



## Boise

### BY SHIFTING FROM ROAD TO RAIL TRANSPORT, COMPANIES CAN REDUCE BOTH COSTS AND EMISSIONS

This is a real-life example of how Boise, a leading manufacturer of packaging and paper products, cut carbon emission and costs by shifting from road to rail transport and making more efficient use of rail containers. This Boise story is the third in a series of EDF and MIT case studies about carbon-efficient logistics.

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#### Background

Freight transport accounts for 15 percent of corporate carbon emissions, making it one of the largest sources of business-related carbon dioxide (CO<sub>2</sub>) emissions in the U.S.<sup>1</sup> Long-entrenched inefficiencies in transportation arrangements cause unnecessary consumption of fuel and avoidable expense.

Boise Inc. is a leading manufacturer of packaging and paper products in the United States, with 2012 sales totaling \$2.6 billion. Boise has operations across the United States

This case study is part of a series featuring leading companies in a variety of industries that are finding opportunities to reduce carbon emissions and cut transportation costs through improved logistics practices. Environmental Defense Fund sponsored this series to highlight opportunities and to call on companies to improve the carbon-efficiency of logistics networks. The analysis for this series was conducted by researchers with the Center for Transportation and Logistics at the Massachusetts Institute of Technology.

and in Canada, Mexico, France, the Netherlands, and Spain.

It has established long-term relationships with many customers, including OfficeMax, a leader in business-to-business office products solutions and retail office products in the United States.

#### Switching to and optimizing for rail to reduce emissions

Boise launched two initiatives to improve the sustainability of their logistics operations. It shifted from road to rail transport and then made more efficient use of rail transport. These initiatives reduced CO<sub>2</sub> emissions by over 60% for these outbound distribution lanes.

#### The Carload Direct Initiative

Manufacturers regularly use trucks, or a mix of trucks and rail, to transport their products to customers. As trucks produce greater emissions than trains, switching from road to rail can provide significant carbon savings. The Carload Direct Initiative was launched by Boise to increase the use of rail from Boise manufacturing facilities to its customers.

# MIT-EDF CASE STUDY SUMMARY



Prior to this initiative, Boise was sending shipments to OfficeMax, one of their main customers, via full truckload. However, both the Boise facilities and OfficeMax facilities were accessible by rail. Through this initiative, more than 200 carloads were shipped via rail direct from Boise manufacturing facilities to OfficeMax distribution centers in 2011. The transition from using a mix of truck and rail to exclusive use of rail eliminated more than 2,600 tons of CO<sub>2</sub> from Boise's supply chain; the equivalent of saving more than 264,000 gallons of fuel.

## Optimizing railcar utilization with three-tier pallets

Boise also launched a Three-Tier Pallet Initiative to increase the volume of products in each rail shipment. Before, railcars were loaded two pallets high, leaving a space from the top of the second pallet to the roof of the railcar, thus underutilizing the full capacity of the railcar. Since the space was not large enough for a traditional pallet layer to be added, Boise tried placing a half-size pallet on top of the existing pallets.

After operational trials, Boise determined that the half-size pallets were best positioned in the bottom layer of the stack in a "step-down" configuration, starting with the highest and heaviest at the far end of the railcar. Cardboard sleeves were added around the top-layer units to reduce the risk of damage. This "three-tier pallet" configuration has the potential to increase railcar utilization by 14%.

Boise worked with its customers to adjust order sizes to fit the three-tier system and found



an unexpected benefit. The half-pallet was a perfect shipment size for seasonal or lower-demand specialty items. It also gave customers greater order flexibility, creating a win-win situation for both Boise and its customers.

These redesigns maximized the benefits of rail by reducing the number of shipments required to deliver product. Using three-tier pallets meant Boise was able to fulfill orders using just 930 railcars in 2011, reducing the company's emissions by 190 tonnes (metric tons) of CO<sub>2</sub>. This is equivalent to the CO<sub>2</sub> emissions from 21,600 gallons of fuel, or the annual greenhouse-gas emissions from 38 passenger vehicles.

Together, Boise Paper's Carload Direct Initiative and the Three-Tier Pallet Initiative have yielded carbon emission reductions of more than 2,800 tonnes of CO<sub>2</sub>.

<sup>1</sup> By end-source. Analysis based on U.S. Energy Information Administration Annual Energy Outlook 2012, Table 19. Energy-Related Carbon Dioxide Emissions by End Use. June 25, 2012

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