ETM 520: Final Project

# Management and Innovation Strategies for Successful Sustainability

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**Executive Summary**

There are growing expectations from both the business and consumer perspective that companies address their impact on both the environment and community. A successful sustainability strategy requires executive management forward thinking, metrics for measuring sustainable performance, implementation of operational practices to reduce energy and material consumption, effective marketing strategies, and innovation to make improvements in operational efficiency possible.

Sustainability is defined as "meeting the needs of the present generation without compromising the ability of future generations to meet their needs." The term "triple bottom line" (TBL) has been used to describe the movement toward an increased focus on an organizations responsibility to the environment, society and stockholders at the same time. Each component of the TBL concept (social, economic, financial) is closely related to the other since long-term successful economic development requires an enduring societal element that exists and is sustained by the environment. The TBL methodology is unique from traditional metrics and philosophies for measuring and guiding business performance by not only focusing on the profitability of the organization. The social bottom line component is a metric of the influence and contributions a company has made on society, while the environmental bottom line shows how a company has contributed to the sustainability of the environment throughout the value chain of suppliers, customers, investors, consumers, legal standards and communities.

The triple bottom line (people, planet, profit) is the driving force behind how companies do business, particularly in a global market where environmental issues are visible and have far reaching organizational consequences. Two leading corporations, Nike, Inc. and Wal-Mart, Inc., are examples of businesses that have incorporated triple bottom line principles into business policies. As the world's largest athletic shoe and apparel company, Nike, Inc. has implemented environmentally and socially conscious practices into their business management and innovation strategies to decrease their global impact. Wal-Mart, the largest public corporation by revenue in the United States, has incorporated green practices into almost every aspect of their ever-expanding business operations.

Economic, environmental, and social innovation and management is necessary to make sustainability feasible and profitable. Effective development and implementation of sustainability practices will result in a win-win for both the environment and stockholders.

## Introduction

What is the global driving force behind sustainability? Is it respect for the environment, climate change, socially unfair trade and labor practices, or awareness of the global economic crisis? These are just a few of the prominent issues that are molding current environmental business policies implemented today. There are growing expectations from both the business and consumer perspective that companies address their impact on both the environment and community.

Effective strategies for successful corporate sustainability implementation are necessary to make sustainability both profitable and meaningful for the environment and society. The key elements necessary for effective sustainability programs are outlined and discussed in this research paper.

## "Triple Bottom Line" (TBL)

Sustainability is defined as "meeting the needs of the present generation without compromising the ability of future generations to meet their needs" [1]. The term "triple bottom line" (TBL) has been used to describe the movement toward an increased focus on an organization's responsibility to the environment, society and stockholders at the same time [2]. Each component of the TBL concept (social, economic, financial) is closely related to the other since long-term successful economic development requires an enduring societal element that exists in and is sustained by the environment [3].

The origins of the TBL philosophy can be traced back to the United Nations Global Compact of 1999, which outlines the following principles for fair practices [4,5]:

- Businesses should support and respect the protection of internationally proclaimed human rights; and
- make sure that they are not complicit in human rights abuses.
- Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- the elimination of all forms of forced and compulsory labor;
- the effective abolition of child labor; and-the elimination of discrimination in respect of employment and occupation.
- businesses should support a precautionary approach to environmental challenges;
- undertake initiatives to promote greater environmental responsibility; and
- encourage the development and diffusion of environmentally friendly technologies.
- Businesses should work against corruption in all its forms, including extortion and bribery.

The TBL methodology is unique from traditional metrics and philosophies for measuring and guiding business performance by not only focusing on the profitability of the organization [6]. The social bottom line component is a metric of the influence and

contributions a company has made on society, while the environmental bottom line shows how a company has contributed to the sustainability of the environment throughout the value chain of suppliers, customers, investors, consumers, legal standards and communities [7]. The overriding factor that supports the TBL methodology is the concept that environmental deterioration will eventually lead to the demise of the key stakeholders that companies depend on for existence [8]. The TBL methodology considers both the needs of current stakeholders in parallel with the needs of long-term future stakeholders [9]. The conceptual relationship between these three key metrics is shown below in Figure 1.

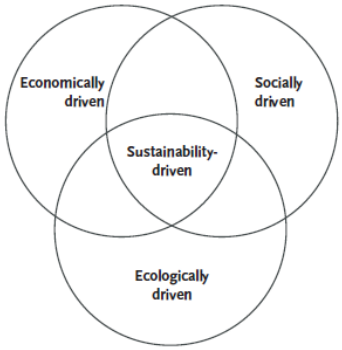


*Figure 1* SUSTAINABILITY-DRIVEN ENTREPRENEURSHIP AS A CONCEPT OF INTERSECTION [10]

The TBL concept serves as a useful metric for organizations to understand the effects of the organizational policy on external factors to the organization. The TBL concept also indicates what remedial actions are necessary to alter the corporate policies with respect to the external stakeholders [11]. For example, when choosing a supplier, IBM requires potential supplier candidates to perform a self-evaluation of their environmental performance. After this internal analysis has been completed and satisfactory scores are achieved, IBM proceeds with an on-site evaluation to audit the organization environmental operations. In this case, TBL reporting is a useful tool that can be utilized to provide a meaningful method for suppliers to better understand their environmental performance with respect to their customer's requirements [12].

It is essential for an organization to understand the direct influence of their products and services with respect to key stakeholders [13]; this capability also allows the organization to identify and evaluate potential opportunities for value creation. Implementing new products and services in response to new social opportunities where nothing existed before is such an opportunity to create new value [14]. Similarly, failure to understand potential value-increasing opportunities can limit the value that an organization can achieve [15].

Pursuant to these objectives, there has been a movement to formally recognize the components of TBL corporate performance. In 2005, almost 70% of the top 250 corporations in the world published triple bottom line report data, up significantly from 2002 when only 15% of the top 250 companies reported this type of data [16]. The influence of the fundamental corporate motivations in the move toward sustainable practices can account for this recent acceptance of TBL methodologies.

**Corporate Motivations for Sustainability: Profitability**

Organizations have a responsibility to their shareholders to generate profits. At first glance, sustainability does not appear to coincide with the concept of "supercapitalism," a term defined by former US Secretary of Labor Robert Reich. Reich's concept of "supercapitalism" is based on the fundamental belief that investors demand maximum services for the lowest prices. ''In supercapitalism, the corporation as a whole must, for competitive reasons, resist doing anything that hurts – and will place a very low priority on anything that doesn't help – the bottom line'' [17]. Reich continues, "In supercapitalism, they [the corporation] cannot be socially responsible, at least not to any significant extent" [18].

This position fails to recognize the inter-relationship between society, the environment and profitability. Without a healthy society that can succeed and prosper in the long term, long-term profits cannot be realized. Reich's position states that social responsibility damages profitability in the short term, but he fails to recognize the long term picture that sustainable practices are necessary for sustainable organizational growth and profit.

There does not necessarily need to be tradeoffs between short-term profitability, long-term profitability and sustainability. Near-term profits do not need to be jeopardized to ensure that long-term economic benefits. The criteria defining economic benefit is not exclusive to sustainable concepts--"Corporate initiatives that improve the quality of products without increasing their price, or increase efficiency and productivity so that prices can be lowered, or otherwise generate higher profits and higher returns for investors, are not socially virtuous. They're just good management practices" [19].

For example, a study of 158 Swiss organizations that have been ISO 14000 certified have found an average payback for the efforts to be ISO compliant is 2.2 years [20]. From an operational perspective, efficiency gains can be made by implementing sustainable practices by reducing scrap and energy requirements. Additionally, sustainable practices have also been shown to result in operational efficiency and social positives "particularly through the impact on employee recruitment, retention, and productivity, customer loyalty, and a positive public policy environment" [21]. It has been shown that corporate social responsibility has produced many positive and quite significant changes in corporate behavior [22].

Sustainability can also be used to mitigate risks and increase business case certainty as a means to secure sustainable profits. Elimination or mitigation of risks associated with damages, litigation and public backlash against unsustainable business practices contributes to the long-term profitability of an organization and therefore increase the company's value [23]. Gains in profitability can also be associated with other intangible advantages such as effects on employees by building greater diversity, quality of workplace, and links to home life [24].

## Corporate Motivations for Sustainability: Legislation

Legislation is another key driver in driving sustainable business practices. The penalties for failing to meet required regulations continue to rise and more aggressive environmental targets for new regulations have lead to the accelerated introduction of sustainable practices [25]. For example, Massey Energy Company was fined $20 million in 2008, the largest civil fine of its type at the time, for failure to comply with Clean Water Act regulations as the result of their coal mining operations. The company was also forced to invest $10 million in pollution control improvements in a number of their coal mining operations [26]. Increased scrutiny of conformance to environmental policies and increased fines will lead corporations embrace more sustainable practices.

## Corporate Motivations for Sustainability: Public Perception

Public perception of an organization is another key driver for the implementation of sustainable practices. It has been shown that consumers react positively to socially responsible companies when making purchasing decisions [27] and react negatively to failures in corporate responsibility. For example, Citigroup Corp has announced that it will phase out lending to the mountaintop mining industry citing "…the practice has a significant impact on the environment and on communities" in response to environmental groups criticism of Citigroup's support of the industry [28].

This illustrates one of the key motives for corporate sustainability--the pressure from activists that attempt to damage companies' market performance by undermining their reputation. Such activist organizations have dramatic influence over consumer perception of organizations and influence the consumer decision-making process [29]. Defenses against activist movements focus on avoiding potential financial losses [30], resulting in potential significant and immediate implications to the traditional bottom line financial reporting.

A key byproduct of public perception is the willingness of the public stakeholders to invest in an organization. The key factors that investors consider in an organization are:

- Execution of corporate strategy
- Management credibility
- Quality of corporate strategy
- Innovativeness
- Ability to attract and retain talented people
- Market share
- Management experience
- Alignment of compensation with shareholder interests
- Research leadership
- Quality of major business processes [31]

These key investment factors show that social and environmental considerations drive investment decisions; regulatory compliance on environmental issues, organization contributions to community service and avoidance of lawsuits have a significant impact on the value of a company [32]. The European Commission, the U.S. Securities and Exchange Commission, and the U.S, Financial Accounting Standards Board all performed studies that show that drivers of wealth creation are dominated by intangible factors such as corporate management philosophy and organizational environmental risk strategy. Contributions to corporate citizenship are considered an important indicator of a management's ability to evaluate forward thinking corporate strategy [33,34]. Additionally, mitigating the environmental, health, and safety impacts of a company can enhance a company's and an industry's image [35]. These are key intangible elements that are now being defined by the TBL concept that are becoming increasingly relevant to an organization's overall value [36].

## Corporate Motivations for Sustainability: Operations

Proactive management and interpretation of the data collected as part of TBL results in improved monitoring of business performance. The metrics for sustainability and market performance are strategically linked [37] for driving efficient operations.

There are significant gains to be achieved through product and process efficiencies through the implementation of sustainable practices due to the relative inefficiency of the products and production processes. The TBL tools can be used to account for the energy used, resources consumed, resources wasted and the overall contribution of products and operation practices to the overall footprint of the organization [38]. By addressing each of these facets of production and manufacturing, firms can reduce their environmental impacts while also lower costs associated with energy and waste [39]. Sustainable design is necessary to develop sustainable products to improve total life-cycle efficiency [40].

Again, there is an historical perspective that environmental compliance and investments activities that address social welfare will negatively influencing the traditional bottom line. However, industry regulation and market pressures also result in improved process efficiencies, new markets, streamlined production and materials use, and led to many other benefits beyond just reducing pollution [41].

## Corporate Motivations for Sustainability: Competition

Green business opportunities can be viewed as a way to gain competitive advantage [42]. In a market that does not have an established sustainable culture, the introduction of sustainable practices can also provide a competitive edge. Leading a field in innovations and market response to the sustainable approaches [43], an organization can increase its value and differentiate itself from its competitors. Product differentiation can be especially important in commodity industries, where the basis of competition has historically relied on operational efficiency and economies of scale; it has been shown that product differentiation by the introduction of sustainable products and practices has

been rewarded by favorable reception in the marketplace [44]. Approximately 34% of Americans indicate that they are more likely to buy sustainable products today than in the past. 78% of American consumers indicate that they would buy more sustainable products if they were less expensive [45]. There are clear market opportunities for growth and profit associated with sustainable products in the future if these products can be made more cost effectively; this can be accomplished by implementing new innovations.

## Innovation and Sustainability

Sustainability is a key driver for innovation as businesses search to find and invent solutions that produce more profits and better social outcomes simultaneously [46]. Material and energy costs will increase as a result of world economy expansion, public pressure for environmental, health, and safety performance is likely to remain strong. Increasing awareness of the TBL philosophy may lead to the increase of consumer demand for products made by companies subscribing to TBL practices. Strong non-government organization activity is expected to continue as globalization issues are gaining public exposure [47]. All of these factors are expected to lead the demand for innovation.

Harvard business professor Michael Porter claims, "Properly constructed regulatory standards, which aim at outcomes and not methods, will encourage companies to re-engineer their technology. The result in many cases is a process that not only pollutes less, but also lowers costs or improves quality. Processes will be modified to decrease use of scarce or toxic resources and to recycle wasted by-products" [48]. Organizations must consider the long-term advantages of sustainable innovation and realize that even if they do not invest in sustainable technologies, other competitors may do so—especially in fields where technology development appears to be inevitable [49]. Another key driver for sustainable innovation includes the "first-mover" advantage for development of manufacturing capabilities that a competitor would be unable to copy or unable to copy quickly; a head start on the next generation of technologies, including the creation of proprietary information, would provide competitive advantage [50]. This concept is driving sustainable innovations today--corporate citizenship is an excellent basis for learning and innovation [51].

## Marketing of Sustainability

With such a large demand for sustainable products, not only is innovation required to produce lower cost sustainable products, but successful marketing of sustainable products is another key element in the formula for a successful sustainable organization.

Marketing "green" products emerged the mid 1990's. These first generation advertisements made minimal mention of environmental issues. They either simply claimed the product was environmentally friendly or communicated that the company practiced environmentally responsible behaviors [52]. The consumer, whom at this time

tended to be better educated, earn higher incomes, and hold professional/white collar jobs [53], was left to decide if this information on the label was credible.

The two most important factors in green marketing trends are the package and the consumer. Thoughts on the purpose of packaging remain quite traditional. The CEO of GreenBiz.com's, (an online resource of sustainable businesses) states, "Packaging is about story-telling in general, but even more so in the sustainability space. This is about some mixture of head and heart; it's about facts, science and hard core data, but it's also about our families and our future. Telling that story, whether it's in word, image or a block of text, in some combination is imperative" [54]. The guidelines on what makes a package sustainable sets the product apart from traditional products.

Customers are not just demanding green products and less packaging, but they want to know a company's impact on the environment and what's being done about it. Hank Stewart, vice-president of strategy at the New York environmental ad agency Green Team, calls this up-and-coming group "the awakening consumer." Stewart feels the internet has empowered customer's power of choice. They now know what a brand really stands for by doing research on the web. "Awakening consumers are well informed, educated, and influential -- they blog their opinions, and they vote with their wallets," according to Stewart [55].

Non-traditional types of advertisement prove to be effective to green product marketing. For example, Timberland created a new boot line called Earthkeepers. The boots are made with a recycled rubber sole and the entire shoe can be recycled at the end of its life cycle. Since today's generation spends a great deal of time on Facebook (facebook.com), a popular and powerful social networking website, the company decided to utilize this way to connect to it's customers. The Earthkeeper campaign was launched in 2008 and set the goal to "recruit one million people to become part of an online network," to create a global movement and inspire change. Facebook users could download an application to grow a "virtual tree," and for each tree "grown," Timberland pledged to plant a real one in a desert in northern China. Facebookers grew 893,000 trees [56].

As green products become more mainstream, an obvious question is, "What's next?" The Fair Trade Certified category is expected to be the next big trend in healthy, conscious living. Consumers have spoken and some companies have already answered. Wal-Mart now stocks six Sam's Choice Fair Trade Certified gourmet coffees, the Wyndham Hotels and Resorts chain introduced Fair Trade Certified Starbucks coffees in hotel restaurants, cafes, bars and via room service and eBay launched World of Good (WorldOfGood.com), an e-marketplace offering one-stop shopping for products that have been certified by TransFair [57,58].

Despite this progress, it will take time for Fair Trade to catch up to green and sustainable products. Many big brand food names such as Kraft and Hershey do not currently have plans to produce Fair Trade products [59]. As the economic downturn persists, marketing specialist believe that "customers are focusing on economic criteria in the selection of products and services," meaning they are looking for dollar value. It is thought that price will be their customers' number one priority over the next 12 months

meaning that expensive fair trade product may have to wait [60,61].

A recent study performed at the Pew Research Center and led by Michael Greenberg, Professor at Rutgers, concluded that the public cares less about a cleaner environment now than it did in 2000. Upon examining why, one possibility is because we are tired of hearing about it. This principal has been titled "Climate Change Fatigue" [62]. This principal could deter a customer from choosing a green product, just because they are tired of the message. Another factor is "greenwashing", when company stretches the truth of a product's positive environmental contribution. For example, saying a product is "All Natural" when simply looking at the ingredient list can disprove that. A company can quickly lose the trust of a customer by greenwashing [63].

**Case Study: Kettle Chips--a local lesson in sustainable practices**

Kettle Foods, a local Northwest company that identified and acted upon the benefits of going green since the conception of their company, in Salem, Oregon over 25 years ago and is currently the largest natural chip brand in the United States. Kettle is famous for their award winning flavors and all natural chips, but is additionally admired for their sustainable business practices and use of alternative energy supplies. In 2003, they partnered with the Energy Trust of Oregon to install one of the largest solar energy systems in the Pacific Northwest. Kettle is a role model for all businesses on the path of getting innovative and high-quality natural products in the hands of consumers [64]. The basic five motivations (competition, legislation, public perception, operations and profitability) for sustainability can be seen through this example.

Although Kettle has been environmentally responsible for decades, they still seek out new ways to reduce their footprint meanwhile addressing their motivation for improving operations. Kettle identified that packaging is the area with the highest levels of waste and have made large changes to improve. As part of their waste reduction efforts, Kettle began shipping chips in all-polyester film in early 2008 eliminating the paper layer of the chip bags and transitioning to an all-poly material thus making the bags recyclable [65]. "The 20% reduction in material will keep 450,000 lbs. of packaging material out of landfills, the company estimates, the pulp equivalent of 22,000 trees" [66]. This new material is not compostable or biodegradable which is Kettle's eventual goal, proving that they will continue to reevaluate and improve their packaging in a positive way. Like many companies, Kettle is motivated to improve the sustainability of their products and operations to stay ahead of their competition. While once considered a "special-occasion" line of chips, they are attempting to change perception to become an "everyday chip." They accomplished this goal by adding smaller sized bags (4-ounce bags) into their product portfolio [67].

Kettle's has a positive public perception as a green company. In 2006, the Portland Business Journal recognized Kettle as "The most admired company in the agriculture and forest products." Company President Tim Fallon said this honor confirmed the positive public perception of their company's mission statement [68]--"We've been growing at a

fast clip to keep up with national expansion, but working hard all the while to stay true to our values. It's nice to see our efforts validated by people we respect," [69]. Kettle is also proud to be recognized by the Environmental Protection Agency's Green Power Partnership program for our purchase of renewable energy, thereby reducing harmful emissions [70].

Kettle Chips is an example of a small sized company that has successfully implemented sustainable practices from its beginnings and continues to expand their sustainable initiatives to drive their success.

**Case Study: Wal-Mart—sustainability in large-scale operations**

Wal-Mart Stores, Inc. has over 8,000 retail stores throughout the world and serves over 200 million customers every week. Wal-Mart's 2009 sales topped $401 billion and currently employ more than 2.1 million workers. As a leader in sustainability, Wal-Mart is ranked first among retailers in Fortune Magazine's 2009 Most Admired Companies survey [71]. Wal-Mart serves as an example of sustainability implemented at large-scale levels.

Wal-Mart's focuses their sustainability philosophy in the operations component of their business. With the large network of stores and supply base, this portion of their business offers a significant opportunity to improve efficiency and implement improved practices to provide immediate impact both financially and environmentally. Wal-Mart's operational sustainability philosophy is summarized by Jim Stanway, Wal-Mart Greenhouse Gas Network Captain, "You're really preparing the company for a future which is highly likely… getting the discipline, the processes and the business concepts that will be very important in a carbon-constrained world embedded into decision-making today. Now, if we only make a couple million dollars doing that, great. But at least we've learned how to do it so when the real game starts, which might not be until 2013, at least we know how to play [72]."

Wal-Mart has made a financial commitment to its sustainability efforts by investing approximately $500 million annually in sustainable technologies and innovations, recognizing the challenges that lie ahead to meet the Wal-Mart sustainability goals. Wal-Mart's sustainability policy states "Our environmental goals at Wal-Mart are simple and straightforward: to be supplied 100 percent by renewable energy; to create zero waste; and to sell products that sustain our resources and our environment [73]." Pursuant to this, Wal-Mart has implemented a multi-faceted program to move toward these sustainable goals.

Packaging is also a major focus Wal-Mart's sustainable business plan due to the high amount of transactions in the production consumption cycle. Since Wal-Mart is the biggest retailer in the world [74], a simple packaging optimization can lead to significant amounts of reduction in transportation and material use and consequently will lead to significant savings for the company. Wal-Mart has summarizing its packaging strategies in 7 "R's", which are composed of: Remove, Reduce, Reuse, Renew, Recycle, Revenue and Read.

Some of the most important accomplishments of Wal-Mart in terms of its new packaging policies are:

> Concentrated Liquid Laundry Detergent: Beginning in late 2007, Wal-Mart began to only offer liquid laundry detergent in concentrated form of 32-oz instead of conventional liquid detergents, which are typically offered to the consumer in 100-oz bottles. It is estimated that in its first 3 years, the initiative will save more than 80 million pounds of plastic resin, 430 million gallons of water and more that 125 million pounds of cardboard [75].
>
> Kid Connection Toys: Partnering with suppliers to reduce the packaging of around 300 types of toys has resulted in saving 3,425 tons of corrugated materials, 1,358 barrels of oil, 5,190 trees, 727 shipping containers and $3.5 million in transportation costs in just one year. After finding success with this strategy, Wal-Mart is now applying it on more than 160,000 of its products [76].
>
> Cut Fruit and 40-oz Vegetable Tray: The new corn-based natural PLA packaging system that Wal-Mart has been pursuing since 2005 can save approximately 800,000 gallons of gasoline and prevent more than 11 million pounds of greenhouse gas emissions from polluting the environment [77].

From a supplier perspective, Wal-Mart has implemented a program that measures its 60,000 suppliers on their ability to improve packaging and conserve natural resources. This initiative is expected to reduce packaging materials and associated costs by 5 percent by 2013.

From a store operations perspective, Wal-Mart has plans to reduce the energy used in its stores by 30 percent—the focus of these efforts are to use higher efficiency LED lights in exterior signs, internal grocery and jewelry cases, fluorescent lights in store-lighting in conjunction with skylights and dimming controls. Wal-Mart also has plans to develop store prototypes that utilize evaporative cooling of the air within the stores and the use of cooking and motor oil for heating [78]. In 2007, Wal-Mart began installing solar panel additions to its facilities in order to move towards its target of using 100% sustainable and clean energy. In 2008, more than 7 million kilowatt hours (KWh) of clean energy were produced as a result of these measures. Further expansion of this project is expected to generate between 8 and 16 million KWh of solar energy annually, which corresponds to a reduction of 10,000 metric tons of carbon dioxide reduction. This carbon dioxide reduction is equivalent to 1.2 million gallons of gasoline consumed (more than 24,000 barrels) [79]. Wal-Mart high efficiency stores are designed to reduce energy consumption up to 25% and reduce greenhouse gas emissions up to 30%. To date, the highest efficiency store was opened in Las Vegas, which is designed to consume 45% less energy than the typical supercenters [80].

Wal-Mart is also focusing on increasing efficiency of their goods transportation operations. Included in these efforts is a wide-ranging project to identify an optimal

truck and trailer combination to improve Wal-Mart's private fleet efficiency 100% from the efficiency levels measured in 2005—this is an excellent example of the variety of approaches and actions a large scale operation can take to embrace sustainability using both low-tech and high-tech operational innovations to improve fuel efficiency. Included in these efforts are:

> Truck Idle Reduction Program: Wal-Mart facilities take the low-tech approach to conserve fuel by prohibiting engines in both their fleet trucks and supplier/contracted trucks to idle longer than three minutes. This program also includes the introduction of seven thousand auxiliary power units, in each of Wal-Mart's fleet trucks. The auxiliary power units eliminate the main engine idle when not moving goods from point to point. These systems include automatic engine shut down and start up timers as a control so driver intervention is not required. These auxiliary power units result in an 8% increase in fuel economy [81].
>
> Fuel Efficient Tires: Using more fuel-efficient tires designs throughout the Wal-Mart truck fleet has resulted in a 6% fuel economy improvement [82].
>
> Fuel additives: Utilization of a fuel additive to improve gas-mileage efficiency has provided Wal-Mart with a 1.6% savings in fuel economy [83].
>
> Truck fleet modernization: Aerodynamic improvements in fleet truck design provide a 4% increase in efficiency over the company's standard fleet truck.
>
> Aerodynamic trailers: In conjunction with trailer developers, Wal-Mart has tested an aerodynamic trailer technology with retractable skirts, reducing wind flow under the trailer providing a 6.25% increase in efficiency [84].
>
> Driver Focus: Wal-Mart driver crews have an average of ten years experience, resulting in superior driver related efficiency related to operating the truck fleets properly [85].
>
> Engine Controls: In conjunction with Cummins, Wal-Mart has developed an engine control module that improved engine performance by making engine power management decisions for the driver, resulting in improved fuel economy [86].
>
> Encourage the use of legislative programs: Wal-Mart supplier carriers have been asked to join the [EPA] SmartWay program to ensure that they are participating in fuel efficiency initiatives. Suppliers that participate in this program receive preferential treatment when Wal-Mart awards business to these suppliers [87].

Recently, Lehman Brothers published a report on the sustainability trends in the retail industry, finding that "It seems likely that the principal impact of climate change on the retail sector will be lower sector demand and increased volatility. Those retailers which

can respond with more flexible supply chains—from design, buying and merchandising, to multi-channel distribution in store and for home delivery—will likely continue to generate strong returns [88]." Based on these examples, it is clear that Wal-Mart has a diverse approach to make operations more efficient, and therefore, generate more profits.

Wal-Mart now incorporates green practices into almost every aspect of their ever-expanding business. They are making green products and organic food accessible to the common household while improving their profits. "Our goal is to be better for the environment and to save money" [89]. During the 2008 holiday season, Wal-Mart used modified slimmer packaging in some toys manufactured in Asia, resulting in 727 fewer ocean containers, saving 1300 barrels of oil [90]. Green products have proved to be cost-effective for the retailer. Reduction of packaging waste is an immediate and inexpensive way for a company to take green initiatives.

Wal-Mart is also working in conjunction with its suppliers to support sustainable products. General Electric produces compact florescent lamps (CFLs) that are carried by Wal-Mart. Since adding this product to their portfolio, Wal-Mart has increased their revenue, enhanced their brand, and strengthened their competitive position [91]. Their popular marketing slogan "Long life for hard-to-reach places," communicates how a CFL's five-year life can be very convenient, satisfying the goal of green marketing to educate consumers that green provides practical consumer value [92]. In these difficult economic times, combining green living with cost savings is essential for product acceptance in the marketplace. For slogan creation, the word "green" is no longer the most popular term in environmental advertising. Now it is the word "less" [93].

Wal-Mart's sustainability direction has a significant impact financially and environmentally due to the large sphere of their influence and operations. No matter their motivation, Wal-Mart will push sustainable products into the homes of millions, further promoting the "green" behavior of the consumer.

**Case Study: Nike, Inc.—sustainability in product design and cradle-to-grave use**

As the world's largest athletic shoe and apparel company [94,95] and ranked near the top of the *Fortune* 500 [96], Nike, Inc. has the capability to have a strong, global impact on environmental policies related to the manufacture, distribution and sale of their products, as well as influence policy of other large-scale operations. Because of their increasing visibility in the global market, it is imperative that Nike establishes aggressive, yet realistic policies that will help reduce their overall environmental footprint. "We're really beginning to see what the business case for corporate responsibility is when we see it as a source for innovation and growth," says Hannah Jones, Vice-President of Corporate Responsibility for Nike, in an interview with *Ethical Corporation Magazine* [97]. As previously mentioned, the triple bottom line (people, planet, profit) is the driving force behind how companies do business, particularly in a global market where environmental issues are visible and have far reaching organizational consequences [98]. The approach by Nike in fulfilling their corporate sustainability responsibilities in a volatile market/economy will ultimately influence future sustainability innovations [99].

Nike, Inc. began to implement environmentally and socially conscious practices into their business management and innovation strategies in an attempt to decrease their global footprint. Nike's flagship environmental policies include the removal of ozone-depleting sulfur hexafluoride ($SF_6$) from the air cushions of their shoes [100], the "Reuse-A-Shoe" and "Grind-A-Shoe" program [101], and their *Considered Design* philosophy [102], which all aim to incorporate environmentally-friendly practices into the lifecycle of their products.

One of the first environmental efforts implemented by Nike, Inc. was the removal of sulfur hexafluoride ($SF_6$) from the air pocket attached to the heel of the "Nike Air" line of athletic footwear. Historically used as a refrigerant in many earlier refrigerator and air conditioning cooling designs, $SF_6$ is classified as a super-potent greenhouse gas that has ozone-depleting characteristics but provided an ideal cushioning medium. At the urging from environmentalists, Nike was forced to develop new technologies that would eliminate/substitute the use of $SF_6$ for heel cushioning. After many years (14) of research and development, Nike was able to reinvent air pockets using nitrogen in the $SF_6$-free design. This new innovation led to the subsequent development of Air Max 360, the first athletic shoe to cushion the entire length of the sole with a bed of air [103,104,105,106].

Nike, Inc. has become increasingly aware of the environmental impact that is attached with the estimated million of pairs of Nike athletic shoes that are sold annually. Millions of pairs of athletic shoes consist of millions of pairs of shoelaces, rubber outsoles, fabric uppers, and foam midsoles. Understanding the environmental impact of millions of pairs of shoes manufactured and sold each year, Nike implemented an innovative program that gave an athletic shoe its second life once the first was complete. "Reuse-A-Shoe" was established to minimize and eliminate landfill waste from their shoes and develop an environmentally conscious closed-loop lifecycle for their products. Nike, Inc. established a program where it began to collect end-of-life athletic shoes (of any brand) from their customers and defective athletic shoes manufactured in their facilities. These athletic shoes were given a second life once its first life was complete through the development of the "Nike Grind" technology. This innovation allowed for the rubber outsoles, foam midsoles, and fabric uppers to be separated into raw materials through a grinding process. These recycled byproducts are later used to create athletic surfaces. The granulated rubber is melted down and reconfigured as the basis of running tracks, soccer, football, baseball fields (Nike Grind Rubber); the granulated fabric is reused as padding under hardwood basketball courts (Nike Grind Upper); the granulated foam is transformed into the bouncy surface for tennis courts and playground surface tiles (Nike Grind Foam). This post-consumer recycling program offered Nike a visible opportunity to incorporate earth-friendly practices into their innovation cycle while simultaneously including the participation of the customer base [107,108,109]. Nike has collected and recycled over 24 millions pairs of shoes since the program's inception in 1990 [110]. Two local examples of this recycling technology in use are found at Duniway Track, part of the Portland Parks and Recreation system, and on the campus at Portland State University at Stott Community Recreation Field. The first of its kind, Duniway Track is created from Nike Grind Rubber and diverted 200,000 pairs of athletic shoes from the landfill [111]. The turf field at Stott Community Recreation Field is constructed from 150,000 recycled pairs of shoes [112].

Nike, Inc. *Considered Design* campaign integrates sustainability principles and innovative design to produce high performance products. At its core, it emphasizes eliminating the use of toxic solvents and minimizing waste while incorporating environmentally conscious, sustainable, and recycled materials to develop a more sustainably complete product. Nike has implemented this design ethos onto one of its most popular basketball shoes, the Air Jordan. Debuted in early 2008, the 23rd iteration of the Air Jordan (XX3) was the first high-performance basketball shoe to utilize eco-friendly manufacturing practices, incorporate recycled content, and minimize solvent use and waste with innovative design principles. As one of Nike's most successful basketball shoes, the visibility and knowledge of sustainable practices both internal and external to the organization can only positively influence future business policies. The prosperous sales of the Air Jordan (XX3) suggest that the consumer is still satisfied by its performance, even with the incorporation of such eco-friendly measures [113,114,115]. Michael Jordan, excited about the positive reception his signature shoe, requested that all future shoes that bear his name be manufactured using similar practices.

What type of influence does the location of its global headquarters in the Beaverton, Oregon, a Portland metropolitan area known for its aggressive environmental conservation efforts have on its corporate environmental policies? How does the location affect the mindset of the employees (particularly Oregon native Phil Knight, co-found and Chairman of Nike, Inc) who devise, implement, and maintain its green initiatives? Nike has established energy efficiency programs at their headquarters buildings and facilities, purchases direct renewable energy and renewable energy credits, promotes virtual meetings and alternative transportation options, emphasizes its *Considered Design and the Environment* campaign for future designs, as well as exploring other opportunities to reduce the organization's overall carbon footprint. Some challenges that Nike and other similar organizations will face are the cost associated with implementing and maintaining such innovative programs, both in operations and manufacturing**.** It is imperative that Nike continues to retool and rethink some of their business policies to establish more efficient and more sustainable practices that will alleviate their global impact on the environment. When discussing sustainability at Nike, Hannah Jones remarks, "When you first say to someone, 'I need you to design a sustainable shoe,' they freeze, because they think 'what does that mean?' Morality will get you to that conversation, but it won't get you past that conversation. What we need to do is give people the tools that they can use in real time to create products that are different." Nike appears to be moving forward and not backward [116].

Nike has established itself as a global leader in athletic apparel and equipment. Incorporation of sustainable design and practices and respect for global social issues that influence their products will allow Nike to remain ahead of their competition.

## Conclusion

A successful sustainability strategy starts from the entire management infrastructure. Top management support and forward thinking are the most critical elements influencing how these programs are implemented and sustained. An established corporate sustainability

strategy increases employee satisfaction by providing a more positive work culture and a greater sense of pride and motivation for the organization, thus being able to retain skilled employees. A successful sustainability strategy will establish metrics that can be used measure progress and effectiveness of such programs. Management needs to be continuously educated on new policies and new practices that can optimize processes for internal and external supply chain operations. Implementation of efficiency programs are next in the progression of building sustainable operations in the competitive markets [117,118,119]. In addition, innovation measures also include opportunities to better streamline processes and for continuous improvement. The development and progress of lean management/six sigma principles has affected how organizations conduct business and helps distinguish those companies that are evolving and most adaptable to for continued success [120,121,122].

A company that has a larger vision of their place in the ever-changing global market is likely to have better, skilled management who is willing to take more risks, establishing more opportunities for innovation. Innovation of new products or re-engineering of established products that are kind to the earth and those around will help differentiate from their competition, as well as enhance their image and brand recognition. Companies that offer environmentally and socially responsible products or services are likely to attract a new clientele, thereby increasing its current market share or developing into new markets. Successful marketing strategies are often employed to better educate and inform consumers on the effects of their choices.

Sustainable practices are necessary for long-term economic growth because these practices maintain consumer quality of life that will ensure that a market for goods will exist in the future. New business metrics (TBL) can be used to monitor the performance of a company financially, economically and socially which allows organizations to identify opportunities for product and operational improvements. Improvements in operational efficiency and product design reduce energy requirements and material scrap—these efficiency improvements are necessary to preserve the environment and ensure a market will exist in the future. Reductions in energy and material use will increase organizational profitability. An environmentally sustainable organizational culture is not only required to maintain and preserve the environment, it is required to sustain long-term corporate profits.

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