

# California exceeds low-carbon fuel standard targets

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Since California's Low Carbon Fuel Standard went into effect in 2011, low carbon transportation fuels have displaced roughly 2.14 billion gallons of gasoline and 77 million gasoline gallon equivalents of diesel, according to a new report by the Institute of Transportation Studies at the University of California, Davis. This prevented the emission of about 2.8 million metric tons of carbon dioxide emissions, equal to removing half a million vehicles from the road.

UC Davis researchers helped create the framework for the nation's first Low Carbon Fuel Standard (referred to as LCFS) in 2007 as a strategy to reduce California's greenhouse gas emissions. Low carbon fuels include biofuels from waste and plant materials, natural gas, electricity used in plug-in vehicles, and hydrogen used in fuel cell vehicles.

"Most people know about California's cap and trade program," said lead author and ITS research scientist Sonia Yeh, referring to the pollution-control program that allows companies releasing high levels of emissions to buy emissions permits from lower-emitting companies. "But in terms of the total impact of reducing California's [greenhouse gas emissions](#), the Low Carbon Fuel Standard policy is just as important."

The LCFS requires oil producers, importers and other fuel providers to gradually reduce the carbon intensity of their transportation fuel mix—from 0.25 percent in 2011 to 10 percent by 2020.

The state's bank of net excess credits—the equivalent of preventing the

release of 1.3 million metric tons of carbon dioxide into the atmosphere—at the end of 2012 represents roughly half of what is needed to cover the policy's target for 2013, the report found.

The policy encourages companies to either make investments in low-carbon [fuel technologies](#) or use the carbon credit market to buy greenhouse gas emission reduction credits from other companies that can produce transportation fuels that mitigate emissions at lower cost.

Overall, California has lowered the carbon intensity of its transportation fuels since the standard took effect. However, continued investment in more low carbon fuels is needed to meet the regulation's goals through 2020.

Using data from the California Air Resources Board, the report aims to make policy performance more transparent and easily accessible to the public, policymakers and stakeholders.

Highlights from the report include:

- In 2012, low carbon fuels displaced 1.06 billion gallons of gasoline and 45 million gasoline gallon equivalents of diesel. Overall, low carbon fuels contributed about 6 percent of the total transportation fuel mix.
- Of the credits, 78 percent were generated from ethanol from corn, other grains and sugarcane; 12 percent from natural gas and bio-based gases, such as liquid and compressed natural gas; 9 percent from biodiesel and renewable diesel; and 1 percent from electricity. Biofuels from waste materials made up less than 1 percent of biofuel volumes but generated 10 percent of biofuel credits, due to their low carbon intensity.
- Credit prices reported to the California Air Resources Board averaged about \$13.50 per metric ton of carbon dioxide

equivalents in 2012 and \$27.70 for the first two months of 2013.

The report, "Status Review of California's Low Carbon Fuel Standard—Spring Issue" was written by Yeh, ITS assistant project scientist Julie Witcover, and Transportation Technology and Policy Ph.D. student Jeff Kessler. It is the second in what the Institute of Transportation Studies expects to be a series of "status reviews" of California's LCFS. The first was published in November 2012.

## About the Low Carbon Fuel Standard

Former California Governor Arnold Schwarzenegger issued an executive order in January 2007 to enact a low carbon fuel standard, the first such mandate in the nation. The California Air Resources Board was charged with developing and implementing the standard. The executive order tasked a University of California team, led by Daniel Sperling, director of the Institute of Transportation Studies at UC Davis, and the late Alexander Farrell of UC Berkeley, with providing the technical and scientific framework for the development of California's Low [Carbon Fuel](#) Standard. Their reports became the backbone of the standard, which was adopted in 2009 and took effect in January 2011.

Provided by UC Davis

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