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The Key Drivers and Barriers to the Sustainable  
Development of Commercial Property in  
New Zealand

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## **1.0 EXECUTIVE SUMMARY**

### **1.1 Introduction**

Research was conducted into the key drivers and barriers to the sustainable development of commercial property in New Zealand. Existing research has been identified and reviewed. Primary research has been undertaken utilising a combination of an online survey of the commercial property sector using the Qualtrics online survey software and an in person structured interview with a representative of the New Zealand Green Building Council (NZGBC).

An invitation to participate in the online survey along with the survey link was emailed to three hundred professionals representing property investors, developers, contractors, financiers, project managers, property managers and property consultants located in the main business centres of New Zealand, including: Auckland, Wellington and Christchurch. A reminder email was sent one week after the initial email. Overall, the online survey achieved an 18.67 per cent response rate with 12.33 per cent of the sample answering all applicable survey questions.

The online survey was structured in five sections. The first section was designed to capture information about the respondents, their companies and whether they have experience in green building. The second section focussed on those respondents who indicated they have experience in green building and sought to capture their views on a range of issues around their involvement in green building including key drivers and barriers to green building. The third section focussed on those respondents who do not have green building experience, but expressed an interest in becoming involved in green building. The fourth section focussed on those respondents who indicated no interest in green building and sought to understand their reasons. The fifth section sought to capture all respondents views on the capacity of the New Zealand property sector to drive forward the sustainability agenda and what changes and improvements are required to increase green building investment and development in New Zealand's commercial property sector.

Questions in the interview with the NZGBC were structured in two sections. Questions in the first section focussed on the development of the NZGBC as an organisation and sought to establish the key constraints to the NZGBC fulfilling its

stated mission which is to accelerate the development and adoption of market-based green building practices. Questions in the second section collected information on green building activity, the progress of Green Star, the education of property practitioners, the introduction of the National Australian Built Environment Rating System (NABERS) into New Zealand and where the NZGBC sees opportunities to promote green building in New Zealand including the rebuild of the Christchurch Central Business District.

## 1.2 Purpose of this Research

The main aims of this research are to identify and investigate the key drivers and barriers to the sustainable development of commercial property in New Zealand, including the roles played by central government, the NZGBC and practitioners/businesses which operate in New Zealand's commercial property sector.

## 1.3 Research Results

Secondary research highlighted that the NZGBC plays a critical role in the promotion and advancement of green building within New Zealand's commercial property sector. The NZGBC does this primarily by developing and implementing Green Star tools and educating the property sector in the principles and practices of green building.

The interview with the NZGBC revealed an organisation that is dedicated to the advancement of sustainable development in New Zealand, but is somewhat constrained by a lack of funding and the availability of suitably qualified people to fully develop the Green Star suite of rating tools.

The introduction into New Zealand of a NABERS like programme and the opportunity for the NZGBC to provide leadership in sustainable development through the Christchurch rebuild are two areas that the NZGBC considers will significantly increase the profile and growth of green building in New Zealand.

Whilst the NZGBC considers that the general public and central government are only moderately interested in green building, by contrast the NZGBC considers that the commercial property sector is highly interested in green building as evidenced by a 450 strong corporate membership and generally good attendance at green building events.

This view is reinforced by the fact that 75 per cent of respondents to the online survey indicated they have a focus on sustainability within their organisation. Reducing energy consumption and building location being the most common areas of focus.

The key commercial property sector drivers and barriers to sustainable property development in New Zealand, identified by the primary and secondary research, are summarised as follows:

#### Drivers

- Superior building performance including the expectation of operating cost savings (primarily energy).
- Industry rating system (Green Star).
- Market differentiation/competitive advantage.
- Tenant satisfaction and productivity.

#### Barriers

- Market perception that green buildings are more expensive to develop than conventional buildings and the markets unwillingness to pay for the additional costs of sustainable features.
- The market is yet to be fully convinced that the additional cost of green building (including Green Star certification) is supported by the benefits.
- Low client demand.

Whilst respondents to the online survey generally felt that the New Zealand property industry has the knowledge, skills, technology and resources to drive forward the sustainability agenda they also made a number of suggestions towards changes and improvements that are required to increase green building development. These include central and local government intervention through mandatory disclosure of a buildings environmental performance, regulation requiring sustainable features in buildings and government subsidies. Increased industry education, demonstration of the cost versus benefits of green building and a significant reduction in the cost of certification were also suggested.

The research indicates that central government is somewhat supportive of sustainable development as evidenced by the funding available through the Energy Efficiency and

Conservation Authority (EECA), the Ministry of Agriculture and Forestry (MAF) and the Electricity Commission. In particular, it is the EECA that is a key sponsor for the introduction of NABERS to the New Zealand property sector.

#### 1.4 Conclusions and Recommendations

The results of this research indicate that whilst reasonable progress has been made to establish a platform for the advancement of green building in New Zealand's commercial property sector there remain some key issues for the property industry to resolve, the most significant of which is the need to clearly demonstrate to the industry the costs versus benefits of green building.

The industry appears to have a genuine desire to embrace green building and the principles of sustainable development. However, the perception that green buildings are significantly more expensive to develop than conventional buildings is a major barrier. The NZGBC holds the view that there is nil to minimal extra cost for building green, providing green building projects are managed correctly. The NZGBC has acknowledged that the present cost of Green Star certification is a barrier and is presently working to significantly reduce this cost.

It appears that the NZGBC needs to do more to educate the commercial property sector around 'best practice' for the project management of green building projects and to clearly demonstrate that green buildings can be developed at a cost comparative to conventional buildings. Otherwise, in the absence of government intervention through regulation, subsidies or leasing policy requiring government departments to occupy Green Star certified buildings, the progress of green building will be driven more by private sector tenants and owner occupiers who are prepared to pay a premium to occupy a green building.

The Christchurch rebuild will provide a significant opportunity for the promotion and advancement of green building in New Zealand providing the NZGBC can convince the industry on the cost versus benefits of building green. Looking forward, the universities and professional bodies also have an important role to play in educating around the principles and practices of green building.



## 2.0 INTRODUCTION

### 2.1 Background

Many governments and companies today recognise the need to better manage the environment. Worldwide initiatives, such as the Kyoto Protocol (2005) which seeks to address global warming by setting targets for participating countries to reduce their greenhouse gas emissions, are underway in an effort to manage natural resources and the environment in a sustainable manner. It has been estimated that buildings contribute around thirty per cent of greenhouse gas emissions globally (Arnel, 2010)

As stated in a report prepared for the Institute of Real Estate Management, “The built environment thrives on the use of vast amounts of resources, including land, materials, energy and water. In fact, the entire life-cycle of a building is wrought with environmental impacts- from development, to operations, to demolition. Yet opportunities for reducing damage to the environment present themselves throughout the entire process” (Klein, Drucker, & Vizzier, 2009, p. 3).

In 2002, eight countries responded to concerns for the global impact of the property sector on the environment by establishing the World Green Building Council (WorldGBC). A number of other countries have subsequently joined the WorldGBC, including New Zealand. The stated mission of the WorldGBC is to: “accelerate the transformation of the built environment towards sustainability” (World Green Building Council, 2010). Further, a number of developed countries have established or are in the process of establishing their own Green Building Councils. One of the most advanced Green Building Councils is the United States of America Green Building Council (USGBC). The USGBC’s stated mission is to: “transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life” ( USGBC, 2011).

The New Zealand Green Building Council’s (NZGBC) stated mission is to: “accelerate the development and adoption of market-based green building practices” (NZGBC, 2008).

These mission statements are reflective of the general direction and purposes of the green building movement internationally.

Whilst green building is a relatively new concept in New Zealand and is lagging behind the major markets of Australia, United Kingdom, Canada and the USA, research indicates that sustainable buildings will play an important role in New Zealand property portfolios in the future (Myers, Reed, & Robinson, 2008).

Those identified by the writer as being in a position to influence sustainable property development in the New Zealand market place include: the New Zealand Government, the NZGBC, corporate tenants, major developers, institutional property investors and to some extent financiers. A cross-section of views outlined here has been sought from these property market participants through the research process.

## 2.2 Research Objectives & Issues Studied

With the above as background and as outlined in the research proposal (Appendix 1), the main objectives of this research are to identify and investigate the key drivers and barriers to the sustainable development of commercial property in New Zealand.

The key areas that this research seeks to cover are to:

- a. Examine the role of the NZGBC in influencing market participants and policy makers.
- b. Investigate and analyse central government policy for green building in New Zealand as it applies to commercial property.
- c. Obtain the views of commercial property sector participants (including: property investors, developers, managers, contractors, financiers and key consultants) on green building in New Zealand.
- d. Determine appropriate recommendations for the advancement of green building in New Zealand's commercial property sector.

This research will only look at green building in the commercial property sector. Residential property is specifically excluded as it would involve a substantially greater exercise and time frame than is available for this study. It would however be important to undertake a similar study of the residential sector in order to gain a comprehensive view of green building in New Zealand.

It is anticipated that the findings of this research will help to advance green building and will be of particular benefit to those involved in the promotion and practise of

green building in New Zealand including the NZGBC, educational institutions and participants in the commercial property sector in general.

### **3.0 METHODOLOGY**

Research methodology involved the collection and analysis of both primary and secondary data. Primary data has been obtained using a combination of an in person structured interview with a representative of the NZGBC and an online survey of participants in the commercial property sector. Secondary data for the literature review has primarily been obtained by a search of the internet, the NZGBC web site, central government web sites and from selected green building texts.

### **4.0 LITERATURE REVIEW**

#### **4.1 Definition: Sustainable Property Development**

In considering the definition of sustainable development, Sayce & Sundberg (2009) explained that “the term ‘sustainable’ has many connotations and can be regarded as contested territory. Within mainstream literature and government publications it derives significantly from the Brundtland definitions (WECD, 1987), which relates to development or to the concept of triple bottom line (TBL) sustainability following from Elkington’s work (Elkington, 1997). All widely used business and government interpretations now recognise that sustainability is not just a matter of environmental protectionism; it requires a balance between the need to conserve the natural environment with the requirement for a just society and economic survival.” (p. 12).

The goal of sustainable development is to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life, without compromising the quality of life of future generations. It involves balancing and integrating the economic, social and environmental considerations for any policy or decision (Department of Trade and Industry, 2006).

A report prepared by the North American based Commission for Environmental Cooperation defined sustainable property development as “the use of environmentally preferable practices and materials in the design, location, construction, operation and disposal of buildings. It applies to both renovation and retrofitting of existing buildings and construction of new buildings, whether residential or commercial, public or private.” (CEC- Independent Secretariat Reports: Green Building, 2010).

Yudelson (2008) stated that “a green building is a high-performance property that considers and reduces its impact on the environment and human health.” He also stated that “in the commercial and institutional arena, if a building is not rated and certified by an independent third party with an open process for creating and maintaining a rating system, it can’t really be called a green building” (p. 13).

For the purposes of this research, a sustainable commercial property or green building is one that fits the social, environmental and economic balance stated in the Brundtland definition of sustainability, evidenced by the property being certified by an independent third party. In New Zealand’s case this independent third party is the NZGBC which administers the Green Star building rating system.

#### 4.2 New Zealand Green Building Council

The establishment of the NZGBC in July 2005 and the progressive development of the Green Star NZ rating tools have given participants within the New Zealand property industry an initial framework to progress down the path of financing, developing and investing in sustainable buildings.

The NZGBC became a member of the World Green Building Council in 2006, bringing New Zealand into the international green building frame work yet maintaining its own identity.

The purpose of the NZGBC is to accelerate the development and adoption of market-based green building practices. The NZGBC achieves these aims through:

- Setting standards of best practice through the adaptation of the Green Star rating tool.
- Education and training for all areas of the building industry value chain.
- Providing access to networks, information and resources for its members to actively lead the market (NZGBC, 2008).

Green Star NZ is a comprehensive, national, voluntary environmental rating scheme that evaluates the environmental attributes and performance of New Zealand’s buildings using a suite of rating tool kits developed to be applicable to each building type and function.

Currently, for non-residential property, rating tools are available for the following property types/categories:

- Office
- Interiors
- Industrial
- Education

Green Star NZ was developed by the NZGBC in partnership with the building industry to:

- Establish a common language and standard of measurement for green buildings;
- Promote integrated, whole-building design;
- Raise awareness of green building benefits;
- Recognise environmental leadership; and
- Reduce the environmental impact of development (NZGBC, 2008)

Green Star works by evaluating a building against a number of categories that assess the environmental impact that is a direct consequence of a building's site selection, design, construction and maintenance.

The nine categories included within all Green Star rating tools are:

- Management
- Indoor Environment Quality
- Energy
- Transport
- Water
- Materials
- Land Use & Ecology
- Emissions
- Innovation (NZGBC, 2008)

In order to successfully introduce the Green Star tools into the market, the NZGBC established a practitioner accreditation process which requires those seeking to become a Green Star practitioner or accredited professional to complete an NZGBC

sponsored training course. Those who successfully complete the courses and become registered can participate in the Green Star NZ Certification process.

Whilst the NZGBC continues to work on rating tool design and development and to promote the sustainable development of New Zealand's property sector, to date rating tools are only available for the design and built stages of a buildings life cycle within the above categories. Tools have yet to be developed for other property categories including retail and tourism properties.

An example of the NZGBC's current efforts to promote sustainable development more widely in the commercial property sector is an initiative that the NZGBC has worked on with the Christchurch City Council. This initiative includes the development of a new building rating tool specifically for the Christchurch recovery efforts called BASE (Building a Sustainable Environment). BASE is a simple, introductory-level green building assessment for the Christchurch Central City rebuild. The Central City Plan for Christchurch proposes that new office, retail, apartments and mixed use buildings within the Central City must achieve a 'Pass' score under BASE (NZGBC, 2008).

This initiative recognises that there are costs associated with Green Star certification which will not be appropriate for smaller buildings in the Christchurch context. The tool has been developed as a separate, but complementary building assessment offering to the NZGBC's existing Green Star tools (NZGBC, 2008).

#### 4.3 New Zealand Government

According to Nelson (2008), "the public sector influences property markets in at least three key ways:

- Regulation of what and how buildings can be constructed;
- Taxation and environmental regulation that alter market dynamics; And,
- The construction and occupancy of their own facilities.

In addition, governments play an indirect role of increasing tenant and developer demand and by raising awareness and demonstrating proof of concept. Often governments commission the earliest green buildings in a locality, providing the local market with the first tangible experience with sustainable building practices." (p.11).

The New Zealand Government's principal policy response to climate change is the New Zealand Emissions Trading Scheme (NZ ETS). "In various sectors (such as energy, forestry and agriculture), the government is also undertaking a range of other policies and measures that are contributing to reducing greenhouse gas emissions" (The Kyoto Protocol Ministry for the Environment, 2010).

A 2009 Ministry for the Environment (MFE) report entitled 'New Zealand's Fifth National Communication under the United Nations Framework Convention on Climate Change' identifies 'other policies and measures' applicable to the commercial property sector. These include programmes run by the EECA to support businesses to become more energy efficient; financial assistance through the Electricity Commission to improve electricity efficiency; and initiatives developed by MAF to increase the use of wood as a construction material as MAF sponsored research shows that wood-based building products have a lower greenhouse gas footprint than other construction materials (Ministry for the Environment, 2011)2011).

Examples of initiatives developed by MAF to increase the use of wood as a construction material include:

- The provision of seed funding in the form of two professorship positions to teach and research the use of timber in building design, and to reduce barriers to the increased use of wood as a construction material.
- The funding of a design competition and support for the construction of a multi-storey timber-based building that will be available as a demonstration building for teaching purposes.
- The funding of demonstration buildings that showcase the construction of wooden sustainable buildings. The initiative includes partial funding to construct in wood up to two government buildings that would ordinarily be built in concrete and steel (Ministry for the Environment, 2011).

Brief details of the outcomes of these initiatives are outlined below:

Professorships:

An excellence in wood design programme was set up under the Forest Industry Development Agenda (FIDA). The FIDA is a relationship between the forest and wood processing industry and the New Zealand Government. It provides a means

for the Government and the industry to develop a strategic approach for the industry's future growth (New Zealand Government, 2005).

The design programme (which ended December 2011) involved two professorships of timber design. Funds were split between Canterbury University (Professor Andy Buchanan) and Auckland University (Professor Pierre Quenneville). Professor Quenneville's expertise is in the area of timber connections (bolts and dowels). Professor Buchanan is involved in a research project, the objective being: "to ensure that new multi-storey timber buildings optimise all the sustainability benefits of wood, including low energy, low CO2 emissions and low life cycle costs" (University of Canterbury, 2012) .

#### Design and Demonstration Project:

This project involved a collaborative research programme, led by the University of Canterbury, for MAF between March 2010 and June 2011 on the construction of a new three storey Arts and Media building at the Nelson Marlborough Institute of Technology. The research provides information on the cost and time of construction of a 'real' open-plan, multi-storey building which uses engineered timber as the main structural material and compares this to similar virtual designs in concrete and steel (John, 2011, p. 3)

Research results indicated that the timber and steel buildings can be considered to have the same construction costs and similar build times whereas the concrete building was 4 per cent cheaper to build but has a longer build time (16 days).

The EECA provides information on new technologies and energy management and one on one support for energy-intensive businesses. Grant funding is available for energy and design audits and also for new or under-utilised technology improvements. Up to 40 per cent of the total project cost is available (up to \$100,000), or up to 75 per cent of the cost of a feasibility study (up to \$10,000) for new technologies. Examples of technologies funded include fans and boiler controls, bio-digesters and heat recovery systems (Ministry for the Environment, 2011).



The EECA is also the principal sponsor for the introduction and use of NABERS in New Zealand and has negotiated a license from the Australian Government for an initial term of five years with an option to extend for a further five years . The EECA is seeking to partner with the New Zealand property industry to administer the NABERS scheme in New Zealand and to this end is presently seeking proposals (RFP) from property sector participants for both the administration of NABERS and the adaptation of NABERS to suit New Zealand market and environmental conditions. The EECA expects to formally launch NABERS in New Zealand by December 2012.

A brief description of NABERS is as follows:

“NABERS is an environmental rating system, developed in Australia, which measures an existing building's environmental performance during operation. NABERS rates a building on the basis of its measured operational impacts in categories such as energy, water, waste and indoor environment” ( NABERS, 2010).

Whilst the EECA intends to grow NABERS in New Zealand over time the initial RFP is for NABERS Office Energy only. The EECA advises that NABERS for wider green aspects (e.g. water) and building types (e.g. hotels) will be discussed with stakeholders as part of the wider programme introduction process and as funding becomes available (Energy Efficiency and Conservation Authority) .

The Electricity Commission offers financial assistance to businesses in the commercial sector to improve their electricity efficiency. Businesses can apply for part-funding from the Electricity Commission for electricity efficiency projects where there is a current barrier preventing such projects from proceeding. These include efficiency projects for commercial buildings. Projects funded to date include electricity efficiency enhancements in several hospitals, office buildings, a tertiary educational institute, and retail outlets. These projects target efficiency measures such as upgrades of building management systems, lighting replacements, replacement of inefficient chiller systems, and installation of monitoring and targeting systems (Ministry for the Environment, 2011).

In addition to the specific government policies and measures outlined above, the general controls of building and environmental legislation, such as the Building Act

2004 and Resource Management Act 1991, provide a broad framework to encourage sustainable development of the commercial property sector.

In 2008 the government of the day decided to signal its desire for a sustainable commercial property sector by introducing a leasing policy requiring all government departments wishing to lease Central Business District commercial office space to occupy a 5 Green Star rated building. Pinckard (Appendix 1) noted that this policy was rescinded in early 2009 due to a change of government in November 2008 and subsequent change of government policy in this area. Had this policy been maintained, it is likely over time to have provided strong encouragement to the commercial property sector to move in the direction of sustainable development, particularly in the Wellington market where government is a significant occupier of commercial space.

According to Pinckard (Appendix 1), “all public service departments are expected to take practical action to reduce their impacts on the environment, where it makes economic sense to do so. This includes taking a ‘whole of life’ approach when procuring goods and services; minimising waste sent to landfill; using resources more efficiently (including energy and water), improving planning, design and construction when commissioning and operating buildings and adopting transport policies that minimise environmental impacts.”

In theory, this policy does not preclude government departments from occupying Green Star certified commercial buildings. It is up to the commercial property sector to demonstrate the environmental and economic advantages of green commercial buildings over non-green commercial buildings in order to continue to secure lease commitments from government departments.

#### 4.4 Drivers and Barriers to Green Building

An earlier study of the New Zealand property sector undertaken by Myers, Reed, & Robinson (2008), found that “the perception of the investor and developer markets in New Zealand was that sustainable buildings will play an important role in property portfolios in the future. Although there is uncertainty about the value and market for sustainable buildings at the present, investor optimism was clearly identified. However, the level of uptake and investment in sustainable buildings would be

accelerated if evidence for the financial case for sustainable buildings was proven” (p. 318).

There is a lack of research in New Zealand around the financial performance of green buildings compared to conventional buildings. However, an Australian Property Institute (API) research report authored by Newell, MacFarlane, & Kok (2011) identified the added value office market premium of the 5 Star NABERS energy rating and the Green Star rating, as well as the discounts often seen for the lower NABERS energy ratings. The report found that the 5 Star NABERS energy rating delivered a 9 per cent green premium in value and the 3-4.5 star NABERS energy ratings delivered a 2-3 per cent green premium in value. The Green Star rating showed a green premium in value of 12 per cent.

Myers, Reed, & Robinson, (2008) also stated that “in order for sustainability to gain industry-wide acceptance (in New Zealand), it is critical that the majority of building owners and investors are assured of depth in the market, as well as the financial certainty and viability of sustainable buildings” (p 298). Clearly, the case for sustainable development in New Zealand would be greatly enhanced should the results of a study around the financial performance of green buildings be consistent with those of the API study.

A corollary of the financial performance of green buildings identified in the literature is the issue of the cost of green buildings compared to conventional buildings. According to Davis Langdon (2007) “there is no significant difference in average costs for green buildings as compared to non-green buildings” (p 3).

The literature indicates that some market practitioners do not hold to this view. According to Bond (2010) “one argument commonly put forward against ‘going green’ is that it costs more than it would to build a comparative conventionally designed building” (p 6). This view is reinforced by research undertaken in Melbourne, Australia, by Ang & Wilkinson (2008), who explained that “developers and the public believe that (ecologically sustainable development) ESD developments cost more with uncertain value added; this is a state that is compounded by inconsistent estimates of cost premiums and a lack of Australian based cost data”(p 4).

This proposition is expanded on by Taylor Wessing LLP (2009), who noted that “the biggest impediment to the development of commercially viable sustainable buildings in the United Kingdom is thought to lie in the extra cost to developers and/or tenants. Yet end users believe that the bigger issue is the focus on short-term build cost rather than whole life building cost and suitability for sustainable and practicable occupation” (p. 13).

According to Bond (2010), this issue of ‘split incentives’ between landlord’s and tenant’s “where the landlords are investing in green buildings but the tenants are benefiting through reduced energy and water costs, greater productivity, etc.”, has been countered by gross leases being structured “to ensure the benefit of the efficiencies in outgoings revert to the building owner/investor ” (p. 6).

The literature identifies the development of green rating schemes such as Green Star and NABERS as drivers of green building. Bond (2010) found that a key factor in assessing sustainability in commercial property in Australia is the development of green rating schemes such as Green Star and NABERS. However, the cost to achieve Green Star certification (Bond, 2010) , and the increased project duration due to lengthy design reviews (Ang & Wilkinson, 2008) have been a barrier to the uptake of green rating schemes.

Internationally, government legislation and regulation is seen as a key driver of green building. According to Taylor Wessing LLP (2009), “a number of regulatory controls, policy initiatives and measures (both incentives and disincentives)” are used in the United Kingdom to encourage the property sector towards sustainability. This view is reinforced by Ang & Wilkinson (2008) who stated that “regulation is the tool government uses to drive the market and it is gearing it towards higher building and environmental performance” (p. 5). In addition, according to Bond (2010), “in Australia, the government and other public-sector bodies are leading by their examples in their briefs for sustainable buildings” (p. 5).

Large progressive corporations in the private sector are also a leading driver for green buildings (Bond, 2010, p. 5). Many companies today have a strong environmental focus and sustainability policy at the core of their business which leads them to occupy a green building. Occupier benefits of increased productivity, staff attraction and

retention, reduced sick leave and absenteeism are identified in the literature as some of the benefits of occupying a green building. In commenting on this, Bond (2010) stated that “ according to a report by the Green Building Council of Australia (2008c) tenants have become less focussed on savings in operating costs and are placing a higher value on the intangible benefits such as productivity, staff attraction and retention, reduced sick leave and absenteeism.” Productivity studies are an increasingly important part of ensuring ESD principles actually work and also provide the business case for going green (Bond, 2010, p. 12).

The literature identifies other drivers of green building as enhanced marketability and market differentiation, reduced risk of obsolescence, improved public profile and community relations and reduced maintenance costs. Smith & Baird (2007) found that ‘rising energy costs’ is one of the primary drivers for sustainable buildings in New Zealand. Although Bond (2010) found that “from a tenant perspective, location and rent were said to be more important to most tenants than environmental, or energy saving features” (p. 15).

Other barriers to green building identified in the literature include a lack of education, awareness and understanding by the public of sustainable development as it relates to property. Wilkinson and Reed, 2007 ( as reported in Ang & Wilkinson 2008) found that “few people understand the term SD (RMIT,2006) and this is due to the broad subject area and the complexity of the issue” (p 5). Further, Bond (2010) found that a lack of skilled facility managers is an ongoing and mounting issue, “ especially with more high performance buildings coming on stream” (p. 16).

## **5.0 SURVEYS/SAMPLING**

Having analysed and discussed the secondary research, our attention now turns to a review and analysis of the primary data collected through the in person interview conducted with the NZGBC and the online survey of the commercial property sector. The approach to these surveys is now discussed under the headings of sampling design and data collection methods.

### **5.1 Sampling Design**

The in person interview with a representative of the NZGBC was relatively straight forward to organise due to the NZGBC’s strong interest in this study. The writers

initial expectation based on preliminary discussions with the NZGBC was to hold a joint interview with the NZGBC's Chief Executive Officer – Ms Alex Cutler and the Director Business and Technical- Ms Rohan Bush. On the day of the interview, the writer was advised that Ms Cutler would not be able to attend the interview and that Ms Bush would represent the NZGBC. Given Ms Bush's position in the NZGBC and by virtue of her being nominated by the NZGBC's senior management to represent the NZGBC in the interview, Ms Bush's answers are considered by the writer to be representative of the NZGBC's position.

The on-line survey of the commercial property sector was somewhat more challenging to organise. In this regard, a total survey sample size of three hundred commercial property sector professionals and executives was compiled from various professional registers and web sites, including the NZGBC web site, the Property Institute of New Zealand membership directory, the Property Council of New Zealand membership directory and the New Zealand Institute of Architects directory. These sources were considered by the writer to provide a reasonably comprehensive list of those individuals and organisations presently active in New Zealand's commercial property sector and likely to provide constructive feedback on green building. This sample was represented by property investors, property developers, property managers, architects, building contractors, financiers, project managers and property consultants.

## 5.2 Data Collection Methods

### 5.2.1 New Zealand Green Building Council

The in person interview with Ms Bush was conducted using a questionnaire (Appendix 2) and took one hour to complete. Whilst the questionnaire was pre-approved by the NZGBC, there was a degree of flexibility in the interview process to allow for questions to be expanded on according to the responses received.

### 5.2.2 Commercial Property Sector

An online survey of the commercial property sector was conducted utilising the Qualtrics online survey software. Due to the length of the overall survey and to encourage respondents to answer all applicable questions, the survey was structured in two parts appended as '2011af' and '2011bf' (Appendix 2). Section 2011af targeted developers, investors and managers and section 2011bf targeted the balance of the sample. With the exception of just a few questions which reflected the particular

sample segment, the questions in section 2011bf mirror section 2011af. Therefore, it was straight forward to combine and analyse the survey results.

The survey was structured in five sections. The first section was designed to capture information about the respondents, their companies and whether they have experience in green building. The second section focussed on those respondents who indicated they have experience in green building and sought to capture their views on a range of issues around their involvement in green building including key drivers and barriers to green building. The third section focussed on those respondents who do not have green building experience, but expressed an interest in becoming involved in green building. The fourth section focussed on those respondents who indicated no interest in green building and sought to understand their reasons. The fifth section sought to capture all respondents views on the capacity of the New Zealand property sector to drive forward the sustainability agenda and what changes and improvements are required to increase green building investment and development in New Zealand's commercial property sector.

A survey link along with an explanation of the purpose of the survey was emailed to each person in the sample, inviting them to participate. A follow up email was sent one week from the initial email. The level of response to the online survey is discussed in 6.2 below.

Responses from the survey were downloaded and analysed using Excel. Numerical results are expressed as either an average of the scores for each category for a particular question (the lower the score the more significant) or as a percentage of the total responses received for a particular question.

## **6.0 RESULTS**

### **6.1 New Zealand Green Building Council**

As indicated, the interview with the NZGBC was conducted with its representative, Ms Rohan Bush. Questions were structured in two sections and were designed to obtain input from the NZGBC in seven key areas including:

- Where the NZGBC is in its development as an organisation.
- The current view of green building within the public and private sectors.

- The overall level of interest in green building.
- Drivers and barriers to green building.
- The status of the Green Star certification system.
- Education of property practitioners on green building.
- Christchurch Rebuild.

The NZGBC's view on each of these areas is now briefly discussed.

#### 6.1.1 Development of the Organisation

The NZGBC has been in existence for over six years and has grown considerably during that time. There are now 13 full time staff equivalents employed by the NZGBC and the organisation's work programme now addresses residential as well as commercial buildings. The NZGBC's forecast optimum staffing level is twenty full time equivalents.

The NZGBC continues to attract a large number of organisations as members and enjoys a high level of industry support. The bulk of the NZGBC's funding comes from corporate membership subscriptions, sponsorships, running green building events, training programmes and through administering the Green Star certification system. Approximately one third of the NZGBC's income comes from membership subscriptions, a further third from running education and training programmes and the final third from running events and managing special projects.

Whilst the NZGBC has progressed in its organisational development and in gaining industry support, until such time as the NZGBC is fully resourced (including financing and staffing levels) to allow for further tools development the industry as a whole will be somewhat hampered in its uptake of green building.

#### 6.1.2 Current View of Green Building

When asked, "How would you characterise the current state of the green building industry in NZ?", the answer was "Developing" as opposed to "In its infancy", "Well developed or Fully developed". The reasons given for this answer were that the existing buildings performance tool and NABERS are not in place. Also, other tools such as for retail property are not in place. The NZGBC would consider the green



building industry to be “Well developed” when these tools are in place and there is strong industry demand.

#### 6.1.3 Level of Interest in Green Building

The NZGBC considers that the public are “Moderately interested” in green building and observed that the media often picks up on events such as a new Green Star rated building being completed or a green building event being held. Notwithstanding this, the NZGBC believes that more education of the public is required around green building.

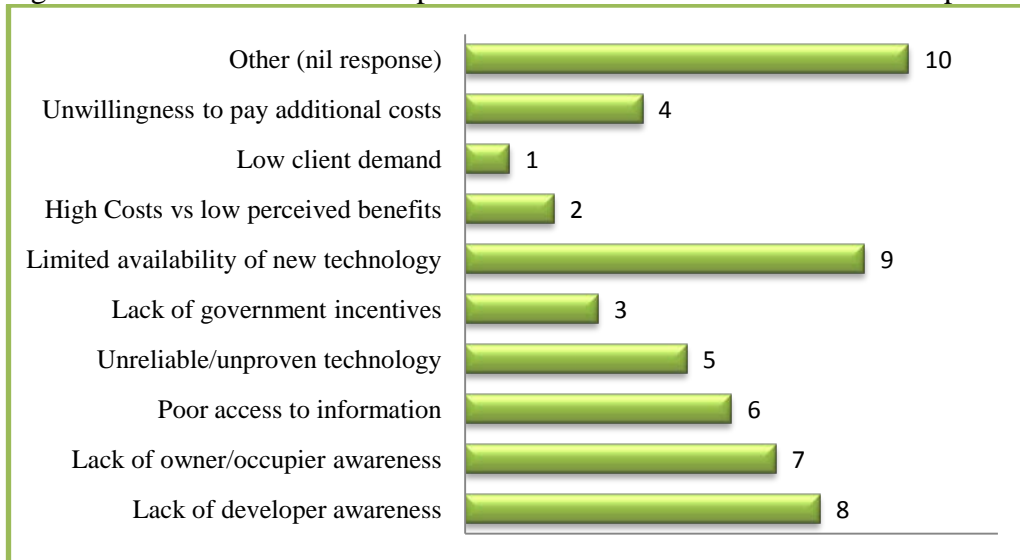
The NZGBC also considers that the government is only moderately interested in green building and that whilst there is some Ministerial support, green building is not a top priority for the present government. It was noted that there is some project based government funding available.

In comparison to its views on the government and public’s interest in green building, the NZGBC considers that the commercial property sector is very interested in green building. The justification for this view includes the fact that the NZGBC has a registered membership of 450 businesses and organisations, generally good attendances at events and a good uptake of Green Star, as reported by the NZGBC.

#### 6.1.4 Drivers and Barriers to Green Building

Figure 1.0 below records the responses provided by the NZGBC’s representative (Ms Bush) when asked to rank various answers (from 1 to 10, 1 being most significant) to the question of what prevents the incorporation of sustainable features in developments.

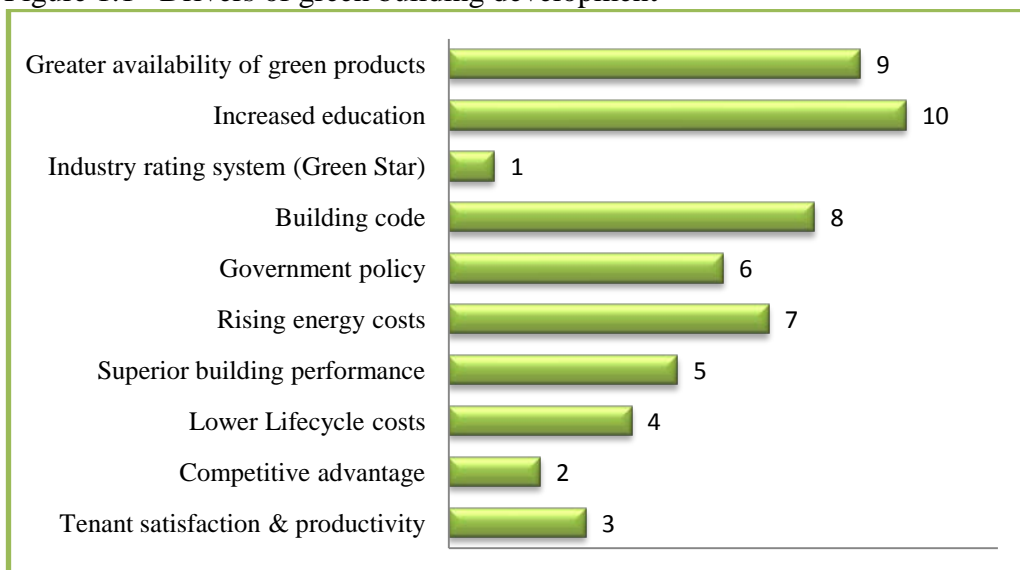
Figure 1.0 Barriers to the incorporation of sustainable features in developments



The above data leads one to the conclusion that whilst the most significant barrier identified by the NZGBC is “Low client demand”, the underlying cause of this low demand is the issue of whether the end user, be it a tenant or owner occupier, can justify the additional cost of achieving a green building compared to a conventional building. It also suggests that a lack of government incentives is a significant barrier to green building development, implying that increased government incentives would help to overcome the issue of cost.

Figure 1.1 below provides the responses given by the NZGBC when asked to rank the drivers of green building development (1 being most significant).

Figure 1.1 Drivers of green building development



Perhaps not surprisingly, the NZGBC identified the most significant driver as the Green Star rating system that it promotes. Beyond this, the rankings given by the NZGBC to this question imply that market related issues such as ‘competitive advantage’ and ‘tenant satisfaction and productivity’ are more significant drivers of green building than ‘government policy’ and regulatory controls such as the building code.

#### 6.1.5 Status of Green Star

The NZGBC licenses Green Star from the Green Building Council of Australia (GBCA) and has to obtain approval from the GBCA for changes to Green Star in New Zealand. Whilst there are significant cost savings to the NZGBC by effectively ‘piggy backing’ on the GBCA, the NZGBC does not completely have a free hand to change Green Star in New Zealand.

Data obtained directly from the NZGBC around the number of registrations for green building certifications has been collated and analysed as shown in table 1.0 below. These figures tend to reinforce the NZGBC’s view on the status of the Green Star certification system.

Table 1.0 Green Star registrations

Tool	New Buildings	Existing Buildings (Retrofit)	Total Registered	Percentage
Industrial 2009	4	0	4	4%
Office 2009	5	1	6	6%
Education 2009	14	2	16	17%
Sub-total	23	3	26	N/A
Office Interiors 2009	N/A	N/A	13	N/A
Office v1	54	14	68	72%
Total (excl. Interiors)	77	17	94	100%

It is noted that 78 per cent of registered projects intending to qualify for a Green Star rating are for office space, indicating reasonably strong support from the commercial office sector for green building. Approximately 82 per cent of all registrations to date have been for new buildings as opposed to 18 per cent for existing buildings.

Data was also obtained from the NZGBC around the number of buildings that have been certified either with a Green Star design or built rating. Table 1.1 below indicates that the majority (67 per cent) of Green Star certifications have been awarded for newly constructed office buildings. Over all, around 78 per cent of all Green Star certifications awarded to date have been for new buildings with 22 per cent for existing buildings.

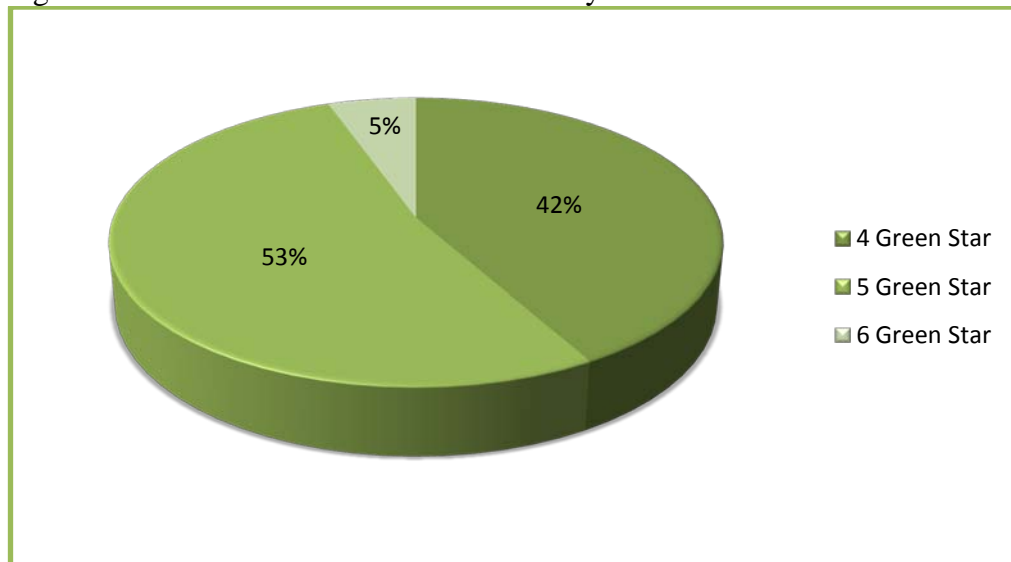
Table 1.1 Green Star certifications

Tool	4 Green Stars	5 Green Stars	6 Green Stars	New Bldgs.	Existing Bldgs. (Retrofit)	Total
Industrial Design 2009	1	0	0	1	0	1
Industrial Built 2009	0	0	0	0	0	0
Office Design 2009	0	1	0	0	1	1
Office Built 2009	0	0	0	0	0	0
Education Design 2009	0	5	0	5	0	5
Education Built 2009	0	0	0	0	0	0
Sub-Total	1	6	0	6	1	7
Interior 2009	1	3	1	N/A	N/A	5
Office V1	22	23	3	37	11	48
Total (excl. Interiors)	23	29	3	43	12	55

The data around Green Star ratings in table 1.1 indicates that 5 Green Stars is achieved more often than 4 or 6 Green Stars, an interesting statistic when viewed in conjunction with the responses by the NZGBC and market participants to the questions around the cost premium for green buildings. This statistic indicates that the market has an appetite for a 5 Green Star office product notwithstanding that a cost premium may apply in comparison to a conventional building or a 4 Green Star product.

This relativity and greater popularity of 5 Green Stars versus 4 and 6 Green Stars is graphically demonstrated by figure 1.2 below. It can be seen that around 53 per cent of buildings awarded a Green Star certification are for 5 Green Star projects.

Figure 1.2 Green Star certifications- relativity

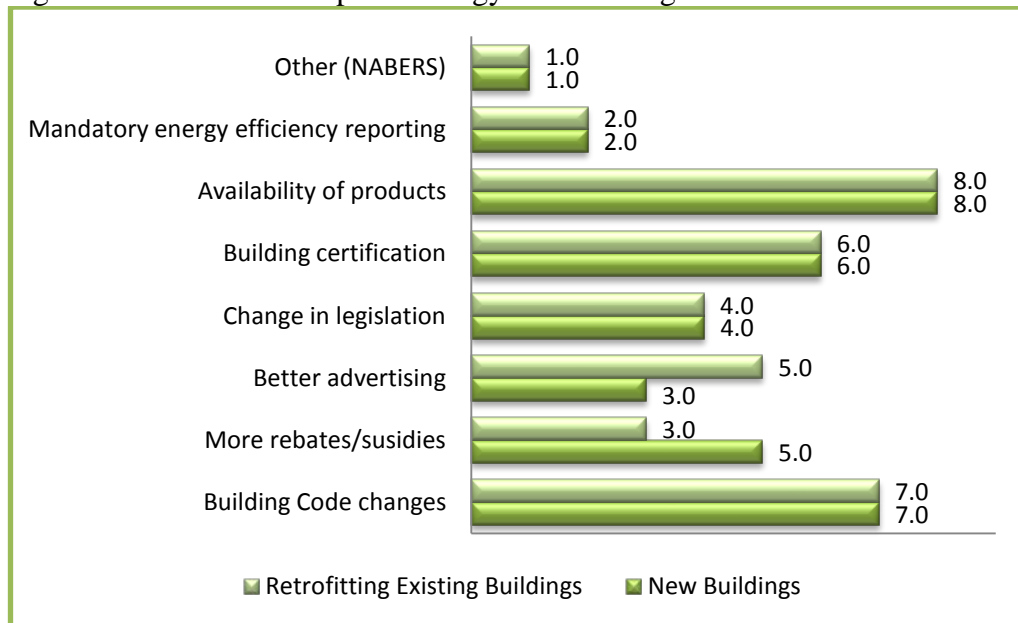


When asked to give an opinion on the cost premium of green buildings versus non green buildings for 4, 5 and 6 Green Stars, the NZGBC advised that no comprehensive research had yet been undertaken to test this in New Zealand, but that international research indicates that if a project is managed correctly there is the potential for no cost premium to achieve a 4 or 5 Green Star certification. However, when not managed correctly a 4 Green Star building can cost up to 5 percent more than a non-green building and a 5 Green Star building can cost up to 10 percent more than a non-green building. A 6 green Star building, if managed correctly, has the potential to attract a premium of around 5 per cent. If not managed correctly, a 6 Green Star building can cost up to 10 per cent more than a non-green building.

The NZGBC considers that one of the main barriers to the commercial property sectors uptake of the Green Star certification system is the cost of obtaining certification. To address this issue, the NZGBC is planning a tool review with the objective of reducing the cost of obtaining certification by 20 to 30 per cent.

Figure 1.3 below summarises the response by the NZGBC to the question around what can be done to improve the uptake and incorporation of energy/water saving (or generating) features into the design of new buildings and the retrofitting of existing buildings (1 being most important).

Figure 1.3 Actions to improve energy/water savings



It is not surprising that the NZGBC in the main has given the same ranking to each answer for both new and existing buildings. However, it is interesting to note that the NZGBC regards the introduction of a performance based rating system such as NABERS as the most important thing that can be done to improve the uptake and incorporation of energy/water saving features into new or existing buildings. That signals that there is presently a lack of tools available in the New Zealand market to properly rate the performance of commercial buildings in the area of energy and water consumption.

Further, the NZGBC does not believe that buildings need to recertify their Design and/or Built rating. Rather it is more appropriate that the operational performance of these buildings is measured and certified through a performance tool, such as NABERS. To this end, the NZGBC has been working with the EECA to bring NABERS into New Zealand as a joint industry/government initiative.

Whilst the NZGBC would like to have developed its own Green Star building performance tool (close to a NABERS equivalent), due to funding restrictions and the EECA being keen on introducing NABERS into the New Zealand property market, it is likely that NABERS will become the property industry benchmark in New Zealand for measuring the environmental performance of commercial buildings.

The NZGBC believes that the introduction of NABERS into the New Zealand market will unlock considerable opportunity to increase green building development and

investment in New Zealand's commercial property sector. Specifically, the NZGBC considers that NABERS will provide the following opportunities:

- Benchmarking of individual buildings and portfolios.
- Increased ability to improve the environmental performance of a building on a measured basis.
- Better level of information available for existing and/or prospective tenants of a building.

In commenting on the strengths and weaknesses of NABERS, the NZGBC noted that NABERS is relatively simple and cost effective to manage. It is also highly flexible in that it can be applied to a 'base building', individual tenancy or entire building. The main weakness of NABERS that the NZGBC identified is that it is not a holistic approach to the assessment of a buildings environmental performance. Ideally, the NZGBC would like to see a Green Star design, built and performance based system in place for the design and ongoing management of green rated commercial buildings in New Zealand.

#### 6.1.6 Education of Property Practitioners

Whilst the NZGBC runs training programmes for those who wish to become qualified practitioners and/or accredited professionals in the application of Green Star, the NZGBC considers there is also a need for increased education of asset and property managers in the management of Green Star certified commercial property.

The NZGBC is working with the Universities, Technical Institutes and the Property Institute of New Zealand to ensure all relevant professions have access to quality education on green buildings.

#### 6.1.7 Christchurch Rebuild

The final question put to the NZGBC was in relation to the opportunities that the rebuild of the Christchurch CBD presents for the NZGBC to promote green building in New Zealand. The NZGBC recognises that the Christchurch rebuild provides an opportunity for it to demonstrate leadership and to facilitate property industry and community discussion around sustainability of the built environment. The NZGBC's Board sees the Christchurch rebuild as an opportunity to make greater progress in advancing the sustainability of New Zealand's built environment.

## 6.2 Commercial Property Sector

As noted earlier, the industry survey involved an online survey of some three hundred New Zealand based professionals representing a wide range of companies, many of whom are key players in New Zealand's commercial property sector. Survey participants included: investors, developers, asset and property managers, building contractors, architects and property consultants. Invitations were sent to financiers and project managers. However, for reasons not disclosed, they chose not to participate.

Figure 2.0 below provides a breakdown of the overall sample and indicates on a percentage basis the categories of property sector participants invited to take part in the survey.

Figure 2.0 Analysis of Sample

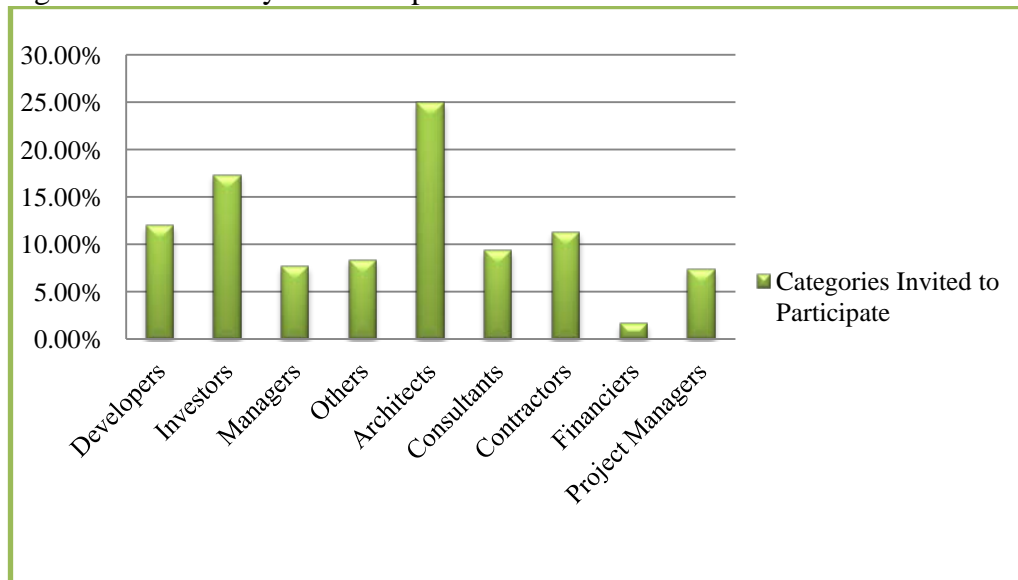
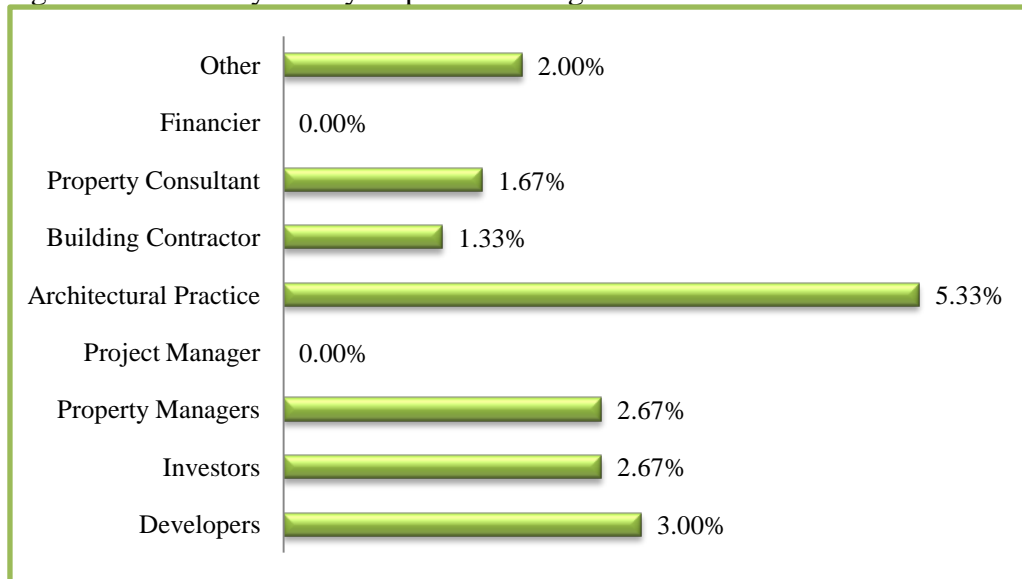


Figure 2.1 below provides a breakdown by category on a percentage basis of the total sample of those that elected to participate in the survey. The 'Other' category primarily represents corporate real estate managers and occupiers.



Figure 2.1 Industry survey respondent categories

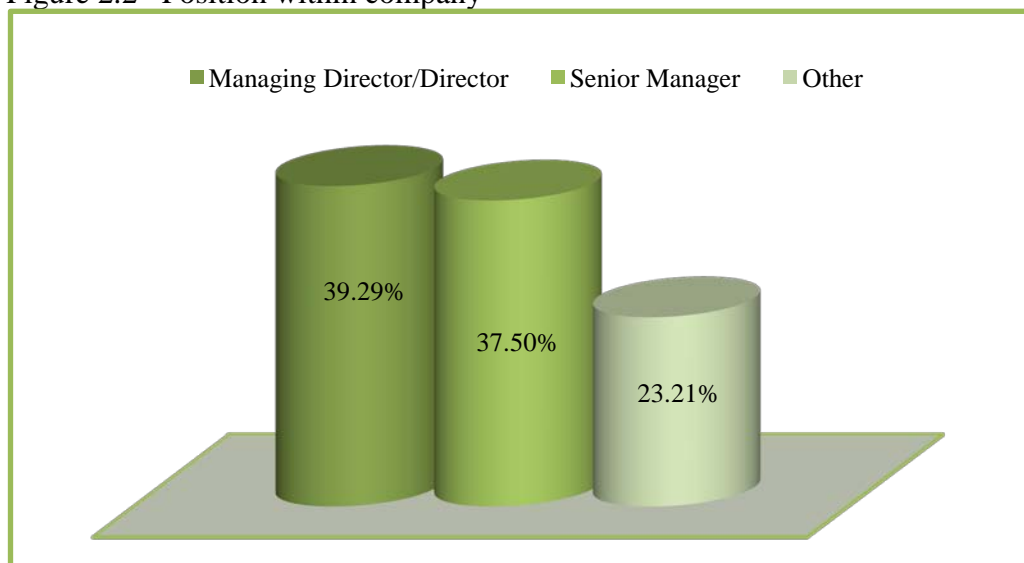


Of the three hundred professionals invited to participate, fifty six actually participated representing 18.67 per cent of the total sample. Of the fifty six who participated, thirty seven answered all applicable survey questions, representing 12.33 per cent of the sample.

### 6.2.1 Company Information

Figure 2.2 below indicates that close to 77 per cent of those who participated in the survey hold a senior management position in their organisation. The 'other' category represents mid tier property managers and property specialists.

Figure 2.2 Position within company



The gender profile of the respondents was 89 per cent male and 11 per cent female. Figure 2.3 below indicates that the operational location of the respondents is heavily weighted towards Auckland, which is appropriate as it is by far New Zealand’s largest commercial property market. Figure 2.4 indicates that the spread of categories within which the respondents operate is strongly weighted towards office, industrial and retail property. The ‘Other’ category represents hotels, motels and retirement villages.

Figure 2.3 Operational location

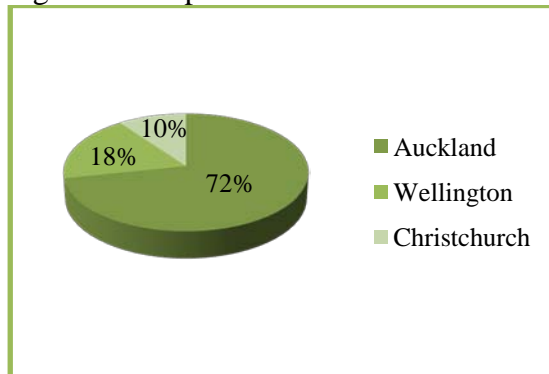
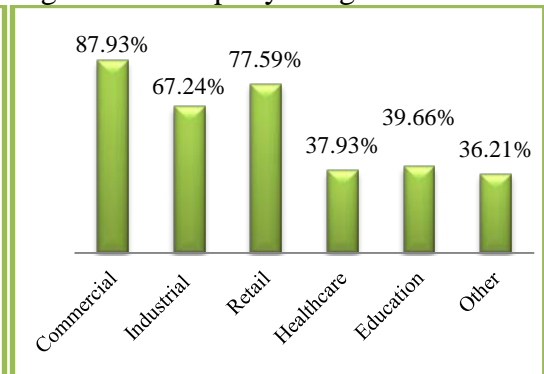
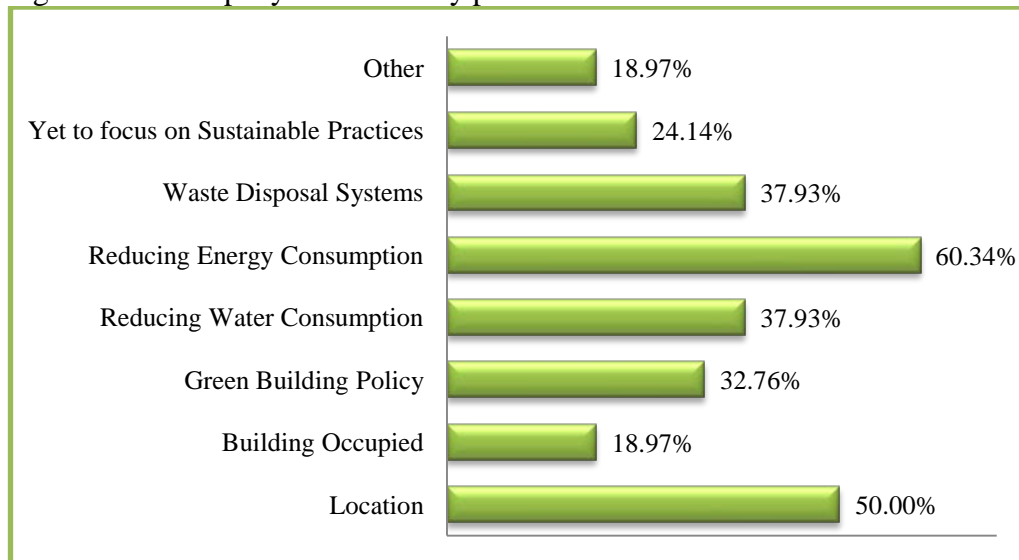


Figure 2.4 Property categories



The sustainability profile of the respondent companies is represented by Figure 2.5 below. Whilst it is perhaps not surprising that reducing energy consumption has a far greater focus amongst the respondents (60.34 per cent) than the other categories, it is interesting to note that ‘location’ also ranks highly, implying that ease of access to public transportation and other services is of high importance to many of the respondent group. It is also worth noting that nearly one quarter of respondents are yet to focus on sustainable practices within their organisation. The ‘Other’ category in figure 2.5 includes items such as ‘we encourage cycling to work’ and ‘Green Star practitioner’.

Figure 2.5 Company sustainability profile



### 6.2.2 Green Building Involvement

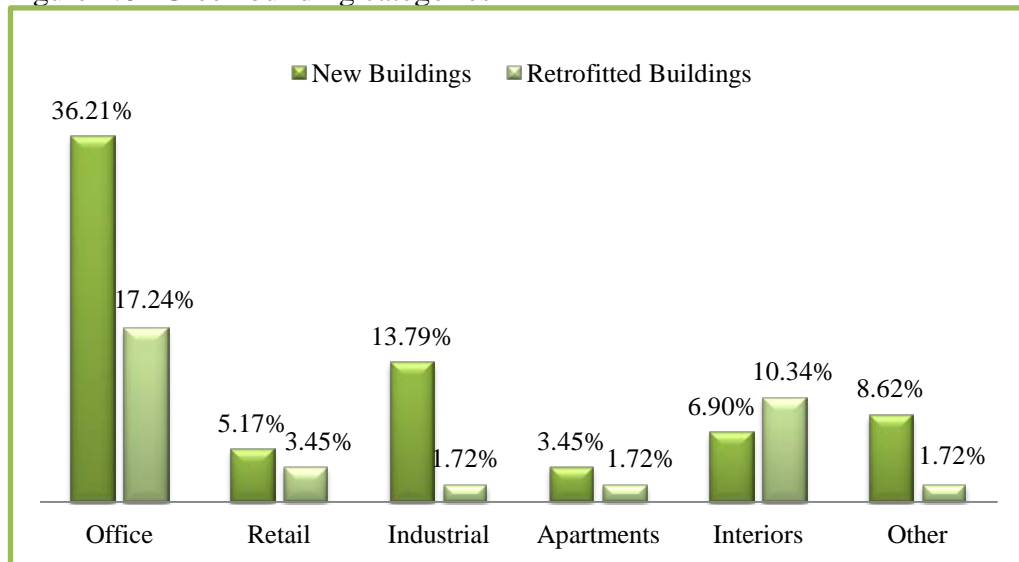
When asked to indicate whether they had participated in green building, 58 per cent of respondents indicated that they have participated in green building either as an investor, manager, developer, building contractor or consultant in the delivery of a green building project. Of the remaining 42 per cent of respondents, 67 per cent said that they intended to become involved in green building in the future, leaving 14 percent of respondents indicating that they do not plan to become involved in green building. Therefore, overall the respondent group to this survey has indicated a high level of interest in green building.

Feedback from those respondents who indicated that they either have had no involvement in green building to date or have no interest in green building at all is covered later in this report. The responses on green building from those who are involved in green building are now considered.

This part of the respondent group has been involved in green building for an average of four years. The average number of new buildings undertaken, managed or owned by this group is four and retrofitted buildings, two. Whilst these statistics indicate that the respondent group is relatively light on green building experience, they are put in perspective when one considers that, as indicated earlier, the NZGBC was only established in July 2005.

Figure 2.6 indicates that the primary categories for new green buildings to date have been the office and industrial sectors. Retrofitted green building has primarily been the domain of the office sector. The ‘Other’ category includes medical, community and educational facilities.

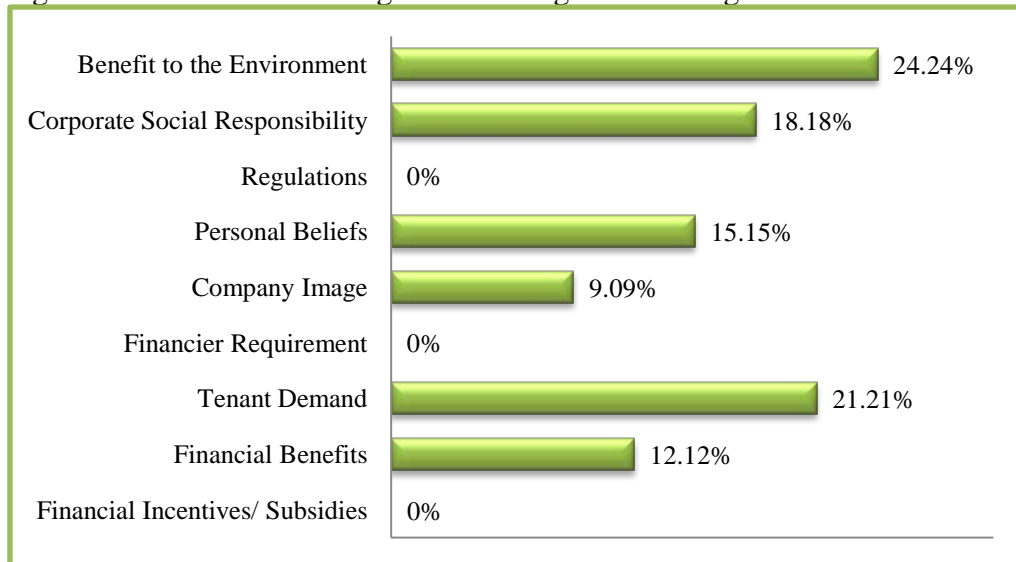
Figure 2.6 Green building categories



### 6.2.3 Drivers and Barriers to Green Building

When asked to indicate their reasons for being involved in green building, the majority (24 per cent) of respondents advised that ‘benefit to the environment’ is the primary driver, closely followed by ‘tenant demand’ (21.21 per cent). Financial benefits ranked significantly lower at 12.12 per cent. (See figure 2.7 below for the full response). These results would indicate that the commercial property sector sees green building as offering a balance between the commercial and environmental aspects of commercial property investment and development.

Figure 2.7 Reasons for being involved in green building



The results in figure 2.8 indicate that by far the greatest area of demand for green building comes from client demand as opposed to being initiated by survey respondents.

Figure 2.8 Demand for green building

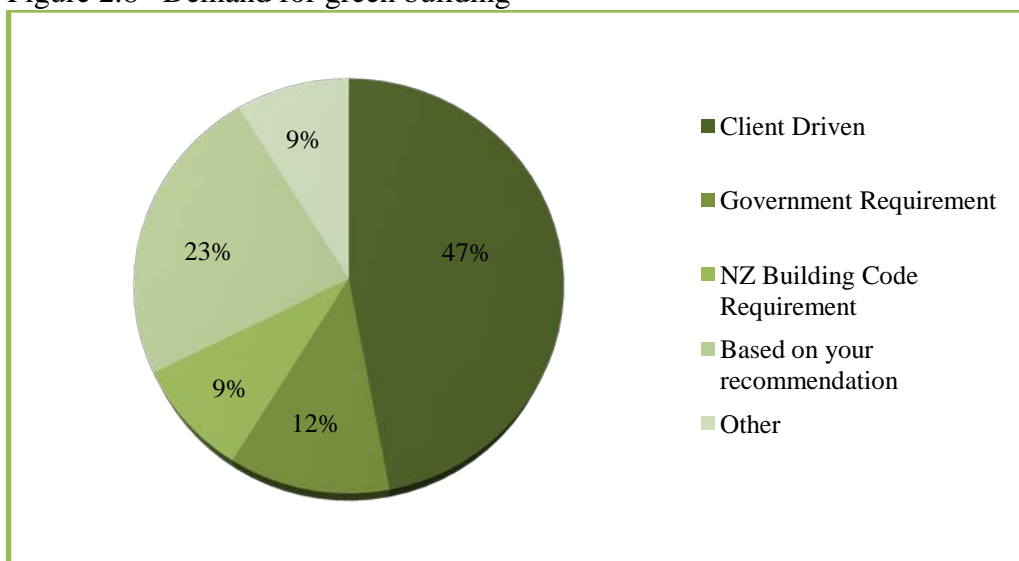
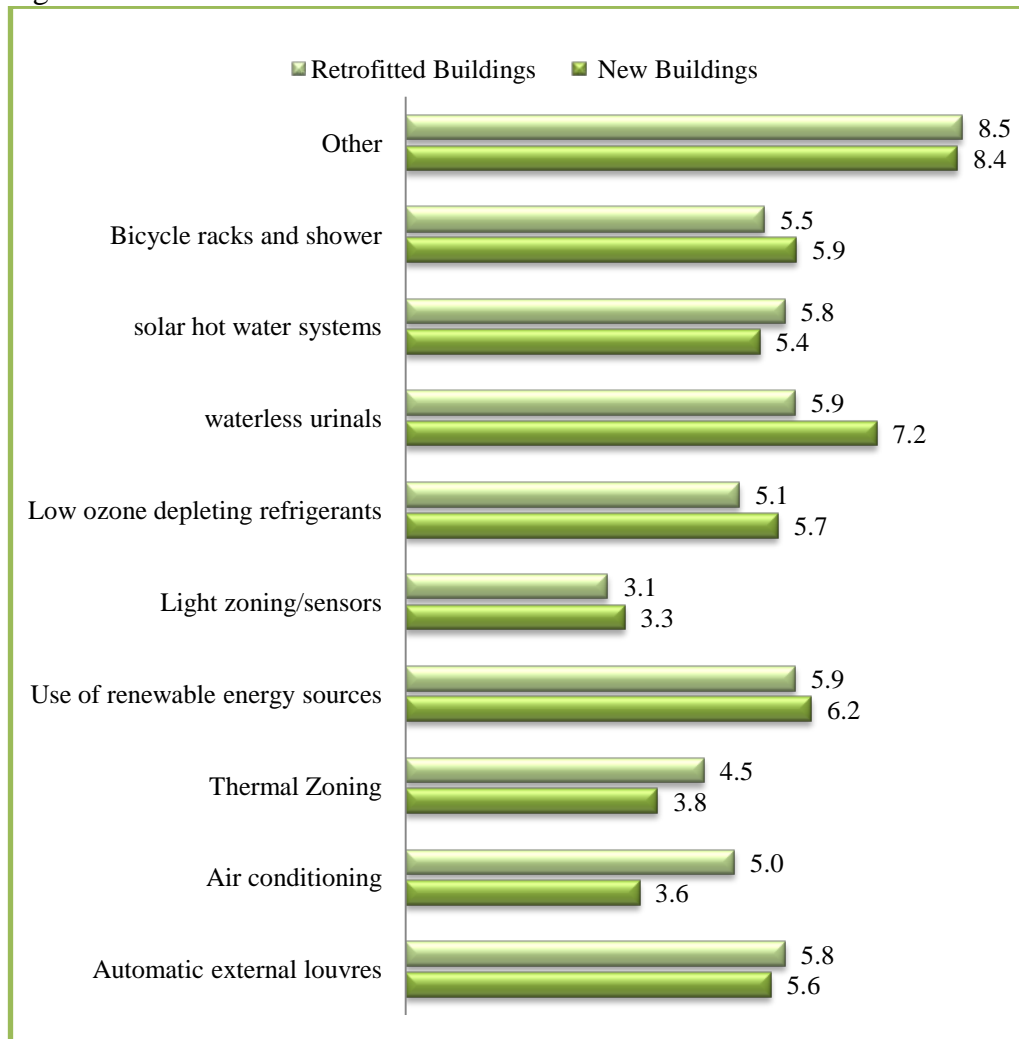


Figure 2.9 below indicates that the most preferred sustainable features being incorporated into new and retrofitted buildings are ‘light zoning/sensors’ followed by ‘thermal zoning’ and air conditioning. The least preferred sustainable features indicated were waterless urinals and renewable energy sources. The ‘Other’ category includes features such as rain water harvesting, smart metering and building

management systems. There were 13 responses to this question representing 4.3% of the sample.

Figure 2.9 Sustainable features



Respondents were asked to identify the most energy efficient sustainable building design features that they have used to achieve positive sustainability outcomes and to indicate payback periods where available. Answers were quite varied and included:

- Good internal light composition, cross ventilation along with good thermal properties in construction materials.
- Upgrade to high frequency (HF) ballasts and eco fluoro lighting- payback approximately 2.1 years.
- Solar orientation, maximise natural light to floor plate.
- Daylight harvesting/daylight improvement - payback less than 6 months
- Reduce open plan lighting levels to 400lux.
- Separate metering of energy.

- Passive design coupled with solar shading and mixed mode natural ventilation.
- The use of VRV air-conditioning, light zoning and sensors.
- Minimising internal applied finishes, lighting and air-conditioning zoning, external sun shade devices.
- Passive ventilation, water reducing elements, solar- payback periods about 5 years.

Respondents were also asked to identify the most effective building materials they have used to achieve energy efficient, sustainable building outcomes and to indicate payback periods where available. Again, answers were quite varied and included:

- Fly ash concrete- even though the cement is a bit of a problem.
- Recycled materials (green rated).
- Low E glazing.
- Exposed concrete for durability and thermal storage.
- Timber.
- Recyclable polyester insulation.

These responses indicate that to a certain extent the industry is aware of and has implemented a range of energy efficient design features, technologies and materials in buildings to achieve positive sustainability outcomes. Although there appears to be somewhat limited knowledge amongst the respondents of the financial performance/benefits of incorporating these design features, technologies and building materials.

When asked whether buildings that are designed to be more energy efficient are actually being used in a way that maximises their energy/resource use performance, 29 per cent of respondents answered yes, 33 per cent answered no and the rest were unsure. Those that answered 'no' indicated that there is a need to better educate owners, managers and occupiers of green buildings. One respondent also noted that there are no measures to ensure that green buildings are operated as designed. Another noted that there is inadequate handover information/user guides provided to occupiers.

Respondents were asked if they know what the average energy/water saving is for a green building compared to a conventional building. Eighty six per cent of respondents answered ‘no’ indicating that there is a real need to educate and get information into the market around the performance of green buildings compared to conventional buildings.

The introduction of a system such as NABERS will give more certainty to those involved in the property industry around the actual environmental performance of green buildings and will assist in the management of these buildings.

Figure 2.10 indicates that the primary barriers to the incorporation of sustainable features in developments are the markets unwillingness to pay for the additional costs of sustainable features and that the market is yet to be fully convinced that the extra cost of building green is supported by the benefits.

There is also an indication that the market would respond more favourably to green building if there were government subsidies and incentives for doing so. The ‘Other’ category includes statements such as ‘our buildings are relatively new’ and ‘not enough incentives’.

Figure 2.10 Barriers to incorporation of sustainable features in developments

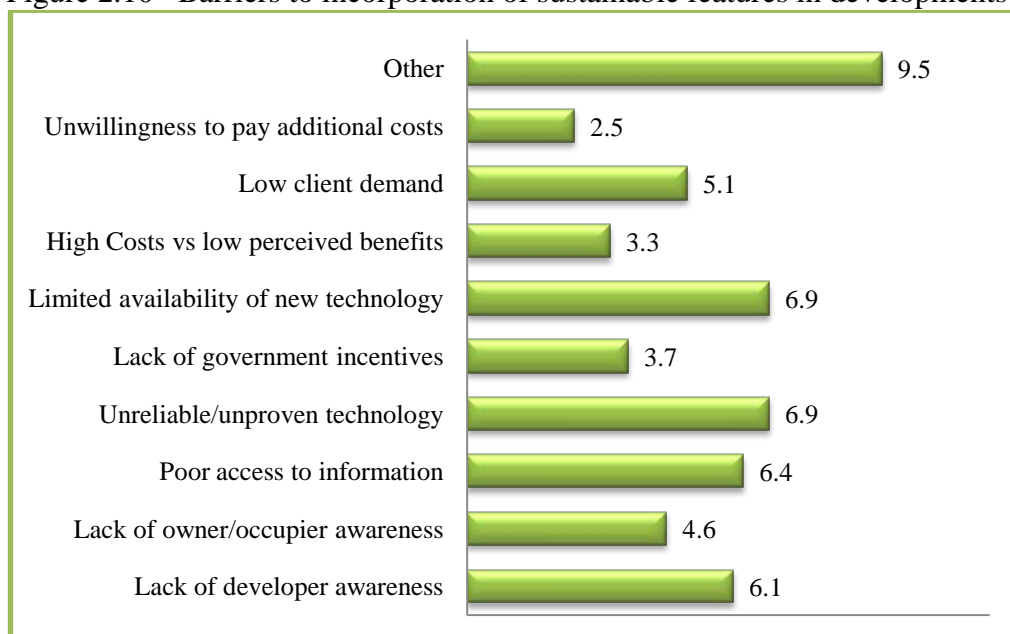
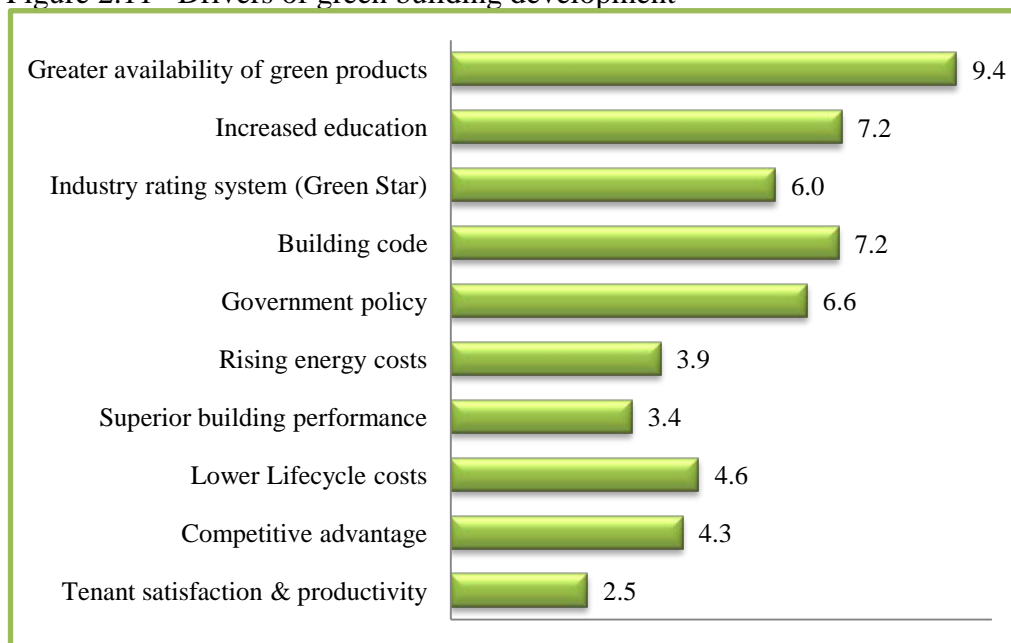




Figure 2.11 indicates that the primary driver of green building is tenant satisfaction and productivity. Today, many corporates have sustainability policies integral to their business operations. The requirement to occupy a green building is often mandated by a company’s sustainability policy. Therefore, it is not surprising that the industry rated ‘tenant satisfaction and productivity’ as the key driver of green building development.

Other key drivers include superior building performance and rising energy costs followed by competitive advantage and lower lifecycle costs. Over the medium to longer term, it is these factors that set green building apart from traditional buildings.

Figure 2.11 Drivers of green building development



#### 6.2.4 Cost of Green Buildings

When asked to indicate what clients would consider an acceptable level of additional cost for incorporating sustainable features into a building, more than half of the respondents (52.9 per cent) indicated that clients would accept a premium of up to 5 percent. The balance of respondents were evenly split between no additional cost and 5 to 10 per cent additional cost.

Figure 2.12 indicates the respondents’ views of what they believe clients would consider the important financial and non-financial benefits to be if there were additional costs for incorporating sustainable features into a building. Occupancy costs saving were considered to be the most important benefit, which would ultimately flow

through to increased rent and property value, being the second and third ranked benefits identified. Financial benefits were generally regarded as more important than non-financial benefits.

Figure 2.12 Important financial and non financial benefits

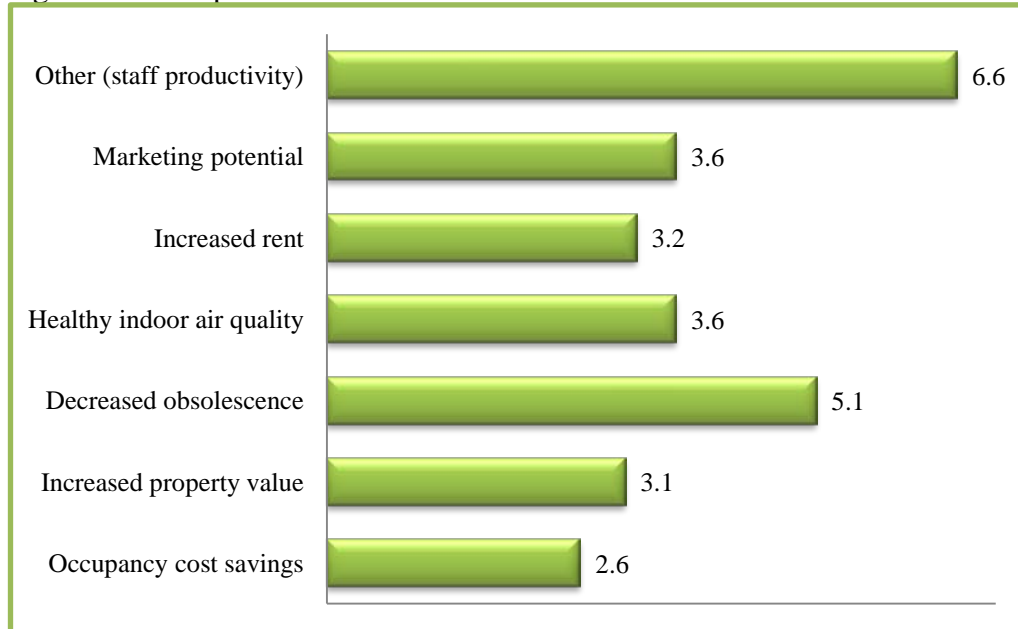


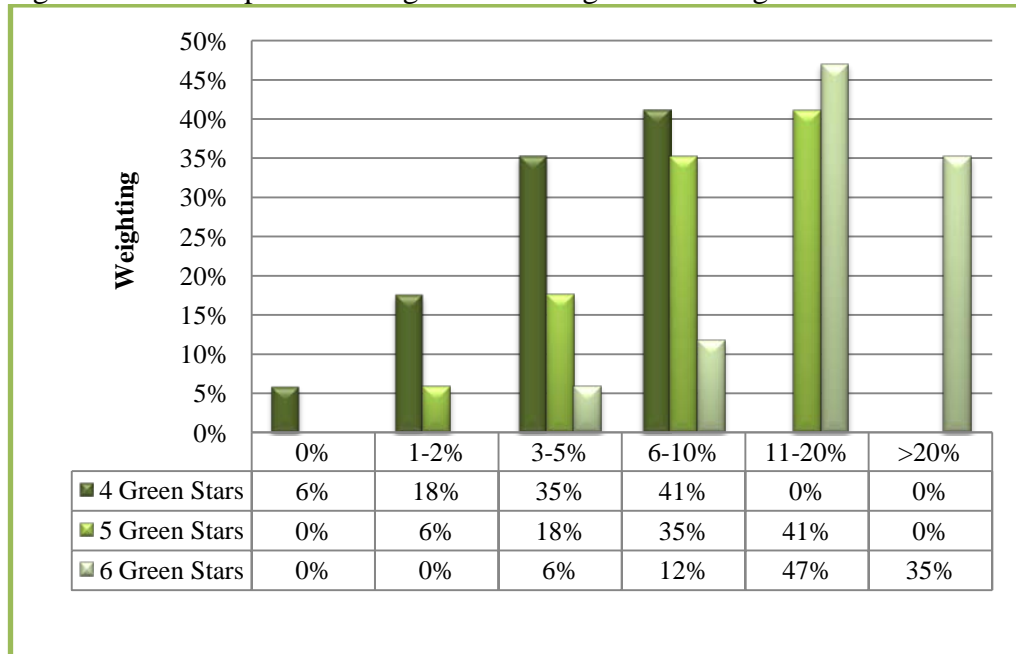
Figure 2.13 below sets out respondents views on the question of what the cost premium is (if any) for a green building versus a non-green building for a 4,5 and 6 Green Star rating. The responses indicate that of respondents who answered this question 76 per cent felt that there is a cost premium to achieve a 4 Green Star rated building of between 3 to 10 per cent. This is a wide variance for what can be described as an “entry level” Green Star rating and is markedly different to the NZGBC’s response to this question which was zero increased cost if managed correctly and up to 5 per cent otherwise.

The same issue appears to exist for 5 Green Star rated buildings. The industry response indicates a cost premium of between 6 to 20 per cent. Whereas the NZGBC has indicated zero cost premium if done properly and up to 10 per cent premium otherwise.

Likewise, the industry has indicated an 11 to 20 per cent premium for a 6 Green Star rated building. Whereas the NZGBC advised a premium of 5 to 10 per cent depending on how well a project is managed.

This issue of the cost premium for green buildings versus non-green buildings is clearly something that the industry is weary of and appears to be a major barrier to the progress of green building in New Zealand.

Figure 2.13 Cost premium of green vs. non green buildings

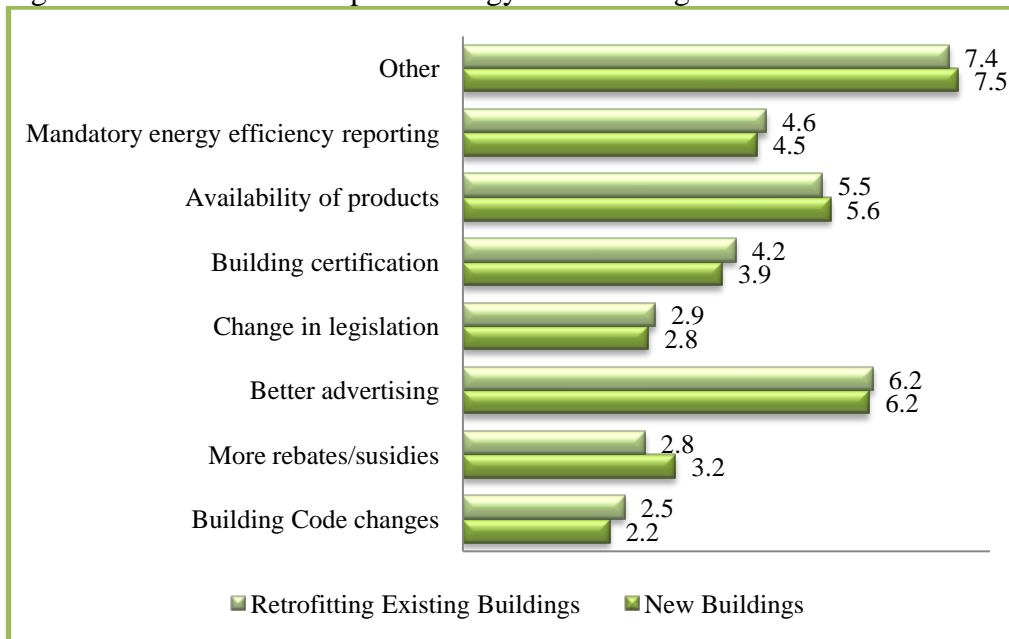


Interestingly, when asked “if a projects profitability was projected to reduce due to green building practices being implemented, would you still proceed?”, 53 per cent of respondents answered ‘yes’ and 47 per cent answered ‘unsure’. Significantly, none of the respondents answered ‘no’ indicating a degree of interest in green building from the respondent group, despite the sensitivity to ‘cost premium’ for green buildings.

#### 6.2.5 Energy and Water Savings

Respondents were asked to indicate what more they think can be done to improve the uptake and incorporation of energy/water savings (or generating) features into the design of new buildings and the retrofitting of existing buildings. Responses were about the same for new and retrofitted buildings. Figure 2.14 indicates that the industry considers that changes to the building code, legislation and increased financial incentives are required to improve the uptake of energy/water saving features, indicating that the industry is not likely to implement energy/water saving measures voluntarily. Other suggestions included increasing water charges.

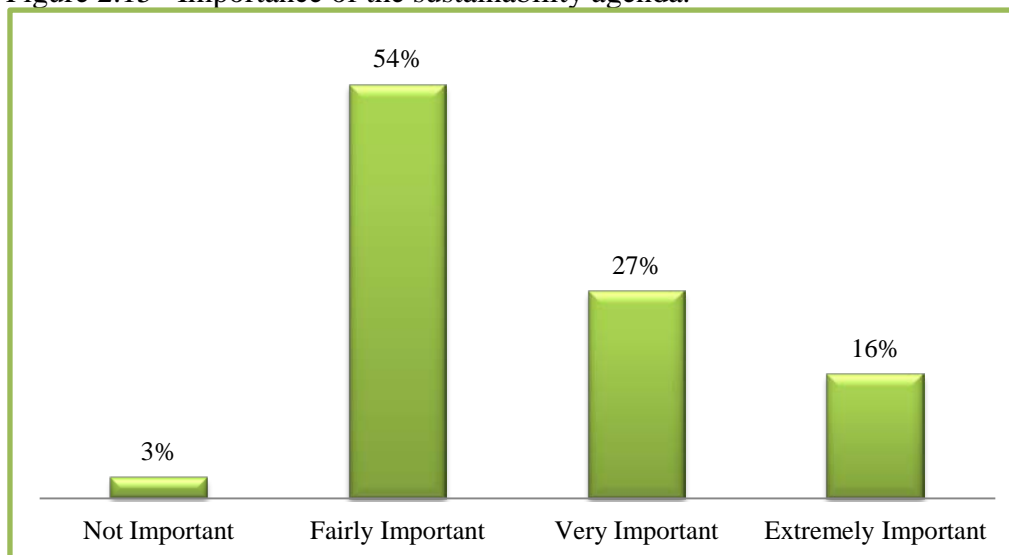
Figure 2.14 Actions to improve energy/water savings



### 6.2.6 Sustainability Agenda

When asked to give their opinion of how important the sustainability agenda is to the New Zealand commercial property sector, very few respondents considered that sustainability is not important. Figure 2.15 indicates that the majority of respondents think that the sustainability agenda is either fairly important or very important to the New Zealand commercial property sector.

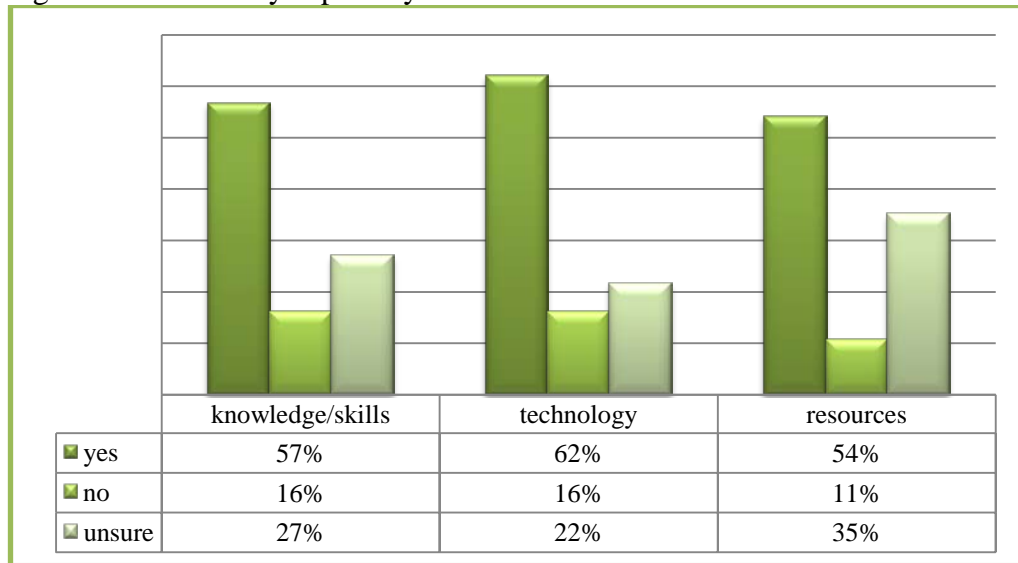
Figure 2.15 Importance of the sustainability agenda.



### 6.2.7 Industry Capability

Respondents were asked to indicate if they consider that the New Zealand property industry has the knowledge/skills, technology and resources to drive forward the sustainability agenda. Figure 2.16 below indicates that a significant percentage of respondents answered 'yes' for each category highlighting that the industry considers it is well placed to advance green building in New Zealand.

Figure 2.16 Industry capability



Those respondents who answered 'no' to any category were asked to give a brief explanation of what knowledge/skills, technology or resources are required. Some constructive suggestions were received. The answers given are summarised, in the main unedited, as follows:

#### Knowledge/Skills:

- Simpler tools for rating of sustainability and knowledge of the financial benefits and costs for achieving ESD properties.
- There is a lack of public information, most seems to be held by 'pay per view' corporates, unless you pay the fees and consultants the information is not available. Meaning small office refurbishment (under \$50,000) would incur significant expenditure to be rated. The information is only used by large commercial organisations and government agencies.
- Consultancies are still lacking in experience and knowledge of green building technologies and products.

- Massive education shift in what a green building actually is and more to the point what sustainability is.
- The industry needs to consider more than individual buildings and look instead at systems: ecology and natural systems, urban design, integration of buildings and landscape. Thinking at present it compartmentalised, narrow, non-creative and lacks integration.

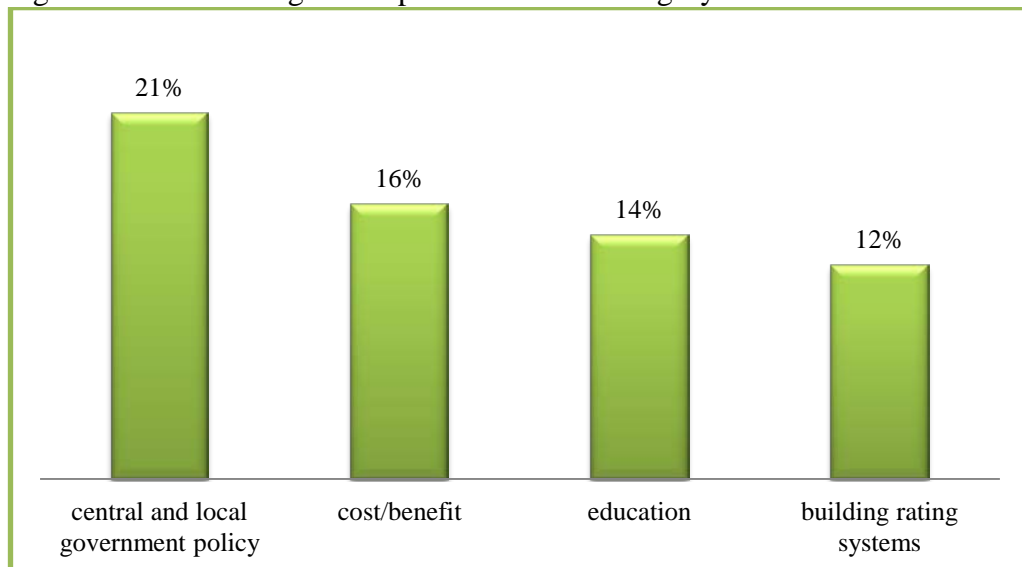
Technology/Resources:

- Information on energy consumption of different classes and grades of property.
- Having a mandatory building energy rating system to reward green buildings or at least those that are energy efficient.

#### 6.2.8 Changes and Improvements

The final general question asked respondents to identify the changes and improvements that are required to increase green building development and investment in New Zealand's commercial property sector. A range of suggestions were put forward. These suggestions have been categorised under four headings including: central and local government policy, cost/benefit, education and building rating systems. Figure 2.17 below indicates the responses received for each category as a percentage of the total number of responses received for the online survey.

Figure 2.17 Percentage of responses for each category



The respondent's suggestions are summarised as follows:

i. Central and Local Government policy.

- Mandatory disclosure of a buildings environmental performance.
- The introduction of central and local government subsidies.
- Tax breaks for certified buildings.
- Regulation requiring sustainable features in buildings.

ii. Cost/benefit.

- Tenants and investors must be prepared to pay.
- More empirical evidence to demonstrate the benefits of green building to tenants and investors.

iii. Education.

- Begin with educating within schools and other learning institutions.
- More training and education of all involved in the sustainable development and retrofitting of commercial property.

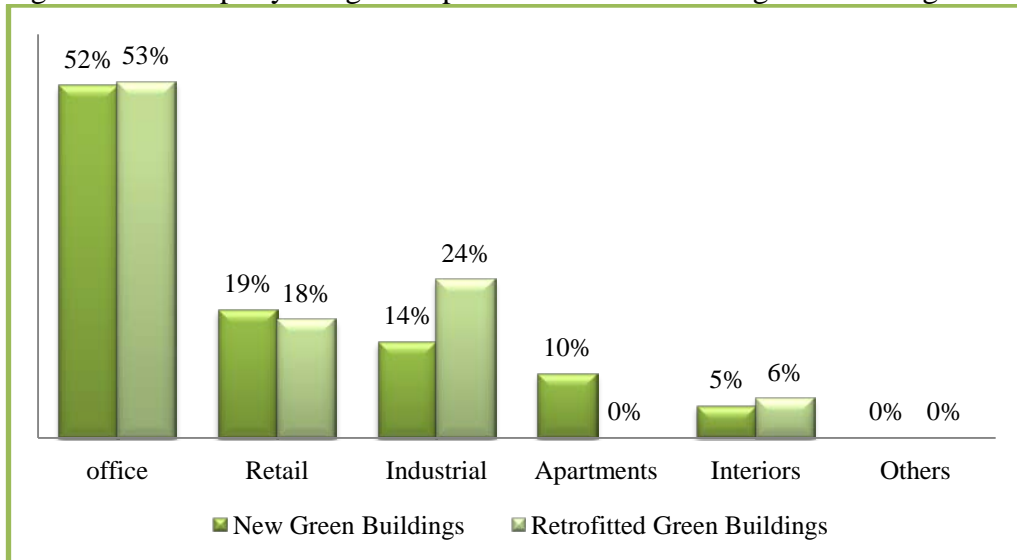
iv. Rating Systems.

- Reduce the NZGBC cost of certifying a building by 50 per cent.
- Introduce a compulsory rating system for energy and water use.
- The planned introduction of NABERS will generate a new level of interest.

#### 6.2.9 Future Participation in Green Building

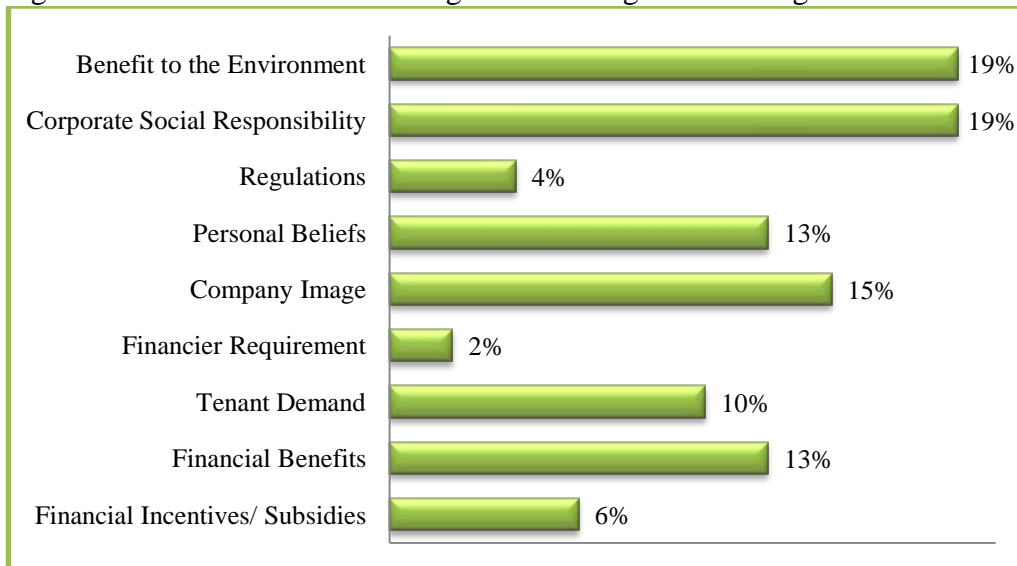
Of those that have not been involved in green building to date but indicated that they intend to become involved in the future, figure 2.18 below shows that respondents expect that over 50 per cent of their involvement will be in office properties. This is a significant increase from that indicated in Section 6.2.2, figure 2.5, particularly as it relates to office property and retrofitted green office buildings. There is also a marked increase in expectations for the ‘greening’ of retail property even though the NZGBC has yet to release a set of Green Star tools for retail property.

Figure 2.18 Property categories- planned involvement in green building



When asked to indicate their reasons for planning to become involved in green building, the majority (38 per cent) of respondents advised that ‘benefit to the environment’ and ‘corporate social responsibility’ are the primary drivers. Financial benefits ranked significantly lower at 13.0 per cent. For this group, ‘tenant demand’ was far less a factor than for those who have already had involvement in green building. These results are shown in figure 2.19 below.

Figure 2.19 Reasons for becoming involved in green building





#### 6.2.10 Those Not Interested in Green Building

The respondents who indicated that they do not intend to become involved in green building in the future were invited to give a brief explanation for their position. A few of their comments are as follows:

- Green building is seen as a nice to have but not essential at this point.
- Because (green building) has been publicly commented on as a “fad”.
- A matter of economics.
- Often our clients are solely focused on immediate economic returns and thus are not interested in Green Building options.

The same respondents were also asked to advise what changes/improvements would be required to encourage their company to become involved in green building. Some of their responses are as follows:

- It would be good to have a checklist of 'easy first steps' to encourage companies to embark upon the sustainability journey. Sometimes the first steps seem the hardest to take. Having some easy fixes would encourage companies to make positive changes.
- Tenant demand.
- There would need to be greater incentives. By this we are not looking for subsidies - just greater reason to introduce green initiatives.
- Financial resources to be able to afford higher rents associated with green buildings.

## 7.0 CONCLUSIONS & RECOMMENDATIONS

In conclusion, whilst green building is relatively new to the New Zealand commercial property sector, indications are that as economic conditions improve green building activity is poised to grow. In particular, the rebuild of the Christchurch CBD will provide a significant opportunity for the promotion and advancement of green building in New Zealand. The NZGBC expects to play a key role in the promotion of green building in the rebuild of Christchurch in terms of the training of professionals and facilitating property industry and community discussion around sustainability of the built environment.

It is anticipated that the NZGBC's review and expected reduction in charges for Green Star will encourage a greater number of property developers and investors to seek a Green Star rating for their buildings. The timing for completion of this review will be particularly relevant to the Christchurch rebuild. The introduction of BASE as an introductory level green building assessment specifically for the Christchurch rebuild should encourage developers and investors to incorporate sustainable features in their commercial properties and is a positive step for Christchurch. The NZGBC should also look at developing rating tools specifically for smaller projects that can be applied universally across New Zealand's commercial property sector. This will encourage developers and owners of smaller commercial properties to participate in sustainable development.

As the property sectors key promoter of green building, the NZGBC needs to better educate the public and users around the benefits of green building. One of the significant barriers to the uptake of green building is the markets view of the cost premium for green building versus conventional building. There appears to be a disconnect between the NZGBC's view and the prevailing industry view on this issue. Given that cost premium was a common barrier to green building identified from the literature review it would tend to support the findings from the industry survey. The solution to overcome this barrier appears to lie with the NZGBC and its training function. The NZGBC needs to clearly demonstrate to the commercial property sector 'best practice' in designing and delivering cost effective green commercial buildings to support its view of a nil to minimal cost premium for green building, depending on the Green Star rating. Otherwise, in the absence of government intervention, the growth of green building will be very much determined by growth in tenant or end user demand for green buildings, which was identified by both the NZGBC and industry survey as a key factor in the uptake of green building at present.

It is also evident that the NZGBC needs to resolve its funding issues in order that staffing levels can be increased sufficient to develop a full suite of Green Star rating tools which will in turn provide a comprehensive green building 'design' and 'built' certification system to the New Zealand commercial property sector. Whilst funding and a staffing shortfall is an immediate need of the NZGBC, there is an opportunity for universities, other educational providers and professional bodies to incorporate green building education within their established qualifications for the medium to longer term supply of qualified professionals to the property sector.

Clearly, in achieving a green building solution there are design features and materials that are preferred by the industry over others. However, an area that needs attention by the industry is the way in which green buildings are occupied and managed as the industry survey revealed that there is a need to better educate owners, managers and occupiers in the actual use of green buildings. This is also a matter that can be addressed by the universities and professional bodies in the training of asset, facilities and property managers.

Whilst central government could play a more direct role in encouraging the commercial property sector towards green building, by reinstating the green leasing policy and through regulation, tax breaks and other incentives, the present government is more inclined to allow market forces to determine the level of green building that occurs. The government is somewhat supportive of sustainable development as evidenced by the funding available through EECA, MAF and the Electricity Commission. In particular, it is the EECA that is a key sponsor for the introduction of NABERS to the New Zealand property sector.

The introduction of NABERS was identified by both the NZGBC and industry as providing a significant opportunity to promote and grow the level of market participation in green building in New Zealand. This is particularly relevant for the existing commercial building stock as although the NZGBC would like to provide a comprehensive design, built and performance based assessment system, Green Star does not assess the ongoing environmental performance of green buildings.

The industry survey indicated strong underlying support for green building within the commercial property sector from both a company sustainability profile perspective and the level of interest in green building. This observation is supported by the NZGBC's own view that the commercial property sector is very interested in green building as evidenced by the strong corporate membership and support for events. The key industry drivers for being involved in green building are a balance between environmental/social conscience and the commercial/financial imperatives of commercial property investment and development including the opportunity to secure good quality tenants.

As noted above, this industry enthusiasm for green building is somewhat tempered by the perception that green buildings are significantly more expensive to develop than conventional buildings. Looking forward, this is a key matter that needs to be resolved within the property industry for green building to become the benchmark for the design and development of buildings within New Zealand's commercial property sector.

## **8.0 ACKNOWLEDGEMENTS**

The participation of the NZGBC and its Director- Business Development and Technical, Ms Rohan Bush, in the structured interview is appreciated. The participation of the respondents to the industry survey is also greatly appreciated, as has been the feedback and direction received from Professor Sandy Bond, who supervised the writer in this research project.

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## APPENDIX 1

The Key Drivers and Barriers to  
the Sustainable Development and  
Management of Commercial  
Property in New Zealand

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# 1 Literature Review

Many governments and successful companies today recognise the need to better manage the environment. Worldwide initiatives, such as the Kyoto Protocol (2005) which seeks to address global warming by setting targets for participating countries to reduce their greenhouse gas emissions, are underway in an effort to manage natural resources and the environment in a sustainable manner. It has been estimated that buildings contribute between forty and fifty per cent of greenhouse gas emissions globally (Victoria, 2010).

As stated in a report prepared for the Institute of Real Estate Management, “The built environment thrives on the use of vast amounts of resources, including land, materials, energy and water. In fact, the entire life-cycle of a building is wrought with environmental impacts—from development, to operations, to demolition. Yet opportunities for reducing damage to the environment present themselves throughout the entire process” (Klein, Drucker, & Vizzier, 2009).

In 2002, eight countries responded to concerns for the global impact of the property sector on the environment by establishing the World Green Building Council (WorldGBC). A number of other countries have subsequently joined the WorldGBC, including New Zealand. The stated mission of the WorldGBC is to: “accelerate the transformation of the built environment towards sustainability” (World Green Building Council, 2010).

A number of countries have established or are in the process of establishing their own Green Building Councils. One of the most advanced Green Building Councils is the United States of America Green Building Council (USGBC). The USGBC’s stated mission is to: “transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life” (About USGBC, 2011).

The New Zealand Green Building Council’s (NZGBC) stated mission is to: “accelerate the development and adoption of market-based green building practices” (About Us: New Zealand Green Building Council, 2008).

These mission statements are reflective of the general direction and purposes of the green building movement internationally.

A report prepared by the North American based Commission for Environmental Cooperation defined sustainable property development (or green building) as “the use of environmentally preferable practices and materials in the design, location, construction, operation and disposal of buildings. It applies to both renovation and retrofitting of existing buildings and construction

of new buildings, whether residential or commercial, public or private.” (CEC- Independent Secretariat Reports: Green Building, 2010).

Whilst green building is a relatively new concept in New Zealand and is lagging behind the major markets of Australia, United Kingdom, Canada and the USA, research indicates that sustainable buildings will play an important role in New Zealand property portfolios in the future (Myers, Reed, & Robinson, 2008).

Those identified as being in a position to influence sustainable property development in the New Zealand market place include: the New Zealand Government, the NZGBC, corporate tenants, major developers, institutional property investors and to some extent financiers.

The New Zealand Governments principal policy response to climate change is the New Zealand Emissions Trading Scheme (NZ ETS). In various sectors (such as energy, forestry and agriculture), the Government is also undertaking a range of other policies and measures that are contributing to reducing greenhouse gas emissions (The Kyoto Protocol Ministry for the Environment, 2010).

A 2009 Ministry for the Environment (MFE) report entitled ‘New Zealand’s Fifth National Communication under the United Nations Framework Convention on Climate Change’ identifies ‘other policies and measures’ applicable to the commercial property sector. These include programmes run by the Energy Efficiency and Conservation Authority (EECA) to support businesses to become more energy efficient; financial assistance through the Electricity Commission to improve electricity efficiency; and initiatives developed by the Ministry of Agriculture and Forestry (MAF) to increase the use of wood as a construction material as MAF sponsored research shows that wood-based building products have a lower greenhouse gas footprint than other construction materials (Ministry for the Environment, 1998-2011, pp. 61-63,78).

The EECA provides information on new technologies and energy management and one on one support for energy-intensive businesses. Grant funding is available for energy and design audits and also for new or under-utilised technology improvements. Up to forty percent of the total project cost is available (up to \$100,000), or up to seventy five percent of the cost of a feasibility study (up to \$10,000) for new technologies. Examples of technologies funded include fans and boiler controls, bio-digesters and heat recovery systems (Ministry for the Environment, 1998-2011, p. 61).

The Electricity Commission offers financial assistance to businesses in the commercial sector to improve their electricity efficiency. Businesses can apply for part-funding from the Electricity Commission for electricity efficiency projects where there is a current barrier preventing such projects from proceeding. These include efficiency projects for commercial buildings. Projects funded to date include electricity efficiency enhancements in several hospitals, office buildings, a tertiary educational institute, and retail outlets. These projects target efficiency measures such as upgrades of building management systems, lighting replacements, replacement of inefficient chiller systems, and installation of monitoring and targeting systems (Ministry for the Environment, 1998-2011, p. 63).

Examples of initiatives developed by MAF to increase the use of wood as a construction material include:

- The provision of seed funding in the form of two professorship positions to teach and research the use of timber in building design, and to reduce barriers to the increased use of wood as a construction material.
- The funding of a design competition and support for the construction of a multi-storey timber-based building that will be available as a demonstration building for teaching purposes.
- The funding of demonstration buildings that showcase the construction of wooden sustainable buildings. The initiative includes partial funding to construct in wood up to two government buildings that would ordinarily be built in concrete and steel (Ministry for the Environment, 1998-2011, p. 78).

In addition to the specific government policies and measures outlined above, the general controls of building and environmental legislation, such as the Building Act 2004 and Resource Management Act 1991, provide a broad framework to encourage sustainable development and management of the commercial property sector.

It is noted that in 2008 the government of the day decided to provide stronger direction in terms of its desire to see a sustainable commercial property sector by introducing a leasing policy requiring all government departments wishing to lease central business district commercial office space to occupy a 5 Star Green Star rated building. Had it been maintained, this policy over time is likely to have provided strong encouragement to the commercial property sector to move in the direction of sustainable development, particularly in the Wellington market where

government is a significant occupier of commercial space. Unfortunately, this policy is no longer in effect.

A search via the internet was carried out to identify existing research on the drivers and barriers to sustainability in the commercial property sector. Notable research identified includes: “Best of the Best in Green design: Drivers and Barriers to Sustainable Development in Australia” (Bond, 2010); “Is the social agenda driving sustainable property development in Melbourne, Australia?” (Ang & Wilkinson, 2008); “Behind the Green Facade.” (Taylor Wessing LLP, 2009) and “Implementation of a Building Sustainability Rating Tool: A Survey of the New Zealand Building Industry.” (Smith & Baird, 2007).

The aims and key findings of this research (identified by report title) are summarised as follows:

1. Best of the Best in Green Design: Drivers and Barriers to Sustainable Development in Australia (Bond, 2010).

The broad aims of this research were to “identify property stakeholders’ motivations for, and experiences of, achieving proven examples of best practice in sustainable development and to assess the incentives, barriers, costs and benefits involved.” (Bond, 2010, p. 2)

This research focussed on both the residential and non-residential property sectors. With reference to the non-residential sector, the report identified key drivers and barriers to sustainable development as follows:

#### Drivers

- The development of green rating schemes such as Green Star and NABERS.
- Government and other public-sector bodies being required to occupy office buildings with either a 5 Green Star or 4.5-5 Star NABERS rating.
- Leadership provided by major institutional investors (LPT’s), developers and private sector corporates for the leasing, development and management of green buildings.
- Long-term rental growth, tenant retention and operating cost savings.
- Occupier benefits of increased productivity, staff attraction, retention, reduced sick leave and absenteeism.

## Barriers

- Cost premium of a green building versus a conventional building. Estimated by Davis Langdon (2007) to be in the range of 3-5% for a 5 Star solution and 5% plus for a 6 Star solution.
  - Cost to achieve a Green Star certification.
  - Split incentives between landlords and tenants where landlords are investing in green buildings but tenants are benefiting through reduced energy and water costs, greater productivity etc. Although the report indicates that this is being overcome by landlords reverting to gross leases.
  - The lack of skilled facility managers.
2. Is the social agenda driving sustainable property development in Melbourne, Australia? (Ang & Wilkinson, 2008).

The principal aim of this research was to analyse the drivers and barriers to sustainable property development in Melbourne, Australia, using the triple bottom line (TBL) theoretical framework. The TBL theoretical framework asserts that sustainability has social, economic and environmental aspects to fulfil (Ang & Wilkinson, 2008).

This research was limited to the pre-construction stages of development. The report identified key drivers and barriers to sustainable development as follows:

## Drivers

- Reduced operating and maintenance costs.
- Enhanced marketability.
- Market differentiation.
- Higher rental rates.
- Higher occupancy.
- Increased tenant retention.
- Reduced risk of obsolescence.
- Increased productivity and job satisfaction.
- Improved public profile and community relations.

## Barriers

- Market perception that green buildings are more expensive to develop than conventional buildings and uncertainty over added value.
- Building designs are subject to lengthy approvals increasing project duration.
- Disparate interests of stakeholders and incentives.
- Plethora of rating tools.
- Lack of awareness and understanding of the relationship between sustainability and property.

### 3. Behind the Green Facade (Taylor Wessing LLP, 2009).

The key aims of this research were to “examine the UK development industry's awareness of, and attitudes towards, the environmental and green agenda” (Taylor Wessing LLP, 2009, p. 9).

One of the key findings of this report was that the word 'sustainability' is itself problematic. “The lack of an industry-wide consensus on what the term means precisely, coupled with the associated raft of European and international concepts and numerous Government policy papers, leads to widespread confusion..” (Taylor Wessing LLP, 2009, p. 9).

In addition, the report identified key drivers and barriers to sustainable development as follows:

#### Drivers

- Legislation for both individual sectors and for the industry as a whole.
- Rising energy costs.
- Potential commercial or brand damage.

#### Barriers

- Cost premium of sustainable building solutions versus conventional building.
- Developer perception that end users and investors are not willing to pay more for a green building.

### 4. Implementation of a Building Sustainability Rating Tool: A Survey of the New Zealand Building Industry (Smith & Baird, 2007).

The main purpose of this research was to determine the conditions required for the successful implementation of a New Zealand building sustainability rating tool (BSRT) such as Green Star NZ (Smith & Baird, 2007).

A key requirement to achieving this purpose was to identify drivers and barriers to sustainability, in the survey process. Accordingly, the report identified several key drivers and barriers to sustainable development in New Zealand. The main issues identified are listed as follows:

#### Drivers

- Rising energy costs.
- Client demand.
- Environmental conditions.
- Lower life cycle costs.
- International trends show it is smart business.
- Competitive advantage.

#### Barriers

- Perceived higher upfront costs.
- Lack of awareness.
- Lack of education.
- No fiscal incentives.

In comparing the results of the above studies, it is clear that the common drivers for sustainable development across the studies are the expectation of operating cost savings (primarily energy) and market differentiation/competitive advantage. The most common barriers to sustainable development are developer perception that green buildings are more expensive to develop than conventional buildings and a general lack of education/awareness of the issues surrounding sustainable development.

Whilst the NZGBC is playing a significant role in the promotion of and educating the market on green building in New Zealand, ultimately market participants (corporate tenants, major developers, institutional property investors, financiers) and policy makers will determine the level of market penetration that green building achieves in New Zealand. It will be interesting to obtain New Zealand market participants current views on the drivers and barriers to

sustainable development of the commercial property sector through the primary research process outlined below.

## 2 Aims

Having regard to the above, the main aims of this research are to identify and investigate the key drivers and barriers to the sustainable development and management of commercial property in New Zealand.

It is anticipated that the findings of this research will help to advance green building and will be of particular benefit to those involved in the promotion and practise of green building in New Zealand.

## 3 Objectives

- a. Further investigate and analyse central government policy for green building in New Zealand as it applies to commercial property.
- b. Obtain the views of commercial property sector participants (including: property investors, developers, managers, financiers and key consultants) on green building in New Zealand.
- c. Examine the role of the NZGBC in influencing market participants and policy makers.
- d. Determine appropriate recommendations for the advancement of green building in the New Zealand commercial property sector.

## 4 Methodology

Research methodology will involve the collection and analysis of both qualitative and quantitative data using a combination of structured interviews and a questionnaire.

It is anticipated that much of the information required to achieve objective a. will be available on line and will be researched through the literature review. Supplementary information will be obtained through telephone interviews and/or by email.

Objective b. research methodology will primarily involve an online survey (utilising surveygizmo) directed at a selection of participants from the commercial property sector. The sample is to include property developers, investors/building owners and managers, financiers, architects and project managers/quantity surveyors. It is anticipated that the sample size will comprise around fifty companies and individuals.

Objective c. research methodology will involve a review of the NZGBC's web site and interviews with representatives of the NZGBC.



## **5 Supervision**

The supervisor proposed for this dissertation is Dr Sandy Bond.

## **6 Research Stages**

This research project will be conducted in four stages.

i. Stage One

Stage one will include a literature review, drafting of the main questionnaire and drafting of the structured interview questions.

ii. Stage Two

Stage two will include the distribution, collection and analysis of the questionnaire. Structured interviews and analysis will also take place during this stage.

iii. Stage Three

Stage three will include drafting the report and formulating conclusions and recommendations.

iv. Stage Four

Stage four involves the drafting of the final report and submission to Dr Bond for review, followed by amendments (if any) and final submission.

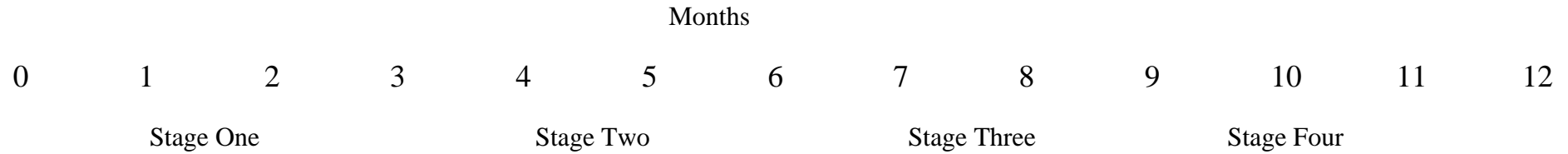
The above stages are incorporated into the time line attached. Whilst there is clearly a sequence of events for completing this project, it may be that the overall programme can be condensed depending on time commitments and timeliness of responses from survey respondents.

## **7 Budget**

A budget of \$500 plus GST is requested to cover costs associated with the preparation and distribution of questionnaires, toll calls and ancillary expenditure.

Guy Perrett

## 8 Time Line



- 
- Formal proposal approved.  
Literature review.  
Draft questionnaire.  
Structured interview questions.

- 
- Distribute questionnaire.  
Conduct structured interviews.  
Collect, collate & analyse results.

- 
- Draft report  
Conclusions and  
Recommendations.

- 
- Final report & submit  
for marking.

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Guy Perrett

Dear Mr Perrett

### **Green commercial buildings and Government policy**

Thank you for your email of 10 February 2011 to the Minister for the Environment regarding green commercial buildings and general Government policy towards sustainable development of the commercial property sector. I am responding on behalf of the Minister.

Due to reprioritisation of work, the Ministry for the Environment does not have a current work programme focused on green building. This work is instead being led by industry and, amongst others, the New Zealand Green Building Council ([www.nzgbc.org.nz](http://www.nzgbc.org.nz)) and the Property Council of New Zealand ([www.propertynz.co.nz](http://www.propertynz.co.nz)). Considerable progress continues to be made in 'greening' commercial buildings across New Zealand. The list of recently developed green commercial buildings on the New Zealand Green Building Council's website provides examples of the kind of work that is underway.

In your email, you mention a policy relating a minimum Green Star New Zealand rating for new Government office buildings in the central business districts. This policy was rescinded in early 2009. However, all public service departments are expected to take practical action to reduce their impacts on the environment, where it makes economic sense to do so. This includes taking a 'whole of life' approach when procuring goods and services; minimising waste sent to landfill; using resources more efficiently (including energy and water), improving planning, design and construction when commissioning and operating buildings and adopting transport policies that minimise environmental impacts.

Sustainable procurement principles continue to be integrated into the fabric of whole-of-government procurement contracts, which falls within the responsibility of the Ministry of Economic Development. You may wish to contact MED directly to discuss your specific queries regarding building services procurement or visit their dedicated website, [www.procurement.govt.nz](http://www.procurement.govt.nz).

Yours sincerely

Martyn  
**Director, Operations**

## APPENDIX 2

# NZGBC Structured Interview 2011

Purpose of this survey:

Date:

To obtain information from the New Zealand Green Building Council (NZGBC) in regard to its role in steering New Zealand's commercial property sector towards green building and to obtain the NZGBC's view on the commercial property sectors progress in adopting green building practices. This survey will be used as a basis to interview representatives of the NZGBC.

## Section 1 Organisation and General Information.

1. Respondents Name(s) \_\_\_\_\_

2. Position in organisation \_\_\_\_\_

3. Number of full time employees in organisation. \_\_\_\_\_

4. Optimal number of full time employees in organisation. \_\_\_\_\_

## Section 2 Green Building Activity

5. How would you characterise the current state of the green building industry in NZ?

In its infancy [ ]

Developing [ ]

Well developed [ ]

Fully developed [ ]

Reasons: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

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**6. How would you characterise the public's interest in green building in NZ?**

- Not interested [ ]
- Moderately interested [ ]
- Neither interested nor disinterested [ ]
- Very Interested [ ]
- Strongly interested [ ]

Reasons: \_\_\_\_\_

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**7. How would you characterise the Government's interest in green building in NZ?**

- Not interested [ ]
- Moderately interested [ ]
- Neither interested nor disinterested [ ]
- Very Interested [ ]
- Strongly interested [ ]

Reasons: \_\_\_\_\_

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**8. How would you characterise the commercial property sectors interest in green building in NZ?**

- Not interested [ ]
- Moderately interested [ ]

- Neither interested nor disinterested [ ]
- Very Interested [ ]
- Strongly interested [ ]

Reasons: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**9. In your opinion, what prevents the incorporation of sustainable features in developments? Please rank these from 1 (most significant barrier) to 10 (least significant barrier) with a brief explanation beside each answer.**

- [ ] Lack of developer awareness  
\_\_\_\_\_
- [ ] Lack of owner/occupier awareness  
\_\_\_\_\_
- [ ] Poor access to information  
\_\_\_\_\_
- [ ] Unreliable/unproven technology  
\_\_\_\_\_
- [ ] Lack of Government incentives  
\_\_\_\_\_
- [ ] Limited availability of new technology  
\_\_\_\_\_
- [ ] High costs vs. low perceived benefits  
\_\_\_\_\_
- [ ] Low client demand  
\_\_\_\_\_
- [ ] Unwillingness to pay additional costs  
\_\_\_\_\_
- [ ] Other, please specify  
\_\_\_\_\_



**10. Rank the following drivers of green building development from 1-10 (1most important -10 least important)**

- Tenant Satisfaction and productivity
- Competitive advantage
- Lower lifecycle costs
- Superior building performance
- Rising energy costs
- Government policy
- Building code
- Industry rating system (Green Star)
- Increased education
- Greater availability of green products

**11. How would you characterise the current status of the Green Star certification system in NZ?**

- In its infancy
- Developing
- Well developed
- Fully developed

Reasons: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**12. No. of Green Star certifications *applied for* to date.**

**New Buildings** \_\_\_\_\_

**Existing Buildings** \_\_\_\_\_

a. Industrial	Design	Built
4 Star	<input type="checkbox"/>	<input type="checkbox"/>
5Star	<input type="checkbox"/>	<input type="checkbox"/>
6Star	<input type="checkbox"/>	<input type="checkbox"/>
b. Office	Design	Built
4 Star	<input type="checkbox"/>	<input type="checkbox"/>
5Star	<input type="checkbox"/>	<input type="checkbox"/>

6Star	[ ]	[ ]
c. Education	Design	Built
4 Star	[ ]	[ ]
5Star	[ ]	[ ]
6Star	[ ]	[ ]
d. Interior	Design	Built
4 Star	[ ]	[ ]
5Star	[ ]	[ ]
6Star	[ ]	[ ]

**13. No. of Green Star certifications *issued* to date.**

**New Buildings** \_\_\_\_\_

**Existing Buildings** \_\_\_\_\_

a. Industrial	Design	Built
4 Star	[ ]	[ ]
5Star	[ ]	[ ]
6Star	[ ]	[ ]
b. Office	Design	Built
4 Star	[ ]	[ ]
5Star	[ ]	[ ]
6Star	[ ]	[ ]
c. Education	Design	Built
4 Star	[ ]	[ ]
5Star	[ ]	[ ]
6Star	[ ]	[ ]
d. Interior	Design	Built
4 Star	[ ]	[ ]
5Star	[ ]	[ ]
6Star	[ ]	[ ]

**14. Which Green Star assessment category should be emphasized most heavily in NZ?**

Management	[ ]
Indoor Environment Quality	[ ]
Energy	[ ]
Transport	[ ]

Water [ ]  
Materials [ ]  
Land Use & Ecology [ ]  
Emissions [ ]  
Innovation [ ]

**Why?**

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**15. What systems and processes are planned or in place to review or re-certify a buildings Green Star rating following initial certification?**

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**16. To what extent, if any, do you believe an established additional green building certification system (such as NABERS) should be adopted in NZ?**

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**17. Would a certification system such as NABERS compete with or compliment NZ Green Star?**

Compete with [ ] Complement [ ]

Explain: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**18. What are the strengths of NABERS?**

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

**19. What are the weaknesses of NABERS?**

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

**20. What are the opportunities for the commercial property sector from adopting NABERS?**

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

**21. Would the adoption of an established international green building certification system (such as NABERS) by the NZ property increase the pace of market adoption of green building practise in NZ?**

Yes  No

**Explain:**

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**22. Please give your opinion of the cost premium of green buildings vs. non green buildings for the following three scenarios:**

a. 4 Green Star Certification

0%  1-2%  3-5%  6-10%  11-20%  >20%

b. 5 Green Star Certification

0%  1-2%  3-5%  6-10%  11-20%  >20%

c. 6 Green Star Certification

0%  1-2%  3-5%  6-10%  11-20%  >20%

Source of information (i.e. reputable or guess):

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**23. What more do you think can be done to improve the uptake and incorporation of energy/water saving (or generating) features into the *design of new buildings*? Please rank these from 1 (most important) to 8 (least important) with a brief explanation beside each answer.**

Building code changes\_\_\_\_\_

More rebates/subsidies\_\_\_\_\_

Better advertising\_\_\_\_\_

Change in legislation\_\_\_\_\_

- Building certification

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- Availability of products

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- Mandatory energy efficiency reporting

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- Other (specify)

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**24. What more do you think can be done to improve the uptake and incorporation of energy/water saving (or generating) features into the *retrofitting of existing buildings*? Please rank these from 1 (most important) to 8 (least important) with a brief explanation beside each answer.**

- Building code changes

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- More rebates/subsidies

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- Better advertising

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- Change in legislation

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- Building certification

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- Availability of products

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- Mandatory energy efficiency reporting

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- Other (specify)

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**25. Is there a need for increased education of asset managers and property managers in the management of Green Star certified commercial property?**

- Yes       No

**If 'Yes', who do you think should be responsible for this training?**

- University       Technical Institute       Property Institute of NZ
  - Property Council       NZGBC       Other, specify
- 

**Explain:**

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**26. Does the NZGBC currently provide training for practitioners such as asset managers and property management professionals who have responsibility for managing Green Star certified commercial properties?**

Yes       No

Explain:

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**27. What training and ongoing certification is planned by the NZGBC for practitioners such as asset managers and property management professionals who have responsibility for managing Green Star certified assets?**

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**28. What are the main barriers to the commercial property sectors uptake of green star certification in NZ?**

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**29. What is being done to overcome those barriers?**

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**30. What changes/improvements are required to increase green building development and investment in NZ's commercial property sector?**

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**31. With the progress towards the rebuild of Christchurch CBD, what opportunities does this present for the NZGBC to promote green building in New Zealand?**

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## Green Building Survey 2011af

Q1 Name of company/business

Q2 The company's operational location

Q3 Your position within the company

Q4 What is your gender?

- Male (1)
- Female (2)

Q5 Which of the following categories best describes your company?

- Property Developer (1)
- Property Investor (2)
- Property Manager (3)
- Other, please specify: (4) \_\_\_\_\_

Q6 How long has your company been involved in the NZ property industry?

Q7 Please indicate the property category(s) your company is involved with:

- Commercial (1)
- Industrial (2)
- Retail (3)
- Healthcare (4)
- Education (5)
- Other, please specify: (6) \_\_\_\_\_

Q8 How well does your company address the issues of sustainability in house?

- Location- reducing transport costs/reliance on motor vehicle (1)
- The building we occupy/lease has a Green Star rating (2)
- Our company has a green building policy (3)
- Reducing water consumption (4)
- Reducing energy consumption (5)
- Waste disposal systems (6)
- We are yet to focus on sustainable practices (7)
- Other, please specify: (8) \_\_\_\_\_

Q9 Does your company develop, own or manage Green Star certified commercial property(s) (termed from here on as "green building(s)") in NZ?

- Yes (1)
- No (2)

Q10 Please indicate the categories that reflect your company's involvement with newly constructed green buildings.

- Office (1)
- Retail (2)
- Industrial (3)
- Apartments (4)
- Interiors (5)
- Other, please specify (6) \_\_\_\_\_

Q10a Please indicate the categories that reflect your company's involvement with retrofitted green buildings.

- Office (1)
- Retail (2)
- Industrial (3)
- Apartments (4)
- Interiors (5)
- Other, please specify: (6) \_\_\_\_\_

Q11 How long has your company been involved in either developing, owning or managing green buildings in NZ?

Q12 How many green buildings has your company developed?

	Green Buildings (1)
Newly Constructed (1)	

Q13 How many green buildings does your company own?

	Green Buildings (1)
Newly Constructed (1)	
Retrofitted (2)	

Q14 How many green buildings does your company manage?

	Green Buildings (1)
Newly Constructed (1)	
Retrofitted (2)	

Q15 Please indicate the option(s) that most closely reflect your company's reasons for being involved in green building:

- Financial incentives and/or subsidies (1)
- Financial benefits/reduced costs/increased property value (2)
- Tenant demand (3)
- Financier requirement (4)
- Company image (5)
- Personal beliefs (6)
- Regulations (7)
- Corporate Social Responsibility (8)
- Benefit to the environment (9)

Q16 Please indicate where the demand for green buildings is coming from:

- Client driven (1)
- Government requirement (2)
- NZ building code requirement (3)
- Based on your recommendation (4)
- Other, please specify: (5) \_\_\_\_\_

Q17 If your company develops green building(s), please indicate as a percentage, the proportion of your developments (undertaken in the last 5 years) that have achieved a Green Star rating of 4 or above:

- \_\_\_\_\_ 4 star Green Star (1)
- \_\_\_\_\_ 5 star Green Star (2)
- \_\_\_\_\_ 6 star Green Star (3)
- \_\_\_\_\_ Other, please specify: (4)

Q18 What types of sustainable features are being incorporated into the design of new buildings? Please rank these items from 1 (most preferred) to 10 (least preferred) with a brief explanation beside each answer.

- \_\_\_\_\_ Automatic external louvers: (1)
- \_\_\_\_\_ Air-conditioning (please specify system): (2)
- \_\_\_\_\_ Thermal zoning: (3)
- \_\_\_\_\_ Use of renewable energy sources (Gas, Solar, Wind Turbines): (4)
- \_\_\_\_\_ Light zoning &/or light sensors: (5)
- \_\_\_\_\_ Low Ozone depleting potential refrigerants: (6)
- \_\_\_\_\_ Waterless urinals: (7)
- \_\_\_\_\_ Solar hot water systems: (8)
- \_\_\_\_\_ Bicycle racks and shower: (9)
- \_\_\_\_\_ Other, please specify: (10)

Q19 What types of sustainable features are being incorporated into the retrofitting of existing buildings? Please rank these items from 1 (most preferred) to 10 (least preferred) with a brief explanation beside each answer.

- \_\_\_\_\_ Automatic external louvers: (1)
- \_\_\_\_\_ Air-conditioning (please specify system): (2)
- \_\_\_\_\_ Thermal zoning: (3)
- \_\_\_\_\_ Use of renewable energy sources (Gas, Solar, Wind Turbines): (4)
- \_\_\_\_\_ Light zoning &/or light sensors: (5)
- \_\_\_\_\_ Low Ozone depleting potential refrigerants: (6)
- \_\_\_\_\_ Waterless urinals: (7)
- \_\_\_\_\_ Solar hot water systems: (8)
- \_\_\_\_\_ Bicycle racks and shower: (9)
- \_\_\_\_\_ Other, please specify: (10)

Q20 What are the most effective energy efficient sustainable building design features that you have used to achieve positive sustainability outcomes? Please specify below and advise payback periods where available:

Q21 What are the most effective building materials that you have used to achieve energy efficient, sustainable building outcomes? Please specify below and advise pay back periods where available:

Q22 Do you think that buildings designed to be more energy efficient are actually being used in a way that maximises their energy/resource use performance?

- Yes (1)
- No (2)
- Unsure (3)

Q22a What do you think the reasons for this are and what do you think could be done to resolve this?

Q23 Do you know what the average energy/water saving is for a green building compared to a conventional building?

- Yes (1)
- No (2)

Q23.1 Please specify the average annual energy saving for a green building compared to a conventional building for each level of Green Star certification below and provide the source:

- 4 Green Star (1) \_\_\_\_\_
- 5 Green Star (2) \_\_\_\_\_
- 6 Green Star (3) \_\_\_\_\_

Q23.2 Please specify the average annual water saving for a green building compared to a conventional building for each level of Green Star certification below and provide the source:

- 4 Green Star (1) \_\_\_\_\_
- 5 Green Star (2) \_\_\_\_\_
- 6 Green Star (3) \_\_\_\_\_

Q24 In your opinion, what prevents the incorporation of sustainable features in developments? Please rank these from 1 (most significant barrier) to 10 (least significant barrier) with a brief explanation beside each answer.

- \_\_\_\_\_ Lack of developer awareness (1)
- \_\_\_\_\_ Lack of owner/occupier awareness (2)
- \_\_\_\_\_ Poor access to information (3)
- \_\_\_\_\_ Unreliable/unproven technology (4)
- \_\_\_\_\_ Lack of Government incentives (5)
- \_\_\_\_\_ Limited availability of new technology (6)
- \_\_\_\_\_ High Costs vs. low perceived benefits (7)
- \_\_\_\_\_ Low client demand (8)
- \_\_\_\_\_ Unwillingness to pay additional costs (9)
- \_\_\_\_\_ Other, please specify (10)

Q25 Rank the following drivers of green building development from 1 (most important) to 10 (least important).

- \_\_\_\_\_ Tenant satisfaction and productivity (1)
- \_\_\_\_\_ Competitive advantage (2)
- \_\_\_\_\_ Lower lifecycle costs (3)
- \_\_\_\_\_ Superior building performance (4)
- \_\_\_\_\_ Rising energy costs (5)
- \_\_\_\_\_ Government policy (6)
- \_\_\_\_\_ Building code (7)
- \_\_\_\_\_ Industry rating system (Green Star) (8)
- \_\_\_\_\_ Increased education (9)
- \_\_\_\_\_ Greater availability of green products (10)

Q26 In a broad sense, what do you think clients would consider an acceptable level of additional cost for incorporating sustainable features into a building?

- No additional cost (1)
- 0-5% more (2)
- 6-10% more (3)
- 11-15% more (4)
- 16-20% more (5)
- More than 20% (6)
- Not sure (7)
- Other, please specify: (8) \_\_\_\_\_

Q27 If there were additional costs for incorporating sustainable features into a building, what do you think clients would consider the important financial and non-financial benefits to be? Please rank these from 1 (most important) to 7 (least important) with a brief explanation beside each answer.

- \_\_\_\_\_ Occupancy cost savings (1)
- \_\_\_\_\_ Increased property value (2)
- \_\_\_\_\_ Decreased obsolescence (3)
- \_\_\_\_\_ Healthy indoor air quality (4)
- \_\_\_\_\_ Increased rent (5)
- \_\_\_\_\_ Marketing potential (i.e. enhanced building or company image) (6)
- \_\_\_\_\_ Other, please specify: (7)

Q28 Please give your opinion of the cost premium of green buildings vs. non green buildings for the following three scenarios:

Q28.1 4 Green Star Certification

- 0% (1)
- 1-2% (2)
- 3-5% (3)
- 6-10% (4)
- 11-20% (5)
- >20% (6)

Q28.2 5 Green Star Certification

- 0% (1)
- 1-2% (2)
- 3-5% (3)
- 6-10% (4)
- 11-20% (5)
- >20% (6)

### Q28.3 6 Green Star Certification

- 0% (1)
- 1-2% (2)
- 3-5% (3)
- 6-10% (4)
- 11-20% (5)
- >20% (6)

Q29 If a projects profitability was projected to reduce due to green building practices being implemented, would you still proceed?

- Yes (1)
- No (2)
- Unsure (3)

Q30 What more do you think can be done to improve the uptake and incorporation of energy/water saving (or generating) features into the design of new buildings? Please rank these from 1 (most important) to 8 (least important) with a brief explanation beside each answer.

- \_\_\_\_\_ Building code changes (1)
- \_\_\_\_\_ More rebates/subsidies (2)
- \_\_\_\_\_ Better advertising (3)
- \_\_\_\_\_ Change in legislation (4)
- \_\_\_\_\_ Building certification (5)
- \_\_\_\_\_ Availability of products (6)
- \_\_\_\_\_ Mandatory energy efficiency reporting (7)
- \_\_\_\_\_ Other, please specify: (8)



Q31 What more do you think can be done to improve the uptake and incorporation of energy/water saving (or generating) features into the retrofitting of existing buildings? Please rank these from 1 (most important) to 8 (least important) with a brief explanation beside each answer.

- \_\_\_\_\_ Building code changes (1)
- \_\_\_\_\_ More rebates/subsidies (2)
- \_\_\_\_\_ Better advertising (3)
- \_\_\_\_\_ Change in legislation (4)
- \_\_\_\_\_ Building certification (5)
- \_\_\_\_\_ Availability of products (6)
- \_\_\_\_\_ Mandatory energy efficiency reporting (7)
- \_\_\_\_\_ Other, please specify: (8)

Q32 Does your company plan to become involved in green building in the future?

- Yes (1)
- No (2)

Q33 Please indicate the categories that reflect your company's planned involvement with new green buildings.

- Office (1)
- Retail (2)
- Industrial (3)
- Apartments (4)
- Interiors (5)
- Other, please specify: (6) \_\_\_\_\_

Q33a Please indicate the categories that reflect your company's planned involvement with retrofitted green buildings.

- Office (1)
- Retail (2)
- Industrial (3)
- Apartments (4)
- Interiors (5)
- Other, please specify: (6) \_\_\_\_\_

Q34 Please indicate the option(s) that most closely reflect your company's reasons for being involved in green building:

- Financial incentives and/or subsidies (1)
- Financial benefits/reduced costs/increased property value (2)
- Tenant demand (3)
- Financier requirement (4)
- Company image (5)
- Personal beliefs (6)
- Regulations (7)
- Corporate Social Responsibility (8)
- Benefit to the environment (9)

Q35 Please indicate your opinion of how important the sustainability agenda is to the New Zealand commercial property sector as a whole.

- Not important (1)
- Fairly important (2)
- Very important (3)
- Extremely important (4)

Q36 Please briefly explain why your company has decided not to be involved in green building.

Q37 Please advise what changes/improvements would be required to encourage your company to become involved in green building.

Q38 Do you consider that the New Zealand property has the knowledge/skills to drive forward the sustainability agenda?

- Yes (1)
- No (2)
- Unsure (3)

Q38.1 Please give your opinion of what knowledge/skills are required:

Q39 Do you consider that the New Zealand property industry has the technology to drive forward the sustainability agenda?

- Yes (1)
- No (2)
- Unsure (3)

Q39.1 Please give your opinion of what additional technology should be adopted:

Q40 Do you consider that the New Zealand property industry has the resources to drive forward the sustainability agenda?

- Yes (1)
- No (2)
- Unsure (3)

Q40.1 Please give your opinion of what resources are required:

Q41 Please express your view on what changes/improvements are required to increase green building development and investment in NZ's commercial property sector.

Green Building Survey 2011bf

Q1 Name of company/business

Q2 The company's operational location

Q3 Your position within the company

Q4 What is your gender?

- Male (1)
- Female (2)

Q5 Which of the following categories best describes your company?

- Project Manager (1)
- Contractor (2)
- Financier (3)
- Architectural Practice (4)
- Property Consultant (5)
- Other, please specify: (6) \_\_\_\_\_

Q6 How long has your company been involved in the NZ property industry?

Q7 Please indicate the property category(s) your company is involved with:

- Commercial (1)
- Industrial (2)
- Retail (3)
- Healthcare (4)
- Education (5)
- Other, please specify: (6) \_\_\_\_\_

Q8 How well does your company address the issues of sustainability in house?

- Location- reducing transport costs/reliance on motor vehicle (1)
- The building we occupy/lease has a Green Star rating (2)
- Our company has a green building policy (3)
- Reducing water consumption (4)
- Reducing energy consumption (5)
- Waste disposal systems (6)
- We are yet to focus on sustainable practices (7)
- Other, please specify: (8) \_\_\_\_\_

Q9 Has your company designed, constructed, project managed, consulted on or financed a Green Star certified commercial property (termed from here on as "green building(s)") in NZ?

- Yes (1)
- No (2)

Q10 Please indicate the categories that reflect your company's involvement with newly constructed green buildings.

- Office (1)
- Retail (2)
- Industrial (3)
- Apartments (4)
- Interiors (5)
- Other, please specify (6) \_\_\_\_\_

Q10a Please indicate the categories that reflect your company's involvement with retrofitted green buildings.

- Office (1)
- Retail (2)
- Industrial (3)
- Apartments (4)
- Interiors (5)
- Other, please specify: (6) \_\_\_\_\_

Q11 How long has your company been involved in green building in NZ?

Q12 How many green buildings has your company had involvement with?

	Green Buildings (1)
Newly Constructed (1)	
Retrofitted (2)	

Q13 Please indicate the option(s) that most closely reflect your company's reasons for being involved in green building:

- Financial incentives and/or subsidies (1)
- Financial benefits/reduced costs/increased property value (2)
- Tenant demand (3)
- Financier requirement (4)
- Company image (5)
- Personal beliefs (6)
- Regulations (7)
- Corporate Social Responsibility (8)
- Benefit to the environment (9)

Q14 Please indicate where the demand for green buildings is coming from:

- Client driven (1)
- Government requirement (2)
- NZ building code requirement (3)
- Based on your recommendation (4)
- Other, please specify: (5) \_\_\_\_\_

Q15 What types of sustainable features are being incorporated into the design of new buildings? Please rank these items from 1 (most preferred) to 10 (least preferred) with a brief explanation beside each answer.

- \_\_\_\_\_ Automatic external louvers: (1)
- \_\_\_\_\_ Air-conditioning (please specify system): (2)
- \_\_\_\_\_ Thermal zoning: (3)
- \_\_\_\_\_ Use of renewable energy sources (Gas, Solar, Wind Turbines): (4)
- \_\_\_\_\_ Light zoning &/or light sensors: (5)
- \_\_\_\_\_ Low Ozone depleting potential refrigerants: (6)
- \_\_\_\_\_ Waterless urinals: (7)
- \_\_\_\_\_ Solar hot water systems: (8)
- \_\_\_\_\_ Bicycle racks and shower: (9)
- \_\_\_\_\_ Other, please specify: (10)

Q16 What types of sustainable features are being incorporated into the retrofitting of existing buildings? Please rank these items from 1 (most preferred) to 10 (least preferred) with a brief explanation beside each answer.

- \_\_\_\_\_ Automatic external louvers: (1)
- \_\_\_\_\_ Air-conditioning (please specify system): (2)
- \_\_\_\_\_ Thermal zoning: (3)
- \_\_\_\_\_ Use of renewable energy sources (Gas, Solar, Wind Turbines): (4)
- \_\_\_\_\_ Light zoning &/or light sensors: (5)
- \_\_\_\_\_ Low Ozone depleting potential refrigerants: (6)
- \_\_\_\_\_ Waterless urinals: (7)
- \_\_\_\_\_ Solar hot water systems: (8)
- \_\_\_\_\_ Bicycle racks and shower: (9)
- \_\_\_\_\_ Other, please specify: (10)

Q17 What are the most effective energy efficient sustainable building design features that you have used to achieve positive sustainability outcomes? Please specify below and advise payback periods where available:

Q18 What are the most effective building materials that you have used to achieve energy efficient, sustainable building outcomes? Please specify below and advise payback periods where available:

Q19 Do you think that buildings designed to be more energy efficient are actually being used in a way that maximises their energy/resource use performance?

- Yes (1)
- No (2)
- Unsure (3)

Q19a What do you think the reasons for this are and what do you think could be done to resolve this?

Q20 Do you know what the average energy/water saving is for a green building compared to a conventional building?

- Yes (1)
- No (2)

Q20.1 Please specify the average annual energy saving for a green building compared to a conventional building for each level of Green Star certification below and provide the source:

- 4 Green Star (1) \_\_\_\_\_
- 5 Green Star (2) \_\_\_\_\_
- 6 Green Star (3) \_\_\_\_\_

Q20.2 Please specify the average annual water saving for a green building compared to a conventional building for each level of Green Star certification below and provide the source:

- 4 Green Star (1) \_\_\_\_\_
- 5 Green Star (2) \_\_\_\_\_
- 6 Green Star (3) \_\_\_\_\_



Q21 In your opinion, what prevents the incorporation of sustainable features in developments? Please rank these from 1 (most significant barrier) to 10 (least significant barrier) with a brief explanation beside each answer.

- \_\_\_\_\_ Lack of developer awareness (1)
- \_\_\_\_\_ Lack of owner/occupier awareness (2)
- \_\_\_\_\_ Poor access to information (3)
- \_\_\_\_\_ Unreliable/unproven technology (4)
- \_\_\_\_\_ Lack of Government incentives (5)
- \_\_\_\_\_ Limited availability of new technology (6)
- \_\_\_\_\_ High Costs vs. low perceived benefits (7)
- \_\_\_\_\_ Low client demand (8)
- \_\_\_\_\_ Unwillingness to pay additional costs (9)
- \_\_\_\_\_ Other, please specify (10)

Q22 Rank the following drivers of green building development from 1 (most important) to 10 (least important).

- \_\_\_\_\_ Tenant satisfaction and productivity (1)
- \_\_\_\_\_ Competitive advantage (2)
- \_\_\_\_\_ Lower lifecycle costs (3)
- \_\_\_\_\_ Superior building performance (4)
- \_\_\_\_\_ Rising energy costs (5)
- \_\_\_\_\_ Government policy (6)
- \_\_\_\_\_ Building code (7)
- \_\_\_\_\_ Industry rating system (Green Star) (8)
- \_\_\_\_\_ Increased education (9)
- \_\_\_\_\_ Greater availability of green products (10)

Q23 In a broad sense, what do you think clients would consider an acceptable level of additional cost for incorporating sustainable features into a building?

- No additional cost (1)
- 0-5% more (2)
- 6-10% more (3)
- 11-15% more (4)
- 16-20% more (5)
- More than 20% (6)
- Not sure (7)
- Other, please specify: (8) \_\_\_\_\_

Q24 If there were additional costs for incorporating sustainable features into a building, what do you think clients would consider the important financial and non-financial benefits to be? Please rank these from 1 (most important) to 7 (least important) with a brief explanation beside each answer.

- \_\_\_\_\_ Occupancy cost savings (1)
- \_\_\_\_\_ Increased property value (2)
- \_\_\_\_\_ Decreased obsolescence (3)
- \_\_\_\_\_ Healthy indoor air quality (4)
- \_\_\_\_\_ Increased rent (5)
- \_\_\_\_\_ Marketing potential (i.e. enhanced building or company image) (6)
- \_\_\_\_\_ Other, please specify: (7)

Q25 Please give your opinion of the cost premium of green buildings vs. non green buildings for the following three scenarios:

Q25.1 4 Green Star Certification

- 0% (1)
- 1-2% (2)
- 3-5% (3)
- 6-10% (4)
- 11-20% (5)
- >20% (6)

Q25.2 5 Green Star Certification

- 0% (1)
- 1-2% (2)
- 3-5% (3)
- 6-10% (4)
- 11-20% (5)
- >20% (6)

Q25.3 6 Green Star Certification

- 0% (1)
- 1-2% (2)
- 3-5% (3)
- 6-10% (4)
- 11-20% (5)
- >20% (6)

Q26 If a projects profitability was projected to reduce due to green building practices being implemented, would you still proceed?

- Yes (1)
- No (2)
- Unsure (3)

Q27 What more do you think can be done to improve the uptake and incorporation of energy/water saving (or generating) features into the design of new buildings? Please rank these from 1 (most important) to 8 (least important) with a brief explanation beside each answer.

- \_\_\_\_\_ Building code changes (1)
- \_\_\_\_\_ More rebates/subsidies (2)
- \_\_\_\_\_ Better advertising (3)
- \_\_\_\_\_ Change in legislation (4)
- \_\_\_\_\_ Building certification (5)
- \_\_\_\_\_ Availability of products (6)
- \_\_\_\_\_ Mandatory energy efficiency reporting (7)
- \_\_\_\_\_ Other, please specify: (8)

Q28 What more do you think can be done to improve the uptake and incorporation of energy/water saving (or generating) features into the retrofitting of existing buildings? Please rank these from 1 (most important) to 8 (least important) with a brief explanation beside each answer.

- \_\_\_\_\_ Building code changes (1)
- \_\_\_\_\_ More rebates/subsidies (2)
- \_\_\_\_\_ Better advertising (3)
- \_\_\_\_\_ Change in legislation (4)
- \_\_\_\_\_ Building certification (5)
- \_\_\_\_\_ Availability of products (6)
- \_\_\_\_\_ Mandatory energy efficiency reporting (7)
- \_\_\_\_\_ Other, please specify: (8)

Q29 Does your company plan to become involved in green building in the future?

- Yes (1)
- No (2)

Q30 Please indicate the categories that reflect your company's planned involvement with new green buildings.

- Office (1)
- Retail (2)
- Industrial (3)
- Apartments (4)
- Interiors (5)
- Other, please specify: (6) \_\_\_\_\_

Q30a Please indicate the categories that reflect your company's planned involvement with retrofitted green buildings.

- Office (1)
- Retail (2)
- Industrial (3)
- Apartments (4)
- Interiors (5)
- Other, please specify: (6) \_\_\_\_\_

Q31 Please indicate the option(s) that most closely reflect your company's reasons for its plans to become involved in green building:

- Financial incentives and/or subsidies (1)
- Financial benefits/reduced costs/increased property value (2)
- Tenant demand (3)
- Financier requirement (4)
- Company image (5)
- Personal beliefs (6)
- Regulations (7)
- Corporate Social Responsibility (8)
- Benefit to the environment (9)

Q32 Please indicate your opinion of how important the sustainability agenda is to the New Zealand commercial property sector as a whole.

- Not important (1)
- Fairly important (2)
- Very important (3)
- Extremely important (4)

Q33 Please briefly explain why your company has decided not to be involved in green building.

Q34 Please advise what changes/improvements would be required to encourage your company to become involved in green building.

Q35 Do you consider that the New Zealand property industry has the knowledge/skills to drive forward the sustainability agenda?

- Yes (1)
- No (2)
- Unsure (3)

Q35.1 Please give your opinion of what knowledge/skills are required:

Q36 Do you consider that the New Zealand property industry has the technology to drive forward the sustainability agenda?

- Yes (1)
- No (2)
- Unsure (3)

Q36.1 Please give your opinion of what additional technology should be adopted:

Q37 Do you consider that the New Zealand property industry has the resources to drive forward the sustainability agenda?

- Yes (1)
- No (2)
- Unsure (3)

Q37.1 Please give your opinion of what resources are required:

Q38 Please express your view on what changes/improvements are required to increase green building development and investment in NZ's commercial property sector.