Freight Railroads are Part of the Solution to Climate Change

KEY TAKEAWAY

As the most fuel-efficient way to move freight over land, freight railroads actively invest in infrastructure, equipment, and technology and deploy sustainable business practices to reduce their carbon footprint and build a more resilient network for a future shaped by climate change.

As cumulative global emissions and CO2-attributable warming continue to rise annually, immediate emissions reductions and smart policies to transition toward a net-zero economy are critical. Railroads remain a responsible partner capable of delivering sustainable transportation solutions in the near term and for the long haul.

With an eye trained on that goal, freight railroads are developing and implementing new technologies, refining operating practices, and working with their suppliers, customers and supply chain partners to reduce GHG emissions. Every North American Class I railroad has an approved target with the Science Based Targets initiative, an organization driving ambitious climate action in the private sector and working to curb temperature rise and mitigate climate change-related impacts.

Reducing GHG Emissions

Greenhouse gas (GHG) emissions are directly related to fuel consumption. According to EPA data, freight railroads account for just 0.5% of total U.S. GHG emissions and just 1.7% of transportation-related GHG emissions. Moving freight by rail instead of truck lowers GHG emissions by up to 75%, on average. AAR analysis of federal data finds that if 25% of the truck traffic moving at least 750 miles went by rail instead, annual GHG emissions would fall by approximately 13.6 million tons.

Through strategic, targeted investments, railroads have worked to improve fuel efficiency and drive down GHG emissions associated with their locomotives. Class I railroads are also working to decarbonize yard equipment, such as switcher locomotives, cranes, and service trucks. Each yard asset represents an opportunity to drive down GHG and criteria pollutant emissions and lessen impacts on local communities.

- Acquiring or retrofitting thousands of more fuel-efficient locomotives that emit fewer criteria air pollutants and GHGs over the past decade.
- Developing more aerodynamic, high-strength, lighter-weight steel railcars in partnership with U.S. Steel to extend the useful life of railcars and decrease the fuel needed to haul this freight.
Developing and installing fuel management and network optimization systems that calculate the most fuel-efficient speed for a train over a given route, determine the most efficient spacing and timing of trains on a railroad's network, minimize the need to slow or stop trains during trips, and monitor locomotives to ensure peak performance and efficiency.

Working with locomotive manufacturers and refiners to test higher percentage blends of low-carbon fuels, including biodiesel and renewable diesel, which could result in substantial GHG emissions savings.

Expanding the use of technologies, such as automated gate systems, to help trucks get in and out of yards more quickly, reducing idling and fuel usage. These investments reduce GHG and criteria pollutant emissions near yards.

Exploring technologies that would allow railroads to use alternative fuels in their existing locomotive fleets and hybrid diesel-electric propulsion technology, which would work much like a plug-in hybrid car.

Deploying near-zero and zero-emission yard equipment, such as natural gas and battery-electric service trucks (which reduce ambient noise and recharge their batteries each time they brake), as well as hybrid and electric cranes.

Reducing Highway Congestion

A single freight train can take several hundred trucks off the nation's highways. Not only does this help motorists breathe easier, but it also helps reduce the enormous economic costs of highway congestion. According to the Texas Transportation Institute, highway congestion cost Americans $190 billion in wasted time (8.7 billion hours) and wasted fuel (3.5 billion gallons) in 2019. Lost productivity, cargo delays and other costs add tens of billions of dollars to this tab.

Shifting freight from roads to rail also reduces highway wear and tear and the pressure to build costly new highways. And, with taxes and fees paid by commercial trucks falling far short of covering the cost of the highway damage they cause, privately owned freight railroads — which spent an average of well above $23 billion a year over the past five years in private capital annually on their network — relieve taxpayer burden, as well.

Building Resiliency

Railroads operate an expansive nationwide network exposed to the increasing frequency of climate-driven natural disasters, such as floods, wildfires, droughts, storms and unpredictable temperature shifts.

Freight railroads invest an average of $23 billion each year to improve their networks, including maintaining and enhancing infrastructure and equipment. Railroads are improving infrastructure and operations to withstand climate-related hazards, which helps maintain economic stability by reducing the impact of climate-related disruptions on the supply chain.
As a result of these investments, the American Society of Civil Engineers awarded rail the highest grade in its last two Infrastructure Report Cards.

- Geo-mapped areas of track prone to wildfires, extreme temperature fluctuations, and flooding to identify and assess vulnerabilities.

- Instituted fire prevention programs that clear rights-of-way of grasses and brush to prevent wildfires and reduce the risk of damaging critical technology and infrastructure throughout the system.

- Built specialized “fire trains” that carry thousands of gallons of water and other firefighting equipment to deploy along railroad rights-of-way.

- Installed seismic, wind and water detectors along high-risk parts of the network. Railroads have also replaced wooden infrastructure with concrete or steel where possible, raised thousands of miles of track to avoid flooding impacts and prevent washouts, and adjusted the timing of track installation and maintenance projects to reduce track-buckling that can be associated with temperature changes.

**Evolving Operations**

Railroads continually find new ways to make their infrastructure, equipment and day-to-day operations more efficient. For example, improved rail car designs and distributed power (placing a locomotive in the middle or rear of a train) reduce the horsepower needed to move a train, which saves fuel.

Railroads are also committed to enhancing a culture of sustainability and know that the collective power of their highly-skilled workforce will advance sustainable practices and initiatives. Every railroader plays a role in protecting the environment, from developing fuel-saving software and sharing operational best practices with their contractors to improving overall environmental stewardship of the freight rail industry.

Not only are freight railroads committed to driving down emissions through technologies and smart operations, but they also recycle, reuse and manage resources, increase office operation efficiencies and conserve electricity, and protect the landscapes their trains move through.