50 as a minimum target. Recognizing that a sample size of 50, though satisfying the above equation was still small, it was determined that between 50 and 100 surveys be collected as time and resources allowed.

## **Sample Collection**

Ultimately, it was desirable to include as much representation of the target population as possible within the sample frame. This is often achieved by making initial contact with participants by mail or telephone. Contacting potential participants in that way would have been ideal, as it would have allowed for a large, diverse sample. However, due to the limitations of time and financial resources, neither of these methods of selecting participants could be employed. It was therefore decided to use a random approach intercept method in high transit areas such as Sky Train stations and shopping malls through which a diverse selection of the target population would pass. Miller et al. (1997 p655) found that “the street-intercept method is a feasible alternative to traditional population survey methods”.

A number of high transit areas were selected around Vancouver including Burrard Street Sky Train station, Commercial Street Sky Train station, Pacific Center shopping mall and the Robson Street area. Surveys were collected between mid-March and mid-April, 2008.

Surveys were collected by randomly approaching potential survey participants in high traffic pedestrian areas. The sample collection process was much slower than anticipated as it was found that the target population was generally not interested in participating in the study. As a result, survey collection was halted once the minimum number of surveys had been collected. In total, 51 participants filled out surveys. Some participants did not respond to all questions, however, leaving individual questions with responses varying from 46 to 51. Only 3 questions had less than 49 responses.

## **Survey Design**

The survey was made up of 38 questions, separated into 5 sections: Sustainability and the Environment in General, Sustainability and Purchasing Habits, Sustainability and Wood Products, British Columbia's Wood Product Industry, and Demographic Information. The survey was made up mostly of Likert scale-style questions along with some multiple choice, categorical, ordinal, and open-ended questions. A special 3-way tug of war-style question was also included which required participants to choose a balance between three competing factors. The survey was designed to require approximately 10 minutes of the participants' time to complete. A copy of the survey is included in Appendix A.

## **Results**

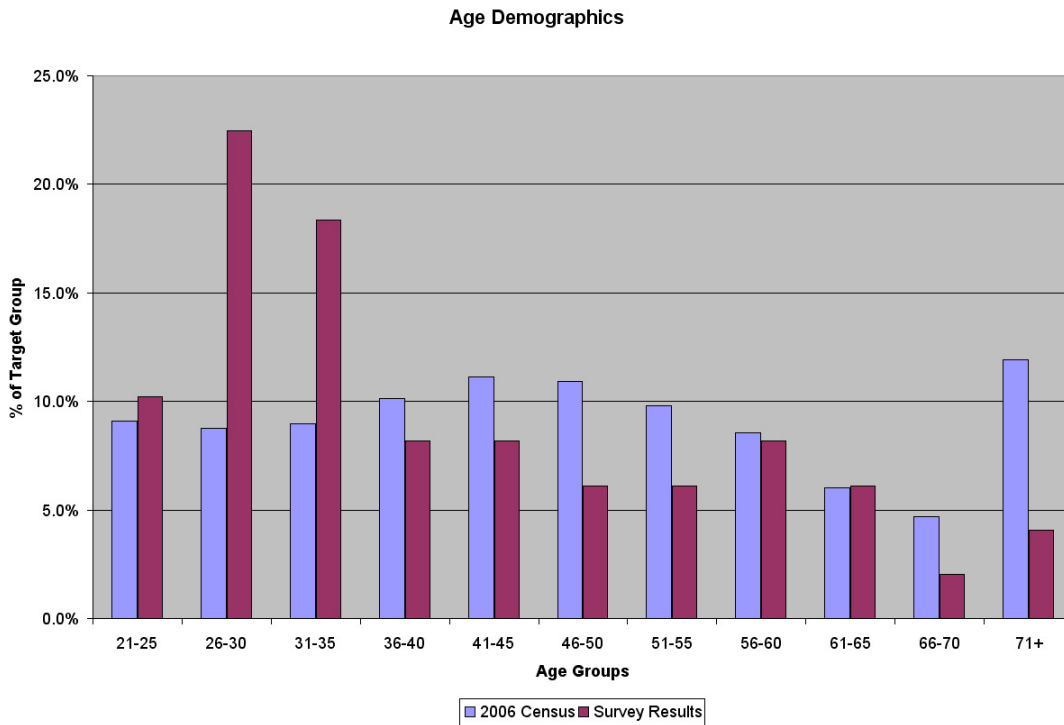
The following sections present the results of the survey questions, grouped into sections by subject. The results of each survey question are presented along with a description of the results. The section breakdown covers the following subject areas: Respondent Demographics, Sustainability and the Environment in General, Sustainability and Purchasing Habits, Sustainability and Wood Products, and British Columbia's Wood Product Industry.

### **Demographics**

Section 5 of the survey gathered demographic information about the participants, including age, gender, income, profession, and the number of years living in the Vancouver area.

#### **Age**

Question 36 of the survey asked participants to select their age group. When compared to the results of the data from the 2006 Canadian census (Census 2006, StatsCan) for the Vancouver metropolitan area, it is apparent that the survey data was disproportionately weighted towards a younger demographic. Specifically, the proportion of participants was noticeably higher in the 26-30 and 31-35 age classes. The age data from the survey is displayed in relation to the Canadian 2006 census data in Figure 7.



**Figure 7: Comparison of Age Demographics with 2006 Census**

## Gender

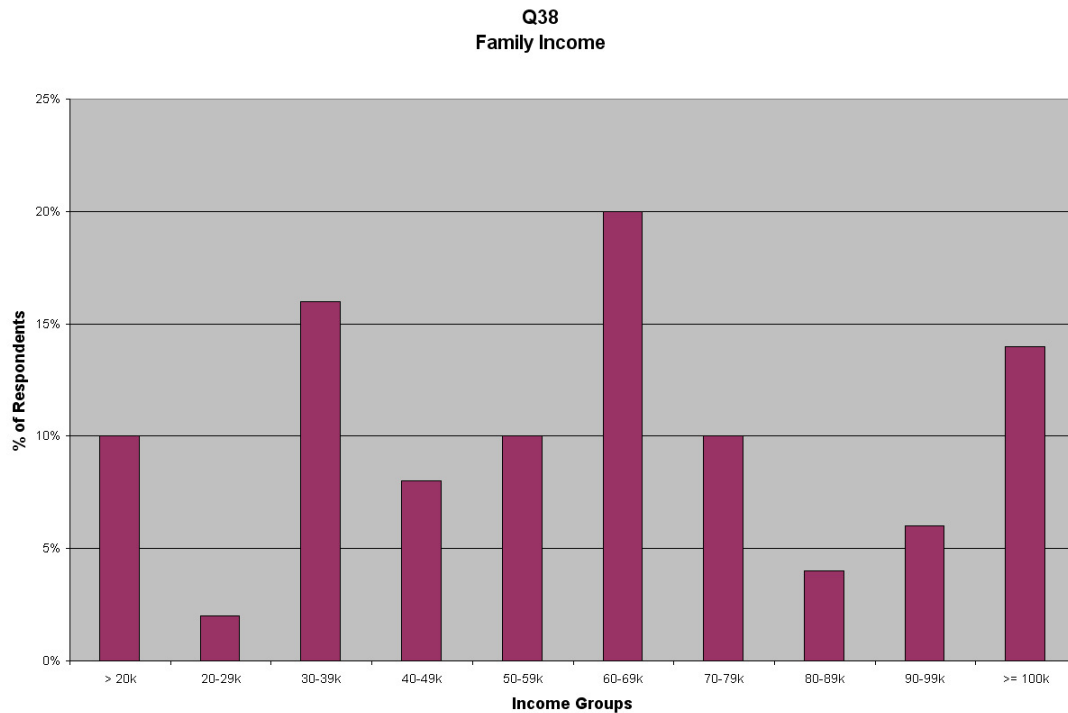
The gender distribution of the survey participants closely matched that of Canada’s Census 2006 results for the Vancouver area.

Survey question 37 asked participants gender. 47% of the survey respondents were male, and 53% were female. According to the 2006 Canadian census, the Vancouver area population was divided 48% male and 52% female.

## Family Income

Question 38 in the survey asked participants about their total family incomes (Figure 8). The median family income was between \$60,000 and \$69,999. This is higher

than the median family income for the area as reported by the 2006 Canadian census, which was \$48,527 (2006, StatsCan).



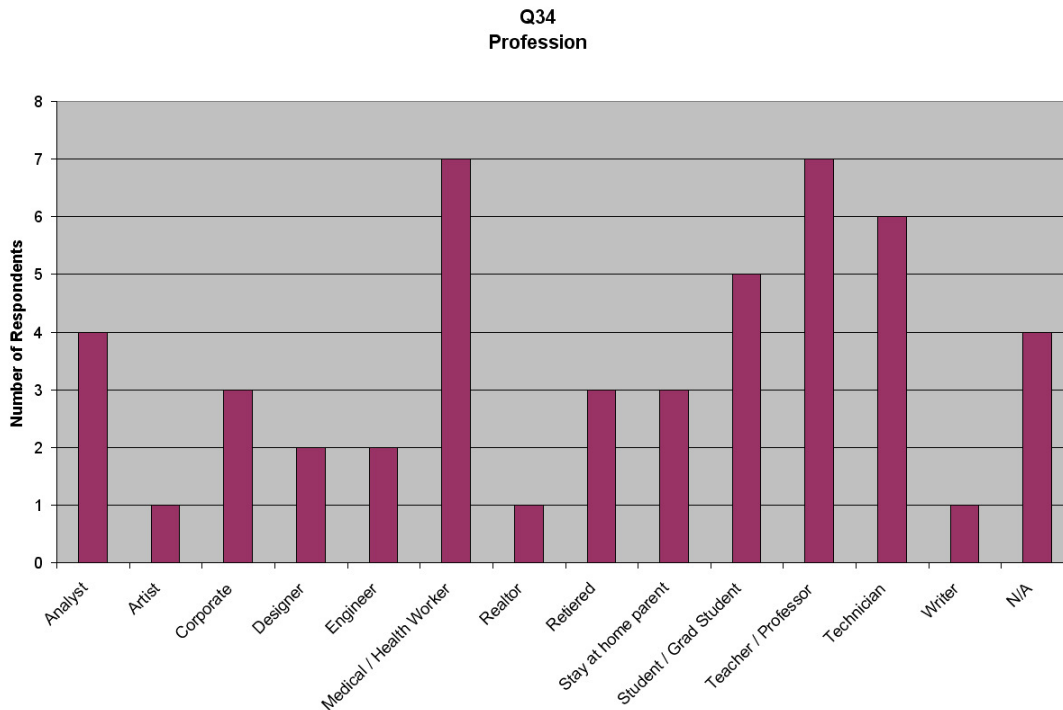
**Figure 8: Family Income Demographics**

## Professions

Question 34 contained two parts; firstly, participants were asked their profession in an open format question, and secondly, participants were asked if they worked in the wood products industry.

A wide range of professions were given in response to this question (Figure 9). The range of professions has been summarized into professional groups in the following figure. 6% of the respondents stated that they worked in the wood products industry.





**Figure 9: Participant Professions**

## Descriptive Results

This section presents basic statistics on the survey question responses along with comparisons made between general demographic groups. Each question was also analyzed for differences in responses based on demographic groupings by Gender, Age and Income. ANOVA and Scheffé tests were used to compare the results (see Appendix B for further details on these tests). Due to the low sample size it was necessary to combine Age and Income groups into larger ranges in order to perform statistical analysis. The combined groups used for Age were:

- 18 to 30 (Low)
- 31 to 50 (Mid)
- 51+ (High)

The combined groups used for income groups were:

- Less than \$40,000 (Low)
- \$40,000 - \$69,999 (Mid)
- \$70,000 and above (High)

The results of the demographic results are presented along with the general results in the following sections. Reference to these results is only made when a statistical difference was identified.

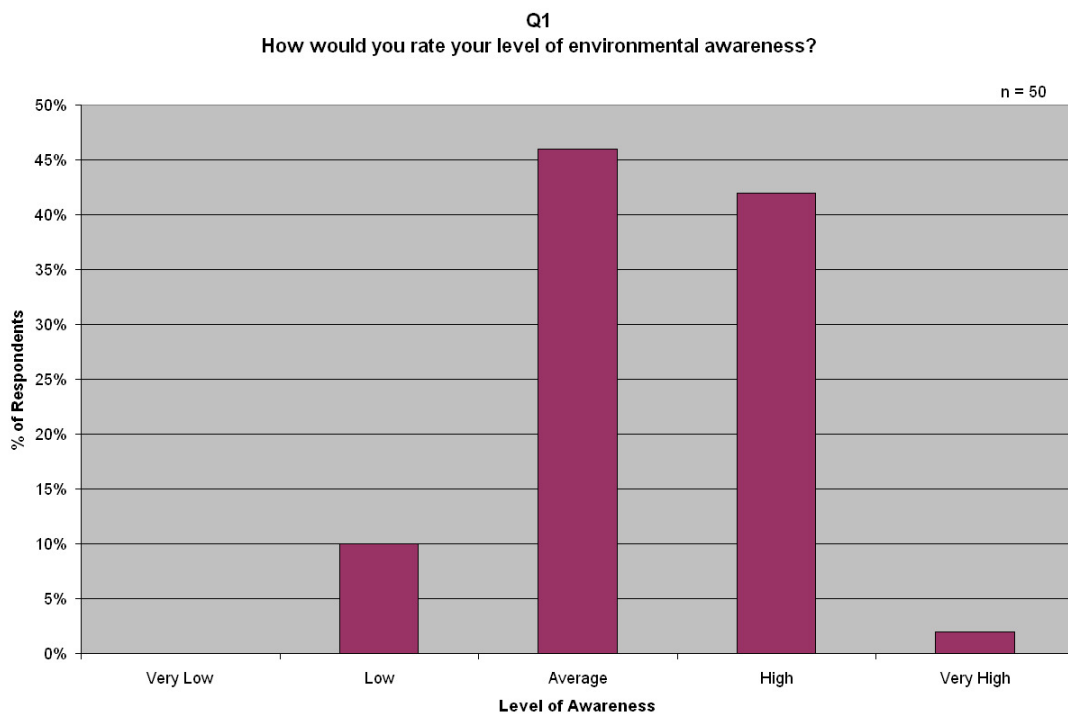
Unless specified otherwise, all statistics discussed were performed with a confidence level of 95% (alpha 0.05).

## **Section 1**

Section 1 of the survey focused on attitudes around the concepts surrounding the terms “Sustainability” and “Environmentally Friendly”. Questions in this section were designed to explore how participants differentiate the concepts of “Environmental Friendliness” and “Environmental Sustainability” and determine what, if any, impact that potential distinction has on respondents’ impressions of various materials. This section includes survey questions 1 through 10.

## Question 1

Question 1 asked participants to rate their impressions of their own level of environmental awareness. Figure 10 shows these results as a proportion of respondents. 44% of the respondents rate their level of environmental awareness as “High” or “Very High”.

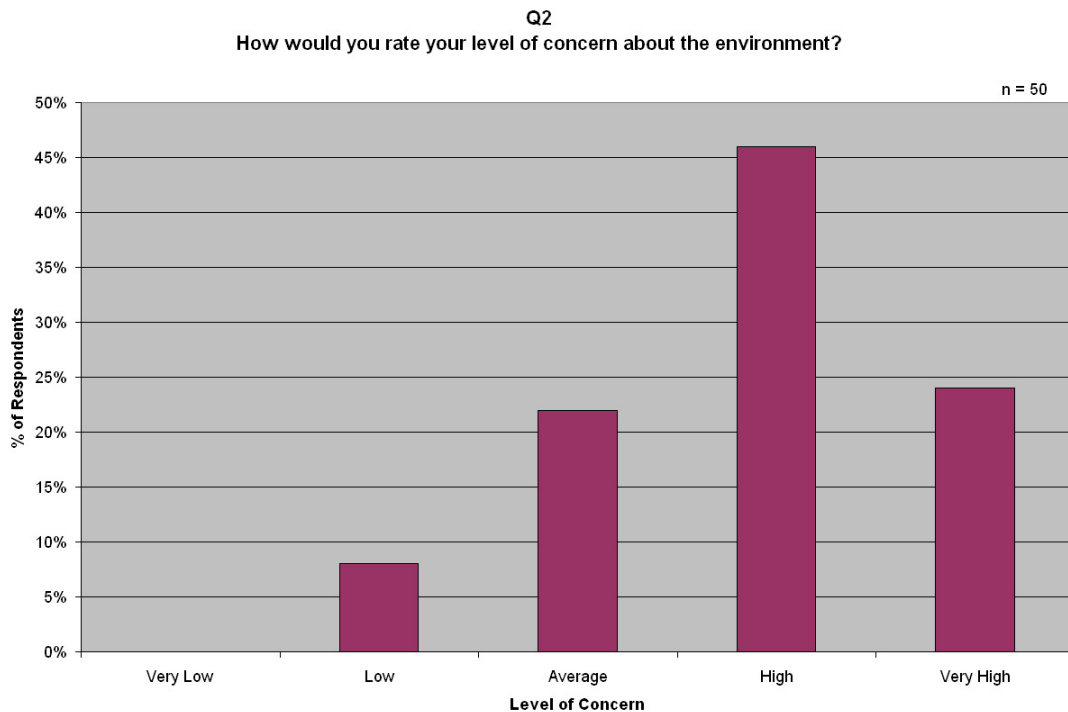


**Figure 10: Respondents' levels of environmental awareness**

## Question 2

Question 2 asked participants to rate their level of concern about the environment. Seventy percent of respondents rated their level of environmental concern as higher than average.

Figure 11 shows these results as a proportion of respondents. Compared with the results from question 1 it can be seen that, on average, respondents have a higher level of concern for the environment, than self assessed levels of awareness.



**Figure 11: Respondents levels of environmental concern**

### **Question 3**

Question 3 was made up of two open-ended questions, where the participants were asked to supply their own definition for the terms “environmentally sustainable” and “environmentally friendly”.

70% of respondents identified the term “environmentally sustainable” as a concept tied to some form of consumerism, selecting words such as “consume”, “produce”, “manufacture”, and “process” as active verbs, and “material”, “resource”, and

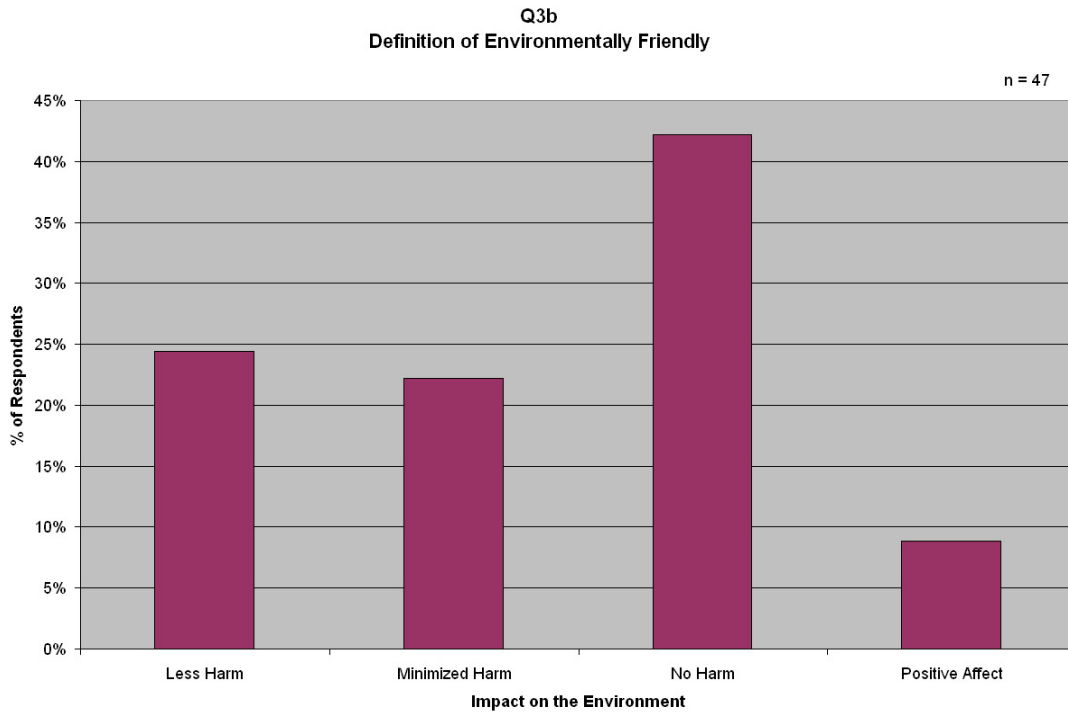
“product” as nouns. 24% of respondents perceived the term in a more passive context, frequently connecting the idea to long-term stability of the environment and a sense of ecological balance that did not necessarily imply direct connections to resource consumption. 39% of respondents directly connected “environmentally sustainable” to the term “renewable”. 24% of respondents connected “environmentally sustainable” to a concept of long-term resource use, without directly indicating that the resources consumed were renewable.

In analyzing the definitions for “environmentally friendly”, a noticeable difference in the perceived degree of impact on the environment was observed. The statements were coded as belonging to one of 4 degrees of impact: Less Harm (compared to other options), Minimum Harm (harm minimized as much as possible), No Harm (no negative affects on the environment), and Positive Impact (only positive affects). The following list gives an example definition for each of the coded categories from the collected responses:

- Less Harm: “Does not harm the environment as much as other similar products.”
- Minimum Harm: “Minimal adverse impact on environment.”
- No Harm: “Does not harm the environment.”
- Positive Impact: “Products that have a net positive impact on the environment.”

The results of the supplied definitions coded in this manner are shown in Figure

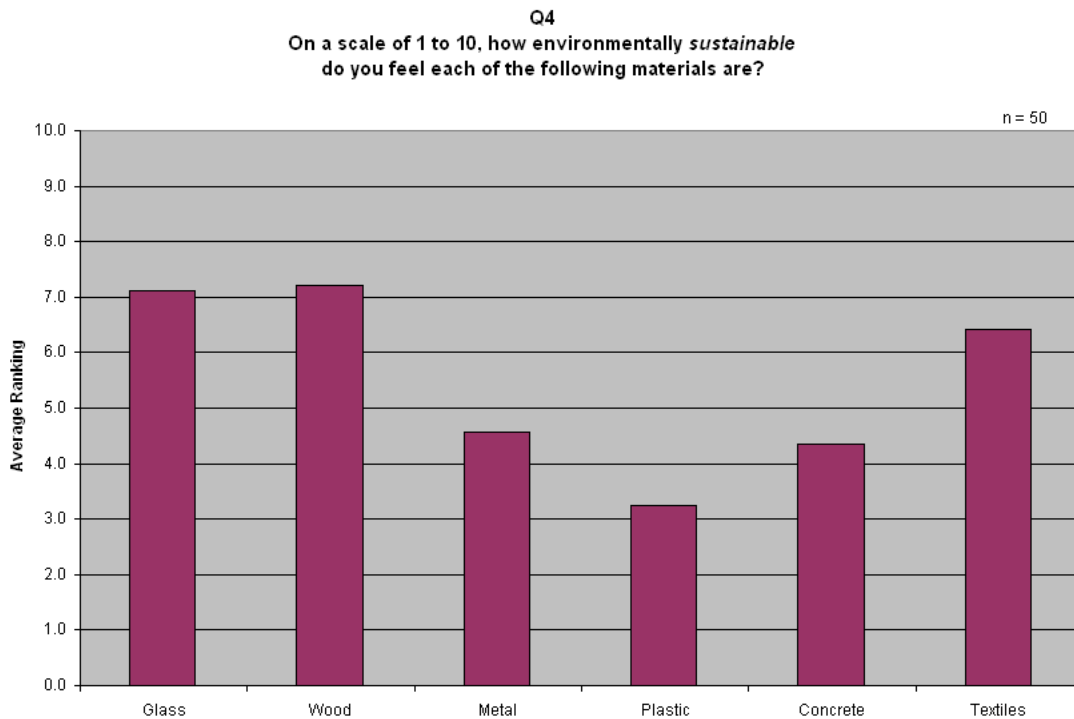
12.



**Figure 12: Respondents Definitions of Environmentally Friendly**

#### **Question 4**

Participants were asked to rate the following materials for their environmental sustainability: wood, metal, concrete, textiles, glass, and plastic. Figure 13 displays the average responses for each material on a scale of 1 to 10, where 1 equaled 'Not at All Environmentally Sustainable' and 10 equaled 'Completely Environmentally Sustainable'.

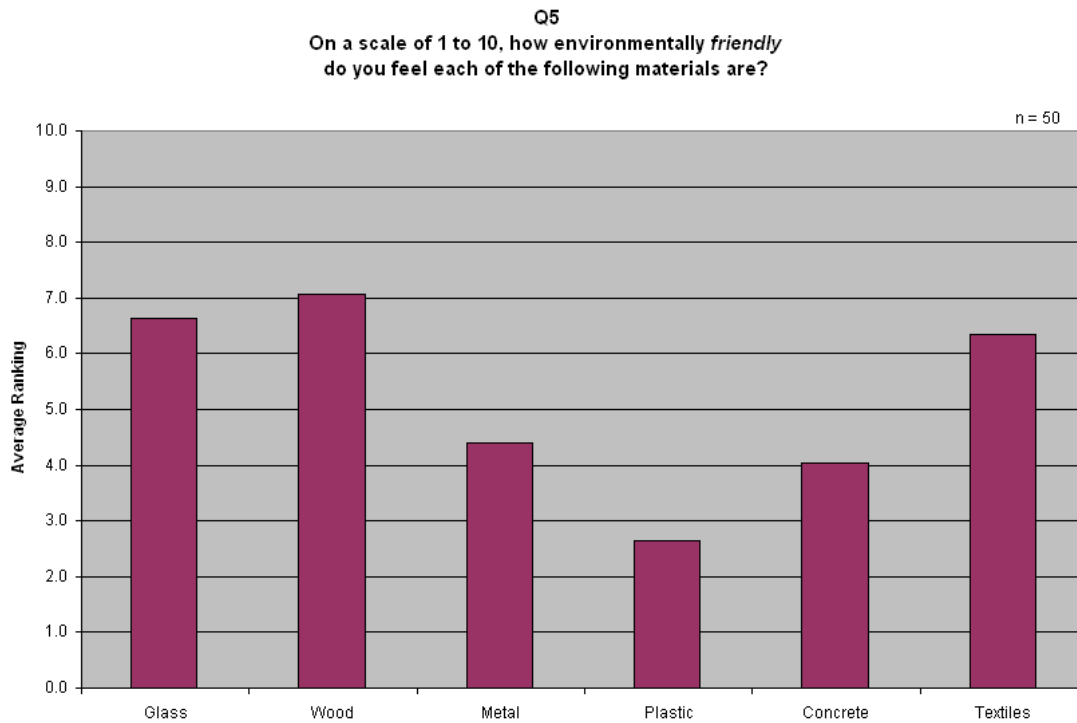


**Figure 13: Average levels of sustainability attributed to various materials**

ANOVA and Scheffé tests on the responses for each material showed two distinct groups of materials, within which the responses were statistically equal. Glass, wood, and textiles were rated as significantly more environmentally sustainable than metal, plastic, and concrete.

### **Question 5**

Participants were asked to rate the following materials for their environmental friendliness: wood, metal, concrete, textiles, glass, and plastic. Figure 14 displays the average responses for each material on a scale of 1 to 10, where 1 equaled ‘Not at All Environmentally Friendly’ and 10 equaled ‘Completely Environmentally Friendly’.



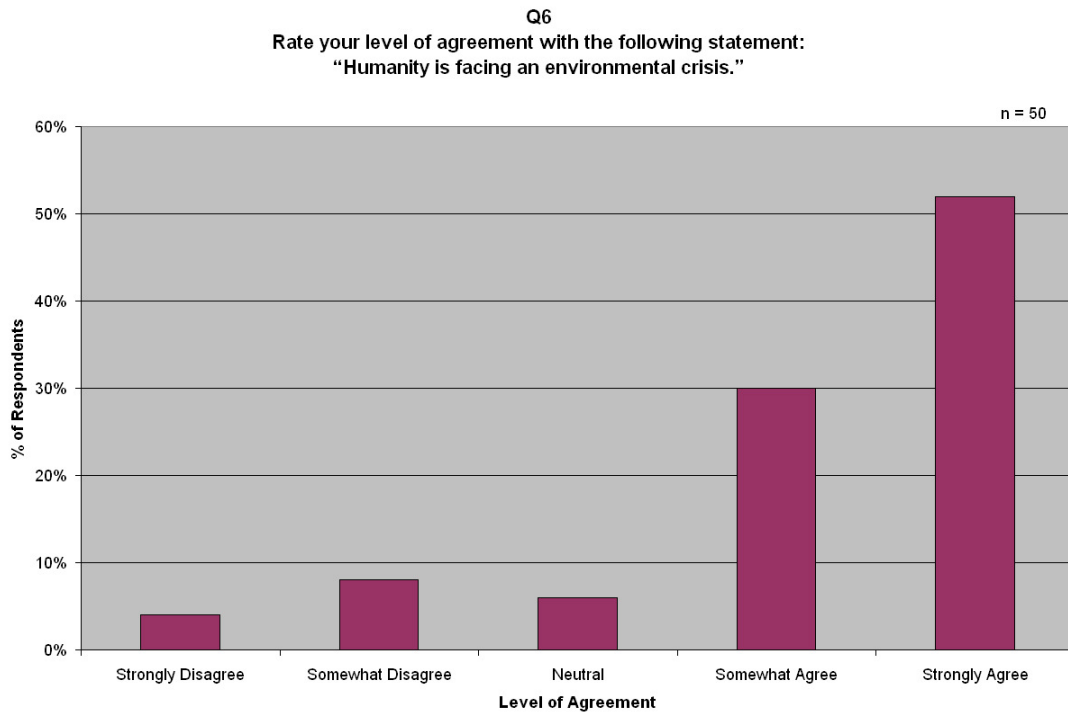
**Figure 14: Average levels of environmental friendliness attributed to various materials**

ANOVA and Scheffé tests on the responses for each material showed three distinct groups of materials, within which the responses were statistically equal. Glass, wood and textiles were rated as the most environmentally friendly, followed by metal and concrete, with plastic rated lowest.

### Question 6

Question 6 asked participants to rate the degree to which they agree with the statement “Humanity is facing an environmental crisis” (see Figure 15). Respondents overwhelmingly agreed with the statement, with 82% of responses being equal to or greater than ‘Somewhat Agree’. On a scale of 1 to 5, where 1 equaled ‘Strongly Disagree’ and 5 equaled ‘Strongly Agree’, the average response was 4.2.

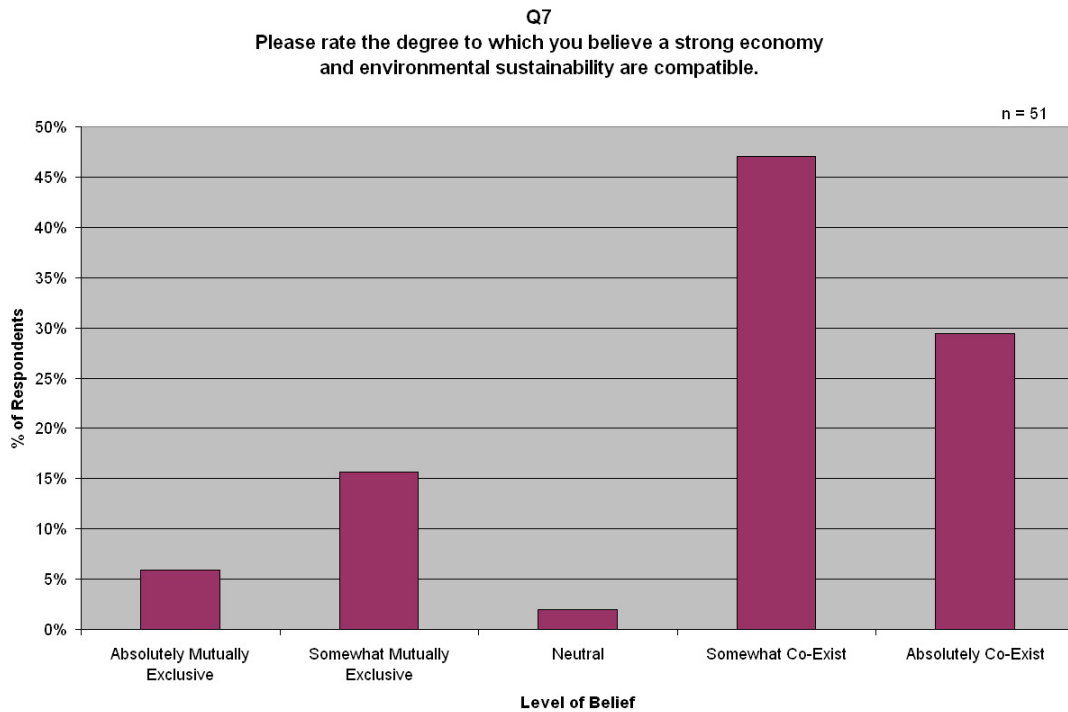




**Figure 15: Respondents level of agreement the statement “humanity is facing an environmental crisis”**

### Question 7

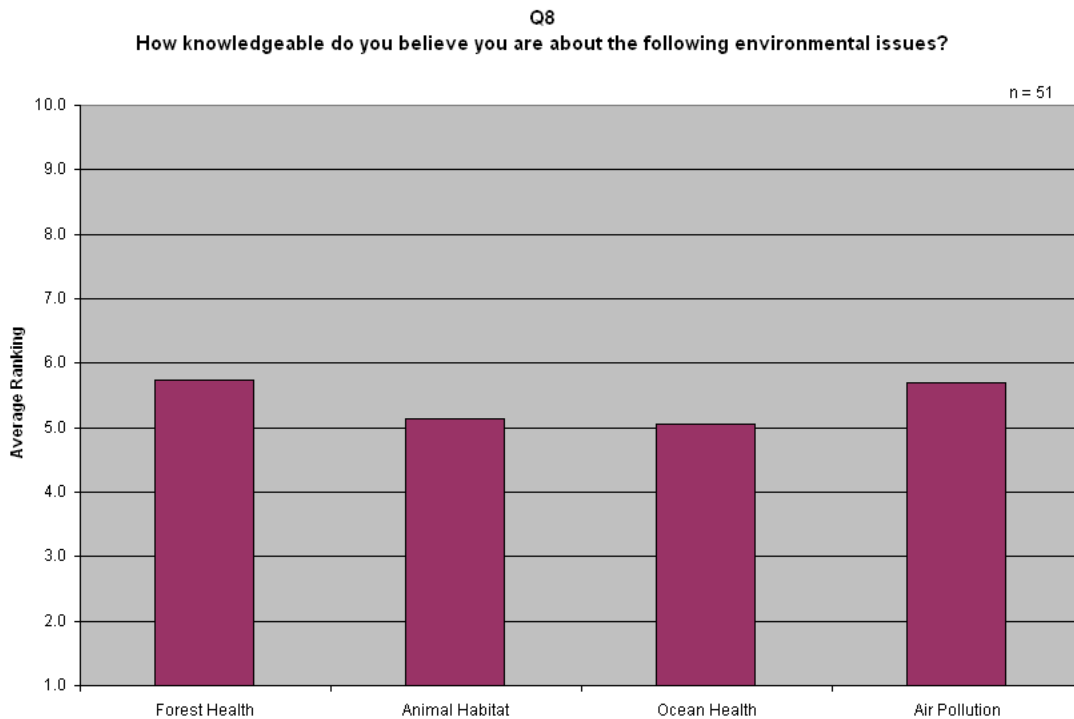
Question 7 asked participants to rate the degree to which they believe that a strong economy and environmental sustainability can co-exist (see Figure 16). Responses to this question were somewhat polarized, with respondents generally avoiding the neutral position. Overall, 76% of respondents felt that some level of co-existence is possible, whereas 22% felt that they were mutually exclusive to some degree.



**Figure 16: Respondents degree of belief that a strong economy and environmental sustainability can co-exist.**

### Question 8

Question 8 asked participants to rate their level of knowledge about four general environmental issues: Forest Health, Animal Habitat, Ocean Health, and Air Pollution. Ratings were made on a scale of 1 to 10, where 1 equaled ‘Not at All Knowledgeable’ and 10 equaled ‘Very Knowledgeable’. The average response for each category is shown in the following figure. An ANOVA test showed that the responses for the four categories were not significantly different. Results are shown in Figure 17.



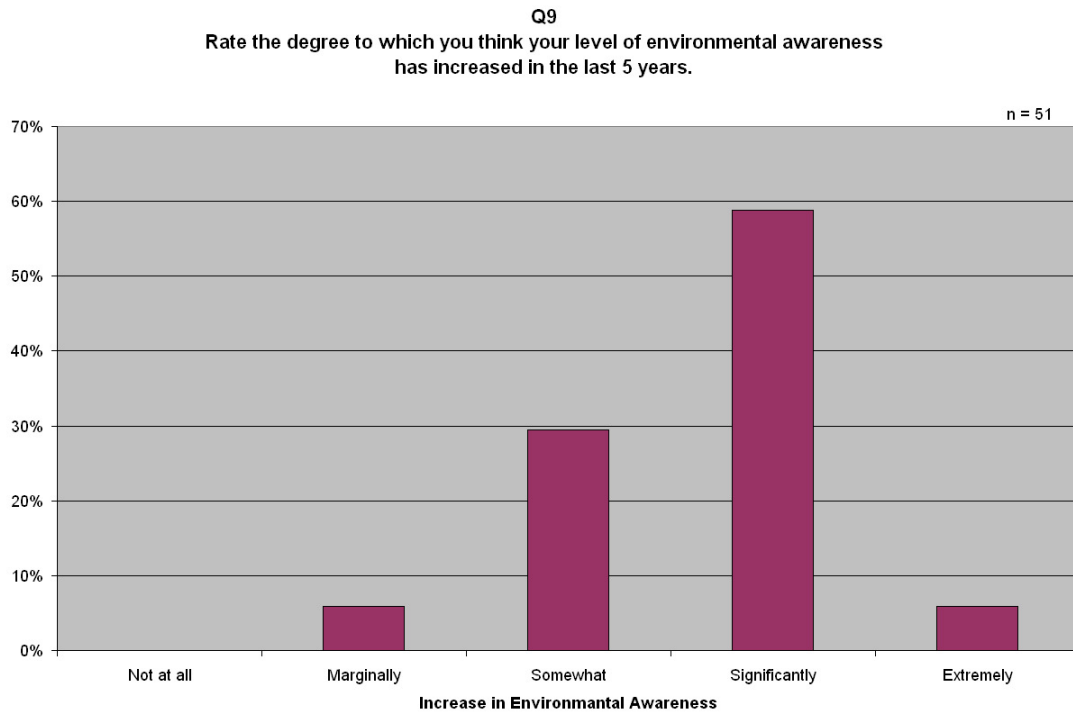
**Figure 17: Respondents level of knowledge on environmental issues**

For both the Forest Health and Air Pollution portions of this question, a statistical difference was found between the responses of men and women. In both cases, men rated themselves with a higher level of knowledge than women. For Forest Health, men and women rated their knowledge at an average of 6.7 and 4.9, respectively; with regards to Air Pollution the average ratings were 6.3 (men) and 5.1 (women).

### **Question 9**

Question 9 asked participants to rate the degree to which they believed their level of environmental awareness had increased over the last 5 years. Responses showed that a majority of participants believed their level of awareness had increased significantly (see

Figure 18). All respondents indicated that their awareness had increased to some degree, and 65% of respondents' awareness increased significantly or extremely.

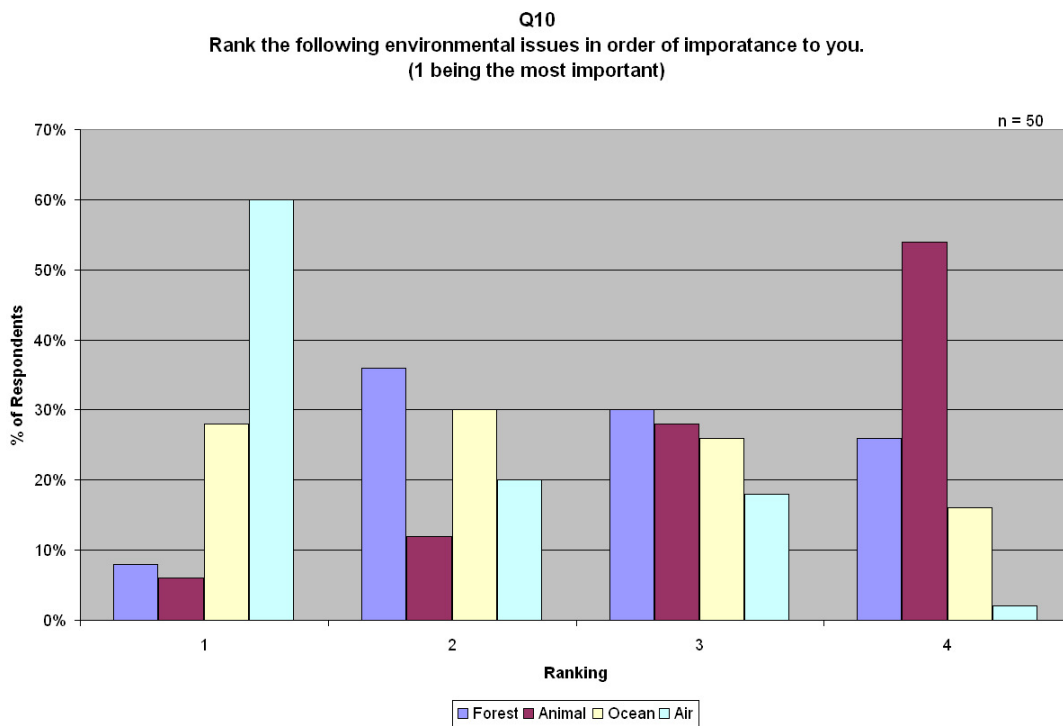


**Figure 18: Respondents increase in environmental awareness**

A comparison of responses by income group found no statistical differences between the Low and Mid income groups, but that the Low and Mid groups both differed from the High income group which indicated that their level of environmental awareness had increased “Significantly” on average. The Low and Mid income groups reported an average of only “Somewhat” of an increase in their awareness. The average responses for each group were 3.6, 3.4, and 4.3 for Low, Mid, and High income groups, respectively.

## Question 10

Question 10 asked participants to rate four general environmental issues in order of importance to themselves. The individual and average ratings for each environmental issue can be seen in Figure 19. Overall, the most important of the four environmental issues to respondents was 'Air Pollution' with an average rating of 1.6. 'Animal Habitat' was the least important to respondents with an average rating of 3.3. Forest Health came in third place with an average of 2.7, preceded by 'Ocean Health' at 2.3.



**Figure 19: Importance of environmental issues to respondents**

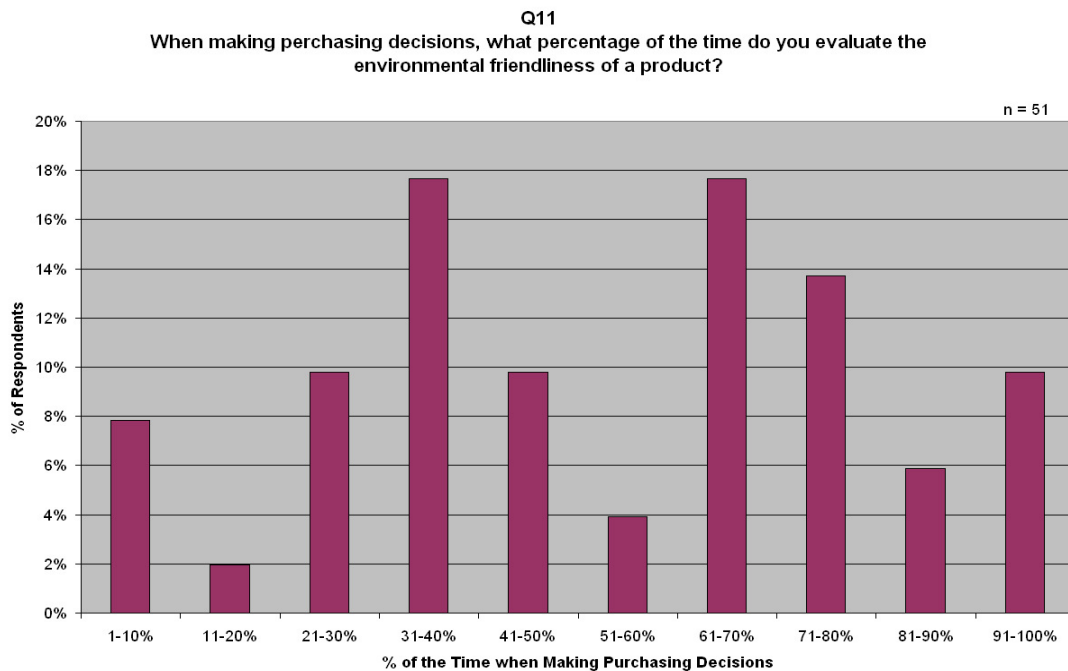
## Section 2

Section 2 of the survey focused on views and self-assessment on issues of environmental sustainability and purchasing habits. Questions in this section were

designed to explore how participants believe environmental attributes affect their purchasing decisions, as well as to compare environmental attributes to other standard product attributes when choosing between products. This section includes summaries of survey questions 11 through 17.

### Question 11

Question 11 asked participants to indicate the percentage of the time they believe they evaluate the environmental friendliness of a product when making purchasing decisions. Results indicated two general groups of respondents clearly seen in Figure 20: those who assess their purchasing over half of the time, and those who assess it less than half of the time. Differences in responses to other survey questions based on these two groups are elaborated on in the Discussion.



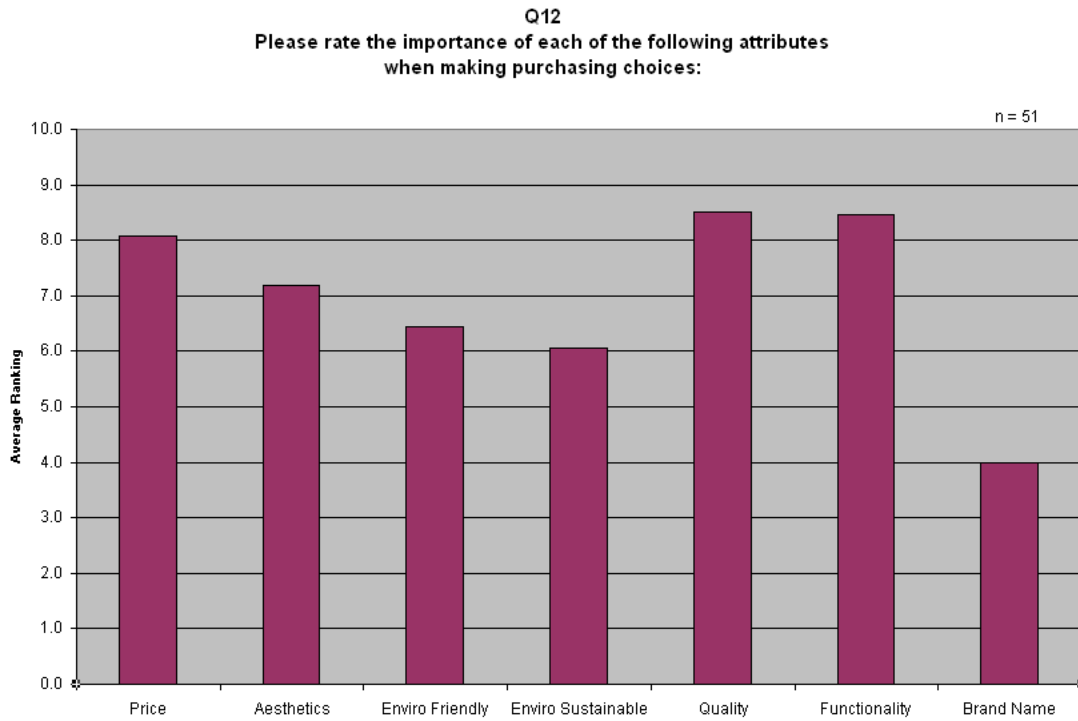
**Figure 20: How often respondents evaluate products environmental friendliness.**

## Question 12

Question 12 asked participants to rate the level of importance of seven basic product attributes to their purchasing decisions. Ratings were made on a scale of 1 to 10, where 1 equaled 'Not at All Important' and 10 equaled 'Very Important'. An ANOVA and Scheffé test showed that the results divided into three general groups of statistically equal attributes. In the order of importance to respondents these groupings were as follows:

- price, aesthetics, quality, and function;
- aesthetics, environmental sustainability, and environmental friendliness;
- brand name.

Note that 'Aesthetics' was statistically equal to the other attributes in both groups 1 and 2. However, the general trend is clear that the respondents, while considering the environmental attributes of a product important, are significantly more interested in other features when making purchasing decisions. The average rating for each attribute is shown in Figure 21.

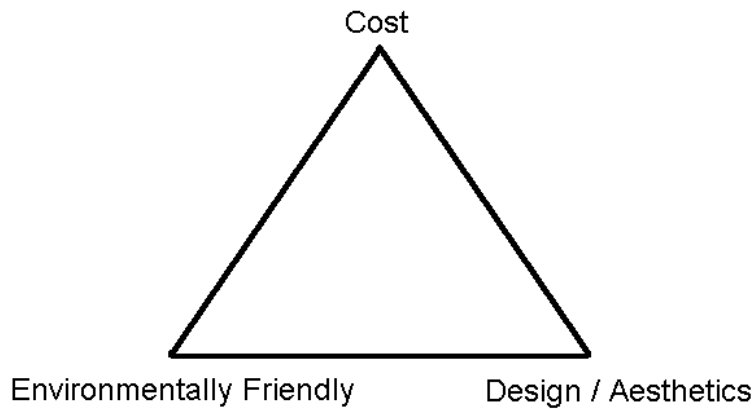


**Figure 21: Importance of product attributes to respondents**

### Question 13

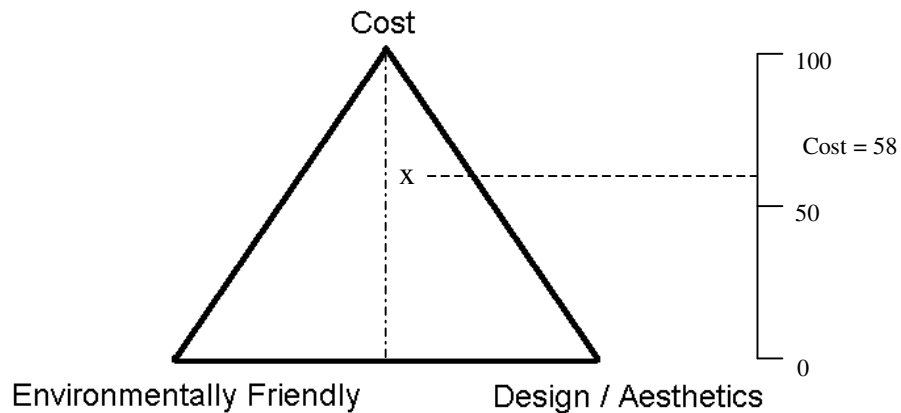
Question 13 asked participants how they balance three product attributes against each other in their purchasing habits, in a three-way tug-of-war scenario. These attributes were cost, design / aesthetics, and environmental friendliness, each represented by the point of an equilateral triangle (see Figure 22). Participants were asked to place an X within the triangle, to represent their personal balance point.





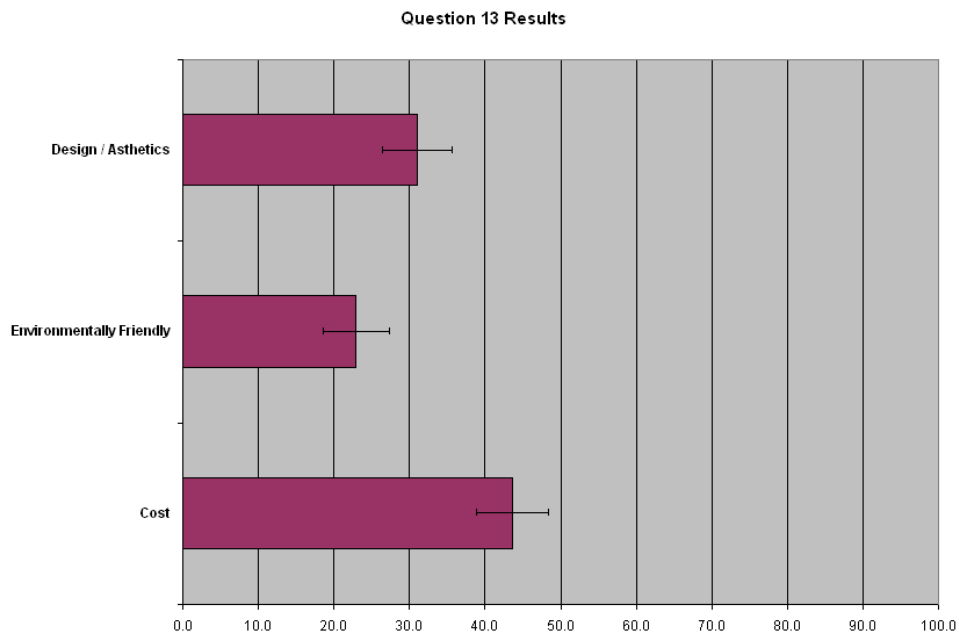
**Figure 22: Question 13 Design**

The distance from each attribute to a respondent's mark was measured with a ruler and the distance scaled between 0 and 100; a mark directly on an attributes point equated to 100, and a point on the line directly opposite an attribute equated to 0. A mark at the point of the triangle (100) would represent a singular uncompromising importance to the respondent, whereas a score on the perpendicular line (0) would indicate that the attribute had no importance at all. An example demonstrating measurement of the Cost attribute is shown in Figure 23.



**Figure 23: Example Question 13 Response**

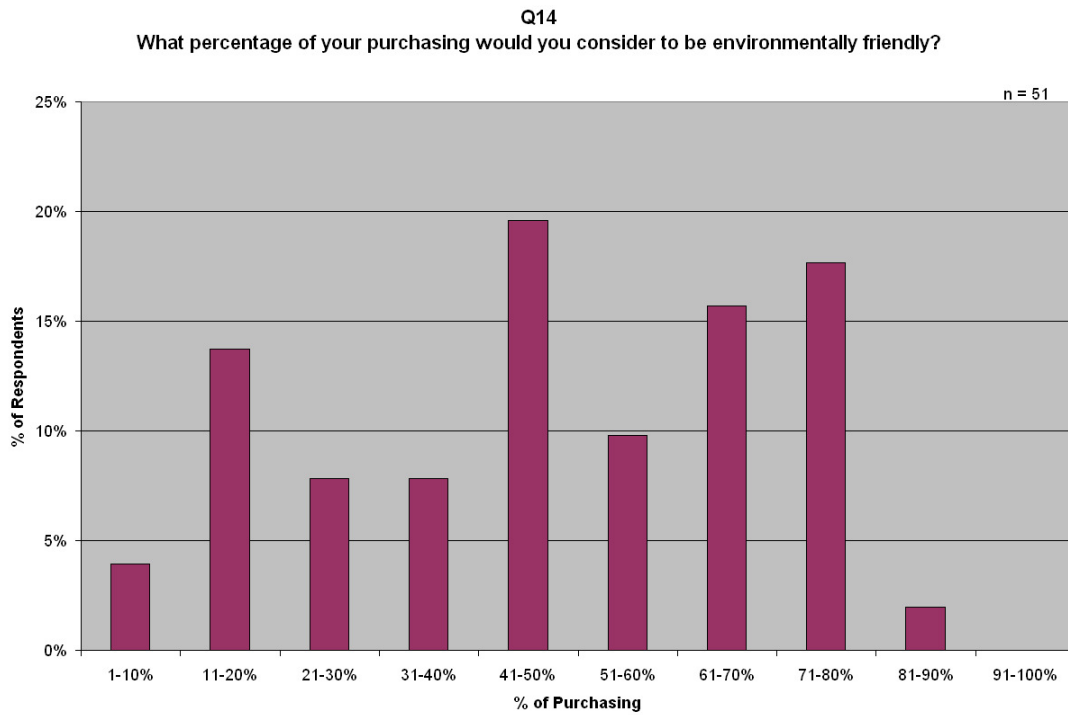
Cost, was by far the most important attribute to respondents, followed by design / aesthetics, and then environmental friendliness. This result is consistent with the results from Question 12. Figure 24 shows the average importance and confidence intervals of each of the three attributes.



**Figure 24: Respondents' balance of attributes**

### Question 14

Question 14 asked participants to indicate what percentage of their purchasing they considered to be environmentally friendly (see Figure 25). On average, respondents considered 48% of their purchasing to be environmentally friendly, with 34% of respondents evaluating between 51% and 80% of their purchasing to be environmentally friendly. Only 2% of responses were greater than 80%, and none greater than 90%.

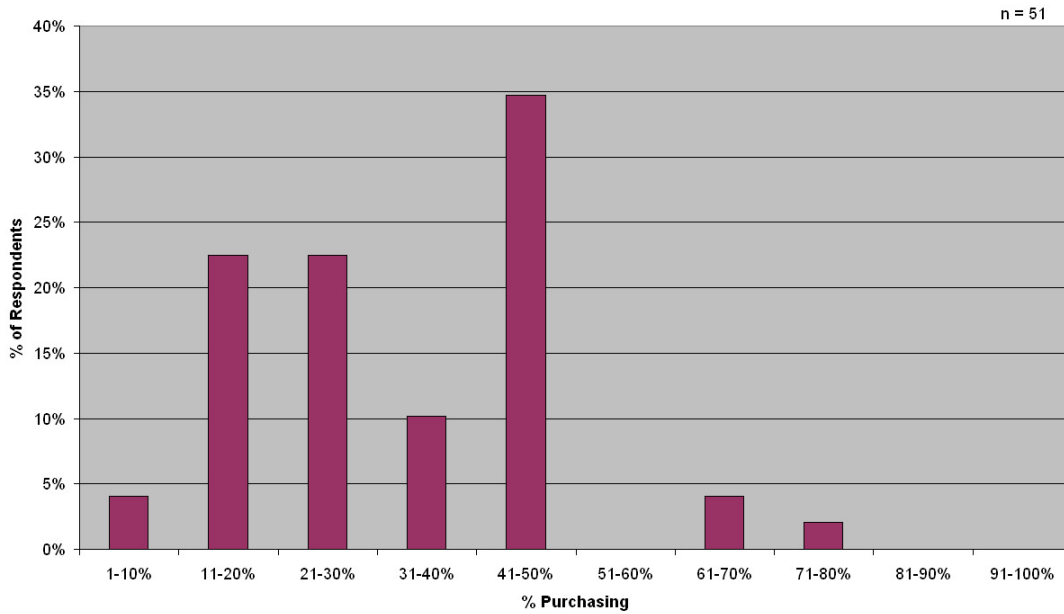


**Figure 25: Percentage of respondents' purchasing assessed to be environmentally friendly**

### Question 15

Question 15 asked participants to indicate what percentage of the general public's purchasing they believed was environmentally friendly. Results show respondents felt strongly that the purchasing decisions made by the general public are generally not environmentally friendly (see Figure 26).

**Q15**  
What percentage of the time do you believe the general public in Vancouver makes environmental friendly purchasing decisions?

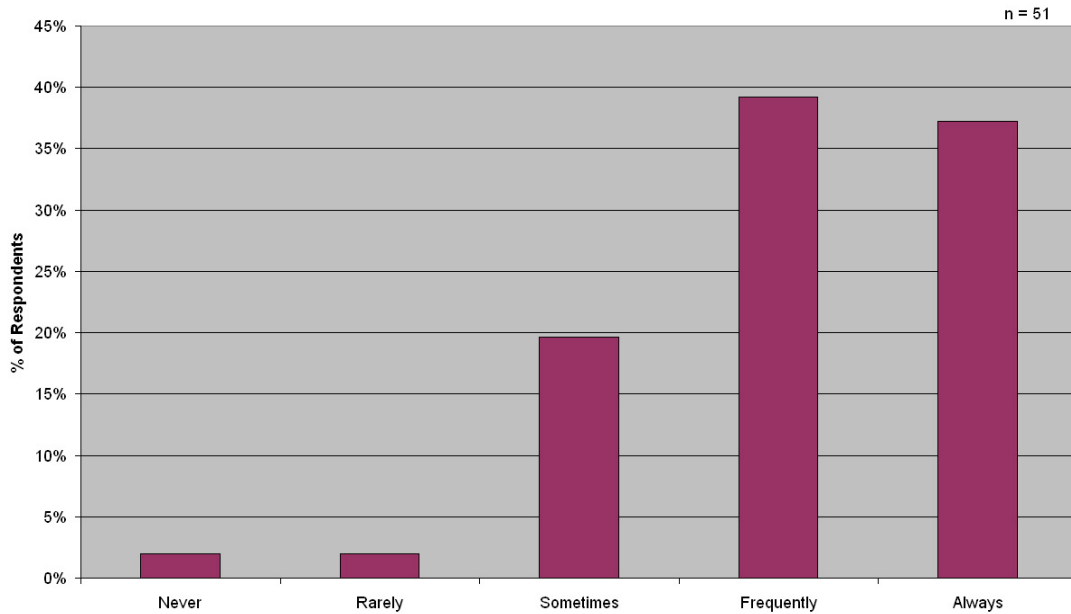


**Figure 26: Respondents' assessment of the percentage of the general public's purchasing which is environmentally friendly**

### Question 16

Question 16 asked participants if, all other things being equal, were they more inclined to purchase a product that they believed to be more environmentally friendly (see Figure 27). 82% of respondents responded that they 'Frequently' or 'Always' more inclined to purchase the environmental option.

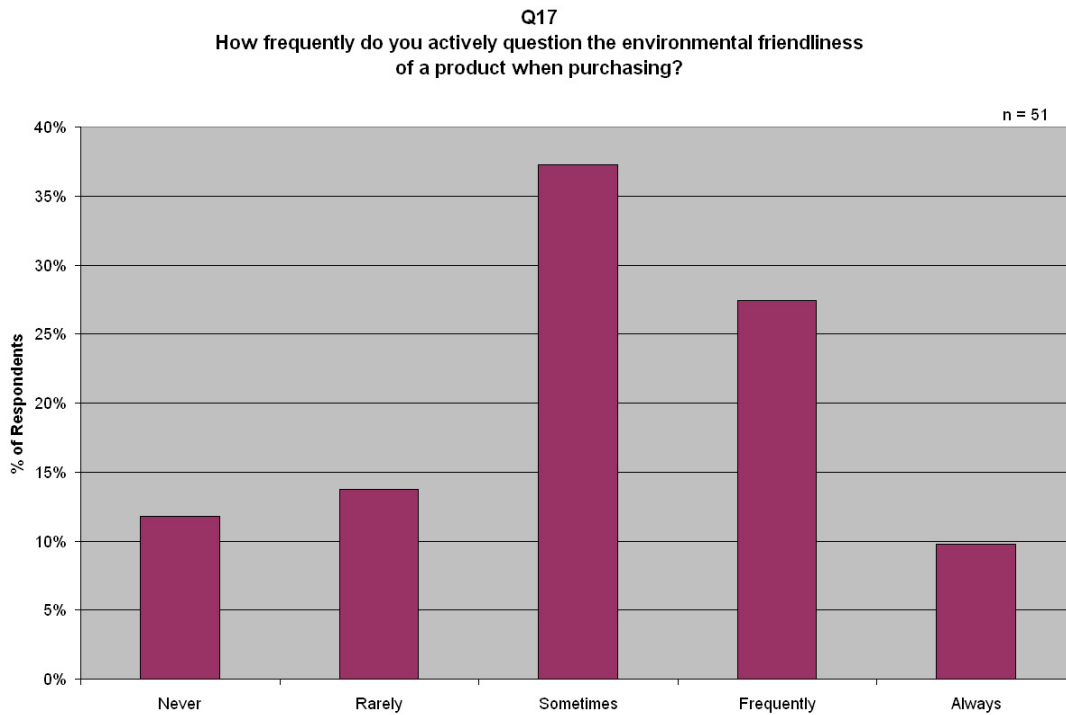
**Q16**  
All other things being equal, are you more inclined to purchase a product you believe to be more environmentally friendly?



**Figure 27: Respondents' likeliness to purchase a more environmentally friendly product, all other things being equal**

### Question 17

Question 17 asked participants how frequently they actively question the environmental friendliness of a product when making purchases. As seen in Figure 28, 37% of respondents replied that they do this frequently or always, whereas 26% replied 'Rarely' or 'Never'.



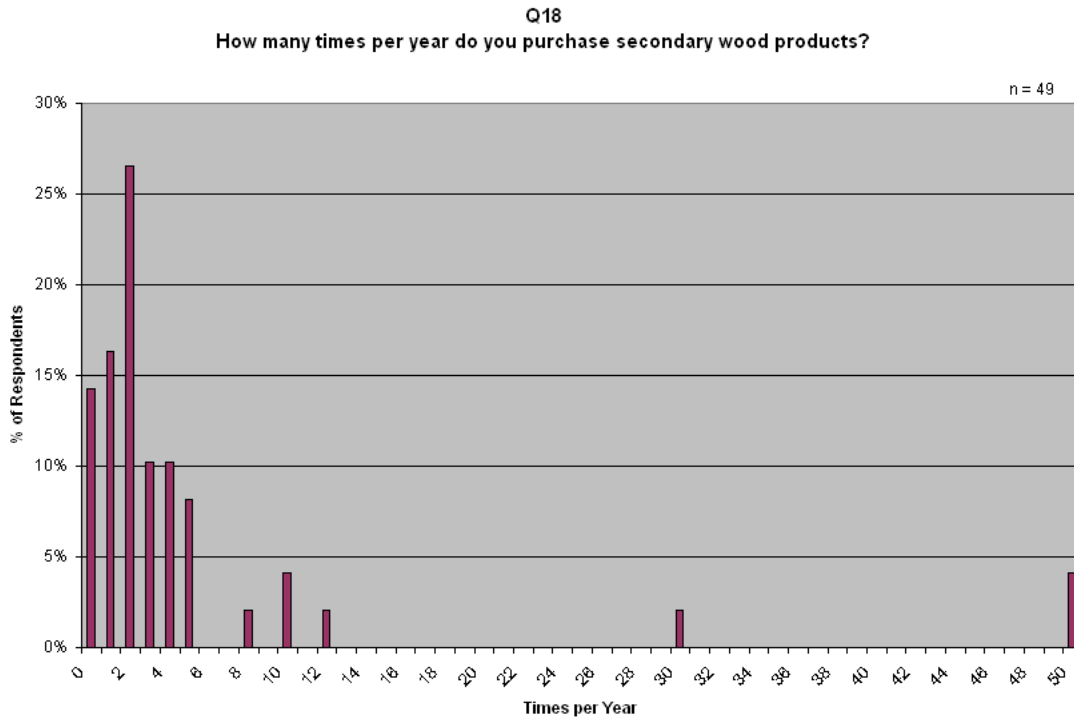
**Figure 28: How frequently respondents question the environmental friendliness of products when purchasing.**

### Section 3

Section 3 of the survey focused on related to environmental sustainability and purchasing habits with a specific focus on Secondary Wood Products. Questions in this section were designed to determine participants' feelings towards the relationship between secondary wood products and the environment. This section includes survey questions 18 through 21.

#### Question 18

Question 18 asked participants how many times per year they purchase secondary wood products. Responses varied widely, with an average of 5.6 times per year and a standard deviation of 10.8 (see Figure 29).



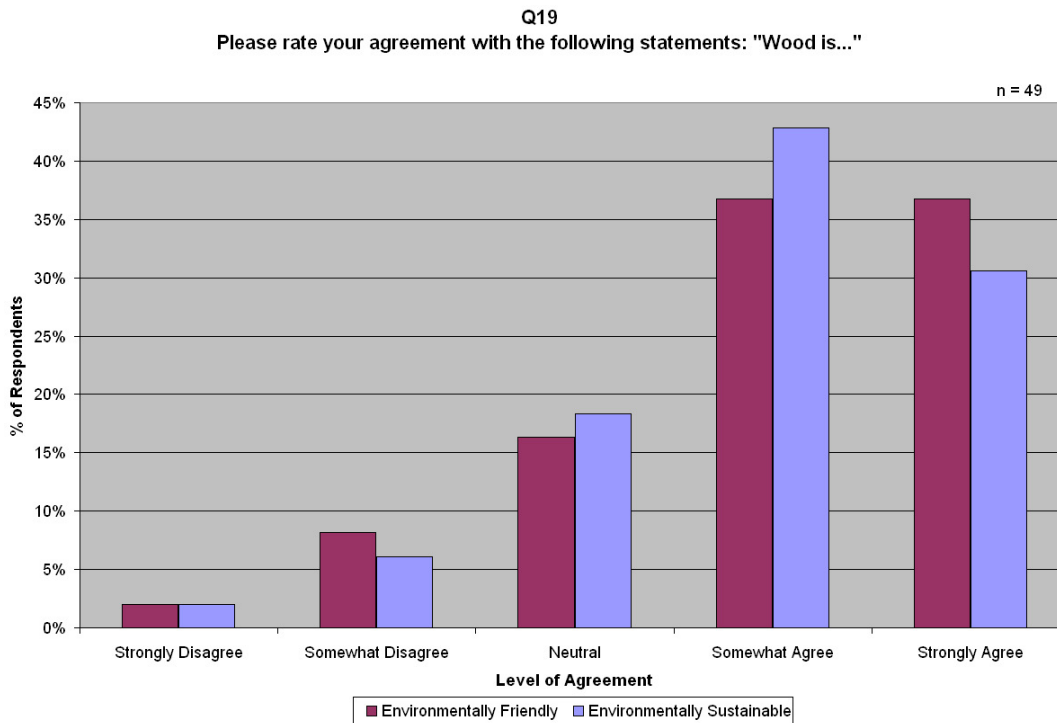
**Figure 29: Number of times per year respondents purchase secondary wood products**

### Question 19

Question 19 asked participants to rate their level of agreement with two statements:

- ‘Wood is environmentally friendly.’
- ‘Wood is environmentally sustainable.’

A Z-Test comparing the means showed that no significant differences existed between the responses to the two statements. Figure 30 shows the responses for both statements.



**Figure 30: Respondents' agreement with the statements that wood is environmentally friendly and environmentally sustainable.**

A significant difference in opinion was noted in the between the High and Low income groups for responses to the statement regarding the environmental friendliness of wood. For this statement, the average response of the Low income group was 3.5, between "Neutral" and "Somewhat Agree", whereas the average response of the High group was 4.5, between "Somewhat Agree" and "Strongly Agree".

## Question 20

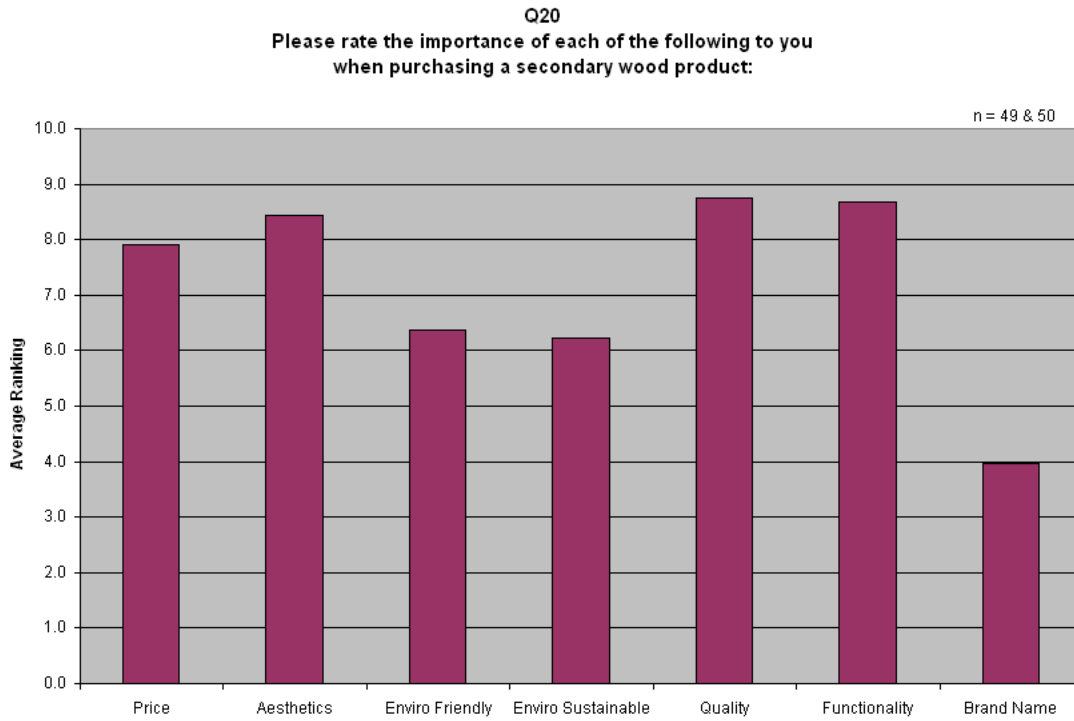
Question 20 asked participants to rate the level of importance of 7 basic product attributes with respect to their purchasing decisions for secondary wood products. Ratings were made on a scale of 1 to 10, where 1 equaled 'Not at All Important' and 10 equaled 'Very Important'. The average rating for each attribute is shown in Figure 31. An



ANOVA and Scheffé tests showed that the results for several of the attributes are not statistically different, but rather the attributes divided into three groups. In the order of importance to respondents, these groupings were as follows:

- price, aesthetics, quality and function;
- environmental sustainability and environmental friendliness;
- brand name.

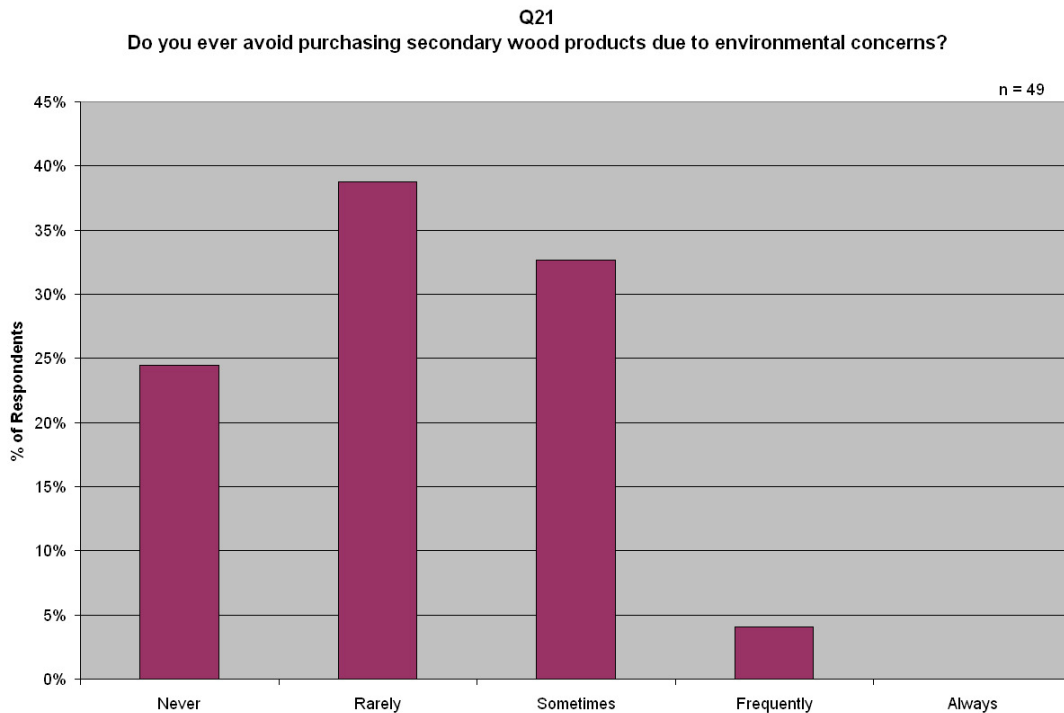
A series of Z-Tests were used to compare the results between the importance of the individual attributes in questions 12 and 20 to determine if there were any significant differences in the responses of participants when considering purchasing in general versus the purchasing of secondary wood products specifically. These tests showed that results for all attributes were statistically equal with the exception of 'Aesthetics', which was rated significantly higher for purchasing wood products.



**Figure 31: Importance of secondary wood product attributes to respondents**

### Question 21

Question 21 asked participants if they ever avoid purchasing secondary wood products due to environmental concerns; 53% of respondents said ‘Rarely’ or ‘Never’, 33% ‘Sometimes’, and 4% ‘Frequently’ (see Figure 32).



**Figure 32: Respondents' avoidance of secondary wood products due to environmental concerns**

Additionally, a statistical difference was found between the responses of participants in the High and Low income ranges. The High income group average responses was 1.7, between “Never” and “Rarely”, whereas the Low income group was more likely to avoid secondary wood products with an average response of 2.7, between “Rarely” and “Sometimes”.

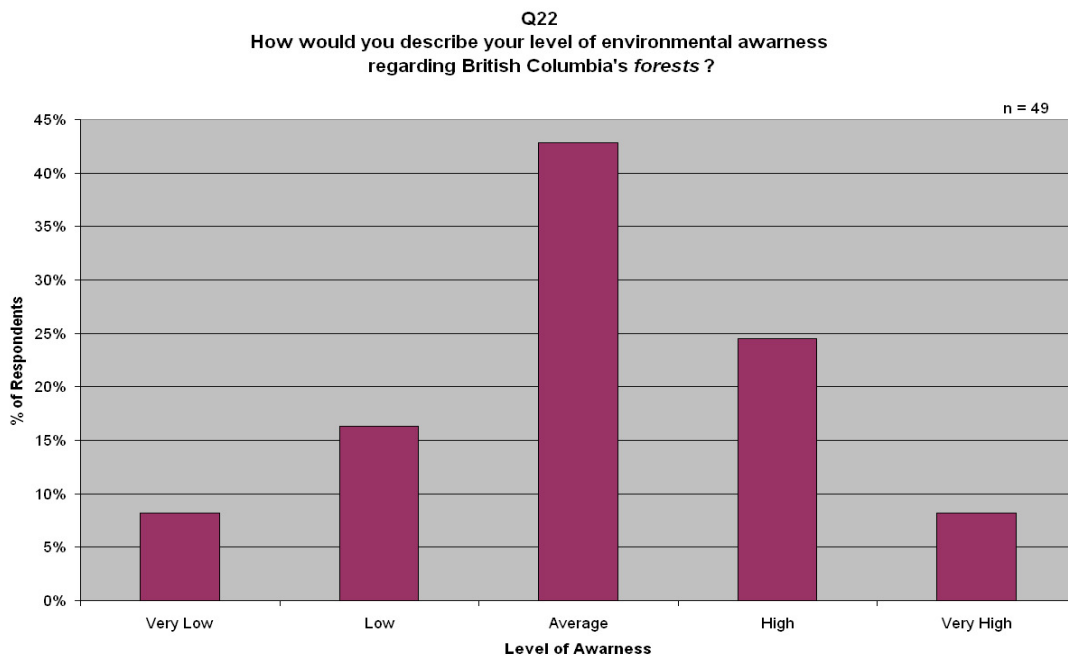
## Section 4

Section 4 of the survey explored participants' views on sustainability in connection to British Columbia's wood products industry. Questions in this section were designed to determine participants' opinions and awareness regarding the environmental friendliness / sustainability of the wood products industry in British Columbia, as well as

their impressions of the impact of environmental concerns on local communities and jobs. This section includes survey questions 22 through 31.

## Question 22

Question 22 asked participants to rate their own level of environmental awareness regarding British Columbia’s forests. 43% of respondents rated their awareness as ‘Average’ (see Figure 33).

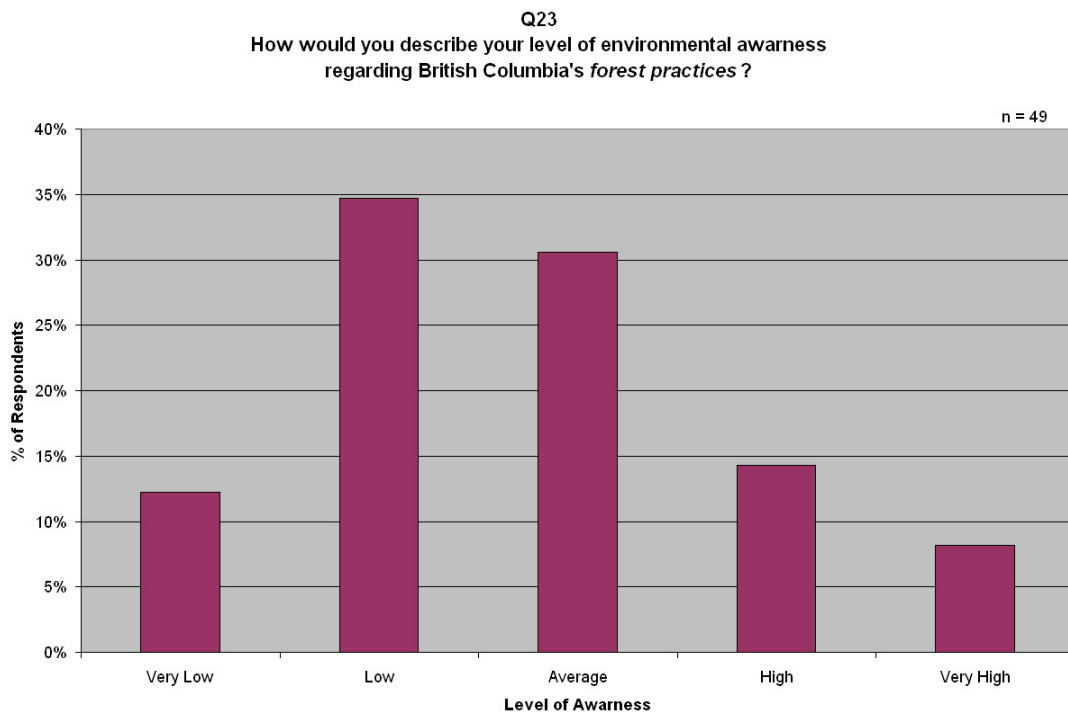


**Figure 33: Respondents’ environmental awareness of B.C.’s forests**

A statistical difference in responses was found between male and female participants. The average rating by male participants was between “Average” and “High”, with an average rating of 3.6 out of 5, whereas the average for female participants was between “Low” and “Average” at 2.6.

## Question 23

Question 23 asked participants to rate their own level of environmental awareness regarding British Columbia's forestry practices. In general, respondents rated their level of knowledge low with an average response of 2.7 out of 5 on a scale, where 1 equaled 'Very Low' and 5 equaled 'Very High' (see Figure 34).

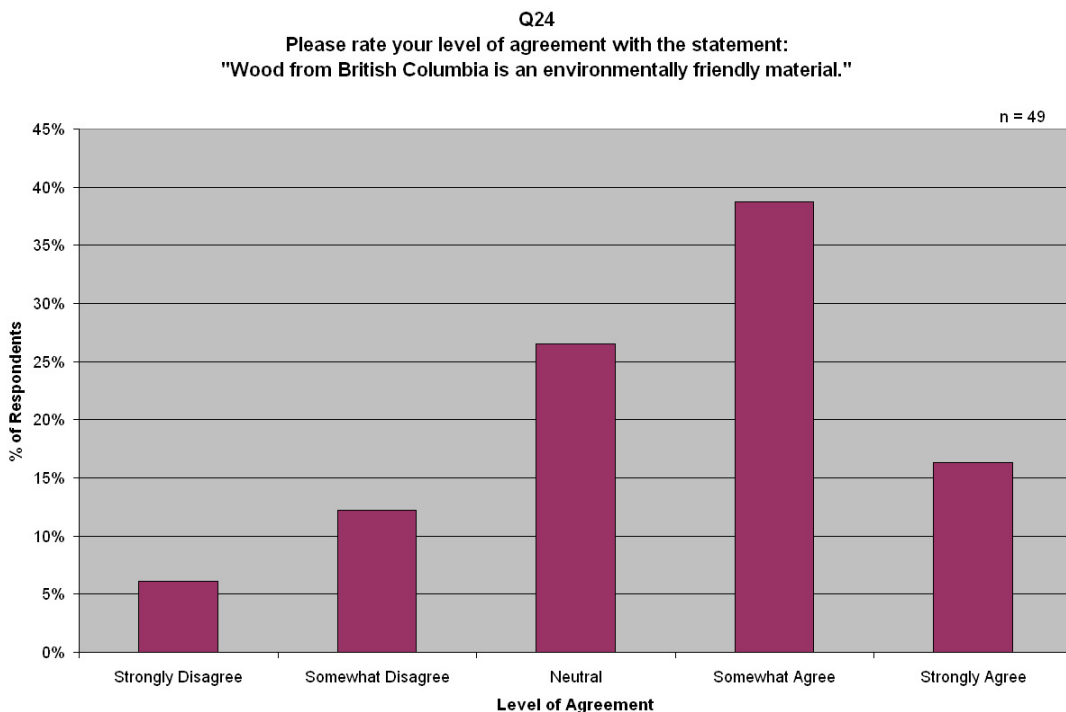


**Figure 34: Respondents' awareness of B.C.'s forest practices**

Statistical tests by gender found that men rated themselves more aware than women did. The average rating for male respondents was 3.2 compared with an average of 2.4 for female respondents.

## Question 24

Question 24 asked participants to rate their level of agreement with the statement “Wood from British Columbia is an environmentally friendly material.” 55% of the respondents agreed that wood from British Columbia is environmentally friendly, whereas 18% disagreed (see Figure 35).



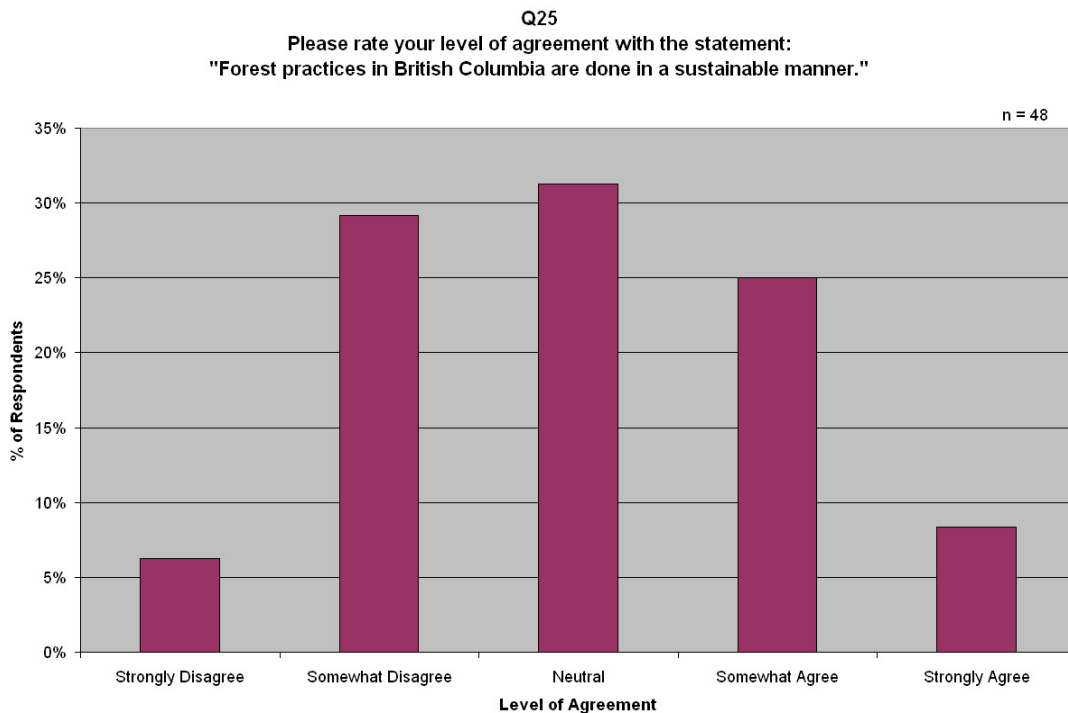
**Figure 35: Respondents’ agreement that wood from B.C. is an environmentally friendly material**

This was the only question for which a statistical difference was found between age groups. The age group 51+ “Somewhat Agreed” with the statement with an average response of 4.0, whereas the 18-30 age group’s average opinion was between “Somewhat Disagree” and “Neutral” with an average of 2.8.

Additionally, a difference in responses was found between income groups. The Low income group's average response was 2.8, between "Somewhat Disagree" and "Neutral", whereas the average response for the High income group was 4.1, just above "Somewhat Agree".

### Question 25

Question 25 asked participants to rate their level of agreement with the statement "Forestry practices in British Columbia are done in an environmentally sustainable manner." Responses to this question were fairly normally spread with an average of 3.0 on a 5-point scale (see Figure 36).



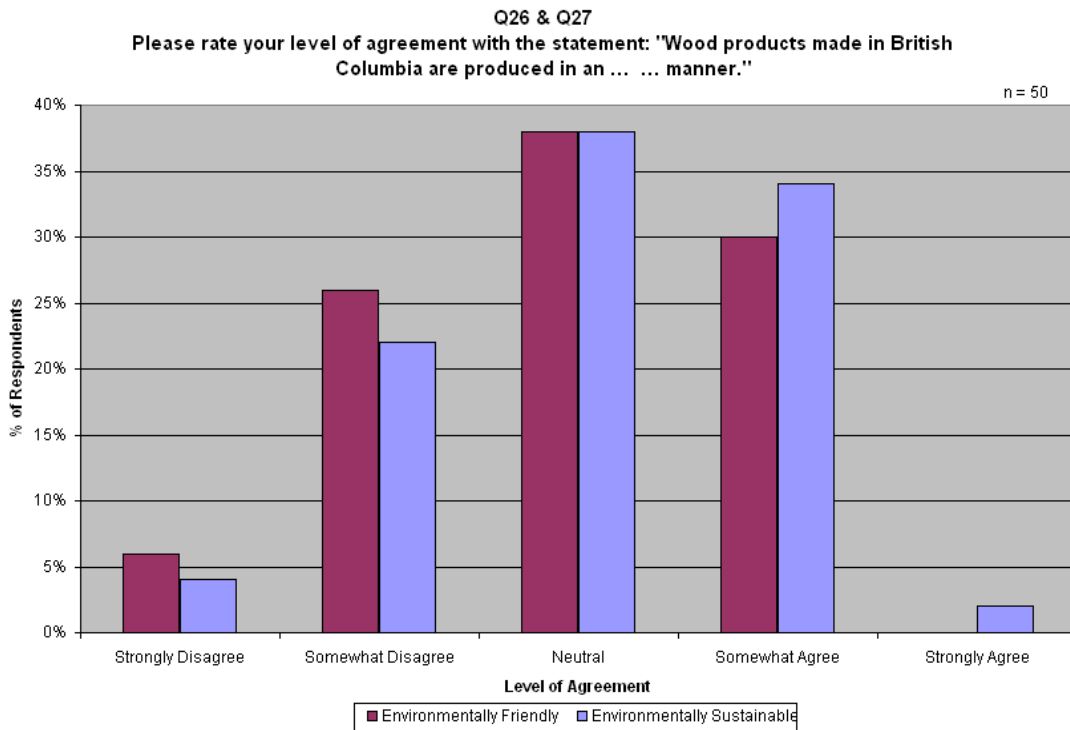
**Figure 36: Respondents' agreement that B.C.'s forestry practices are environmentally sustainable.**

Responses differed, however, between the High and Low income groups. The Low income group disagreed with the statement, with an average response of 2.2, whereas the High income group had an average response of 3.5.

### **Questions 26 and 27**

Questions 26 and 27 asked participants to rate their level of agreement with the statements “Wood products made in British Columbia are produced in an *environmentally friendly* manner” and “Wood products made in British Columbia are produced in an *environmentally sustainable* manner.” As with the previous question, opinion was evenly split between agreement and disagreement. Additionally, most of the respondents did not display strong feelings towards these statements, with very few responses in either the ‘Strongly Agree’ or ‘Strongly Disagree’ categories. The results of these questions are shown in Figure 37.





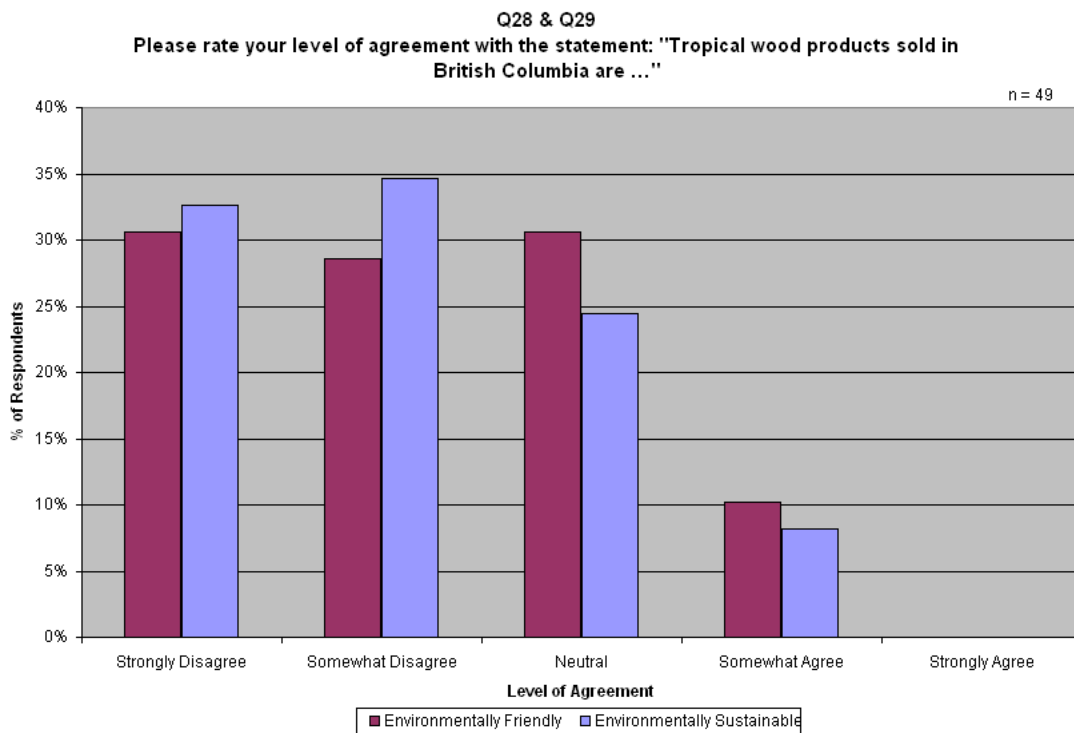
**Figure 37: Respondents' agreement that B.C. wood products are produced in an environmentally friendly and environmentally sustainable manner**

Differences in responses by income group were found in both Question 26 and 27. On average, participants in the Low income group disagreed with both statements with average responses of 2.3 and 2.5, respectively.

### Questions 28 and 29

Questions 28 and 29 asked participants to rate their level of agreement with the statements "Tropical wood products sold in British Columbia's stores are *environmentally friendly*" and "Tropical wood products sold in British Columbia's stores are *environmentally sustainable*." Responses to these questions showed strong negative feelings towards these environmental attributes of tropical wood products available in British Columbia. 60% and 68% of respondents, respectively, disagreed with these

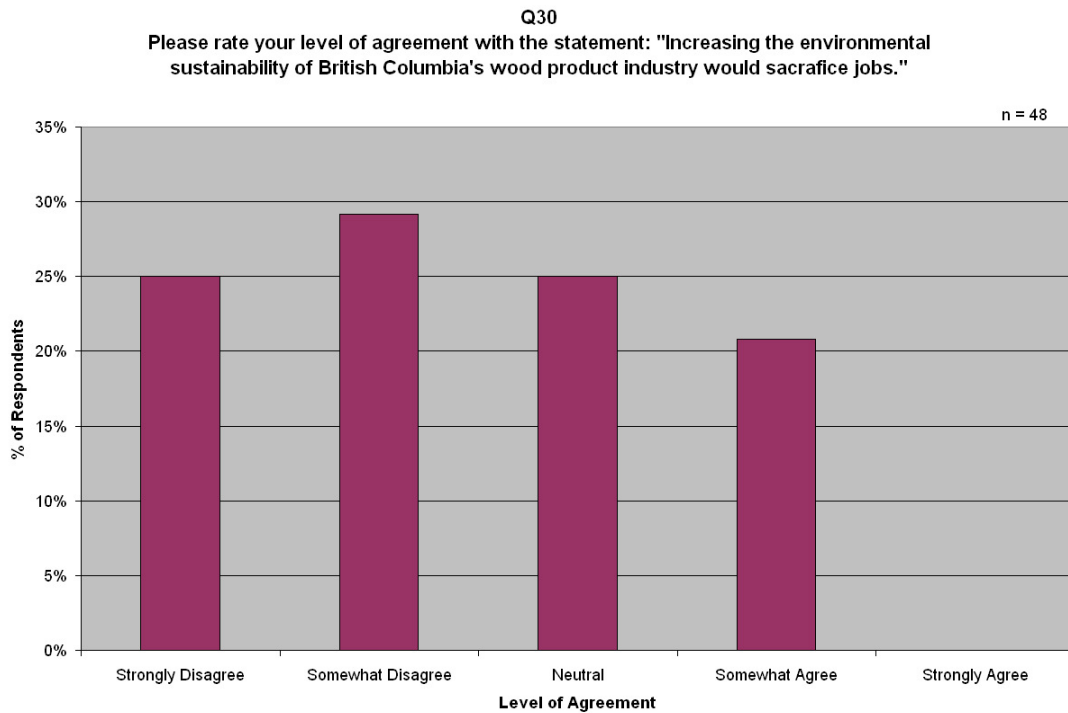
statements. When compared back to the results of questions 26 and 27, it can be seen that British Columbia wood products hold an advantage in the public perception compared to tropical competitors. The results from questions 28 and 29 are shown in Figure 38.



**Figure 38: Respondents’ agreement that tropical wood products sold in B.C. are environmentally friendly and environmentally sustainable**

### Question 30

Question 30 asked participants to rate their level of agreement with the statement “Increasing the environmental sustainability of British Columbia’s wood products industry would sacrifice jobs.” The average response on a 5-point scale was 2.5, with 54% of respondents disagreeing with the statement (see Figure 39).

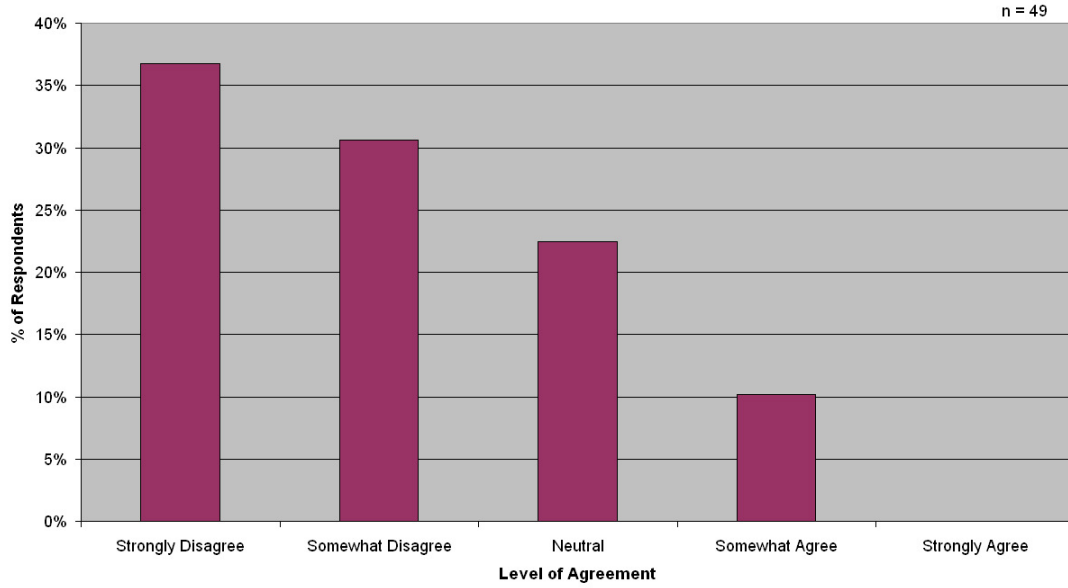


**Figure 39: Respondents' agreement that increasing environmental sustainability of B.C. wood products industry would sacrifice jobs**

### Question 31

Question 31 asked participants to rate their level of agreement with the statement "Increasing the environmental sustainability of British Columbia's wood products would be detrimental to communities." Participants overwhelmingly disagreed with this statement, with 68% of responses indicating a belief that increasing environmental sustainability would not be detrimental to communities (see Figure 40).

**Q31**  
Please rate your level of agreement with the statement:  
"Increasing the environmental sustainability of British Columbia's  
wood product industry would be detrimental to communities."



**Figure 40: Respondents' agreement that increasing environmental sustainability of B.C. wood products industry would be detrimental to communities**

## Discussion

This intercept survey attempted to address three core research questions regarding how the general public associates secondary wood products with concepts of environmental friendliness / sustainability, and the impact of these associations on their purchasing habits.

The first research question sought to determine how important people feel sustainability and environmental concerns are in their daily lives. Questions in the survey that dealt with this main research question focused on determining respondents' perceptions of the terms "environmentally friendly" and "environmentally sustainable", as well as perceptions of levels of concern and awareness about environmental issues.

The first step in exploring the question of respondents' impressions of the importance of environmental concerns in their daily lives was to determine how respondents define the terms "environmentally sustainable" and "environmentally friendly." Respondents' definitions of these terms were frequently vague and unclear; however, when codifying the responses, a trend was noticed for each term. The term "environmentally sustainable" was more closely connected to concepts of responsible consumerism, while the term "environmentally friendly" was more closely connected to harm reduction. Despite the identification of these trends, no consistent definitions of these terms existed across responses, indicating that the public perception of the meanings behind these terms remains similarly unclear.

This lack of clarity between terms is illuminated in other questions in the survey, such as the comparison of these terms in connection to specific materials. When respondents were asked in Question 4 and Question 5 to rate the environmental friendliness and environmental sustainability of six materials (metal, glass, wood, plastic, concrete, and textiles), no statistical differences were found between the two questions for each material. This indicates that respondents may interchangeably use these terms to conceptualize a deeper and poorly defined notion of which materials are and are not “good” for the environment.

Responses to Question 4 and Question 5 indicate that the two terms may often be used interchangeably, despite the identified trend in different meanings revealed in the survey results. For example, when analyzed carefully using the comparison between consuming responsibly and causing less harm, it could be argued that plastic (the lowest rated material in each question) is relatively environmentally sustainable due to its capacity to be repeatedly recycled. However, plastics may not be considered environmentally friendly, because they are not usually biodegradable, and frequently require a chemically intensive (toxic) production process. Effectively, plastics illustrate how one may recycle and reuse a product that is environmentally harmful to produce and dispose of. Further research on this would be interesting to determine whether behavioural trends can be identified based on conceptualizations of environmental terminology.

Question 2 and Question 6 dealt with respondents' perceptions of the current environmental state of the world. With 82% of respondents agreeing that humanity is facing an environmental crisis, and 70% reporting high or very high levels of environmental concern, it is evident that participants feel strongly about the well being of the environment. Given current media and popular attention on the environment, this is not a surprising result. However, when compared with the responses gathered for the second research question on purchasing habits, a number of interesting observations can be made on the difference between reported levels of concern and reported purchasing habits.

The second research question was to determine how people perceive the impact of environmental sustainability and environmental friendliness on their purchasing decisions. The question also asked if people feel they make sustainable purchasing choices. Survey questions targeting this aspect of the research asked participants how often they evaluate the environmental qualities of products they purchase and how much of their purchasing they believed to be environmentally friendly.

Despite respondents' agreement that humanity is facing an environmental crisis, this level of concern did not directly translate to behavioural trends. In fact, despite reporting high levels of concern, a surprising number of participants displayed substantial levels of apathy in altering purchasing habits towards environmentally friendly or environmentally sustainable choices. Disturbingly, this indicates that not even high levels of concern are enough to generate a change in behaviour on behalf of the general public.

Participants reported, on average, that they assess the Environmental Friendliness of a product 51% of the time before purchasing, and that 48% of their purchases are environmentally friendly; these proportions were not statistically different. This implies that whenever the environmental aspects of a product are considered, respondents choose an environmental option.

This result is suspect when considering the responses to Question 12, which demonstrates that other product attributes regularly outweigh environmental concerns. When asked to rate the importance of multiple factors in purchasing, respondents indicated that the Environmental Sustainability and the Environmental Friendliness of a product are two of the least important attributes when making purchasing decisions. These attributes were less important, on average, than cost, aesthetics, functionality, and quality. Only brand name was rated as less important than the environmental attributes of a product. This result was affirmed in the tug-of-war-style Question 13<sup>2</sup> (triangle question), where participants' responses again showed that environmental attributes were considered less important in purchasing decisions than cost and design. This suggests that while the respondents are concerned about the environment, they are not concerned enough to sacrifice other desires.

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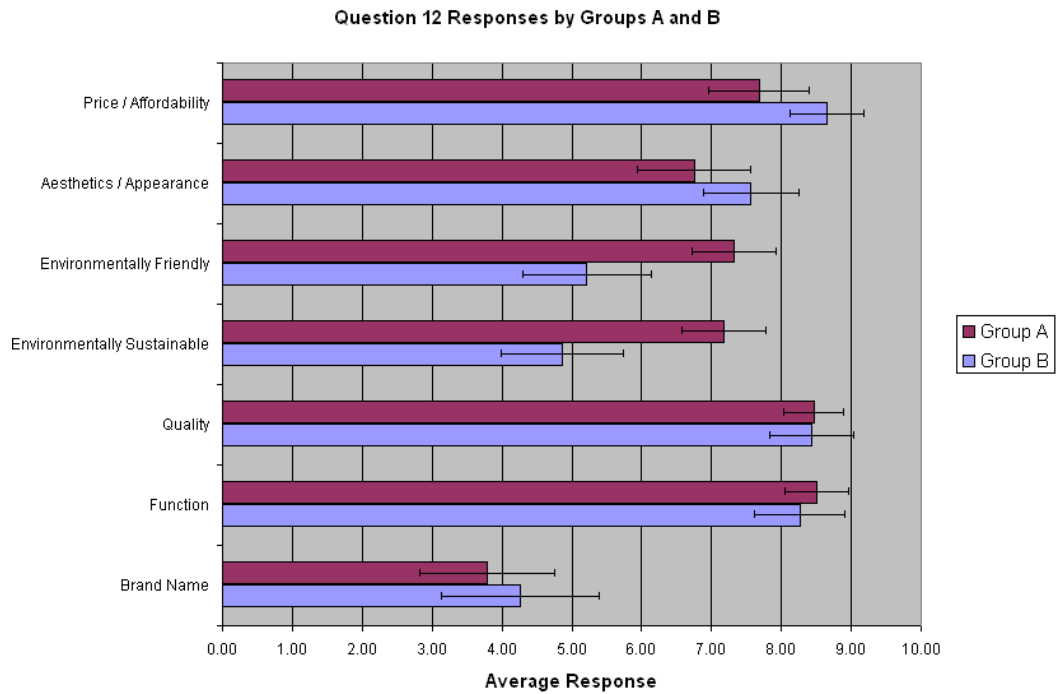
<sup>2</sup> The three-way tug-of-war style question was developed by the author as a means of testing respondent preferences between three competing attributes. This question style was found to be an effective tool for measuring tradeoffs in attitudinal surveys.



This issue is shown once again in Question 16 where only 36% of respondents stated they would “Always” select a more environmentally friendly product, given all other factors being equal. Given that 70% of respondents rated their current concern for the environment as either “High” or “Very High”, and 82% of respondents agreed that humanity was facing an environmental crisis, it is surprising that only 36% of respondents would “Always” select environmentally friendly products when there was no additional sacrifice required in doing so. While the study asked respondents to rate their levels of awareness and to comment on their purchasing decisions, it did not provide a test for consumer apathy. The results of Question 16 are inconsistent with the relatively high reporting of both environmental concern and attention to environmental factors in making purchasing decisions.

Although, on average, the survey participants reported that they assess the Environmental Friendliness of a product 51% of the time before they purchase it, two distinct groups can be seen in this data: those that evaluate products more than 50% of the time (group A); and those who do so less than 50% of the time (group B). When comparing the responses of these two groups in other survey questions, some statistically significant differences were identified. In Question 12 the group B respondents’ lack of attention to the environmental friendliness of products (noted in Question 11) was confirmed. Results indicate that the environmental attributes of a product were significantly less important to members of group B than group A; in effect, the group that paid more attention to the environmental attributes of a product placed significantly more importance on them. In fact, group A placed so much more significance on the

environmental attributes of a product that these attributes become directly competitive with price and aesthetics. Figure 41 shows the relative importance of product attributes to the two groups.



**Figure 41: Comparison of Responses by Groups A and B**

Additionally, in the three-way tug-of-war in Question 13, group A again showed significantly more consideration of a product’s environmental impact. Interestingly, group B went on to assess their percentage of environmentally friendly purchasing as significantly lower than that of group A, with averages of 37% and 56% of purchasing, respectively.

Interestingly, respondents generally had a significantly higher opinion of their own environmental purchasing habits compared to those of the general public. On average, respondents reported that they believed the general public made environmentally friendly purchasing decisions 34% of the time, compared with an average self assessment of 47% of the time. This suggests that people feel they are individually more responsible than society at large.

Overall, responses to the survey questions in relationship to the first two research questions regarding the importance of environmental concerns and the impact of perceptions on purchasing habits, show an attitude-behaviour gap in participant responses to environmental concerns, and a lack of differentiation in terminology. This speaks broadly to issues of consumer confusion around environmental sustainability and environmental friendliness. Considering this, it is useful to examine the third research question, which deals specifically with secondary wood products.

The third research question explored respondents' perceptions of wood as an environmentally sustainable and environmentally friendly material. This question sought to determine how people compare wood to other materials in terms of environmental sustainability and environmental friendliness, and to evaluate how environmental concerns weigh into people's purchasing decisions regarding secondary wood products. Questions in the survey that dealt with this research question asked participants to rate their impressions of several basic material types in connection to environmental sustainability and environmental friendliness, and asked participants to assess the

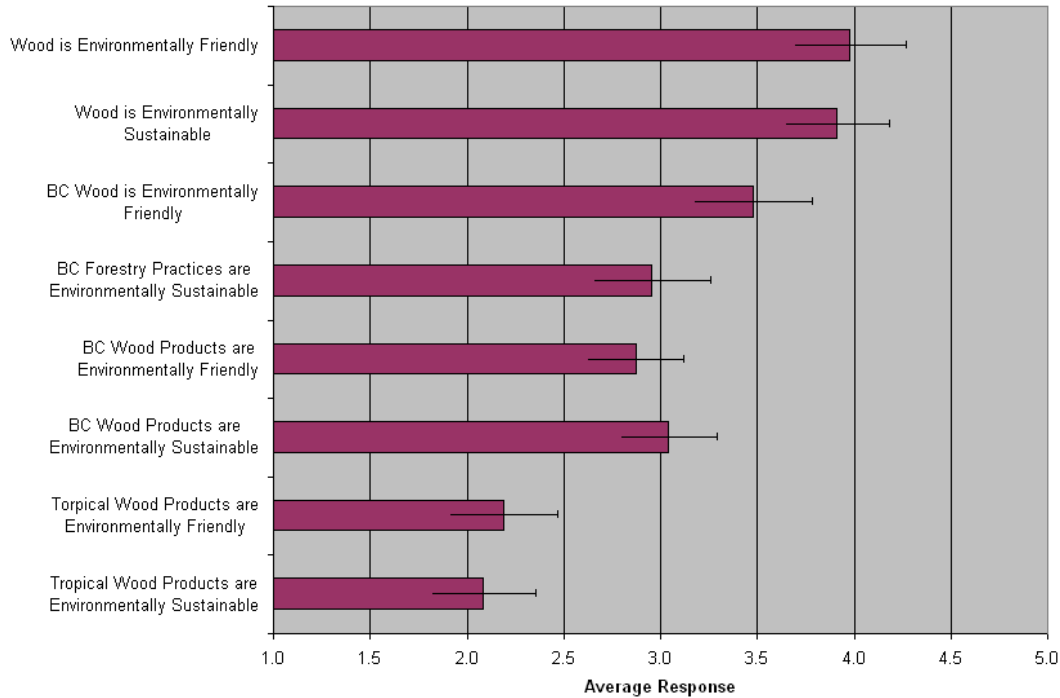
importance of various product attributes for purchases (both in general and for secondary wood products). These questions also directly asked for participants' environmental impressions of forestry, wood, and the wood products industry.

Results from Question 19 showed that wood was considered by respondents to be environmentally friendly and environmentally sustainable. This was consistent with responses from Questions 4 and 5, which asked participants to rate their impressions of the environmental sustainability and environmental friendliness of several materials including wood, glass, metal, concrete, plastic and textiles. On average, respondents rated wood the highest for both environmental sustainability and environmental friendliness; however, the results for glass and textiles were statistically equal to wood. Respondents demonstrated significant agreement that wood, glass and textiles were all environmentally sustainable and environmentally friendly.

Despite an overall support for wood as an environmentally sustainable and environmentally friendly material, respondents did not think highly of wood or wood products from British Columbia. As seen in the following graph, participants showed significant agreement that *wood* in general is both environmentally sustainable and environmentally friendly. They also demonstrated their belief that *wood* in general is more environmentally friendly than *wood from British Columbia*, and significantly more environmentally friendly than *British Columbia wood products*. However, respondents significantly disagreed with statements regarding *tropical wood products* being environmentally sustainable or environmentally friendly. These results suggest two

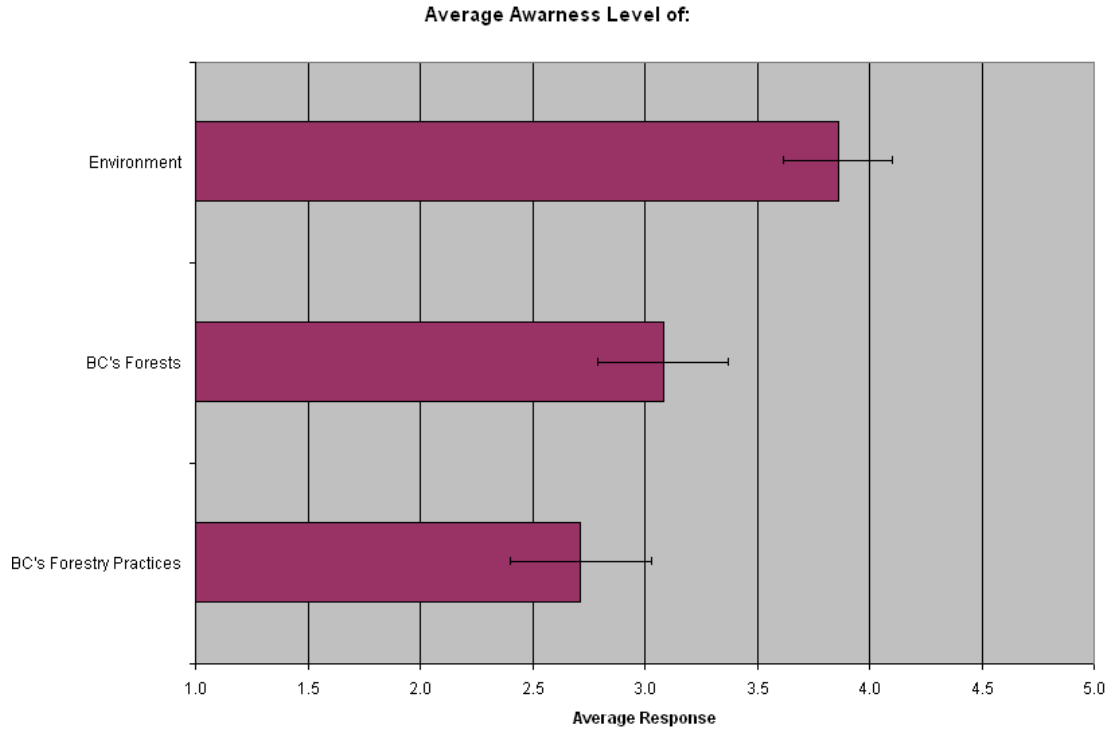
further questions not covered by this research: why did respondents rate the environmental friendliness of British Columbia's wood products significantly lower than wood in general; and where do respondents believe more environmentally friendly wood products are produced?

Additionally, participants had a generally mediocre opinion of forestry practices in British Columbia. This indicates a lack of education of the public on forestry issues and practices in British Columbia, considering that "Canada's forest policy regulation and compliance regime [is] among the most progressive and stringent in the world" (Council of Canadian Forest Ministers, date not available, p6). Participants self-affirmed this lack of education by rating their average environmental awareness regarding British Columbia's forestry practices at 2.7 on a 5-point scale, with 47% rating their awareness as low or very low.



**Figure 42: Environmental Friendliness and Sustainability of Wood and Wood Products**

In general, most participants (65%) felt that their level of environmental awareness has increased significantly over the last 5 years. When asked about their level of awareness regarding the environment, participants rated their knowledge level as reasonably high, on average; however, when asked more specifically about their awareness regarding British Columbia’s forests and forestry practices, participants felt much less knowledgeable, as shown in Figure 43. This demonstrates the need for increased education of the general public regarding the forestry practices and sustainability of British Columbia’s forests.



**Figure 43: Average Levels of Environmental Awareness**

Despite a self-reported lack of awareness of B.C. forest practices, respondents had clear perspectives on the connection between environmental concerns and the state of the economy, including the forestry industry. When considering the economic impacts of being environmentally friendly, the majority (76%) of respondents believed that a strong economy and environmental sustainability could co-exist. When it came to jobs and British Columbia’s wood products industry however, participants were less sure. By comparison, 63% believed that increasing the sustainability of the wood products industry in British Columbia would not be detrimental to communities, and only 54% of respondents believed that it would not sacrifice jobs.

Beyond a discussion of results from the main research questions, a demographic analysis revealed some interesting patterns, particularly in relationship to statistical analysis on gender and family income group.

Interestingly, the only questions in which a statistical difference was found between genders were those that asked the participants to assess their own level of awareness or knowledge. These questions included questions 1, 2, 8 (a to d), 22 and 23. Of these, questions 8a, 8d, 22 and 23 show a significant difference in the views of men versus women. The results from these questions showed a trend that women consistently rated their own levels of awareness lower than men did. Many significant differences in levels of self-efficacy between genders have been documented. These results are consistent with the findings of several studies, which show a higher academic self-confidence in men than women (Jackson et al., 1994).

The analysis by income group indicated that participants with higher levels of family income are also consistently more likely than those with lower incomes to believe that wood, both from British Columbia and in general, as well as British Columbian wood products and forestry practices, are environmentally friendly / sustainable. Statistically, the trend can only be claimed between the high- and low-income groups; however, the results for the middle-income group followed the same trend, even though the average responses fell within the confidence intervals for the high and low-income groups.



Correspondingly, the high-income group was also less likely than low and middle-income groups to avoid purchasing wood products due to environmental concerns. Interestingly, the high-income group also rated the degree to which their environmental awareness has increased over the last five years as significantly higher than the other groups. These three trends in levels of family income could potentially be due to a higher degree of accessibility to information and education; Statistics Canada (2003) notes that there is a “long standing tendency” for people from higher income families to have higher degrees of education. Additionally, a study by Statistics Canada on bottled water consumption in Canada found that Canadians with higher levels of education were far more likely to use tap water rather than bottled water, which the study attributes to a greater awareness of environmental issues. Although this survey did not include questions regarding participants’ level of education, it would be interesting in future research on environmental perceptions of secondary wood products to be able to add this factor to the analysis.

## Recommendations for the British Columbia Secondary Wood Products Sector

Considering the increasing level of attention being given to issues surrounding the environment and sustainability, it is natural for manufacturers to consider ways to market secondary wood products as environmentally friendly solutions. In order to successfully market secondary wood products on this basis, to a population represented by the survey participants of this research, it is recommended that the British Columbia secondary wood product industry:

- Not rely purely on the marketability of the environmental attributes of a product, but ensure that it maintains competitiveness in at least one additional attribute to attract the majority of consumers: price, aesthetics, quality, or functionality. (Notably, aesthetics / design was the most important attribute for the majority of respondents.)
- Address the self-identified knowledge gap that exists in respondents with regard to the environmental sustainability of British Columbia's forests and forest practices.
- Educate the public on the environmental impacts of British Columbia's secondary wood products industry as compared to alternative industries and producing regions.

- Further investigate some of the survey results along demographic differences (i.e. gender and income) in attitude and purchasing habits in order to better tailor marketing efforts to specific consumer groups.

Marketing British Columbia's secondary wood products on the basis of their environmental attributes would likely appeal to a segment of the survey participants, and would attract some respondents as customers. However, as respondents rarely avoid purchasing secondary wood products on the grounds of environmental concerns, the effect of this marketing would be limited. Any marketing of secondary wood products on environmental grounds must first address respondents' desires for quality, aesthetics, price and functionality above the environment and the fact that participants' environmental opinion of British Columbia's wood product industries is not high.

## Limitations

This research suffered from two significant limitations: sample size and demographic representation.

Sample size was a serious limitation to the statistical analysis of the survey results. Many more tests, including multiple regressions, could have been performed and the statistics of all tests could have been done with a greater level of confidence or smaller precision level.

Additionally, several of the survey's demographic results were significantly different when compared to the demographics of the general public, based on results published by Statistics Canada from the 2006 census. In particular, inconsistency in demographic representation was identified in the results in the age and family income categories.

The age data showed a significantly higher proportion of respondents in the 36-30 and 31-35 year old age ranges. This could potentially have been caused by a higher concentration of these age groups (living or working in the survey areas) while the survey was being carried out, or potentially these groups were more willing to participate.

It was also found that the median family income of the participants was significantly higher than the comparable figures from Statistics Canada. This difference could potentially be explained by the locations and timing in which the study participants

were approached (i.e. younger professionals in core downtown areas). The average income provided by StatsCan was for the entire Vancouver CMA, whereas the study locations were all relatively close to the city core. Potentially, one might expect higher average salaries closer to the centre of the metropolitan area.

Both of these issues stemmed from financial limitations on the research study. As no funding was available, a no-cost data collection method was required, hence the use of street intercept data collection. Should a future study of this type take place with funding, this survey would be better carried out as a mail survey, where a larger number of potential respondents could be reached with better demographic coverage.

Another limitation was with the time required to complete the survey itself. It was found that survey was too long, and in some instances took a surprisingly long time for participants to fill in, well over the 10-minute estimate. While no participants failed to complete the survey due to the time required, several commented on the inconsistency with the estimate. Additionally, potential participants declined to fill in the survey having observed the time taken by others.

## Conclusions

This research examined the purchasing practices of consumers and the degree to which they associate secondary wood products with environmentally friendly and environmentally sustainable options. Any opportunities in marketing secondary wood products as environmentally responsible options would be contingent on consumers' attitudes towards these products and their perceived associations with the environment.

A literature review demonstrated that Canada, and British Columbia in particular, has been falling behind other secondary wood products producing regions, and noted that many groups have identified secondary processing of wood products as a substantial driver in job creation and maximizing the economic benefits of harvested timber. The literature review also showed increasing interest by the general public in the environment and discussion around environmentally friendly and environmentally sustainable products.

51 participants living in the Vancouver area, aged 18 years or older, completed the 31-question street-intercept survey. The surveys, collected in high transit areas around the city of Vancouver, attempted to acquire a representative sample of Vancouverites with minimal expense.

Survey results revealed that respondents did not appear to have a clear perspective of what the terms environmentally friendly and environmentally sustainable mean, although participants reported high levels of concern for the environment and believed

that humanity is facing an environmental crisis. This concern, however, was partnered with low levels of action in response. Respondents showed that they consider the environmental friendliness of products they purchase only some of the time, and that they rate Environmental Sustainability and Environmental Friendliness as two of the least important product attributes when making purchasing decisions. Despite high levels of concern, respondents were unwilling to sacrifice other priorities, such as price, quality, functionality, and aesthetics, for environmental reasons. In fact, only 36% of respondents stated they would “Always” select a more environmentally friendly product, given all other attributes being equal.

In connection to the secondary wood products industry, respondents considered wood to be a more environmentally friendly and environmentally sustainable material than metal, glass, plastic, concrete, and textiles. Despite this, respondents had a mediocre opinion of wood products and forestry practices from British Columbia in terms of environmental attributes, and indicated a general lack of knowledge about British Columbia’s wood products industry and forestry practices. However, respondents believed that a strong economy and environmental sustainability could co-exist. The majority of respondents believed that increasing the sustainability of the wood products industry in British Columbia would not be detrimental to communities, although approximately half of them felt that jobs would be sacrificed.

The significant attitude-behavior gap identified in the survey results between respondents concern about the environment and the value placed on environmental

product attributes, as well as respondents' inconsistent understanding of terminology and perspectives on British Columbia's forest products industry and forest practices, point to a need for public education. Successful marketing of secondary wood products based on environmental attributes would potentially not be widely successful without some educational measures. This research indicates that marketers need to find a way to ensure that purchasers remain mindful of environmental concerns when making purchases, and secondary wood products manufacturers need to educate consumers on the environmental benefits of purchasing B.C. wood products.



## References

Archer, Hadley. The Impact of Forest Certification Labeling and Advertising on Consumer Purchase Intent. Toronto, Canada: Faculty of Forestry, University of Toronto, 2004.

Archer, Hadley, Robert Kozak, & David Balsilie. "The Impact of Forest Certification Labeling and Advertising: An exploratory assessment of consumer purchase intent in Canada." The Forestry Chronicle 81.2 (2005): 229-244.

Auditor General of Canada. 2000 Report of the Auditor General of Canada. 2000. 6 September 2007. <[http://www.oag-bvg.gc.ca/internet/English/parl\\_oag\\_200012\\_e\\_1139.html](http://www.oag-bvg.gc.ca/internet/English/parl_oag_200012_e_1139.html)>

Anderson, Roy. Do Forest Certification Ecolabels Impact Consumer Behavior? Corvallis, Oregon, USA: Presentation from Oregon State University. 2002.

Anderson, Roy, and Eric Hansen. Determining consumer preferences for ecolabel forest products: an experimental approach. Journal of Forestry 102.4(2004): 28–32.

Anderson, Roy, and Eric Hansen. Do Forest Certification Ecolabels Impact Consumer Behavior? Oregon State University, Corvallis, USA. Wood Solutions Forest Business, Science and Engineering, Oregon State University, 2002a.

Anderson, Roy, and Eric Hansen. Segmenting Consumers of Ecolabeled Forest Products. Oregon State University, Corvallis, USA. Wood Solutions Forest Business, Science and Engineering, Oregon State University, 2002b.

Anderson, Roy, David Laband, Eric Hansen and Christopher Knowles. Price Premiums in the Mist. Madison, WI , USA: Forest Products Journal, 2005.

BC Stats. Small Business Profile 2003: A Profile of Small Business in British Columbia. Victoria, Canada: BC Stats, 2003.

BC Stats. Value Added Exports Grow Fast in British Columbia but Faster in Rest of Canada. Victoria, Canada: BC Stats, 2003.

BC Stats. Exports: Value Added Wood Production in BC Lagging Rest of Canada. Victoria, Canada: BC Stats, 2000.

BC Stats. Infoline: British Columbia Falling Behind in Export Boom for Secondary Manufactured Wood. Victoria, Canada: BC Stats, 1998.

Baldwin, John, William Chandler, Can Le and Tom Papailiadis. Strategies For Success: A Profile of Growing Small and Medium-sized Enterprises (GSMEs) in Canada. Ottawa, Canada: Statistics Canada, 1994.

Baumbach, Clifford. How to Organize and Operate a Small Business. New Jersey, USA: Prentice-Hall Inc., 1985.

Bluman, A.G. Elementary Statistics: A step by step approach (3rd edition). Boston, USA: WCB McGraw-Hill, 1997.

Bowyer, Jim L. "Fact vs. Perception." Forest Products Journal 45.11/12 (1995) 17-24.

Bourke, I. J. and Leitch, J. Trade Restrictions and Their Impact on International Trade in Forest Products. Rome, Italy: Food and Agriculture Organization, 1998.

British Columbia Chamber of Commerce. The BC Chamber of Commerce 2004-2005 Policy and Positions Manual. Victoria, Canada: BC Chamber of Commerce, 2004.

British Columbia Ministry of Small Business, Tourism and Culture. Starting a home-based small business: a manual for success. Victoria, Canada: Ministry of Small Business, Tourism and Culture, 2000.

British Columbia Ministry of Forests and Range. 2006. The State of British Columbia's Forests. Government of British Columbia. Victoria, Canada.

Canadian Council of Forest Ministers. Canada's Boreal Forest. No date. 10 October 2008 <[http://www.sfmcanada.org/CMFiles/PublicationLibrary/IFPP\\_Brochure\\_eng\\_v31LAV-11142008-5686.pdf](http://www.sfmcanada.org/CMFiles/PublicationLibrary/IFPP_Brochure_eng_v31LAV-11142008-5686.pdf)>.

Canadian Forest Service. Canadian Forest Service – Industry and Trade. 2005. 6 February 2005. <<http://www2.nrcan.gc.ca/cfs-scf/industrytrade/>>.

Cashore, B. & McDermott, C. Global environmental forest policies: Canada as a constant case comparison of select forest practice regulations. Vancouver, Canada: International Forest Resources, 2004.

Clark, Andrea, Mark Harvey, and Deborah Kane. Attitudes and behavior: Are produce consumers affected by eco-labels? USDA-Natural Resources Conservation Service. No date. 30 January 2006. <<http://www.ssi.nrcs.usda.gov>>.

Cohen, D.H., and R. Kozak. Mapping the Value Chain of SMEs in the Forest Products Industry. Prepared for Environment Canada and the Canadian Forest Service, Ottawa Ontario. 2006.

Cohen, D.H., S. Tolnai, and B. Wilson. Assessment of BC Opportunities in the US Mouldings Market. Victoria, BC: Natural Resources Canada. 1997.

Competition Bureau of Canada. Environmental Claims: A Guide for Industry and Advertisers. June 2008. January 2009. <<http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02701.html>>.

Council of Canadian Forest Ministers. Sustainable Forest Management in Canada. 8 October, 2008 <<http://sfmcanada.org/english/topics-boreal-caw.asp>>.

Delcourt, G. and B. Wilson. "Forest Industry Employment: A Jurisdictional Comparison." Canadian Public Policy 24 (1998).

DeLong, D.L., R.A. Kozak and D.H. Cohen. The Canadian Secondary Wood Products Sector: Competitive Success Factors and Current Status. Ottawa, Canada: Canadian Forest Service, 2004.

DeLong, D.L., R.A. Kozak and D.H. Cohen. Overview of the Canadian Value-Added Wood Products Sector and the Competitive Factors that Contribute to its Success. Canadian Journal of Forest Research 37.11 (2007): 2211-2226.

Demeritt, Laurie. "What makes a green consumer?" Seattle Daily Journal of Commerce, Environmental Outlook 2005 2005. 7 June 2006. <<http://www.djc.com/special/enviro2005/>>

Flint, D.J. "Strategic marketing in global supply chains: Four challenges." Industrial Market Management 33:45 (2004):50.

Forintek Canada Corp. Sustainable Design and Wood. Vancouver, Canada: Forintek Canada Corp. 2003.

Geis, Don and Tammy Kutzmark. "Developing Sustainable Communities." Public Management Magazine August (1995): 4-13.

Ghosh, B.C., T.W. Liang, T.T. Meng, and Chan. "The key success factors, distinctive capabilities, and strategic thrusts of top SMEs in Singapore." Journal of Business Research, 51(2001): 209-221

Global Strategy Group. American Attitudes on the Environment – Key Findings. New York, USA: Yale University School of Forestry and Environmental Studies. 2005.

Global Strategy Group. The Environmental Deficit Survey on American Attitudes on the Environment. New York, USA: Yale University School of Forestry and Environmental Studies. 2004.

Globerman, Steven., M. Nakamura, K. Ruckman, I. Vertinsky and T. Williamson. Technological progress and competitiveness in the Canadian forest products industry.

Ottawa, Canada: Science and the Industry, Economics and Programs Branch, Canadian Forest Service. 1999.

Globerman, Steven. "The location of higher value-added activities." Industry Canada Research Publications Program, Occasional Paper 27(2001): 27

Gupta, Shruti, and Denise Ogden. The attitude-behavior gap in environmental consumerism. Northeastern Association of Business, Economics and Technology (NABET) Proceedings. Fall 2006.

Hand, Carl, and Ginger Macheski.. "Environment-Economy Tradeoffs and Forest Environmentalism." Electronic Green Journal 1.18 (2003): Article 2.

Harris Interactive. Harris Poll #77. Rochester, New York, USA: Harris Interactive Inc. 2005.

Hawkins, Paul. The Ecology of Commerce. New York, USA: Harper Collins, 1993.

Holliday, Ruth. Investigating Small Firms: Nice Work? London, England: Routledge, 1995.

Husack, Glen A. and Rudolph W.Gibbons. A Do-It-Yourself Feasibility Study: New Manufacturing Ventures. Kitchener, Canada: The Institute for Small Business, 1979.

Jackson, Linda, C. Hodge and J. Ingram. "Gender and self-concept: A reexamination of stereotypic differences and the roles of gender attitudes." Sex Roles: Journal of Research 30.9/10 (1994): 615:630.

Kao, Raymond. Small Business Management: A Strategic Emphasis. Toronto, Canada: Holt, Rinehart and Winston, 1984.

Kozak, R.A. and T. C. Maness. "Quality Assurance for Value-Added Wood Producers in British Columbia." Forest Products Journal 51.6 (2001): 47-55.

Kozak, R.A., T.C. Maness and T. Caldecott. "Solid Wood Supply Impediments for Secondary Wood Producers in British Columbia." The Forestry Chronicle 79.6 (2003): 1107-1120.

Landstrom, Hans, Hermann Frank and José M. Veciana. Entrepreneurship and Small Business Research in Europe: An ECSB Survey. Brookfield, USA: Ashgate Publishing Company, 1998.

Lippke, Bruce, Jim Wilson, John Perez-Garcia, Jim Bowyer, and Jamie Meil. "CORRIM: Life-Cycle Environmental Performance of Renewable Building Materials." The Forest Products Journal 54.6 (2004): 8-19.

Lloyd, Bruce. Entrepreneurship: Creating and Managing New Ventures. New York, USA: Pergamon Press, 1989.

Management Magazine. "Mr. Sustainability." Management Magazine February 2006. <[http://findarticles.com/p/articles/mi\\_qn5305/is\\_/ai\\_n24915033](http://findarticles.com/p/articles/mi_qn5305/is_/ai_n24915033)>.

Manly, B F. J. Multivariate Statistical Methods: A Primer. New York, USA: Chapman and Hall, 2000.

Mark Trend Research. Forest Issues Survey. Presented to COFI on October 23, 2000.

Martin, R.L. and Michael E. Porter. Canadian Competitiveness: Nine Years After the Crossroads. Ottawa, Canada: Centre for the Study of Living Standards, CSLS Conference on the Canada-U.S. Manufacturing Productivity Gap. 2000.

Miles, Morgan P., and Jeffrey G. Covin. "Environmental Marketing: A Source of Reputational, Competitive, and Financial Advantage." Journal of Business Ethics 23.3 (2000): 299-311.

Miller, Kevin W, Lora B. Wilder, Frances A. Stillman, EdD and Diane M. Becker. "The Feasibility of a Street-Intercept Survey Method in an African American Community." American Journal of Public Health 87.4 (1997): 655-658.

National Association of State Foresters. NASF Resolution No. 1999-7, Taxation and Forest Sustainability: Recommendations for Positive Change. Washington DC, USA: National Association of State Foresters, 1999.

Norman, Jan. What No One Ever Tells You About Starting Your Own Business. Chicago, USA: Upstart Publishing Company, 1999.

Obara, Louise. Human Rights and Sustainability. Cardiff University, Cardiff, United Kingdom: Centre for Business Relationships, Accountability, Sustainability and Society (BRASS), no date.

O'Connor, Jennifer and Jim Dangerfield. The Environmental Benefits of Wood Construction. Vancouver, Canada: Forintek Canada Corp. 2004.

Organic Consumers. Europeans Believe Preserving the Environment is All-Important. 2005. 15 January 2006. <<http://www.organicconsumers.org/>>

Osler. Advertising and Market Review. October 2008. January 2009. <<http://www.osler.com/resources.aspx?id=15988>>

Ozanne, L. K. and Vlosky, R. P. "Willingness to Pay for Environmentally Certified Wood Products: A Consumer Perspective." Forest Products Journal 47.6 (1997): 39-49.

Peck, Tim. "The International Timber Trade." Forest Products Journal 52.9(2002): 10-20.

Polzin, Paul and Jim Bowyer. "Misperceptions about forests and wood products: a statewide survey in Montana." Forest Products Journal 49.9(1999): 37-42.

Ponzer, Mildred S., and Catherine M. Frank. Secondary Wood Product Manufacturing. Rolla, Missouri, USA: Small Business Research & Information Center, University of Missouri-Rolla, 2000.

Porter, Michael E. Canada at the Crossroads: The Reality of a New Competitive Environment. Ottawa, Canada: The Business Council on National Issues and the Government of Canada, 1991.

Pöyry, Jaakko. Assessment of the Status and Future Opportunities of Ontario's Solid Wood Value-Added Sector. New York, USA: Jaakko Pöyry, 2001.

Pöyry, Jaakko. Value Chain and Clustering. 7 June 2005.  
<[http://www.livinglegacytrust.org/pdf/Value\\_Chain\\_and\\_Clustering-Miikka\\_Pesonen.pdf](http://www.livinglegacytrust.org/pdf/Value_Chain_and_Clustering-Miikka_Pesonen.pdf)>

Price Waterhouse Coopers. Alberta Forest Products Value Added Manufacturing Industry Benchmark Study. Alberta Sustainable Resource Development – Forest Business and Policy Branch, 2003.

Prugh, Thomas, and Robert Costanza. Natural Capital and Human Economic Survival, (Second Edition). New York, USA: CRC Press, 1999.

Rametsteiner, Ewald. "The attitude of European consumers towards forests and forestry." *Unasylva*, Food and Agriculture Organization of the United Nation. 50.1(1999).

Redefining Progress. 6 February 2006. <<http://www.rprogress.org/>>

Reid, Gavin. Small Business Enterprise: An economic analysis. London, England: Routledge, 1993.

Rice, Jenny. An analysis of interior wood products and their psychological impact. M.Sc. Thesis. Vancouver Canada: University of British Columbia. 2004.

Shrier, Dan. "Value Added Wood Production in BC Logging Rest of Canada." Exports 3.5 (2003): 2-5.

Smith & Nephew. Sustainability Report. 2005. 10 June 2006. <<http://www.smith-nephew.com/sustainability2005/sr2005.pdf>>.

Statistics Canada. 2006 Census: Population and dwelling counts. Release No.1: 13 March 2007. 12 May 2008.

<[http://www12.statcan.ca/english/census06/release/release\\_popdwell.cfm](http://www12.statcan.ca/english/census06/release/release_popdwell.cfm)>.

Stennes B. and B. Wilson. Recent growth and prospects for US exports of value-added wood products from British Columbia. Valdivia, Chile: In proceedings of the IUFRO Forestry Extension Conference. (2002): 379-388.

Strategis – Canadian Industry Statistics. 2004. 2 October 2004.

<<http://strategis.ic.gc.ca/>>.

Sustainability Report, The. 1 February 2006. <<http://www.sustreport.org/>>.

Taylor and Associates. Value-Added Wood Products Strategy for the Kootenay-Boundary Region. Victoria, Canada: Forest Renewal B.C., 1998.

Taylor and Associates. Southern Interior Value-Added Wood Products Bench Marking & Opportunity Identification Study. Victoria, Canada: Forest Renewal B.C., 1996.

Torgler, Benno, and Garcia~Valinas. “The Willingness to Pay for Preventing Environmental Damage. CREMA Working Paper 2005.22 (2005).

Tyson, Eric and Tim Schell. Small Business for Dummies: Second Edition. Indianapolis, USA: Wiley Publishing, 2003.

Uhrg, Peter. Public Perceptions of the Forest products Industry in the United States. Blacksburg, Virginia, USA: Virginia Tech, 1999.

United Nations. Forest Products Annual Market Review 2000-2001. New York, USA: United Nations, 2001.

United Nations. 2004. Forest Products Annual Market Review 2002-2004 New York, USA: United Nations, 2004.

United Nations. 2007. Forest Products Annual Market Review 2007. New York, USA: United Nations, 2007.

United Nations. 2008. Forest Products Annual Market Review 2008. New York, USA: United Nations, 2008.

Verbeke, Wim, and Iris Vermeir. Determinants of the consumer attitude – behaviour gap in sustainable consumption decisions. Antwerp, Belgium: 10<sup>th</sup> European Roundtable on Sustainable Consumption and Production, 2005.

Vlosky, Denese, and Richard Vlosky. Exploring Age-Related Environmental Attitudes in the Context of Wood Products Certification. Baton Rouge, USA: Working Paper #51, Louisiana Forest Products Laboratory, LSU Agricultural Center. 2001.

Wicksteed, Segal. Encouraging Small Business Start-up and Growth: Creating a supportive local environment. London, England: Her Majesty's Stationery Office, 1998.

Wilson, Bill, and R. Ennis. Directory of Secondary Manufacturing of Wood Products in British Columbia. Victoria, Canada: Government of Canada, Province of British Columbia, 1993.

Wilson, Bill, Brad Stennes, Sen Wang. An examination of secondary manufacturing in British Columbia: structure, significance and trends. Victoria, Canada: Canadian Forest Service, 1999.

Wilson, Bill, Brad Stennes, Sen Wang, Louise Wilson. The structure and economic contribution of secondary manufacturing in British Columbia 1990-1999. Victoria, Canada: Canadian Forest Service, 2001.

Wilson, Bill, Brad Stennes. Secondary manufacturing of solid wood products in British Columbia 2006: structure, economic contribution and changes since 1990. Victoria, Canada: Canadian Forest Service, 2008.

Woodbridge, Peter & Associates Ltd. Evolution of the North American Home Building Industry: An Opportunity for Value-Added manufacturing Investment in BC. Victoria, Canada: Forest Renewal British Columbia, 2000.

Woodbridge, Peter & Associates Ltd. Manufacturing of value-added wood products in Western North America. How competitive is BC? Report prepared for the Interior Value Added Wood Association. 2003.

Wood Promotion Network. 9 January 2006.  
<<http://www.woodpromotion.net/home/default.asp#>>.

World Business Council for Sustainable Development. January 6, 2006.  
<<http://www.wbcds.ch>>.

World Forestry Centre, The. World Forest Products. 6 February 2005.  
<<http://www.worldforestry.org/wfi/trade-1.htm>>

Yale Strategy Group. The Environmental Deficit. New York, New York, USA: Global Strategy Group. 2004a.

Yale Strategy Group. The Environmental Deficit; Focus: Global Warming. New York, New York, USA: Global Strategy Group. 2004b.



Yale Strategy Group. 2005. Survey on American Attitudes on the Environment. New York, New York, USA: Global Strategy Group. 2005.

Zikmund, W. G. Exploring marketing research (6th Edition). Fort Worth, USA: Dryden, 1997.

## **Appendix A: Survey Questionnaire**

Begins on following page.

SECTION 1: SUSTAINABILITY AND THE ENVIRONMENT IN GENERAL

**How would you rate your level of environmental awareness?**

Very Low	Low	Average	High	Very High
①	②	③	④	⑤

**How would you rate your level of concern about the environment?**

Very Low	Low	Somewhat	High	Very High
①	②	③	④	⑤

**In your own words, please describe what the following terms mean to you:**

Environmentally Sustainable: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Environmentally Friendly: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**On a scale of 1 to 10, how environmentally *sustainable* do you feel each of the following materials are?**

	Not at all					Completely				
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Glass:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Wood:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Metal:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Plastic:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Concrete:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Textile/Fabric:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

On a scale of 1 to 10, how environmentally *friendly* do you feel each of the following materials are?

	Not at all					Completely				
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Glass:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Wood:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Metal:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Plastic:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Concrete:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Textile/Fabric:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

Rate your level of agreement with the following statement: “Humanity is facing an environmental crisis.”

Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
①	②	③	④	⑤

Rate your level of agreement with the following statement: “A strong economy and environmental sustainable are compatible goals.”

Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
①	②	③	④	⑤

How knowledgeable do you believe you are about the following environmental issues?

	Not at all knowledgeable					Very knowledgeable				
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Forest Health:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Animal Habitat:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Ocean Health:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Air Pollution:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

Rate the degree to which you think your level of environmental awareness has increased in the last 5 years.

Not at all	Marginally	Somewhat	Significantly	Extremely
①	②	③	④	⑤

Please rank the following environmental issues in order of importance to you (from 1 to 4, with 1 being the most important).

Forest Health: \_\_\_\_\_  
 Animal Habitat: \_\_\_\_\_  
 Ocean Health: \_\_\_\_\_  
 Air Pollution: \_\_\_\_\_

SECTION 2: SUSTAINABILITY AND PURCHASING HABITS

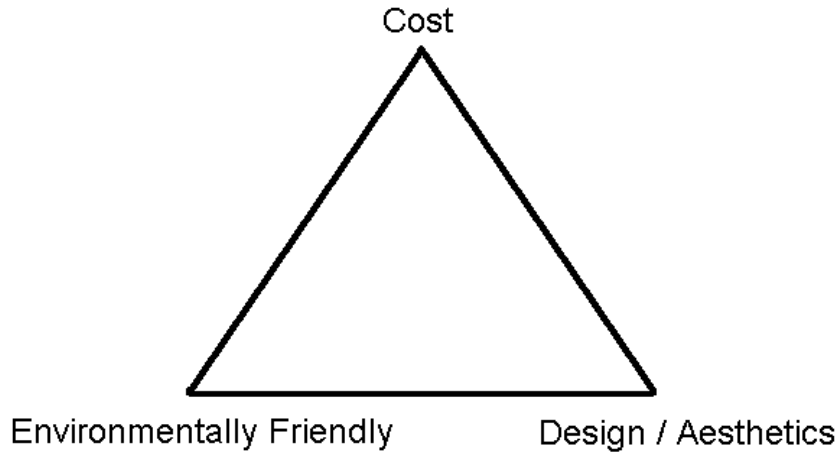
When making purchasing decisions, what percentage of the time do you evaluate the environmental friendliness of a product? Please mark on the line.

(0%) (50%) (100%)  
 |-----|-----|

Please rate the importance of each of the following attributes when making purchasing choices:

	Not at all important							Very important		
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Price / Affordability:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Aesthetics / Appearance:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Environmental Friendliness:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Environmental Sustainability:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Quality:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Functionality:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Brand Name:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

How would you classify your purchasing choices when different considerations are balanced against each other? Please place an X within the triangle.



What percentage of your purchasing would you consider to be environmentally friendly? Please mark on the line.

(0%) (50%) (100%)  
 |-----|-----|

What percentage of the time do you believe the general public in Vancouver makes environmentally friendly purchasing decisions? Please mark on the line.

(0%) (50%) (100%)  
 |-----|-----|

**All other things being equal, are you more inclined to purchase a product you believe to be more environmentally friendly?**

Never	Rarely	Sometimes	Frequently	Always
①	②	③	④	⑤

**How frequently do you actively question the environmental friendliness of a product when purchasing a product?**

Never	Rarely	Sometimes	Frequently	Always
①	②	③	④	⑤

SECTION 3: SUSTAINABILITY AND WOOD PRODUCTS

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**Definition:**

*Secondary Wood Products* are considered to include, furniture, cabinets, home accessories, fixtures and millwork. (This term does not include any cardboard, paper or other pulp-based products.)

**Approximately, how many times per year do you purchase secondary wood products?**

\_\_\_\_\_ times per year

**Please rate your level of agreement with the following statements:**

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
Wood, as a material, is environmentally friendly.	①	②	③	④	⑤
Wood, as a material, is environmentally sustainable.	①	②	③	④	⑤

**Please rate the importance of each of the following to you when purchasing a secondary wood product:**

	Not at all important					Very important				
Price / Affordability:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Aesthetics / Appearance:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Environmental Friendliness:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Environmental Sustainability:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Quality:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Functionality:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Brand Name:	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

**Do you ever avoid purchasing secondary wood products due to environmental concerns?**

Never	Rarely	Sometimes	Frequently	Always
①	②	③	④	⑤

SECTION 4: BRITISH COLUMBIA'S WOOD PRODUCT INDUSTRY

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**How would you describe your level of environmental awareness regarding British Columbia's forests?**

Very Low	Low	Average	High	Very High
①	②	③	④	⑤

**How would you describe your level of environmental awareness regarding British Columbia's *forestry practices*?**

Very Low	Low	Average	High	Very High
①	②	③	④	⑤

**Please rate your level of agreement with the following statements:**

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
Wood from British Columbia is an environmentally <i>friendly</i> material.	①	②	③	④	⑤
Forestry practices in British Columbia are done in a <i>sustainable</i> manner.	①	②	③	④	⑤
Wood products made in British Columbia are produced in an environmentally <i>friendly</i> manner.	①	②	③	④	⑤
Wood products made in British Columbia are produced in an environmentally <i>sustainable</i> manner.	①	②	③	④	⑤
<i>Tropical</i> wood products sold in British Columbia's stores are environmentally <i>friendly</i> .	①	②	③	④	⑤
<i>Tropical</i> wood products sold in British Columbia's stores are environmentally <i>sustainable</i> .	①	②	③	④	⑤
Increasing the environmental sustainability of British Columbia's wood products industry would sacrifice jobs.	①	②	③	④	⑤
Increasing the environmental sustainability of British Columbia's wood product industry would be detrimental to communities.	①	②	③	④	⑤



SECTION 5: DEMOGRAPHIC INFORMATION

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**Do you live in the Vancouver area?**

Yes

No

**If yes, for how many years have you lived in the Vancouver area?** \_\_\_\_ years

**What is your occupation?** \_\_\_\_\_

**Do you work in the wood products industry?**

Yes

No

**If yes, please describe:**

\_\_\_\_\_  
\_\_\_\_\_

**Please check your age group:**

16-20

21-25

26-30

31-35

36-40

41-45

46-50

51-55

56-60

61-65

66-70

71 or over

**Gender:**

Male

Female

**Total family income group:**

less than 20,000

20,000 – 29,999

30,000 – 39,999

40,000 – 49,999

50,000 – 59,999

60,000 – 69,999

70,000 – 79,999

80,000 – 89,999

90,000 – 99,999

100,000 or over

**Thank you.**

Thank you for taking the time to fill out this survey. Your responses will assist us in gaining a better understanding of how people in Vancouver feel about and identify with issues surrounding the environment, sustainability and wood products from British Columbia.

## Appendix B:

### Gender T-Test Results

Survey Question	T-Test		
	T	Tcrit	Ho
1	-1.94	± 2.07	Accept
2	-1.86	± 2.07	Accept
3a	N/A	N/A	N/A
3b	N/A	N/A	N/A
4a	0.63	± 2.07	Accept
4b	-1.37	± 2.07	Accept
4c	-0.13	± 2.07	Accept
4d	1.30	± 2.07	Accept
4e	-1.81	± 2.07	Accept
4f	-2.08	± 2.07	Reject
5a	-0.06	± 2.07	Accept
5b	0.32	± 2.07	Accept
5c	0.00	± 2.07	Accept
5d	0.67	± 2.07	Accept
5e	-0.83	± 2.07	Accept
5f	0.29	± 2.08	Accept
6	-0.41	± 2.07	Accept
7	0.41	± 2.07	Accept
8a	-2.87	± 2.07	Reject
8b	-1.88	± 2.07	Accept
8c	-0.77	± 2.07	Accept
8d	-2.20	± 2.07	Reject
9	-1.35	± 2.07	Accept
10a	0.60	± 2.07	Accept
10b	-0.41	± 2.07	Accept
10c	1.04	± 2.07	Accept
10d	1.37	± 2.07	Accept
11	-0.87	± 2.07	Accept
12a	-1.25	± 2.07	Accept
12b	-0.20	± 2.07	Accept
12c	0.12	± 2.07	Accept
12d	-0.22	± 2.07	Accept
12e	-0.88	± 2.07	Accept
12f	-0.38	± 2.07	Accept
12g	-1.67	± 2.07	Accept

Survey Question	T-Test		
	T	Tcrit	Ho
13a	0.67	± 2.07	Accept
13b	-0.02	± 2.07	Accept
13c	-0.66	± 2.07	Accept
14	-0.76	± 2.07	Accept
15	-0.07	± 2.08	Accept
16	1.13	± 2.07	Accept
17	0.16	± 2.07	Accept
18	1.52	± 2.08	Accept
19a	0.13	± 2.07	Accept
19b	-1.01	± 2.07	Accept
20a	-1.62	± 2.07	Accept
20b	0.15	± 2.07	Accept
20c	-0.19	± 2.07	Accept
20d	-0.54	± 2.07	Accept
20e	-0.24	± 2.07	Accept
20f	-0.55	± 2.07	Accept
20g	-0.43	± 2.07	Accept
21	0.59	± 2.07	Accept
22	-3.83	± 2.08	Reject
23	2.51	± 2.08	Reject
24	-0.31	± 2.07	Accept
25	0.53	± 2.07	Accept
26	0.26	± 2.07	Accept
27	-1.32	± 2.07	Accept
28	0.20	± 2.07	Accept
29	0.86	± 2.07	Accept
30	-0.15	± 2.07	Accept
31	-0.11	± 2.07	Accept

## Age Group ANOVA & Ad Hoc Results

Survey Question	ANOVA			Scheffe Tests										
	F	Fcrit	Ho	Low vs Mid			Mid vs High			Low vs High				
				Fs	Fcrit	Ho	Fs	Fcrit	Ho	Fs	Fcrit	Ho		
1	1.06	4.04	Accept											
2	0.83	4.04	Accept											
3a	N/A	N/A	N/A											
3b	N/A	N/A	N/A											
4a	1.95	4.04	Accept											
4b	0.26	4.04	Accept											
4c	0.62	4.04	Accept											
4d	1.56	4.04	Accept											
4e	1.19	4.04	Accept											
4f	2.66	4.04	Accept											
5a	2.59	4.04	Accept											
5b	0.94	4.04	Accept											
5c	0.73	4.04	Accept											
5d	0.13	4.04	Accept											
5e	1.19	4.04	Accept											
5f	3.12	4.04	Accept											
6	0.30	4.04	Accept											
7	0.24	4.03	Accept											
8a	0.86	4.03	Accept											
8b	1.75	4.03	Accept											
8c	0.55	4.03	Accept											
8d	1.29	4.03	Accept											
9	2.10	4.03	Accept											
10a	1.25	4.04	Accept											
10b	0.69	4.04	Accept											
10c	1.71	4.04	Accept											
10d	2.53	4.04	Accept											
11	0.83	4.03	Accept											
12a	0.25	4.03	Accept											
12b	0.56	4.03	Accept											
12c	0.36	4.03	Accept											
12d	1.39	4.03	Accept											
12e	0.90	4.03	Accept											
12f	0.44	4.03	Accept											
12g	0.66	4.03	Accept											
13a	2.23	4.04	Accept											
13b	0.57	4.04	Accept											
13c	0.20	4.04	Accept											
14	0.51	4.03	Accept											
15	1.21	4.04	Accept											
16	0.90	4.03	Accept											
17	2.70	4.03	Accept											
18	0.13	4.06	Accept											
19a	3.55	4.04	Accept											
19b	3.94	4.04	Accept											

(Age Group ANOVA and Ad Hoc tests continued)

Survey Question	ANOVA			Scheffe Tests								
	F	Fcrit	Ho	Low vs Mid			Mid vs High			Low vs High		
				Fs	Fcrit	Ho	Fs	Fcrit	Ho	Fs	Fcrit	Ho
20a	3.62	4.04	Accept									
20b	0.06	4.04	Accept									
20c	0.71	4.04	Accept									
20d	1.60	4.04	Accept									
20e	0.39	4.04	Accept									
20f	0.31	4.04	Accept									
20g	1.70	4.04	Accept									
21	0.25	4.04	Accept									
22	1.42	4.04	Accept									
23	1.68	4.04	Accept									
24	5.74	4.04	Reject	6.56	8.08	Accept	0.76	8.08	Accept	10.07	8.08	Reject
25	0.44	4.05	Accept									
26	1.09	4.04	Accept									
27	0.26	4.04	Accept									
28	1.25	4.04	Accept									
29	1.51	4.04	Accept									
30	0.11	4.05	Accept									
31	0.35	4.04	Accept									

## Income Group ANOVA & Ad Hoc Results

Survey Question	ANOVA			Scheffe Tests										
	F	Fcrit	Ho	Low vs Mid			Mid vs High			Low vs High				
				Fs	Fcrit	Ho	Fs	Fcrit	Ho	Fs	Fcrit	Ho		
1	0.47	4.04	Accept											
2	1.63	4.04	Accept											
3a	N/A	N/A	N/A											
3b	N/A	N/A	N/A											
4a	1.08	4.04	Accept											
4b	0.38	4.04	Accept											
4c	0.15	4.04	Accept											
4d	2.29	4.04	Accept											
4e	0.71	4.04	Accept											
4f	1.84	4.04	Accept											
5a	0.28	4.04	Accept											
5b	0.15	4.04	Accept											
5c	0.60	4.04	Accept											
5d	0.47	4.04	Accept											
5e	0.02	4.04	Accept											
5f	1.59	4.04	Accept											
6	0.64	4.04	Accept											
7	2.34	4.03	Accept											
8a	0.83	4.03	Accept											
8b	2.94	4.03	Accept											
8c	0.81	4.03	Accept											
8d	1.19	4.03	Accept											
9	7.43	4.03	Reject	0.53	8.06	Accept	14.60	8.06	Reject	8.14	8.06	Reject		
10a	0.99	4.04	Accept											
10b	1.71	4.04	Accept											
10c	0.31	4.04	Accept											
10d	0.09	4.04	Accept											
11	1.10	4.03	Accept											
12a	1.57	4.03	Accept											
12b	0.55	4.03	Accept											
12c	2.02	4.03	Accept											
12d	2.02	4.03	Accept											
12e	0.44	4.03	Accept											
12f	1.41	4.03	Accept											
12g	0.58	4.03	Accept											
13a	3.48	4.04	Accept											
13b	1.53	4.04	Accept											
13c	0.36	4.04	Accept											
14	1.99	4.03	Accept											
15	0.06	4.04	Accept											
16	0.50	4.03	Accept											
17	3.83	4.03	Accept											
18	2.26	4.06	Accept											
19a	3.08	4.04	Accept											
19b	2.32	4.04	Accept											

(Income Group ANOVA and Ad Hoc tests continued)

Survey Question	ANOVA			Scheffe Tests										
	F	Fcrit	Ho	Low vs Mid			Mid vs High			Low vs High				
				Fs	Fcrit	Ho	Fs	Fcrit	Ho	Fs	Fcrit	Ho		
20a	1.67	4.04	Accept											
20b	0.14	4.04	Accept											
20c	3.27	4.04	Accept											
20d	1.79	4.04	Accept											
20e	0.67	4.04	Accept											
20f	0.57	4.04	Accept											
20g	1.59	4.04	Accept											
21	4.37	4.04	Reject	4.49	8.08	Accept	1.63	8.08	Accept	8.18	8.08	Reject		
22	1.14	4.04	Accept											
23	1.16	4.04	Accept											
24	4.45	4.04	Reject	4.18	8.08	Accept	1.96	8.08	Accept	8.50	8.08	Reject		
25	5.88	4.05	Reject	8.45	8.10	Reject	0.68	8.10	Accept	9.57	8.10	Reject		
26	7.00	4.04	Reject	5.11	8.07	Accept	4.53	8.07	Accept	13.85	8.07	Reject		
27	5.70	4.04	Reject	6.42	8.07	Accept	1.77	8.07	Accept	10.39	8.07	Reject		
28	2.49	4.04	Accept											
29	1.65	4.04	Accept											
30	1.44	4.05	Accept											
31	1.36	4.04	Accept											

# Appendix C: UBC Research Ethics Board Certificate of Approval



The University of British Columbia  
 Office of Research Services  
**Behavioural Research Ethics Board**  
 Suite 102, 6190 Agronomy Road, Vancouver, B.C. V6T 1Z3

## CERTIFICATE OF APPROVAL - MINIMAL RISK

<b>PRINCIPAL INVESTIGATOR:</b> Robert Kozak	<b>INSTITUTION / DEPARTMENT:</b> UBC/Forestry/Wood Science	<b>UBC BREB NUMBER:</b> H07-00026
<b>INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:</b>		
Institution		Site
N/A		N/A
Other locations where the research will be conducted: Survey data will be collected in areas of the City of Vancouver identified as 'hubs' through which a representative cross section of Vancouverites pass.		
<b>CO-INVESTIGATOR(S):</b> Rowan Eberle		
<b>SPONSORING AGENCIES:</b> N/A		
<b>PROJECT TITLE:</b> Public Perceptions: Are Secondary Wood Products Environmentally Friendly?		

**CERTIFICATE EXPIRY DATE: August 14, 2008**

<b>DOCUMENTS INCLUDED IN THIS APPROVAL:</b>	<b>DATE APPROVED:</b> August 14, 2007	
Document Name	Version	Date
<b>Protocol:</b>		
Research Proposal	N/A	July 4, 2007
<b>Consent Forms:</b>		
Survey Consent Form	N/A	August 12, 2007
<b>Questionnaire, Questionnaire Cover Letter, Tests:</b>		
Survey Questions	N/A	July 12, 2007
Survey Cover Letter	N/A	July 10, 2007

The application for ethical review and the document(s) listed above have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.

**Approval is issued on behalf of the Behavioural Research Ethics Board  
 and signed electronically by one of the following:**

\_\_\_\_\_  
 Dr. Arminee Kazanjian, Associate Chair  
 Dr. M. Judith Lynam, Associate Chair  
 Dr. Laurie Ford, Associate Chair