

Can a Green Supply Chain Be an Efficient Supply Chain?

Opinion by Guy Courtin



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Companies are finding motivation to become green for a variety of reasons. One specific catalyst is government regulations, and from this beachhead the movement expands into other parts of a company's thinking and strategy—including the supply chain. Firms are also highly motivated by what their customers are asking for with regard to the environment; being socially responsible has a tremendous impact on a company's brand and market perception.

It is not simply within their four walls that companies are tackling green. For example, the efforts by some companies to attain cleaner water consumption and alternative energy sources for server farms are now being joined by a focus on making supply chains more environmentally friendly. Realizing that being green and efficient are not mutually exclusive, companies are looking at multiple levels of the supply chain for improvements. The main areas of focus within the supply chain are material selection, sourcing policies, resource consumption and greenhouse gas emissions, and fulfillment or transportation.

Material selection

Companies are realizing that being more environmentally friendly—using less packaging material, for example—also makes their loads more efficient, lighter and therefore more effective and cost-efficient. This is something everyone is concerned about in an era of \$5-a-gallon diesel fuel.

Sourcing policies

Companies are rightfully concerned about where and from whom they source materials, and this impacts both the assembly and disassembly of their products. It also creates new supplier requirements in areas such as transportation and quality assurance.

Resource consumption

Companies are increasingly looking to reduce their greenhouse gas impact, particularly in water, gas and energy consumption. To this end, organizations are examining resource consumption, asking questions such as, “Can I reduce the consumption of water and energy within my four walls?” and “Can I improve shipping efficiency to reduce carbon emissions?” By reducing use of natural resources, companies can not only decrease their environmental impact, they can also add efficiencies to their supply chains in areas like transportation.

In fact, transportation presents many opportunities to bring both environmental and business efficiencies to an organization. Companies must look at transportation modes and how they can be greener; how they can cut down on the distance needed to move material; how they package goods to be moved; and if packaging can be reused to lower the overall environmental impact.

But of course, ultimately companies must look at the economic impact first and the green impact second. Leading companies in green initiatives are the ones that are finding a profitable balance between economic and environmental responsibilities. This is easier said than done.

An even more imposing challenge is how a company can gain a greater understanding of its entire carbon (CO₂) footprint. Because there are so many components that go into measuring CO₂ (or CO₂ equivalents), it begs the question—can the footprint really be measured and a dollar value assigned? Ideally, CO₂ footprinting would be as easy as calorie counting, with a label simply displayed on the side of products. But the science and calculations for CO₂ footprints are nearly impossible to measure and accurately account for. This adds tremendous complexity to a company's attempt at balancing good business decisions and environmental friendliness.

Another challenge is that getting an accurate picture of carbon footprints requires companies to take a value chain perspective—extending their view of the supply chain to include their suppliers' suppliers and their customers' customers. To identify areas where energy use can be reduced, companies need to closely examine the entire value chain. For instance, a review could reveal that changing a sourcing

policy or manufacturing closer to home would reduce overall transportation costs. Organizations that examine the issue holistically and start thinking about the entire value chain will be able to better identify and isolate which problems they can tackle. Otherwise the effort can become overwhelming.

A company doesn't go green overnight. Those companies that are successfully going green realize it is a journey. For example, Cisco looks at supplier relationship management as a way to address the green supply chain, rather than addressing it on the transportation side. They perform quarterly reviews of their procedures to ensure they and their suppliers are working within Cisco's green guidelines for consumption. They are also focused on how they package and ship their goods, with reducing the amount of packaging materials as one desired outcome.

While many companies are making significant inroads in reducing their environmental impact, no one industry's supply chain can be singled out as being the most green. Companies and industries should strive to address each aspect of their business with innovative and fresh approaches. For example, rather than saying it needs to get a certain number of laptops to a client, maybe a PC manufacturer should instead ask how it can meet its client's specific computing needs. Taking a different approach to addressing customers' needs potentially changes the business model for a company—how it does business, what it defines as its product, and what distinguishes its company from the next. They can start looking at environmental efficiencies at every step of the product life cycle—even going back to research and development—to make the supply chain greener and more efficient. If companies think about what the customer is really buying, and what the business problem really is, then they can more effectively weave going green into the business and the supply chain.



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Instead of asking if a green supply chain can be an efficient supply chain, I really believe that the question should be “where doesn't green fit into a corporation's overall strategy?” When I was managing Dell's green supply chain strategy, I didn't view green initiatives separately from the corporation. The corporation as a whole had an impact on the environment in one form or fashion; hence the corporation needed to be green.

With regard to the supply chain, a green consciousness plays an integral role in companies' strategies. Companies

would be well served to source as much product locally as possible and eliminate long, costly cross-country transport runs to deliver products. Obviously, purchasing locally significantly reduces transportation costs and carbon emissions. Additionally it allows for a more rapid response to replenishment and time to market, making the business cycle more efficient.

Companies can find efficiencies combined with environmental friendliness in a number of areas, starting with transportation. In my articles and in speeches given at logistics conferences, I always state that one of the best investments a company can make is to have its entire supply chain analyzed to identify the optimal transportation network. Optimal transportation networks identify opportunities to consolidate parcel shipments into less-than-truckload (LTL), and LTL shipments into truckload shipments, and to convert air shipments to more efficient ground shipments where feasible.

Many companies are achieving significant reductions in logistics-related costs by ensuring that they have a network in place that eliminates unnecessary transportation and uses the optimal mode of transportation for all shipping. With Dell, and with my current employer, supply chain analysis and transportation management software has made reduced logistics costs a reality. This analysis not only ensures cost savings and efficiencies for companies but renders their supply chain greener.

Green product packaging

Another area in which a company can go green is in product packaging. At Dell and at the companies I work for in my current role, packaging is one of the primary areas addressed. My recommendations include:

- Collaborating with suppliers and customers to identify the optimal packaging configurations to eliminate unnecessary materials
- Utilizing logistics beams and air bags in trailers to double-stack pallets safely to eliminate damage in transit
- Identifying opportunities to collaborate with customers on recycling
- Utilizing multi-pack shipping boxes to eliminate the number of individual boxes needed to fill an order
- Creating a “design for sustainability” mindset whereby all packaging is designed to be as green as possible

Green product design

At Dell we spent a tremendous amount of time and effort to design and sell the most green and energy-efficient products on the markets. We also designed products configured specifically to require less packaging—thereby saving money for Dell. Companies also need to be aware



of what happens to their products at end of life. This is an area that makes a tremendous impact on the environment. If you can design products with end-of-life considerations inherent in their design, you will recognize tremendous savings when it comes to handling waste, and at the same time be environmentally conscious.

It is clear that supporting an efficient supply chain goes hand-in-hand with green concerns, and green fits everywhere in business. Unfortunately, far too many companies have jumped on the green bandwagon merely for the sake of public relations. At Dell, however, we understood that all of the efforts we put into product design, supply chain analysis and management, packaging, supplier collaboration, and so on all increased Dell's competitive advantage.

Measurable savings from green initiatives come in the form of reduced transportation, packaging and component costs. In addition, when suppliers and customers recognize the value of collaboration, relationships strengthen and sales grow—making a green supply chain a smart supply chain.



Dr. Larry Lapide

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I am not sure we should talk about energy-efficient supply chains and green supply chains in the same sentence. This is not because the two cannot coexist, but because we are still in an immature stage when it comes to applying green policies governing supply chain processes (which I define as complying with government regulations and not harming the environment).

Why are supply chains still immature regarding green? We are all getting constantly bombarded with companies touting their “green” initiatives. However, I am not convinced that these firms have unilaterally taken steps toward being green because we have not proven that these steps can be efficient or profitable. When it comes to the greening of supply chains, we are still only in a hype cycle. We should not be giving a company credit for truly being green, when all they’ve done is become more energy efficient to save costs.

We must understand and accept the fact that companies will not truly tackle green issues until there is universal pressure to motivate all companies to act green. Governments can pass tougher environmental laws if they work in unison with other governments and global organizations such as the United Nations. In addition, I would not be surprised to see consumers start pressuring companies. If the end product is not “green” enough, environmentally-conscious consumers may seek alternatives and therefore

avoid doing business with companies that don't measure up to certain green standards.

So when will the tipping point occur? I'm not sure, but I do believe it is coming. Governmental regulations, and potentially consumers, will likely act as the primary catalysts. Once companies gain the proper motivation and start looking at the greening of their supply chains in earnest, supply chain managers will need to focus on three areas of relevance for them:

1. Reverse logistics

As governments on both national and regional levels start imposing increased regulations on recycling, supply chain systems will have to accommodate products being returned for recycling or disposal at end of product life. This will require a truly closed-loop supply chain where goods have to return to the supply chain to be broken down and properly disposed.

2. Greener product design

Designers will need to use the maximum amount of environmentally-safe product components, and finished goods and packaging will need to be more biodegradable and minimally harmful to the environment.

3. Supply network compliance

It is not good enough for a company to be environmentally friendly if any of their suppliers—as removed as they may be from the end product—are not themselves green. It will become imperative for companies to do an audit of their suppliers and their suppliers' suppliers to ensure every firm—both local and global—that has an impact on their products is complying with green guidelines. Non-compliant suppliers can do great damage to brand-name firms. The risk potential of situations such as this should be sufficient motivation for these firms to police their supply chain for green compliance.

Transportation is very much in vogue as a topic of green discussion. I think we confuse the desire to reduce spending on high-priced fuel with the goal of becoming green. When talking about reducing the carbon footprint by rendering our transportation more efficient, I caution that this is really an economically motivated initiative. Companies look to reduce fuel consumption for financial reasons driven by the high cost of fuel, not necessarily to save the planet. Yes, the by-product of increasing efficiencies in transportation—maximizing truck loads, reducing shipping distances, and planning fuel efficient routes, to name a few options—is the reduction of carbon dioxide emissions. I would argue, however, that the true motivation for firms is pure economics. The reality is that cheap oil from the past 20 years has led to supply chains becoming less green from a transportation standpoint, and now we are paying the price for these past excesses.

I think we are still in the midst of hype when it comes to green. However, as government mandates become more



universal and consumer pressures increase, companies will begin to focus on being green in earnest. By understanding how to handle reverse logistics, product and packaging design, and supply network compliance, supply chain managers will play an important role in driving effective green initiatives. Companies will find that they can continue to be efficient—and maybe become even more efficient—with their green efforts.

The Last Word



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Green supply chain management considers environmental impacts when planning and executing the supply chain. Execution of each step in the supply chain creates waste by-products in the form of carbon dioxide, packaging materials and hazardous materials associated with product design, manufacturing and delivery. It also creates the product itself, which eventually will become a waste product that needs to be recycled.

The more efficient the supply chain, the less natural resources and energy it consumes and thus the less environmental impact it incurs. In that sense, the two things are inextricably intertwined—make your supply chain more efficient, and you make it greener. If you make your transportation network 10 percent more efficient, you reduce your fuel charges by 10 percent and your carbon emissions by 10 percent. Despite significant improvements in the past 15 years, supply chains throughout the world still have huge inefficiencies. Reducing those inefficiencies directly and positively affects a company's bottom line, but also has the added effect of reducing the impact to the environment.

More explicitly, however, green variables must be introduced into supply chain decision making. For example, carbon credit management should be part of sales and operations management decisions, and green product content should be part of material sourcing and design-for-supply-chain decisions.

Ultimately, green considerations merely extend the domain of constraints to be considered in the practice of supply chain management. i2 has been a pioneer in the management of constraints and optimized decision making across a set of constraints. Green considerations extend the set of constraints we are incorporating into our solutions. Most of these constraints—like carbon emissions—actually force other things to be more efficient

when considered in the decision-making process.

The world is becoming more and more of an interconnected supply chain, incorporating the raw materials we take from the environment and the products, emissions and other by-products we put back into the environment. At the end of the day, the most efficient supply chains will not only win in company-to-company competition, but will win in their participation in the community of supply chains that make up the global supply chain. So yes, a green supply chain is, and will continue to be, an efficient supply chain.

Opinion Interviews were conducted by **Guy Courtin**, senior manager, Marketing, i2.



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