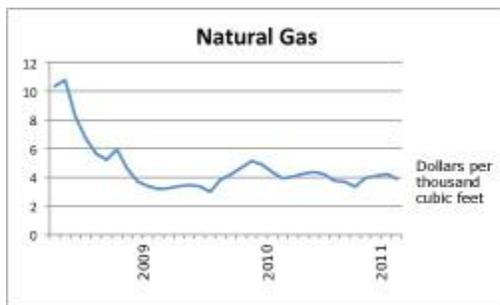


CTA on sidelines as others embrace clean, cheap natural gas

By Steve Louie
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U.S. Energy Information Administration/Steve Louie/MEDILL

On January 12, 2011 the Los Angeles Metro retired its last diesel-run bus. It was a celebrated achievement for a city that has been buying compressed natural gas buses for the last 18 years, an alternative fuel hailed by industry supporters as cleaner than both gasoline and diesel.

Chicago, a city often lauded for its green efforts, has chosen to remain on the sidelines on CNG, except for a few vehicles in the city's non-revenue fleet. Instead, the city uses ultra-low sulfur diesel buses and diesel-electric hybrid buses.

All vehicles delivered after 2007 have clean diesel engines that meet emissions standards, according to the CTA. But those vehicles are still dirtier than CNG-powered buses, said Ted Barnes, principal engineer in advanced energy systems at the Gas Technology Institute in Des Plaines.

Diesel-electric hybrids also burn dirtier than CNG on a per-gallon basis, but they're more efficient. Still, as Barnes points out, CNG-electric hybrids are also available and the bottom line is that CNG is cleaner than diesel.

"Natural gas innately has less carbon per unit of energy, so when it's burned it burns cleaner – typically from 25 percent to 50 percent cleaner for greenhouse gases, and up to 90 percent for some of the other smog-forming and hazardous gases that come from vehicles," said Barnes.

The success of CNG in Los Angeles has led several dozen other cities to move in that direction, with mixed results. But the city of Chicago isn't planning a switch to CNG anytime soon.

“The CTA explored the idea a number of years ago and determined that it wasn’t a cost-effective investment at the time due to the cost to purchase new buses, as well as a significant upfront capital investment to install the necessary fueling, maintenance and safety equipment,” a CTA representative wrote in an email.

L.A. Metro spent an estimated \$1 billion over the past 15 years as it made the transition to CNG, said John Drayton, manager for vehicle technology at the L.A. Metro.

There are federal tax incentives and grant money available to help finance infrastructure, but in the case of the L.A. Metro, the city shouldered much of the cost.

With both Chicago and the state of Illinois facing budget shortfalls, where to find that kind of money would be the first of many difficult questions.

Natural gas becomes more viable as a fuel

To be fair, the CTA’s decision on CNG came before new drilling and transporting technologies made the fuel less expensive and thus more viable.

The combination of two new techniques—horizontal drilling and hydraulic fracturing—has made it possible for drillers to release natural gas trapped in hard shale rock. This process helps the gas flow into pipelines, and is expected to allow extraction of a vast amount of untouched natural gas deposits.

“A few years ago before shale broke, natural gas prices went through the roof, largely because we’d already started forcing utilities to move to natural gas generation to get away from coal,” said **Sterling Burnett**, a senior fellow at the **National Center for Policy Analysis** in Dallas.

But since July 2008, the price of natural gas has fallen 61 percent, from \$12.59 per thousand cubic feet, to \$4.80.

“The biggest change in the last two to three years is that natural gas has become compellingly cheaper than diesel,” L.A. Metro’s Drayton said. “We’ve increasingly seen that natural gas is a less expensive fuel stock to put into an engine and move a bus down the street.”

The reduced fuel cost is what helped L.A. push through to 100 percent conversion to CNG, he said.

As it applies to fueling vehicles, on an energy-equivalent basis, CNG costs \$1.56 less per gasoline-gallon equivalent than diesel, according to a report by the U.S. Department of Energy. Those dollars add up for a fleet of roughly 1,800 buses in a city as large as Chicago.

The L.A. Metro saves \$30.7 million per year on CNG, Drayton said.

“Another main barrier is trying to crack that fuel availability problem,” said Chris Benge, intergovernmental and enterprise director for the city of Tulsa. Tulsa, led by Mayor Dewey F.

Bartlett Jr., is pursuing an aggressive transition to CNG vehicles for both its bus fleet as well as its garbage trucks.

Making fuel available is much easier to manage with a central fueling station, like the ones most metropolitan fleets use, Bengé said.

Start-up, maintenance costs daunting

Cities that bought CNG buses but didn't have the necessary infrastructure or training programs in place were "less happy" with the switch-over, **Burnett** said. "There's a number of things packed into the equation," he added.

Fleet size, training programs, fueling infrastructure, maintenance costs, and even the scope of public relations campaigns were outlined as success factors for CNG implementation in a 2002 report by the National Renewable Energy Laboratory.

The report surveyed the experiences of 42 transit agencies that had integrated natural gas buses into their operations as of June 2001. While the data is a decade old, lessons learned from the successes and failures are relevant today.

For example, maintenance crews need to be retrained to work on CNG engines. That's an expensive process. There's also the cost of retrofitting bus-fueling stations, not to mention the fact that the buses themselves cost more, as does their maintenance.

"Just a simple example is spark plugs," said L.A. Metro's Drayton. "You never have to change a diesel spark plug. There's no such thing – whereas with a natural gas vehicle you have a maintenance interval, every 15,000 to 18,000 miles you have to change out the spark plugs."

Drayton said the fueling system is also more complicated, and that natural gas systems need to be inspected every three years.

Some cities reported that CNG buses broke down more often than their diesel counterparts.

"What's even worse than high gasoline prices, is no transit at all," **Burnett** said. "In the end, liability is more important [to the city] than price."

Future of shale gas drilling a wild card

Drilling for shale gas is likely to face regulatory and political hurdles in the future, as environmental groups highlight potential risks, such as contaminated aquifers and water supplies.

The state of New York has placed a moratorium on new shale gas production, meaning that for now, no new permits will be authorized to break ground on new wells.

The province of Quebec has also placed a moratorium on new shale exploration for the next two-

and-a-half years.

“As with every other environmental challenge, these challenges will only become greater over time, and my suspicion is they will shut down shale gas whether they have evidence of harm or not,” **Burnett** said, adding that no study has ever found a causal connection between hydraulic fracturing and water table contamination.

The Environmental Protection Agency is investigating the safety of hydraulic fracturing, and the initial results are due in 2012.

For now, Chicagoans will have to wait to see whether CNG will become the fuel of the future, or if something new will emerge.

“We remain open to whatever technologies, including CNG, that provide the best combination of benefits from both business and environmental standpoints,” the CTA representative said.

There are two ways to interpret the term “green city.”