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STANTEC OFFICE SUSTAINABILITY IMPROVEMENT GUIDE

A Major Qualifying Project

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by

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ABSTRACT

Stantec has been developing its sustainable affairs both internally and externally. With the hiring of an internal sustainability coordinator in 2006, the company has been encouraging its offices to pursue sustainable efforts, especially those that aim towards LEED certification. While offices have been given a framework for developing, organizing, managing, and budgeting a "sustainability committee," there is currently no general methodology for approaching sustainable office changes from within the company. This report assists in developing such a framework/methodology for pursuing sustainable changes that consider both the internal operations of Stantec and relevant external matters that must be considered for pursuing sustainable changes in the office environment.

CAPSTONE DESIGN

Following the "Criteria for Accrediting Engineering" set by the Accrediting Board for Engineering and Technology (ABET), this Major Qualifying Project was designed around six of the eight considerations described in ABET General Criterion 4: Professional Component. The project draws upon knowledge from previous course work, new research prompted from the project, professional engineering standards, and realistic constraints while considering important factors in the following six fields: economic, environmental, sustainability, health and safety, social, and political. Each consideration, as it relates to the project, is briefly described below.

Economic Considerations

In nearly any professional business scenario, a project will not receive approval if its economic burden outweighs all other factors. In a capitalist system, a business' main economic goal is to profit. Given the priority to profit, it was important to understand all of the costs components, from design and construction to operations and maintenance, involved with green buildings, specifically those that are LEED certified. Without an economic incentive identified for green buildings, it would be economically impractical for Stantec to pursue sustainable changes in their offices; Therefore, several studies were identified in Section 3.1 that provided supportive evidence for the cost savings of "green" buildings and also helped develop the business case for green buildings at Stantec. One study indicates no difference in construction costs when comparing LEED new construction to non-LEED new construction. Another study points out the strong correlation between increased energy performance, decreased energy use, and subsequent energy cost savings. A study on health conditions and green buildings indicates that there can be considerable savings in health care costs and loss of worker productivity based on improved indoor environmental quality, a feature of green buildings. Based on the importance of cost savings, the methodology for pursuing sustainable changes in Stantec's office buildings suggests several ways to monitor cost savings including utilizing energy modeling software, tracking electric and water bills, and installing and recording data from electric and water meters.

Environmental Considerations

The environment is one of Stantec's five core practice areas. Given Stantec's experience with environmental projects such as Brownfield redevelopment, ecosystem restoration, stormwater management, and water and wastewater treatment, the office sustainability assessment guide that was developed, located in Appendix C, suggests using in-house capabilities to incorporate environmental improvements which also comply with LEED certification.

Sustainability Considerations

A broad definition of sustainability purports the importance of meeting the needs of the present without compromising future generations' ability to meet their needs. In essence, this project was an investigation in sustainable concepts. Stantec has been incorporating sustainability into all components of their business using a three-fold approach that addresses economic, social, and environmental factors and considers

sustainability to be part of the company's main vision and values. As elaborated upon in Sections 2.1.3 and 2.1.4, in order to develop a methodology for implementing sustainable changes in Stantec's offices, Stantec's existing sustainable practices were researched and observed via their LEED certified projects for clients, LEED certified and sustainable office buildings, and internal sustainability coordination. Interviews were conducted with three of Stantec's LEED certified offices, including the Edmonton, San Francisco, and Vancouver offices. Details on these offices are provided in Section 4.2. External sustainable components such as the LEED Certification program and ISO 14000 were identified as critical components for offices to pursue and consistent with Stantec's company-wide vision.

Health and Safety Considerations

Major benefits of green and LEED certified buildings which assisted in proving the business case for such buildings are their resistance to Sick Building Syndrome, reduction of allergies and asthma, and decreased propagation of respiratory illness. All aforementioned conditions have a direct correlation to indoor environmental quality, and can be improved by improved ventilation, better cleaning practices, and lower occupant density, amongst other methods as described in Section 3.1.3. The methodology for making sustainable improvements identifies the risk of sick building syndrome and identifies options for improving indoor air quality in both newly constructed and existing offices.

Social Considerations

A key aspect of Stantec's three-fold approach to sustainability deals with social considerations. The methodology for pursing sustainable office changes that was developed for Stantec provides suggestions for community involvement, as well as strong communication about sustainable achievements and goals between employees, clients, investors, and the community in order to create a positive, symbiotic relationship. Stantec also strives to keep employees safe, comfortable, and happy to ensure positive employee contributions to the work environment. Building factors such as lighting and temperature, while confirmed by some studies but not yet agreed upon on a large scale, can increase worker productivity, as described in Section 3.1.4.

Political Considerations

Given the growing global energy and resource crisis, it was relevant to briefly identify the politics that are regulating and influencing corporate policies and procedures. Positioned as a global corporation striving to be within the top 5 in its field, the political opinion on sustainability was certainly applicable to Stantec and deserving of attention. The United State's energy policies established in the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007 are discussed in Section 2.3, providing more background and creating relevancy to the development of an office sustainability assessment method. Portions of these two Acts are especially relevant to green buildings, as they establish funding incentives and research for green buildings.

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1. PROJECT DESCRIPTION

Stantec has been developing its sustainable affairs both internally and externally. With the hiring of an internal sustainability coordinator in 2006, the company has been encouraging its offices to pursue sustainable efforts, especially those that aim towards LEED certification. While offices have been given a framework for developing, organizing, managing, and budgeting a "sustainability committee," there is currently no general methodology for approaching sustainable office changes from within the company. Stantec requests assistance on developing such a framework/methodology for pursuing sustainable changes that consider both the internal operations of Stantec and relevant external matters that must be considered for pursuing sustainable changes in the office environment.

In order to accomplish this task, a step-by-step approach was taken. First, general background information on Stantec and the state of green buildings in the political realm were identified and assessed. Then the value of green design had to be confirmed in order to make the business case for green buildings and indentify risks. Third, Stantec's existing internal affairs were examined and interviews were conducted to learn how existing offices were able to successfully make sustainable changes and on to what degree. A special focus was made on LEED certified offices, which Stantec ultimately prefers to see its offices pursue. Based on the Stantecs vision, background research, and business case, a framework, called the Stantec Office Sustainability Improvement Guide, was developed to help offices identify the steps needed to pursue sustainable changes in their offices, aiming ultimately for LEED certification.

2. BACKGROUND

2.1. STANTEC

Stantec is a large, international design and consulting firm whose services address all fields of civil and environmental engineering as well as the pharmaceuticals and energy and resources sectors. With more than 8,500 employees and over 125 locations in North America (About Stantec, 2008), the company continues to grow and hopes to become a top 10 global design firm (CEO Message, 2008).

2.1.1. HISTORY

Founded in 1954 by Dr. Don Stanley as D.R. Stanley and Associates, Stantec has matured into an international design and consulting firm. Dr. Stanley's original vision was to provide Canadian communities with affordable water and sewer systems. He put a great deal of effort into finding creative solutions that effectively addressed water and sewer needs without imposing large costs on his clients. In 1955 two partners, Herb Roblin and Louis Grimble, joined Dr. Stanley in his practice, changing the company's name to Stanley Grimble Roblin Ltd. and adding transportation services to the company's repertoire. In 1963 Herb Roblin retired, Dr. Stanley bought out Louis Grimble's shares, and the company became Stanley & Associates Engineering, Ltd., having nearly 100 employees. Thanks to Dr. Stanley's innovative and inexpensive water and sewer solutions and his connection with the World Health Organization (WHO), Stanley Associates began working on international projects. (Stantec Milestones, 2008)

In 1983 Don Stanley turned the company over to Ron Triffo who had originally joined Stanley & Associates in 1977 as Vice President of Transportation. At this time, Alberta was suffering from a poor economy and a reduction in staff had to be made. Stanley & Associates was still able to remain profitable by expanding both their services and their locations and by making acquisitions. In 1994, Stanley Associates became a public company, causing the company to double in the first five years. (Stantec Milestones, 2008)

In 1998, Ron stepped down from his position as President and Chief Executive Officer, and Tony Franceschini, who had joined the company in 1978 as a transportation engineer, took his place. Since then Tony has set various goals for the company including turning it into a 10,000 employee, billion dollar firm by 2008. In order to have a global, single-brand identity that was easily recognized, Stanley & Associates was restructured and came together under the name Stantec. Stantec is continuing to meet these ambitious goals. (Stantec Milestones, 2008)

2.1.2. SERVICES

Stantec provides design and consulting services in planning, engineering, architecture, surveying, economics, and project management. These disciplines are extended into a variety of sectors, as outlined in Table 2.1.

TABLE 2.1. STANTEC'S SERVICE AREAS

Sector	Services	
Buildings (Buildings, 2008)	• Architecture • Electrical Engineering • Interior Design • International • Landscape Architecture • Mechanical Engineering • Planning & Operations	• Program & Project Management • Specialty Services • Strategic Management • Structural Engineering • Surveys/Geomatics • Sustainability

Environment (Environment, 2008)	• Brownfield Development • EA, Permitting, & Compliance • Ecosystem Restoration • Geotechnical Engineering • Infrastructure Management • International • Pipelines • Program & Project Management • Pumping Stations • Site Mgmt & Remediation	• Stormwater Management • Strategic Management • Surveys/Geomatics • Waste Management • Wastewater Conveyance • Wastewater Treatment • Water Resources Management • Water Storage Facilities • Water Supply • Water Treatment
Industrial (Industrial, 2008)	• Compliance • Control System Integration • Environment Health & Safety • Facilities & Infrastructure Development • Facilities Engineering • GMP Facilities Engineering	• Industrial Process Engineering • International • Process Engineering • Program & Project Management • Strategic Management • Surveys/Geomatics
Transportation (Transportation, 2008)	• Communications • Construction Services • Infrastructure Management • International • Program & Project Management	• Pavement Engineering • Strategic Management • Surveys/Geomatics • Transit Oriented Design • Transportation Design • Transportation Planning
Urban Land (Urban Land, 2008)	• Community Planning • Construction Administration • Entitlements & Approvals • Environmental Management • Infrastructure Management • International • Land Development Engineering	• Landscape Architecture • Regional & Policy Planning • Stormwater Management • Strategic Management • Surveys/Geomatics • Transit Oriented Design • Urban Design

2.1.3. VISION AND VALUES

"Stantec is **One Team** providing **Infinite Solutions**" (About Stantec, 2008). Stantec has proudly adopted this credo and by fulfilling it, hopes to become a top 10 global design firm (CEO Message, 2008). To meet this goal, Stantec strives to bring excellence, consistency, and effectiveness to every project and values integrity, people, teamwork, clients, and profits (Vision and Values, 2008). Part of the company's sustainable vision "is to meet the needs of the present while contributing to an environmentally sustainable future for approaching generations" (Sustainability, 2008). Stantec has a clear focus in sustainability, utilizing a three-fold approach, as illustrated in Figure 2.1, that addresses economic, environmental, and social factors. Such sustainable practices are aimed at completely satisfying their customer's needs without compromising the environment in both the short and long term. To meet their vision of becoming a top 10 global design firm, Stantec plans to expand and increase publicity of their sustainability practices, specifically in LEED certification (Franceschini, 2008).

(Stantec's Sustainability Model, 2008)

FIGURE 2.1. STANTEC'S 3-FOLD APPROACH TO SUSTAINABILITY

2.1.4. SUSTAINABILITY

In 2006, Stantec decided to make a corporate commitment to sustainability and hired a full-time Internal Sustainability Coordinator to coordinate internal sustainability efforts throughout the company. To this point Laura Franceschini, who currently fills the position, has been working to find good measures of sustainability that are also easy to obtain and track. (Franceschini, 2008)

Concurrently, Stantec incorporated sustainability into their clients' projects, striving to:

- Optimize energy performance (Stantec Sustainable Marketing Brochure, 2007)
- Improve indoor air quality (Stantec Sustainable Marketing Brochure, 2007)
- Reduce emissions (Stantec Sustainable Marketing Brochure, 2007)
- Incorporate high efficiency fixtures (Stantec Sustainable Marketing Brochure, 2007)
- Reduce waste (Stantec Sustainable Marketing Brochure, 2007)
- Encourage recycling (Stantec Sustainable Marketing Brochure, 2007)
- Encourage environmentally friendly modes of transportation (Stantec Sustainable Marketing Brochure, 2007)
- Reduce sediment contamination and soil erosion (Stantec Sustainable Marketing Brochure, 2007)

These practices and the company's commitment to sustainability are what have made it stand out as a 'green' pioneer in the design and consulting markets. A large factor in why the company is well respected for its sustainable practices is because it "walks the talk" and "practices what it preaches." A good example of these adages is demonstrated in

Stantec's LEED certified construction projects that have been completed for clients as well as the company's own office buildings. Overall, the company has completed 45 LEED certified projects for clients and itself, achieving ratings from certified to platinum (Sustainable Design Solutions for the Future, 2008).

The Stantec Atrium Tower, a 3-story, 52,000 square foot addition to the company's headquarters in Edmonton, Alberta, achieved a Silver LEED Certified Building rating because of the following:

- Materials and building components have high recycled content (Stantec Centre – Atrium Tower Marketing Materials, 2008)
- 100% Green power (Stantec Centre – Atrium Tower Marketing Materials, 2008)
- Operable windows to improve user comfort (Stantec Centre – Atrium Tower Marketing Materials, 2008)
- Interior spaces have access to daylight (Stantec Centre – Atrium Tower Marketing Materials, 2008)
- 51% reduction of potable water use (Stantec Centre – Atrium Tower Marketing Materials, 2008)
- Garden roof to reduce storm water runoff (Stantec Centre – Atrium Tower Marketing Materials, 2008)
- Low-VOC emission materials used on interior surfaces (Stantec Centre – Atrium Tower Marketing Materials, 2008)

Similarly, Stantec's Vancouver office building received a Silver LEED Certified Commercial Interior rating because of the following:

- Large percentage of workspace receives daylighting (Stantec Vancouver Office, 2008)
- 30% reduction in lighting power density (Stantec Vancouver Office, 2008)
- Energy efficient HVAC emitting zero CFCs (Stantec Vancouver Office, 2008)
- 40% existing building interior was reused (Stantec Vancouver Office, 2008)
- 86% construction related waste diverted from landfills (Stantec Vancouver Office, 2008)
- Uses natural, low VOC emitting materials and finishes (Stantec Vancouver Office, 2008)

Stantec employs nearly 300 LEED accredited professionals, and in July of 2007, *Building Design & Construction Magazine* ranked Stantec as #4 out of the top five LEED accredited design firms. The company has completed a variety of LEED certified projects that have achieved ratings ranging from Certified to Platinum. The main focuses of Stantec's LEED design projects which have made them so successful include sustainable site planning, safeguarding water and water efficiency, energy efficiency and renewable energy, conservation of materials and resources, and indoor environmental quality. (Sustainable Design Solutions for the Future, 2008)

Other ways Stantec has incorporated environmental consciousness into its internal affairs include office recycling programs, use of recycled, FSC certified, chlorine-free paper products, use of nontoxic/environmentally safe cleaning products, an ISO 14001 certified environmental management system, incentives for biking or taking public transportation to work, and the purchase of renewable energy credits. (Internal Sustainability – Operations, 2008)

2.2. GREEN BUILDING RATING SYSTEMS

There are a variety of systems available that help make organizations' buildings and operations environmentally conscious including LEED, ISO 14000, and other rating systems. All green building initiatives inherently involve some benefits and risks.

2.2.1. LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN

The United States Green Building Council (USGBC) and the Canada Green Building Council (CaGBC) are responsible for the Leadership in Energy and Environmental Design (LEED) system in their respective countries. The LEED system rates and certifies buildings based on their impact on the environment via physical building components and operation and maintenance. Based on the number of points achieved during assessment, a building can receive, in order of lowest to highest points and least to most green qualifications, a rating of certified, silver, gold, or platinum, with platinum achieving the highest number of points. Certification requires an assessment, performed by the Green Building council, along with a fee.

Various LEED rating systems have been developed to tailor to specific forms of construction, including new construction, existing buildings, commercial interiors, cores and shells, schools, retail, healthcare, homes, and neighborhood development (LEED Rating Systems, 2008). Each rating system, with the exception of the neighborhood development system, covers six major fields of environmental improvements:

- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources

- Indoor Environmental Quality
- Innovation and Design Process

Under each field the USGBC and CaGBC provide descriptions and guidance on possible points that can be achieved and the requirements for achieving them.

2.2.2. ISO 14000

ISO 14000 is an environmental management plan that sets management standards for a business's operations and maintenance. The standards are developed by the International Organization for Standardization (ISO) and keep the environment in mind by addressing the life cycle of a product, product labeling, manufacturing, performance, and data collection (Morris, 2004). ISO 14000 has a much broader scope compared to LEED certification and is applicable to whole business operations rather than just building features. ISO 14000 certification is optional and if pursued, is performed for a fee by a company independent from ISO (Certification, 2008).

2.2.3. OTHER RATING SYSTEMS

There are a variety of building rating systems other than LEED available for use, such as BREEAM and Green Globes. Although LEED is the predominantly accepted rating system in the United States (Yudelson, 18), these other systems are often considered and may be more suitable for a specific company's needs, interests, or operations. It is important to note that these systems do not have as much industry and public acceptance in the marketplace, reducing some of the marketing benefits that could be achieved through their use.

The Building Research Establishment Environmental Assessment Method (BREEAM) helps assess buildings though the various phases of manufacturing construction materials, building design, building construction, and post-construction. Specific tools are available for new and existing buildings, life cycle assessments, building impacts, master planning, operations impacts, and waste management. BREEAM is based in the United Kingdom; However, BREEAM International, which can be modified to suite your locality, is available. (BREEAM Family, 2007)

The Green Globe rating system was built upon BREEAM, and was released as an online assessment tool in 2000. Online assessment tools are available for new buildings, significant renovations, management and operations of existing buildings, building emergency management, building intelligence, and fit-ups. In Canada, Green Globe is owned and operated by Building Owners and Managers Association (BOMA) Canada. In the United States, Green Globe is owned and operated by the Green Building Initiative (GBI). GBI is currently attempting to make Green Globe an American National Standards Institute (ANSI) standard. (What is Green Globes?, 2008)

2.3. GREEN POLITICS

Federal programs and initiatives are essential for funding and fueling continued research and development in the green building industry and are integral for continued improvements in cost savings, environmental quality, and occupant satisfaction. Federal programs often draw a great deal of public scrutiny and attention. When presented in the right light, these programs encourage building owners, financers, the general public, and market sectors to invest in green buildings. Continuous government investment in green buildings and sustainability in general indicates a national importance, increases public

awareness and acceptance, and helps provide valuable research data that confirms the worth of green buildings. The following summarizes several key, green building related components of two major Acts passed in the United States: the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007.

Energy Policy Act of 2005

On August 8, 2005, the Energy Policy Act of 2005 was enacted "to ensure jobs for our [the United States'] future with secure, affordable, and reliable energy." The Act addresses a variety of sustainability related topics including buildings, consumer products, renewable and nonrenewable energy, vehicles, climate change, and tax incentives. (Energy Policy Act of 2005)

Of particular relevance to green buildings are several items from the Act that implement energy use plans, grants, and research and development. Section 101, titled Energy and Water Saving Measures in Congressional Buildings, required the Architect of the Capitol to "develop, update, and implement a cost-effective energy conservation and management plan … for all facilities administered by Congress … to meet the energy performance requirements for Federal buildings established under section 543(a)(1)" within 180 days of enactment of the Act. The Architect is required to report annually on energy expenditures and savings, management projects, and future priorities for all Federal buildings. (Energy Policy Act of 2005)

Section 102, titled Energy Management Requirements, sets a goal to reduce energy consumption in Federal Buildings by certain percentages compared to 2003 data on Federal building energy consumption per gross square foot. Reduction percentages are

set for the 2006 through 2015 fiscal years. Table 2.2 outlines the percent energy reduction goals for each fiscal year. (Energy Policy Act of 2005)

TABLE 2.2. FEDERAL BUILDINGS PERCENT REDUCTION IN ENERGY CONSUMPTION BY FISCAL YEAR – ENERGY POLICY ACT OF 2005

Fiscal Year	Percent Reduction in Energy Consumption/Gross Square Foot
2006	2
2007	4
2008	6
2009	8
2010	10
2011	12
2012	14
2013	16
2014	18
2015	20

Section 103, titled Energy Use Measurement and Accountability, requires Federal buildings to have hourly energy use meters installed by October 1, 2012 in order to facilitate energy use monitoring and subsequent energy improvement projects. Section 104, titled Procurement of Energy Efficient Products, requires Federal buildings to purchase Energy Star and Federal Energy Management Program (FEMP) products. (Energy Policy Act of 2005)

Section 107, titled Advanced Building Efficiency Testbed, established a "program for the development, testing, and demonstration of advanced engineering systems, components, and materials to enable innovations in building technologies." The goal of Section 107 was to "evaluate efficiency concepts for government and industry buildings, and demonstrate the ability of next generation buildings to support individual and organizational productivity and health (including by improving indoor air quality) as well as flexibility and technological change to improve environmental sustainability."

Implementation of the program was to be conducted from 2006 through 2008 and led by a university with multifaceted skills in building technology. (Energy Policy Act of 2005)

Section 109, titled Federal Building Performance Standards, implemented more stringent building codes by implementing the 2004 International Energy Conservation Code for Federally owned residential buildings and the ASHRAE Standard 90.1–2004 for all other Federally owned buildings. (Energy Policy Act of 2005)

Section 125, titled Energy Efficient Public Buildings, offers grants to State agencies and local governments in charge of establishing energy conservation plans. The grant offers money to improve the energy efficiency of public buildings either through new construction or renovation of existing buildings. Both require at least 30 percent less energy use compared to a comparable building type baseline. Similarly, grant money is available through Section 128, titled State Building Energy Efficiency Codes Incentives, for State agencies and local governments in charge of establishing energy conservation plans to implement "a plan to achieve and document at least a 90 percent rate of compliance with residential and commercial building energy efficiency codes." (Energy Policy Act of 2005)

Section 913, titled National Building Performance Initiative, establishes an interagency group combining Federal, State, and private sector agents to perform "research, development, demonstration, and commercial application of energy technology and infrastructure" for building envelope, building components, and automatic operation of building equipment, followed by "the collection, analysis, and dissemination of research results and other pertinent information on enhancing building

performance to industry, government entities, and the public." (Energy Policy Act of 2005)

Finally, Section 914, titled Building Standards, establishes "a grant and technical assistance program to support the development of voluntary consensus-based standards for high performance buildings." Additionally, Section 914 creates an agreement between the Federal Government and the National Institute of Building Sciences to:

- "conduct an assessment (in cooperation with industry, standards development organizations, and other entities, as appropriate) of whether the current voluntary consensus standards and rating systems for high performance buildings are consistent with the current technological state of the art, including relevant results from the research, development and demonstration activities of the Department;
- determine if additional research is required, based on the findings of the assessment; and
- recommend steps for the Secretary to accelerate the development of voluntary consensus-based standards for high performance buildings that are based on the findings of the assessment." (Energy Policy Act of 2005)

Energy Independence and Security Act of 2007

On December 19, 2007, the Energy Independence and Security Act was passed into law. The Act addresses issues regarding energy use in the United States and aims to secure energy independence and security through various initiatives. Of particular note is the Act's focus on vehicle fuel economy and renewable and nonrenewable energy sources. Title IV of the Act, titled Energy Savings in Buildings and Industry, is of

particular relevance to green buildings and addresses green buildings in the residential, commercial, Federal, and public sphere. (Energy Independence and Security Act of 2007)

Section 421, titled Commercial High-Performance Green Buildings, requires the Secretary to appoint a Director of Commercial High-Performance Green Buildings who will "establish and manage the Office of Commercial High-Performance Green Buildings." The Director will also appoint members to the High-Performance Green Building Partnership Consortium. Members of the consortium are various persons important to the green building field selected from:

- "the design professions, including national associations of architects and of professional engineers;
- the development, construction, financial, and real estate industries;
- building owners and operators from the public and private sectors;
- academic and research organizations, including at least one national laboratory with extensive commercial building energy expertise;
- building code agencies and organizations, including a model energy code-setting organization;
- independent high-performance green building associations or councils;
- experts in indoor air quality and environmental factors;
- experts in intelligent buildings and integrated building information systems;
- utility energy efficiency programs;
- manufacturers and providers of equipment and techniques used in high-performance green buildings;
- public transportation industry experts; and

- nongovernmental energy efficiency organizations." (Energy Independence and Security Act of 2007)

The role of the Consortium is to assist the Director in reporting on high-performance green building programs and to assist in carrying out various initiatives. (Energy Independence and Security Act of 2007)

Section 422, which implements the Zero Net Energy Commercial Buildings Initiative, aims to reduce energy consumption in buildings and develop "zero net energy" commercial buildings by creating and propagating "technologies, practices, and policies for the development and establishment of zero net energy commercial buildings for (1) any commercial building newly constructed in the United States by 2030; (2) 50 percent of the commercial building stock of the United States by 2040; and (3) all commercial buildings in the United States by 2050." (Energy Independence and Security Act of 2007)

Section 423, titled Public Outreach, requires the Directors of both the Commercial and Federal Offices of High-Performance Buildings to provide public outreach to educate the public on high performance green buildings. Their efforts include creating a resource for the public on the Internet, recommending educational resources, providing technical assistance, tools, and other resources, providing certification and commissioning application instructions, and reviewing research and studies on high-performance green buildings. (Energy Independence and Security Act of 2007)

Subtitle C of Title V of the Act, titled High-Performance Federal Buildings, has similarities with the Energy Policy Act of 2005, and even amends parts of the 2005 Act. Section 431, titled Energy Reduction Goals for Federal Buildings, changes the previously

mentioned energy savings goals per square foot to the following, shown in Table 2.3. (Energy Independence and Security Act of 2007)

TABLE 2.3. FEDERAL BUILDINGS PERCENT REDUCTION IN ENERGY CONSUMPTION BY FISCAL YEAR – ENERGY INDEPENDENCE AND SECURITY ACT OF 2007

Fiscal Year	Percent Reduction in Energy Consumption/Gross Square Foot
2006	2
2007	4
2008	9
2009	12
2010	15
2011	18
2012	21
2013	24
2014	27
2015	30

Section 432, titled Management of Energy and Water Efficiency in Federal Buildings, appoints energy managers at Federal facilities who are responsible for completing "a comprehensive energy and water evaluation for approximately 25 percent of the facilities of each agency" such that the breadth of facilities within each agency would be completely evaluated every four years. Within two years of an energy and water evaluation, the facility must implement any cost-effective measures for improving energy and water performance. Scores of the facilities will be recorded, benchmarked, and made available to the public. (Energy Independence and Security Act of 2007)

Section 433, titled Federal Building Energy Efficiency Performance Standards, sets a requirement that Federal Buildings must reduce their fossil fuel dependence by a certain percentage compared to 2003 energy consumption data. The reductions are to occur in fiscal years 2010 through 2030 and are summarized in Table 2.4. (Energy Independence and Security Act of 2007)

TABLE 2.4. PERCENT REDUCTION IN FOSSIL FUEL USE BY FISCAL YEAR – ENERGY INDEPENDENCE AND SECURITY ACT OF 2007

Fiscal Year	Percent Reduction in Fossil Fuel Use
2010	55
2015	65
2020	80
2025	90
2030	100

Secton 434, titled management of Federal Building Efficiency, requires implementation of a review process for large capital energy investments made in Federal buildings. Section 435, titled Leasing, states that no Federal agency can lease a building that hasn't been energy star rated. (Energy Independence and Security Act of 2007)

Section 436, titled High-Performance Green Federal Buildings, requires the Administrator to appoint a Director of Federal High-Performance Green Buildings who will "establish and manage the Office of Federal High-Performance Green Buildings." This Office is parallel to the Office of Commercial High Performance Green Buildings established in Section 421 of the Act. (Energy Independence and Security Act of 2007)

Section 438, titled Storm Water Runoff Requirements for Federal Development Projects, requires "site planning, design, construction, and maintenance strategies" to establish predevelopment hydrology conditions including temperature, rate, volume, and duration for any Federal building undergoing development or redevelopment with a footprint greater than 5,000 square feet. (Energy Independence and Security Act of 2007)

Section 461, titled Healthy High-Performance Schools, amends the Toxic Substances Control Act (15 U.S.C. 2601 et seq.) in regards to schools. It provides grant money to schools that are addressing environmental issues and to developing state programs that are addressing environmental health in schools, helps establish guidelines

for healthy schools, and implement public outreach. (Energy Independence and Security Act of 2007)

Section 462, titled Study on Indoor Environmental Quality in Schools, establishes a study to:

- "investigate the combined effect building stressors such as heating, cooling, humidity, lighting, and acoustics have on building occupants' health, productivity, and overall well-being;
- identify how sustainable building features, such as energy efficiency, are influencing these human outcomes singly and in concert; and
- ensure that the impacts of the indoor environmental quality are evaluated as a whole." (Energy Independence and Security Act of 2007)

Section 471, titled Energy Sustainability and Efficiency Grants and Loans for Institutions, offers loans and grants for technical assistance, energy efficiency improvement and energy sustainability, and innovation in energy sustainability for institutions of higher education, public school districts, local governments, and municipal utilities. (Energy Independence and Security Act of 2007)

Section 491, titled Demonstration Project, requires the Federal and Commercial Directors to "establish guidelines to implement a demonstration project to contribute to the research goals of the Office of Commercial High-Performance Green Buildings and the Office of Federal High-Performance Green Buildings." (Energy Independence and Security Act of 2007)

Section 494, titles Green Building Advisory Committee, requires the Federal and Commercial Directors to establish the Green Building Advisory Committee, whose

purpose is to provide advice and expertise to assist in the Directors implementation of various items in the Act. (Energy Independence and Security Act of 2007)

Review of the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007 reveals that the United States Federal Government's goals are in line with the objectives of the USGBC and CaGBC LEED rating systems. While some goals may seem lofty and ambitious, they are specific and targeted with clear deadlines. Implementation of specific tasks is paired with a great deal of funding towards research and development that also has very specific, targeted goals.

3. LITERARY REVIEW

In order to justify the development of a sustainability methodology for Stantec, the business case for green buildings must be identified and validated. A variety of studies regarding costs, energy savings/performance, health and safety, and worker productivity were identified and reviewed in order to develop the business case and risks involved with green buildings.

3.1. DEVELOPING A BUSINESS CASE

There are two key factors that are causing corporations to pursue sustainable changes: the environment's limited capacity and an increasing demand from stakeholders and clients to go green (Esty & Winston, 10).

Given the growing green market, there are a variety of reasons that make the business case for green buildings: upside benefits, management of downside risks, and community stewardship.

Upside benefits characterize the favorable hard benefits seen in greening your corporation and typically include "higher revenues, lower operational costs, and even lower lending rates from banks that see reduced risk in companies with carefully constructed environmental management systems" (Esty & Winston, 11), as well as soft benefits including increased "value, credibility, and brand trust" (Esty & Winston, 11). Green buildings specifically can:

- Reduce operating costs from energy savings (Yudelson, 51)
- Reduce maintenance costs from commissioning (Yudelson, 51-52)
- Increase worker productivity from healthier indoor space (Yudelson, 52)

- Increase the building value (Yudelson, 53)
- Be more competitive in the market (Yudelson, 53)
- Aid in employee recruitment and retention due to a healthy work environment (Rodenburg, 2007)

Management of downside risks prevents companies from making mistakes in their operations. The consequences can be severe, especially when a mistake is exposed to the public. By managing downside risks and being an environmental leader, a company can keep a positive relationship with regulators, politicians, and its local community while preserving a reliable cash flow, brand value, and customer loyalty (Esty & Winston, 12-13). Green buildings specifically help ensure management of downside risks by:

- Creating a healthy work environment that will help prevent "sick building syndrome" lawsuits (Yudelson, 52)

Community stewardship allows a company to generate morals that are relevant to the surrounding community and incorporate these morals into both the company's business needs and vision. By having a set of company values, a competitive advantage is achieved, as a company with recognized values "attracts the best people, enhances brand value, and builds trust with customers and stakeholders" (Esty & Winston, 14). Green buildings specifically help companies become community stewards by:

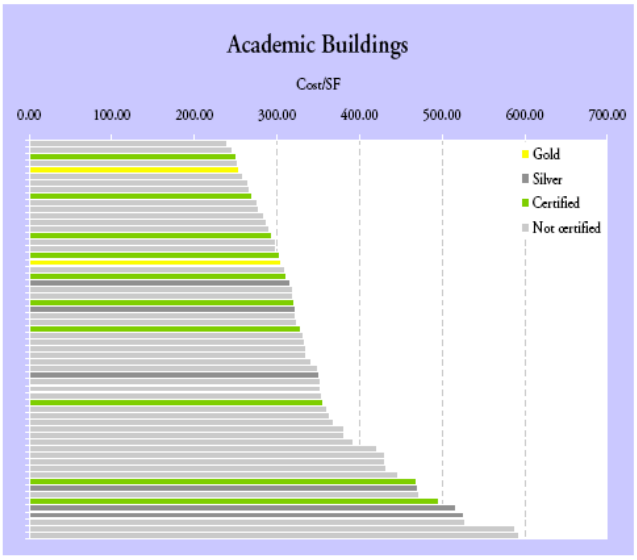
- Showing stakeholders, customers, and employees that the company is concerned for both the environment and their wellbeing (Yudelson, 52)
- Establishing the company as an environmental steward which establishes it as a good neighbor and helps with marketing and public relations (Yudelson, 52)

3.1.1. COSTS

Cost savings seen in green buildings are categorized as upside benefits. In July of 2004, the cost consulting firm Davis Langdon released a study indicating that green buildings do not cost more per square foot compared to conventional buildings (Yudelson, 39). In July of 2007, Davis Langdon revisited their study and came to the same conclusion.

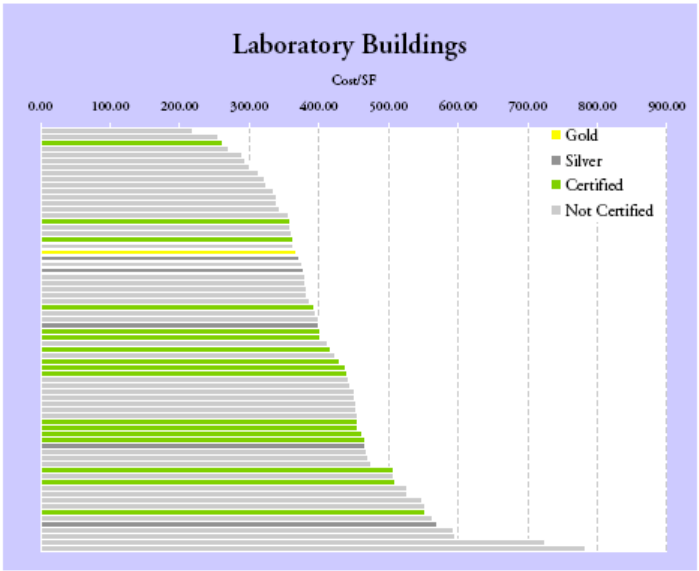
The 2007 study looked at 221 new construction buildings, 83 of which were designed for achieving some level of LEED certification and the other 138 having no sustainable design goals. The types of buildings analyzed in the study included academic buildings, laboratories, libraries, community centers, and ambulatory care facilities. All costs were adjusted for time and location and the buildings' LEED scores were adjusted to reflect the LEED 2.2 rating criteria. (Morris and Matthiessen, 4)

The academic buildings, laboratories, and libraries showed no significant statistical difference in the cost per square foot of various levels of LEED certified buildings versus non-certified buildings. While the sample size of community centers and ambulatory care facilities was not large enough to draw any statistical conclusions, the data suggests there is no cost premium for these facilities that incorporated LEED certification into their design. Figures 3.1 through 3.5 illustrate the 5 types of buildings studied and the distribution of cost per square foot for each type of building.



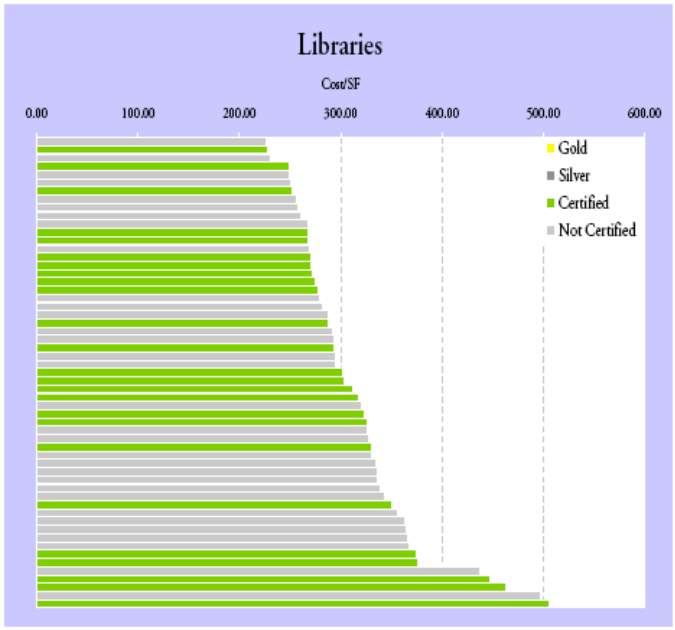
(Morris and Matthiessen, 5)

FIGURE 3.1. LEED VS NON-LEED: ACADEMIC BUILDING COSTS



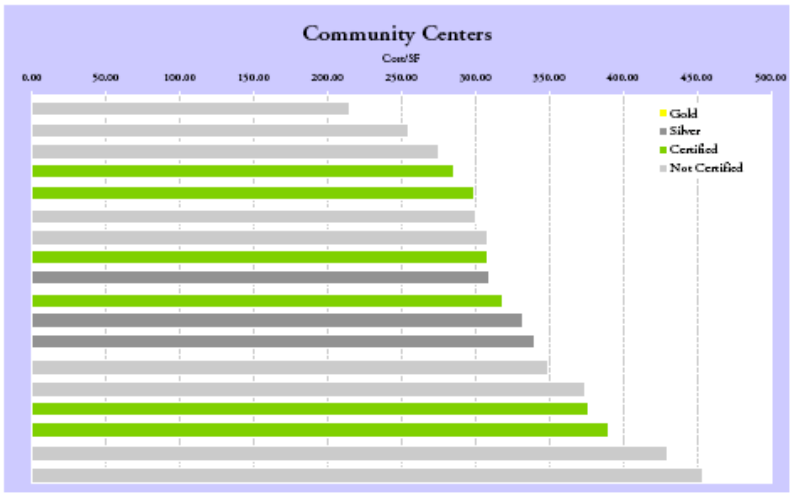
(Morris and Matthiessen, 6)

FIGURE 3.2. LEED VS NON-LEED: LABORATORY BUILDING COSTS



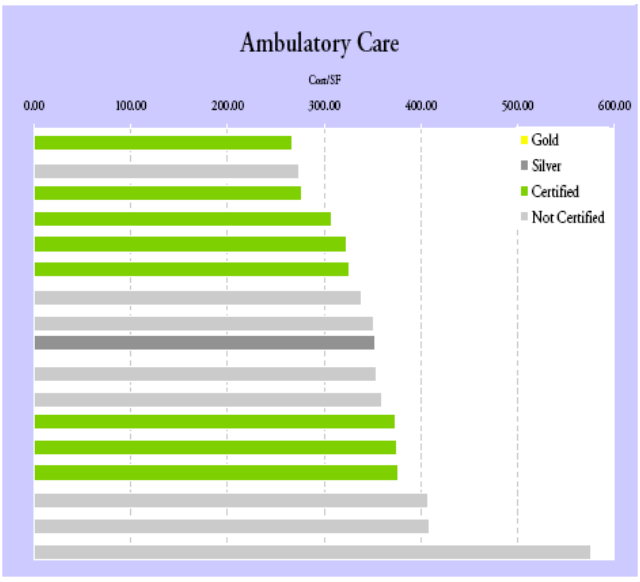
(Morris and Matthiessen, 7)

FIGURE 3.3. LEED VS NON-LEED: LIBRARY COSTS



(Morris and Matthiessen, 8)

FIGURE 3.4. LEED VS NON-LEED: COMMUNITY CENTER COSTS



(Morris and Matthiessen, 9)

FIGURE 3.5. LEED VS NON-LEED: AMBULATORY CARE COSTS

While there is no significant difference in the cost to construct a LEED certified building compared to a non-certified building, LEED buildings and green buildings in general that are constructed with energy use/performance and indoor environmental quality in mind do provide costs savings. Improved energy performance coupled with reduced energy consumption will subsequently reduce energy costs. Additionally, businesses often invest money into health care insurance for employees and when their employees get sick, they take an additional hit cost-wise and productivity-wise when considering "sick leave and reduced employee performance during periods of illness" (Fisk, 538). As William J. Fisk illustrates in his paper titled "Health and productivity gains from better indoor environments and their relationship with building energy efficiency," indoor environmental quality has a significant impact on pervasiveness of various sicknesses in a workplace. Buildings with better indoor environmental quality

reduce the prevalence of sickness and therefore reduce cost losses for companies in green buildings, potentially keeping insurance premiums low and employee attendance and productivity up. Energy savings/performance and health and safety are further discussed in the following sections.

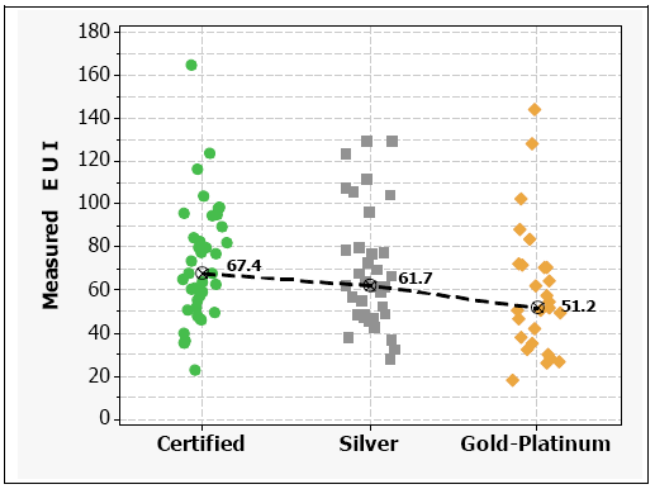
3.1.2. ENERGY SAVINGS/PERFORMANCE

The energy savings and resultant costs savings of green buildings would also be considered an upside benefit. In a report issued by the New Buildings Institute on March 4, 2008 titled *Energy Performance of LEED for New Construction Buildings* and authored by Cathy Turner and Mark Frankel, it is shown that out of a sample of 121 LEED New Construction Version 2 buildings, energy performance was significantly better compared to non-LEED buildings (Turner and Frankel, 1). The study analyzes buildings using three measures; energy use intensity (EUI), energy star ratings, and field results versus design and baseline modeling (Turner and Frankel, 1-2). LEED certified buildings are compared to what Turner and Frankel call "non-LEED building stock." LEED certified buildings participating in this study were required to have at least one year of post-occupancy energy use data available (Turner and Frankel, 1).

Energy Use Intensity

In the energy use intensity portion of the study, non-LEED building stock data came from the 2003 Commercial Building Energy Consumption Survey (Turner and Frankel, 14). Energy use intensity data was based on monthly energy bills typically furnished by building owners (Turner and Frankel,8). Overall, when comparing all LEED certified buildings participating in the study with the national building stock average EUI of 91 kBtu/sf, the LEED buildings had a median EUI of 69 kBtu/sf which is 24% below

the national building stock average. This figure considers all LEED certified buildings participating in the study, 21 of which are considered to be “High Energy Type” (Turner and Frankel, 14). High energy type buildings are considered to be buildings such as laboratories and data centers that are energy intensive. When comparing solely buildings considered as medium energy type that are more representative of offices, these buildings averaged 62 kBtu/sf which is 32% below the national building stock average (Turner and Frankel, 14). Figure 3.6 illustrates the median EUI by LEED certification level of medium energy type buildings, indicating an improvement in EUI as LEED certification level increases. Certified, silver, and gold/platinum rated buildings are shown to be 26%, 32%, and 44% lower than the national building stock average respectively (Turner and Frankel, 16).



(Turner and Frankel, 16)

FIGURE 3.6. MEASURED EUI AND MEDIAN EUI BY LEED CERTIFICATION LEVEL

A similar trend is shown when plotting the EUIs of medium energy type, LEED certified buildings versus their points awarded in LEED EA credit 1 (Turner and Frankel,

17). Additionally, when comparing medium energy type LEED buildings and the national stock buildings by climate zone, LEED buildings EUIs were found to be 51% to 64% lower in mixed, cool, and cold climates (Turner and Frankel, 17). In warm and hot climates, there was no significant difference shown between the two (Turner and Frankel, 17).

Energy Star Rating

Sixty of the 121 LEED certified buildings used in this study were eligible for energy star calculations which factor in a building's metered energy in addition to "energy lost in power generation, transmission, and distribution" (Turner and Frankel, 18). The energy star ratings of all LEED certified buildings (both high and medium energy type) were normalized for comparison with the building stock average (Turner and Frankel, 18). Energy star rating scores are based on performance percentiles, meaning a building score of 20 indicates 20% of similar buildings perform worse than that building (Turner and Frankel, 18). Given a median national building stock average energy star rating of 50, 75% of the 60 LEED certified buildings scored higher than the national building stock average (Turner and Frankel,18). Data did not suggest energy star rating was related to building type (Turner and Frankel, 19).

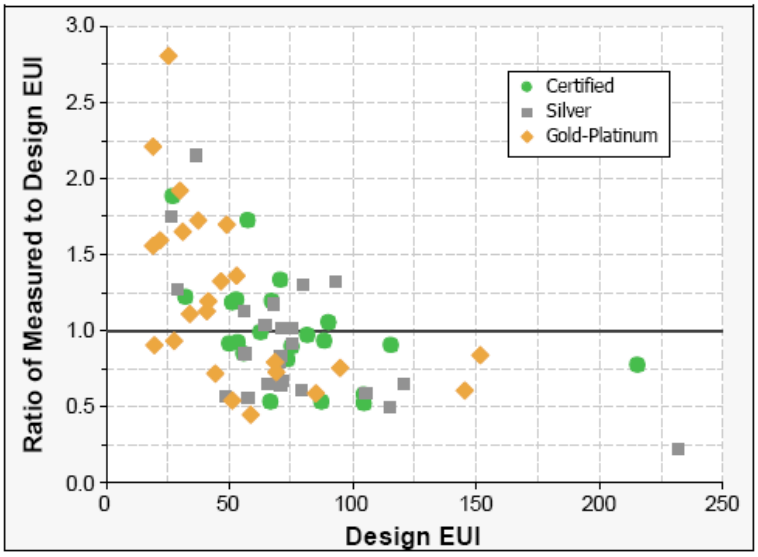
Measured Results Versus Modeling

Seventy-one of the medium type energy, LEED certified buildings participating in this study had energy modeling data available (Turner and Frankel, 20). A field measurement to design ratio of 1 (100%) indicates that energy modeling is accurate. The medium type energy, LEED certified buildings had an average measured to design EUI ratio of 92%, indicating a high accuracy in energy modeling techniques (Turner and

Frankel, 21). Furthermore, when comparing proposed savings in building modeling to field measurements of savings, the average measured to design savings ratio was 112%, indicating better savings in the field than modeling predicts. Average cost savings for the design and field measurements, 25% and 28% respectively (Turner and Frankel, 21), were developed as a percentage compared to baseline energy code requirements set by the AHRAE 90.1 standard (Turner and Frankel, 25).

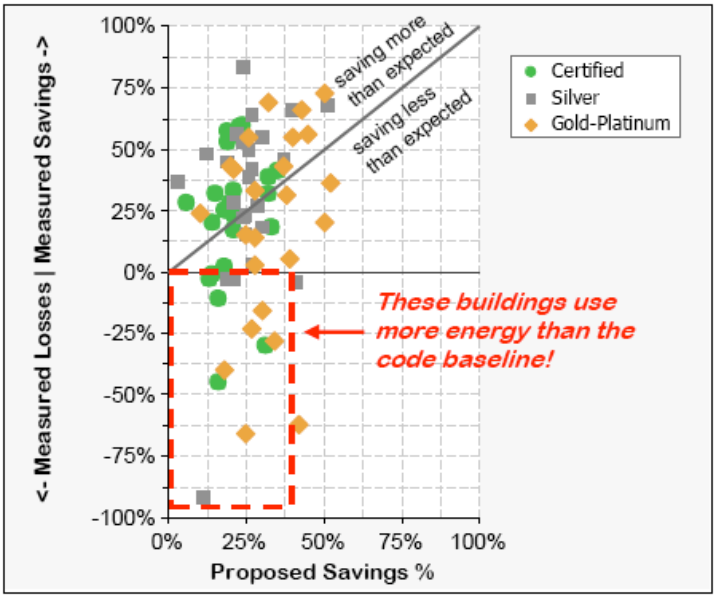
The aforementioned EUI and savings results are based on an average of the composite of medium type energy LEED certified buildings; However, when examined on an individual level, more than half of the 71 buildings' measured EUIs deviate more than 25% from the design EUIs, as shown in Figure 3.7 (Turner and Frankel, 23). Thirty percent showed higher measured to design EUI ratios (better performance than predicted) while 25% showed lower measured to design EUI ratios (worse performance than predicted) (Turner and Franekel, 23). Similarly, "25% of the buildings show savings in excess of 50%, well above any predicted outcomes, while 21% show unanticipated measured losses," as shown in Figure 3.8 (Turner and Frankel, 23).

Turner and Frankel's analysis indicates that while the average measured:design ratios for LEED buildings show energy design predictions in a positive light, these results are deceiving after considering the results on an individual basis. In developing the business case for green buildings and energy savings and performance, using design and modeling measures are the least reliable source of information based on Turner and Frankel's study. Turner and Frankel suggest several causes of the variation stemming from problems with design and modeling, including uncertainty about typical building operations (Turner and Frankel, 24), over/under-estimation of building performance



(Turner and Frankel, 23)

FIGURE 3.7. DESIGN EUI VERSUS RATIO OF MEASURED:DESIGN EUI



(Turner and Frankel, 24)

FIGURE 3.8. DESIGN SAVINGS VERSUS MEASURED SAVINGS

(Turner and Frankel, 24), and variability in the ASHRAE 90.1 standard baseline based on project type, LEED level, and expected performance levels (Turner and Frankel, 27). Turner and Frankel recommend continued research and improvements in the LEED rating system to account for this problem (Turner and Frankel, 23).

3.1.3. HEALTH AND SAFETY

As previously mentioned, indoor environmental quality has a significant effect on the health of building patrons. In his paper titled "Health and productivity gains from better indoor environments and their relationship with building energy efficiency," William J. Fisk identifies three conditions and symptoms including communicable respiratory illness, allergies and asthma, and sick building syndrome, then illustrates their relation to indoor environmental quality, their financial and productivity costs to the U.S. market, and the potential financial and productivity gains for the U.S. market through improved indoor environmental quality, a factor commonly associated with green buildings. Fisk develops a composite of published literature, conference proceedings, and discussions with researchers in his paper to draw statistically significant evidence and conclusions (Fisk, 538). Table 3.1 summarizes Fisk's results. Annual costs and potential savings were adjusted by Fisk to reflect U.S. dollar amounts for 1996. While there is a 12 year difference from Fisk's estimates and the time of publication of this paper, it is assumed that Fisk's numbers would increase nearly proportionately with the population gain since 1996 and that a negligible amount of indoor environmental quality improvements have been made given the relatively large number of existing buildings compared to the relatively small number of buildings with green technologies.

TABLE 3.1. ANNUAL COSTS AND POTENTAL SAVINGS WITH IMPROVED INDOOR AIR QUALITY

Health Condition	Annual Cost	Potential Annual Savings
Communicable Respiratory Illness	$70 Billion	$6 to $14 Billion
Allergies and Asthma	$15 Billion	$1 to $4 Billion
Sick Building Syndrome	$60 Billion	$10 to $30 Billion

Communicable Respiratory Illness

Fisk defines communicable respiratory illness as the "common cold, influenza, adenovirus infections, measles, and other common respiratory illness" (Fisk, 540) which are transmitted from one person to another in the form of infectious aerosols (Fisk, 540). Infectious aerosol transmission "may be influenced by [building conditions and characteristics such as] the efficiency or rate of air filtration, the rate of ventilation…, the amount of air recirculation in ventilation systems, the separation between individuals…, and air temperature and humidity…" (Fisk, 539). Two particular studies cited in Fisk's research paper involved work places. The first study, published by Jaakkola and Heinonen in 1993 and titled "Shared office space and the risk of the common cold," noted a 20% increase in likelihood in office workers to have more than two cases of the common cold if they shared their office with one or more roommates compared to fellow coworkers who had no office roommates (Fisk, 540). In another study published by Milton et al in 2000 and titled "Risk of sick leave associated with outdoor ventilation level, humidification, and building related complaints," worker absence rates were calculated for buildings classified as having either moderate ventilation (12 L per second per occupant) or high ventilation (24 L per second per occupant). After factoring in "age, gender, seniority, crowding, and type of workspace," (Fisk, 543) Milton et al concluded that buildings with higher ventilation saw a 35% lower absence rate than moderate ventilation buildings (Fisk, 543).

Based on a 1985 study by R.E. Dixon titled "Economic costs of respiratory tract infections in the United States," Fisk adjusts Dixon's numbers based on population gain to report that 176 million days are lost from work and an additional 121 million days worth of work in the U.S. due to substantially restricted activity, assuming a 100% loss and 25% decrease in productivity respectively due to common respiratory illnesses including the common cold, influenza, pneumonia, and bronchitis (Fisk, 543). Assuming an average annual salary of $39,200, this equates to $34 billion in lost work and an additional $36 billion in health care costs, totaling $70 billion lost annually due to respiratory infections (Fisk, 543).

Fisk suggests that through "increased ventilation, reduced air recirculation, improved filtration, ultraviolet disinfection of air, reduced space sharing…, and reduced occupant density…," (Fisk, 544) exposure to infectious aerosols can be reduced by a factor of 2 (Fisk, 544). Considering the statistical relevance of the various studies Fisk compiles, he estimates an annual savings between $6 billion and $14 billion (Fisk, 544).

Allergies and Asthma

Fisk reports that allergies and asthma can be triggered by various indoor air allergens including "dust mites, pets, fungi, insects, and pollens" (Fisk, 545). Building factors strongly related to asthma and allergies include "moisture problems, house dust mites, molds, cats and dogs, and cockroach infestation" (Fisk, 545). Fisk notes that there are relatively few studies published about "the effect of changes in building conditions on the symptoms of allergies and asthma." (Fisk, 545) Given the data that is available, one case study showed that "higher relative humidity, higher concentrations of alternaria (a mold) allergen in air, and higher dust mite antigen in floor dust were associated with a

higher prevalence of respiratory symptoms" (Fisk, 545). Based on five studies available estimating the cost of allergies and asthma, Fisk deduces an average annual cost of $15 billion attributed to allergies and asthma in the U.S. (Fisk, 546).

Fisk suggests three methods for reducing the occurrence of allergies and asthma; controlling the sources, air cleaning and increased ventilation, and building modification (Fisk, 547). Control of the source includes restricting tobacco smoking to isolated, specially ventilated rooms or prohibiting it altogether, keeping animals outdoors, reducing water leaks and moisture problems, decreasing indoor humidity, and improving the cleaning of the building interiors and HVAC systems (Fisk, 547). Given the nature of indoor allergens and asthma and the three proposed solutions, Fisk projects a feasible reduction of 8 to 25 percent reduction of symptoms totaling approximately $1 billion to $4 billion in annual savings (Fisk, 548).

Sick Building Syndrome

Sick building syndrome broadly defines acute symptoms felt by building occupants that are caused by building characteristics (Fisk, 548). Such symptoms "include irritation of eyes, nose, and skin, headache, fatigue, and difficulty breathing" (Fisk, 548). Sick building syndrome symptoms can be exacerbated or improved based on the "type of ventilation system, rate of outside air ventilation, level of chemical and microbiological pollution, and indoor temperature and humidity" (Fisk, 549). Using an average of the gross domestic product associated with office work and the gross average annual income for the nation, and factoring in an estimated 2% decrease in productivity due to sick building syndrome, Fisk estimates a nationwide annual loss of $60 billion due to sick building syndrome.

Fisk suggests that symptoms of sick building syndrome can be reduced through "increased ventilation, decreased temperature, and improved cleaning of floors and chairs" (Fisk, 549). Assuming a 20 to 50 percent reduction in sick building syndrome by improving building characteristics potentially leads to an approximate $10 billion to $30 billion in savings (Fisk, 553).

3.1.4. WORKER PRODUCTIVITY

In addition to causing health problems for building occupants, poor indoor environmental quality can also affect the physical and mental performance of workers as a separate, independent entity (Fisk, 553). Fisk identifies several studies that show a relationship between thermal and lighting conditions and productivity. It is important to note that studies in this area are challenging due to uncontrolled and external factors such as worker motivation and worker self-assessment and that while some studies draw statistically significant results, other studies have shown no correlation between thermal and lighting conditions and productivity (Fisk, 553).

Fisk's research in the relationship between thermal conditions and worker productivity concludes that "changes in temperature of a few degrees Celsius within the 18*C to 30*C can significantly influence performance in several tasks including typewriting, factory work, signal recognition, time to respond to signals, learning performance, reading speed and comprehension, multiplication speed, and word memory" (Fisk, 553). The specific optimal thermal conditions vary depending on task, the individual, and over time (Fisk, 553). One study suggests that providing individual control of temperature can increase productivity by 2 percent (Fisk, 553) Another study suggests that productivity can be increased by 3 percent for logical thinking and skilled

manual work and by 7 percent for typing with individual temperature control of +- 3*C (Fisk, 553).

Fisk's research in the relationship between lighting conditions and worker productivity concludes that while there are many studies showing a relationship between lighting conditions and visually demanding tasks, "the potential to use improved lighting to significantly improve the performance of office workers seems to be largely unproved…" (Fisk, 554). The composite of studies Fisk researches investigate how illuminance, glare, reflections, lighting spectrum, and contrast affect performance (Fisk, 554). Fisk notes that in accordance with the National Electrical Manufacturers Association's paper titled "Lighting and human performance: a review," "lighting has the theoretical potential to influence performance directly because work performance depends on vision, and indirectly because lighting may direct attention, or influence arousal or motivation" (Fisk, 554).

Given the relatively small amount of research available in the field of temperature and lighting conditions and productivity, Fisk conservatively estimates a potential 0.5 percent to 5 percent increase in productivity with improvements in lighting and temperature equating to approximately $20 billion to $160 billion in productivity gains (Fisk, 556).

3.2. RISKS

Pursuing LEED certification inherently involves some risks, especially at this point in time because of the rating system's relative infancy in the construction market. The risk most directly associated with the system's infancy is whether or not it will be widely accepted within the industry. LEED certification currently stands as an

innovation, a new product, method, or idea that strays from the conventional (Yudelson, 23). Classical marketing theory states that it typically takes anywhere between 15 and 25 years for an innovation to be adopted by 90% of the total market (Yudelson, 23). The construction industry has been known to fall within this range. Compared to the relatively slow acceptance of innovations in the construction industry, the acceptance of green buildings has been growing quite quickly (Zimmerman, 2007). The U.S. Green Building Council developed LEED with the intention of only reaching 25% of the construction market (Yudelson, 46). As of August 2007, green buildings made up 10 to 15% of the new construction market (Zimmerman, 2007).

Whether or not LEED certification is accepted in the construction industry will have strong implications for marketing the LEED brand to consumers. If the values associated with having a LEED certified building are not present, then there is little value in investing in the superficial branding of a green building. However, it is important to note that the intrinsic benefits of green buildings are separate from brand recognition.

Aside from the acceptance of LEED certification, depending on the nature of the economy, vacancy rates, interest rates, and market location, it may not be economical to invest in green improvements. Furthermore, initially investing in the LEED certification system can generate cost premiums ranging from 0% to 8% of the soft building costs (Yudelson, 40), but with careful planning, increased experience, and integrated design, the cost premiums can often be reduced or avoided altogether.

4. STANTEC OPERATIONS AND NEEDS ANALYSIS

4.1. INTERNAL SUSTAINABILITY

Stantec has a variety of internal programs developed that help encourage sustainable practices throughout the company. The Seattle office offers an alternative transportation incentive in which employees using public transportation receive "$25 a month towards bus fare and bikers, walkers and carpoolers receive $25 in certificates that are good at several local businesses" (Dowding, 19). The Seattle office also frequently walks to client meetings and project sites, uses a city-wide car sharing service when traveling far, purchases recycled furniture, and buys organic goods (Dowding 18-19). The Victoria office purchased a DaimlerChrysler smart car to replace the offices company car, and CEO Tony Franceschini expects to replace all company cars in the U.S. and Canada with these smart cars as the company cars become outdated (Mueller, 26-27). The Guelph office runs a lunchroom composting program, uses daylighting whenever possible, installed programmable thermostats to reduce heating and cooling costs, installed low flow toilets, and planted a perennial wildflower garden (Scalise & Riches, 42-43).

While there are great examples of sustainability within the company, there are offices on the opposite side of the spectrum that have less interest and motivation to pursue making sustainable efforts. Since hiring an Internal Sustainability Coordinator, Stantec has begun encouraging offices to develop sustainability committees. A document titled "Local Internal Sustainability Committees: Operating Guidelines," located in Appendix A, was developed to help offices form committees that can successfully

implement sustainable changes in an organized fashion. The guide covers important issues relevant to a committee such as committee objectives, membership, meetings, and budgets. Thirteen of Stantec's 125 offices have formed Sustainability Committees; however, 10 of these committees were formed in the last year and have yet to implement any form of sustainable changes. (Franceschini, 2008)

The lack of action on the part of Stantec's office sustainability committees is in part due to their being no available directions for approaching sustainable changes. This confirms the purpose of developing the Stantec Office Sustainability Improvement Guide.

4.2. INTERNAL LEED CERTIFICATION AND SUSTAINBLE EFFORTS

In order to obtain direct input and comments from Stantec's LEED certified offices, a series of interviews were conducted with the Edmonton, San Francisco, and Vancouver offices as well as with Stantec's Real Estate Department and Stantec's Sustainability Coordinator. Questions used to guide these interviews are located in Appendix B.

Stantec Centre Tower III, Edmonton, Alberta

The Stantec Centre Tower III, located in Edmonton, AB, first began construction in 2003 as an addition to two existing, connected office buildings. As the first Stantec building to pursue LEED certification, it faced many challenges. The building's request to go green was made prior to Stantec's commitment to sustainability in 2006, and therefore required convincing CEO Tony Franceschini and Vice President of Alberta-

North Bob Gomes to approve the project. At the time of the project proposal, LEED certification was internally considered a marketing hype with few actual benefits. With the help of Mike Woodland, Principal Architect, AAA, NWTAAA, and LEED AP, Mr. Franceschini and Mr. Gomes were convinced to allow LEED certification of the new Edmonton addition with the stipulation that it had to fall within the existing proposed budget. Mike secured $200,000 in grant money that assisted in constructing the building's green roof and since the building was an addition to an existing location, there were already several location characteristics, such as proximity to public transportation and population density, that helped achieved LEED points without having to pursue major costs. Employees were also hesitant to support the project; However, about a year into construction around late 2004 and early 2005, Canada began seeing increased media coverage of green buildings causing employees to be more supportive and understanding. (Woodland, 2008)

Design of the building took an integrated approach, which is preferred for LEED construction, and utilized energy modeling programs. Design came from in-house professionals and was a good way for employees to gain experience in designing sustainable buildings. Some of the perceived benefits of the certified office are open space for more interaction, daylighting and nice views, unique and comfortable office space, and energy savings. (Woodland, 2008)

As the first LEED certified Stantec building, the Centre Tower III set a precedent for the company. Initially starting as a grassroots movement from within the company, it has now spurred a top-down movement from the corporate office that is encouraging company-wide sustainability. Over time it is anticipated that the grassroots movement

and the corporate approach will meet in the middle, resulting in a completely sustainable corporation.

San Francisco, California

The San Francisco office achieved LEED-CI certification in 2005 prior to being acquired by Stantec in 2007. The office pursued LEED certification in order to gain in-house experience, as they receive many clients in the health and education sectors, both of which frequently seek LEED certification, as well as to benefit employees' wellbeing. (Barett, 2008)

Similar to the Edmonton office, pursuing LEED certification required some convincing of the company's owners. Once overcoming the ower's reservations and gaining employee support, the office was faced with some resistance from the building landlord. The landlord refused to re-install windows that were installed backwards. Re-installation could have generated energy savings. Additionally, the landlord refused to replace the existing PVC window blinds with more environmentally conscious blinds. While the company was able to reduce their energy consumption, the office was not able to receive the full benefit of energy cost reduction because their lease agreement makes them pay for energy on a square-footage basis. As a result, the energy savings of the office were spread to other building tenants. The office has installed E-Mon D-Mon energy monitoring units, but have yet to utilize the energy saving information. (Barett, 2008)

Overall the office is pleased with the outcome of LEED-CI certification. The office feels they have made a positive impact on their employees and the environment

with their energy use reduction, low flow toilets, temperature monitoring, access to daylight, and air filtration. (Barett, 2008)

Vancouver, British Columbia

The Vancouver office is one of Stantec's star offices, having successfully achieved a LEED-CI Silver rating as well as implementing an ISO 14000 plan for an employee sub-group. The corporate office, branch employees, and the building owner endorsed pursuit of LEED certification. In fact, after completing LEED certification in the Vancouver office, the building owner subsequently "applied LEED principles to one of the largest private real estate portfolios" (Hartley, 2008). Design work came from in-house employees, and a post-occupancy review confirmed environmental and employee benefits. Unfortunately, the office has yet to calculate any cost savings that certification may have achieved. (Hartley, 2008)

The Vancouver office has extended its knowledge to other offices, hosting a "webinar" presentation online which other offices could electronically connect to. Their success is a testament that sustainable changes can be achieved though LEED certification and ISO 14000.

Boston, Massachusetts

The Boston, Massachusetts office was recently acquired by Stantec in May of 2007 and has since established a sustainability committee following Stantec's *Local Internal Sustainability Committees: Operating Guidelines*. At the time of an interview with the office's sustainability committee on March 4, 2008, the committee indcated that this was their third meeting and due to its infancy at that point in time, it had only performed research and held discussions on sustainable changes. While the office hasn't

implemented many sustainable changes or achieved LEED certification, it serves as a good representation of an office that is just beginning to approach sustainability. The committee has divided itself into four subgroups: plumbing and electrical, recycling, office supplies, and education. (Tavares, 2008)

A hidden advantage to the Boston office is that it already has several "green" components in its construction and operation. For example, it has recycled carpets, energy saving lights, a sunroof, and an open layout, all features deemed green and contributing to good environmental health and worker productivity. Topics that the office's sustainability committee have discussed and hope to implement include arranging for recyclables pick up of bottles and mixed paper, purchasing green office supplies, installing low flow or no flow urinals and toilets, and giving an office wide presentation on green technologies. (Tavares, 2008)

4.3. NEEDS ANALYSIS

Upon reviewing the *Local Internal Sustainability Committees: Operating Guidelines* and hearing how various offices are attempting or were able to make sustainable changes, it's apparent that Stantec has a good foundation for organizing its employees into a goal driven committee with similar values and outlooks on the environment; However, once committees have been assembled there is little guidance on which avenues to approach for making sustainable changes other than networking with other offices, consulting the Sustainability Coordinator, or doing independent research. It is also apparent that no follow-up efforts are being undertaken by each office to actively monitor their green improvements post-implementation. Each office varies in size, professional expertise, services, and individual experiences.

Given each office is so different, its possible that certain offices will not have an all-inclusive arsenal of employees serving on a sustainability committee who are equipped with enough knowledge to tackle all considerations needed for making sustainable improvements. For example, upon accessing the Boston office's efforts to pursue sustainability, some factors had not yet been considered such as the landlords willingness to meter utilities in the building separately for each lease holder or to buy into water saving technologies such as no flow toilets. During interviews, when offices were asked about methods of tracking and reporting energy use and other sustainable changes, it appeared that although offices made sustainable changes, no follow-up efforts were put into tracking the energy savings, progress, or what does and doesn't work.

Instead of an office having to "learn as it goes" and identify problems to address while implementing green technologies, it would be helpful to have some guidance and examples at hand illustrating items to consider when making sustainable changes and suggestions on how to track progress once sustainable changes have been made. Given Stantec's operations, vision and values, and the business case for green buildings, development of the Stantec Office Sustainability Implementation Guide is justified.

5. DELIVERABLE

5.1. PURPOSE

Given the strong business case for green buildings, Stantec has made a commitment towards incorporating sustainable design into its clients' projects. To affirm clients' confidence in the company, Stantec makes sure to "walk the talk," having recently implemented internally green operations and green office space. While the company has been able to achieve LEED certification in a handful of its offices and the hiring of an internal sustainability coordinator has helped increase the company's sustainable practices, Stantec currently lacks an internal document that gives offices instruction and direction for making green improvements and documenting afterward. The Stantec Office Sustainability Improvement Guide was developed to provide offices with such direction.

The guide covers a variety of important avenues to pursue when making sustainable changes including why it is important to green an office, what types of changes can be made, key features of building leases, and how to make and monitor changes in a practical, linear method. It is important to recognize that each Stantec office is unique, and an exact formula cannot be applied to every office. Consequently, this guide illustrates to the user the general steps to achieving a sustainable office. The guide is considering a living document, to be edited as more offices use it and come across valuable experiences and information.

5.2. METHODOLOGY

The Stantec Office Sustainability Improvement Guide was initially developed based on personal interviews with Statec's Sustainability Coordinator, Real Estate Acquisitions Department, and various offices that have already been successful in making sustainable changes as well as research on various building rating systems, the market for green buildings, and building design processes. During interviews with offices that had already made successful sustainable changes, it was apparent that there is a lack of tracking the progress of offices making sustainable changes. Offices were unable to track or utilize historical and current data on energy use. After speaking with the Stantec Sustainability Coordinator and the Boston office, it was also clear that those offices that had formed a sustainability committee were slow to start making changes due to a lack of direction. Consequently, the guide was formed around these premises.

5.3. ORGANIZATION AND FORMAT

The Guide is arranged in a linear format which takes the user through logical steps, including locating and office, signing a lease, forming a sustainability committee, setting goals, implementing sustainable changes, tracking and evaluating progress, and educating the company and clients about success. Formatting was kept at a minumum to allow Stantec to format the document to their own internal style guidelines.

5.4. PRODUCT

Appendix C contains the final deliverable, the *Stantec Office Sustainability Improvement Guide*, to be used by Stantec offices for implementing sustainable changes.

6. CONCLUSIONS AND RECOMMENDATIONS

The business case developed for green buildings indicates a strong correlation with cost savings, increased energy savings and performance, and improved occupant health and worker productivity. Such benefits are desirable by building owners, leasers, and tenants alike. The establishment of various sources of funding, research and development, and prioritization of green buildings in the United States alone through Federal law suggests there is a high level of worth to green buildings deserving national attention that is justifiable.

Given Stantec's three-fold approach to sustainability on an economic, social, and environmental level and the company's bevy of services that already provide sustainable solutions to clients, setting a goal of incorporating sustainability into Stantec's internal operations and then developing the "Local Internal Sustainability Committees: Operating Guidelines" were practical first steps; However, these guidelines do not direct readers on how to approach sustainable changes; Only on how to form and manage a sustainability committee. Seeing a need, the next practical step was to develop a framework to approach sustainability in the "Stantec Office Sustainability Improvement Guidelines," which this project has delivered. These guidelines serve as a practical, generalized, linear method for approaching sustainable changes in Stantec's offices, providing suggestions to employees that may have been overlooked without the guide.

While the "Stantec Office Sustainability Improvement Guidelines" serve as a good foundation for leading offices through sustainable changes, it by no means should be a final, non-negotiable set of guidelines. Green building technologies and factors that influence their implementation are always changing. As indicated, the guidelines are

provided as an internal "living" document to be edited and added to based on the experiences of Stantec employees as they use it for making sustainable changes.

As Stantec continues to develop and more offices chose to pursue sustainability, a variety of follow-up projects stemming from this guide could be implemented. More concrete and focused examples of sustainable changes could be added to the guide, outlining specific process flows to approach these changes. Examples of sustainable changes that are commonly implemented in Statec's offices would be especially beneficial to add to the guide; However, this would require an entity within Stantec, most likely the Internal Sustainability Coordinator, to have collected enough data on offices throughout the company to indicate trends in green improvements within the company.

Other potential spin-off projects include assisting an office in real life implementation of sustainable changes through use of the guidelines. As there was no "trial run" for the developed guide, there has been no feedback to indicate its strong points and weaknesses or items that may have been overlooked. Yet another project could develop similar approach guidelines that are specifically tailored to the LEED system, which Stantec prefers to see its offices pursue. While USGBC and CaGBC already have a system in place for guiding its users through the LEED certification process, an internal guide produced by Stantec may be useful for providing offices with a more company-specific approach to LEED that reflects LEED points Stantec favors and any challenges, successes, and additional factors to consider which may not explicitly be said through the USGBC or CaGBC.

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APPENDIX A
Local Internal Sustainability Committees: Operating Guidelines

Local Internal Sustainability Committees

Operating Guidelines

Last Updated October 9, 2007

Stantec

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LOCAL INTERNAL SUSTAINABILITY COMMITTEES:
OPERATING GUIDELINES

BACKGROUND

A local Internal Sustainability Committee is a voluntary group of employees interested in 'greening' their office. They may also be known as 'Green Office Committees', 'Green Teams', or by a location-specific name (ie. COST - the Calgary Office Sustainability Team). There are currently 12 Stantec offices with such a committee in operation, including: Vancouver, Calgary, Edmonton, Regina, Saskatoon, Winnipeg, Toronto (Wellington), Kitchener, Seattle, Sarasota, Tucson, and Westford. Employees from at least a dozen more offices have expressed interest in starting one.

Some offices may have more than one type of sustainability committee, or else they may have several sub-committees. In this situation, typically one committee or sub-committee is focused on greening the office and the other is focused on incorporating sustainable design principles into the services that we provide. This document only applies to the former.

RATIONALE

- Reducing the environmental footprint of an office will often result in considerable savings through initiatives such as reduced energy and water use, reduced materials use, and reduced travel.
- Employees at many of our offices are interested in trying to make their office's operations more environmentally responsible; however, they often don't know where to start. Office Leaders can channel the initiative and passion of such employees by facilitating the organization of a voluntary committee dedicated to greening their office.
- Stantec has a corporate commitment to sustainability. Initiating a Sustainability Committee is a way for offices to demonstrate this commitment at a local level while ensuring that greening efforts are in synch across the Company.
- As the younger generation is increasingly concerned with environmental responsibility, presence of a Sustainability Committee can also be a good recruitment and retention tool.

COMMITTEE GOALS

Mandates

1) Recommend, initiate, and implement efforts to reduce the environmental footprint of the office's internal operations
2) Help coordinate and support corporate sustainability initiatives at a local level (ie. Bike to Work challenge, Car Free Day, Rideshare Week, Earth Day, Energy/ Water Awareness campaigns)
3) Gather operational sustainability information and relay to Corporate (ie. data on office facilities, waste management, employee habits, environmental incentive programs, etc.)
4) Promote environmental education and awareness among employees
5) Communicate and coordinate activities with the Internal Sustainability Coordinator, as well as with sustainability committees at other offices

Objectives

To encourage and support the following activities within the office:

- Waste reduction/ management: Reduction in waste (ie. paper use), recycling, composting
- Energy and water efficiency/ conservation: Efficiency improvements, Energy/ Water Wise campaigns
- Alternative transportation: Transit use, carpooling, biking/walking, etc.
- Environmental awareness/ education: Organizing/ conducting educational presentations, events, contests, discussions; screenings of environmental films
- Ethical purchasing: Sourcing local products and services with a reduced environmental/ social impact

ASSISTANCE

The Internal Sustainability Coordinator (Laura Franceschini) will be available to assist offices interested in this initiative, both during initial committee set up and subsequent operation. She will help committees to fulfill their goals by providing resources and guidance, as well as ensuring that committee efforts are coordinated across the Company. Through collaboration, each committee can ensure that they will achieve maximum benefit with minimal use of employee resources, and that Stantec will be able to generate uniform and comparable operational sustainability data across all offices.

Targets

Each quarter, the Internal Sustainability Coordinator will give the committees a focus area such as 'Alternative transportation'. All committees will be presented with a variety of potential initiatives to improve their office's environmental performance in that area, and they will then each be asked to select one idea to pursue during that quarter. Committees will of course also be free to work on their own local initiatives throughout the year.

MEMBERSHIP

Membership is at the discretion of each committee. Wherever possible, there should be at least one member representing each major Profit Centre within that office. For disaggregated offices, there should be at least one member from each separate location.

Membership Types

- Active/ Formal committee members are task owning. They will each take on at least one action item and will be responsible for deliverables. They should be encouraged to regularly attend meetings.
- Observant/ Informal committee members are free to attend meetings and observe proceedings on a casual basis without necessarily taking an active role. Most active members will start initially as observant members.

Designated Roles

Leadership

Each committee shall have at least one Chair and one Deputy Chair (or Co-Chair). Both the Chair and Deputy Chair/ Co-Chair should have management approval. Responsibilities involved with these roles are as follows:

- Chair: Responsible for initiating meetings, managing the committee, tracking progress, and communicating with the Internal Sustainability Coordinator.
- Deputy Chair/ Co-Chair: An alternate contact for the Internal Sustainability Coordinator and takes on the responsibilities of the Chair as needed.

Secondary Roles

Other roles may be designated at the discretion of each committee. Some examples of possible additional roles and their associated responsibilities are listed below:

- Treasurer: Prepares a Committee budget (if applicable), collects and safeguards any funds, handles purchases, and files expenses.
- Secretary: Responsible for taking meeting minutes, monitoring attendance, filing information, and communicating this information to the other committee members and the Internal Sustainability Coordinator.

- Communications/ Promotions: Responsible for generating awareness about the Committee and its activities, as well as designing any necessary promotional or graphic materials.
- Librarian: Responsible for building and maintaining a Sustainability Resource Library (where applicable) and keeping track of loans/ returns.

Sub-Groups

In addition, some committees may find that it is beneficial to instate sub-groups which are assigned specific tasks. This could be a good way to distribute the committee workload and further divvy up responsibilities. Sub-groups could be organized around the 5 key objectives of the committee, as follows:

- Waste Reduction/ Management
- Energy/ Water Conservation
- Alternative Transportation
- Education/ Awareness
- Ethical purchasing

MEETINGS

- Committee meetings should preferably be scheduled to occur at least once a month. Suggested meeting times are at lunch or after office hours. Wherever possible, meeting times and locations should be consistent and should be well publicized.
- Unless granted special permission by management, meetings are to occur on employees' own time and should not interfere with any regular office activities.
- The minutes of each meeting should be well documented in order to keep track of Committee activities and communicate them to those interested, such as management.
- In addition, an itemized Task Agenda should be maintained which keeps track of any planned initiatives, which members are assigned to further research/ implement each task, any timelines/ deadlines to be adhered to, and any progress to date.

BUDGET

It is recommended that each Committee be assigned an **annual operating budget of $1,000 - $5,000**, determined by local management and typically charged to the Shared Services budget. This will facilitate planning events requiring funds and avoid creating costly and unnecessary administrative work each time. Each committee is responsible for obtaining budget approval from their Regional/ Office Leader.

The Committee Budget would be used for smaller expenses such as the following:

- Catering/food for Committee meetings and events (ie. lunch for special guest presentations, popcorn/drinks for environmental video screenings)
- Renting needed supplies, such as screens, projectors, laptops, etc.
- Prizes for in-house and company-wide competitions and contests
- Registration fees for community events (ie. Clean Commute Challenge, Earth Day festivities, Energy Fairs, environmental conferences)
- Producing any necessary promotional material such as brochures, pamphlets, or posters for events, awareness campaigns, and/or contests

For larger office greening initiatives requiring funding and/or approval, each Committee will be expected to put together an independent proposal including a budget which will be reviewed by local management on a case by case basis. Alternatively, a Committee may choose to put together an annual budget proposal outlining the greening initiatives they wish to pursue for the year along with the estimated cost of each.

APPENDIX B
Interview Questions

QUESTIONS FOR STANTEC'S OFFICES

LEED Certified Offices

1. What were the deciding factors for pursuing LEED certification?
2. Were there any limiting factors?
    a. Location specific
    b. Corporate opinion
    c. Employee related
    d. Building owner and other tenant's opinions
3. What level of involvement did the corporate office, branch employees, building owner/management company, and other building tenants have in pursuing certification?
4. How were you able to achieve LEED certification?
    a. Report outlining the final certification review
    b. Operations and maintenance manuals developed for credit
    c. Data submitted for award of credit
5. What are your perceived benefits of achieving certification? Are they substantiated with data?
    a. Economic
    b. Environmental
    c. Employee Health
6. What are your perceived drawbacks of achieving certification? Are they substantiated with data?
    a. Economic
    b. Environmental
    c. Employee Health
7. Are you considering LEED-EB recertification?
8. Additional comments?

Non-LEED Certified Offices

1. Are you familiar with LEED certification?
2. What do you perceive as benefits and drawbacks of certification?
3. Are you considering or have you considered pursuing LEED certification of your branch?
4. If so, what factors have you considered to assist in deciding whether or not to pursue certification?
    a. What factors support pursuit?
    b. What factors discredit pursuit?
5. Are there other tenants in your building?
6. Do you currently monitor your building's energy use, water consumption, and air quality?

7. Does the building already participate in sustainable practices, such as a recycling program, use of non-toxic cleaning supplies, erosion control, etc?
8. Are you considering making sustainable changes without certification?
9. Additional comments?

QUESTIONS FOR STANTEC'S INTERNAL SUSTAINABILITY COORDINATOR

1. What is Stantec's internal perspective on sustainability?
2. In what ways does Stantec pursue sustainability in both its internal operations and business endeavors? I.e.) LEED certification, recycling, brownfield projects, wetlands restoration, etc.
3. As a result of Stantec's sustainable operations, has the company seen any:
    a. Measurable benefits/drawbacks? I.e.) revenue, # of projects awarded
    b. Perceived benefits/drawbacks? I.e.) PR, brand identification, employee satisfaction

QUESTIONS FOR STANTEC'S REAL ESTATE DEPARTMENT

1. At this point in time, how does Stantec go about acquiring/upgrading office space? What are the general steps?
    a. Does the corporate office or the satellite office make the decision?
    b. At what point does the Real Estate division assist in selecting a location/upgrades?
    c. Are there certain criteria that a location/upgrade must meet?
        i. Who determines these criteria?
2. What role does the Real Estate division play in green acquisitions/upgrades?
    a. Who determines the need to go green and how do they determine that going green is an appropriate fit for the location?
    b. Are there certain criteria that a green location/upgrade must meet?
        i. Who determines these criteria?

APPENDIX C
Stantec Office Sustainability Improvement Guide

Stantec Office Sustainability Improvement Guide

By Cheryl Kocsis

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Executive Summary

With Stantec's growing commitment to sustainability, many offices are faced with a desire to make sustainable changes but no clear direction to follow. Additionally, discussions with various Stantec offices that have successfully made sustainable changes reveal that the success of these offices' post-green improvements is not well monitored or reported. As a result, the Stantec Office Sustainability Improvement Guide was developed to provide offices with a framework to follow when trying to make sustainable changes in their buildings and operations.

Employees from all different backgrounds and all different departments within Stantec are encouraged to use the guide when pursuing sustainable changes in the office. The Guide serves as a general outline of the steps every person, from the novice to the expert, will have to consider while making sustainable changes in the office.

The Guide brings readers through a series of linearly organized steps and identifies key factors to consider during the pursuit of green building improvements. The major steps covered in this Guide include:

- Selecting an office space/location
- Negotiating with a landlord
- Forming an office sustainability committee
- Setting goals
- Implementing sustainable goals
- Tracking and evaluating progress
- Educating others

Offices in their infancy that are starting from "scratch" will benefit from all seven steps outlined. Offices that are already settled into office locations and even have a sustainability committees will also benefit from all seven sections. While an established office may have already implemented sustainable change, their efforts shouldn't stop there. Tracking and evaluating sustainable changes after implementation is essential for determining whether these changes are actually cost effective or cost prohibitive in real world application and what benefits and downsides actually came from their implementation. Such evaluation is intended to lead an office into setting new goals based on their experiences, bringing even an established office back within the 7 steps. While linear in thought, the seven steps are ultimately cyclical, continually striving for improvement.

Based on user feedback and experiences, this Guide is intended to be edited and added to accordingly. As a living document, its intent is to grow with Stantec's experiences as well with the continued changes in green building technologies.

Purpose

The Stantec Office Sustainability Improvement Guide was developed to help your office make sustainable changes. This guide covers a variety of important avenues to pursue when making sustainable changes including why it is important to green your office, what types of changes you can make, key features of your building and lease, and how to make and monitor changes in a practical, linear method. It is important to recognize that each office is unique, and an exact formula cannot be applied to every office. This is a general guide. Keep a creative mind while reading this manual and don't be afraid to explore sustainable ideas and implement them to their fullest potential.

This is an *internal living document* intended for continuous additions and improvements. It was prepared in response to Stantec's corporate initiative to incorporate sustainability into the company's operations. Stantec has made a strong commitment to sustainability by incorporating environmental responsibility into its environmental, social, and economic practices, also known as the triple threat. This has helped confirm to clients and stakeholders that Stantec knows how to "walks the talk" (Business Review, 2007).

Methodology

The guide was initially developed based on personal interviews with Statec's Sustainability Coordinator, Real Estate Acquisitions Department, and various offices that have already been successful in making or were at the time trying to make sustainable changes, including the Edmonton, San Francisco, and Vancouver officer. Background research on various building rating systems, the market for green buildings, and building design processes was also performed. The result is a practical guide on how to approach sustainable changes in your office.

Why Green Your Office?

There are two key factors that are causing corporations to pursue sustainable changes: the environment's limited capacity and an increasing demand from stakeholders and clients to go green (Esty & Winston, 2006).

Given the growing green market, there are a variety of reasons that make the business case for green buildings: upside benefits, management of downside risks, and community stewardship (Esty & Winston, 2006).

Upside Benefits characterize the favorable hard benefits seen in greening your corporation and typically include "higher revenues, lower operational costs, and even lower lending rates from banks that see reduced risk in companies with carefully constructed environmental management systems," as well as soft benefits including increased "value, credibility, and brand trust" (Esty & Winston, 2006). Green buildings specifically can:

- Reduce operating costs from energy savings (Yudelson, 2006)
- Reduce maintenance costs from commissioning (Yudelson, 2006)
- Increase worker productivity from healthier indoor space (Yudelson, 2006)
- Increase the building value (Yudelson, 2006)
- Be more competitive in the market (Yudelson, 2006)
- Aid in employee recruitment and retention due to a healthy work environment (Rodenburg, 2007)

Management of Downside Risks prevents companies making mistakes in their operations. The consequences can be severe, especially when a mistake is exposed to the public. By managing your downside risks and being an environmental leader, you can keep a positive relationship with regulators, politicians, and your local community while preserving a reliable cash flow, brand

value, and customer loyalty (Esty & Winston, 2006). Green buildings specifically help ensure management of downside risks by:

- Creating a healthy work environment that will help prevent "sick building syndrome" lawsuits (Yudelson, 2006)

Community Stewardship allows a company to generate morals that are relevant to the surrounding community and incorporate these morals into both the company's business needs and vision. By having a set of company values, a competitive advantage is achieved, as a company with recognized values "attracts the best people, enhances brand value, and builds trust with customers and stakeholders" (Esty & Winston, 2006). Green buildings specifically help companies become community stewards by:

- Showing stakeholders, customers, and employees that the company is concerned for both the environment and their wellbeing (Yudelson, 2006)
- Establishing the company as an environmental steward which establishes it as a good neighbor and helps with marketing and public relations (Yudelson, 2006)

Stantec appreciates the benefits of the green business case and strives to incorporate green practices into the company's operations. Sustainable design fits into Stantec's vision by balancing the company's economic, social, and environmental values in a responsible manner. (Sustainability, 2008)

Risks

While there are great benefits that make the business case for going green, there are inherently some risks involved with green buildings. Depending on the nature of the economy, vacancy rates, interest rates, and market location, it may not be economical to invest in green improvements. Furthermore, initially investing in the LEED certification system can generate cost premiums ranging from 0% to 8% of the soft building costs, but with careful planning, increased experience, and integrated design, the cost premiums can often be reduced or avoided altogether. While LEED is currently not an industry standard, it is the most prominent system in North America and has been adopted by Stantec. If the LEED rating system does not continue to expand and grow, a LEED certified building may benefit from the branding behind it, but it will still reap the benefits of operating a green building. (Yudelson, 2006)

Overview

The following Figure 1 illustrates the various steps this guide will take you through in order to successfully make your office more sustainable, from choosing an office location, forming a sustainability committee, making sustainable changes, and evaluating your progress.

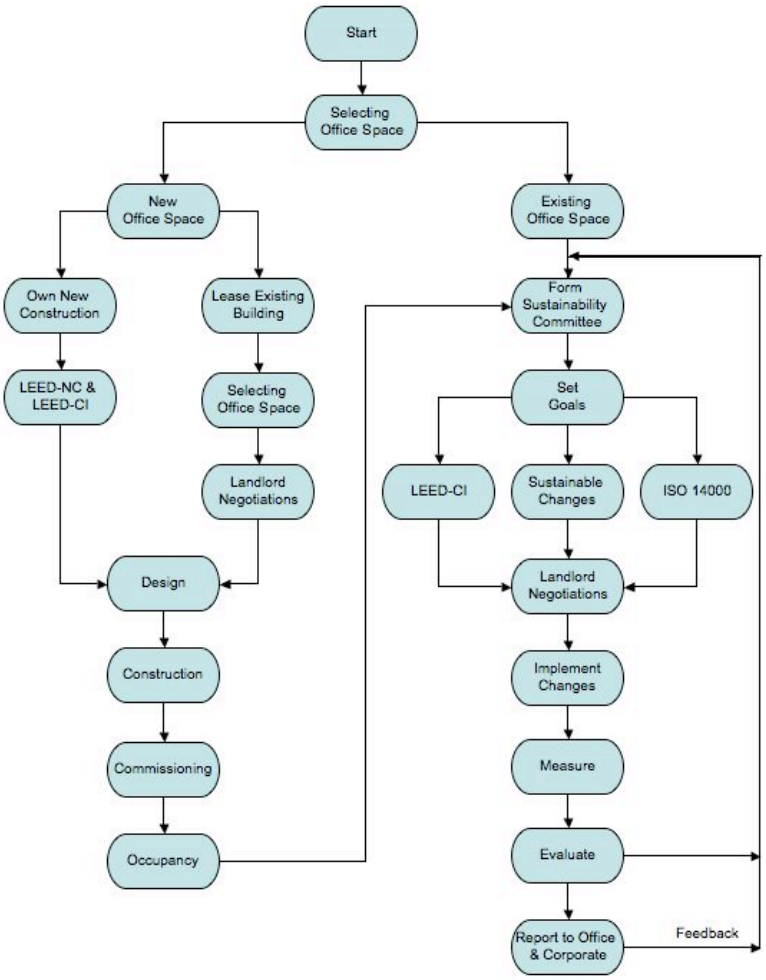

Figure 1. Overall Process

Selecting New Office Space

With more than 125 offices and growing, Stantec is constantly in the process of making new acquisitions, consolidating, and expanding. With this comes the need to find new office space to call home. (D. Soller & B. Stephenson, personal interview, January 23, 2008). If your office is in the process of relocating, it is important to work with Stantec's Real Estate Acquisitions Department to find the best building suited for sustainable features.

Some building characteristics are inherently green and have substantial sustainable benefits. Stantec's Real Estate Acquisitions typically looks for certain building features that are relevant to sustainability including building age, available technology, existing improvements, lighting, and mechanical systems (D. Soller & B. Stephenson, personal interview, January 23, 2008).

Generally speaking, prior to selecting a building you should consider the following:

- **Location**
- **Proximity to Public Transportation**
- **Commissioning and Re-commissioning**
- **Age**
- **HVAC System**
- **Technology**
- **Updated Utilities and Amenities**

Location is important, as the physical location of a building can have a positive impact on the environment. Consider selecting an office building that is a Brownfield site or perhaps has allocated a portion of its lot to manmade wetlands.

Proximity to Public Transportation is important because it reduces employees' reliance on the automobile. A few offices at Stantec offer incentives for taking alternative forms of transportation to work (Franceschini, 2008)

Commissioning and Re-commissioning provide the best opportunity for a building to be as efficient as possible. It ensures that all building systems are running smoothly and in unison prior to occupancy, therefore reducing energy costs and avoiding costly operational failures.

Age of a building can be an important factor because as buildings grow older, the quality and efficiency of its systems can decrease.

HVAC Systems should be efficient and well maintained. HVAC systems are an important part of a building's make-up, helping to provide temperature control and healthy indoor air quality.

Technology should be up to date and compatible with Stantec's IT infrastructure.

Updated Utilities and Amenities should be available in the building in order to avoid paying for upgrades. This may include a shower or a kitchen included in a break room.

Negotiating With Your Landlord

Whether moving into a new location or resigning your lease, it is important to have a good relationship with your landlord and to understand the terms and conditions of your lease agreement. This section covers important features of your lease agreement and how to work with your landlord in order to optimize the types of sustainable changes you can make.

Getting the Landlord on Board with Sustainability

To maximize the degree of sustainable changes your office can make, it is important to have a positive relationship with your landlord and convey to the landlord the benefits of owning a sustainable building. The more your landlord values the sustainable changes you want to make, the more willing he will be to work with you and to take on some of the associated costs.

Your lease agreement usually will not include the ability to make changes to whole building systems and exterior building components, such as the HVAC system or parking lights (Brudner, 2004). If you are interested in making sustainable changes that fall out of the realm of your lease agreement, the landlord must be willing to invest in these changes.

The burden of orchestrating and paying for these changes not included in your lease can fall upon Stantec or the landlord or both parties, depending on the landlord's interest in the change. It

is even possible to split the costs between other tenants in the building if they too see the value of sustainable changes.

Understanding and Negotiating Your Lease Agreement

When it comes to making sustainable changes to your office space, it is important to understand what types of changes you are allowed to make inside your building and on whom the burden of cost falls upon. Lease agreements typically include a Work Letter that addresses this issue.

A Work Letter defines what types of improvements can be made by the tenant and outlines who is responsible for the construction, schedule, cost, quality of design, and quality of construction (Brudner, 2004). These responsibilities can be distributed between the tenant and landlord in a variety of ways (Brudner, 2004). The AIR Commercial Real Estate Association provides a sample Work Letter that suggests a Work Letter cover stipulations for each of the following:

- Partitions
- Wall Surfaces
- Draperies
- Carpeting
- Doors
- Electrical and Telephone Outlets
- Ceiling
- Lighting
- Heating and Air Conditioning Ducts
- Sound Proofing
- Plumbing
- Entrance Doors

An article in the lease agreement titled the Landlord Allowance or Construction Allowance will explain what portion of construction the landlord will be responsible for paying. Typically the landlord will pay a certain dollar amount per square footage of office space, although it is not unheard of for a landlord to cover all costs for a particular type of construction. An explanation of what costs are and are not covered by the landlord should be expressly written in the Landlord Allowance. Note that costs associated with changing the base structure of the building or costs for building work provided to all building tenants are usually not covered by the Landlord Allowance (Brudner, 2004).

The terms of a Work Letter are often overlooked. Make sure to pay particular attention to it during lease negotiations. By optimizing the terms of your agreement, your office can make sustainable changes within a budget while protecting itself from oversight costs (Brudner, 2004).

Aside from the Work Letter, it is important to negotiate other building operations in the lease that optimize sustainable changes. For example, it may be important to include in the lease whether or not the landlord will specifically meter your office's energy use versus the entire building's use or whether or not the landlord will pay for the removal of trash and recyclables. These are key features that can help monitor your progress and maximize the degree of sustainable changes you can make.

Your office's level of involvement in negotiating the lease agreement may vary. You are encouraged to work with Stantec's Real Estate Acquisitions, which manages all of Stantec's real estate, especially upon first negotiations or during lease renewal.

Figure 2 summarizes the steps to effectively sign your lease while securing the greatest opportunities to make sustainable changes. It is important to go through the flow process again before renewing your lease because the demand for and acceptance of green buildings can quickly increase with a growing market or an energy crisis. In this event your landlord may be more willing to permit sustainable changes throughout the building.

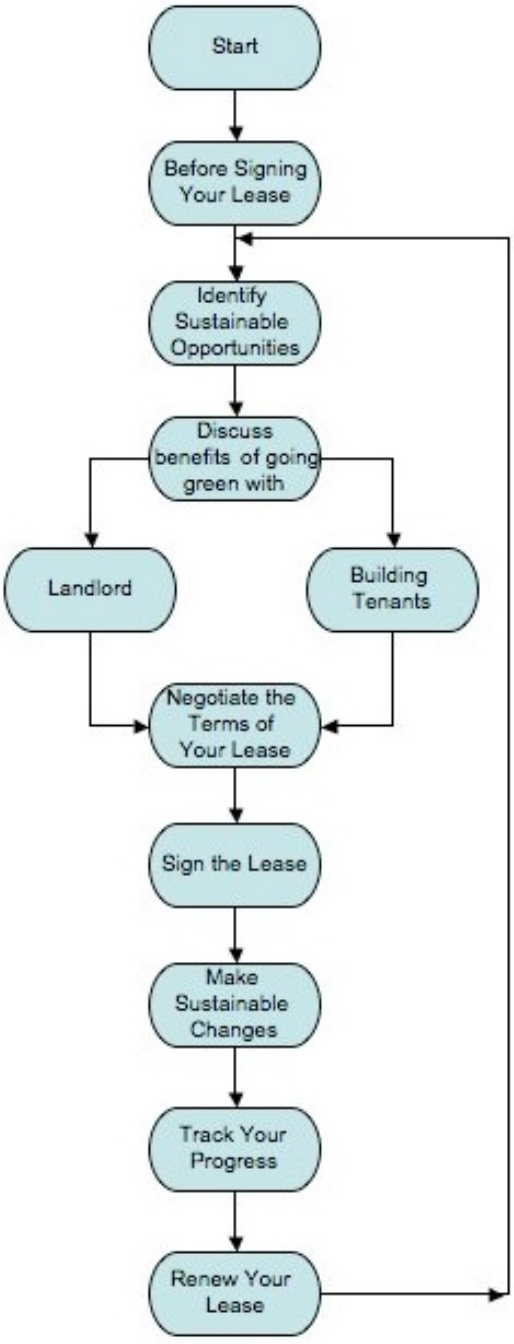

Figure 2. Signing a Lease

Prior to Signing/Renewing the Lease

- **Discuss with the landlord the benefits of sustainable buildings**
  - **Increased Rental Prices (Yudelson, 2006)**
  - **Cost Savings (Yudelson, 2006)**
  - **Increased Market Value (Yudelson, 2006)**
  - **Improved Environmental and Tenant Health (Yudelson, 2006)**
  - **Tenant/Investor Satisfaction (Yudelson, 2006)**
  - **Provide reading materials and research based on the office location**
- **Discuss with the other tenants of the building the benefits of sustainable buildings**
  - **Improved Environmental and Tenant Health (Yudelson, 2006)**
  - **Possible Added Value to Clients (Yudelson, 2006)**
  - **Investor Satisfaction (Yudelson, 2006)**
  - **Marketing Benefits (Yudelson, 2006)**
  - **Provide reading materials and research based on the office location**
- **Working with Stantec's Real Estate Acquisitions, negotiate your lease's Work Letter to optimize sustainable changes that fall within your budget.**
- **If the landlord and/or other tenants are willing, negotiate the terms of other sustainable improvements to be made on the building that fall outside of your lease agreement, such as structural changes that affect the entire building or other tenants. This depends upon the landlord's perceived benefits of green buildings.**

After Signing the Lease

- **Retain a copy of your lease agreement, for your reference.**
- **Reference the Work Letter to determine if you can make a particular sustainable improvement.**
- **Reference the Landlord Allowance when determining budgets for sustainable improvements.**
- **Continue working with the landlord and building tenants to discuss new avenues for green improvements.**

For assistance in selecting an office building, signing a new lease, or renewing a lease, contact Stantec's Real Estate Acquisitions Department. Statec's Real Estate Acquisitions Department plays a large role in leasing office space, and the more cooperation and collaboration between you and the department, the higher the chance of obtaining a sustainable office.

Forming and Operating an Office Sustainability Committee

Once a new or existing office has settled into its location, it is important to form an Office Sustainability Committee so that appropriate objectives can be set by an authoritative body and to ensure that these objectives are consistent with Stantec's overall commitment to sustainability.

Stantec's Internal Sustainability Coordinator has developed a set of guidelines for assembling and operating an internal office sustainability committee. The document, titled *Local Internal Sustainability Committees: Operating Guidelines*, is located in Appendix A and serves as a good tool for both newly formed committees and existing veteran committees, covering a variety of important topics including committee goals, membership, meetings, and budgets.

Setting Goals

Once your sustainability committee has been formed, it is time to outline sustainable goals for implementation in your office. There are a variety of ways you can have a positive environmental impact in your office:

- Achieve LEED certification
- Implement an ISO 14000 management plan
- Make general sustainable changes

LEED Certification addresses the design of physical building components and the operation and maintenance of a building. LEED stands for Leadership in Energy and Environmental Design, and the certification criteria are set by the United States Green Building Council (USGBC) and the Canada Green Building Council (CaGBC). In order to achieve LEED certification, you must pay a fee to the USGBC or CaGBC to assess your building and you must meet a minimum number of points based on the green features of your office building. Based on the number of points achieved, a building can be rated certified, silver, gold, or platinum, in order of least to most points. For the majority of Stantec buildings, which are leased, LEED Commercial Interiors (CI) is the best certification option to pursue because of terms in your lease agreement which limit the type of work you can perform on the building. More information about the limits of your lease is included in the “Working With Your Landlord” section.

ISO 14000 is an environmental management plan that sets management standards for a business’s operations and maintenance. The standards are developed by the International Organization for Standardization (ISO) and keep the environment in mind by addressing the life cycle of a product, product labeling, manufacturing, performance, and data collection (Morris, 2004). ISO 14000 has a much broader scope compared to LEED certification and is applicable to whole business operations rather than just building features. ISO 14000 certification is optional and if pursued, is performed for a fee by a company independent from ISO (Certification, 2008).

Sustainable Changes provide offices with an opportunity to incorporate components from both the LEED and ISO 14000 programs into their building in the event that they are unable to achieve LEED certification or implement a complete ISO 14000 plan. In this way, even if it is not possible to attain LEED or ISO 14000 recognition, you can still experience many of the benefits these programs provide. Since LEED certification and ISO 14000 have been adopted by Stantec, strive to set goals within these frameworks, relying on sustainable changes only when needed.

Figure 3 illustrates the similarities and differences between LEED certification, ISO 14000, and sustainable changes. Regardless of which method is pursued, all three make the same business case by helping to reduce costs, protect the environment, improve client and stakeholder relations, and increase PR and marketability.

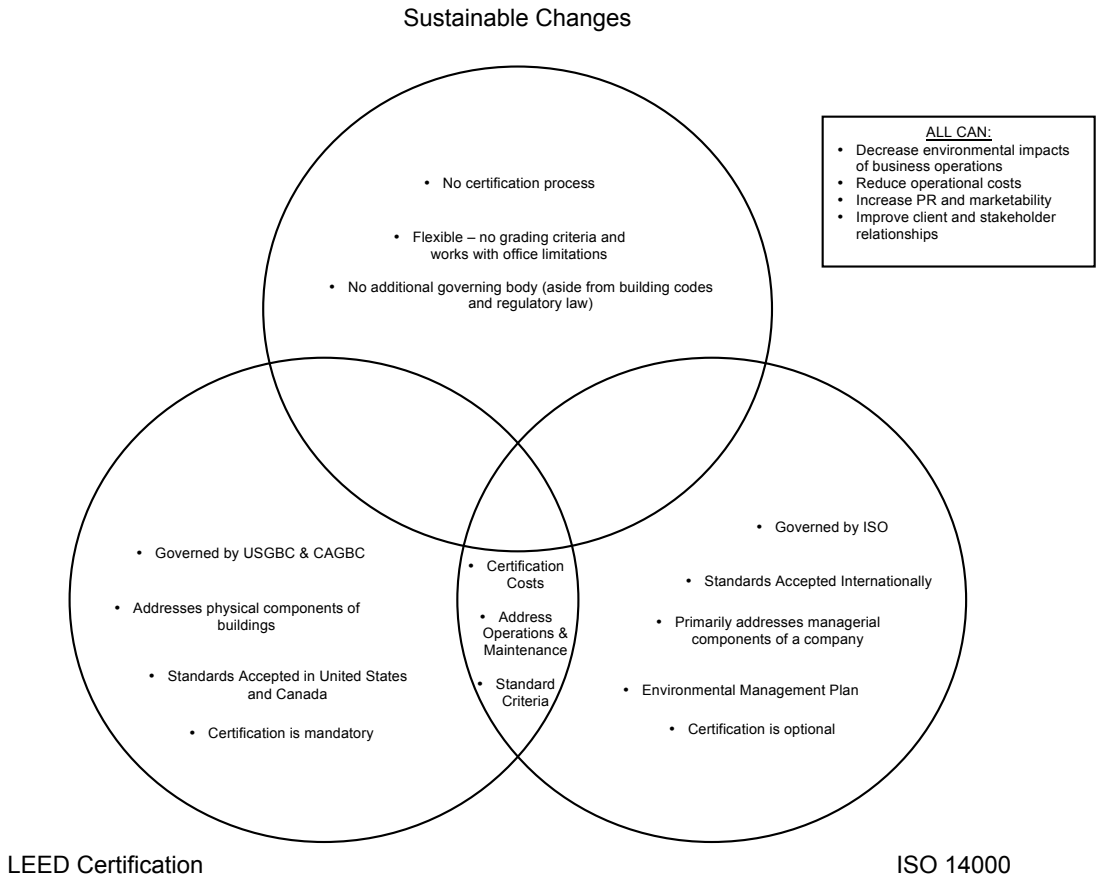

Figure 3. LEED Certification, ISO 14000, and Sustainable Changes Comparrison

There are a variety of building rating systems other than LEED available for use, such as BREEAM and Green Globes. Although LEED is the predominantly accepted rating system in the United States (Yudelson, 2006), you may want to consider using these other systems; However, they do not have as much industry and public acceptance in the marketplace, reducing some of the marketing benefits that could be achieved. For this reason, Stantec has adopted LEED certificaton and ISO 14000 as its preferred rating systems.

The Building Research Establishment Environmental Assessment Method (BREEAM) helps assess buildings though the various phases of manufacturing construction materials, building design, building construction, and post-construction. Specific tools are available for new and existing buildings, life cycle assessments, building impacts, master planning, operations impacts, and waste management. BREEAM is based in the United Kingdom; However BREEAM International, which can be modified to suite your locality, is available. (The BREEAM Family, 2007)

The Green Globe rating system was built upon BREEAM, and was released as an online assessment tool in 2000. Online assessment tools are available for new buildings, significant renovations, management and operations of existing buildings, building emergency management, building intelligence, and fit-ups. In Canada, Green Globe is owned and operated by Building Owners and Managers Association (BOMA) Canada. In the United States, Green Globe is owned and operated by the Green Building Initiative (GBI). GBI is currently attempting to make Green Globe an American National Standards Institute (ANSI) standard. (About, 2008)

Implementing Sustainable Changes

Setting goals is only the first step in making sustainable changes. Once your goals have been established, you must find an appropriate way to fulfill them while considering the costs, available technology, and benefits. The following Figure 4 illustrates the general process you should take when implementing sustainable changes.

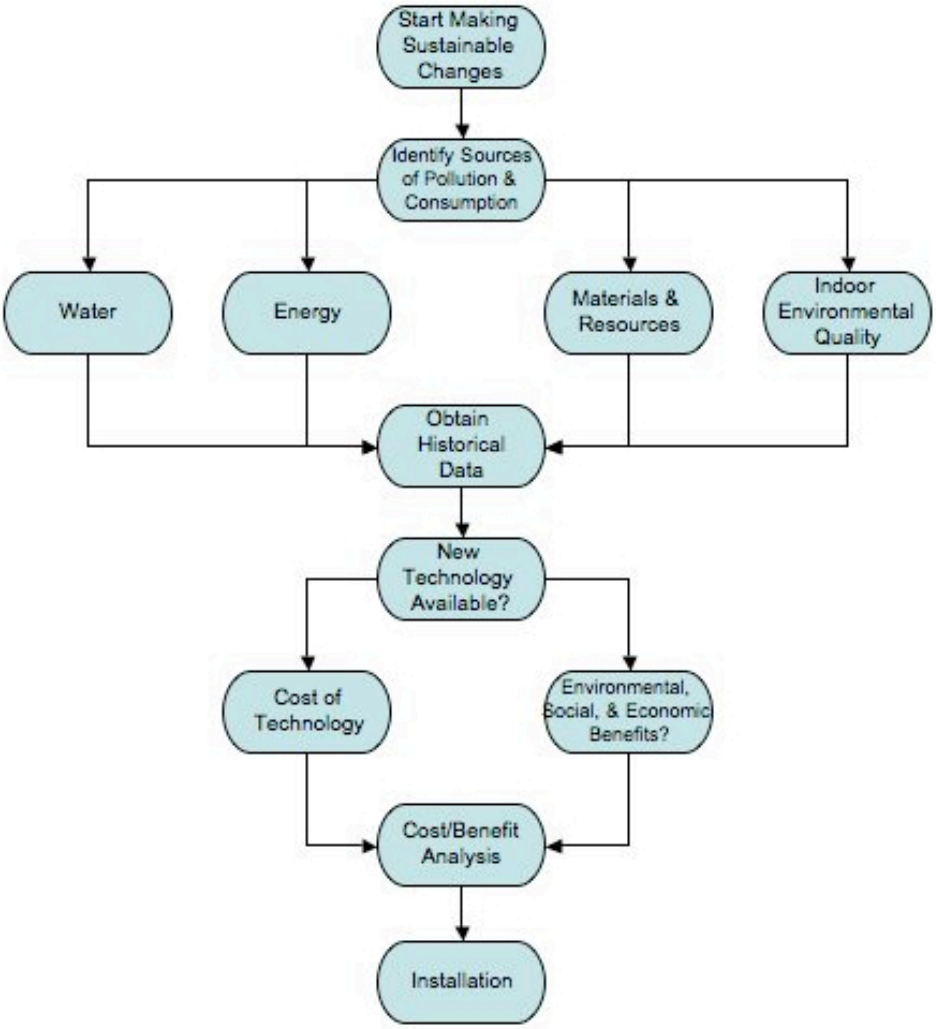

Figure 4. Implementing Sustainable Changes

Identify Sources of Consumption and Pollution

Once you have developed some general goals, such as reducing water consumption in your office by pursuing LEED certification, you must now identify potential sources of consumption or pollution.

Obtain Historical Data

Once a source is identified, see if you can obtain any historical data on the source that may indicate a consumption rate, cost, or environmental threat.

Is New Technology Available?

Research what technology is available to replace the existing source of consumption and potentially improve the results of your historical data. Note the cost to install and operate the new technology and the environmental, social, and economic benefits that accompany it.

Cost/Benefit Analysis

Compare the cost to install and operate the new technology with the benefits. Does one outweigh the other? Is Stantec willing to take an economic loss for implementing environmentally or socially responsible technology?

Installation
If the benefits outweigh the drawbacks, install the new technology and proceed to "Tracking Your Progress." If the benefits don't outweigh the drawbacks, reconsider other technologies.

The following Table 1 provides examples of the types of sustainable changes you can make:

Table 1. Sample Sustainable Changes

Category	Source of Consumption	New Technology
Water	Sink	Push-button/Automated sink
	Shower	Pull string shower
	Toilets/Urinals	Low flow/No flow toilets and urinals
	Sprinkler System	Low flow system
	Irrigation System	Native, low water consuming plants
Energy & Atmosphere	Lighting	Compact florescent light bulbs; Light timers
	Computers	Energy star rating; Turn off computers at night
	Appliances	Energy star rating
	HVAC	Temperature control panel; Commissioning; Insulated concrete forms (ICF)
	Building Emissions	Emissions filters; Carbon credits
Materials & Resources	Office Supplies	Recycled office supplies, Soy-based inks
	Bottles and Cans	Recycling program
	Building Materials	Bamboo flooring; Recycled carpet
	Landscaping Materials	Local lumber and mulching
Indoor Environmental Quality	Cleaning Products	Green cleaning products
	Paint	Low/No VOC paint
	Furniture	Sustainably built furniture
	Carpet	Recycled carpet
	Windows/Lighting	Increase windows/Open space

Tracking and Evaluating Your Progress

An office's efforts shouldn't end once it has implemented sustainable changes. Following installation of sustainable improvements, you should begin tracking and evaluating the progress you make. Without this important step, the true benefits of your efforts may never be achieved. In fact, without proper evaluation, it is possible you may be experiencing greater costs or causing harm to the environment. The following Figure 5 illustrates the steps to tracking your progress.

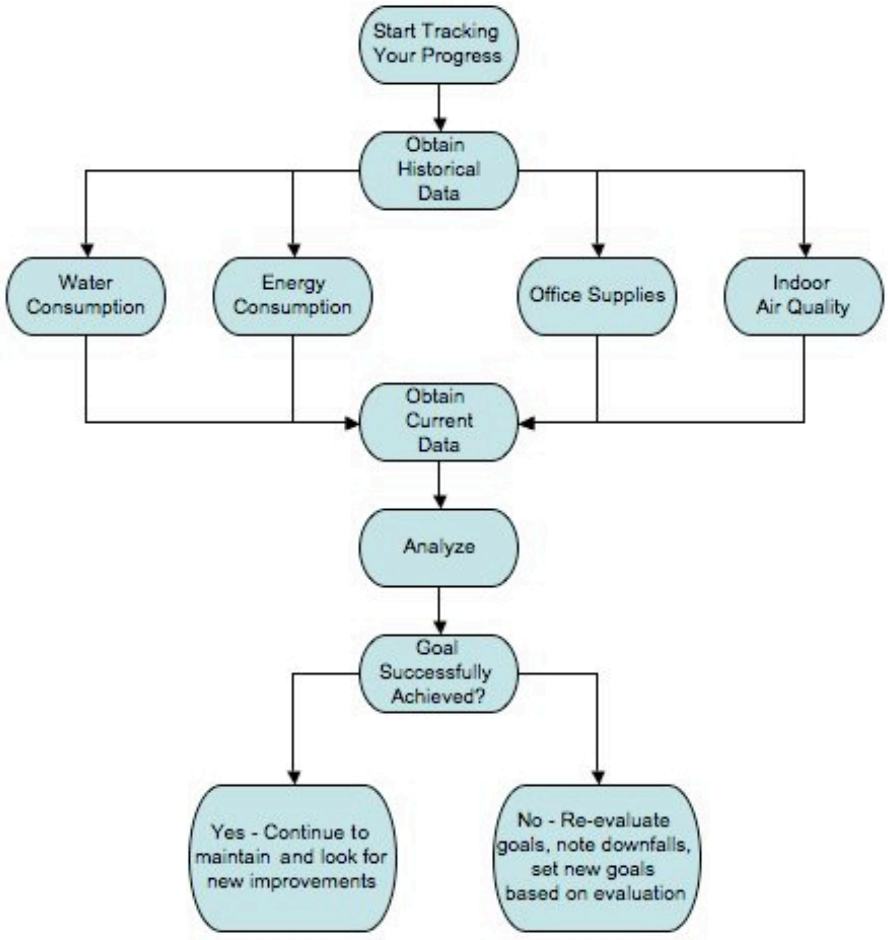

Figure 5. Tracking Your Progress

Obtain Historical Data

Try to obtain historical data on the previous system or technology in place. This information may have already been obtained when following the "Implementing Sustainable Changes" flow diagram. Historical data will serve as a baseline to compare your sustainable changes to. Possible sources of historical data could be an electric or water bill, the consumption rate of a particular appliance, or an air quality measurement.

Obtain Current Data

After the new system or technology has been installed, retrieve current data similar to that of the historical data you retrieved. Note concrete and perceived economic, social, and environmental benefits.

Analyze

Compare the historical data with the current data and analyze for any environmental, economic, and social gains, losses, and stand-stills.

Was Your Goal Successfully Achieved?

If you were able to successfully meet your goals and achieve positive environmental, economic, and social gains, congratulations! Continue maintaining the technology or operations you've implemented. Be sure to continuously monitor your success and investigate new technologies that may improve your efficiency.

If you weren't able to successfully achieve your goals, reconsider them. What were the drawbacks? Limiting factors? Set new goals based on your analysis, and begin the "Implementing Sustainable Changes" process over again.

Education

The final step to making sustainable changes in your office is to educate your employees, clients, and stakeholders of the progress you've made and to get feedback from them.

Consider the following to educate and get feedback from employees:

- Report success and failures with supporting information to the corporate office
- Hold informative green lunch seminars accompanied with a presentation
- Raffles giving away green products or green services
- Company incentives such as a bike to work program
- Collaboration with other offices
- Inter-office competitions such as who can recycle the most or clock the most miles biked to work
- Electronic questionnaires for feedback
- Electronic newsletters that inform the office of new green initiatives

Consider the following to educate and get feedback from clients and stakeholders:

- Create a portfolio that showcases the office's successful green projects
- Forward clients and stakeholders Stantec's annual business review
- Publish case studies, newspaper articles, and magazine features
- Get clients and stakeholders personally involved with Stantec through friendly green competitions

These suggestions should help get employees, clients, and stakeholders educated, involved, and providing feedback.

Summary

As previously indicated, this document is a living document and should be continually edited and added to based on user experiences. While the Guide is a general overview of the important steps involved in making sustainable changes, it is important to remember that each office has its own unique circumstances surrounding it and that not every suggestion herein may be applicable to it. The more input and project experience that gets shared within the constraints of this document, the more likely offices will be able to benefit from use of the Guide. As offices are directed through the necessary steps for making sustainable changes, they are not only learning how to green their own office, but are also gaining valuable knowledge and insight that can be applicable to Stantec's clients' projects.

Resources

For more detailed information, consult the following sources:

Leadership in Energy and Environmental Design (LEED)

- USA:
  - http://www.usgbc.org/
- Canada:
  - http://www.cagbc.org/

ISO 14000

- International Organization for Standardization
  - http://www.iso.org/iso/iso_catalogue/management_standards/iso_9000_iso_14000.htm

Landlord Allowances

- Joel S. Burdner of Corporate Real Estate Services, Inc.
  - http://www.crslease.com/industry/workletter.htm.

Sample Work Letter

- AIR Commercial Real Estate's website
  - http://www.airea.com

Green Marketing

- Marketing Green Buildings
  - By Jerry Yudelson
- Green to Gold
  - By Daniel C. Esty and Andrew S. Winston

Green Offices

- Greening Your Office: From Cupboard to Corporation, An A-Z Guide
  - By Jon Clift and Amanda Cuthbert
- The Green Office Manua: A Guide to Responsible Practice
  - By Wastebusters Ltd.
- The Green Office
  - By Tanya Ha
- Sustainable Commercial Interiors
  - By Penny Bonda and Katie Sosnowchik

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Appendix A

Local Internal Sustainability Committees: Operating Guidelines

Local Internal Sustainability Committees

Operating Guidelines

Last Updated October 9, 2007

Stantec

Table of Contents

LOCAL INTERNAL SUSTAINABILITY COMMITTEES:
OPERATING GUIDELINES

BACKGROUND

A local Internal Sustainability Committee is a voluntary group of employees interested in 'greening' their office. They may also be known as 'Green Office Committees', 'Green Teams', or by a location-specific name (ie. COST - the Calgary Office Sustainability Team). There are currently 12 Stantec offices with such a committee in operation, including: Vancouver, Calgary, Edmonton, Regina, Saskatoon, Winnipeg, Toronto (Wellington), Kitchener, Seattle, Sarasota, Tucson, and Westford. Employees from at least a dozen more offices have expressed interest in starting one.

Some offices may have more than one type of sustainability committee, or else they may have several sub-committees. In this situation, typically one committee or sub-committee is focused on greening the office and the other is focused on incorporating sustainable design principles into the services that we provide. This document only applies to the former.

RATIONALE

- Reducing the environmental footprint of an office will often result in considerable savings through initiatives such as reduced energy and water use, reduced materials use, and reduced travel.
- Employees at many of our offices are interested in trying to make their office's operations more environmentally responsible; however, they often don't know where to start. Office Leaders can channel the initiative and passion of such employees by facilitating the organization of a voluntary committee dedicated to greening their office.
- Stantec has a corporate commitment to sustainability. Initiating a Sustainability Committee is a way for offices to demonstrate this commitment at a local level while ensuring that greening efforts are in synch across the Company.
- As the younger generation is increasingly concerned with environmental responsibility, presence of a Sustainability Committee can also be a good recruitment and retention tool.

COMMITTEE GOALS

Mandates

1) Recommend, initiate, and implement efforts to reduce the environmental footprint of the office's internal operations
2) Help coordinate and support corporate sustainability initiatives at a local level (ie. Bike to Work challenge, Car Free Day, Rideshare Week, Earth Day, Energy/ Water Awareness campaigns)
3) Gather operational sustainability information and relay to Corporate (ie. data on office facilities, waste management, employee habits, environmental incentive programs, etc.)
4) Promote environmental education and awareness among employees
5) Communicate and coordinate activities with the Internal Sustainability Coordinator, as well as with sustainability committees at other offices

Objectives

To encourage and support the following activities within the office:

- Waste reduction/ management: Reduction in waste (ie. paper use), recycling, composting
- Energy and water efficiency/ conservation: Efficiency improvements, Energy/ Water Wise campaigns
- Alternative transportation: Transit use, carpooling, biking/walking, etc.
- Environmental awareness/ education: Organizing/ conducting educational presentations, events, contests, discussions; screenings of environmental films
- Ethical purchasing: Sourcing local products and services with a reduced environmental/ social impact

ASSISTANCE

The Internal Sustainability Coordinator (Laura Franceschini) will be available to assist offices interested in this initiative, both during initial committee set up and subsequent operation. She will help committees to fulfill their goals by providing resources and guidance, as well as ensuring that committee efforts are coordinated across the Company. Through collaboration, each committee can ensure that they will achieve maximum benefit with minimal use of employee resources, and that Stantec will be able to generate uniform and comparable operational sustainability data across all offices.

Targets

Each quarter, the Internal Sustainability Coordinator will give the committees a focus area such as 'Alternative transportation'. All committees will be presented with a variety of potential initiatives to improve their office's environmental performance in that area, and they will then each be asked to select one idea to pursue during that quarter. Committees will of course also be free to work on their own local initiatives throughout the year.

MEMBERSHIP

Membership is at the discretion of each committee. Wherever possible, there should be at least one member representing each major Profit Centre within that office. For disaggregated offices, there should be at least one member from each separate location.

Membership Types

- Active/ Formal committee members are task owning. They will each take on at least one action item and will be responsible for deliverables. They should be encouraged to regularly attend meetings.
- Observant/ Informal committee members are free to attend meetings and observe proceedings on a casual basis without necessarily taking an active role. Most active members will start initially as observant members.

Designated Roles

Leadership

Each committee shall have at least one Chair and one Deputy Chair (or Co-Chair). Both the Chair and Deputy Chair/ Co-Chair should have management approval. Responsibilities involved with these roles are as follows:

- Chair: Responsible for initiating meetings, managing the committee, tracking progress, and communicating with the Internal Sustainability Coordinator.
- Deputy Chair/ Co-Chair: An alternate contact for the Internal Sustainability Coordinator and takes on the responsibilities of the Chair as needed.

Secondary Roles

Other roles may be designated at the discretion of each committee. Some examples of possible additional roles and their associated responsibilities are listed below:

- Treasurer: Prepares a Committee budget (if applicable), collects and safeguards any funds, handles purchases, and files expenses.
- Secretary: Responsible for taking meeting minutes, monitoring attendance, filing information, and communicating this information to the other committee members and the Internal Sustainability Coordinator.

- Communications/ Promotions: Responsible for generating awareness about the Committee and its activities, as well as designing any necessary promotional or graphic materials.
- Librarian: Responsible for building and maintaining a Sustainability Resource Library (where applicable) and keeping track of loans/ returns.

Sub-Groups

In addition, some committees may find that it is beneficial to instate sub-groups which are assigned specific tasks. This could be a good way to distribute the committee workload and further divvy up responsibilities. Sub-groups could be organized around the 5 key objectives of the committee, as follows:

- Waste Reduction/ Management
- Energy/ Water Conservation
- Alternative Transportation
- Education/ Awareness
- Ethical purchasing

MEETINGS

- Committee meetings should preferably be scheduled to occur at least once a month. Suggested meeting times are at lunch or after office hours. Wherever possible, meeting times and locations should be consistent and should be well publicized.
- Unless granted special permission by management, meetings are to occur on employees' own time and should not interfere with any regular office activities.
- The minutes of each meeting should be well documented in order to keep track of Committee activities and communicate them to those interested, such as management.
- In addition, an itemized Task Agenda should be maintained which keeps track of any planned initiatives, which members are assigned to further research/ implement each task, any timelines/ deadlines to be adhered to, and any progress to date.

BUDGET

It is recommended that each Committee be assigned an **annual operating budget of $1,000 - $5,000**, determined by local management and typically charged to the Shared Services budget. This will facilitate planning events requiring funds and avoid creating costly and unnecessary administrative work each time. Each committee is responsible for obtaining budget approval from their Regional/ Office Leader.

The Committee Budget would be used for smaller expenses such as the following:

- Catering/food for Committee meetings and events (ie. lunch for special guest presentations, popcorn/drinks for environmental video screenings)
- Renting needed supplies, such as screens, projectors, laptops, etc.
- Prizes for in-house and company-wide competitions and contests
- Registration fees for community events (ie. Clean Commute Challenge, Earth Day festivities, Energy Fairs, environmental conferences)
- Producing any necessary promotional material such as brochures, pamphlets, or posters for events, awareness campaigns, and/or contests

For larger office greening initiatives requiring funding and/or approval, each Committee will be expected to put together an independent proposal including a budget which will be reviewed by local management on a case by case basis. Alternatively, a Committee may choose to put together an annual budget proposal outlining the greening initiatives they wish to pursue for the year along with the estimated cost of each.