

This Space Available:
Send photos of your natural gas buses to hseiff@cleanvehicle.org and we'll show them off here in later editions of *TUG Tidbits*!

TUG Tidbits

Newsletter of the Natural Gas Transit Users Group

March, 2007

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“Free” Money for Natural Gas Bus Users!

The Transportation Act of August 2005 provides a substantial "rebate" for the use of natural gas fuel in your buses and other vehicles. Your fleet may be able to claim this rebate, EVEN IF YOU DON'T PAY TAXES!

The February 26 edition of *Fleets and Fuels* reports that LA Metro, the nation’s largest natural-gas bus fleet, got a check “for \$1.735 million for October alone, reflecting use of the diesel gallon equivalent of about 3.5 million gallons of CNG.” We calculate that a smaller fleet we've recently spoken to, with, having about 50 natural gas buses, may be eligible for a payment/credit of almost \$250,000 for 2007. And WMATA (Washington, DC) with around 400 natural gas buses expects to get \$2.5 million annually.

In January we sent you a flyer explaining more about the natural gas fuel rebate. For another copy click on the icon or contact Hank Seiff at hseiff@cleanvehicle.org.



Show Me the Money
for Transit.doc

Deere to Exit NGV Engine Market

John Deere Power Systems (JDPS) will end production of its 8.1L compressed natural gas (CNG) engines for use in school buses, transit buses, urban buses and waste haulers at the end of 2007. Order deadline is October 15, 2007.

Deere will continue to maintain support of its natural gas dealer network and parts for the 8.1L natural gas engines will continue to be available for 10 years after the end of production.

The February 12 edition of *Fleets and Fuels* reports the reason for leaving the market "...is resources, as Deere is engineering its (off-road) diesel engines to meet new emissions rules, diverting funding from the natural gas side."

Contact Tom Withers (319-292-4617, WithersTomK@JohnDeere.com) or Tom Cummings (319-292-5220, cummingstome@johndeere.com) for more information.

2006 TUG Meeting Presentations and Proceedings now Available

The October 2006 TUG meeting at LA Metro focused on training CNG cylinder safety inspectors, but also included a number of presentations, such as information on a hydrogen and HCNG (blend of hydrogen and CNG) project in California, a report on natural gas bus "incidents" and a summary of LA Metro's "first responder" training program. Copies of these presentations are available on the "members only" section of the TUG website at <http://www.nrel.gov/extranet/vehiclesandfuels/tug/>. If you don't already have a username and password for that part of the website, contact Hank Seiff at hseiff@cleanvehicle.org.

Capital's Air Quality Improving

The December 22, 2006 edition of "The Hindu – Indian's National Newspaper" reports that air quality in New Delhi, India's capital city, has improved over the past 15 years.

"Of all the interventions made to clean up Delhi's air, conversion of diesel-run buses into CNG mode has been the most important. The CNG's programme has made a huge difference to air quality." These results were found in a study conducted by "Resources for the Future," a think-tank located in Washington, DC.

While carbon monoxide and sulfur dioxide levels have fallen, NO_x levels have risen, attributed primarily to an increase in diesel-powered cars and light trucks, but also to the general increase in traffic levels.

Two New Fuel Cell Bus Studies Available from NREL

The DOE's National Renewable Energy Laboratory (NREL) recently published two preliminary reports on its evaluation of hydrogen internal combustion engine (ICE) and fuel cell buses in service at SunLine Transit Agency (Thousand Palms, California) and AC Transit (Oakland, California.) The SunLine report can be downloaded at http://www.eere.energy.gov/hydrogenandfuelcells/tech_validation/pdfs/41001.pdf and the AC Transit report at <http://www.nrel.gov/hydrogen/pdfs/41041.pdf>.

SunLine evaluated one hydrogen hybrid ICE (internal-combustion engine) bus and one fuel cell bus. The \$1.2 million ICE bus was built by New Flyer and uses ultracapacitors for fuel storage and a Ford V10 Triton engine customized to operate on hydrogen. The fuel cell bus, manufactured by Van Hool and ISE Corp using an electric hybrid drive system with a UTC Power PureMotion™ 120 fuel cell power system and ZEBRA batteries, cost \$3.1 million. SunLine compared the hydrogen prototypes with new Orion CNG buses with CWI C Gas Plus engines (at a cost of \$375,000 each). The fuel economy of the fuel cell bus and the hydrogen hybrid ICE buses was 149% and 46% higher (per gge – respectively - not counting the higher cost of hydrogen than CNG – see below) respectively than the CNG buses. The maintenance costs of the fuel cell and hydrogen ICE buses were 76% and 120% higher respectively than the CNG buses. The CNG buses have had very few road calls, while the fuel cell and hydrogen ICE buses have had several road calls and lower vehicle usage (about half or less than that of the baseline CNG buses) which is indicative of their prototype nature.

AC Transit compared three Van Hool/ISE hybrid-electric fuel cell buses with diesel baseline buses powered by Cummins ISL engines. The fuel cell buses averaged 6.22 miles per diesel gallon equivalent, compared to around 4 for the diesel buses. When including the approximate cost of hydrogen at \$8 per kilogram, the fuel cost per mile of the fuel cell buses was \$1.45 compared to \$0.58 per mile for the diesels at \$2.30/gallon. The maintenance cost per mile (without warranty costs) for the fuel cell buses were 71% higher than for the diesels. The diesel buses had an average of 4,468 miles between roadcalls while the fuel cell buses had 773 miles between road calls.

In both cases the reports stress, “There is no intent to consider the implementation of these hydrogen-fueled transit buses as commercial (or full revenue transit service).”

“NREL’s Technology Validation team evaluates fuel cell buses for the Hydrogen, Fuel Cells, and Infrastructure Technologies Program within the U.S. Department of Energy. All fuel cell bus publications can be found at this link: http://www.nrel.gov/hydrogen/proj_fc_bus_eval.html”

Landfill Gas to Help Fuel OCTA Buses

On January 11th, Prometheus Energy became the first in the world to produce commercial quantities of liquefied natural gas from a landfill when it began producing LNG at the Frank R. Bowerman Landfill in Orange County, California. The facility is now producing about 1,000 gallons of the LNG per day, which will be used in buses operated by the Orange County Transit Authority. Prometheus plans to expand its capacity to about 35,000 gallons per day by the end of the year. "The landfill flares enough gas to make about 40,000 gallons of LNG, so there's considerably more capacity," said Prometheus' Dan Clarkson.

Prometheus also is in the design phase of an LNG project at the Kiefer Road Landfill in Sacramento County, California, and is building another facility that would produce LNG from a stranded gas well in San Joaquin County, California. In addition, Prometheus has formed LNG Silesia with Polish firm CETUS Energetyka Gazowa to commercialize methane from coal mines. The first phase of a project in southern Poland calls for the production of 10,000 gallons per day of LNG. Together, the Poland and California projects would have an estimated production capacity of 65,000 gallons of LNG per day.

For more information, contact Dan Clarkson at 206/267-0800 or dclarkson@prometheus-energy.com. (source: NGV America Newsletter 1-26-07)

New Natural Gas Bus Purchases Around the World

Los Angeles, CA: Los Angeles International Airport approved the purchase of 21 CNG transit buses from North American Bus Industries, to provide shuttle service between airport terminals and parking facilities. The purchase is part of LAX's "...ongoing commitment to replace existing gasoline-powered vehicles in the airport's fleet with alternative-fuel vehicles...." (Source: LAX Press Release 12-4-06)

Burlington, VT: The University of Vermont has purchased two CNG buses for its Campus Area Transportation System – with the fleet planned to grow to six by fall 2008. A press release brags, “this is not a noisy vehicle spewing a black cloud of diesel smoke. It sounds quiet and there is no smell from the tailpipe.” The buses are fueled by Vermont’s first fast-fill CNG refueling station. “Particulate pollution on these CNG buses should be about 100 times lower than what you get from typical

buses,” says UVM engineering professor Britt Holmen, an expert on vehicle emissions.

Santa Clarita, CA “operates 14 of its full-sized New Flyer buses on compressed natural gas fuel and confirms plans to convert all of its approximately 100 buses to CNG.” (Source: Fleets and Fuels, 1-15-07)

Orange County (CA) Transportation Authority (OCTA) has ordered 531 Cummins Westport engines to be installed in new buses and to repower older ones... OCTA will use the new 0.2 gm NOx ISL G engine and the C Gas Plus model.” (Source: 12/18/06 CalNGV News)

Shenzhen City, China: The Guang Dong Province Liquefied Natural Gas (LNG) project is now providing fuel for the expansion of NGV use in Shenzhen City, one of the major port cities in China. Buses, taxis and trash trucks in the city are mainly powered by CNG, with some fuel being provided by LCNG and LNG facilities. By 2010, it is forecast that 10,000 NGVs will be in operation, rising to 21,000 by 2020. (Source: NGVAmerica Newsletter 1-5-07)

Karachi, Pakistan: Pakistan’s “federal government has approved an ambitious program to introduced CNG-based public transport systems in all major cities in five years. The project is aimed at replacing the existing diesel vehicles with CNG buses.... Karachi will be the first major city to benefit under the plan as about 500-600 CNG buses will hit the city roads early next financial year, followed by Lahore, Peshawar, Quetta and Rawalpindi-Islamabad.” (Source: Khaleej Times Online, 3-1-07)

Tunis, Tunisia: Iveco Irisbus is delivering two CNG CityClass buses as part of a cooperative agreement between the Italian Ministry of Foreign Affairs and the Tunisian Ministry of Transport. The units will be used to demonstrate how CNG technology can help transport improve air quality, reduce the dependence on oil, improve fuel consumption and improve passenger comfort. (Source: NGVAmerica Newsletter 3-2-07)

Please send all questions, comments, requests for information, etc. to Hank Seiff at 703-534-6151 or hseiff@cleanvehicle.org.