CSR Activities Promotes Sustainability

A case study of Bombardier

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“I would like to thank my mom, who has always supported me especially during the thesis process. She gave me the strength to go forward both in my life and in my studies. I would like to give my appreciation to my friends for making this journey possible with their continuous support. “

By Nazanin Bagherzadeh

“I would like to dedicate this thesis to my friends and family for their support throughout this process”

By Christina Manoli
Abstract

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Title: CSR Activities Promotes Sustainability: A Case study of Bombardier

Problem: Transportation companies face an increase of emissions due to the increased use of transportation systems. The environment and society are being affected by emissions and solutions need to be created in order to stop the acceleration of harmful release to the planet. Transportation industries have to be sustainable.

Research Questions: How can the introduction of new activities within CSR help a company become sustainable by reducing its ecological footprint?

Which CSR activities could be adopted by a company so as to become sustainable by improving social conditions?

Purpose: The purpose of this study is to discuss and analyze how innovation in CSR activities, related to environment and society, can lead a company to be sustainable by reducing its ecological footprint.

Methods: A qualitative method of approach was used for this research work, with regards to primary data; interviews (telephone interview and email correspondence) were used. Secondary data sources were literature, articles, journals and internet sources from the university data bases.

Conclusion: Through CSR activities companies can be sustainable, since they are linking the company into responsible actions, taking it further, new thinking can take these actions into another level. Finding new solutions to the arising environmental problems can result in decreasing ecological footprint. Companies do not have time to wait for solutions coming to them, they have to approach and motivate innovation in their company and constantly try new projects in order to be sustainable.

Key words: Corporate social responsibility (CSR), innovation, sustainability, Bombardier
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List of Abbreviations

CO₂ Carbon-dioxide
CSR Corporate Social Responsibility
DfE Design for Environment
DJSI Don Jones Sustainable Index
EPD Environment Product Declaration
GDP Gross Domestic Product
GHG Greenhouse Gas
GRI Global Reporting Initiative
Gt Gigatonnes
HSE Health, Safety and Environment policy
IEA International Energy Agency
ISO International Organization for Standardization
LCA Lifecycle Assessment
MNE Multinational Enterprise
NGO Non-Governmental Organization
OECD The Organization of Economic Cooperation and Development
R&D Research and Development
SAM Sustainable Asset Management
UN United Nations
1. Introduction

This chapter provides an introduction to the topic followed by a discussion of the problem area and the definition of the research question. In addition, this section will present the purpose including the target group and research approach.

1.1 Background
In today’s global society, transportation systems play an important role since it is part of almost every activity people do and has become a mean to improve people’s lives (Sustainable Transport for All, 2012). As it was stated in the European Commission “the transport industry directly employs around 10 million people and accounts for about 5% of Gross Domestic Product (GDP)” (Transport, 2012). As an advantage it helps with the transfer of goods and services, helping people move from place to place, as well as, enabling economic growth by creating jobs (Krautzberger & Wetzel, 2011). However, the disadvantage of transportation system is the emissions that are released from the transportation means while they are growing rapidly with the most increase in carbon-dioxide ($CO_2$) emissions (Addressing Climate Change in Transport, 2012).

Due to increasing demand of transportation means, transportation companies are now aiming for a greener development where products have fewer environmental damages to the society. Being green has required companies to act in a more sustainable and responsible way; an example of such a company have been studied in this thesis. The transportation company Bombardier is a multinational enterprise (MNE) with corporate social responsibility (CSR) activities in aerospace and rail transportation. As a member of this industry, Bombardier faces sustainable issues and aims to overcome these challenges while having innovation as a key target.

It has been discussed in recent years that in the business world of 21st century the way of organizing some corporations, public organization, social relations and society are not really sustainable. Therefore, sustainability has increased the interest of managers in different corporations (Dobers, 2010, s. 7). While any company looks through different ways of having sustainable development and be responsible to the society, people also seek information about different companies’ sustainable activities. Sustainability is not solely about corporations itself, since one of the factors affecting sustainability is people themselves; both people working in a company and people outside the company (Bell & Morse, 2003, p. 3). Making use of the resources impacts both environment and people, and concerns both today’s and future generations. “Meet present needs without compromising the ability of future generations to meet their needs” (WCED 1987 cited in: What is Sustainable Development, 2012). This statement expresses that by applying a good quality of life in a community and by being sustainable, a healthy and meaningful life for the next generation can be provided (Hart, 2010).

In order to survive in the long run, any corporation, public or private, should act in a sustainable way and be responsible for the consequences of its long-term operations (Dobers, 2010, p. 8). This is of great importance to transportation companies who are also aiming to help the society by decreasing their environmental footprint (Marsden, Kimble, & Nellthorp, 2007).
As corporations are aiming to be sustainable and responsible to the society in which they exist in, the matter of CSR arises. Debates over CSR vary but as Steve May, et. al., stated (2007, p. 5): “Emphasis of the concept is what companies could do to better the world rather than what companies could do to ensure their own survival”. Recently, discussions and actions around CSR and sustainable development have matured rapidly, driven by demand for greater accountability by corporations to the society (Edelman). It should be noticed here that among corporations of any size, multinational ones are facing more difficulties since they are holding activities in countries with variety of rules and laws. As a result, they often fail to respond effectively to important issues in the host country (Husted & Allen, 2006).

Along with the global CSR issues there are specific challenges that refer to each country’s policies, economic situation and environment. If a company wants to be a good corporate citizen, responsible and sustainable in their activities while at the same time gain competitive advantage, it needs to be one step ahead and be innovative. Therefore, motivating and engaging its employees to take initiatives are successful management tools in order to move forward and responsible into a greener world. Moreover, it leads companies to maintain legitimacy with the society they exist in and at the same time, remain sustainable and responsible (Hockerts & Morsning).

There are standards and common ways for companies to adapt and in that sense become sustainable but yet, many companies strive to be innovative in their CSR activities rather than follow the stream. Some companies even aim to develop already existing CSR activities in order to be new thinking and to be one step ahead. This study is going to map the innovative CSR activities operated by Bombardier in order to analyze if they contribute to sustainability by reducing its ecological footprint. Bombardier is the world’s only producer of both trains and planes and thus evolves mobility worldwide; making it easier for people to travel and connect (About Us, 2012).

1.2 Problem Discussion
People are adapting more and more to the use of transportation tools such as trains and airplanes, therefore the matter of sustainability from the society and environmental point of view becomes important to companies. One of the common problems that the use of transportation can cause is the increasing amount of CO\(_2\) released from transportation means. While most sectors in different businesses have been reducing CO\(_2\) emissions, transport share has been steadily increasing in the world (European Commission Mobility and Transport). According to preliminary estimates from the International Energy Agency (IEA), global CO\(_2\) emissions from fossil-fuel combustion reached a record high of 31.6 gigatonnes (Gt) in 2011; an increase of 1.0 Gt from 2010, or 3.2%. In addition, coal accounted for 45% of total energy-related CO\(_2\) emissions in 2011, followed by oil (35%) and natural gas (20%) (Global carbon-dioxide emissions increase by 1.0 Gt in 2011 to record high, 2012).

The problem that every transportation corporation may face is whether their products are designed and developed in a sustainable manner. As well as, how rules and regulations set by government can force managers to change their way of thinking into a more innovative and responsible way. For that reason, sustainability and innovation in CSR activities plays a vital role. Transportation industries can start producing existing or/and new products with fewer damages to the society and environment depending
on their economic situation. The problem that they may face is how to be innovative in their CSR activities in order to decrease emissions and be sustainable.

1.3 Research Questions
The research in this study will follow these questions mentioned below:

How can the introduction of new activities within CSR help a company become sustainable by reducing its ecological footprint?

Which CSR activities could be adopted by a company so as to become sustainable by improving social conditions?

1.4 Purpose
The purpose of this study is to discuss and analyze how innovation in CSR activities, related to environment and society, can lead a company to be sustainable by reducing its ecological footprint and by improving its social conditions. Furthermore, companies need to take into consideration rules and regulations, while looking through improvements in their actions.

In order to get a clearer view of the purpose in this thesis, a case study will be presented to strengthen the aim and to contribute to a better understanding of innovation’s effects on CSR and its impact to the environment and to the society. The company that has been chosen is Bombardier, a member of transportation industry, and this study is going to distinguish their new CSR activities and what impact they have to sustainability.

1.5 Limitation
The focus of this study has been on innovation, the criteria are new thinking and original, with that said, the authors have had the final decision regarding whether an activity is innovative or not. Furthermore, CSR initiatives that do not meet the characteristics of innovative ones will not be considered. The distinction of innovative CSR activities stems from the theory provided in this study from books and scientific articles along with the information collected from Bombardier through interviews and from their web pages.

After finding innovative CSR activities, this study has been focusing on the environmental, economical and social impacts of those innovative CSR projects. This approach was taken partially due to time limitations, but mainly because of the fact that almost all of Bombardier’s crucial CSR initiatives are created for monitoring and dealing with the company’s impact on the environment and the society. Nonetheless, as any multinational corporation, Bombardier aims at running a profitable and competitive company and for that reason the economic impact is always at the core of any operation.

This study has not gone deep into any economic figures and numbers due to the sensitive relation between CSR and finance. When asking the company about its CSR expenses there were no direct answers rather that it is included in everything the company do. Having in mind that economic is the basis for companies to survive, measurements in this study were based on the company’s new activities and their GRI indicator which were all publicly available.
Moreover, this study limits its research area by focusing on the transportation industry and thereby, to the environment it operates in and to the community it affects. It is important to mention that the impact to the environment and the society will not go beyond the production process of Bombardier, meaning that the impact of the final product itself lies outside the scope of the thesis.

Finally, this thesis investigates only one company’s innovative CSR activities and their actions to become sustainable through reducing its ecological footprint. It is important to note that no comparison study has been made and therefore, generalization is not optimal.

1.6 Target Group
The target readers in this study are people who are interested with terms such as innovation, CSR and sustainability written in a bachelor level. It can be students, teachers and professors but also people outside the academic world with a passion for CSR innovation and sustainability.

Furthermore, Bombardier itself is a target reader since it includes a case study of them; therefore, managers and employees would be interested reading this thesis. As well as, companies who are interested in or are active within CSR innovation and sustainability suits within this target group.

1.7 Research Approach
The research approach in this thesis will follow these steps:

- The methodology contains information and explanations of the data collection, including primary and secondary data, and the strategy of the research. Furthermore, method critique also gives information about the criticism of the research in this study.
- Continuously, the thesis introduces theoretical framework from recognized authors in the field of CSR, innovation and sustainability in order to establish a theoretical foundation before bringing the empirical findings.
- Furthermore, the empirical results include a case study of Bombardier; with a company background, author’s findings collected from interviews with Bombardier and from their web pages.
- After analyzing all the findings and results by using theories mentioned in the theoretical framework, a conclusion have been presented emphasizing the importance of what was discovered and thereby closing the subject and the empirical findings.
2. Methodology

This chapter presents the selection of research topic and the research method along with the process of collecting data. In the end, the reliability and the credibility of this work have been clarified.

2.1 Selection of Research Topic

After an insight in CSR and MNEs, from a past course called “Managing the Multinational Enterprise” at a bachelor level held at Mälardalen University, the authors’ interest grew into finding out more about why companies use CSR in their business. Additionally, the importance of operating in a sustainable way towards the environment and the people, both within the company but also those in the community, was a factor that contributed to the selection of this topic. Furthermore, another reason was the curiosity of looking deeper into innovation within CSR and its effects to sustainability. It is interesting to have a deeper look at what companies do in order to create new thinking and be one step ahead, since it is not easy being innovative, especially when the goal is to be sustainable and at the same time to be profitable.

2.2 Research Method

The research method in this thesis is based on finding the data needed in order to answer the research question. Collecting information may vary from primary to secondary data as well as from qualitative to quantitative methods. Finding the proper method to work with is essential since it helps to collect the correct data so that a better analysis can be framed.

2.2.1 Qualitative vs. Quantitative Data

Many writers on methodological issues find it helpful to distinguish between quantitative and qualitative research (Bryman & Bell, 2011, p. 26). In general, quantitative method refers to the numerical data collected while qualitative data generates non-numerical data. But it should be pointed out that the differences between these two methods are not just limited to these. Looking through differences between these two methods shows that there are some arguments on using either of methods to answer a research question or use both of them. Some researchers may believe that these two methods cannot be combined with each other while some believe in using a combination and others believe in using both of them simultaneously (The Qualitative vs Quantitative Data, 2012).

Qualitative research aims to gather view of relationship between theories and research (Bryman & Bell, 2011, p. 386). It is assumed to be the exploratory research which involves interviews, documents and observations to be explained (Fisher, 2010). There are two particular reasons that are important in choosing and using this research method. First, it can be said that qualitative research subsumes several diverse research methods that differ from each other considerably. Second, the connection between theory and research is somewhat more ambiguous than in quantitative research (Bryman & Bell, 2011, pp. 387-398).

On the other hand, quantitative data refers to collecting the numerical data. But it is important to know that it is not just limited to numbers. As Bryman and Bell (2011) stated, it is “as exhibiting a view of
relationship between theory and research as deductive, a predilection for a natural science approach and as having an objectivist conception of social reality."

The approach of research method in this study is qualitative data, given that the findings were from interviews, emails, books, scientific articles and web pages with the intention to get an in-depth understanding of the problem.

2.2.2 Primary vs. Secondary Data
Primary data is the data collected from interviews, questionnaires and customer feedback. As Schluter (1926, p. 78) stated the primary data can either be direct or indirect. The direct method is the collection of data through personal observations of the problems and phenomena in reality, and through personal interviews. The indirect method is the collection of data with the use of some employed means (Schluter, 1926, p. 79).

In secondary data the researcher has not been involved in the collection of the information referring to the analysis (Bryman & Bell, 2011, p. 313). In other words, the secondary collected data are from others finished work, nonetheless, in business and management, secondary data is of increasing interest to researchers (Bryman & Bell, 2011, p. 312). Comparing to the primary data collection, in secondary data collection time and money are saved and data collection are of high quality. The opportunity of the cross-border analysis (as in the case study of this thesis) will also be increased.

The approaches for this study are including both primary and secondary data and together these formed the frame for theoretical and empirical work (Bryman & Bell, 2011, pp. 313-318).

- **Procedure in collecting primary data**
The thought behind having primary data was to get an insight to the business world with the possibility of collecting new information from the company directly by asking questions and receiving answers that may fit this research.

Besides, this study is about innovation; therefore to find original answers was a priority. Having in mind that it is not easy to find contacts, especially since the people holding valuable information are so busy, the ambition was to at least try.

As a result, a short resume of the study’s ideas and thoughts were sent to Bombardier Aerospace in Belfast through email. The anticipation was huge and after some days a reply came from Michael J Ryan, who is the Vice President and General Manager in Bombardier Aerospace, Belfast. Bombardier was interested in collaboration and wanted to contribute with data to the findings. Along with that, the original email sent to Belfast was forwarded to their headquarter in Montreal, Canada in order to give us a contact person. It all went very fast, as within a week, Bruce Parry, CSR Manager in Bombardier Aerospace in Montreal send a response: "...I would be happy to be part of an interview or other requirements that you may have to complete the thesis you are planning, depending on the time requirements and us being in different parts of the world of course, but we can discuss that if you’re happy for me to contribute" (Cited from: Parry, Email, 2012).
The next step, and an important one, was to create accurate questions in order to capture the information that is required to make this thesis. Preparations started and the result was a questionnaire of 15 open questions about CSR, sustainability and innovation. The purpose was to find out how Bombardier defines those three concepts and how it is incorporated into the company. The plan was to send it to his email one week before the phone interview so as to give the receiver the possibility to prepare and, if necessary, ask questions about the questionnaire in advance. In that sense, when the interview would be held, there would be a communication flow and a mutual understanding. Between the period of first contact and the interview a few email dialogues occurred so as to be more familiar with each other’s work.

The choice of a phone interview was preferred since attending to a face to face interview was difficult due to the distance. Furthermore, through a phone conversation a dialogue can easier be made than from writing, because there is an immediate contact with an oral conversation making it easier to be understood or to give additional questions, interrupt or capture emotions than from the writing. Of course, a negative part holding a phone interview is that facial or body expressions become unknown.

The interview was successfully held on 4th of May and contributed with valuable information. Luckily the interview was recorded, with the permission from the CSR manager, and therefore, gave the possibility to listen to it carefully and repeatedly. Additionally, and maybe the most important, the recording gave the possibility to capture the entire interview.

Parallel with the contact in Montreal, a contact in Bombardier Sweden was created with the intention of bringing a wider aspect. His name is Pär Isaksson and is the director of communications in Bombardier Transportation in Sweden. The first contact was through a phone conversation where a brief description of the thesis was introduced, as Pär liked the idea an agreement was made that a questionnaire would be emailed to him following with a phone interview later on. Although both parties are located in Sweden, a phone interview took place on 7th of May due to the limited amount of time from the counterpart.

- **Procedure in collecting secondary data**

The reason this study also included secondary data was because it gave a broader perspective, due to the insight from several observers’ expertise, and a deeper knowledge to the topic. With today’s technology knowledge transfer is easily reached and taking benefit of others work and their knowledge are a helpful and an important implement.

In order to cover the theoretical inputs necessary for the purpose of this study, books from the school’s library and scientific articles which relate to the topic were chosen. Some publications were found through the database of Mälardalen University and some through Google’s search engine. The common key words that gave a successful exploration were for instance CSR, sustainability, ecological footprint and innovation. Furthermore, Bombardier’s homepage, their separate CSR website and their 2011 CSR Report were also important and were helpful with the purpose of finding information about the company and its CSR activities. Furthermore, in order to get inspiration and ideas about this subject, the DiVA database was used in order to search for student thesis.
2.3 Reliability

“Reliability refers to the consistency of a measure of a concept” (Bryman & Bell, 2011, p. 158). In order to collect reliable data, it is important to obtain accurate information from reliable and trustworthy contacts as well as from well-known databases available on internet.

To achieve consistency and reliability, the research in this study was supported by interviews with the aim of gaining an insight to the relation between innovation, CSR and sustainability. The people interviewed are currently working at Bombardier headquarter in Canada and at the transportation site in Sweden which are responsible for CSR and communication issues. Also, the interviews and the email correspondence gave validity to this study’s secondary data. Furthermore, Mälardalen University’s library has been used in order to ease the research process. Finally, Bombardier’s CSR webpage and homepage along with their 2011 CSR annual report have also contributed to this study’s reliability and accuracy as they presented company’s CSR activities in depth.

2.4 Credibility

The issue of credibility refers to being able to demonstrate that the research was designed in a manner that accurately identified and described the phenomenon to be investigated (Remenyi, Williams, Money, & Swarts, 1998, p. 116).

The result of this study is credible to the best of authors’ knowledge as all sources used and chosen for this research have undergone to scrutiny to ensure that all information collected and presented are from a thorough review of scientific articles and literatures done by previous researchers.

2.5 Method Critique

It would be better if the authors could collect information from all stakeholders of the company, but due to the limited time and the scope of this research which was based on looking through a case from the company’s point of view; it was not possible to include all stakeholders’ point of view and opinions as the company’s stakeholders are included in a large group. Therefore, the thesis will focus on employees as they are the main stakeholders in Bombardier and then continue with the company’s approach connecting to theories used later in the study.

The authors are aware that collecting information from just two sources (the company website and interviews) would not be sufficient to draw a general conclusion applicable to the whole company, but the information collected from these sources where sufficient for them to analyze the case.

Authors are also aware that this subject presented in this study is sensitive and therefore the company of the study may present a positive picture of themselves to the public. Taking that into consideration, this could not be used to draw a general conclusion between the organization and its stakeholders. However, the material available made the ability to answer the research question.
3. Theoretical Framework

In this chapter theories developed and presented by other authors connected to the topic have been used. Furthermore, models for sustainability, CSR, and innovation have also been applied.

3.1 Sustainability

The term sustainability is both simple and complex. People agree with it but not really everyone knows what it is (Bosselman, 2008, p. 20). So in the beginning of 21st century the problem of global sustainability attracted many scientists, teachers, journalists, students and many people to discuss about the term (Adams, 2006).

The sustainability idea was first established and became important to human beings during 1970s and 1980s. Earlier in 1969 the first establishment of a national policy in US was published for environmental sustainability which stated: “foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony and fulfill the social, economic and other requirements of present and future generations.” Later on, in 1970s the Stockholm conference, which was held in the capital of Sweden, pointed out to a more specified and scientific definition of sustainability. According to the reports from the conference, sustainability is a mean of realizing the developmental needs of all people without sacrificing the earth’s capacity to sustain life (History of Sustainability, 2012).

Sustainability and sustainable development is all about an improvement in human conditions and the term does not emphasize on economic growth or production. On the other hand it can be said that economic is the base for a business and sustainability focuses more on other factors than economic (Wackernagel, 1996, p.32). It should be noticed that by human conditions here, sustainability means the environment and the results that it has for future generations (Bell & Morse, 2003, p. 19). Sustainability assessments are also examining whether human activities will lead to a more sustainable society (Dimitri, 2000). In order to continue having water, materials, and resources to protect human health and the environment, sustainability is crucial. Everything that is necessary for survival and well-being depends, either directly or indirectly, on the natural environment (What Is Sustainability, 2012). It is also important to know, that in the area of sustainability different corporations should pay extra attention to the pressure each government has on them in order to obey the laws and rules in the large scale.

Any corporation must have some defined strategies and goals for themselves that they want to achieve and fulfill. If goals of sustainability are going to be achieved, corporations must be reformed, redesigned and restructured to minimize their ecological impacts on the society as a whole (Shrivastava, 1995, pp. 936-960). The ecological footprint is based on the idea that renewable resources for products are coming from the earth to fulfill public consumption, so the non-renewable resources are not assessed because their use is not sustainable (Ecological Footprint, 2003). Ecological footprint is an indicator reflecting the national and global sustainability (Issoufou & Ouattara3, 2009) and the size of it varies between time depending on population, resources used for production and the region. It is measured in
global acres (or global hectares) (Ecological Footprints). The figure below shows the connection of ecological footprint in the world with region and population until 2001.

As it can be seen from the figure, although the population (horizontal axis) in North-America is less than Asia and Africa, their ecological footprint is higher. This could be explained by the fact that companies in North-America, which focus more into having a strong economy, disregard the ecological implications and do not focus in managing their environmental footprint (Ecological Footprint, 2003).

Sustainability therefore depends both on reducing ecological footprint and on improving the quality of life. For their structurally and ecological changes, as Bob Willard (2005, p. 1) stated, sustainability strategies make the choice for corporations to define new rules and be awarded by their stakeholders due to the level of responsibility they have. But this is from stakeholder’s fraction which forces a company to be sustainable in their activities. Nigel Room (Willard, 2005, p. 38) stated: “there is no single company that is good at all dimensions of corporate environmental management or sustainability. What people are more likely to find are companies that are advanced in certain areas. There are a number of companies that do interesting things, but no single company puts the whole thing together into a package.” It means that not any company can be sustainable in all areas of sustainability such as environment, economy and the society.

The ideas behind sustainability have been pointed out to the reduction in the waste and pollution by increasing the use of renewable resources and by learning the right way of using energy (Bell & Morse, 2003, p. 22). For learning the right way of using resources in a sustainable approach, companies should begin to understand themselves as part of the nature rather than thinking that they are apart from environment and society (Steve May; George Cheney; Juliet Roper, 2007, p. 351). In order to connect companies with the society and environment different sustainability models, have been published. According to the World Conservation Union (Adams, 2006), the three dimensions of sustainability
(economic, social and environmental) are represented either as pillars, embedded circles or in the popular Venn diagram of three overlapping circles.

In this study the overlapping circles have been chosen which gives a better understanding of sustainability and can be defined as the figure below:

![Sustainability model](source: Adams, 2006)

The model represents that all three dimensions of sustainability are equally important and they are all connected to each other. But Nowadays, the economic circle is of more importance and the environment has the less importance comparing to the other dimensions (Adams, 2006). This may be for the reason that currently different business are thinking more about their profit than the results that their products and their production line can have on the society and environment as the most external metric to corporations (Adams, 2006). Therefore the intersection part of the three dimensions will be less to the environment and society.

It is interesting to know how companies are now managing the sustainability through different laws and regulations. Are they still thinking of their economy more or are they moving through more environmental and social sustainability?

### 3.1.1 Sustainability in Transportation Industry

It has been discussed that sustainability model is equally important in those three areas: economy, environment and the society. But for a transportation business the environment is of more importance than of the society since it directly has an impact to the nature with its ecological footprint and indirectly affects the society (Jeon, Amekudzi, & Guensler, 2010).

The Center for Sustainable Transportation at the University of Winnipeg defines a sustainable transportation as the one that allows basic access needs of individuals and societies to be met safely and in a human being manner. Concerning human beings and their needs and wants from a transportation company the main objective, for a sustainable transportation which should be taken into consideration,
is to reduce the transport-related pollutants and greenhouse gases released (Jeon & Amekudzi, 2005). A sustainable transportation tool should limit the emissions and waste and as a whole it should be along with environmental issues that exist nowadays in every country (Sustainable Transport, 2012). On the other hand, it can be said that environment is a barrier for transportation corporations which are paying attention to sustainability by not leaving harmful environmental results for the next generation.

The transportation industry is aware of the need to develop environmental and social strategies in order to be sustainable. A process following this direction is CSR, whereby companies combine social, environmental and ethical issues into their strategy and business operations (Environmental Rules, 2011).

3.1.2 Sustainability and Global Standards
For multinational corporations sustainability can be equal to integrating long-term economic, environmental and social aspects in their business strategies while maintaining global competitiveness (Corporate Sustainability, 2011). It is also a matter of importance for MNEs to fulfill shareholders demands and needs by being profitable. What companies needed was an investable index where they could measure and standardize their sustainability investments. In response, the Dow Jones Sustainability Indexes (DJSI) was launched in 1999 and provides a financial quantification of companies’ sustainability strategies and motivate them to increase their long-term shareholder values by responding to sustainability objectives (economic, environmental, and social (Sustainability Investment, 2011).

Furthermore, Sustainable Asset Management (SAM) offers benchmark indicators of sustainability. They have been evaluating and documenting the sustainability of over 2000 corporations on yearly basis since 1999 and have currently one of the largest worldwide databases on corporate responsibility. The world’s 2500 largest companies (based on the Dow Jones Global Total Stock Market Index) are invited to participate in SAM’s Corporate Sustainability Assessment every year (Dow Jones Sustainability Indexes in Collaboration With SAM, 2011).

Moreover, if companies want to show that they have fulfilled some or all parts of the sustainability areas they need to have a sustainability report. According to Global Reporting Initiative (GRI) “a sustainability report enables companies and organizations to report sustainability information in a way that is similar to financial reporting. Systematic sustainability reporting gives comparable data, with agreed disclosures and metrics” (About Sustainability Reporting, 2012). Sustainability reporting through GRI allows corporations around the world to cover and measure four main areas of sustainability: environment, economic and society, as well as governance. It will also provide steps for managing changes toward sustainability. GRI’s mission is to make sustainability reporting a standard practice and support organizations in their goals to become more responsible (About GRI, 2012). In addition, the awareness of acting responsibly has created approaches not only within the company but also from global aspects. For instance, a global approach to CSR is the ten principles of the UN Global Compact (Appendix A) (Sustainability, 2011).
3.2 CSR
The definition of CSR is limitless and is constantly changing in the literature especially since 1950s (Caroll, 1999). Even the name of CSR itself is found to have many other variations. Some examples are corporate responsibility, corporate citizenship, responsible entrepreneurship, and “triple bottom line”, which refer to the People, Planet and Profit (Hohnen, 2007). If we were to define CSR according to International Standard Organization (ISO), CSR will be described as the “responsibility of an organization for the impacts of its decisions and activities on society and the environment through transparent and ethical behavior that is consistent with sustainable development and the welfare of society; takes into account the expectations of stakeholders; is in compliance with applicable law and consistent with international norms of behavior; and is integrated throughout the organization” (ISO 26000, 2010).

Generally, CSR refers to actions taken by firms, which go beyond what is legally required by them and regard employees, communities and environment (Barnea & Rubin, 2006).

In spite of the excess of CSR definitions over the last 50 years, Carroll’s four concepts has been the most durable and commonly cited in the literature (Crane & Matten, 2004). His CSR model is probably the most familiar model of CSR, indicating the relative importance of economic, legal, ethical and philanthropic responsibilities respectively (Dobers, 2010, p. 101). The diverse actions taken to manage business’ relationship with society should go within these four types of responsibilities, where proportions simply suggest the relative scale of each responsibility (Carroll, 1999):

Figure 3: Carroll’s typology of corporate responsibilities
Source: (Caroll, 1999, p. 499)

To examine these individually, economic responsibility signify to the fundamental responsibility of business to be profitable while producing goods and services that the society demands. Moreover, companies shall have a purpose and understand in what ways profits are made and not only consider
profits. In addition, companies must operate within the restrictions of the law where local, national and international law sets out rules stating what companies can and cannot do. The purpose of being lawful ensures a protection in many areas such as employment, environment, corruption, human rights and safety. In other words, law defines what legitimate business activity is. Furthermore, ethical responsibility refers to the companies responsibilities that go beyond what is required by regulations and economic rationality. The meaning is to rethink what companies produce and how they do so. In the past, companies relied on government to say what was allowed however nowadays companies have more responsibility and have accepted that preventing is more effective than command-and-control regulatory solutions. The last responsibility implies the importance of giving back to society. The idea of discretionary responsibilities is to find strategies where philanthropy and business goals can be aligned (Blowfield & Muray, 2011, pp. 17-25).

However, there are now more sophisticated frameworks in order to understand corporate responsibility and the practice of managing the relationship with wider society. Kotler and Lee (2005) defined CSR as a “commitment to improve community well-being through discretionary business practices and contributions of corporate resources”. Some important areas of corporate responsibility activity today are: Community involvement, environmental management, sustainability, human rights, business ethics and corporate governance (Blowfield & Muray, 2011, p. 28). There are two approaches companies can distinct from, either to be defensive to corporate responsibility or to be offensive. The first approach refer to reducing risks, protecting the company’s reputation and obey the law while offensive approach indicates to utilize the corporate assets in finding solutions to societal problems. These approaches can be broken down into evolutionary levels of responsibility giving the opportunity for companies to create and develop its values in order to establish business decisions that lie in the heart of the business. When the company there after becomes aware and clear of its core values and goals then it can see its role as a leader in managing societal issues (Blowfield & Muray, 2011, pp. 136-163).

The new policy in the European Commission published in October 2011 states that enterprises “should have in place a process to integrate social, environmental, ethical and human rights concerns into their business operations and core strategy in close collaboration with their stakeholders” in order to fully meet their social responsibilities (Sustainability, 2011). Altogether, CSR humanizes companies and portray them as responsible citizens who care about the social and environmental welfare (Dobers, 2010, p. 101). As CSR issues become increasingly integrated into modern business practices it becomes highly important to take them into account and act responsibly. Seeing as a real commitment to CSR makes corporations noticeable (Corporate Social Responsibility , 2012)and becomes a perfect reminder of the bond between company and society (Das, 2011).

When a company has a positive impact on society and environment then it has created its policies in order to show CSR. This process requires that social responsibility goals are prioritized through constantly developing policies, daily operating procedures and through corporate activities. Furthermore, companies can create efforts to accomplish sustainability and form activities so as to appear green. Environmental friendly products and recycling activities of companies can create less negative impacts on the environment. These measures are important due to the declining resources, toxic waste and global warming.
When companies are doing the right thing and behave responsibly they should publish their CSR activities in order to make these reports accessible to all who have an interest and to create awareness amongst customers, suppliers and the local community (Corporate Social Responsibility, 2012); for instance through its annual reports.

3.2.1 Arguments For and Against CSR

Five arguments have been chosen against CSR and five arguments for CSR (Smith, Arguments For and Against CSR: Expected from Morality and the Market, 1990) and below they will be briefly discussed.

Starting with the disadvantages of CSR:

1. The role of profit
2. Competitive disadvantage
3. Competence
4. Fairness
5. Legitimacy

The arguments against CSR lie on the assumption that companies function is not social rather economic and therefore the goal is to make a profit and maximize social welfare through the efficiency which that involves. Other ways, the company will be in a competitive disadvantage due to social actions cost. The suggestion is to either let the government take care of it or legislate CSR so that the requirements will be equal for all companies. Furthermore, the arguments emphasize the competence of the businessmen to handle this issue, how are they supposed to know what social responsibility is? Those that are against CSR state that a firm is not component to deal with social matters. They are questioning the companies' technical skills and lack of knowledge on the society's needs, just to mention two concerns.

The fourth argument states the dilemma on fairness, since CSR is costly, not all companies can implement it and therefore it will create domination by businesses; those companies that can implement CSR will gain more power. The final argument against CSR is legitimacy. Again the importance of government’s role is emphasized and argued that social issues are the government’s concern and not the company’s.

Advantages of CSR:

1. Public expectations of business
2. Enlightened self-interest
3. Avoidance of government intervention
4. The extent of corporate power and the need to balance this with responsibility in self-regulation
5. Business resources

Today’s business decisions are not solely economical, there are mixtures of good citizenship and humanity involved too that surroundings expects companies to perform after. The issue is not whether companies have social responsibility or not, because everyone does, but the main concern is to find
CSR Activities Promotes Sustainability

Each company’s role and what every individual firm can contribute to make the world a better place. The expectations from the society of businesses acting responsibly are as never before and the reason behind it is the impact of globalization. Companies are now starting to realize that they need to take responsibility of their actions for some of their most significant sustainability consequences.

3.2.2 CSR in MNEs
There are many different manners in which a company can implement CSR measures for the benefit of all concerned (Rooyen, 2007). Given that MNEs operate in various environments and cultures, they come across several stakeholder groups and non-governmental organizations (NGOs) (Rodriguez, Siegel, Hillman, & Eden, 2006). Organizations are both drawing on existing CSR initiatives as well as being innovative. One of the world’s most used multi-stakeholder CSR initiative is the United Nations (UN) Global Compact. It calls on the private sector to embrace a core set of ten principles in the areas of human rights, labor standards, the environment, and anticorruption (Appendix A).

CSR attempts to make a positive and productive relationship between corporations and society. There are an increasing awareness from the organizations and their stakeholders of the need for and benefits of socially responsible behavior which in turn will contribute to sustainable development. A critical part of measuring company’s overall performance and its ability to continue operating effectively is through its relation towards the society in which it operates and to its impact on the environment. This highlights the importance of the need to ensure healthy ecosystems, social justness and organizational governance. As in the long run, companies’ activities depend on the health of the world’s ecosystems. The awareness and certainty of an organization’s performance on social responsibility can influence, among other things:

- Its competitive advantage;
- its reputation;
- its ability to attract and retain workers or members, customers, clients or users;
- the maintenance of employees’ morale, commitment and productivity;
- the view of investors, owners, donors, sponsors and the financial community; and
- its relationship with companies, governments, the media, suppliers, peers, customers and the community in which it operates (ISO 14040, 2006).

3.2.3 CSR in Transportation Industry
For different local and multinational transportation corporations it is important to act in a more responsible way to their environment in which they are acting in. In addition to the environment which is a matter of sustainability, CSR also talks about human rights and codes of conducts. In transportation, CSR mostly refers to the environment but human rights and the behavior of different corporations with people is also important. According to CSR policies and objectives of each corporation including a transportation company, behavior of different stakeholder inside the company (employees) should act in a responsible way. Corporations should also try to minimize the effects of principles described in their codes of conduct in relation to their employees.
Transportation industry causes a lot of damage for instance through the emissions and waste of their plains and trains, therefore CSR here plays a vital role. Companies need to work with CSR in order to be successful and sustainable. Nowadays there are regulations and rules demanding companies to follow certain criteria in order to be environmentally friendly and to become sustainable (Europa.eu, environmental rules, 2012). Companies recognize the relation between profit, planet and people and due to the high competition and because of civil society pressure they need to implement CSR in their core values. The further a company gets from beginning to implement corporate responsibility, the more difficult it becomes to put it into practice (Blowfield & Muray, 2011).

3.3 Innovation
As it comes from the word of “innovation” people and companies are making new manufactured goods so that they can improve the quality of their life while making it easier. But it is important to know if these innovations are really helping public’s life by not harming the environment and their society or not. Innovation is something that everybody talks about it. It shouts at you from different advertisements for small and big products and this is the thing that makes a huge difference between organizations of all shapes and sizes (Bessant & Tidd, 2007, p. 3). Innovation and new technology are hand in hand together for providing a better social progress and to improve the ways of carrying out activities (Gilson & Sligson, 2004).

“An innovative business is one which lives and breathes ‘outside the box’. It is not just good ideas, it is a combination of good ideas, motivated staff and an instinctive understanding of what your customer wants” (Richard Branson- DTI Innovation lecture, 1999, cited in: Bessant & Tidd, 2007, p. 11).

For innovation to have an effective result it must have an improvement in the product, economic, environment and people’s lifestyle. Nevertheless, innovation is not just about inventing a new product; it can also be helpful in doing the CSR activities and being responsible to the environment. Innovation is often presented as a major contribution to environment through a good economic condition. However, it can be seen as a large part of environmental solutions (Bessant & Tidd, 2007, p. 325).

Becoming environmental friendly lowers costs for a company producing different products. However, lowering costs by reducing the inputs corporations use put innovation and sustainability together regarding the society and customer satisfaction. This can be assumed as a goal for almost every corporation that has sustainability related activity (Nidumolu, Prahalad, & Rangaswami, 2009). The base of innovation is related to sustainability. Customer satisfaction in a sustainable responsible way brings up the level of environmental impact which should be decreased by having improvements in products or in order words to be innovative in manufacturing a product with less societal damages (Fussler, 1996, p. 5). In order to be product innovative companies must use related and competence tools they need at early stages of their production, for example at the design stage (Nidumolu, Prahalad, & Rangaswami, 2009). In the design stage changes possible can be done resulting in a better society with having more responsibility.

Just being innovative doesn’t mean that a company can also be successful. Success in innovation depends on two key ingredients: resources and the capability to manage them and the second one is of
course more difficult to achieve (Bessant & Tidd, 2007, p. 10). It should be noticed that firms are not capable of managing the firm and its innovation from beginning; they learn it over the time.

One of the challenges for every company might be to ensure that compliance with norms within every society they exist in, is an opportunity for them to be innovative (Nidumolu, Prahalad, & Rangaswami, 2009). Of course innovation seems easier for those companies that are acting in some emerging markets except the traditional-minded ones. However, there are different ways in which innovation can contribute to sustainability. The figure below can explain a topology of sustainable innovations:

In the bottom left quadrant the innovation focuses on the improvement of existing technologies, products and services. This is not necessarily incremental and may be changed during the time while the goals are constant. This is the most common type of the innovation. The top left-hand quadrant represents the development of new knowledge, but its application to existing problems and includes alternative materials, processes or technologies used in existing products. Moreover, the right bottom quadrant represents the application of existing knowledge to create new market niches (positions) by using different components and sub-systems in new configurations. These are very important for sustainable innovation. The top-right quadrant can be the most fundamental contribution of innovation to sustainability. It is in this stage that new “socio-technical” systems are brought together (Bessant & Tidd, 2007, pp. 324-326).

Depending on the industry and the company’s aim in being sustainable, innovative activities can be placed in any of these four boxes in the figure. Later in this study, Bombardier as a transportation corporation will be placed in the figure depending on its current situation and the future the company is aiming for.
3.3.1 Innovation in Transportation Industry

Perhaps the ways that transport connects innovations to development seems far afield from everyday concerns (Garrison, 1996). It can be said that innovation plays an important role in transportation (Innovations in Transportation: research and policy lessons of recent successful cases). Transportation companies cannot compete through the new environmental issues unless they become more innovative and respond more effectively to customers’ needs and preferences (Garrison, 1996). Here social innovation is of great importance for those corporations, resulting in producing new products and offering new services to their customers and all this, by paying more attention to the environment (Industrial innovation, 2012).

To reduce the environmental impact of transport every transportation business needs several kinds of innovations in its products. By being innovative in the design and production of products the harmful results that any product can have both on the environment and people in each society will be reduced and societies can move toward a greener future. For transportation, innovation can be seen in manufacturing products with less emissions and pollutants.

Many companies take their own initiatives and create innovative CSR activities because it is beneficial to both the society and the enterprise itself. The aim is to enhance positive impacts and at the same time, minimize and, when possible, prevent the negative ones (Sustainability, 2011).

3.4 The Steering Three Concepts

In order to provide a clear picture surrounding the concepts of innovation, sustainability and CSR, this section aims at highlighting three exact definitions that best represent this thesis’ views. In addition, this will allow the reader to have a clearer picture of those three concepts throughout the reading of the thesis.

Sustainability:
"Foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony and fulfill the social, economic and other requirements of present and future generations" (What Is Sustainability, 2012).

CSR:
“A commitment to improve community well-being through discretionary business practices and contributions of corporate resources” (Kolter & Lee, 2005, p. 3).

Innovation:
“An innovative business is one which lives and breathes ‘outside the box’. It is not just good ideas, it is a combination of good ideas, motivated staff and an instinctive understanding of what your customer wants” (Richard Branson- DTI Innovation lecture, 1999, cited in : Bessant & Tidd, 2007, p. 11).
4. Empirical Findings

This chapter provides information about the case study of Bombardier and describes its CSR activities. The results of the findings will be presented in this section.

4.1 Company Background

Bombardier is a multinational transportation company which operates in two industries naming aerospace (Canada) and rail transportation (Germany) with its headquarters in Montreal, Canada (Aerospace About Us, 2012) and Berlin, Germany (Transportation About Us, 2012). The company is present in more than 60 countries with 76 production and engineering sites and a worldwide network of service centers. With 70,000 employees in both sectors, Bombardier designs, manufactures and supports innovative aerospace and transportation products. Bombardier aims to be the world’s transportation leader by “engineering ingenious and sustainable solutions to today’s mobility challenges and opportunities” (About Us, 2012).

Its revenue for the fiscal year ended January 31, 2011, was $17.9 billion, and its shares are traded on the Toronto Stock Exchange (BBD). Bombardier is also listed as an index component to the Dow Jones Sustainability World and North America indexes (Media Centre, 2010).

Bombardier’s mission and core values have helped the company to make strategic planning. All people engaged in Bombardier’s activities such as employees and management are aware of these two commitments (About Us Promise and Values, 2012). By identifying CSR, the company ensures that it becomes the forefront of their business and remains embedded in every activity they do. While the company creates innovative transportation solutions, it remains committed to be sustainable and move forward responsibly (Our Approach, Our Corporate Strategy, 2012). Appendix C presents Bombardier’s corporate strategy as well as CSR governance structure. Their cross-functional CSR Committee develops CSR guidelines and initiatives with broad representation from across the organization. Bombardier’s conscious use of new technologies, philosophies and wise management approach has led it to fulfill its long-term competitiveness and growth (History, 2012).

Like many other MNEs, Bombardier is also looking toward sustainability by having corporate strategies. Many years before Bombardier started its CSR activities, the company had the J Armand foundation which helped people in different societies. In that sense, many things where there for Bombardier, but not managed within CSR perspective. The company began its CSR activities from 2007 by signing the UN global compact. At that moment they had just 3 initiatives namely people, excellence and environment which they initially focused on, but as they were continuously improving, by 2009 they had 6 initiatives (Governance, Employees, Supply chain, Products, Operations and Responsible Citizenship (Parry, Questionnaire, 2012).

4.2 Findings/ Results

For Bombardier, CSR, sustainability and innovation are hand in hand and they help the company continuously to achieve its goals. To quote Michael J Ryan: “Be the change you wish to see” (Ryan, 2012).
4.2.1 Innovative CSR Activities
Bombardier cannot really define CSR, but as Bruce Parry expressed: “CSR is part of everything we do, it is important to know that it is not a project or initiative” (Parry, Questionnaire, 2012). Moreover, as Pär Isaksson also stated: “It is difficult to define CSR, it relates to production and the size of it. But as a whole, CSR is a tool for making the world a better place” (Isaksson, 2012). Below, is a collection of Bombardier’s most innovative CSR activities are presented.

- **Environment and Society**
The company’s mission is to constantly implement new community investments and as a result they invented an approach called the 3Es; representing Environment, Education and Entrepreneurship. Within those three areas Bombardier donates, sponsors and involves in communities while focusing in its CSR activities (Parry, Questionnaire, 2012). Furthermore, according to governance priorities they were totally successful in completing their mission (Governance, Objectives, 2012). Governing effectively is the right process in place to make sure CSR has been managed properly. By having ethics Bombardier is making sure that they are keeping their promises concerning CSR by basically having core values (Parry, Questionnaire, 2012). Furthermore, every year Bombardier holds an "Employee Engagement Survey". It has a whole variety of questions to the company, the employee and also CSR related questions as part of it. This is how Bombardier measures its overall practices as a company in its employee’s eyes. Where there are areas that employees do not think they are doing well, there are action plans in place to improve them (Parry, Questionnaire, 2012).

Moreover, Bombardier is a participant to the UN Global Compact as the world’s largest corporate citizenship and sustainability initiative. Even though the signing of the UN Global Compact is not an innovative action by itself, the result by being a member leads Bombardier to be innovative in its CSR activities in order to follow the principles. Their mission is to provide transportation and aviation sustainable growth for the benefit of global society (Governance, United Nations Global Compact, 2012). To stay sustainable the company is developing safe products while engaging their customers and stakeholders in their sustainability activities (Product, 2012). Signing the UN Global compact resulted in collaboration between the government and society. Beaudoin, P. stated, “I firmly believe that this type of collaboration is the key to effectively tackling issues of an increasingly global nature” (Our Approach, Executive Messages, 2012).

After Bombardier signed the UN Global compact, they started to promote different initiatives including both internal and external environment. For example, an environment initiative is their Environment Management System which helps them to identify specific environmental aspects and take appropriate actions for the improvement of the environment. Bombardier’s risk assessment approach continuously improves energy and resource consumption in addition to waste generation impacts (Governance, United Nations Global Compact, 2012).

Reducing the ecological footprint has been a main issue for the company and there has been an ongoing focus on it in order to develop a plan (Operations, 2012). Therefore, in order to support local initiatives and Bombardier’s achievements in environmental targets and commitments, they launched the Bombardier Green Fund in 2010; implemented at both Aerospace and Transportation sites. In this
program, they encourage their employees to submit project ideas and in that sense, engage their enthusiasm for Moving Forward Responsibly. The projects are based on optimal energy and GHG emission savings, payback period and cost and are selected by the Green Fund selection committee (Operations, Environmental Initiatives, 2012). In 2011, Aerospace selected eight best-practice initiatives to launch the program. Parallel, Bombardier’s Transportation group implemented 11 Green Fund initiatives. Examples of Green Fund initiatives are presented in Appendix D. Moreover, to improve their ability to motivate innovation among their employees, several programs have been formed to recognize and reward employees who contribute to Bombardier’s innovation and success (Employees’ Engagement, 2012).

Furthermore, in order to move forward responsibly Bombardier identifies CSR as a strategic priority. As a result innovative transportation solutions have been made (Our Approach, Our Corporate Strategy, 2012). An innovative project that leads Bombardier to sustainability is their Greenhouse gas emission (GHG) project; which includes activities in both sectors. The company is constantly looking for innovative solutions to overcome challenges such as climate change, stricter emission, noise and land-use regulations (Products, Greenhouse Gas Emissions, 2012).

Moreover, Bombardier has a training program for its employees and the environment surrounding them, in order to fulfill their needs which are summarized in the Health, Safety and Environment (HSE) policy (Employees, Health and Safety, HSE Policy, 2012). The company has also created environmental initiatives where they play some videos for the employees on the Earth Day every year and provide them with updates about the company and the environmental issues (Operations, Environmental Initiatives, 2012).

The environment is not just limited to the environment outside the company, the working environment is also an important factor; employee survey is the tool which helps the company to improve its working environment by receiving feedback from employees (Employees, Employee Engagement, Listening, 2012). Bruce Parry (2012) pointed out that “employees are basis for values and principles and Bombardier has to make sure that its employees are engaged in activities and are innovative-dedicated to what they do”.

Bombardier has continued to design products for the environment and also supported their aerospace customers to establish their compliance along with new environmental issues and regulations (Products, Objectives, 2012). Designing for Environment (DfE) means to increase the recyclability and reduce the noise and emissions gained from products (Products, Our Product Responsibility Strategy, Design for Environment, 2012). Furthermore, DfE looks into the design of the product at all the stages of its being, from conception to disposal; design, supply chain, manufacturing, operation and end of life. DfE optimizes the design for the use it will face from both a train and plane point of view, what Bombardier cannot control is the way operators chose

![Figure 5: Plan-Do-Check-Act methodology](source: Bombardier CSR)
to operate and dispose of their product, they can only recommend how they use it and get the best out of it (Parry, Questionnaire, 2012). With the help of DfE, the company can understand two aspects, firstly the environmental impacts of their products and secondly acting upon those impacts thus 60%-80% of the ecological footprint are determined when a product is designed (Parry, Questionnaire, 2012). Their main objective is to achieve carbon-neutral operations by 2020. Along with their main objectives, Bombardier also wants to switch into renewable materials, decrease the amount of natural resources such as water, energy and raw materials used in their products and operations and delivering a zero waste performance (Operations, 2012).

Hand in hand with DfE principles, Bombardier has created a lifecycle management approach. This Lifecycle Assessment (LCA) evaluates the process Bombardier uses to measure a products’ impact on the environment at any point or over its whole lifetime. The foundation for LCAs principles comes from the ISO 14040 series (Appendix E) and guides them to further improve their product performance by looking deeper into other solutions and designs to minimize environmental impact (Products, Our Product Responsibility Strategy, Lifecycle Assessment, 2012). Figure 5 illustrates how Bombardier applies the Plan-Do-Check-Act methodology; DfE is the philosophy that helps to improve the environmental impact and LCA is the evaluative process.

Bombardier has set new standards and regulations regarding sustainable transportation among their products produced and designed for the trains such as windows, lights and graphics. An example of it could be the transportation system available in Winter Olympic 2010 in Vancouver Canada where Bombardier got the STAR Award for creating a sustainable public transportation option for people attending the games (Our Approach, Recognitions, 2012). “Design for Environment is a cornerstone for advancing sustainable mobility” (Parry 2012 Cited in Bombardier CSR: Products, Design for Environment, 2012).

Bombardier’s stakeholders are expecting dedication and responsible behavior in order to reduce the carbon footprint and their operating costs. Being innovative in their production process helps Bombardier to meet those necessities (Our Approach, Executive Messages, 2012). Their stakeholders are important in the process of acting responsibly since they are the ones moving it further and putting it into action. The supply chain is part of their CSR activities and using the supply chain as a tool, the company can share its values with different suppliers. It is important for them to know how their suppliers are adapting CSR. Their core value here is to transfer all believes to their suppliers (Parry, Questionnaire, 2012). Furthermore, Bombardier reports its products’ environmental impact to its stakeholders (Figure 6) through their Environmental Product Declaration (EPDs). This reporting allows customers and suppliers to be a part of the company and help Bombardier to meet the growing requirements (Products, Our Product Responsibility Strategy, Environmental Product Declaration, 2012).
A sustainable organization requires the engagement of their customers as well. For this goal, they made their customers to be involved in designing new aircrafts. Letting them be a part of the working process makes it possible to work together towards a more sustainable planet. Moreover, a customer survey has also helped them to understand customers’ sustainable needs and wants (Products, Engaging Customers in Product Responsibility, 2012). Another example of engaging customers in sustainability is the Gröna Tåget (Green Train) in Sweden. With help of customers and other business partners, they produce energy efficient, high speed trains which suits the Nordic climate and traffic (Products, Engaging Customers in Product Responsibility, 2012).

Furthermore, collaboration between Bombardier and Cascades started in 2010, which resulted in an innovative use of eco-responsible products (Supply Chain, Objectives, 2012). This groundbreaking agreement on CSR provides Bombardier to further reduce the ecological footprint of its operations, since Cascades will share its expertise in energy efficiency. To share knowledge and expertise with one another is a great step towards working together to improve environmental performance (Media Centre, 2010).

As the world keeps changing, environmental and social conditions are also changing parallel with Bombardier’s stakeholder’s expectations. They expect Bombardier to move beyond the strategies set for the company by taking concrete actions so that Bombardier should meet their expectations and needs by taking sustainable action (Our Approach, Executive Messages, 2012). Bombardier is now working on the environment for a more sustainable future to reduce their ecological footprint of their operations and products and DfE has helped them in that process: “It helps the company to ensure sustainability in terms of environment” (Parry, Questionnaire, 2012). They are also encouraging their stakeholders to set
some new rules and regulations in order to help them be successful in their work (Responsible Citizenship, Community Involvement, 2012).

Bombardier’s relationship to community engagement involves a growing number of employees. The intention is to foster greater employee engagement and to contribute to the communities they are operating in. Emphasizing in engaging, developing and inspiring their human capital will result in innovative, productive and dedicated employees. Steps towards that are through volunteering activities which help communities with different projects and, in that sense, contribute worldwide. Also here, the 3E approach is the base for the direction of the projects (Responsible Citizenship, 2012).

Different projects that Bombardier held in different countries in the recent years has made the company to become more responsible for the society they operate in. For example the project held in India with employees’ engagement concerning sustainability helped them to gather the rainwater, plant trees and fostering local entrepreneurship (Isaksson, 2012). Another example is from a project held in South Africa, named STARS, which was to educate students aiming to improve their skills and to build capable workforce in order to solve the African Transportation System problems (Major Projects, 2012). Furthermore, Bombardier carried out a joint project with Goldmud-Lhasa railway in Tibet, China aiming to educate local poor students in order to improve their business conditions in their region (Major Projects, 2012).

Another major project for developing the environment (as well as the economy) is their enduring support of Sierra Gorda World Biosphere Reserve which is located in Querétaro, central Mexico (Parry, Questionnaire, 2012). They became supporter in October 2010 and the projects that Bombardier is assisting with helps benefit the reserve’s 23,000 residents directly and more than 90,000 people in the region indirectly. In addition, it assists the rare and dying out species in the reserve as well as helps the intersection between northern and tropical species. These projects involve reforesting destroyed areas of the reserve, commercial plantations and restoring the community’s watershed (Major Projects, 2012).

In order to evolve hand-in-hand with the communities Bombardier serves, the J. Armand Bombardier foundation was established in 1965. It is a private family foundation which presses forward the humanitarian work of Joseph-Armand Bombardier, the founder of the company. There is a mutual support and engagement between Bombardier and the foundation; Bombardier contributes a percentage of its pre-tax incomes to the foundation and the foundation supports Bombardier’s vision of social responsibility. Besides the financial support given to organizations across the country, they contribute with training workshops, networking activities and newsletters. The foundation donates and sponsors organizations and institutions working in four key areas: Education, community support, healthcare and arts and culture. Through the foundation Bombardier can give organizations the ability to be innovative and progress together towards a better society (Responsible Citizenship, J.Armand Bombardier Foundation, 2012). It is important to note that the J. Armand Bombardier Foundation is separate to Bombardier’s donations to the community and does not come under the 3E policy (Parry, Questionnaire, 2012).
• **Economic**

CSR for Bombardier is equal to moving forward responsibly, but being a social responsible company needs to have a good economic condition. Pierre Beaudoin (*President and Chief Executive Officer Bombardier Inc*) mentioned that one of their biggest achievements was to navigate the economic downturn and its impact on the aviation industry; as a result remaining profitable. Moreover, their good economy condition has also led them to continue being innovative (*Our Approach, Executive Messages*, 2012).

The main factor which has helped the company to be innovative is their strong economy resulting from manufacturing innovative products for their aerospace industry. Another objective helping them to be successful is their commitment to produce innovative transportation product according to the needs and wants of their customers (*Governance, CSR governance*, 2012).

When asking the question concerning how much money has been allocated to CSR activities the answer was that CSR is part of everything Bombardier does and that the company does not put specific budget allocated just for CSR. However, Bombardier does put a specific budget for the Green Fund project which is one of their CSR projects (*Parry, Questionnaire*, 2012).

From this year, Bombardier publishes its CSR reports at the same time as, or integral to annual reports. “This brings us in line with the current way of thinking”, stated Bruce Parry (*cited from email*, 26 April 2012). As part of this shift, Bombardier is also planning to have their report externally verified within the next two years, for instance doing the necessary in terms of GRI indicators (*cited from email*: Parry, 26 April 2012). In addition, Bombardier’s sustainability practices are also measured through the DJSI, where they have been listed as an index component for the last five years; both the World and North America indexes. An important note is that Bombardier was awarded SAM Sector Mover and SAM Gold Class in this year’s SAM sustainability Yearbook 2012. These awards represent international recognition of Bombardier’s sustainability practices and are a testament to their performance over the past year. These results are a significant achievement in CSR at Bombardier and their commitment to continue moving forward responsibly (*Our Approach, Recognitions*, 2012).

### 4.2.2 Measuring Bombardier's Performance

Bombardier’s 2011 CSR Report has been constructed using the GRI Framework Guideline. The following provides an overview on the GRI standard disclosures (*Moving Forward Responsibly All Abroad*, 2011).

• **Environment**

Regarding Bombardier’s total energy consumption the company decreased its usage by 1.4% between 2010 and 2011, along with its total GHG emissions that decreased with 5% between the same year.

Although Bombardier has worked to respect the environment through different actions and activities, there is still some work needed to be done. By looking at their GRI index the company could not cover the total volume of water recycled and reused, between 2010 and 2011 the water consumption increased by 1.4%, however, taking a deeper look from 2007 until 2011 a downward trend is obvious where the water consumption has decreased by 5.3%. In addition, the waste (Hazardous and non-
hazardous) has increased by 11.6% between the years 2010 and 2011 however, the hazardous waste between the years 2007 and 2011 has decreased by 10.7%. Appendix F(1).

• **Society and Economic**
Regarding Bombardier’s donations and sponsorships the company’s contributions have increased by 5.6% between 2010 and 2011, while donations and sponsorships to the J. Armand Bombardier Foundation itself have increased by 26% between the same years. Appendix F(2).

Despite their constant investment in CSR projects, revenues have increased with 2.5% between 2010 and 2011. Appendix F(3). However, Bombardier’s DJSI score last year indicates that there were improvements to be made in the social area of CSR (Parry, Questionnaire, 2012).
5. Analysis

In this chapter, the outcome of findings and results will be analyzed with the theories presented in this study.

The CSR model presented in this study is a good foundation to have as guidance in order to see whether a company is implementing CSR activities or not. The model highlights the importance of economy and the necessity of protecting the environment and humanitarian actions; both voluntary and from the law. It is important to note that companies are businesses with the aim to survive; therefore, profits are a priority and can sometimes be in the way of philanthropic means. A company can only contribute as much as its economy allows it to.

With that in mind, Bombardier has let the spirit of CSR to capture the company’s core values and be a part of everything they do; from design and production, to engaging its employees and to be responsible to its surroundings. They have involved CSR into their corporate strategy and also formed a CSR governance structure to better inform, report and perform necessary measures for implementing CSR. For that reason, they have succeeded in making CSR part of their identity and therefore easier to put activities into action.

Bombardier has also three important approaches, including environment, education and entrepreneurship (3Es), where these main areas are the focus of the company and a guideline in their implementation of CSR activities. The 3E approach are used for donations, sponsorships and community involvement and in order to not lose focus and to not have a broad spectrum of causes, Bombardier evaluate each application to see whether or not it fits within the 3E guidelines.

Furthermore, in line with the theories, Bombardier has created innovative CSR projects with the purpose of being sustainable, for instance through having employee engagement- and control environment surveys, and through its Green Fund project. The latest presented being a project that engages its employees and as a result contributes to a better planet when accomplishing the work. The Green Fund is Bombardier’s most innovative CSR activity and allows employees to think outside the box and find innovative solutions to be sustainable. Its major projects have given the possibility to develop societies and make them more eco-friendly.

The Green Fund has also contributed within these three parts of sustainability mobility in Bombardier: DfE, LCA and EPD. Together they focus on designing, building and delivering products that are more environmental by using greener technologies and materials. Looking further at the technology implemented by Bombardier, DfE represents an innovative approach which takes into account environmental concerns from the earliest stage of design and encourages Bombardier in their development of eco-friendly technology. Furthermore, ISO 14040 series guides them to further improve their product performance by looking deeper into other solutions and designs to minimize environmental impact. Being innovative will endorse in decreased consumption of inputs and resources such as water, energy and materials. In addition reduce, and when achievable, remove unwanted
outputs including greenhouse, gas emissions, volatile organic compound emissions, waste water release and dangerous waste materials.

More engagement from employees for the cause of improving the environment and the society take place through volunteering. Letting their employees work outside the company and give back to the society contributes to a wider understanding of the planet and the people; it foster relationships and communication. Bombardier recognizes that employees are its most important stakeholders since they are holding the knowledge for the upcoming products and are an important factor for keeping the business alive. Besides volunteering, Bombardier is also donating and sponsoring events and organizations which fit in within the 3E approach. These inputs are possible through the J Armand Bombardier foundation where the goal is to motivate people and other organizations to be role models concerning the environmental impact and sustainability.

To support CSR Bombardier has signed to the UN Global Compact and has thereafter established different policies and codes within the company with the purpose of sustaining its beliefs and values. This results in establishing innovative CSR actions corresponding to the UN Global Compact principles. For instance, environmental challenges (principal 7-9) are being confronted through Bombardier’s Environmental Management System, HSE Policy and through their DfE approach, all of which are innovative CSR actions within Bombardier.

Along with CSR activities, Bombardier has done lots of innovative activities in order to be more responsible and sustainable. Although people are getting more adapted to use public transportation means such as trains and airplanes except their personal vehicles, still the amount of emissions in the air are increasing. The main issue for transportation industry is the increasing amounts of CO₂ released from transport means therefore Bombardier tries to be innovative in the Research and Development (R&D) stage with a result in decrease of CO₂ liberate from their products.

By looking through their innovative activities and products manufactured, the company can be placed in the innovation typology figure as below:

![Figure 7: A typology of Bombardier’s sustainable innovations](image)

Source: Author’s invention
CSR Activities Promotes Sustainability

The figure shows that Bombardier have either used their existing knowledge and existing application, so that they manufactured innovative products or that they have gained new knowledge while applying to their existing application. An example of the first group is carbon-neutrality where the company’s innovation aimed in reducing their carbon footprint in their production process. It resulted in reduction of 14230 KG CO\textsubscript{2} equivalent to the annual emissions of 5 cars (Moving Forward Responsibly All Abroad, 2011). Although the company has done lots of innovations to overcome this issue, they are not at their aim yet, since their goal is to be carbon-neutral. Having in mind that these challenges take time to overcome, they do not disappear over a day; Bombardier’s goal is to overcome this by 2020.

For the second group a good example can be the GHG. The company wants to overcome climate changes affecting their products by using new knowledge and make innovative solutions. The new knowledge can come from employee engagement, as employees are part of the society and the environment or it can be achieved by the relationship and contact that Bombardier has with its stakeholders. Furthermore, as employees are company’s front counterparts they can understand demands and transferring them to the manager and the headquarter, in that sense, Bombardier can be more innovative by listening to its surrounding.

The question that may arise after looking further into the typology mentioned above is why they are not using new knowledge or existing knowledge to produce new applications? A reasonable explanation may be that producing an airplane takes 7 years, while producing a train takes 3 years, so it becomes difficult to be innovative in manufacturing application while being environmental friendly and at the same time, follow the regularly changes in the environment. Taking those facts into consideration, new/existing knowledge and new products is a long-term innovative plan which cannot be achieved easily. In addition to the time issue, the cost of producing totally new innovative products can be expensive for the company, therefore, making innovation in some parts and sections of their existing products can be more efficient; in that sense be sustainable and responsible.

Any corporation has to have strategies which help them to achieve their goals. Bombardier’s environmental plan is to reduce their ecological footprint. In order to achieve their goal Bombardier continuously launched projects and activities in order to be more environmental friendly. For them it is important to fulfill customers’ environmental needs that are looking for a better environmental condition. The transfer of customers’ needs to the company is shaped by the connection between employees and them. Employees as main stakeholders have helped the company to understand customers’ needs since employees are a link between customers, society and Bombardier. The employee voluntary programs held during the years have really helped the company to improve this link and network between the company and customers.

By looking at their GRI measurements (Appendix F), if environmental impacts are measured every 5 years as figures suggest, Bombardier’s trend in waste (hazardous and non-hazardous) from 2007 to 2011, has an increase. This goes against their goal which is to achieve minimum level of waste by 2020. Also by looking through their yearly achievements, they had an increase in water (1.4%) and waste (11.6%) which should concern Bombardier and try to turn the slope downwards. Even though Bombardier has not reached its final aim, it has already achieved some important milestones: their
energy consumption was down 1.4% in 2011 compared to the previous year, greenhouse gas emissions were reduced by 5%, while their revenues increased by 2.5%, or $0.4 billion compared to last fiscal year. This proves that encouraging innovation and implementing CSR to the company is advantageous, and has good effects on both the economy and the sustainability; it is important to find a balance in the company between business and humanitarian behavior.

Bombardiers strive for excellence can be seen through their participation in SAM Corporate Sustainability Assessment, where they were listed on both the Dow Jones Sustainability North America and Dow Jones Sustainability World Indexes for the fifth consecutive year, benchmark indicators of sustainability. This resulted in being recognized as the SAM 2011 Sector Mover, ranking within the top 15% of their sector, Aerospace & Defense, and having achieved the largest proportional improvement in their sustainability performance over last year. Bombardier also received the SAM Gold Class award, ranking within 1% of the Sector Leader’s score. Moreover, these awards represent international appreciation of their sustainability practices and are a testament to their performance over the past year. To have the evaluation and score from an independent source like the DJSI shows Bombardier that they are heading in the right direction.

In spite of not having enough economic information from innovative CSR activities in Bombardier, it can be said that economy is still more important for them and is in the center of attention for Bombardier and its stakeholders. Figures from the ecological footprint presented in the theoretical framework shows that due to the good economic situation in Canada, the companies are having more ecological footprints such as CO₂ emissions therefore the company does not act in a sustainable manner.

In addition, as Caroll’s model also illustrates, economy is the basis for a business and without profits it cannot survive. However, Caroll’s model as well as the sustainability model illustrates for more activities than just economy for a business. As mentioned in the theory, environmental and societal approaches are essential too, a business cannot only think of its bottom line since people and planet are connected to a company’s profits. Looking deeper into what has been stated about Bombardier, their sustainability model can be illustrated as below:

![Figure 8: A typology of Bombardier’s sustainability position](image-url)

Source: Author’s invention
The figure shows that the intersection of sustainability lies more in the economic objective of sustainability rather than having an equal amount between all three objectives and due to what is mentioned above the company takes fewer considerations to the society comparing to other issues. As Bruce Parry explained, Bombardier’s DJSI score last year indicated that there were improvements to be made in the social area of CSR, therefore, the assessment of the sustainability position of Bombardier can be illustrated as in figure 8.

As mentioned earlier in the limitation, economic is the basis for a business to survive so as for Bombardier. So the figure shows that Bombardier’s economic interest is a first priority, joining by the environmental concern and then the societal awareness. Keeping a business alive is challenging while holding all three positions equal, keeping in mind profits are a main concern for the company and its stakeholders. As well as, a company needs to concentrate on its surrounding that it primary effects and there after the rest. Bombardier’s manufacturing process and operating behavior is crucial effecting the environment, therefore, most of their innovative CSR activities are directed to reduce ecological footprint. Certainly, Bombardier has an effect on the society too; however its actions are affecting it indirectly. It does not mean that it is less important but it is a priority. Therefore, Bombardier uses activities that often have a double effect, such as the major projects in Mexico, China, South Africa and India. The aim is to improve the environment in those areas but by including the population in those projects through education and awareness, the society gains as well. As the typology exemplify, the circles are unified and connected with one another.

Moreover, in order to combine business with sustainability, Bombardier has incorporated CSR into the core of the business and making it a part of the strategies and values. Their corporate strategy illustrates this engagement and commitment. Furthermore, Bombardier has also created a CSR governance structure to better handle the challenges Bombardier face within sustainability. In that sense, people within the company are involved with CSR activities and are facing the challenges that the company is having. Having CSR infiltrated to the corporate strategy means that both parts (corporation and CSR) can have a dialogue and find the best solutions to move forward responsibly.
6. Conclusions and Future Studies

The purpose of this study together with the analysis presented above provides conclusion(s) in order to answer the research question. In the end, this chapter will present suggestions for future studies.

According to the theories given earlier, sustainability is the intersection point between the economy, environment and society. Due to the increase of the ecological footprint, companies need to be innovative and think one step ahead. In addition, each company’s activities have a direct impact to the surrounding society and thus there is an increased need for CSR activities that improve social standards. Bombardier has understood these two important links and works with new activities in order to become sustainable.

Innovation is the key to be the best, but being responsible is something that has to be done either way in order to be the leader in sustainability, but also for businesses to be more profitable and gain a competitive advantage. In today’s society, governments, organizations and people demand companies to take responsibility for their actions. Bringing innovation into CSR activities increases their chances to find solutions towards the vast environmental threat that transportation industries create and improve the poor living standards that exist. Despite working against the odds since the production and function of its products is harmful, transportation is still necessary for the community; people need the transportation to go to work, vacation and simply to connect with people. Therefore it is important to find new ways of manufacturing transportation means, since the environment is at stake.

Regarding the research questions in section 1.3 the findings indicate that Bombardier is fulfilling and even surpassing legal and regulatory requirements. With DfE program at both Aerospace and Transportation, Bombardier ensures that environmental concerns are addressed from the earliest stages of product development to proactively prepare for a low carbon economy and increasing fuel prices. They are also working to diminish their ecological footprint steadily so that their global operations will be carbon-neutral by 2020. Furthermore, to be successful nowadays involves thinking beyond the bottom line; the strategy is to connect economy, environment and society to get the best results. In order to achieve this goal, Bombardier has introduced the Green Fund initiative to increase employee engagement and generate new CSR projects which lead to sustainability. Such projects help for instance to improve the living conditions for the inhabitants by educating, creating job opportunities and increasing the ease of living.

Through CSR activities Bombardier can be sustainable, since they are linking the company with responsible actions, taking it further, innovation can take these actions into another level. Finding new solutions to the arising environmental problems can result in decreasing ecological footprint. Bombardier does not have time to wait for solutions coming to them, they have to approach and motivate new thinking in their company and constantly try innovative projects in order to be sustainable.

Tangible results from Bombardier’s sustainability efforts come from their listing on both the Dow Jones Sustainability North America and Dow Jones Sustainability World Indexes and their awards for SAM.
2011 Sector Mover and the SAM Gold Class award. Such recognitions prove that Bombardier is on the right track, and even though they do not have all the answers to the sustainability challenges they face, they act on what they learn and are constantly moving forward responsibly having innovation as their key driver.

Finally, in this thesis one company has been the basis for studying how innovation in CSR can lead a company to be sustainable. It would be interesting for future studies to make a comparison with more companies involved to compare their methods in order to reach sustainability. As well as, a more in depth analysis or a similar study in a few years to come.
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CSR Activities Promotes Sustainability


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Other Sources

Front page

Picture borrowed from Bombardier’s homepage. www.bombardier.com

Report


Emails


Appendix A

The Ten Principles

- **Human Rights**
  - Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
  - Principle 2: make sure that they are not complicit in human rights abuses.

- **Labour**
  - Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
  - Principle 4: the elimination of all forms of forced and compulsory labour;
  - Principle 5: the effective abolition of child labour; and
  - Principle 6: the elimination of discrimination in respect of employment and occupation.

- **Environment**
  - Principle 7: Businesses should support a precautionary approach to environmental challenges;
  - Principle 8: undertake initiatives to promote greater environmental responsibility; and
  - Principle 9: encourage the development and diffusion of environmentally friendly technologies.

- **Anti-Corruption**
  - Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.
Appendix B

Questionnaire

1. Can you please briefly describe your background in Bombardier?
2. Before we go deeply into the discussion of Bombardier’s 6 CSR initiatives, we would like to ask you to briefly present to us your personal point of view regarding the CSR initiatives, their objectives, purpose and progress.

• CSR
3. How do you define CSR in Bombardier?
4. How much of the company’s budget was allocated for CSR activities in 2011?
5. How do you measure the success and progress of CSR initiatives that started in 2011 or continued from previous years?
6. As a CSR manager in Bombardier, can you please tell which one of the CSR objectives do you consider as the most valuable for the company?
7. How much profit did Bombardier realize from its CSR activities in 2011?
8. Has there been any CSR initiative, in 2011 or before, that was not doing as good as Bombardier expected?

• Sustainability
9. What does sustainability stand for in Bombardier?
10. In the environmental section of Bombardier’s GRI index (published in Bombardier’s website: http://csr.bombardier.com/en/governance/gri-index) the company has not covered some environmental standards and issues. What is your personal point of view on this and how crucial are the implications for the CSR initiatives?

• Innovation
11. How important is innovation for Bombardier’s sustainability?
12. Which of the CSR projects would you identify as the most innovative ones?
13. How important is it for the company to be innovative in applying new CSR initiatives rather than using the existing ones?

• Future plans
14. Could you provide us with an insight into Bombardier’s future CSR plans which are both sustainable and innovative?
15. What are Bombardier’s current environmental challenges and what are your plans to overcome these challenges?
Appendix C

Corporate Strategy

AT BOMBARDIER WE'RE SHAPING THE EVOLUTION OF MOBILITY BY...

- Creating better ways to move the world
- Capturing global growth opportunities
- Strengthening our customer-focused excellence

OUR GROWTH STRATEGIES

- Great talent globally
- Strong financial discipline
- Active risk management
- Committed corporate social responsibility

OUR COMPETITIVE FOUNDATION

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CSR GOVERNANCE STRUCTURE

Source: Copied from (Moving Forward Responsibly All Abroad, 2011 p. 6, 15)
Appendix D

Green Fund Initiatives

- **Aerospace: cutting GHG emissions and energy consumption**
  - Global Completion Centre (Montréal, Québec) – installed a solar wall to preheat the paint shop; will reduce CO\(_2\) emissions by 65 tonnes annually and energy (natural gas) consumption by 35,000 m\(^3\).
  - Downsview site (Toronto, Ontario) – modernized the lighting in the warehouse and bay area; will reduce energy consumption by 45%, CO\(_2\) emissions by 181 tonnes and energy consumption by 821,000 kWh.
  - Downsview site (Toronto, Ontario) – replaced the constant-flow chilled water pumping system with a variable flow system; created a more comfortable workplace, generated substantial cost savings and will reduce electrical energy consumption by 584,000 kWh and CO\(_2\) emissions by 128 tonnes annually.
  - Administrative Centre (Dorval, Québec) – replaced an electrical steam boiler by an atomized water system that requires no heat to operate; will reduce annual CO\(_2\) emissions by 9 tonnes and electrical energy consumption by 1.8 million kWh.
  - Business Aircraft Service Centre (Dallas, Texas) – modernized lighting; will reduce total energy use per year by more than 230,000 kWh and CO\(_2\) emissions by 156 tonnes.

- **Transportation: carbon-neutral operations in sight**
  - Česká Lípa site (Czech Republic) – introduced a sand-blasting robot in the paint shop; reduced energy consumption and annual CO\(_2\) emissions by 800 tonnes; also installed a high-efficiency ventilation control system; will cut annual carbon emissions by 80 tonnes; set a target to meet 20% of the site’s annual electricity requirements using renewable energy sources.
  - Görlitz site (Germany) – installed a smart energy consumption control system in the paint booths; will reduce carbon emissions by 300 tonnes annually with a payback period of less than one year.
Appendix E

ISO 14040

Principles of LCA

- **Life cycle perspective**
  - LCA considers the entire life cycle of a product, from raw material extraction and acquisition, through energy and material production and manufacturing, to use and end of life treatment and final disposal. Through such a systematic overview and perspective, the shifting of a potential environmental burden between life cycle stages or individual processes can be identified and possibly avoided.

- **Environmental focus**
  - LCA addresses the environmental aspects and impacts of a product system. Economic and social aspects and impacts are, typically, outside the scope of the LCA. Other tools may be combined with LCA for more extensive assessments.

- **Relative approach and functional unit**
  - LCA is a relative approach, which is structured around a functional unit. This functional unit defines what is being studied. All subsequent analyses are then relative to that functional unit, as all inputs and outputs in the LCI and consequently the LCIA profile are related to the functional unit.

- **Iterative approach**
  - LCA is an iterative technique. The individual phases of an LCA use results of the other phases. The iterative approach within and between the phases contributes to the comprehensiveness and consistency of the study and the reported results.

- **Transparency**
  - Due to the inherent complexity in LCA, transparency is an important guiding principle in executing LCAs, in order to ensure a proper interpretation of the results.

- **Comprehensiveness**
  - LCA considers all attributes or aspects of natural environment, human health and resources. By considering all attributes and aspects within one study in a cross-media perspective, potential trade-offs can be identified and assessed.

- **Priority of scientific approach**
  - Decisions within an LCA are preferably based on natural science. If this is not possible, other scientific approaches (e.g. from social and economic sciences) may be used or international conventions may be referred to. If neither a scientific basis exists nor a justification based on other scientific approaches or international conventions is possible, then, as appropriate, decisions may be based on value choices.

*Source: (ISO 14040, 2006)*
Appendix F

Measurements

1. Environmental

Source: *Copied* (Moving Forward Responsibly All Abroad, 2011 p. 57)
2. Economical

![Contributions Worldwide Chart]

Source: Copied from (Moving Forward Responsibly All Abroad, 2011 p. 62)

3.

![Economic Table]

Source: Copied from (Moving Forward Responsibly All Abroad, 2011 p. 74)