

Innovation and employee education save fuel.



Since 2000, Union Pacific has achieved a 19 percent improvement in fuel efficiency. Today, the railroad continues to look for new ways to squeeze the most out of every drop of fuel, focusing on conservation through better locomotive technology, engineer training and employee involvement.

Fuel-efficient locomotives

We operate North America's cleanest and most modern locomotive fleet.

- Since 2000, Union Pacific has spent approximately \$6 billion to purchase more than 3,500 locomotives that meet EPA Tier 0, Tier 1 or Tier 2 guidelines, with plans to purchase an additional 200 locomotives in 2012.

In the yard, Union Pacific pioneered the Genset switcher, which uses ultra-low-emissions, EPA-certified, off-road diesel engines and is expected to reduce fuel use by 37 percent. UP has 171 Gensets.

Reduced engine idling

Locomotive engines may be kept idling for several reasons: In a yard, they idle between work events; on the main line, they idle while meeting or passing other trains; in cold temperatures, they idle to keep their fuel and water lines from freezing. Union Pacific has developed a comprehensive plan to reduce the amount of time locomotive engines idle. As a part of this strategy, all new locomotives have automatic Stop-Start equipment and older locomotives are being retrofitted with it, which eliminates unnecessary idling. Locomotive shutdowns can save 15-24 gallons of fuel, per locomotive, per day. More than 70 percent of our locomotive fleet is equipped with this technology.

Union Pacific's locomotive shutdown rules reduce emissions and also save fuel. Locomotives are to be shut down if left standing 15 minutes or longer, unless the temperature is expected to drop below 35 degrees.

Innovation and employee education save fuel. (cont.)

Union Pacific has a three-pronged approach to improving fuel efficiency by improving operations, incorporating technology and engaging employees.

In 2011, Union Pacific's fuel consumption rate declined by 0.3 percent due to increased use of older locomotives as volume increased and trains were re-routed due to record-setting Midwestern floods and the Texas drought.

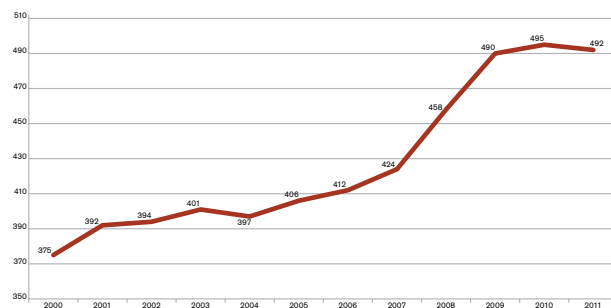
Fuel Masters

Fuel Masters is an employee-driven conservation program that rewards the fuel-saving efforts of locomotive engineers.

More than 7,000 engineers on more than 160 routes are taking part in the program.

The engineers with the best consumption rates receive debit cards they can use to fill their own vehicles with gas or to purchase other items.

UP Locomotive Fuel Efficiency



Emerging technology

Union Pacific is an industry leader in the development of fuel conservation techniques. The railroad is evaluating several emerging technologies, including:

- Wheel/Rail Lubrication and Friction Modifiers.
- Locomotive and Car Aerodynamic Enhancements: Modifications to containers that could reduce aerodynamic drag are in development.
- Additional Innovations: Many other innovative efforts are under way, including assigning power by tons per axle to reduce fuel consumption and locomotive wear, and increasing use of distributed power to reduce in-train forces and drag while saving fuel and train starts.

A greener way to ship

Even without Union Pacific's fuel-saving efforts, rail is already considered the most fuel-efficient way to ship freight.

- Railroads move freight four times more fuel efficiently than trucks.
- If 10 percent of highway freight moved by rail instead, our country would save more than one billion gallons of fuel annually.
- One Union Pacific intermodal train can take up to 300 trucks off our already congested highways.
- Union Pacific moves one ton of freight nearly 500 miles on a single gallon of diesel fuel.