

Moving the needle on supply chain sustainability

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Plastic and other material overflow in a garbage bin on October 26, 2022 in Los Angeles, California. According to a new Greenpeace report, only about five percent of 51 million tons of plastic waste was recycled in the United States in 2021, down from a 2014 high of 9.5 percent. The report further noted that no type of plastic used for packaging in the U.S. meets the Ellen MacArthur Foundation's definition of 'recyclable'. (Photo by Mario Tama/Getty Images)

Consumers consistently tell pollsters that they care about the environment. In fact, according to a 2022 report, 66 percent of them said that they are willing to pay more for sustainable products. Prior to the current inflationary trend, other studies reported an even higher proportion. Most corporate managers, however, know that the reality is very different.

The MIT Center for Transportation & Logistics conducted a fact-finding experiment in 2019 by observing consumers' actual behavior in the supermarket aisle. When presented side by side with sustainable products (paper products from recycled paper, laundry detergent with no harsh

chemicals, etc.) and standard ones, only 14 percent of consumers chose sustainable products. And this was in Massachusetts, one of the most progressive states in the U.S. One can only conclude that, for the majority of consumers, economics trumps sustainability.

Of course, the pandemic has demonstrated the difficulties of convincing people to change. Faced with clear and present risk of sickness and death, a dishearteningly large number of people chose to avoid lifesaving expert recommendations on masking, social distancing and vaccination. Convincing a large majority of people to change their behavior in the face of an environmental risk decades in the future seems like an almost insurmountable hurdle.

Some consumers argue that the responsibility for moving society toward sustainable lifestyle falls on governments. Indeed, many governments have enacted incentives for sustainable choices, such as the 2021 European Climate Law and the recent U.S. Inflation Reduction Act of 2022. Yet, government actions are limited by the preference of their citizens. Recall the Yellow Vest protests in France in response to a carbon tax or the Liberal Party's landslide victory in Australia after campaigning to "axe the tax."

Since consumers are not likely to alter their behavior in large enough numbers and government actions can be stunted by voters' choices, some of the burden does fall on company leaders to take meaningful actions. And companies are under increasing pressure to deliver.

For example, the State of Supply Chain Sustainability report published annually by the MIT Center for Transportation & Logistics (CTL) and the Council of Supply Chain Management Professionals (CSCMP) is a study that gauges companies' efforts to make their supply chains more sustainable. The report, based on more than 3,000 global survey responses and in-depth executive interviews, documents companies' sense that the pressure to improve supply chain sustainability — from investors, top executives, and customers — has increased over the three years the annual report has been published.

However, the degree to which this pressure translates into supply chain changes on the ground is less clear. In fact, while such pressure enjoys more support as a corporate goal, it does not necessarily translate into investment dollars. So, how can corporate leaders actually "move the needle" on sustainability?

The first order of business is to understand that corporate sustainability is a supply chain issue. Measuring and reducing corporate emissions, for example, is meaningless if most of the dirty manufacturing processes are taken by offshore suppliers. And, in fact, many companies are pressuring their suppliers to measure and reduce their emissions.

Yet, there are many more green initiatives that companies can take in their own logistics and supply chain management operations, as demonstrated by several projects at the MIT Center for Transportation & Logistics. They include the following:

Redesigning last-mile delivery

As trucks navigate their way to deliver goods to multiple customers, the standard optimal routing algorithm can be tweaked to include certain emission-reducing considerations. The two measures developed by the MIT team include accounting for altitude and road slope (which impacts engine performance) and the weight of the cargo. The idea was to deliver the heaviest cargo first, which would lighten the load of the truck for the rest of the delivery route, and to bypass steep slopes, taking into account the effects of possibly higher distance, while also controlling the speed. Working with a brewery serving 8,000 retail customers in Mexico City, the MIT model generated an average reduction of 5 percent in the total amount of fuel used to deliver to all customers. Note that this was despite of the fact that many of the routes were longer.

Influencing consumer choices

Working with leading Mexican retailer Coppel, and analyzing some 3,000 home deliveries across 10 regions in Mexico, 90 percent of the consumers surveyed were willing to delay home deliveries by five days if given an environmental incentive to do so at the time of purchase. The most effective inducement was informing buyers how many trees were saved by choosing the delayed delivery option. This “trees” option outperformed other types of messaging (such as kg of CO₂ conserved, at less than 40 percent), suggesting that the nature of the message at the point of sale is key to its effectiveness.

Incentivizing returnable containers

Many companies (especially in Europe) have been using returnable containers for consumer deliveries but also grappling with consumers not actually returning them. For example, a German retailer now collects 90 percent of its reusable polypropylene boxes by levying a refundable deposit to encourage consumers to send them back. This project explored several other schemes such as voucher-based incentives and return labels.

These and other research projects demonstrate that supply chains can be designed to reduce emissions from operations and to reorient their buying behavior in support of carbon emissions reductions.

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