



## Green Auto Market

The Business of Green Cars, Fuels & Technologies

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## The latest trends in U.S. alternative fuel infrastructure and future fuels

### Infrastructure: US Fueling and Charging Stations – September vs. April

Biodiesel (B20 and above): 198 – down from 211 in April

Compressed Natural Gas (CNG): 952 – up from 945 in April

Electric Vehicle Charging Stations: 16,245 – up from 15,794 in April

Ethanol (E85): 3,005 – up from 2,899 in April

Hydrogen: 39 – up from 34 in April

Liquefied Natural Gas (LNG): 76 – at the same number as April

Liquefied Petroleum Gas (Propane): 388 – up from 318 in April

Source: Alternative Fuels Data Center

Alternative fuel stations are continuing to see slow growth, with propane autogas and electric vehicle charging stations running counter to that trend. Here's a look at the latest trends and other clean fuels that are expected to come to market:

- **Propane autogas** saw the largest increase rate at 22% growth since April 2017. That follows a long period of propane fueling station decline as the industry continued to go through reorganization and consolidating stations. Fleets bringing in propane, including school buses, have installed more of their own private propane stations.
- **EV charging stations** have seen an increase of 2.85% since April 2017. It is the largest of the green infrastructures in the U.S., but it's still only about 10% the size of the country's 168,000 gasoline stations. The gains have been impressive for charging stations in the past five years, with Level 2 chargers being the standard and more fast chargers (including Tesla Superchargers) being installed each month.
- **Compressed natural gas** growth rate is taking a slower pace than it had been seeing, with a 0.74% growth rate since April. CNG stations are much more costly to install than propane and EV charging. Fleets dedicated to CNG-powered vehicles have typically made their own infrastructure investments, adding more fuel pumps as needed. Propane has seen a competitive edge over natural gas, with one Autogas for America study analyzing a CNG station costing between \$400,000 and \$1,700,000. A comparable autogas station costs between \$45,000 and \$175,000.
- **Ethanol stations** continue to be in a state of slow growth and lack of clarity over its future. Most of its stations are in the Great Lake states, Midwest, and Northeast; with Florida, Texas, and California also having several stations with up to e85 in their gas pumps. The Trump administration appears to be supportive of ethanol in the Renewable Fuel Standards, but competition will be increasing from other fuels and vehicle technologies.

- **Hydrogen** is in a similar state as it's been over the past five years with California being the hub, two stations in South Carolina and only two in the Northeast. It will see growth, but the cost is heavy and California continues to be the most supportive market for matching funds and incentives.
- **Biodiesel** is on a decline in available public stations. Renewable diesel is taking off with several fleets, and several fleets are leaving diesel engine vehicles behind altogether.
- **Liquefied natural gas** is staying flat, with much of the opportunity for suppliers happening overseas.
- **The U.S. Dept. of Energy's Alternative Fuels Data Center** sees five fuels classified as "emerging alternative fuels:"
  1. Biobutanol
  2. Dimethyl ether
  3. Methanol
  4. Renewable hydrocarbon biofuels (such as renewable diesel)
  5. Renewable natural gas

Some were considered alternative fuels under the Energy Policy Act of 1992 and may qualify for federal and state incentives and laws. State incentives can sometimes support funding R&D and trial projects with fleets using these fuels. As for the existing refueling infrastructure and interest from fleets and applications to current vehicles, renewable natural gas, renewable diesel, and dimethyl ether have the most promise.



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