

# Motor Pool

## Helps to Clear the Air

### All PWC Washington Vehicles Meet Executive Order for Federal Fleets



**T**he Navy Public Works Center (PWC) Washington is setting the example for government motor pools. One hundred percent of their Executive Motor Pool now uses alternative fuel.

The recent arrival of 14 compressed natural gas powered Crown Victorias replaced the last of the gasoline-powered vehicles in the motor pool.

In April 2000, then-President Bill Clinton signed Executive Order Executive Order 13149 “Greening the Government Through Federal Fleet and

Transportation Efficiency” that requires Federal government fleets to set the example for environmental responsibility by increasing the use of alternative fuels and reducing consumption of petroleum. This set a goal for the Federal government to reduce fuel consumption by 20 percent from the 1999 baseline.

“We will accomplish this reduction through a three-pronged approach—fewer vehicles, more fuel efficient vehicles and more alternative fuel vehicles.”



Leroy Tillery, supervisor for PWC Washington’s Executive Motor Pool, test drives one of the new natural gas powered Crown Victorias that replaced the last of the gasoline-powered vehicles in the motor pool. These vehicles are used to transport flag officers and senior government officials around the Washington, DC area taking an estimated 60,000 trips a year.

## DIFFERENT TYPES OF ALTERNATIVE FUELS

The types of alternative fuels are constantly expanding. At the present time, there are six primary alternative fuels in use or under development in the United States:

### ■ Compressed Natural Gas (CNG)

Natural gas is a mixture of hydrocarbons—mainly methane—and is produced either from gas wells or in conjunction with crude oil production. The interest for natural gas as an alternative fuel stems mainly from its clean burning qualities, its domestic resource base, and its commercial availability to end-users. Because of the gaseous nature of this fuel, it must be stored onboard a vehicle in either a compressed gaseous state (CNG) or in a liquefied state (LNG). The main constituent of natural gas is methane, which is a relatively unreactive hydrocarbon.

### ■ Biodiesel

Biodiesel is a cleaner-burning diesel fuel made from natural, renewable sources such as vegetable oils. Just like petroleum diesel, biodiesel operates in combustion-ignition engines. Essentially no engine modifications are required, and biodiesel maintains the payload capacity and range of diesel. The use of biodiesel in a conventional diesel engine results in substantial reduction of unburned hydrocarbons, carbon monoxide, and particulate matter. Emissions of nitrogen oxides are either slightly reduced or slightly increased depending on the duty cycle and testing methods.

### ■ Electric Fuel

Electricity is unique among the alternative fuels in that mechanical power is derived directly from it, whereas the other alternative fuels release stored chemical energy through combustion to provide mechanical power. Motive power is produced from electricity by an electric motor. Batteries commonly provide electricity used to power vehicles, but fuel cells are also being explored. Batteries are energy storage devices, but unlike batteries, fuel cells convert chemical energy to electricity.

### ■ Ethanol

Ethanol (ethyl alcohol, grain alcohol) is a clear, colorless liquid with a characteristic, agreeable odor. In dilute aqueous solution, it has a somewhat sweet flavor, but in more concentrated solutions it has a burning taste. Ethanol is an alcohol, a group of chemical compounds whose molecules contain a hydroxyl group bonded to a carbon atom. Two higher blends of ethanol, E-85 and E-95, are being explored as alternative fuels in demonstration programs. Ethanol is also made into an ether, ethyltertiary-butyl ether (ETBE), that has properties of interest for oxygenated gasoline and reformulated fuels.

### ■ Methanol

Methanol is an alcohol fuel. Today a process using natural gas as a feedstock produces most of the world's methanol. However, the ability to produce methanol from non-petroleum feedstocks such as coal or biomass is of interest for reducing petroleum imports. The alternative methanol fuel currently being used is M-85. In the future, neat methanol, or M-100, may also be used. Methanol is also made into an ether, Methyl Tertiary Butyl Ether (MTBE), which is blended with gasoline to enhance octane and to create oxygenated gasoline.

### ■ Liquefied Petroleum Gas or Propane (LPG)

Liquefied petroleum gas (LPG) consists mainly of propane, propylene, butane, and butylene in various mixtures. For all fuels in the United States, the mixture is mainly propane. LPG is produced as a by-product of natural gas processing and petroleum refining. The components of LPG are gases at normal temperatures and pressures. LPG, like natural gas and unlike gasoline, is a simple mixture of hydrocarbons, mainly propane/propylene and butane/butylene.

Source: KNOWnet—The Electronic Logistics Training & Support Network (EL-TRAINS) at <http://www.manageyourfleet.gov/LAI/Module1/alternat.htm>.

“We are open to technology that will help us reduce emissions as well as our reliance on foreign oil.”



PWC Washington has its own filling station for compressed natural gas. Vehicles can be filled up normally, or they can be set on an overnight slow-fill that equalizes tank pressure. The vehicles achieve approximately the same fuel efficiency as gasoline-powered vehicles, except the fuel is cleaner, produces fewer emissions and reduces dependency on petroleum products.



“We will accomplish this reduction through a three-pronged approach,” said Bob Gill, head of PWC Washington’s Transportation Department.

“Fewer vehicles, more fuel efficient vehicles and more alternative fuel vehicles.”

All of the vehicles in PWC’s Executive Motor Pool operate on natural gas or ethanol (a product made from corn). This includes 28 sedans and minivans that make as many as 60,000 trips a year in the local Washington, DC area.

Approximately 175 additional vehicles in PWC Washington’s fleet also run on alternative fuels, including sedans, vans, pick-up trucks and shop vehicles.

This is significant because it complies with Executive Order 13149. It is of added importance in the Washington,

DC area where the Environmental Protection Agency recently downgraded the ambient air quality from serious to severe. With the staggering number of vehicles on the roads in the Washington, DC area every day, cleaner emissions are paramount to improving air quality.



LEFT: Leroy Tillery tops off the compressed natural gas in one of the motor pool's newest Crown Victorias. Fourteen of these sedans replaced the last of the gasoline-powered vehicles in the motor pool.

BELOW: This specially retrofitted pick-up truck carries spare tanks of compressed natural gas and can be used as a mobile emergency refueling station for natural gas powered vehicles in the PWC Washington fleet. The service truck was designed and retrofitted by PWC mechanics.



## Highlights of Executive Order 13149

The purpose of this Executive Order is to ensure that the Federal government exercises leadership in the reduction of petroleum consumption through improvements in fleet fuel efficiency and the use of alternative fuel vehicles (AFVs) and alternative fuels.

- 20 percent reduction in annual petroleum consumption from the FY 1999 baseline for light duty acquisitions by FY 2005.
- Use alternative fuel in AFVs the majority of the time by FY 2005.
- Increase average fuel economy of new light duty acquisitions by 3.0 miles per gallon by FY 2005.
- Exemptions for security and emergency vehicles; annual compliance reports to the Department of Energy.
- Supersedes Executive Order 13031 "Federal Alternative Fueled Vehicle Leadership".

Source: KNOWnet—The Electronic Logistics Training & Support Network (EL-TRAINS) at <http://www.manageyourfleet.gov/LAI/Module1/alternat.htm>.

"We are also investigating hydrogen cell technology and the use of bio-diesel," Gill said. Bio-diesel is a fuel made from soy. "We are open to technology that will help us reduce emissions as well as our reliance on foreign oil."

For more information about Alternative Fuel Vehicles, visit <http://www.manageyourfleet.gov/>.

For more information about Executive Order 13149, visit <http://frwebgate.access.gpo.gov/>. [↕](#)

Photos by John Verrico.

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