

Freight Railroads Help Reduce Greenhouse Gas Emissions

ASSOCIATION OF AMERICAN RAILROADS

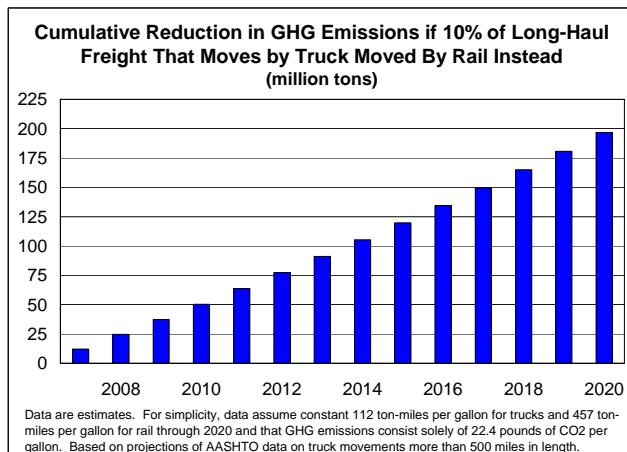
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Summary

Greater use of freight rail offers a **simple, inexpensive, and immediate way** to meaningfully **reduce greenhouse gas emissions** without harming the economy. On average, railroads are four times more fuel efficient than trucks. That means that moving freight by rail instead of truck **reduces greenhouse gas emissions by 75 percent**. According to Environmental Protection Agency (EPA) data, freight railroads account for just 0.6 percent of U.S. greenhouse gas emissions from all sources and just 2.4 percent of emissions from transportation-related sources.

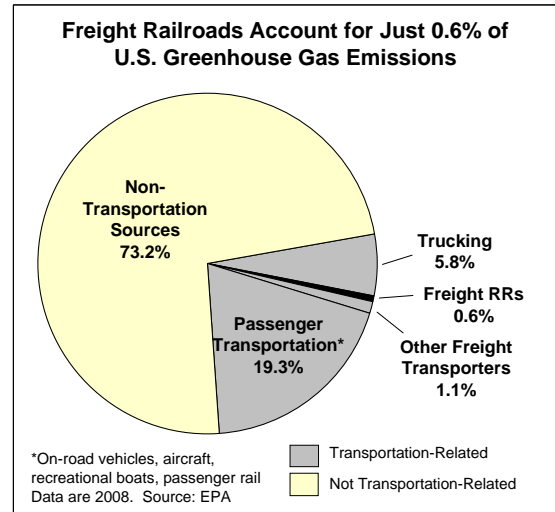
Moving More Freight By Rail Would Significantly Reduce Greenhouse Gas Emissions

- According to a recent independent study for the Federal Railroad Administration, railroads on average are **four times more fuel efficient than trucks**. Greenhouse gas emissions are directly related to fuel consumption. That means **moving freight by rail instead of truck reduces greenhouse gas emissions by 75 percent**.
- If just 10 percent of long-haul freight now moving by truck moved by rail instead, annual greenhouse gas emissions would fall by more than **12 million tons**. That's equivalent to taking **2 million cars off the road** or **planting 280 million trees**. Cumulative reductions through 2020 would be around **200 million tons**.
- Moving more freight by rail also **reduces highway congestion**, which costs us \$87 billion each year just in wasted travel time (4.2 billion hours) and wasted fuel (2.8 billion gallons). **A train can take the equivalent of 280 or more trucks** off our highways. Railroads thus enhance mobility, reduce the costs of maintaining existing roads, and reduce the pressure to build costly new roads.
- America's seven largest freight railroads have all joined the EPA's voluntary "SmartWay Transport" partnership aimed at improving fuel efficiency and reducing greenhouse gas emissions.



Freight Railroads Account For a Small Portion of U.S. Greenhouse Gas Emissions

- According to EPA data, total U.S. greenhouse gas emissions in 2008 were 6,957 teragrams (trillion grams) of carbon dioxide equivalents. Non-transportation sources (power plants, industry, etc.) accounted for 73.2 percent of this total, with transportation accounting for the remaining 26.8 percent.
- The 44.4 teragrams accounted for by freight railroads was just 0.6 percent of total U.S. greenhouse gas emissions from all sources and just 2.4 percent of transportation-related greenhouse gas emissions.



U.S. Greenhouse Gas Emissions By Economic Sector: 2008			U.S. Greenhouse Gas Emissions from Transportation: 2008		
Economic Sector	Tg CO2 Eq.	% of Total	Economic Sector	Tg CO2 Eq.	% of Transp. Total
Electric. generation	2,404.2	34.6%	Trucking	401.2	21.5%
Residential	359.3	5.2%	Freight Railroads	44.4	2.4%
Industry	1,342.4	19.3%	Waterborne Freight	24.1	1.3%
Agriculture	504.1	7.2%	Pipelines	34.9	1.9%
Transportation	1,886.1	27.1%	Aircraft	140.4	7.5%
Commercial	410.9	5.9%	Passenger Boats	14.5	0.8%
U.S. Territories	49.9	0.7%	Passenger Railroads	6.1	0.3%
Total	6,956.8	100.0%	Cars, Light Trucks, Motorcycles	1,186.7	63.7%
			Buses	12.1	0.6%
			Total	1,864.4	100.0%

Data are in teragrams of CO2 equivalents.

Source: EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*, Tables ES-7, A-109, and A-110. Totals for "transportation" in the two tables do not match because the table on the left includes emissions from sources considered to be transportation but not considered to be passenger or freight (e.g., lubricants).

Railroads Are Constantly Working to Improve Fuel Efficiency

- In 1980, one gallon of diesel fuel moved one ton of freight by rail an average of 235 miles. Today, one gallon of fuel moves one ton of freight by rail an average of 480 miles — a 104 percent improvement since 1980.
- In 2009 alone, U.S. freight railroads consumed 3.3 billion fewer gallons of fuel and emitted **37 million fewer tons of carbon dioxide** than they would have if their fuel efficiency had remained constant since 1980. From 1980 through 2009, U.S. freight railroads consumed 55 billion fewer gallons of fuel and emitted **617 million fewer tons of carbon dioxide** than they would have if their fuel efficiency had not improved.

How Railroads Do It

- Railroads use a variety of means to cut fuel consumption and greenhouse gas emissions. For example:
 - ✓ **New locomotives.** Railroads have spent billions of dollars in recent years on thousands of new, more fuel efficient locomotives and on overhauling older units to make them more fuel efficient. Many new switching locomotives used to assemble and disassemble trains in rail yards are “**genset**” (generator set) **locomotives**. Gensets have two or three independent engines that switch on and off depending on how much power is needed for the task at hand. Some switching locomotives are **hybrids** with a small diesel-fueled engine and a large bank of rechargeable batteries. Research is underway on hybrid long-haul locomotives.
 - ✓ **Locomotive monitoring systems.** Railroads use sophisticated on-board monitoring systems to gather and evaluate information on location, topography, track curvature, train weight, and more to provide engineers with **real-time “coaching”** on the best speed for that train from a fuel-savings standpoint.
 - ✓ **Training.** Railroad fuel efficiency depends on how well an engineer handles a train. That’s why railroads use the skills of their engineers to save fuel. For example, railroads commonly offer training programs through which locomotive engineers offer suggestions to their colleagues on ways to save fuel.
 - ✓ **Reduced idling.** Railroads are implementing “**stop-start**” **idling-reduction technology** that allows main engines to shut down when ambient conditions are favorable. One advantage of “genset” locomotives is that their smaller engines use anti-freeze, thus allowing them to shut down in cold weather. Some railroads also use “**auxiliary power units**” that warm engines so that locomotives can be shut down in cold weather.
 - ✓ **Components and design.** Railroads use innovative freight car and locomotive designs to save fuel. For example, advanced top-of-rail lubrication techniques save fuel by reducing friction and wear.