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GREENING THE SUPPLY CHAIN – TRENDS IN CORPORATE AMERICA

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Abstract

Corporate America is not only becoming conscious through environmental stewardship initiatives, but this awareness is leading to innovative practices perhaps because of the direct impact it has on productivity and customer sales. Although the trend could have started in Europe, in the United States, this is more pronounced than ever before. From product innovation to reducing and recycling to greening their supply chains and aiming for zero waste, many companies are making deliberate efforts to go green. This article conducts a literature review to explore trends among a broad spectrum of American companies in their activities to green with particular emphasis on greening their supply chains.

Keywords: Sustainability, Sustainable Operations, Supply Chains

JEL Classification: M11, M14

1. INTRODUCTION

With recent significant increase of information about sustainability, corporate America is not only becoming innovative with environmental stewardship initiatives, but is aware of the direct impact on productivity and customer sales. From reducing carbon emission to leaning operations, many companies have taken huge steps. We conduct a literature review to explore sustainability trends in American companies with emphasis on greening their supply chains.

2. THEORY

Early studies on corporate sustainability suggest ways for businesses to become sustainable (Dyllick, Thomas, and Hockerts (2002). Managers need to satisfy ecological efficiency, socio-efficiency, eco-effectiveness and combine socio-effectiveness, sufficiency and ecological equity. In 2005, only 32% of the top 100 companies (by revenue) in the U.S. had sustainability reports with their standard corporate reporting. By 2008, the rate increased to 73% (Borkowski et al 2010). This reflects an increased interest in growing green. In 2007, Goldman Sachs reported that companies leading the way in environmental, social, and governance policies tended to outperform the markets in their industries, by 25% (Strandberg, 2009) Strandberg also reports a 2005 KPMG survey that 68% of Fortune 2050 companies now publicly report on social and environmental initiatives along with financial performance. A 2003 Pricewaterhouse Coopers survey suggests 79% of CEOs agreed that sustainability is vital to profitability. Wagner and Schaltegger (2003) look at the traditional view that sustainability actually forces businesses to pay and spend more and does not yield net positive value. They argue that in fact, a positive link exists between environmental goals and economic ones, whether in stock performance or overall economic performance. Flynn and Flynn (2009), discuss the relevance of stockholders in a sustainable business. Engaging stockholders in sustainability activities through focus groups and philanthropic activities can increase awareness of environmental issues. Tools such as the corporate sustainability model are necessary for a company to become sustainable. The model helps businesses reduce liability through risk management in order for the company to achieve sustainability (Yilmaz, 2008). Companies are beginning to see that aligning employees and management with a vision of sustainability strengthens the company's overall strategic goal (Esty D.C et al, 2010). Harmon et al, 2010, report a strong correlation between the level of involvement of an HR executive in discussing sustainability as a strategy and the success of

implementing sustainability initiatives in an organization. Wagner and Schaltegger (2003), explore the interdependencies of sustainability performance, business competitiveness and economic success. Fields (2002) explores and identifies social responsibility as a cornerstone to sustainable business practice. He also identifies new green technologies as a competitive advantage for companies Borden et al. (2007) presents ways companies are greening up -- and saving money. Walmart has a classic goal statement: To be supplied 100 percent by renewable energy; To create zero waste; To sell products that sustain people and the environment." Wal-Mart believes its customers desire products that are more efficient, last longer and perform better. They want to know the product's entire lifecycle that materials in the product are safe, that it is made well and is produced in a responsible way. These helped Walmart develop the sustainability index and create a more transparent supply chain.

3. METHODS AND FINDINGS

This research is of a qualitative nature and is conceptual. We analyze literature to explore the scope of what American companies are doing to go green. Newspaper articles and company website information on green initiatives are also included. Sustainability initiatives of American companies are grouped into four categories:

3.1 Product Design

Sustainable product design attempts to "eliminate negative environmental impact completely through skillful, sensitive design" (McLennan, 2004), lessening a product's carbon footprint being a major component. At 3M, soap pads are made from 100% recycled plastic while scrubbers are made from 50% natural fibers from the renewable resource of the agave plant. Sponges are made from 100% natural fibers. All of Apple's products meet Energy Star requirements for energy efficiency. Sustainable design at Boeing revolves around fuel efficiency and emissions reduction. New commercial airplanes generate 70% fewer emissions. Boeing aims to improve fuel and CO2 efficiency by 15% for every new model. (Boeing, 2011). They reconfigured air ducts in the 737's so that a two-mile stream of packing material was eliminated. Coca-Cola plans to phase out all HFCs in all of its cold drink equipment by 2015. GM debuted the Chevy Volt, a car that can run the first 40 miles on electricity alone and then use a small gasoline powered generator to drive another 300 miles before recharge. Kohler designs bathroom fixtures that focus on water conservation and toilets that use 1.28 gallons per flush

saving 16,500 gallons of water/year. UPS has Express envelopes, boxes, and tubes made of 100% recycled fiber. Herman Miller designs furniture to use recycled material with the ability to disassemble and recycle at end-of life. Campbell Soup has decreased the amount packaging for their products. Alcoa has increased their use of recyclables in products. Target has made changes in their packaging to decrease cardboard. Sub-Zero uses recycled plastic and stainless steel in their appliances. Motorola's Motocubo phone is BFR/PVC-free, Carbon*Free* ® certified phone. Preserve products are made from recycled plastics. U.S. Bank offers credit cards made from recycled and corn-based plastics. Fernwood, a funeral home in California, has taken the design of service to a new level through eco-friendly burials, removing invasive species and replacing with native plants above the grave site and an ecofriendly casket. They also offer a digital "Lifestories" biography as a means of preserving memories of the deceased" (Rich, 2005). Starbucks' paper cup, the most environmentally wasteful component of their business, 1.9 bn a year, is also one of their prime sources of branding and advertising. Starbucks transitioned their paper cups to a 10% post consumer paper pulp blend and changed the plastic in their cups from polyethylene to polypropylene. The next step is a totally recyclable cup. (Starbucks). They also teamed with Wojo to make seats from recycled cups and wool, winning the 2010 Product Innovation award. Unilever, is designing products that involve less packaging and efficient use by consumers that result in overall waste/cost reduction. This is similar to P&G that designed cold water laundry detergents, requiring habit changes for the consumer. Beach Buff launched a range of sun care formulas formulated to biodegrade in water within 90 days with no toxic residues. Bridgestone's new tire design features improved rolling efficiency, resulting in better fuel efficiency and reducing CO2 emissions while extending the life of the tire. They are also expanding educational programs on tire and vehicle maintenance and eco-driving.

3.2 Reducing Waste

Many companies are working on reducing waste from manufacturing processes. 3M is reducing the amount of platinum catalyst, working with recyclers to process and reuse the excess platinum waste, saving money and preventing 1,000 tons of platinum waste each year. Coca-Cola reduced the size of their bottle caps and is recycling for bottles, eliminating nearly 40 m pounds of plastic each year in the US. General Mills redesigned its packaging of Hamburger Helper cutting off 20% of the cardboard box without shrinking the product. This cut cardboard waste

allowed General Mills to fit more product on its trucks – which translated to 500 fewer distribution trucks per year. Target slashed waste by 70% recycling or fixing 48,000 broken carts and 2 m pounds of plastic hangers, as well as shrink wrap and rechargeable batteries. Campbell Soup Co. recycles over 84% of their waste. Boise, Inc. is increasing recovery and recycling paper materials and using production products for energy. UPS is using less fuel by the use of CNG and hybrid vehicles. U.S. Bank installed power management software to save energy. *L'Oreal*'s has set benchmarks to achieve its long-term goal to send zero waste to landfill. Using waste levels from 2005 as a baseline, they have a target of 50% waste reduction per finished product by 2015, through initiatives like waste recovery and waste management at the factory level. Bridgestone has a policy of paperless environment. Boeing targets 25 percent reduction in hazardous waste generation by 2012. General Electric has developed Treasure Hunts, to identify energy savings opportunities to reduce waste, save money, minimize emissions and conserve natural resources. Intel has reduced their ecological footprint by implementing e-waste reduction programs while Starbucks created cup sleeves to reduce "double cupping", offers product discounts to customers who bring their own container and has committed to reducing water usage by 15% by 2012. Meijer uses landscaping to channel rain from its roof and property to an adjoining wetland, maintaining a wild environment and keeping water from burdening local sewer systems. GE with its Evolution locomotives, cut fuel consumption by 5% and emissions by 40% compared to a year earlier. Ford sped up its painting process with technology that applies all three coats in one go. Since 2002, on a revenue-adjusted basis, Boeing has reduced CO_2 emissions by 31 percent, energy consumption by 32 percent, water consumption by 43 percent and hazardous waste generation by 38 percent.

3.3 Recycling

There has been a recent spurt in the availability of repurposed building materials, that offer a chance to re-use materials. Terracycle started with processing organic waste into fertilizer and have expanded their mission to recycling consumer waste products into useful bags, toys and household items. A network of socially and environmentally conscious consumers (Brigades) collect materials for Terracycle and receive compensation. Several corporations are designing their products to be reused or recycled easily at the end of their lifecycle, and developing programs to help recycle parts of their products like cell phone batteries. Others find ways to turn trash into entirely new products. The Appleseed Corporation in New York

melts down recycled plastics and metals to produce new garden equipment. Kidwise recycles used tires to rubber mulch for use around children's playground equipment. GM uses carpets in their vehicles made from pop bottles and denim jeans. Best Buy offers in-store recycling of appliances and other products. Apple encourages customers to recycle outdated products before purchasing new ones, through recycling centers in cities and campuses. P&Gs goal is to use 100% renewable or recycled materials for all products and packaging. JPMorgan Chase collects rainwater on the roof of its 53 story building in Manhattan, that is used for flushing toilets. GAP's price tags accounting for 10 tons of paper/year will now be made of 100% post consumer recycled material. Office Depot and Target have recycling centers in their stores for print cartridges and paper for customers. Motorola's Motocubo phone comes with a postage paid return envelope. Preserve products are returnable at end-of-life, with the toothbrush's packaging being a postage paid return envelope. *Aveda*, the largest user of PCR plastic in the Health & Beauty industry, claim to use 1 million tons of PCR plastics, which saves 1 million tons of virgin plastics. *Burt's Bees*, committed to go from 80% PCR to 100% PCR in all of their bottles and jars, and all of their cardboard displays and cartons are made from 100% recycled and recyclable materials. 98% of all material that goes into the manufacturing of P&G goods goes out as a finished product. Boeing brought together 11 companies to form the Aircraft Fleet Recycling Association and these 42 members have recycled 7,000 aircraft. In 2006, General Mills recycled 86% of its solid waste and Dell recovered 40,000 tons of unwanted equipment for recycling, up 93% from 2005.

3.4 Greening the Supply Chain

We focus on efforts by US Corporations to green their supply chains. A greener supply chain will have two directions: the suppliers and vendors that handle the resources before the production process begins and the distribution network. Many large corporations are working with their suppliers to help reduce carbon emissions and improve product/process sustainability, Wal-Mart being a visible one. Automating their supply chain and requiring suppliers to adopt more "green" practices and initiatives to measure energy use in the Supply chain and its environmental impact in a partnership with the Carbon Disclosure Project, Wal-Mart also plans to cut 20 m metric tons of greenhouse gases from its supply chain by 2015. Downstream efforts can produce significant cost savings for the business with a common method being to reduce packaging used for the product, ranging from disc-based products to Legos smaller packaging. Cisco approaches the green

supply chain holistically, from initial design to end-of-life recycling and is developing strategy to reduce the environmental impact associated with products throughout their lifecycle. This includes using materials that are less impactful on the environment, reducing delivery costs, and increasing natural resource conservation. IBM requires all of their suppliers to follow a strict code of environmental conduct to do business. Kimberly-Clark uses approximately 27% recycled fiber in their products and 98% of Kleenex boxes are made from 100% recycled fiber. Johnson & Johnson is holding their external manufacturers to their own sustainable standards. By 2007, 80% of their contracts with external manufacturers had language requiring the company to meet the same sustainability standards. Boeing has developed an alternative to chrome-based paint (a carcinogen) to reduce the amount of heavy metal used in its airplanes and are researching ways to eliminate halon as a fire suppressing agent and Apple by eliminating bromine and chlorine from all of their products. All display screens are mercury and arsenic free. Target's supply of wild-caught salmon is certified by the Marine Stewardship Council. Office Depot is making changes in their supply chain to increase recycled products. Hershey's has a Supplier Code of Conduct that evaluates and tracks environmental performance and practices of its suppliers. Johnson Controls assess their suppliers on labor practices, health and safety, and environmental impact. Boise, Inc. procures its wood fiber from Sustainable Forestry Initiative certified sources and uses recycled paper. P&G requires suppliers to complete a Supplier Sustainability Scorecard annually to show progress in various eco-efficiencies. Elements of the scorecard (energy, air, water & waste measures) have been adopted as some of the core aspects of the suppliers' sustainability programs. Bridgestone commits to increasing their procurement of more environmentally friendly materials while also working to develop advanced material that will reduce resources used in their products. GE has deployed the "Product Life Cycle Accounting and Reporting Standard" developed by the Greenhouse Gas Protocol Initiative to assess greenhouse gas emissions of suppliers. Future programs reduce the minerals extracted from the Congo region and ensure cleaner production processes with suppliers in Mexico. Starbucks developed a "cup summit", inviting all of their vendors and supplier to challenge their suppliers to create more environmentally friendly cups. Specific Trends in Greening the Supply Chain can be categorized as:

Operations: The trend to go green with Lean manufacturing- a set of continuous improvement activities closely connected with the Toyota Production System and

Just-In-Time Manufacturing systems. Many companies when initiating Lean, see a positive cash flow within the 120 days from its beginning (Michael, 2004).

Value Stream Mapping: Organizations identifying major sources of non-value added time and materials waste that flow into product or service and developing an action plan to implement waste reduction practices and processes (Paul, 2006).

Vendor Survey and Qualification: Surveying supply chain partners and asking questions designed to identify resource consumption and waste management.

Modes of Transportation, a challenging area: In 2007, transportation accounted for 28.4% of US energy consumption and 33.6% of carbon dioxide emissions (William, 2007). Sourcing raw materials from other countries has naturally increased transportation distance. Companies are also spending aggressively on faster transportation i.e. trucks & other vehicles and freight. These modes have unfavorable effects on the environment, being four times less fuel-efficient per ton mile than rail. Emissions from freight transportation are 600 times higher than those from rail or ocean shipping and 90 times higher than those from truck transportation in the US (Carter, Joseph, Ferrin and Bruce, 1995). Programs like Transportation Investment Generating Economic Recovery Discretionary Grant are aimed at improving both the efficiency and quality of transportation systems while cutting the negative environmental impacts (Golicic, Boerstler, C., and Ellram, L, 2010). Very few Fortune 500 companies have taken actions to reduce greenhouse gas emissions from freight transportation through technological and operational tactics. 22 among them are aggressively decreasing the use of fuel and switching more to environmentally friendly modes i.e. rail mode, adopting new technologies to increase efficiency and effectiveness of shipments and reducing shipment volumes. 13 are implementing new tactics to conserve fuel or substitute alternative fuels, and 6 have shifted to less polluting fuels. 7 are either using auxiliary power units or changing their delivery practices to reduce truck idle times which are a really big contributor to fuel waste. FedEx, Johnson & Johnson and Wal-Mart report using wider tires on their trucks, and Tyson Foods uses aluminum wheels on its tractors, reducing road friction, increasing fuel efficiency and reducing emissions. FedEx is proposing that US Senate Energy and Natural Resources Committee establish vehicle efficiency standards, to impact all road shipments (Azalier, M.., 2008).

4. DISCUSSION AND CONCLUSIONS

For companies that decide to go green, several issues emerge from changing operations to strategy to training HR emerge to cost. Small businesses often do not have reserves to invest in expensive procedures. There are so many directions to go green that cause uncertainty in choosing an effective path. Although companies like Wal-Mart can warrant leverage, others find it difficult. Issues involved with producing a sustainable product or service, span from the design of the product to end-of life disposition. It is time-consuming for small businesses to determine specific sustainability requirements, find, evaluate, and continually monitor the supply chain, production process, life span of the product, and the entire business environment.

However, public interest in the green movement is at an all time high and will continue to grow as environmental concerns increase. Those that position themselves as sustainable will create the right conditions for success. The issue will always be seamless integration of sustainable initiatives into current operations. More work needs to be done, to study impact of sustainable initiatives on productivity and consumer satisfaction. Also ways to keep costs low for consumers, while pursuing green initiatives need to be found. Demand will be for processes to become more transparent, from sourcing to carbon footprint numbers. Intense scrutiny of the supply chain regardless of the place it is produced will be a natural focus. This will also require many significant changes in relationships, logistics and marketing. The law and future contracts can mandate that. Despite fears of the many issues, through appropriate actions like reducing environmental footprints, having tools in place to measure and report carbon emissions, investing in product innovation, sourcing & operating ethically, and setting other relevant sustainability markers as part of their corporate goals, corporations moving towards sustainability will ultimately enhancing their position within the industry.

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