

# AFDC UPDATE

News of the Alternative Fuels Data Center

## Transit Bus Emissions and Operational Data to be Included in AFDC

Extensive exhaust emissions and in-service performance data will be collected from alternative-fuel-powered buses in several transit districts under the Urban Bus Program of the Alternative Motor Fuels Act (AMFA).

This three-year program will use data from alternative-fuel and diesel control buses to focus on understanding the impact of alternative fuels on safety, emissions, reliability, cost, and fuel economy.

The activity will involve about ten buses at each of six tentative sites: Garden Grove, CA; Denver, CO; Miami, FL; Peoria, IL; Houston, TX; and Tacoma, WA. The National Renewable Energy Laboratory (NREL) is administering the program for the U.S. Department of Energy (DOE), which is providing operational funding. Funding for the buses is provided by the Department of Transportation's Federal Transit Administration (FTA).

West Virginia University (WVU) will test the buses for exhaust emissions, using its transportable chassis dynamometer. (See related article below.) WVU will report results through the Alternative Fuels Data Center.



Battelle Memorial Laboratory (Columbus, OH) will provide scientific and engineering support, and will collect and report data to NREL.

Congress established the Alternative Fuels Bus Program (AFBP) under AMFA. The program involves DOE, the Environmental Protection Agency, and the FTA. Because FTA is most closely involved with urban transit bus issues, it has been assigned the lead role in the AFBP through an interagency agreement with DOE. The AFBP is closely integrated with FTA's existing Clean Air Program, which includes the Alternative Fuels Initiative that has funded the purchase of more than 1,000 alternative fuel buses nationwide. □

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## DOE/WVU Mobile Emissions Lab Partnership Completes Successful Year

West Virginia University's Transportable Heavy-duty Vehicle Emissions Testing Laboratory, the first of its kind, had a successful first year, testing 104 heavy-duty trucks and buses in nine cities across the nation.

The transportable chassis dynamometer was funded by the U.S. Department of Energy's (DOE) Office of Alternative Fuels as part of its overall efforts to evaluate the environmental benefits of various alternative fuels. The emissions data will be made available through DOE's Alternative Fuels Data Center (AFDC) in Golden, CO.

The emissions laboratory has the capability of testing the engine without removing it from the vehicle. This feature saves considerable labor hours

and shipping costs. Also, the time that the vehicle is out of service for these tests is significantly reduced.

The laboratory will continue to step up emissions testing during 1993. And, because of the high demand for vehicle testing, DOE has committed to funding a second transportable laboratory.

"We are working for the first time in history with a government agency to develop data on heavy-duty engines after installation," according to Laboratory Director Dr. Reda Bata. "Engines are generally tested by manufacturers using (the) federal test procedure (FTP) prior to installation," he said, "and not after they have been in use."

*(continued on page 2)*

## DOE/WVU Mobile Emissions Lab (continued from page 1)

### *New and Unique Data from Multiple Applications*

Because heavy-duty engines are used in different applications (e.g., vehicles, boats, power stations, and earth-moving equipment), exhaust gas emissions differ. Data from these tests will be analyzed to study the effects of alternative fuels on energy consumption and environmental ecology.

Although data analysis is not yet complete, Bata commented that, "Generally, all the alternative fuel engines tested by the laboratory met the 1994 U.S. Environmental Protection Agency emissions standards because of the use of new alternative fuel technologies."

Fuels included No. 1 and No. 2 diesel fuel, compressed natural gas, liquefied natural gas, liquefied petroleum gas, ethanol, and methanol. Diesel engines were tested with and without particulate traps. Engines running on low-sulfur diesel with additives were tested in several locations.



*Figure 1: Test emissions of Ann Arbor, MI, transit bus using the portable laboratory*

The transportable laboratory tested vehicles during 1992 in Houston, TX; Parkersburg, WV; Pittsburgh, PA; New York, NY; Dayton, OH; Peoria, IL; Phoenix, AZ; Orange County, CA; and Tacoma, WA. Plans are to repeat tests on all 104 vehicles in these locations in 1993, and to include vehicles in other locations.

Vehicles tested by the mobile lab in 1992 varied in age from one to four years, with most produced by original

equipment manufacturers and others converted to alternative fuels by local transit authorities.

For more information about the lab, its capabilities, and operation, contact Dr. Donald Lyons, Chairman of the Department, or Dr. Reda Bata, Laboratory Director, Department of Mechanical and Aerospace Engineering, WVU, P.O. Box 6101, Morgantown, WV, 26506-6101, or call 304-293-3111 (Fax: 304-293-6689). □

## AFDC Shares its Information with Federal and State Fleet Operators

Each year, U.S. federal fleet operators conduct regional symposia under the sponsorship of the Interagency Motor Equipment Advisory Committee (IMEAC). The IMEAC symposia are held at different times through the year with full participation by federal, state, local, Indian reservation, and private fleet operators.

This year, the Department of Energy (DOE) is conducting a series of alternative fuels orientation workshops at the IMEAC symposia as a quick and efficient way to prepare and familiarize fleet operators with the merits and different characteristics of alternative fuel vehicles.

The first workshop was held in Albuquerque, NM in January. Additional workshops will be held as follows:

### **April 14-16**

Kansas City, MO (Regions 5 and 6: WI, MI, IL, IN, OH, MN, NE, IA, KS, MO). Call: Bob Blake at (913) 236-2533.

### **May 4-6**

Sturbridge, MA (Regions 1 and 2: ME, NH, MA, VT, CT, NY, NJ, Puerto Rico, Virgin Islands). Call: Charlie Studley at (617) 835-7327.

### **May 17-19**

Phoenix, AZ (Region 9: CA, NV, AZ, HI, Am. Samoa, Guam, No. Marianna, Pacific Trust Territories). Call: Darla Willis at (415) 744-6073.

### **June 15-17**

Lancaster, PA (Region 3 and Washington, D.C. Area: PA, MD, DE, WV, VA, DC). Call: Maureen Walsh at (215) 597-1076. □

## Energy Policy Act to Greatly Expand Role of OTT, AFDC

This fall, Congress passed the most comprehensive energy bill in more than a decade. The legislation, which should have a significant impact on the market for alternative fuel vehicles, will directly affect the U.S. Department of Energy's (DOE) Office of Transportation Technologies (OTT), and expand activities of the Alternative Fuels Data Center.

Public Law, 102-486, the Energy Policy Act of 1992 (EPACT), will increase OTT's role in transferring innovative transportation technologies to the consumer. The bill puts the Federal government in a leadership position to promote the use of alternative fuels, especially in the commercial sector. In so doing, the work OTT does in gathering and interpreting technical data, and in supporting evaluation research, will be utilized to support DOE policy decisions. In

addition, consumers will be made more aware of the benefits and costs of alternative fuels.

"The time ahead will be exciting and challenging for all of us at OTT," said Acting Deputy Assistant Secretary for OTT, Thomas J. Gross. "With commercialization taking a larger role in OTT's activities, the office's responsibilities will be expanded. The results of our work with industry and others should benefit both the economy and the environment."

OTT's Office of Alternative Fuels (OAF) has the lead responsibility to provide technical expertise and management of many EPACT programs. These include the requirement that alternative fuel "providers" use the alternative fuels they supply to the public; state financial and technical assistance (including a \$10 million grant program); the low-interest small business loan program (a \$25 million program), plus other non-federal fleet programs; an enhanced public information program; certification training programs; an industry survey to define costs and availability of alternative fuels and AFVs; and other infrastructure-building initiatives.

"The future of alternative fuels in transportation is brighter than ever," said OAF Director Jerry Allsup. "We are very excited about the expanded role of alternative transportation fuel programs at OAF, and are looking forward with great anticipation to fulfilling the goals of the EPACT." OAF will work closely with other DOE offices, such as the Office of Technical and Financial Assistance and the Energy Information Administration, to implement EPACT provisions.

Other changes at OAF are in the Fuel Utilization and Data Analysis Division, which will expand its data collection and reporting efforts to include information from compatible demonstration projects. This information ultimately will be available through the Alternative Fuels Data Center. R&D work will include two more fuels: biodiesel and liquefied petroleum gas.

In addition, the bill is expected to expand OAF's biomass program by authorizing more extensive activities to make biomass fuels more cost competitive with conventional fuels, and to actively promote their use in the transportation sector. □

## Seeing is Believing: DOE, NREL and SCRTD Prepare a CNG Safety Video

The U.S. Department of Energy (DOE), the National Renewable Energy Laboratory (NREL), and the Southern California Rapid Transit District (RTD) have worked together to produce two educational video tapes on compressed natural gas (CNG), featuring actress Pam Dawber as narrator.

The shorter tape, "CNG: A Clean Safe Fuel," is 13 minutes long. It summarizes the history and emergence of CNG as a transportation fuel, its fuel characteristics, the refueling process, storage procedures, safety concerns, federal programs, and California's experience with CNG.

The video features safety tests of CNG storage cylinders. The cylinders are shot with a .357 magnum handgun, blasted with dynamite, and dropped 30 feet, while in the trunk of a vehicle. The cylinders endured all tests with no significant damage.

Both videos alleviate concerns people may have about switching from liquid fuels to gaseous fuels. The film's safety rules and precautions are intended to convince viewers to be careful with, but not afraid of, CNG.

"Safety First with CNG: An Introduction to CNG Safety for Fleet Operators," is a 17-minute version of the same video. It offers more detailed information on fueling sites, refueling options, storage procedures and concerns, and issues affecting the fleet operator. The video also offers suggestions on planning the construction of a CNG refueling facility.

For a free VHS copy of either video, contact the National Alternative Fuels Hotline at 800-423-1DOE or 202-554-5047. □

## Atlanta to Become Site of Concentrated Demonstration Program

Atlanta, host of the 1996 Olympic Games, will begin a concentrated alternative fuel demonstration project. The U.S. Department of Energy (DOE) will work closely with the city of Atlanta, providing strong technical assistance.

The Olympic site was chosen to maximize media and public exposure. "If the last Olympics in Barcelona is any indication, this next Olympics will attract 15,000 reporters and millions of spectators and participants," according to DOE Program Manager Frank Mallgrave.

The project's main goals are to open alternative fuel refueling sites on major arteries and to improve air quality in Atlanta before the Olympic Games by burning cleaner fuels.

Program participants expect that by the time the Olympic torch is lit, 10,000 vehicles in Atlanta will be running on alternative fuels. By 1996, DOE and its partners anticipate a large number of new vehicles sold in Atlanta will fuel with an alternative to gasoline, and that major private fleet vehicles will do the same.

## Large-scale Private and Public Commitments

The federal government has committed to placing maximum numbers of alternative fuel vehicles (AFVs) in Atlanta to meet the needs identified by federal agencies in the area.

Amoco has announced plans to install several new compressed natural gas (CNG) refueling stations at the end of 1993, and Tren Fuels Inc. will provide six refueling stations. The stated goal is that Atlanta will be the first major city to have a completed CNG refueling infrastructure by the end of 1993.

The measure of the goal is that a motorist operating a vehicle on CNG in Atlanta will be no more than 15 minutes from a refueling site day or night.

Atlanta Power will spearhead a separate but related effort, and has committed to opening public recharging stations for electric vehicles.

Interest in the Atlanta project is mushrooming, according to Mallgrave, who is working on a similar partnership between the city of Philadelphia, DOE, the state of Pennsylvania, Philadelphia Gas Works, and Sunoco.

Data on refueling sites and emissions tests will be available to the Alternative Fuels Data Center. □

TV camera crews turn out for dedication of Amoco CNG refueling site for Atlanta demonstration program



## Initial Emissions Results Look Promising for M85 Vehicles

Newly released demonstration fleet-vehicle emissions results, which will be available in the Alternative Fuels Data Center, indicate a significant hydrocarbon emissions decrease

in M85 (85% methanol/15% gasoline) powered vehicles compared to conventional gasoline-fueled vehicles.

The M85 vehicles proved to reduce evaporative hydrocarbon emissions by an average of 0.42 gram per test and showed a small reduction in exhaust hydrocarbon emissions over the gasoline-powered vehicles.

The emissions tests were performed on 17 different vehicles. To portray unbiased emission levels, M85

Chevrolet Lumina, M85 Ford Taurus, and two gasoline powered Chevrolet Lumina and two gasoline powered Ford Taurus were tested. "Due to variability between laboratories and test results," according to Ken Kelly of the National Renewable Energy Laboratory, "extensive testing from vehicles used in typical operation is necessary to portray a reliable analysis of emissions data." (See related article, page 5.) □

## DOE Expands Light-duty Vehicle Emissions Testing

As a direct result of the increase in federal alternative fuel fleet vehicles, emissions testing of the U.S. Department of Energy's (DOE) demonstration fleets will be significantly expanded this year. The AMFA fleets grew from 65 vehicles in 4 cities (in 1991) to 3,267 vehicles in 9 cities (in 1992).

Testing will expand from a dozen Chevrolet Lumina and Ford Taurus cars, powered by M85 (85% methanol and 15% unleaded gasoline) and gasoline control vehicles, to more than 800 vehicles, including compressed natural gas, M85, E85 (85% ethanol and 15% unleaded gasoline), and additional control vehicles. More than 1,400 tests will be performed. DOE will organize the vehicle emissions tests. One goal, according to John Garbak, DOE's Light-duty Vehicle Program Manager, is to determine if there is a correlation between the Environmental Protection Agency (EPA) Federal Test Procedure (FTP) and the IM240, a shorter inspection and maintenance test. The FTP evaluates vehicle emissions over a lengthy driving cycle, while the IM240 is a test run during the FTP evaluation. If a strong correlation exists, DOE may eliminate the lengthy FTP during future emissions testing programs.

The selected vehicles will be tested at 4,000 and 10,000 miles and every 10,000 miles accumulated thereafter — or annually — whichever is more frequent. The results of the emissions tests will be made available in the Alternative Fuels Data Center.

DOE, through the National Renewable Energy Laboratory, intends to award approximately 14 subcontracts to complete emissions testing in each fleet location. The subcontracts are expected to be announced in mid-March. □

## Hotline Responds to Callers' Questions on EPACT



The National Alternative Fuels Hotline has responded to many calls requesting information on the Energy Policy Act of 1992 (EPACT), passed late last year. Below are answers to some of the most-asked questions that the hotline has received to date:

**Q.** Which fleets are subject to alternative fuel fleet requirements?

**A.** There are federal, state, municipal, private and fuel-provider requirements.

Generally those fleets subject to the requirements are: Federal, state, municipal, private business and alternative fuel-provider fleets of 20 or more centrally fueled vehicles in large population centers greater than 250,000 if the fleet operator owns 50 or more vehicles that are used primarily in metropolitan areas. Each of these fleet categories over the next few years have specific alternative fuel vehicle (AFV) phase-in goals for new vehicles purchased. Exclusions from this rule generally include rental vehicles, motor vehicles held for sale, test vehicles, law enforcement and emergency motor vehicles, military vehicles, nonroad vehicles, and vehicles garaged overnight at personal residences.

**Q.** What types of incentives for switching to AFVs are provided in EPACT?

**A.** Taxpayers can qualify for up to

a \$2,000 tax deduction by converting a conventionally fueled vehicle to an AFV, or by purchasing an original equipment manufactured AFV under 10,000 lbs; \$5,000 for trucks or vans with gross vehicle weights (GVW) of 10,000-26,000 lbs; and \$50,000 for trucks or vans with GVW of more than 26,000 lbs., and buses with seating capacity of 20 or more adults. Qualified electric vehicles may be eligible for up to a \$4,000 tax credit.

If, within three years after the vehicle conversion, a vehicle is converted from an AFV back to a conventional fuel, the benefit of the recapture will be deducted.

**Q.** Which alternative fuels could qualify a vehicle for the tax deduction as defined in the Act?

**A.** Under EPACT, an AFV is defined as one that is either dedicated or "dual fueled" and is capable of operating on an alternative fuel.

The alternative fuels that qualify a vehicle for the tax deductions include: methanol; denatured ethanol; other alcohols separately or in mixtures of 85 vol.% or more; ethers; compressed natural gas; liquefied natural gas; liquefied petroleum gas; hydrogen; and electricity.

For further information, or a copy of a legislative summary, please contact the National Alternative Fuels Hotline at 1-800-423-1DOE. □

## DOE to Fund Vehicle Conversion and Fuel Supply Services

The comprehensive national Energy Policy Act of 1992 (EPACT) will

require federal agencies to purchase 5,000 alternative fuel vehicles (AFVs) in FY 1993 and more than 10,000 vehicles in 1995. Because of a lack of original equipment manufacturers' AFVs, the AFV demand will be met through vehicle conversions. The U.S. Department of Energy's Office of Alternative Fuels was designated in EPACT to make AFV conversions and

*(continued on page 6)*

## Vehicle Conversion/ Fuel Supply Services *(continued from page 5)*

refueling stations accessible for those agencies required to obtain AFVs.

Pursuant to this requirement, the National Renewable Energy Laboratory (NREL) is soliciting organizations interested in providing these services. Although entities capable of providing both functions are preferred, separate refueling and conversion proposals will be accepted. Interested parties must be capable of providing services for a three-year period.

For more information regarding this request for proposal (RFP), write to the National Renewable Energy Laboratory, 1617 Cole Blvd., Golden, CO 80401-3393, attention: Stephen Griffin, Subcontract Section, and reference the RFP number: RU-3-13031. NREL will be accepting proposals until April 9. □

## Meetings and Conferences

**March 17-19:** 4th Annual U.S. Hydrogen Meeting, Washington, D.C. For information, call the National Hydrogen Association at 202-223-5547, or write: National Hydrogen Association, 1101 Connecticut Avenue, N.W., Suite 910, Washington, DC 20036

**March 22-26:** Natural Gas Vehicle Conversion, Hocking College Energy Center, Nelsonville, OH. For more information, call Pat Walsh at 800-262-7980, or write: Pat Walsh, Director Hocking College International Energy Center, 3301 Hocking Parkway, Nelsonville, OH 45764

**May 10-14:** 15th Symposium on Biotechnology for Fuels, Chemicals and Materials, Colorado Springs, CO. For information, call Charles Wyman at 303-231-1753, or write: Charles Wyman, National Renewable Energy Laboratory, 1617 Cole Boulevard, Golden, CO 80401-3393

**June 14-16:** 1993 Windsor Workshop on Alternative Fuels, Holiday Inn Toronto Downtown-City Hall, Toronto, Canada. For information, call Susan Horton at 416-822-4111, Ext. 515, or write: Susan Horton, ORTECH International, 2395 Speakman Drive, Mississauga, Ontario L5K 1B3

**November 7-10:** International Symposium on Alcohol Fuels (ISAF), The Broadmoor Hotel, Colorado Springs, CO. For more information, call Jessica White at 303-231-1158, or write: Jessica White, Conference Coordinator, National Renewable Energy Laboratory, 1617 Cole Boulevard, Golden, CO, 80401-3393

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