

There can be challenges to starting a green fleet, or converting an existing fleet to the use of alternative fuels. According to some industry experts, a successful plan to reduce fuel consumption and carbon emissions requires a long-term vision, incremental change, support from top management, and flexibility to make changes along the way.

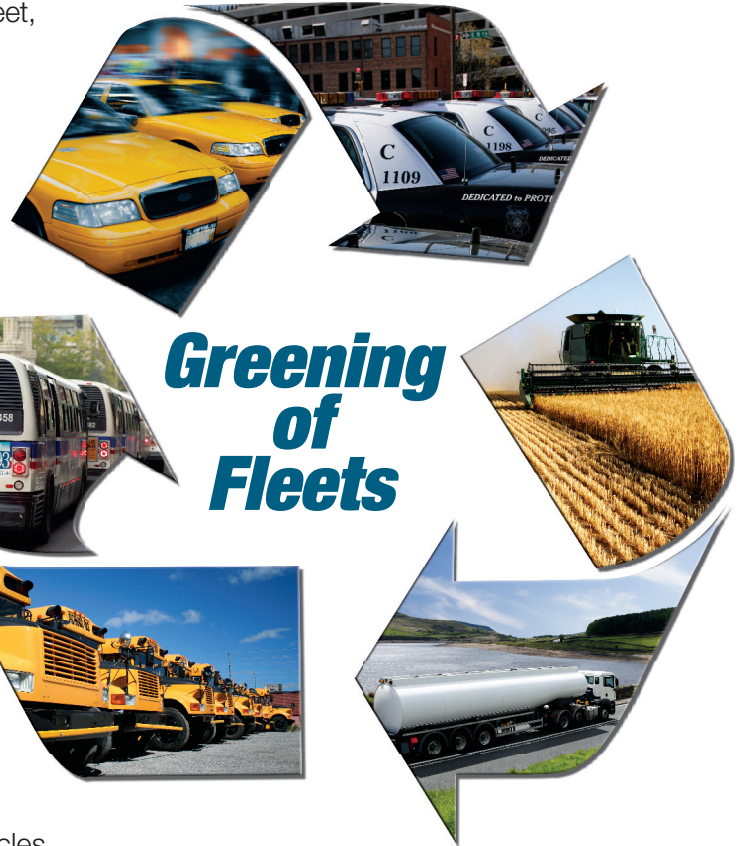
There are compelling reasons *why* fleets should be green and deliberate steps on *how* to implement alternative fuels.

Why Use Green Fleets?

- **Reduce operating costs** by improving efficiency, reducing life cycle costs, and reducing vulnerability to volatile fuel prices.
- **Reduce greenhouse gas emissions** by implementing the use of hydrogen in vehicles, which are the primary source of greenhouse gases and urban air pollution.
- **Improve corporate image** by branding business strategies and appealing to public concerns about energy conservation and ecological sensibilities.

How to Implement Green Fleets

- **Get buy-in** from all management and staff levels, and be sure to communicate information about the benefits, goals, and targets frequently.
- **Create long-term objectives** and tangible goals based on best practices in the industry (such as baselines, benchmarks, and progress reports).
- **Avoid setting reduction goals in absolute numbers** for growing fleets or fleets just starting because absolute goals can impede growth.
- **Anticipate obstacles**, such as driver resistance, lag time between original equipment manufacturers' technology and market availability, and slower return on investment.
- **Move slowly** and implement change over time.
- **Improve vehicle use** with selection analysis and education of drivers.
- **Track and report progress** and share successes with employees, shareholders, and the public.

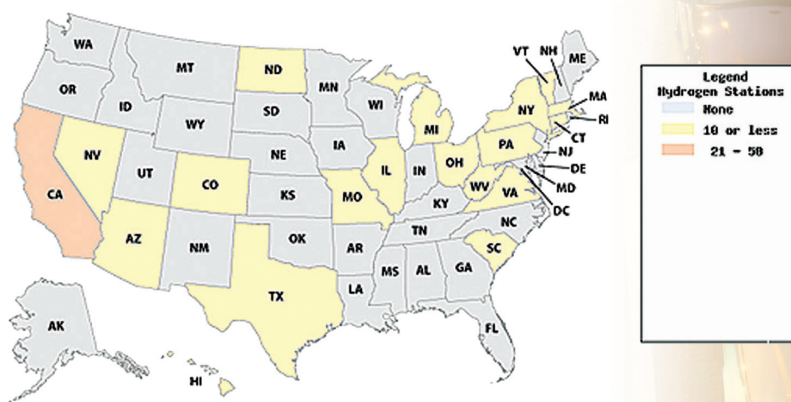


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Hydrogen Basics

The use of hydrogen as a widespread alternative fuel is not yet a viable option, but its use in localized fleets is a current option. The biggest obstacle for the use of hydrogen is a nationwide production and distribution infrastructure. However, it is currently a main focus of research as a future widespread alternative fuel. There are two pathways for the use of hydrogen as a fuel: use as a fuel for a modified internal combustion engine (ICE) or as the fuel for use with hydrogen fuel cells.

- **Simplest element in the universe. Commonly found in**
 - Water, H₂O
 - Natural gas/methane, CH₄
- **Hydrogen can be used as a fuel for vehicles in both**
 - Internal combustion engines (ICEs)
 - Hydrogen fuel cells
- **Domestically produced from two main processes**
 - 95% produced from steam methane reformation
 - Second popular method is electrolysis
 - Electrolysis can use renewable energy for hydrogen production
- **Stations are limited but onsite production is a major option**



Hydrogen fueling stations to date. Source: AFDC.

Incentives

Despite the fluctuating economy and budget woes, there are a record number of grants and incentives for funding alternative fuel vehicles that have been made available. For example, in 2009 the U.S. Department of Energy (DOE) made nearly \$300 million of American Reinvestment and Recovery Act (ARRA) funding available through the Clean Cities program. This single grant funding opportunity is responsible for putting more than 9,000 alternative fuel and energy efficient vehicles on the road and establishing an additional 542 fueling stations across the country.

Hydrogen Availability

Hydrogen fuel is not yet widely available because of the challenges of cost effective production, storage, and distribution. There is also little demand for hydrogen as a vehicle fuel outside of research and demonstration projects. As more hydrogen consuming technologies are developed the demand for hydrogen will increase, assisting in the availability and cost of hydrogen as vehicle fuel.

Hydrogen Cost

The equivalent-per-gallon cost of hydrogen fuel has decreased over the past three years. Increase in availability is one of the contributing factors to the price decrease, as are technical improvements in the process to create hydrogen fuel. The national average is based on limited numbers of public fueling stations. In fact two of the reporting stations in 2012 offered hydrogen free to consumers; these were not included in the 2012 average.

Fuel	Area	2012 Cost	2009 Cost
Conventional Gasoline	National Average	\$3.37	\$1.86
Hydrogen	National Average	\$3.49	\$12.32

Fuel type cost comparison, 2009-2012. Source: AFDC.