

INTEGRATION OF GREEN INITIATIVES IN THE TRUCKING INDUSTRY: AN EVOLUTIONARY PERSPECTIVE

Gurpreet Gill, Jesse Merriam, Kalinga Jagoda,
Bissett School of Business, Mount Royal University

Abstract:

Over the past decade there has been a significant increase in public awareness of the negative impacts of greenhouse gas emissions. Companies are being held accountable for their greenhouse gas emissions and are under pressure to adopt environmentally friendly practices. Using sustainable technologies to reduce greenhouse gas emissions is becoming a critical aspect of operational growth. The transportation industry is often scrutinized for its heavy environmental impact. Currently the trucking industry in Canada is responsible for 27% of the Canadian transportation sector greenhouse gases emissions. Being responsible for almost one third of the countries greenhouse gas emissions, it is understandable why the transportation industry is under pressure to reduce its negative impact on the environment. Many trucking companies are finding it necessary to strategically integrate green practices for their survival and growth. Research has shown that integrating green practices can not only address these concerns but also provide a cost advantage and increase industry competitiveness. This paper proposes the evolutionary model for the adoption of green practices. Bison Transport, a Western Canadian transport company is used to demonstrate the effectiveness of the model.

Introduction:

In the past fifty years society has gone through a significant change in environmental awareness. Activism starting in the early 1960s has brought awareness of global issues into the public eye. Environmental catastrophes have raised concern for the public wellbeing and have provided the catalyst necessary for social change. Everything ranging from the 1962 Silent Spring DDT (Pesticide) sprayings (The Story of

Silent Spring, 1997), to the 2010 BP oil spill, has brought environmental concerns to the forefront of society.

Business is being viewed through a green lens and the demand to adapt environmental procedures into everyday operations is becoming a growing concern. Bailey and Solomon demonstrated the links between air pollution and elevated levels of illness, in which they suggested that the quality of air in an environment, specifically nitrogen oxides and particulate matter, had direct correlation to health in local communities (2004). These health implications include but are not limited to development of asthma, other respiratory diseases, cardio vascular disease, and lung cancer.

Environmental sustainability is a global issue, and its affects can be seen around the world. Badrinarayana (2010), states that out of the one hundred and ninety countries actively involved in the international community, only twenty are capable of controlling climate change. Developing solutions and creating green policies has become a concern for many countries. There have been many global initiatives to fight the effects of greenhouse gases. In order to curtail the GHG emissions, some countries have even taken steps to instigate environmental taxes. According to Jacobsen, Pederson, and Wier (2003) environmental concerns have reached a level where countries are finding it necessary to implement a taxation policy where citizens are being taxed on their environmental output.

Individual outputs only make up a small percentage of the toxicity emitted into the environment. Industries such as oil and gas exploration, steel manufacturing and transportation are three of the key producers of these emissions. Therefore, it is necessary for industry to adhere to new standards and regulations to reduce their negative impact towards the environment. Businesses are starting to implement new practices, policies and procedures that address their negative environmental impact. If implemented and integrated properly, green initiatives can provide a multitude of benefits. According to Porter and van der Linde (1995) businesses integrating green policies can find benefits, as they can allow for advantages in

reduced costs, can have influence on future regulations, and experience first mover advantages.

Therefore it can be seen that there is a definitive need to provide green alternatives to business practices. Growing awareness from the global community for green initiatives, health implications of pollutants which effect the safety and well being of the public, and the notion that cost advantages and added value gains can be attributed to companies who integrate green policies. As industry is the key provider to creating negative environmental impacts it is essential that they lead the way to a sustainable future.

The transportation industry is often scrutinized for its heavy environmental impact. Currently the trucking industry of Canada is responsible for 27% of the Canadian transportation sector greenhouse gas emissions. Responsible for almost one third of the countries greenhouse gas emissions, it is understandable why the transportation industry is under pressure to reduce its negative impact on the environment. Many trucking companies are finding it necessary to strategically integrate green practices for their survival and growth. However this raises concerns to what level of green integration can provide the greatest benefit.

There are many factors that support the growth and development of environmentally friendly systems. The current research on green initiatives in the trucking industry is pragmatic at best. Despite the increasing popularity of research on green initiatives among businesses in manufacturing industries, research in the context of transportation industry has been few and far between. The main intent of this paper is to propose a model, which can be used to illustrate the advantages of integrating green initiatives. Developers and policy makers can use it to provide perspective in what values are gained through managing and implementing green initiatives. A perspective aimed from the Canadian trucking industry will be used to demonstrate the applicability of the model.

The rest of the article is presented in four components. First, a brief introduction of the model is provided, followed by an explanation of

the factors involved in planning and implementing green initiatives then, the methodology is briefly expressed. A case from Bison Transport will be used to illustrate the model and provide specific attention to identifying factors; policies and practices that have allowed Bison to facilitate the innovation process. The action plan for implementing green initiatives is outlined. Finally, some conclusive remarks are made.

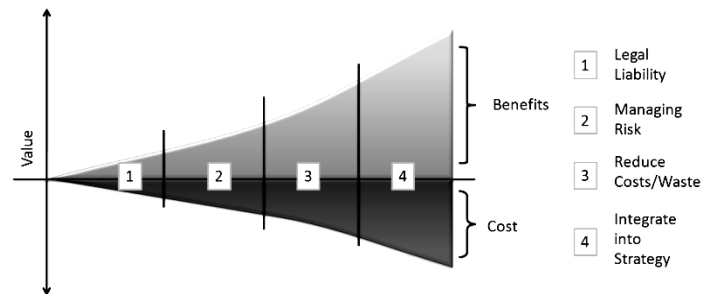
The Evolutionary Perspective Model to Implementing Green Initiatives:

Implementing green initiatives is a time consuming process and in order to harness long-term gains, companies must effectively and properly integrate policies, which can be sustained over time. Furthermore, in order to create change and improve processes, companies would need to invest in new innovations and technologies. The model demonstrates that there is an exponential, and inverse relationship between the costs and benefits of integrating green practices. As the level of integration expands into the next evolutionary phase, the benefits gained will grow exponentially to the cost. There are two main components that are used to determine value, tangible benefits, and intangible benefits. Tangible gains can be seen directly through cost, and direct service improvements. Cost can be measured quantitatively, and is often seen through cost savings by reduced consumption. Intangible gains can alternatively be seen as elevating corporate image, and enhancing the company's stance towards accountability, and care for the global community. Other intangible benefits include elevating a company's ability to provide a greater service level and increase customer satisfaction.

The model illustrates the four different stages in the evolutionary perspective to implementing green initiatives, which include: maintaining legal liability, managing and reducing risks, reducing costs and minimizing waste, and integrating environmental initiatives into the corporate strategy. Implementing green initiatives into a company provides cost efficiencies, and streamlined operations, in addition to other added value to corporate image and service levels.

As each level of the evolutionary model escalates, the required amount of integration and focus towards environmentally friendly practices will also increase.

Evolutionary Model for Planning and Implementing Green Initiatives:



Legal Liability:

Governments mandate that all companies must adopt a minimum standard of environmental practices that allow for safe and sustainable operations. Legislation implemented by government bodies determines what principles and practices are socially accepted, and ensure businesses operate within ethical means. Every company is responsible for demonstrating due diligence by deploying environmental practices that prevent the destruction of the environment caused by their operations. For example, California is instating new regulations that limit the amount of greenhouse gas emissions to reduce soot pollution by 85%, which are emitted from commercial trucks (Smith, 2008). This is forcing many carriers to make large investments in green innovation in order to adhere to this regulation.

If a company chooses to integrate environmental policies to only cover their legal liability to society, the benefits gained will be minimal if not non-existent. The company will be faced by external costs that may not provide a strong fiscal return or provide any of the intangible benefits associated with environmental friendly practices. This is considered to be the minimum amount of integration needed for a company. Without adhering to their legal responsibilities the company would be restricted in their ability to function. This can be further exemplified by the restrictions on turnpike use. Turnpikes are long combination vehicles that utilize one tractor/truck to haul two trailers. The Canadian Government has created legislation which restricts the use of Turnpikes on Canadian highways. These policies include but are not limited to, weight restrictions to prevent damage to road surfaces, and restricting road use to double lane highways for the safety of other drivers (Schulman, 2003).

Managing Risk:

The second level of the evolution model to integrating environmental practices is the management of risk through green policies. This level utilizes environmental policy to go beyond the minimum standard of sustainable business methods required by government. It enables a company to reduce the risks of negative impacts through preventative environmental practices. This also helps to develop added values such as enhanced public image to gain positive attention. It demonstrates to customers that the company not only cares about its environmental impact, but most importantly it shows they care about the community. As processes become more integrated into a corporate policy it enables a company to see minor benefits from implementing these opportunities.

For example, in Canada the Transportation of Dangerous Goods Act is a legislative policy that enforces all transportation companies to follow a universal strategy which enforces safe operating procedures. This act ensures that carriers have the correct packaging, labeling, documentation, and other safe handling practices, when transporting goods that are considered to be dangerous or harmful to the environment. This includes but is not limited to explosives,

combustibles, corrosives and other products, which if improperly handled could cause serious damage to the environment and jeopardize the public safety (“Transportation of Dangerous Goods Act,” 2011). Enabling a nationwide universal environmental policy, upholds businesses to an ethical code of practice, preventing any misuse or destructive treatment of the environment.

As public awareness for sustainable practices rise, it has elevated many companies to take on new green responsibilities.

Reducing Costs and Wastes:

Environmental policies can also be utilized to distinguish capital gains and streamlined operation processes. These policies tend to require greater capital investments, and strategic integration. This enables a company to focus on reducing inputs while promoting equal, if not greater outcomes. This requires companies to perceive environmentally friendly practices as an opportunity to evaluate internal processes and adapt new innovations to increase overall performance.

There are many examples large and small, of cases where companies adapt new green technologies to increase performance and reduce waste. For example trailer fairings (also known as gap fairings or trailer skirts) are a new innovation introduced to the trucking industry. These are a thin piece of metal, which extends from the rear of the front trailer wheels, to the front of the back wheels that prevents air flow from traveling under the trailer will decrease overall air resistance. The outcome of these trailer fairings will provide less fuel consumption, which reduces overall fuel costs, and the total amount of greenhouse gasses emitted. If this technology is integrated properly into carrier fleets they can provide a significant return on investment.

Integrating into Corporate Strategy:

Implementing environmental policies into a corporate strategy involves modifying the company’s vision to view every function,

process, and operation through a green lens. This allows for a continuous development of green policy to ensure long-term sustainable benefits in addition to achieving a positive impact on the environment. Companies who intertwine green practices with their corporate strategy often receive recognition from the public, and customers.

It can be seen that with each escalating integration level, there is a direct correlation between the complexity of integration and the amount of value created. In order for companies to see the greatest benefit for their investment, it is necessary to adopt green principles into every aspect of operation. The process in itself can be beneficial, as companies are able to internally evaluate business practices and adapt them to be more effective. Ultimately, it will enable companies to become more flexible and competitive within their industry.

Methodology:

The case study methodology was used in this study. Case studies over the past decades have gained considerable acceptance in business research, particularly as a method of choice for holistically examining complex phenomena in real life settings (Benbasat et al. 1987; Yin 2003; Eisenhardt 1989). According to Yin (2003), the case study strategy is most suitable when the research involves why or how questions. Although multiple case studies have limitations to generalize its findings, when multiple techniques of inquiry and appropriate data validation methods are used, it is rigorous enough to explore relationships (Oliveira and Rozenfeld 2010; Bader 2008; Bhaskaran and Jenkins 2009).

Multiple semi-structured interviews with the Vice President Western Operations, and senior managers of Bison Transport were conducted to collect data for the case studies. The framework was used to establish an interview protocol to guide the data collection process. Site visits were carried out in 2010-2011 to gain an understanding of the application of green initiatives. In addition, direct detailed observations, and company documents were used to collect and verify

information provided by the participants. We also obtained several project related documents, which were very useful in triangulating the information. All interviews were transcribed and the analysis was done by examining how closely the selected initiative followed the activities and linkages prescribed in the framework. Additional interviews were conducted to achieve the theoretical saturation suggested by Eisenhardt (1989). The final case was sent to the participant to check the accuracy of information and validation.

Case Study:

Bison Transport will be used in this section to illustrate how effective deployment of environmental policy can provide cost savings and other benefits to a company. Bison Transport is a leader in the Canadian trucking industry when it comes to implementing green practices. Bison is committed to providing customer satisfaction, and efficient operating practices. They are able to do this by reducing costs through utilizing strategic capacity planning and innovative green technologies.

Environmental awareness is a very important aspect of business to Bison Transport. Bison takes pride in adapting new strategies to ensure they are providing a sustainable future. These technologies include but are not limited to; idle reduction technologies, recycling programs, efficient routing practices and development of efficient equipment (About Bison Transport , 2007). Bison has instilled green thinking into their corporate strategy, and with the aid of government funded initiatives as well as newly developed technologies, they have been able to adapt and implement a variety of green practices. Some of the methods that are utilized are turnpikes, trailer skirts, and Auxiliary Power Units (APU's). Maintaining a positive image regarding environmental awareness is a key aspect for a transportation company in the new age of environmental consciousness.

Bison has also taken advantage of participating in various studies in partnership with the Canadian Government and other industry

leaders, piloting new green technologies. This has enabled the company to receive feedback on current operating processes, and evaluate the advantages in adapting new innovations. For example, in August of 2006, Bison took part in a study done by Transport Canada in conjunction with Freight Wings Ltd, a manufacturing company that produces trailer fairings (also known as trailer skirts) to determine if these new innovations could produce sustained cost savings through reduced fuel consumption. The final results of the study determined that significant cost savings could be found in implementing waste reduction technologies. According to Transport Canada the effects of aerodynamic profiling utilizing Freight Wing aerodynamic fairings, demonstrated that the trailer fairings could reduce fuel consumption by 6.4%. This result demonstrated an opportunity for cost savings in fuel costs and also reduces the total amount of greenhouse gas emissions. This study helped Bison establish the value in environmental policies, and furthermore, see how implementing new environmental practices can help to improve operating performances. This study also demonstrated how integrating green policies into a strategic plan has optimized performances by providing significant cost savings. In addition, recent developments are being made with the Canadian Government to increase the accessible road use, and locations where turnpikes can be utilized.

Another initiative Bison is taking to increase payload and reduce their negative effects towards the environment are turnpikes. Turnpikes are a method of pulling two trailers with one tractor. This is another strong example of how implementing an environmental change can not only produce positive effects towards the environment, but also provide additional savings for the company. With the use of turnpikes, Bison is able to reduce the amount of drivers needed to haul loads in addition to maximizing the amount of product transported in relation to fuel consumption. As a result, they have extra tractors to pull more loads, which will increase the ability to effectively utilize tractors and trailers, while promoting green business practices. Turnpikes are strategic capacity planning units, as it is more cost effective to run a turnpike compared to a single tractor and trailer.

With the addition of aerodynamic profiling, Bison has been able to increase fuel savings and efficiency as well as decrease the amount of emissions of greenhouse gases (GHG's). Using a lane from Calgary to Edmonton is 185 miles and with the use of a turnpike the amount of greenhouse gases reduced is approximately 241.20 kg according to the greenhouse calculator made available on the Bison Transport website. The reduction in GHG's is caused by the reduced amount of fuel consumption, in turn reducing expenditures on fuel. Due to escalations in fuel costs, any method to reduce the amount of fuel consumed can lead to significant cost savings. One of the reasons why Bison is able to reduce GHG's by so much is their continued commitment to integrating new green technologies.

Trying to become environmentally friendly is an ideal goal for a company, however, at the end of the day satisfying the customer is ultimately what determines a company's direction. Pressures from the community to adapt green practices have lead customers to question distributors and suppliers on the initiatives they are taking to become environmentally friendly. Customers are beginning to demand that vendors in their supply chains approach policies through a green lens. For example, the automotive industry is pushing environmentally friendly hybrids as more people are looking for green alternatives. It may not seem as necessary now, but as more companies begin to require environmental polices it will change from a competitive advantage to a necessity of doing business. By implementing polices now, Bison is staying ahead of the curve and will not need to play catch up down the road. Proof of Bison's commitment to its customers can be exemplified by its recent award received from Wal-Mart Canada as Innovative Carrier of the Year. This was received in "recognition of Bison as a leader in transportation sustainability" as quoted by Don Streuber in his response to receiving the award ("Competition Watch: Wal-Mart awards to Canadian carriers"). This shows how Bison's green initiatives have created greater value through customer appreciation and attaining a better public image. With a continued commitment to a green strategy Bison will continue to grow and be a leader in the trucking industry.

Conclusion:

The Evolutionary Model for Planning and Implementing Green Initiatives demonstrates the comparison between the integration of green initiatives relation to the benefits they provide. There are many small developments a company can utilize to increase awareness and promote sustainable business practices.

First, it is essential that there be executive support in any strategic change. This ensures employee adoption and enables a new innovation to be successful. If the employees feel that it is a serious change and it is strongly endorsed they are more likely to support the change.

Second, before any significant changes can be made, an examination of current procedures needs to be assessed. This compels a company to look at environmental integration on a strategic level and prevents companies from rushing into new implementations that are not cost effective or sustainable. Becoming green can have significant cost advantages and other intangible advantages if deployed properly.

Third, it is important to realize that even the smallest changes can make a considerable impact. For example, a company can switch all incandescent lighting to energy efficient bulbs. This small change will incorporate less consumption of energy which is better for the environment while providing cost savings. Focusing on the smaller tasks are often more feasible, and don't require huge investments. Big changes take time to research, require support and may take a long time to implement and see results. Once basic environmental policies and strategies are established, bigger projects can be pursued. Other small projects could include: simple recycling programs, and other reduced consumption initiatives, such as reducing the amount of paper usage in the office. If monitored properly a company can see how cost savings are developed through simple projects and can expand their environmental portfolio further.

Finally, it is critical to monitor and record results. In monitoring and recording results it allows for the project to be analyzed, and reviewed determining the success of a particular project. It can provide information on any errors, or inefficiencies that may exist to determine if there are any other improvements that could be made. With constant monitoring and recording, environmental innovation can use utilized to see successful long-term results.

Viewing business practices through a green lens is necessary in today's industry to remain lean, flexible, and competitive. New innovations and technologies are designed to enhance performances by reducing inputs and producing and maintaining outcomes. Developing a company mentality and framework around optimizing efficiencies will not only benefit the environment but also provide added value to the company, customers and community. Any attempt, no matter how small, for cleaner practices can lead to advantages and cost savings. Whether it is small recycling programs to piloting new bio fuels projects, companies are finding it necessary to strategically integrate green practices for their survival and growth.

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